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**RESOURCE-BASED COMPETITION BETWEEN
RETAILERS AND E-TAILERS WITHIN THE MARKETSPACE:
A SUPPLY CHAIN PERSPECTIVE OF E-COMMERCE**

DOCTORAL DISSERTATION

JESUS BENJAMIN RODRIGUEZ GARCIA

Monterrey, N. L.; June 2006

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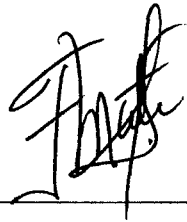
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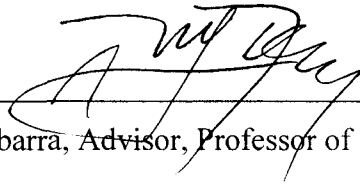
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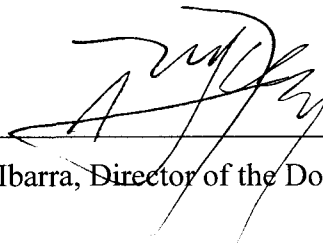
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Dr. Alejandro Ibarra, Director of the Doctoral Program

To my wife Eda and my son Benjamín

To my parents Inés and Oscar

To my brother Isidro, and my sisters Mely, Vicky, Angelina, and Edna

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This Ph.D. was a family project, I want to thank my wife Eda for her love and support during this time, and my soon Benjamín for being my source of courage and happiness. I want to thank the authorities of ITESM Campus Sinaloa, Francisco García and Randolpho Álvarez, who believed in this project and provided me of the necessary resources and motivation to achieve this purpose. The completion of this project would not have been accomplished without the commitment and support of my dissertation committee members. I would like to thank Dr. Socorro Marcos for her advises to improve this research work, Dr. Alejandro Ibarra who not only enthusiastically advised me in this project but also gave me his encouraging support as the Director of the Ph.D. in Business Administration, and specially to Dr. Fernando Mata for not only being my main research advisor but also being my mentor and friend. I would also thank Dr. Germán Otálora, Dr. Bryan Husted, Dr. Ricardo Flores, Dr. Alberto Rodríguez, Dr. Nicolás Gutiérrez, Dr. Agustín Buendía, Dr. Oscar Garza, Dr. Jorge Pedroza, Dr. Edwin Abán, Dr. Elisa Cobas, Josefina Cárdenas, Gregorio Vázquez, and all my colleagues and friends from the EGADE-ITESM that generously helped me to satisfactorily conduct my empirical investigation. Finally, I would like to acknowledge all the people that directly or indirectly contributed to allow me to succeed in this transcendental project in my life.

**RESOURCE-BASED COMPETITION BETWEEN
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Jesús Benjamín Rodríguez García, Ph.D. in Business Administration
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Main Advisor: Fernando Mata Carrasco

This dissertation is composed of three individual articles which are related each other. The purpose of this investigation was to theoretically develop a conceptual model for the analysis of the competitive environment where traditional retailers compete against e-tailers. To accomplish this purpose, the supply chain management, strategic management, information technologies, and open systems research fields were combined through the three articles. In the first article, a conceptual definition of supply chain management as a management philosophy was developed. The supply chain phenomenon was studied under an open systems perspective to explain why the non-rational motivations of the individuals composing the supply chain should be aligned across the social-psychological, the organizational structure, and the ecological levels of supply chain analysis. Using the resource-based view of the firm,

it was explained how it is possible to implement a competitive strategy for the entire supply chain to achieve a competitive advantage for the supply chain as a whole and, in turn, for its members. In the second article, the e-tailer was considered as the last member of a truncated supply chain. The inter-organizational management systems implemented along the chain were considered as supply chain capabilities increasing the e-tailer's customer value and consequently as the basis for achieving and sustaining the e-tailer's competitive advantage. The e-tailing model of B2C e-commerce was described and a model to analyze competition between retailers and e-tailers within the marketspace was developed under a resource-based view of the firm. In the third article, it was assumed that customers decide to buy products through the Internet based on: the value they receive from e-tailers, their reliability concerns related to the e-tailer and the Internet as transaction medium, and the existence of network externalities. The value offered by an e-tailer was defined as a function of: product quality; delivery speed; flexibility to customize the product accordingly to customer specifications; objective costs such as price, and shipping cost; and subjective costs regarding time and location constraints to place an order. A survey was conducted and the empirical results served to partially prove the model developed in the second article.

**COMPETENCIA BASADA-EN-RECURSOS ENTRE TIENDAS FÍSICAS
Y TIENDAS EN-LÍNEA DENTRO DEL ESPACIO DE MERCADO:
EL COMERCIO ELECTRÓNICO BAJO UNA PERSPECTIVA DE CADENA
DE SUMINISTROS**

Jesús Benjamín Rodríguez García, Doctorado en Filosofía en Administración
Instituto Tecnológico y de Estudios Superiores de Monterrey, 2006

Asesor Principal: Fernando Mata Carrasco

Esta disertación se compone de tres artículos individuales relacionados entre ellos. El propósito de esta investigación fue teóricamente desarrollar un modelo para el análisis del ambiente competitivo donde las tiendas físicas compiten contra las tiendas en-línea. Para lograr este propósito, los dominios de investigación sobre administración de la cadena de suministros, administración estratégica, tecnologías de información y sistemas abiertos se combinaron mediante los tres artículos. En el primer artículo se desarrolló una definición de administración de la cadena de suministros como una filosofía de administración. La cadena de suministros se estudió bajo una perspectiva de sistemas abiertos para explicar por qué las motivaciones no-rationales de los individuos que integran la cadena deberían ser

alineadas a través de los niveles de análisis psicológico-social, estructura-organizacional y ecológico. Usando la perspectiva basada-en-recursos, se explicó cómo es posible implementar una estrategia competitiva para obtener una ventaja competitiva para la cadena como un todo y, en consecuencia, para sus miembros. En el segundo artículo, la tienda en-línea es considerada como el último miembro de una cadena de suministros trunca. Los sistemas de administración inter-organizacionales implementados en la cadena fueron considerados como las capacidades de la cadena de suministros que incrementan el valor ofrecido al cliente por la tienda en-línea y consecuentemente como la base para obtener y sustentar su ventaja competitiva. Se describió el modelo de tienda en-línea y se desarrolló un modelo para analizar la competencia entre tiendas físicas y tiendas en-línea dentro del espacio de mercado. En el tercer artículo, se asumió que los clientes deciden comprar un producto a través de internet con base en: el valor que reciben de la tienda en-línea, sus preocupaciones de confiabilidad relacionadas a la tienda en-línea y a internet como medio de transacción, y la existencia de externalidades de la red. El valor ofrecido por la tienda en-línea se definió como una función de: la calidad del producto, la velocidad de entrega, la flexibilidad para personalizar el producto, y los costos objetivos y subjetivos. Se realizó una encuesta y los resultados empíricos sirvieron para probar parcialmente el modelo desarrollado en el segundo artículo.

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CHAPTER 1

INTRODUCTION

In an exploratory study Hawk (2004) found out that the main macroeconomic factors restraining the ramp up of e-commerce in developing countries are: Lack of telecommunications infrastructure, low computer and internet penetration, lack of internet skills, low average income, distrust in payment options, and poor delivery infrastructure. However, although most of those factors were partially resolved in the USA during the “dotcoms fiasco” period, from 1995 to 2000, there was a mass failure of e-commerce firms and only a small number of strong survivors managed to remain in the market (Razi et al., 2004). The dotcoms fiasco suggests that although the external environment affects firm performance, organizations are capable of undertaking different initiatives in order to survive.

1.1. Resurgence of e-commerce after the dotcom fiasco

The term “dotcom” is generally used to refer to a firm using internet as the interaction medium to implement its business model; i.e. a dotcom is a firm performing e-commerce activities (Laudon and Traver, 2004). Dotcoms make revenues by one or more of the following alternatives: sales of physical products, sales of services, advertising, subscription fees, and transaction fees (Laudon and Traver, 2004). Although a part of the causes of failure were uncontrollable by the firm (Razi et al, 2004), the principal controllable causes include: Distorted market signals, lack of strategic vision, lack of differentiation, poor customer service, and

inadequate response capacity (Kemp, 2000; Razi et al., 2004; Pandya and Dholakia, 2005; Porter, 2001).

Considering the revenue side of the profit equation the sales figures were unreliable for several reasons: Many dotcom firms were offering free services or products, totally depending on advertisement revenue. Many companies discounted (subsidized) the price of their products and services in order to develop customer loyalties and attracting a base of customers. Governments subsidized on-line shopping by exempting it from sales taxes. And many buyers were willing to conduct transactions on-line guided by curiosity, even when the benefits had been uncertain or limited (Porter, 2001).

Most wrong decisions were made because many dotcoms were launched by new enthusiastic entrepreneurs who lacked a clear understanding of business fundamentals in the areas of finance, marketing, and supply chain management. In consequence, they were not able to formulate the feasible business strategy that was required to launch their products or services in the market (Razi et al., 2004). A survey conducted by Matchco.com.uk indicated that 62 percent of the companies surveyed had no financial expertise, and 50 percent did not sufficiently understand marketing.

Doing business through internet increases the number of possible customers and suppliers, but also brings new potential competitors. This increased competition led most firms to offer almost identical goods to customers and compete based on price reduction without creating any differentiation in product quality and service levels

(Porter, 2001). In order to increase their customer base dotcoms relied heavily on promotion and competitive price, which led them to a higher spending and a lower profit margin; consequently they became trapped in debts and finally had to fold their operations (Razi et al., 2004).

According to Pandya and Dholakia (2005), poor customer service was one of the main causes of dotcoms failure. Most dotcoms were mainly interested in getting customer orders, but overlooked the importance of after-sales interaction with the customers (Pandya and Dholakia, 2005). Technical errors on a company's web-site often directed customer inquiries to a webmaster instead of a corporate representative (Kemp, 2000). Firms lacked of adequate "order tracking" services, and customers were not well informed about their order status (Razi et al., 2004).

Moreover, at the beginning of the e-commerce era, forecasting demand for products and services through the Internet was practically futile. Because of the unpredictable demand, many dotcom companies were caught off-guard and were too slow to respond to the changes of demand (Pandya and Dholakia, 2005). Customers in many cases expected next-day delivery from the suppliers, whereas suppliers, on the other hand, did not have adequate supply chain practices to deliver products in a reasonable time period. Frequently products were delivered late, sometimes to the wrong customer, and in addition the wrong product. Late delivery combined with the shipping and handling costs, to a certain extent, were responsible for reduced interest in online purchases (Razi et al., 2004). On the other hand, in order to be able to fulfill

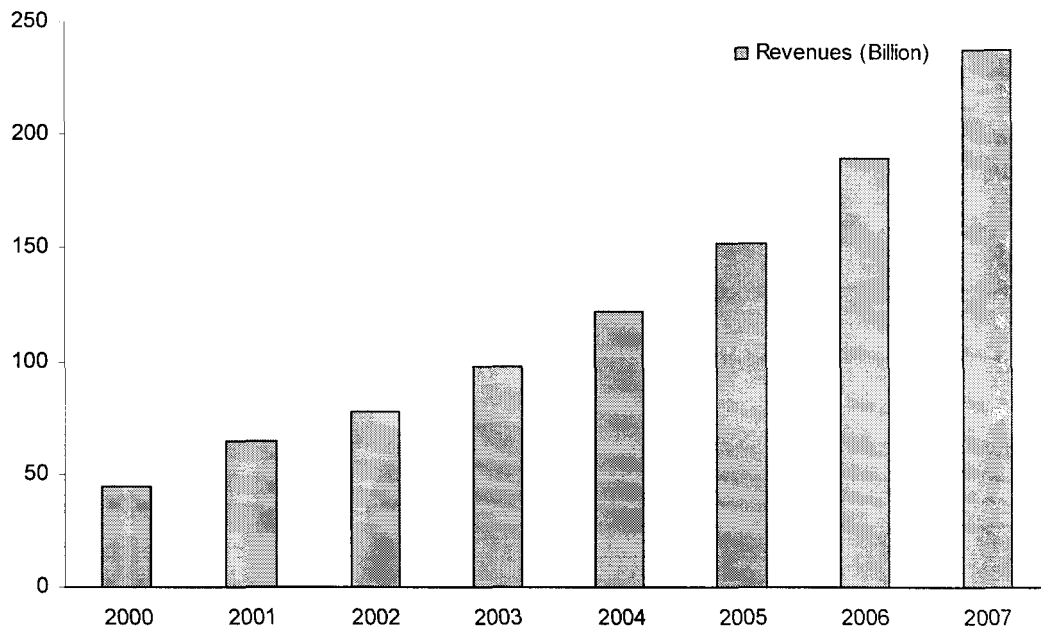
a large expected demand, some dotcoms invested in massive fulfillment, delivery and inventory management systems; however they were unable to repay the debts because a small realized demand (Kemp, 2000).

Geoffrion and Krishnan (2001) group the business models that use the Internet as the transaction medium into two main classifications: consumer-oriented activity, and business-oriented activity. The consumer-oriented models consist of business to consumer (B2C), consumer to consumer (C2C), and government to consumer (G2C) activities. The business oriented models comprise business to business (B2B), business to government (B2G), and government to business (G2B) activities.

According to Laudon and Traver (2004), B2C and B2B markets have been steadily growing since 2000. They assert that it is expected that direct sales of products to the final customers to reach \$238 billion by 2007 (see Figure 1.1); whereas B2B e-commerce is expected to experience an exponential growth to reach \$5.4 trillion by 2006 (see Figure 1.2).

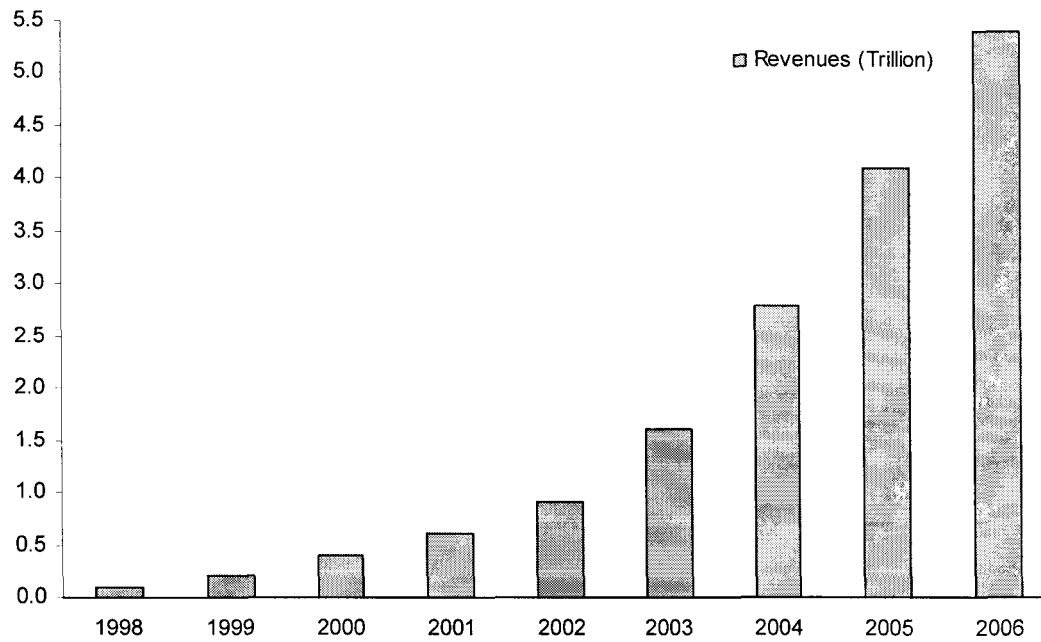
The impressive expected growth of e-commerce suggests that instead of aborting the e-commerce idea after the dotcoms fiasco, firms are trying to solve the problems that cause previous failures. This suggests that an analysis of the competitive environment involving firms that use the Internet as transaction medium is worthwhile.

Figure 1.1: Expected Growth of Direct Sales of Products through the Internet



Source: Adaptation from Laudon and Traver (2004, Figure 1.5)

Figure 1.2: Expected B2B Growth



Source: Adaptation from Laudon and Traver (2004, Figure 1.6)

1.2. Research phenomenon: E-tailing model of B2C e-commerce

B2C is the most well known and familiar type of e-commerce model. It consists of the use of a variety of Internet applications that enable companies to sell or promote goods directly to a final consumer. B2C initiatives not oriented to the selling of goods have the goal of providing content or facilitating transactions, and produce revenues from subscription fees, transaction fees, or advertising. Table 1.1 summarizes the most common B2C e-commerce models.

Model	Modality	Description	Examples	Revenue Source
E-tailer	Virtual dealer	Online version of retail store	Amazon.com	Sales of products
	Clicks and Bricks	Online distribution channel for company that also has physical stores	Wal-Mart.com Sears.com	Sales of products
	Catalog dealer	Online version of direct mail catalog	Grizzly.com	Sales of products
	Manufacturer-direct	Customized sales made directly by a manufacturer	Dell.com	Sales of products
Service Provider		Selling users a service, rather than a product	Elearning.com	Sales of services
Portal		Offers an integrated package of services and content such as search, news, e-mail, chat, multimedia, and calendars. Seeks to be a user's home page	Yahoo.com Google.com MSN.com	Advertising Subscription fees Transaction fees
Content Provider		Information and entertainment providers	ESPN.com CNN.com	Advertising Subscription fees Affiliate referral fees
Transaction Broker		Processors of online sales transaction, such as stock brokers and travel agents.	Stockbrokers.com Travelocity.com	Transaction fees
Market Creator	Auctions and other forms of dynamic pricing	Web-based businesses to create markets that bring buyers and seller together	eBay.com	Transaction fees

Source: Adaptation from Laudon and Traver (2004).

Since poor customer service, and inadequate response capacity were problems that more severely affected dotcoms selling physical products (Kemp, 2000; Razi et al., 2004; Pandya and Dholakia, 2005), the present investigation is focused on the analysis of the e-tailer model of B2C e-commerce and comprises its different modalities: virtual dealer, clicks and bricks, catalog dealer, and manufacturer-direct. The term e-tailer is used to refer to any company making revenues by means of using the Internet to sell a physical product to a final consumer.

1.3. Research purpose

Failing to recognize market signals, lack of strategic vision, and lack of differentiation can be considered as strategic failures; and poor customer service, and inadequate response capacity can be considered as supply chain management (SCM) failures. That is, the main controllable causes of early dotcoms' failures can be grouped as strategic and supply chain (SC) failures. This implies that the studying the e-commerce phenomenon involves, in addition to the inherent information technologies (IT), the strategy and supply chain research fields.

At the moment that customers want to buy a product, they may have the possibility to buy it from accessible physical retailers or from e-tailers through the Internet. That is, customers buy products within the marketplace where the marketplace integrated by accessible retailing stores and the e-market integrated by e-tailers overlap each other (Rayport and Sviokla, 1994).

From Strategy theory, Barney (1991) argues that the resource-based view of the firm (RBV) states that firms are distinct with respect to the resources they use to compete and these resources may not be perfectly mobile across firms; thus, the heterogeneity of resources can be long lasting. The combination of two or more firm's resources constitutes a firm's capability (Grant, 1998). From Supply Chain theory, Mentzer et al. (2001) assert that the implementation of supply chain management initiatives enhances customer value, which in turn leads to attain a competitive advantage for the supply chain, as well as each supply chain member. From Information Technologies theory, Laudon and Traver (2004) argue that knowing the internet's potential as a relative low cost and standard communication protocol, organizations are rethinking their business models to develop new sources of customer satisfaction using this information technology.

Based on the above arguments, the main purpose of this dissertation is to theoretically develop a conceptual model for the analysis of the competitive environment where traditional retailers compete against e-tailers. To do so, the e-tailer is conceptualized as the last member of a truncated supply chain, and competition within the marketplace is analyzed with basis on the value added for the final customer (i.e. customer value) along the supply chains of the retailers and e-tailers. The combination of the supply chain members' resources are conceived as the supply chain capabilities that enhance customer value, which is considered as the basis to achieve a competitive advantage within the marketplace competitive

environment. The degree of imperfect mobility of the supply chain capabilities that enable a firm to achieve a competitive advantage determines whether it is sustainable.

This dissertation is structured in four chapters. This first chapter corresponds to the introduction to the phenomenon to be studied, and to the theoretical background to do so; second, third, and fourth chapters are individual articles each one addressing a particular topic derived from the research purpose. In Section 1.4 of this introductory chapter, the abstract of each one of the three individual articles is presented. An explanation of how the three articles are interconnected and how they help to accomplish the research purpose is presented on Section 1.5. Finally, in the fifth chapter the conclusions emerged from this investigation are drawn.

1.4. Abstracts

The analysis of the competition between retailers and e-tailers under a supply chain perspective was possible by developing three individual articles through which the supply chain management, strategic management, information technologies, and open systems research fields are combined in order to accomplish the research purpose. The content of each self-contained article is abstracted next.

1.4.1. Supply Chain Management as a Management Philosophy: An Open Systems View of Supply Chain. (Chapter 2, first article)

Under an open systems perspective, the non-rational motivations of individuals composing the supply chain are considered as determinants of the supply chain's optimal operation. Combining the supply chain, strategic management, and open

systems research fields, a theoretically developed conceptual definition of supply chain management as a management philosophy is presented.

The supply chain phenomenon is studied under three sequential levels of analysis: the social-psychological, the organizational structure, and the ecological. At each level, the subjects of analysis constitute the subsystems composing a bigger system in the subsequent level. Based on the resource-based view of the firm, an explanation is presented about how it is possible to implement a competitive strategy for the entire supply chain by integration of the three levels of analysis in order to achieve a competitive advantage for the supply chain as a whole entity and, in turn, for its members.

1.4.2. Competition between retailers and e-tailers: Inter-organizational management systems as supply chain capabilities for achieving and sustaining the e-tailer's competitive advantage. (Chapter 3, second article)

Brick-and-mortar retailers compete against e-tailers within the marketspace composed by the overlap of marketplace and e-market. It is assumed that customer's decision from where to buy a product within the marketspace is based on the sellers' customer value. Customer value is defined as the customer's perception about the value offered by a seller through its correspondent supply chain bundle. The supply chain bundle's value is operationalized as a function of: product quality; delivery speed; flexibility to customize the product accordingly to customer specifications; objective costs such as price, and shipping cost; and subjective costs regarding to time

and location constrains to place an order.

Under a systems perspective, a supply chain is conceptualized as a whole entity composed by interdependent supply chain members. The e-tailer is considered as the last member of a truncated supply chain. Inter-organizational management systems implemented along the chain are considered as supply chain capabilities increasing the e-tailer's customer value and consequently as the basis for attaining and sustaining the e-tailer's resource-based competitive advantage. The e-tailing model of B2C e-commerce is described and a model to analyze competition between e-tailers and retailers is developed under a resource-based view of firm competition.

1.4.3. The impact of Customer Value, Reliability Concerns, and Network Externalities on e-tailing B2C e-commerce. (Chapter 4, third article)

The e-tailing B2C e-commerce is addressed under a supply chain perspective. The value offered by an e-tailer is defined as a function of: (1) product quality; (2) delivery speed; (3) flexibility to customize the product accordingly to customer specifications; (4) objective costs such as price, and shipping cost; and (5) subjective costs regarding time and location constrains to place an order.

When customers are able to know e-tailer reliability and/or product quality because of the availability of previous consumers' feedbacks, network externalities arise. It is assumed that customers decide to buy products through the Internet based on: (1) the value they receive from e-tailers, (2) their reliability concerns related to the e-tailer and the Internet as transaction medium, and (3) the existence of network externalities.

A survey was conducted using a stratified random sample of 300 e-buyers. Factor analysis and linear regression were used to analyze the data. The empirical results demonstrate that customer value, reliability concerns, and network externalities, as well as customer's income level and internet ability, all influence customers' frequency of product purchases through the Internet. That is, they impact the demand side of e-tailing B2C e-commerce.

1.5. How the three articles together help to accomplish the research purpose

The first article theoretically supports the definition of supply chain management as a management philosophy, clarifying the idea that managing the supply chain implies viewing it as whole entity with cooperative relationships among its members in order increase the overall value offered for the final customer (i.e. customer value) as the basis to achieve a resource-based competitive advantage for the entire supply chain and for its members as consequence. The second article retakes the conceptualization of the supply chain as a whole entity, as it was conceived in the first article, to observe the inter-organizational management systems (IOMS) implemented along the chain as the supply chain capabilities (i.e. a resource-based view of supply chain competition as it was stated in the first article) to compete against other supply chains. The way how e-tailing model of B2C e-commerce impacts the value offered for the final customer by a supply chain is explained. The model for the analysis of the competitive environment where traditional retailers compete against e-tailers is developed here considering that customers' decisions to buy a product within the

marketplace is based on the customer value offered by the competing supply chains of the e-tailers and physical retailers. The model considers that the e-tailer is capable of constructing supply chain capabilities (i.e. IOMS) in order to increase the value offered for the final customer, as the basis for achieving and sustaining a resource-based competitive advantage. The third article helps to partially prove the model developed in the second article. An empirical investigation was conducted to determine what factors impact the customer's decision of buying products through the Internet. The results showed that the value offered by the e-tailer's supply chain for the final customer indeed impacts the customer's decision of buying a product from an e-tailer.

1.6. Contributions

The study of the demand of products commercialized through the Internet has been addressed under different perspectives such as: Macro-factors affecting the development of B2C market in different countries (e.g. Hawk, 2004); web-page features influencing customer motivation to purchase a product through the Internet (e.g. Dadzie et al., 2005; Constantinides, 2004); mass customization attractiveness as a differentiated characteristic of product offered by means of the Internet (e.g. Combe, 2002; Squire et al., 2004; Bardakci and Whitelock, 2004; Goldsmith and Freiden, 2004); and marketing efforts to increase the demand of products commercialized through the Internet (e.g. Jiang, 2000; Vijayasarathy, 2002; Constantinides, 2004). This investigation is different from previous studies because it

addresses both, the supply and demand, sides of the B2C e-commerce market under a supply chain perspective. The model developed to analyze competition between retailers and e-tailers (see Figure 3.6) on the one hand explains, from the supply side perspective, how the implications of the e-tailing model of B2C e-commerce as well as the IOMS to manage the supply chain impact the value offered for the final customer by the e-tailer's supply chain; and, on the other hand, from the demand side perspective, explains how customers decide to buy products within the marketplace. The demand and the supply sides of the B2C e-commerce are matched with basis on the value offered for the final customer by the supply chain.

This investigation contributes to supply chain knowledge by combining the supply chain, strategic management, and open systems research fields to present a theoretically developed definition of SCM as a management philosophy. In doing so, it was shown how the three levels of organization analysis (i.e. the social-psychological level, the organizational structure level, and the ecological level) can be aligned in the supply chain context. By operationalizing the value offered for the final customer by an e-tailer through its supply chain bundle, this research work contributes to e-commerce knowledge in two ways. On the one hand, it was possible to model, under a resource-based perspective, the competition between retailers and e-tailers within the marketplace with basis on the value they offer for the final customer. On the other hand, it was possible to present empirical evidence of the impact of value offered by the e-tailer on the customer's decision of buying products

through the Internet. Thus, this investigation contributes to e-commerce knowledge by explaining both, the supply and demand, sides of the B2C e-commerce market under a supply chain perspective.

CHAPTER 2
SUPPLY CHAIN MANAGEMENT AS A
MANAGEMENT PHILOSOPHY:
AN OPEN SYSTEMS VIEW OF SUPPLY CHAIN

2.1. Introduction

International competition, technology advances, shorter product life cycles, and customized products and services, have forced companies to expand their trade boundaries looking across the world not only for customers, but also for suppliers (Simchi-Levi et al, 2003; Tracey et al., 2004). They are constantly trying to find the best resource locations, and developing new capabilities in order to increase their competitive advantages (Chopra & Meindl, 2001). In an effort to reduce production, inventory, and distribution costs; to reduce lead times; and to increase product quality, companies outsource some of their manufacturing, warehousing, distribution, and sales activities to other organizations geographically dispersed (Chopra and Meindl, 2001; Stock and Lambert, 2001; Morash and Lynch, 2002). It is from this necessity of relying on external partners that the concept of Supply Chain (SC) arises (Simchi-Levi et al., 2003; Stonebraker & Liao, 2004). This collaboration implies to manage intra-firm and inter-firm activities in order to obtain the best performance for the entire supply chain, hence producing the supply chain management (SCM) concept (Copper et al., 1997; Stock and Lambert, 2001; Mentzer et al., 2001).

Monczka et al. (1998) state that the main purpose of SCM is to improve the competitive advantage of the supply chain as a whole entity. Mentzer et al. (2001) claim that under a systems perspective enhancing supply chain competitive advantage will in turn enhance each supply chain member's competitive advantage, which is their motive to be part of the chain (Monczka et al., 1998). According to Mentzer (2001), improving a firm's (SC member) competitive advantage through SCM can be accomplished by enhancing overall (supply chain as a whole entity) supply chain's customer satisfaction.

Mentzer et al. (2001) state that despite of the well-known supply chain management term, both in academia and practice, there remains considerable ambiguity about its meaning. They find out that some authors define SCM in logistics terms (i.e. managing inventory storage, and inventory and information flows), some in terms of a set of management processes (e.g. customer relationship management, production flow management, procurement, product development, and financial management), and some others as a management philosophy. In order to unify the supply chain management concept, these authors conducted an extensive review of its definitions and formally proposed that SCM as management philosophy is based on a systems approach to view the supply chain as a whole entity whose members have a strategic orientation to align the intra-firm and inter-firm capabilities into a unified whole, where the entire supply chain has a customer focus in order to create unique and individualized sources of customer value.

Mentzer et al. and their literature sources (e.g.: Jones and Riley, 1985; Houlihan, 1988; Ellram, 1991; Ellram and Cooper, 1990; Cooper et al., 1997; Tyndall et al., 1998; and Ross, 1998) conceptualize the supply chain under a hard systems approach but they do not theoretically explain why the supply chain phenomenon should be studied under a systems perspective. According to Rigby et al. (2000), the “normative how” the supply chain must operate to achieve its optimal results under a hard systems approach, is a rational assumption and it is not a sufficient driver to achieve the optimization purpose. Since the human-to-human interactions are complex mainly because individuals have multiple perceptions, values, and interests; Rigby et al. claim that understanding the intra-firm and inter-firm human-to-human relationships phenomena of collaboration, trust, and power requires a non-rational, i.e. a soft systems, approach to consider the diverse motivations behind the individuals participating within the supply chain.

Following Rigby and his colleagues’ assertion, this work intends to contribute to supply chain knowledge by combining supply chain, open systems, and strategic management research fields to theoretically explain why the supply chain phenomenon should be studied under an open systems perspective considering the three levels of analysis of social organizations (i.e. the social-psychological level, the organizational structure level, and the ecological level). We use the resource-based view (RBV) of the firm to explain supply chain competition and assume that the implementation of supply chain optimization initiatives must consider the non-

rational behaviors of the individuals composing the chain in order to achieve a competitive advantage for the supply chain as a whole entity and for each supply chain member in consequence. The final output of this paper is a theoretically developed conceptual definition of supply chain management as management philosophy.

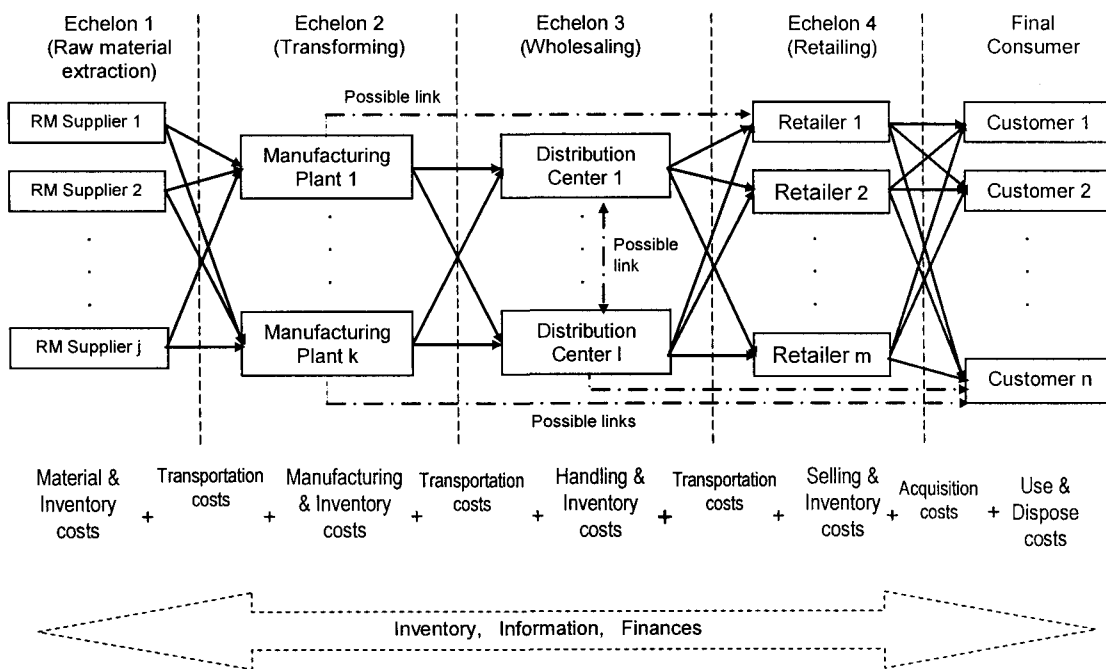
In order to develop a theoretical definition of SCM as a management philosophy this paper is structured as follows: In Section 2, we present a literature review of supply chain theory. In Section 3, we offer a literature review of strategic management theory. In Section 4, we present a literature review of open systems theory. In Section 5, we develop an open systems view of supply chain. In Section 6, we show the supply chain competitive environment. In Section 7, we explain how the three levels of supply chain analysis can be aligned. In Section 8, we present our own definition of SCM as a management philosophy. Finally, in Section 9, we present the conclusions drawn from this study.

2.2. Supply Chain Theory

A supply chain is integrated by a set of firms (i.e. SC members) performing different functions. Simchi-Levi et al (2003) classify them as: Raw material suppliers, manufacturing plants, warehouses, distribution centers, and retailers. La Londe and Masters (1994) refer to supply chain members as a set of generally ownership-independent firms involved in manufacturing a product and placing it in the hands of the final consumer in a supply chain. Mentzer et al. (2001) state that the final

consumer is also part of the SC. The chain is structured by several echelons (or stages) each consisting on a set de members of the same class; that is, a set of raw material suppliers constitutes the first echelon, a set of manufacturing plants constitute the second echelon, and so on. Figure 2.1 represents a simplified structure of a supply chain. The number of echelons in the chain ranges from 2 to n depending on the number of principal activities required to manufacturing and delivering the product to the final consumer; the supply chain in Figure 2.1 consists on four echelons, and the principal activities are raw material extraction, manufacturing, wholesaling, and retailing.

Figure 2.1: Supply Chain Structure



Along the different echelons, inventories of raw materials, work-in-process, finished goods, and returned items may exist in each member's facilities; and transportation costs are incurred to move these inventories between echelons (Chopra and Meindl, 2001).

In addition to the physical inventory flow, among the chain members there are financial and information flows needed to operate and coordinate the SC; that is, supply chain's members are linked by inventory, information, and financial flows. In some occasions there are direct flows (links) from one echelon to a nonadjacent echelon (e.g. from manufacturer to retailer). Sometimes there are direct flows from manufacturing plants or distribution centers to final consumers. Even occasionally there are flows between members of the same echelon (e.g. from distribution center 1 to distribution center 2). In fact, these links instead of forming a chain they construct a network (Chopra & Meindl, 2001); this is why a SC is also referred as supply network or logistics network (Stock and Lambert, 2001; Simchi-Levi et al., 2003). Since the supply chain term is the most broadly utilized, it will be used along this paper.

Frohlich and Westbrook (2001) state that most successful firms seem to be those that have efficiently managed the links among their internal processes to those of external suppliers and customers; that is, those implementing the best supply chain management approach. Wisner (2003) maintains that the short-term objectives of SCM are increasing quality and productivity, reducing inventory and transportation costs, and shrinking cycle time; and that the long-term objectives of SCM are

increasing customer satisfaction, market share, and profits for all supply chain members.

Mentzer et al. (2001) state that despite of the well-known supply chain management term, both in academia and practice, there remains considerable ambiguity about its meaning; and they undertake the task of presenting a unified and comprehensive SCM definition in their study “Defining Supply Chain Management”. They find that: (1) some authors define SCM in logistics terms; i.e., the SCM tasks are efficiently managing the flows of inventory and information, and optimizing inventory allocation. (2) Some others define SCM in terms of a set of management processes; i.e., the SC members must change their own functional structure to adopt a process approach focused on meeting customer’s requirements; those processes include customer relationship management, customer service management, demand management, order fulfillment, production flow management, procurement, product development, and financial management. And (3) some others argue that SCM is a management philosophy.

After an exhaustive revision of supply chain management definitions, Mentzer et al. (2001) propose that SCM as a management philosophy has the following characteristics:

1. A systems approach to viewing the supply chain as a whole, and to managing the total flow of goods inventory from the supplier to the ultimate customer;
2. A strategic orientation toward cooperative efforts to synchronize and converge intra-firm and inter-firm operational and strategic capabilities into a unified whole; and

3. A customer focus to create unique and individualized sources of customer value, leading to customer satisfaction (Mentzer et al., 2001).

Summing up, they present a comprehensive definition of SCM:

... supply chain management is defined as the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole (Mentzer et al., 2001).

Since Mentzer et al. work is an extensive SCM literature review to present a comprehensive SCM definition, a deep analysis about systems theory was out of their intention. For the purposes of our work we will build upon their definition of supply chain management as a management philosophy, but first we need to go deeper on systems theory as a basis for studying the supply chain phenomenon.

2.3. Strategic Management Theory

Barney (1991) states that a firm may achieve a competitive advantage by implementing a competitive strategy that enables it to offer greater value for customers vis-à-vis its competitors. Melnyk and Denzler (1996) define the value offered for customers as a function of customer's satisfaction and costs. Prahalad and Hamel (1990) assert that the resources that a firm possesses are fundamental to determine the firm performance, they argue that those resources determine the final customer's satisfaction and the efficiency (i.e. the total costs) with which that satisfaction is achieved. According to Grant (1998), a firm has a resource-based

competitive advantage when it possesses the resources enabling it to consistently obtain a performance (e.g. profits, market share, etc.) above the average within its industry. Barney (1991) formalizes the resource-based view of the firm (RBV) considering that firms within an industry may be distinct with respect to the resources they use to create the value they offer for the final customer, and that these resources may not be perfectly mobile across firms; what implies that the heterogeneity of resources can be long lasting allowing a firm having a competitive advantage to sustain it.

Resources can be grouped as tangible and intangible assets, human capital, and organizational capabilities (Grant, 1998; Collis and Montgomery, 1997; Pearce and Robinson, 2005), where organizational capability is defined as the firm's capacity of performing a particular activity by means of a linkage (i.e. complex combination) of assets, people, and processes (Collis & Montgomery, 1997). Barney (1991) argues that not all firm resources are strategically relevant ones, so he defines "strategic resources" as the "strengths" that firms can use to conceive and implement their competitive strategy. The strategic relevance of a firm resource depends on the characteristics of the industry and the macro-environment within which the firm competes; that is, aspects such as distribution channels, natural resources, government regulations, labor force, demographic composition of the market, and technology determine whether a firm resource is strategically relevant to implement a competitive strategy (Grant, 1998). For example, a firm's great production capacity

may not be a strategically relevant resource in an industry or country where having control of distribution channels is what determines the firm's profits. This implies that a resource may be strategic for a firm whereas the same resource may be not strategic for another firm competing within a different environment (Barney, 1991; Grant, 1998).

Obtaining above-average performance attracts new entrant firms to the market; however, apart from firm resources such as patents, copyrights, and satisfying regulatory requirements, which may be considered as true entry barriers; organizational capabilities are the basis to construct "resource barriers" in order to sustain a competitive advantage (Wernerfelt, 1984). RBV scholars (e.g. Rumelt, 1974, 1984; Wernerfelt, 1984; Barney, 1991; Conner, 1991; Collis and Montgomery, 1997; Grant, 1998; Dierickx and Cool, 1989) agree about the fact that the "linkedness" of the resources composing an strategic organizational capability define its degree of imperfect mobility and determines whether it can be considered as a resource barrier to sustain the firm's competitive advantage. Dierickx and Cool (1989) argue that the sustainability of a firm's advantageous resource-based position depends on how easily these resources can be acquired, imitated, or substituted by its competitors; i.e. the degree of imperfect mobility of such resources. They describe the following factors enabling firms to construct resource barriers: (1) Time compression diseconomies to imitation, making it more difficult for a new entrant to catch up by simply investing money to acquire or develop the resource. (2) Resource mass

efficiencies, firms already possessing a substantial stock of resources can add to it at a lower cost than can do so a new entrant. (3) Interconnectedness of resources, a newly acquired or developed resource does not produce the same results for two distinct firms having different previous stocks of resources. And (4) causal ambiguity, because of the linkedness of resources, sometimes it not possible to fully separate which resources are causing specific observed outcomes and consequently making infeasible the replication of results by other firms.

2.4. Open Systems Theory

According to Bertalanffy (1956), under the general systems perspective, all systems are characterized by an assemblage or combinations of parts whose relations make them interdependent. He argues that many of the most important scientifically studied subjects (e.g. atoms, cells, organisms, groups, organizations, societies, and solar systems) are all subsumable under the general concept of system; that is, every unit of analysis can be considered as a subsystem of a bigger system. When we move our unit of analysis from mechanical to organic, and to social systems, the parts composing the systems become more complex and variable (Bertalanffy, 1956). Buckley (1967) asserts that social organizations, in contrast with mechanical structures, are complex and loosely coupled. He states that as we move from simple to complex and from tightly to loosely coupled systems, the nature and relative importance of the various flows among the subsystems conforming the system and between the system and its environment change. He considers that the principal types

of flows within a system are those of materials, energy, and information. He enunciates:

Whereas the relations among components of mechanical systems are a function primarily of spatial and temporal considerations and the transmission of energy from one component to another, the interrelations characterizing higher levels come to depend more on the transmission of information (Buckley, 1967).

Scott (2003) asserts that an open systems perspective considers organization as loosely coupled systems open to the environment, they depend on external flows of: human capital; tangible resources such raw materials, components, and machinery; and intangible resources such as information and finances. Katz and Kahn (1966) argue that all social organizations must constantly reintroduce energy to their systems obtaining this energy from other elements in the environment such as people, natural resources, and other organizations. Scott (2003) argues that an organization's connections with external elements can even be more critical than those among its internal components.

Katz and Kahn (1966) formally introduce the concepts of systems theory into organization theory. Based in the physical systems' principle of entropy, i.e. some part of the energy entering into the system cannot be turned into work which condemns the activity of closed systems to stop; they argue that the straightforward application of the concepts of closed systems in natural science to social science is a restraint to understand social organizations. According to Katz and Kahn, all living systems (e.g. biological organisms, and social organizations) are not self-sufficient,

i.e. they excessively depend on the exchange (importing and exporting) of energy with the external environment, and they must be analyzed as open (to the environment) systems because they are capable of importing energy from their environment to counteract against entropy. They analyze organizations as an open system of input-processing-output-restoration of energy, where the outgoing energy is used to reactivate the system. For example, a company manufacturing automobiles uses money to buy input parts and hire personnel (incoming energy), uses these input parts and personnel to manufacture and sale automobiles (processing energy), obtains money (outgoing energy) by doing so, and uses the earned money to buy new input parts and compensate the personnel (restoring energy).

Considering organizations as loosely coupled systems, Katz and Kahn (1966) argue that there is a discrepancy between the organization's normative structure (i.e. formal goals and rules) and its behavioral structure (i.e. individuals' actions). Cole and Scott (2000) state that managers may convincingly talk about total quality management programs in their organizations but there is little or no evidence that such activities improve the performance of production and service departments. Because of the discrepancy among the normative "how" the organization must operate, which is a rational assumption, and the real operation of the organization, Katz and Kahn assert that a theoretical conceptualization of organizations must start with the input, the output, and operation of the organization as a system, instead of beginning with the analysis of the rational organization managers' purposes.

According to Scott (2003), open system theorists emphasize that individuals within an organization have multiple loyalties and identities; individuals engage ongoing exchanges with the organization, they constantly ponder the advantages of maintaining or ending this relationship. Pfeffer and Salancik (1978) argue that individuals, having their own interests and objectives, recognize the necessity to perpetuate the organization existence and integrate groups of interest where each one attempts to obtain something from the collectivity. Under an open system perspective, organizations may contain elements (e.g. individuals or groups) weakly connected to others elements within the organization and some of these loosely coupled elements are even capable of autonomous actions (Weick, 1976). Because of the existence of loosely coupled subsystems having their own interests and behaviors, the normative structure of an organization is only loosely coupled with its behavioral structure; that is, within an organization there is an informal structure composed by groups of interest that may be more influential in guiding the behaviors of the individuals than the formal structure (Scott, 2003). Pfeffer and Sutton (2000) provide many examples of the gap between normative goals and observed behavior of individuals and groups within organizations. Organizations cannot be understood as sets of participants rationally pursuing common goals, rather understanding organizations implies the analysis of the non-rational purposes of its participants and many organizational phenomena are better understood and explained by viewing organizations as system composed by loosely coupled subsystems (Scott, 2003).

2.5. Open Systems View of Supply Chain

Moving, transforming, storing, and selling goods along the supply chain imply different types of costs and delay times (Chopra & Meindl, 2001). Efficiently managing these costs and times requires a systems approach to successfully identify, analyze, and coordinate the interactions among the supply chain members (Burke & Vakharia, 2002). Most SCM definitions at the end of the XX century and at the beginning of XXI century (e.g. Cooper et al., 1997; Tyndall et al., 1998; Ross, 1998; Rigby et al., 2000; Mentzer et al., 2001, and Burke & Vakharia, 2002) consider that SCM takes a systems approach to view the SC as a whole entity, rather than as a set of fragmented parts, each performing its own function. Based on this conceptualization, we will go deeper in the explanation of why an open systems perspective is appropriate for studying the supply chain phenomenon.

The supply chain integration and management phenomena can be explained under an open systems perspective under three basic conditions: (1) considering the supply chain as a system, (2) considering the SC as a system that exchanges (imports and exports) energy with the environment for self-restoration, and (3) considering that supply chain understanding requires a non-rational approach.

From the definition of supply chain we have that a SC is integrated by a set of firms (parts of the system) performing different functions, e.g. raw material suppliers, manufacturing plants, warehouses, distribution centers, and retailers (Simchi-Levi et al., 2003), pursuing the purpose of manufacturing a product and placing it in the

hands of the final consumer (La Londe and Masters, 1994). The supply chain outcome's value offered for the final customer (i.e. customer value) represents the value added by all SC members along the chain (Craighead & Shaw, 2003). According to Mentzer et al. (2001), offering greater customer value will improve the supply chain competitive advantage, what will increase the overall supply chain's profits and, in turn, will increase supply chain members' profits. This means that there is interdependence among the SC members, each firm (subsystem) in the supply chain (system) affects the overall performance and consequently it affects the performance of all the other members (subsystems), consequently a supply chain resembles the characteristics of a system.

Considering the supply chain as a whole entity (i.e. a system), it requires of resources from the environment to produce its final outcome. The required resources by supply chain members (i.e. subsystems) include raw materials, components, personnel, information, and finances (Simchi-Levi et al., 2003); they may be obtained from other elements in the environment such as people, natural resources, and other organizations (i.e. other supply chain members). These required resources constitute the imported energy from the environment. The incoming resources are transformed along the supply chain into an outcome considered as a bundle composed by a product and a service-level that is offered in the market (Craighead and Shaw, 2003). The supply chain bundle constitutes the exported energy to the environment. "In many organizations outcomes are converted into money and new energy is furnished

through this mechanism” (Katz and Kahn, 1966). The earnings from the sale of the supply chain bundle are distributed among the supply chain members to compensate their personnel and to buy other required resources to continue their operations (Chopra and Meindl, 2001). Thus, this imported energy (i.e. the earnings) is distributed among the subsystems (i.e. the supply chain members) to restore the entire system (i.e. the supply chain).

Burke and Vakharia (2002) state, from a general systems perspective, that the total performance of the entire supply chain is improved when all links in the chain are simultaneously optimized, compared to the resulting total performance when each individual link is separately optimized. Rigby et al. (2000) assert that supply chain optimization considering quantifiable cost (e.g. inventory, manufacturing, transportation, and selling) can be done from a hard systems (e.g. operations research, and industrial organization economics) perspective using engineering and economics tools (e.g. simulation, linear programming, heuristics, dynamic programming, and game theory) to mathematically find out how the supply chain would optimally operate. However, they argue that the “normative how” the supply chain must operate to attain SC optimization is a rational assumption and it is not a sufficient driver to achieve the optimization purpose since the human-to-human interactions are complex because individuals have multiple perceptions, values, and interests. Rigby et al. consider that the analysis of the motives behind the individuals integrating the human component of the supply chain cannot be considered under a hard systems approach.

They claim that understanding the intra-firm and inter-firm human-to-human relationships phenomena of collaboration, trust, and power requires a non-rational approach to consider the diverse interests behind the individuals participating within the supply chain.

Since a supply chain resembles the three basic characteristic of an open systems, its integration and management may be studied under an open systems perspective.

2.6. Supply Chain Competition

Monczka et al. (1998) state that the motive behind SCM is to improve the competitive advantage of the supply chain as a whole entity. Mentzer et al (2001) claim, under a systems perspective, that enhancing supply chain competitive advantage will, in turn, enhance each SC member's competitive advantage. Since firms decide to be part of supply chain looking for achieving a competitive advantage (Monczka et al., 1998), in this section we review the necessary strategic management issues for explaining the supply chain competitive environment.

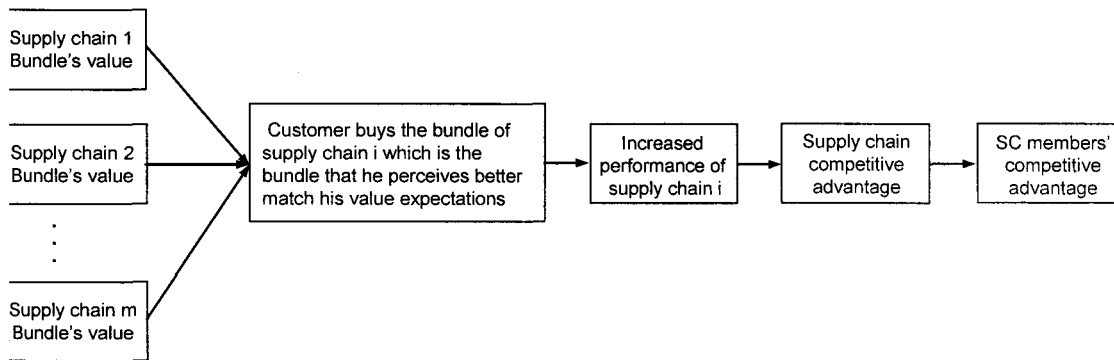
Craighead and Shaw (2003) assert that the supply chain's output is a supply chain bundle (SCB) whose value depends on the combined capabilities of all supply chain members; that is, the supply chain bundle's value represents the accumulated value added for all supply chain members along the chain. In the process of buying a product, customers have the possibility to compare different supply chain bundles' values and they will buy the bundle that, they perceive, best match their value expectations . For example, in the automotive industry; car dealers are the final

echelon in the supply chain, but their sales depend not only on their selling abilities, but also on automobiles availability in distribution centers for quick delivery to the customer. Then, Ford is competing against General Motors not only in automobile quality, but also in rapid response to customer demand. In the supply chain competitive environment, competition lies between supply chains as much or more than between individual firms (Best 1990; Chopra and Meindl, 2001; Simchi-Levi et al., 2003).

Melnyk and Denzler (1996) define customer value as the value offered by the supply chain for the final customer, and assert that customer value is a function of *satisfaction* and *cost*. Where *satisfaction* is measured as a function of product quality, delivery speed, and flexibility to customize the product according to customer's needs; and *cost* represents final customer's objective costs (e.g. product price) and subjective costs (e.g. searching time to find the product, and convenience regarding to when and from where to buy the product) to acquire the product. Based on Melnyk and Denzler operationalization of customer value, we consider that the supply chain bundle's value is a function of product quality, delivery speed, flexibility, objective costs, subjective costs. A customer compares the bundles' values of different supply chains and decides to buy the bundle of supply chain i which is the bundle that he perceives better match his value expectations, and this will positively impact the performance of supply chain i (Craighead and Shaw, 2003). As well as a supply chain is capable of offering greater value (i.e. greater satisfaction and/or lower costs) for its

target customers, the greater its performance will be and since a firm has a competitive advantage when it consistently obtains a performance above the average within its industry (Grant, 1998), then the increased performance of a supply chain will lead it to achieve a competitive advantage. According to Mentzer et al. (2001), achieving a competitive advantage for a supply chain, will, in turn, derive in a competitive advantage for its supply chain members (see Figure 2.2).

Figure 2.2: Customer Buying Decision based on the Supply Chain Bundle's Value



2.7. Alignment of the three Levels of Supply Chain Analysis under an OSP

Because of the multiple interests and behaviors of individuals and groups within organizations, Scott (2003) proposes that social organizations (e.g. a supply chain) should be studied under three basic levels of analysis: (1) the social-psychological level, focusing on the study of the behavior of individuals or interpersonal relationships within the organization. Studies at this level consider the characteristics of an organization as the individuals' environment and the impact of these characteristics on the behavior of individuals is analyzed. (2) The organizational structure level, focusing on the structural features or processes that characterize social

organizations. Research works at this level may study the various subsystems that integrate the social organization; e.g. work groups, departments, and authority ranks; or may study the particular attributes that characterize the structures or operational routines within the organization, e.g. specialization, leadership styles, and power hierarchy. And (3) the ecological level, focusing on the characteristics or actions of the social organization viewed as a whole entity operating in a larger systems of relations. Research works at this level may study the relation between a specific organization and its environment, or may study the relationships that develop among a number of social organizations viewed as an interdependent system.

Farias and Varma (2000) combine job characteristics theory (JCT), sociotechnical systems theory (STS), and reengineering theory (REE) to describe the necessity to align the individuals' goals, the groups' goals, and the organizational structure within an organization. In the social-psychological level, they use JCT (see Hackman and Oldham, 1976, 1980) to examine how the meaningfulness of work, the responsibility for the outcome of the work, and the knowledge of the results of the work impact the behavior of individuals belonging to an organization. In the organizational structure level, they use STS (see Trist, 1981) to analyze the behavior of the autonomous groups within an organization. Additionally, at this same level of analysis, based on REE (see Hammer, 1990; Hammer and Champy, 1993), they argue that the organizational structure of organizations operating sociotechnical systems needs to be flattened because teams now make decisions that were the prerogative of managers

and supervisors. They argue that the alignment of individuals' goals, groups' goals, and organizational structure can be achieved by integration. That is, there must be congruence between an individual's interests and those of the group he belong to; and at the same time there must be congruence between the way how decisions are made and the organization's power hierarchy.

We extend Farias and Varma's (2000) insight to the supply chain context. To do so, we select the organization itself as the unit of analysis; that is, we extend Farias and Varma's integration process to the ecological level of analysis. Particularly, resource dependence theory (RDT), considered as an open systems perspective (see Scott, 2003), is well situated for this purpose. Resource dependence theory, developed by Pfeffer and Salancik (1978), conceptualizes organizations at the ecological level of analysis. The RDT focuses primarily on one organization and its exchange partners, "to understand organizational behavior, one must understand how the organization relates to other social actors in its environment" (Pfeffer& Salancik, 1978).

Under a RDT perspective, Scott (2003) asserts the all organizations depend on suppliers and customers, but which exchange partners are chosen and what terms of exchanges are negotiated is partly determined by the organization itself. According to Pfeffer and Salancik (1978), inter-organizational linkages stabilize the organization's exchanges with its environment and reduce uncertainty, it is of common interest for parties in a relationship to have some degree of assurance and predictability regarding what they can expect from one another. Cool and Henderson (1998) argue that

dependence power (i.e. power originated by the dependence on the resources that other organizations possess) in a supply chain structure does not need to reduce the profitability of one of the transacting members; instead they may recognize their mutual dependence in the resources that each one possess as members of the same supply chain (system) and try to jointly improve the overall supply performance, which, in turn, improve the SC members' performance (Mentzer et al., 2001). Thus, there must be congruence among the interests of the supply chain members and there must be congruence among the interests of the organization's internal participants (i.e. individuals, and groups) and the organization's interest as supply chain member. That is, the supply chain integration process implies that the interests of individuals must be aligned to the interests of the groups they belong to, and the interests of the individuals and groups inside each organization member of the chain must be aligned to the common interests of the supply chain members.

2.8. Defining SCM as a Management Philosophy

Grant (1998) asserts that implementing a competitive strategy, under a RBV of the firm, requires tailoring the management systems of the organization to the requirements of the strategy; that is, the management systems must be conceived to exploit the strategic relevance of the resources on which the firm has decided to implement its competitive strategy. He defines that management systems serve to exercise control over the activities within the organization through coordination and cooperation mechanisms. Coordination mechanisms relate to initiatives undertaken

to: (1) coordinate the interaction of individuals and groups carrying out specialized actions in order to perform a particular activity; (2) and coordinate the flows of inventory, services, finances, and information. Cooperation mechanisms relate to initiatives undertaken to align the goals and behaviors of individuals and groups with those of the organization (Grant, 1998).

Since supply chain management relates to manage a set of not vertically integrated but interdependent firms (Ellram, 1991), managing the supply chain as a whole entity requires the implementation of management systems controlling intra-firm and inter-firm activities (Mentzer et al., 2001). Thus, the main tasks of SCM are establishing mechanisms for cooperation and coordinating the intra-firm and inter-firm activities in order to improve each supply chain member's performance through elimination of unnecessary activities and capitalizing the individual SC members' capabilities (Morgan and Monczka, 1995).

The supply chain cooperation mechanism include: transfer prices, buying back and returns policies, quantity flexibility, allocation rules, and trust development (Sahin and Robinson, 2002, Chopra and Meindl, 2001; Simchi-Levi, 2003). Chopra and Meindl (2001) state that supply chain coordination requires that members of each supply chain echelon takes into account the impact of its actions have on other echelons of the supply chain. Mentzer et al. (2001) argue that a firm, as SC member, has a supply chain orientation (SCO) philosophy if its management: (1) can see the implications (advantages and disadvantages) of managing the upstream and

downstream flow of products, services, finances, and information across the entire supply chain; and (2) it is disposed to subdue the firm's operation in favor of increasing the overall supply chain (system) performance. Supply chain management is the sum total of all the management initiatives undertaken to coordinate the interactions of the supply chain members having a SCO philosophy across the chain (Mentzer et al., 2001).

Considering SMC as a management philosophy implies that the intra-firm and inter-firm management processes must be aligned. This alignment implies that: (1) When a firm activity is related to a broader inter-firm activity, the process defining the way how to coordinate the interaction among individuals and groups within the firm to perform that particular firm activity (i.e. intra-firm process) must be redesigned to consider not only the interests and interactions of the individuals and groups within an organization, but also to consider the interests and interactions among individuals and groups of the different organizations implicated in performing the inter-firm activity; that is, the intra-firm process is aligned to the inter-firm process. And (2) the processes defining the flows of inventory, services, finances, and information within the firm must be aligned to comprise those inter-firm flows. Thus, the alignment of intra-firm and inter-firm processes implies the integration of the social-psychological, organizational structure, and ecological levels for organization analysis.

When SCM is conceptualized as a management philosophy, a resource-based view of the supply chain is possible by system integration; that is, a competitive strategy

for the supply chain as a whole can be defined and the intra-firm and inter-firm processes can be aligned by integration of the three levels of supply chain analysis to inter-link the SC members' resources. These inter-linked resources resulting from the implementation of inter-organizational management systems such as JIT, quick response, vendor managed inventory, cross-docking, and postponement elevates to a higher level the individual SC members' resources to constitute the supply chain's capabilities.

Supply chain capabilities include the inter-firm linkedness of the individual SC members' tangible and intangible assets, human capital, and capabilities (intra-linked resources). The supply chain capabilities constructed through the intra-link and inter-link of resources enable the supply chain to enhance the supply chain bundle's value offered for the final customer, which, according to Mentzer et al. (2001), leads to a achieve a competitive advantage for the supply chain as a whole and, in turn, for its members. The degree of imperfect mobility (see Dierickx and Cool, 1989) of the supply chain capabilities will determine whether the SC competitive advantage will be sustainable.

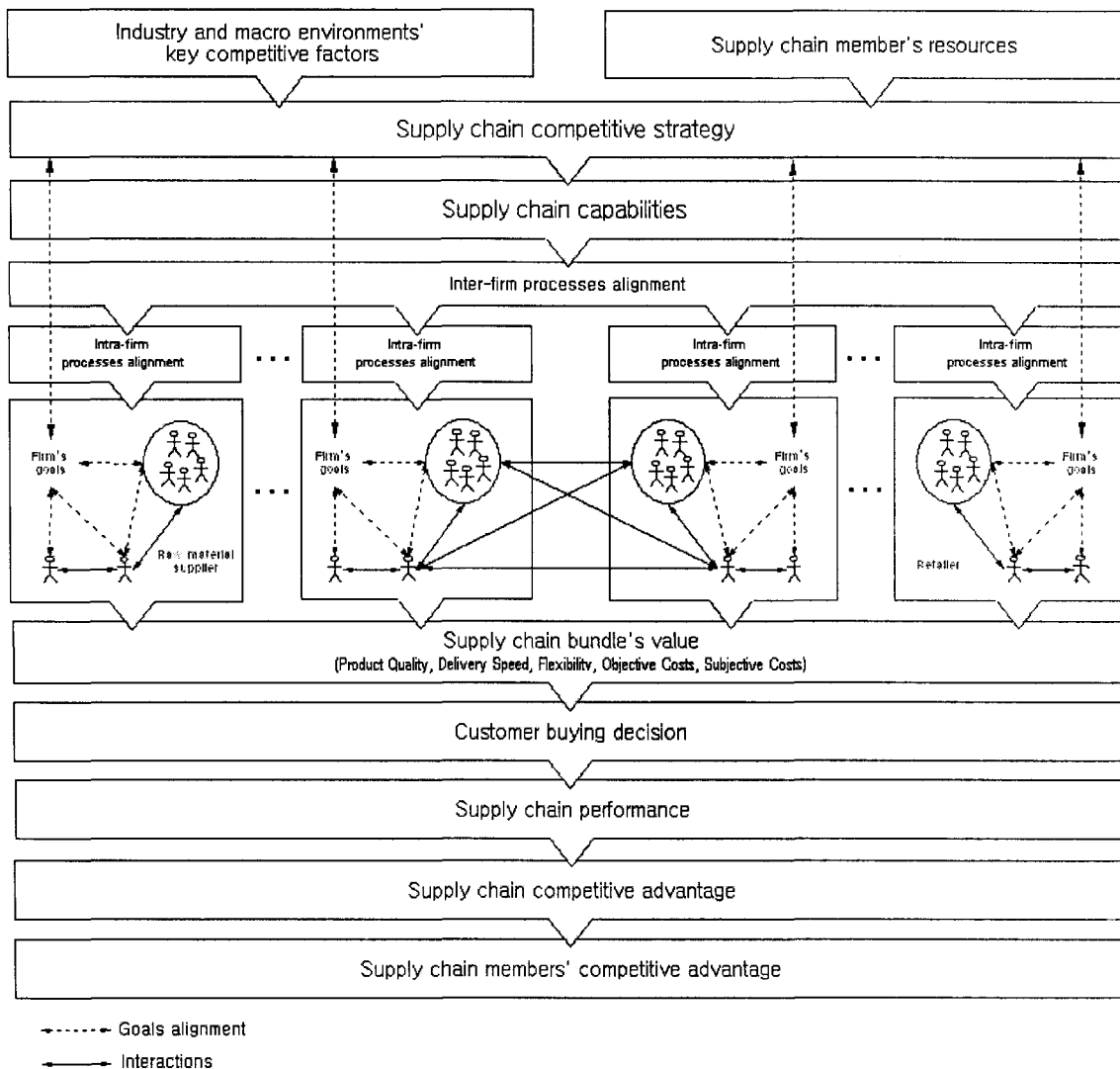
Under an open systems view of supply chain, the inter-linkedness of the individual supply chain members' resources makes them (subsystems of the system) interdependent. Considering the supply chain as the system, a competitive strategy is defined for the supply chain as a whole entity and the inter-firm and intra-firm processes are aligned by integration at the three levels of supply chain analysis in

order to develop and deploy the strategic resources chosen as the basis to implement the competitive strategy. We are now ready to present our own SCM definition:

Supply chain management is a management philosophy recognizing the motives behind the human component of the chain. It is based on inter-firm partnership to aligning the intra-firm to the inter-firm processes in order to integrate a whole entity with a defined and incorporated competitive strategy. Such strategy is defined considering the individual resources of each SC member at the social-psychological, organizational structure, and ecological levels to build supply chain capabilities in order to offer the best supply chain bundle's value for the final customer, which constitutes the basis for achieving and sustaining a competitive advantage for the entire supply chain as well as for each individual SC member.

This authors' definition, graphically expressed in the model presented in Figure 2.3, includes the three management philosophy characteristics proposed by Mentzer et al. (2001): a systems approach, a strategic orientation, and a customer focus.

Figure 2.3: Model of Supply Chain Management as a Management Philosophy



2.9. Conclusions

Under an open systems perspective, we argue that the non-rational motivations of individuals composing the supply chain must be taken into consideration during the implementation of inter-organizational management systems for supply chain management. Under the resource-based view of the firm, we consider that the inter-linkedness of the supply chain members' resources involved in the implementation of

an inter-organizational management system constitute a supply chain capability.

Based on the integration of the three levels of organization analysis, we explain how the goals of the subsystems (i.e. individuals, groups, and supply chain members) should be aligned in order to make it possible to implement a competitive strategy for the entire supply chain.

Our contribution to supply chain knowledge consists on combining the supply chain, strategic management, and open systems research fields to present a theoretically developed definition of SCM as a management philosophy. To do so, we show how the three levels of organization analysis (i.e. the social-psychological level, the organizational structure level, and the ecological level) can be integrated in the context of supply chain study. For practitioners, the model of SCM as a management philosophy presents a good insight to realize that it is possible to implement cooperative initiatives in order to achieve a competitive advantage for the supply chain as a whole and, in turn, for its members.

Our definition of supply chain management as a management philosophy was theoretically constructed with basis on previous research works; this implies that there are several assumptions that should be empirically validated. Some questions arise that could be addressed on future research works: To what extend, supply chains in practice consider SCM as a management philosophy? Are there more collaborative or more bargaining relationships among the members of a supply chain? Are there in practice initiatives to align the goals of individuals, groups, and supply chain

members? Can be supply chain capabilities really considered as resource barriers to deter new potential entrants? Even though these limitations should be overcome, we consider that the purpose of develop a theoretically sustained explanation of why the supply chain phenomenon should be studied under an open systems perspective was satisfactorily accomplished.

CHAPTER 3

COMPETITION BETWEEN RETAILERS AND E-TAILERS: INTER-ORGANIZATIONAL MANAGEMENT SYSTEMS AS SUPPLY CHAIN CAPABILITIES FOR ACHIEVING AND SUSTAINING THE E-TAILER'S COMPETITIVE ADVANTAGE

3.1. Introduction

According to Laudon and Traver (2004), business to consumer (B2C) and business to business (B2B) e-commerce have been steadily growing since year 2000. It is expected for B2C to reach \$238 billion by 2007, whereas B2B, which in significant part represents inter-organizational management systems (IOMS) for supply chain management (Ross, 2003), is expected to experience an exponential growth to reach \$5.4 trillion by 2006 (Laudon and Traver, 2004). Because of the impressive B2C e-markets' expansions, customers have now the possibility of buying products from local stores (i.e. retailers) or from companies commercializing their products through the Internet (i.e. e-tailers), which implies that physical marketplace's boundaries have been blurred because of the overlapping boundaries of e-markets. Consequently, brick-and-mortar retailers compete against e-tailers within the market space composed by the marketplace and the e-market (Rayport and Sviokla, 1994), and an analysis of this competitive environment is worthwhile.

B2C is the most well known and familiar model of e-commerce. It consists of the use of a variety of Internet applications that enable companies to sell or promote goods directly to a final consumer (Laudon and Traver, 2004). The most common

models of B2C e-commerce include: e-tailer, making revenues through sales of products; service provider, obtaining revenues via sales of services; portal, making earnings by means of advertising, and subscription and transaction fees; content provider, securing gains via advertising, and subscription and affiliate referral fees; transaction broker, obtaining rents by charging transaction fees; and market creator, making revenues by charging transaction fees. Particularly, the present study is focused on the e-tailer model of B2C e-commerce and comprises its different modalities: virtual dealer, which is the online version of a retail store; clicks and bricks, consisting on companies who commercialize their products by means of physical stores and the Internet also; catalog dealer, which is the online version of direct mail catalog dealer; and manufacturer-direct, consisting on customized sales made directly by a manufacturer. We use the term e-tailer to refer to any company making revenues by means of using the Internet to sell a physical product to a final consumer.

The term “dotcom” is generally used to refer to a company using the Internet as the transaction medium to implement its business model; i.e. a dotcom is a company performing e-business activities (Razi et al., 2004; Laudon and Traver, 2004). Most causes of early dotcoms’ failures can be grouped as strategic (Porter, 2001; Razi et al., 2004) and supply chain (SC) failures (Kemp, 2000; Razi et al., 2004; Pandya and Dholakia, 2005), which implies that studying the B2C e-commerce phenomenon involves, in addition to the inherent information technologies (IT), the strategy and

supply chain research fields.

Several studies have addressed the importance of information technologies in a firm's competitive advantage. Mata et al. (1995) show how managerial IT skills help to sustain a firm's resource-based competitive advantage. Porter (2001) explains how the Internet can be used to implement a firm's competitive strategy. Tractinsky and Lowengart (2003), from a marketing perspective, use perceptual maps and gap analysis to study e-tailers' competition within e-markets. Kim et al. (2004) use Porter's (1980) strategic model to analyze competition between B2C firms within an e-market. Our contribution through this work consists on interlinking the IT, SC, and strategy research fields to theoretically develop a resource-based model for the analysis of competition between physical retailers and e-tailers within the marketplace composed by the marketplace and the e-market.

In order to explain how retailers compete against e-tailers within the marketplace this paper is structured as follows: In Section 2, we present a literature review of strategic management and supply chain theoretical concepts to be considered in this study. In Section 3, we develop the supply chain bundle (SCB) multidimensional construct to explain how the supply chain members may add value to the final supply chain's output (i.e. the SCB) offered for the final customer. In Section 4, we detail how each IOMS helps to increase the supply chain bundle's value. In Section 5, we describe how the e-tailing model's implications impact the supply chain bundle's value. In Section 6, we consider the e-tailer's SCM as management philosophy and

the e-tailing model's implications as multidimensional constructs to present a simplified model of their respective impacts on the e-tailer supply chain bundle's value. In Section 7, we expand our model to explain how the supply chain bundles' values of the accessible (physically or through the Internet) sellers influences customer decision of buying from the e-tailer. In Section 8, we complete our model to describe how the IOMS implemented along the chain can be considered as supply chain capabilities for achieving and sustaining the e-tailer's competitive advantage. In Section 9, based in our model, we theoretically explain the market space competitive environment. Finally, in Section 10 we present the conclusions drawn from this study.

3.2. Literature Review

A firm has a resource-based competitive advantage when it possesses the resources enabling it to consistently obtain a performance (e.g. profits, market share, etc.) above the average within its industry (Grant, 1998). Conner (1991) states that in a resource-based view of the firm, achieving a competitive advantage requires solving the critical problem faced by the firm of "how" to maintain the distinctiveness of its product or its low cost position, while not investing so much as to destroy the above-average performance; he argues that firms solve this "how" by means of the resources they use to implement their competitive strategies. Barney (1991) formalizes the resource-based view of the firm (RBV) considering that firms are distinct with respect to the resources they use to compete and these resources may not be perfectly mobile across firms, and consequently the heterogeneity of resources can be long lasting.

Resources can be grouped as tangible and intangible assets, human capital, and organizational capabilities (Grant, 1998; Collis and Montgomery, 1997; Pearce and Robinson, 2005). The linkage of two or more assets and/or human resources constitutes an organizational capability (Grant, 1998). Barney (1991) argues that not all firm resources are strategically relevant resources. He defines “strategic resources” as the “strengths” that firms can use to conceive and implement their competitive strategy. The strategic relevance of a firm resource depends on the characteristics of the industry and the macro environment within which the firm competes (Grant, 1998). For the purposes of our study we use the term “resource” to broadly refer to strategically relevant tangible and intangible assets, human capital, and organizational capabilities.

Apart from firm resources such as patents, copyrights, and satisfying regulatory requirements which may be considered as true entry barriers, organizational capabilities are the basis to construct “resource barriers” in order to sustain a competitive advantage (Wernerfelt, 1984). RBV scholars (e.g. Rumelt, 1974, 1984; Wernerfelt, 1984; Barney, 1991; Conner, 1991; Collis and Montgomery, 1997; Grant, 1998; Dierickx and Cool, 1989) agree about the fact that the “linkedness” of the resources composing a strategic organizational capability define its degree of imperfect mobility and determines whether it can be considered as a resource barrier to sustain the firm’s competitive advantage. Dierickx and Cool (1989) argue that the sustainability of a firm’s advantageous resource-based position depends on how

easily these resources can be acquired, imitated, or substituted by its competitors; i.e. the degree of imperfect mobility of resources. They describe the following factors enabling firms to construct resource barriers: (1) Time compression diseconomies to imitation, making it more difficult for a new entrant to catch up by simply investing money to acquire or develop the resource; (2) resource mass efficiencies, firms already possessing a substantial stock of resources can add to it at a lower cost than can do so a new entrant; (3) interconnectedness of resources, a newly acquired or developed resource does not produce the same results for two distinct firms having different previous stocks of resources; and (4) causal ambiguity, because of the linkedness of resources, sometimes it not possible to fully separate which resources are causing specific observed outcomes and consequently making infeasible the replication of results by other firms.

According to Chopra and Meindl (2001), in the path from extraction of raw materials to the delivery of a finished product for a final consumer, there are a set of interrelated firms performing different activities; they name the interrelated firms in this path as a supply chain. Frohlich and Westbrook (2001) state that most successful firms seem to be those that have efficiently manage the links among their internal processes to those of external suppliers and customers; that is, those implementing the best supply chain management (SCM) approach. Mentzer et al. (2001), in their intention to unify the SCM concept, conducted a exhaustive review of its definitions and formally propose that SCM can be considered as a management philosophy based

in a systems approach to view the supply chain as a whole, whose members have a strategic orientation to align the intra-firm and inter-firm capabilities into a unified whole with a customer focus, to then create differentiated sources of customer value. They assert that the implementation of supply chain management initiatives enhances customer value, which leads to attain a competitive advantage for the entire supply chain and consequently for each supply chain member.

Melnyk and Denzler (1996) define customer value as a function of *satisfaction* and *cost*; where *satisfaction* represents the customer's perception about the benefits he/she will receive from the product's quality, the speed at which he/she will receive the product, and the flexibility to customize the product; and *cost* represents the customer's perception about the objective and subjective costs he/she has to incur to acquire the product. Based on Melnyk and Denzler's formula, value creation occurs due to anyone or a combination of the following initiatives across the supply chain: an increase in products quality, an increase in delivery speed, an increase in flexibility, a decrease in objective costs, or a decrease in subjective costs. Generally, initiatives undertaken to increase satisfaction also increase costs; consequently it is the net effect what determines whether value is created or destroyed.

In the path from extraction of raw materials to delivery a consumer good, each supply chain member adds value to the final supply chain output by performing activities such as raw materials extraction, manufacturing, warehousing, distribution, transportation, and selling (Chopra and Meindl, 2001; Simchi-Levi et al., 2003).

Craighead and Shaw (2003) assert that the supply chain's output is a supply chain bundle (SCB) whose value depends on the combined capabilities of all supply chain members; the supply chain bundle's value represents the accumulated value added for all supply chain members along the chain. In the process of buying a product, customers have the possibility to compare the values of different supply chain bundles and will buy the bundle that, they perceive, best matches their value expectations (Craighead and Shaw, 2003).

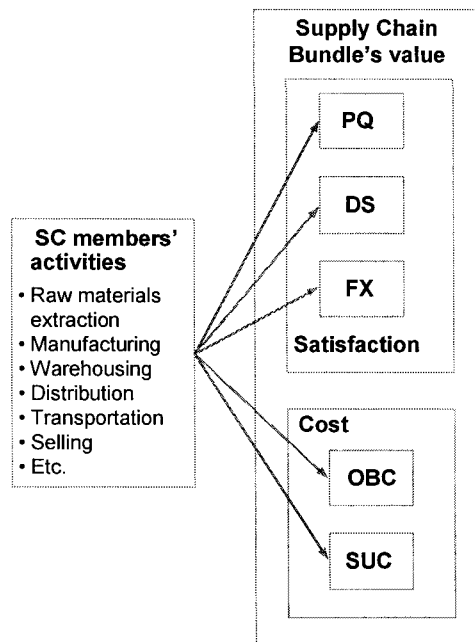
3.3. Conceptualization of the Value offered by a Supply Chain for the Final Customer

In accordance with Melnyk and Denzler's definition, we consider that the value of the SCB can be measured according to five dimensions: product quality, delivery speed, flexibility, objective costs, and subjective costs. Thus, we define customer value as the customer's perception about the benefits he/she will receive from the seller according to issues related to: (1) product quality; (2) the speed at which he/she will receive the product; and (3) the flexibility to customize the product accordingly to his specifications; and the costs he/she will incur to acquire the product according to issues related to (4) objective costs (e.g. price, transportation, and shipping charges); and (5) the subjective costs (e.g. time required to locate a product, and the necessity to assist to a specific place at restricted attendance hours to acquire the product).

In the path from extraction of raw materials to delivery a consumer good, at the

same time that each supply chain member collaborates for the production and delivery of the good, each member's capabilities determine how good will be product quality, how fast the product can be delivered, whether it is possible to customize the product, and objective and subjective costs; that is, each supply chain member adds value to the final SC bundle (see Figure 3.1) accordingly to its capabilities, which means that the total SC bundle's value is a function of the accumulated value added along the chain (Melnyk and Denzler, 1996; Naylor et al., 1999; Craighead and Shaw, 2003).

Figure 3.1: Accumulated Value Added along the Supply Chain



PQ represents customer's perceived benefits from the quality of the final product, which depends, among other factors, on the quality of each one of its components and how well every manufacturing activity along the chain is performed. DS represents

the time it takes to delivery the product from a specific point of the chain. If the product is delivered from a retailer, DS is zero, whereas if it is delivered from a manufacturer, DS is the time required to ship and deliver the product; DS may also include the assembling time if the customer wants a customized product. FX represents customer's perceived benefits from the possibility of customizing the product according to his specifications. This implies that the chain has to have special characteristics such as managing a system for direct communication between manufacturer and customer, and capacity to perform flexible manufacturing and postponement. OBC represents the objective costs that the customer has to pay to acquire the product; they may include price, transportation, and shipping charges. SUC represents the subjective cost that the customer has to incur to acquire the product; they include the time required to buy and the convenience regarding how, when, and where to buy.

3.4. Inter-Organizational Management Systems for SCM

In an extensive revision of studies addressing information technologies for supply chain management, Sahin and Robinson (2002) find out that the most relevant IOMS include: Quick response (QR), vendor managed inventory (VMI), and enterprise resource planning (ERP). Stock and Lambert (2001) present other IOMS providing significant benefits for SCM, they are: just-in-time manufacturing (JIT), cross-docking (CDK), and postponement (PSP). Each one of these IOMS contribute to increase the value added along the supply chain through at least one of the following

ways: (1) increasing product quality; (2) increasing delivery speed as consequence of reducing lead times; (3) increasing flexibility through enabling product customization; or (4) reducing objective costs by means of reducing manufacturing, inventory, or transportation cost. That is, an IOMS increases the value offered for the final customer through the SCB if its implementation derivates on anyone or a combination of the previous conditions. We next explain how each one these IOMS particularly helps to increase the value offered for the final customer.

3.4.1. Quick response

In a QR system, retailers share their real sales data with their suppliers. Suppliers, which can be distributors or manufacturers, use information about real demand from final customers, versus the more highly variable demand from retailers, to more accurately forecast future orders from the retailer. This allows managers to more accurately elaborate purchase orders to their immediate suppliers and program the required production runs in order to minimize the firm's inventory levels to face their immediate demand, reducing in this way the bullwhip effect (Chopra and Meindl, 2001). Consequently, QR systems help to reduce inventory and production costs, and to shrink lead time (Stock and Lambert, 2001; Chopra and Meindl, 2001; Simchi-Levi et al., 2003). J.C. Penney, and Levi Strauss & Company have QR systems implemented along their supply chains (Stock and Lambert, 2001; Sahin and Robinson, 2002).

A QR system is the most simplified IOMS taking advantage from inter-organizational information sharing, it implies that SC members take action and make use of their resources such as warehousing and production capacities and financial assets in response to the information they receive from the retailer; that is, a QR system inter-links information, production, finances, interpersonal relationships, skills, and warehousing resources between a retailer and its supplier. The implementation of a QR system reduces inventory and production costs. Since this reduction of costs may derive on a price reduction, which increases the value offered through the SC bundle's objective costs dimension, then we formulate the following proposition:

P1a: The implementation of a QR system positively impacts the value offered through the supply chain bundle's objective costs dimension.

Since a QR system shrinks lead time, implying an increase in delivery speed, we formulate the following proposition:

P1b: The implementation of a QR system positively impacts the value offered through the supply chain bundle's delivery speed dimension.

3.4.2. Vendor Managed Inventory

One extension to a QR system is the vendor managed inventory system, also known as supplier managed inventory (Waller et al., 1999). Under a VMI system, the supplier owns the inventory stored in the retailer's facilities, it monitors the retailer's inventory levels and makes periodic replenishment decisions (within previously agreed-upon bounds) involving quantities, delivery mode, and the timing of

replenishments (Simchi-Levi et al., 2003). The supplier's main advantages from implementing a VMI system is the mitigation of demand uncertainty regarding when an order will arrive and the orders quantities; having control over these two conditions allows suppliers to elaborate more accurately and consistent (less variability) purchase orders to their immediate suppliers and more efficiently program the required production runs in order to maintain inventory levels more close to the "optimal level". Furthermore, a VMI system expands the advantages of a QR system because the suppliers can accumulate the replenishment quantities for several customers and develop a better distribution program to use less transportation tours with fuller trucks. Thereby, a VMI system allows maintaining a specified service level and minimizing (more close to optimal) inventory, production, and transportation costs (Simchi-Levi et al., 2003; Chopra and Meindl, 2001). Dillard Department Stores, and Wal-Mart have VMI systems implemented along their supply chains (Sahin and Robinson, 2002; Simchi-Levi et al., 2003).

As an inter-organizational management system, a VMI system creates inter-linkages of information, production capacity, finances, interpersonal relationships, skills, warehousing, and distribution resources between a retailer and its supplier. The implementation of a VMI system reduces inventory, production, and transportation costs. Since this reduction of costs may derive in a price reduction, which increases the value offered through the SC bundle's objective costs dimension, then we formulate the following proposition:

P2a: The implementation of a VMI system positively impacts the value offered through the supply chain bundle's objective costs dimension.

Since the implementation of a VMI system reduces lead time, implying an increase on delivery speed, then we formulate the following proposition:

P2b: The implementation of a VMI system positively impacts the value offered through the supply chain bundle's delivery speed dimension.

3.4.3. Enterprise Resource Planning

Early ERP systems were concerned with intra-firm processes management.

However later ERP systems evolved from enterprise optimization to collaborative commerce and supply chain coordination, and their domain expands from a focus on manufacturing and distribution to include demand and procurement management (Simchi-Levi et al., 2003). The new generation of ERP systems (often called ERP II) is concerned with intra-firm and inter-firm process management (Reyes et al., 2002). We conceive an ERP system as including the intra-firm and inter-firm processes management, but we use the term ERP, instead of ERP II, to refer to them.

According to Stratman and Roth (2002), an ERP system consists of three elements: (1) a single central database; (2) computer applications for collecting inter-firm and intra-firm transactional data; and (3) information-generating computer applications allowing the user to extract multiple views of the supply chain data. The computer applications of the ERP systems can be grouped in four major modules: (1) financial accounting; (2) human resources; (3) manufacturing and logistics; and (4) sales and distribution (Stock and Lambert, 2001). An ERP system provides transaction tracking

and global visibility of information (e.g. inventory levels, order status, and production runs) from any of the firms integrating the supply chain. This allows each supply chain member to know the real demand from final customers, and to more accurately elaborate a forecast of future purchase orders from its immediate customers.

Consequently managers can more accurately elaborate purchase orders to their immediate suppliers and program the required production runs in order to minimize inventory levels to face their immediate demand, reducing in this way the bullwhip effect (Chopra and Meindl, 2001). Thus, an ERP system has broader impact than a QR system because it helps to reduce inventory and production costs, and to shrink lead time across the entire supply chain (Simchi-Levi et al., 2003). Companies like Exxon, Kodak, Coca-Cola Bottling Co., and Wal-Mart utilize ERP systems to manage their supply chains (Stock and Lambert, 2001; Laudon and Traver, 2004).

An ERP system inter-links information, production, finances, interpersonal relationships, skills, and warehousing resources across the entire supply chain. The implementation of an ERP system reduces inventory and production costs. Since this reduction of costs may derive in a price reduction, which increases the value offered through the SC bundle's objective costs dimension, then we formulate the following proposition:

P3a: The implementation of an ERP system positively impacts the value offered through the supply chain bundle's objective costs dimension.

Since the implementation of an ERP system reduces lead time, what implies an increase on delivery speed, we formulate the following proposition:

P3b: The implementation of an ERP system positively impacts the value offered through the supply chain bundle's delivery speed dimension.

3.4.4. Just in Time Manufacturing

Just-in-time is an inventory management system introduced in the 1970s, but whose utility continues to be of great importance (Stock and Lambert, 2001). Melnyk and Denzler (1996) define just-in-time manufacturing as the “quest to produce output within the minimum possible lead time and at the lowest possible total cost by continuously identifying and eliminating all forms of waste and variance.” Giunipero and Law (1990) define JIT as “a program which seeks to eliminate non-value-added activities from any operation with the objectives of producing high-quality products, high productivity levels, lower levels of inventory, and developing long-term relationships with channel members.” These definitions enhance the notion that anything over the minimum amount necessary for an activity is considered a waste. A JIT system attempts to minimize inventories through the elimination of safety stocks. Components or other materials are delivered at the precise moment (or the closest possible to that moment) when they are needed by the manufacturer; thus, JIT implementation requires close coordination between the manufacturer and its suppliers (Stock and Lambert, 2001).

Melnyk and Denzler (1996) identify the following benefits from the implementation of a JIT system: (1) inventory cost reduction, there is no safety stock, inventory levels must be practically zero; (2) product quality improvement, the quality level of inputs, products, and process must be “zero-defects” to avoid unnecessary rework; (3) lead

times reduction, time consuming activities must be anticipated to reduce as much as possible “waiting” times; and (4) continuous improvement, JIT implies a never-ending process of identifying and solving (i.e. correcting and avoiding in the future) problems. Companies like Dell, Xerox, Zytec, and Delphi Packard Electric Systems utilize JIT manufacturing systems (Stock and Lambert, 2001).

As an inter-organizational management system, JIT manufacturing inter-links information, finances, interpersonal relationships, skills, warehousing, transportation, and production resources between the suppliers, and the manufacturer. The implementation of a JIT system reduces inventory cost. Since this reduction of costs may derive on a price reduction, which increases the value offered through the SC bundle’s objective costs dimension, then we formulate the following proposition:

P4a: The implementation of a JIT system positively impacts the value offered through the supply chain bundle’s objective costs dimension.

Since the implementation of a JIT system reduces lead time, what implies an increase on delivery speed, we formulate the following proposition:

P4b: The implementation of a JIT system positively impacts the value offered through the supply chain bundle’s delivery speed dimension.

Since the implementation of a JIT system improves product quality, we formulate the following proposition:

P4c: The implementation of a JIT system positively impacts the value offered through the supply chain bundle’s product quality dimension.

3.4.5. Cross-docking

In a Cross-docking system there is a cross-docking center operating as an inventory coordination point rather than as an inventory storage point, the idea is that products are consolidated and bypassed through the cross-docking center (Simchi-Levi et al., 2003). Stock and Lambert (2001) describe the cross-docking process consisting on: (1) products arrive from the manufacturer to the cross-docking center; (2) sometimes the bulk of products can be transferred directly to vehicles (trucks or smaller transporting vehicles) serving the retailers, or sometimes the bulks are broken down and products are mixed to form a new bulk accordingly to the quantities required by retailers and then the new bulk is loaded in vehicles serving the retailers; and (3) the vehicles are dispatched to delivery the mixed products to retailers.

Technically, products are never stored in the cross-docking center; generally they stay less than twelve hours within the warehouse. Cross-docking points, retailers, and suppliers must be linked with advanced information systems to ensure that all pickups and deliveries are made within the required time windows (Simchi-Levi, 2003). A cross-docking system helps to reduce inventory and transportation costs, and to shrink lead times (Stock and Lambert, 2001; Simchi-Levi, 2003). Wal-Mart utilizes a cross-docking system to distribute products to its retail stores (Stock and Lambert, 2001; Chopra and Meindl, 2001; Simchi-Levi et al., 2003).

As an inter-organizational management system, cross-docking inter-links information, finances, interpersonal relationships, skills, warehousing, and distribution resources between the retailer, the cross-docking point, and the

manufacturer. The implementation of a CDK system reduces inventory and transportation costs. Since this reduction of costs may derive on a price reduction, which increases the value offered through the SC bundle's objective costs dimension, then we formulate the following proposition:

P5a: The implementation of a CDK system positively impacts the value offered through the supply chain bundle's objective costs dimension.

Since the implementation of a CDK system reduces lead time, what implies an increase on delivery speed, we formulate the following proposition:

P5b: The implementation of a JIT system positively impacts the value offered through the supply chain bundle's delivery speed dimension.

3.4.6. Postponement

A postponement (or delayed product differentiation) system consists on manufacturing a generic product that is later changed in the form and identity in the last possible point of the delivery process (Stock and Lambert, 2001). By delaying differentiation, production and inventory decision can be made taking advantage of the aggregated demand of the generic product; which reduces inventory and production costs, and shrinks lead times (Simchi-Levi et al., 2003). The final characteristics of the product may be defined at assembling facilities, distribution centers, third-party facilities, or retail stores (Simchi-Levi et al., 2003; Stock and Lambert, 2001). Delaying differentiation may include product assembling, aggregation of operation manuals, adding stickers, moving switches, or repackaging (i.e. meet on-transit). Moving this customization closer to the final customer demand

where demand variability is smaller has the following advantages: (1) provides the flexibility to customize the product accordingly to particular requirements; (2) reduces inventory and production costs; (3) reduces lead times; and (4) cheapens product customization (Chopra and Meindl, 2001; Stock and Lambert, 2001; Simchi-Levi et al., 2003). Companies like Dell, and Benetton are well known by their utilization of postponement systems (Chopra and Meindl, 2001; Simchi-Levi et al., 2003).

As an inter-organizational management system, postponement inter-links information, finances, interpersonal relationships, skills, warehousing, and production resources between manufacturers, distribution centers, third party service providers, and retailers. The implementation of a PSP system reduces inventory and production costs. Since this reduction of costs may derive on a price reduction, which increases the value offered through the SC bundle's objective costs dimension, then we formulate the following proposition:

P6a: The implementation of a PSP system positively impacts the value offered through the supply chain bundle's objective costs dimension.

Since the implementation of a PSP system reduces lead time, what implies an increase on delivery speed, we formulate the following proposition:

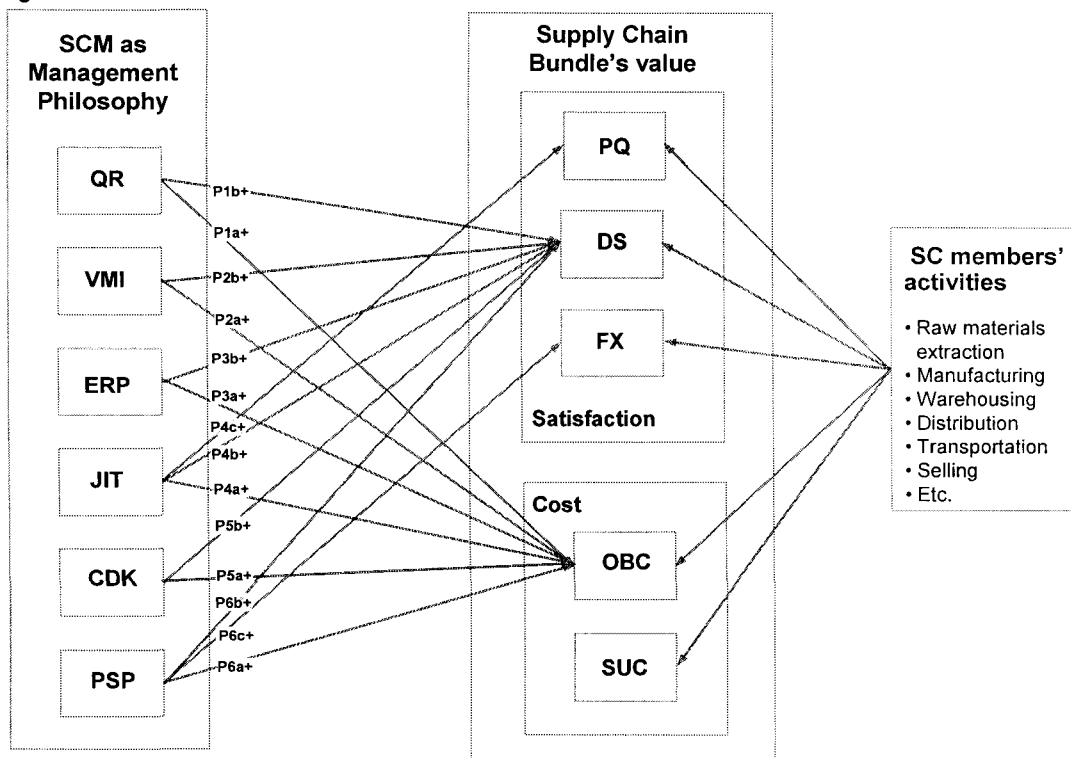
P6b: The implementation of a PSP system positively impacts the value offered through the supply chain bundle's delivery speed dimension.

Since the implementation of a PSP enables product customization, we formulate the following proposition:

P6c: The implementation of a PSP system positively impacts the value offered through the supply chain bundle's flexibility dimension.

According to Mentzer et al. (2001), supply chain management as a management philosophy is the sum total of all the management initiatives undertaken to coordinate the interactions of the supply chain members along the chain. Based on this, we can group all the inter-organizational management systems implemented along the supply chain under a SCM multidimensional construct. We show how each IOMS adds value to the supply chain bundle through the following model constructed using the above propositions (see Figure 3.2).

Figure 3.2: How IOMS Add Value to the SCB



3.5. The E-tailing Model of B2C E-commerce

The e-tailer (observed firm) is the last member of the chain, the supply chain is truncated at this point. It is assumed that customers are not able to buy the product by internet and pick it the e-tailer warehouse, the e-tailer relies on a third-party logistics (3PL) provider to deliver the product on the final customer's selected destination. That implies that the customer has to wait to receive the product, which decreases the value offered through the supply chain bundle's delivery speed dimension. The shipping cost is generally charged to the final customer, which decreases the value offered through the supply chain bundle's objective costs dimension. Thus, we formulate the following propositions:

P7: Waiting time negatively impacts the value offered through the supply chain bundle's delivery speed dimension.

P8: Shipping costs negatively impacts the value offered through the supply chain bundle's objective costs dimension.

On the other hand, since the e-tailer may be a manufacturer, it is possible that the manufacturer allows the customer to customize the product, which increases the value offered through the supply chain bundle's flexibility dimension. Based on this, we formulate the following proposition:

P9: The possibility of product customization positively impacts the value offered through the supply chain bundle's flexibility dimension.

According to Laudon and Traver (2004), an e-tailer is concerned with: (1) Facilitating final customer shopping by breaking time and place barriers; that is, customers can shop through the Internet at any hour of the day even at night without

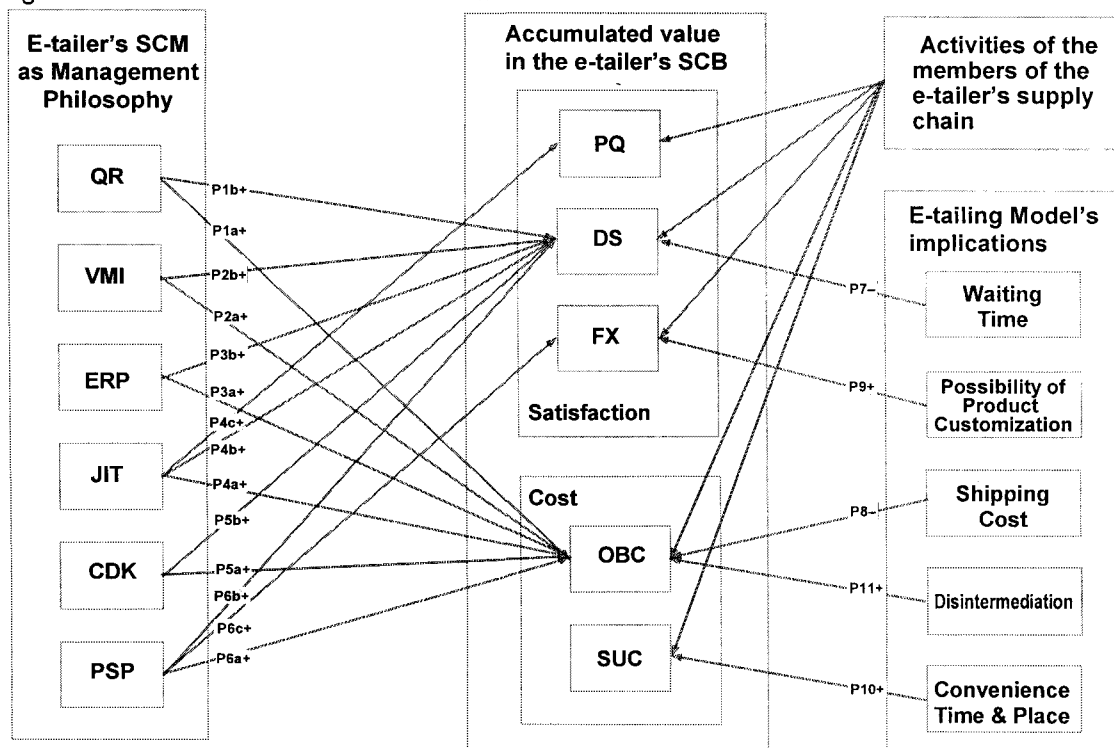
leaving their home or office, which increases the value offered through the supply chain bundle's subjective costs dimension; and (2) avoiding retailing costs and sometimes distribution cost also (i.e. disintermediation), which allows the e-tailer to decrease its price and consequently increase the value offered through the supply chain bundle's objective costs dimension. Thus, we formulate the following propositions:

P10: Convenience of time and place positively impacts the value offered through the supply chain bundle's subjective costs dimension.

P11: Disintermediation positively impacts the value offered through the supply chain bundle's objective costs dimension.

We now extend our model to consider the implications of the e-tailing model of B2C e-commerce on the supply chain bundle's value offered for the final customer (see Figure 3.3).

Figure 3.3: Accumulated Value in the E-tailer's SCB



3.6. E-tailer's SCM and E-tailing Model's Implications as Multidimensional Constructs

In order to present a parsimonious representation of competition between retailers and e-tailers, we simplified the previous model by considering the e-tailer's SCM as management philosophy and the e-tailing model's implications as multidimensional constructs. Since the IOMS composing the SCM construct positively impact the supply chain bundle's value, we formulate the following proposition:

P12: E-tailer's SCM as Management Philosophy positively impacts the e-tailer supply chain bundle's value.

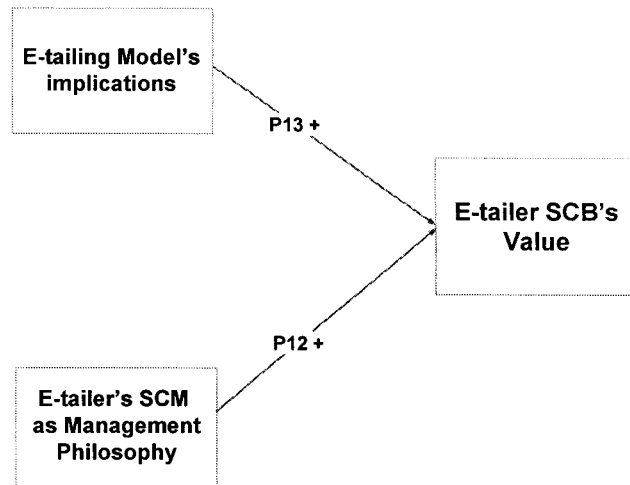
On the other hand, some e-tailing model's implications such as waiting time, and shipping cost negatively impact the supply chain bundle's value; but others such as product customization, convenience of time and place, and disintermediation positively impact it; then, it is the net effect what determines whether e-tailing model's implications positively or negatively impact the supply chain bundle's value. It is assumed that the value added by objective cost savings because of disintermediation and the perceived benefits from product customization and buying convenience is grater than the value lost by shipping cost and waiting time. Thus we formulate the following proposition:

P13: E-tailing Model's implications positively impact the e-tailer supply chain bundle's value.

The activities performed by the members of the e-tailer's supply chain indeed impact the final value of the supply chain bundle; however, they are not relevant for

our analysis. Consequently, we discard them in our simplified model for the analysis of the e-tailer supply chain bundle's value (see Figure 3.4).

Figure 3.4: The Impact of the E-tailing Model's Implications and E-tailer's SCM on the E-tailer Supply Chain Bundle's Value



3.7. Customer's Buying Decision within the Marketplace

Customers buy products within the marketplace where the marketplace integrated by accessible retailing stores and the e-market integrated by e-tailers overlap each other (Rayport and Sviokla, 1994). Competition between retailers and e-tailers is based on the value they offer through their respective supply chain bundles. At the moment that customers want to buy a product, they have the possibility to buy it from accessible physical retailers or from e-tailers through the Internet. Customers compare their accessible (physically or through the Internet) supply chain bundles' values based on the benefits they would receive from their respective product quality, delivery speed, and flexibility supply chain bundles' dimensions; and the costs they would have to incur to acquire the product accordingly to their respective objective

costs and subjective costs supply chain bundles' dimensions. Thus, customers will buy the bundle that, they perceive, best matches their customer value expectations accordingly to the PQ, DS, FX, OBC, and SUC supply chain bundle's dimensions. It is important to notice that customer value is a customer's perception, which implies that two different potential customers may perceive different customer value from the same seller's supply chain bundle. We now formulate the following propositions:

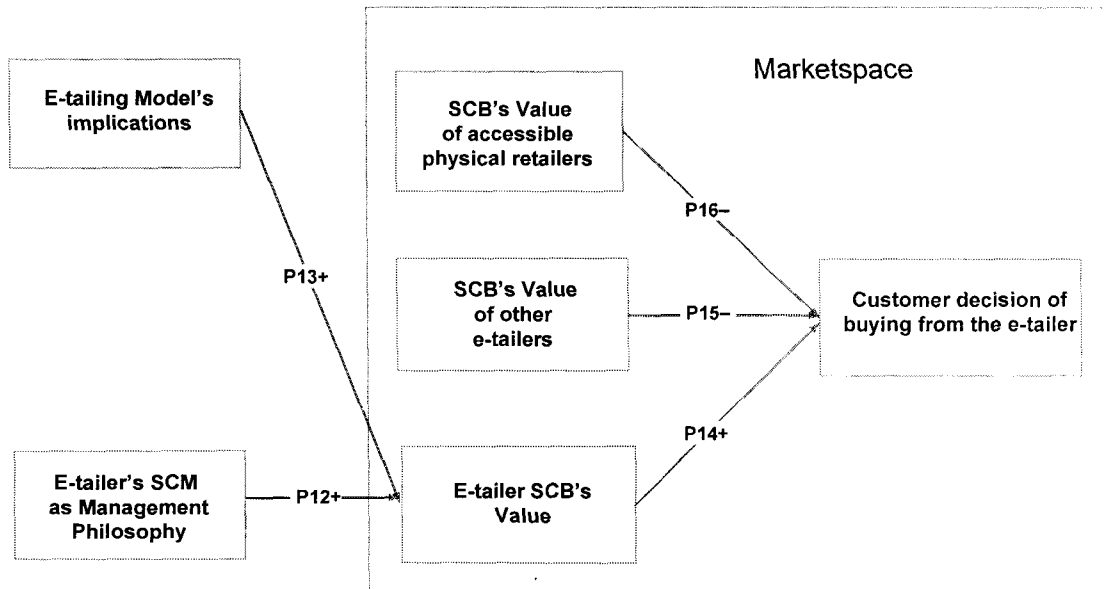
P14: The e-tailer supply chain bundle's value positively impacts customer decision to buy from the e-tailer.

P15: The values of the supply chain bundles offered by the other e-tailers negatively impact customer decision to buy from the e-tailer.

P16: The values of the supply chain bundles offered by accessible physical retailers negatively impact customer decision to buy from the e-tailer.

We now illustrate the process through which customers decide from where to buy within the marketspace (see Figure 3.5).

Figure 3.5: Customer Buying Decision within the Marketspace



3.8. Achieving and Sustaining a Competitive Advantage within the Marketplace

The implementation of an IOMS implies inter-alignment and intra-alignment of processes between the participating members in order to take advantage their individual resources (Finnegan et al., 2003). These resources include tangible assets, intangible assets, human capital, and organizational capabilities (Grant, 1998; Collis and Montgomery, 1997; Pearce and Robinson, 2005). When two or more supply members cooperate to implement an IOMS, they are linking together their individual resources to increase the total value offered for the final customer; that is, they construct a composed “supply chain capability” (SCC). Thus, IOMS can be considered as supply chain capabilities; and if they are not perfectly mobile, then they become the basis for achieving and sustaining a competitive advantage. Since a firm has a competitive advantage when it possesses the resources enabling it to consistently obtain a performance above the average within its industry (Grant, 1998), and the e-tailer’s performance is increased when customers decide to buy from it; then we formulate the following propositions:

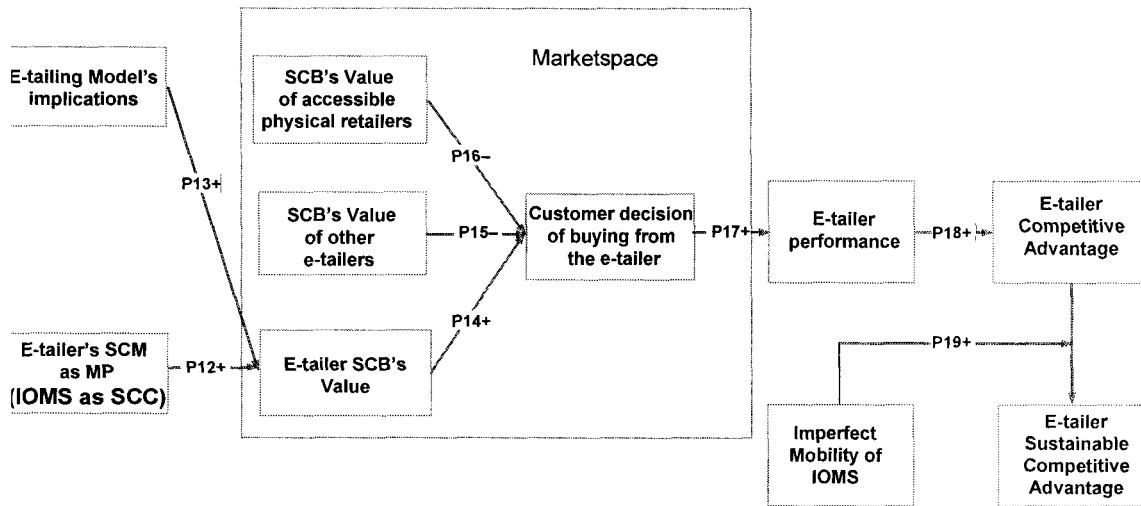
P17: A customer decision to buy from the e-tailer positively impacts the e-tailer performance.

P18: The e-tailer’s performance positively impacts e-tailer competitive advantage.

P19: The imperfect mobility of IOMS sustains the e-tailer’s competitive advantage.

We now illustrate the complete model for explaining how an e-tailer may achieve and sustain a resource-based competitive advantage within the marketplace (see Figure 3.6).

Figure 3.6: IOMS as SCC for Achieving and Sustaining the E-tailer's Competitive Advantage



3.9. Discussing the Model: IOMS as Supply Chain Capabilities for Achieving and Sustaining the E-tailer's Competitive Advantage

When customers buy products, they buy more than a simple product; they buy a supply chain bundle whose dimensions are product quality, delivery speed, flexibility, objective cost, and subjective cost. The customer's buying decision is based on his preferences and his perceptions about the value that each firm offers through its supply chain bundle. Customers shop within the marketplace, which means that e-tailers and physical retailers compete for the buying decisions of the same customers. Each competing firm (e-tailer or retailer) decides, according to their respective competitive strategies, what will be their value level offered through each one of the

five dimension of its bundle in order to be the winner of the customer's buying decision.

Firms will try to offer the greater supply chain bundle's value for its target market in order to achieve a competitive advantage. As Conner (1991) states, in a resource-based view of the firm, achieving a competitive advantage requires solving how to maintain the distinctiveness of its product or its low cost position, while not investing so much as to destroy the above-average performance. He argues that firms solve this "how" by means of the resources they use to implement their competitive strategies. Our observed firm is the e-tailer, which is the last member of a truncated supply chain. To achieve a resource-based competitive advantage, the e-tailer may rely on its "partners" along its supply chain to: (1) reduce inventory, production, and transportation costs, which will increase the value offered through the objective costs dimension of its SCB; (2) increase the quality of its product quality, which will increase the value offered through the product quality dimension of its SCB; (3) reduce lead times, which will increase the value offered through the delivery speed dimension of its SCB; and (3) offer product customization, which will increase the value offered through the flexibility dimension of its SCB. To accomplish these purposes, SC members collaborate to implement inter-organizational management systems such as quick response, vendor managed inventory, enterprise resource planning, just in time manufacturing, cross docking, and postponement. The idea is that these IOMS help to increase the supply chain bundle's value offered for the final

customer without a sacrifice of profits. That is, these IOMS are the resources that the e-tailer uses to achieve its competitive advantage.

As it was explained in Section 8, an IOMS can be considered as a supply chain capability. Thus, the IOMS implemented along the chain are the capabilities that help the e-tailer to increase the value offered through the SCB that it offers for the customer. This leads the customer's buying decision being on favor of the e-tailer's bundle. That, in turn, increases the e-tailer's performance, which can evolve towards a competitive advantage for the e-tailer if the e-tailer maintains its bundle's value greater than those of its competitors making the e-tailer to regularly obtain an above industry-average performance. However, if the e-tailer implements an IOMS and it enables the e-tailer to offer greater supply chain bundle's value as compared to those of its competitors, then its competitors will try to "copy" (i.e. acquire, imitate, or substitute) the IOMS. However, since an IOMS represents the inter-linkage of the collaborating member's individual capabilities, they are inherent capabilities to the e-tailer's supply chain. That is, IOMS are the imperfectly mobile e-tailer's supply chain capabilities allowing the e-tailer to achieve and sustain its competitive advantage.

3.10. Conclusions

The purpose of this study was to present a model for the analysis of competition between retailers and e-tailers within the marketplace. A resource-based view of this competitive environment is possible when supply chain management is conceptualized as a management philosophy by the members of the chain. It implies

that they recognize their interdependence as members of a whole system (i.e. the supply chain), and have a strategic orientation to be disposed to undertake cooperative efforts to aligning the intra-firm to the inter-firm management processes in order to inter-link their individual resources to construct strategically relevant supply chain capabilities. These SC capabilities allows the firm, the e-tailer in this case, to increase the value offered for the customers through its SCB, which constitutes the basis for achieving and sustaining the firm's competitive advantage.

Strategic management theory, particularly the resource-based view of the firm; supply chain theory, considering SCM as a management philosophy and operationalizing customer value offered through the supply chain bundle; and information technologies theory, conceptualizing the e-tailing model of B2C e-commerce where combined to present a theoretical model to analyze competition between retailers and retailers within the marketspace. Our contribution to these research fields, and to science in general, consist on showing, by combining these three research fields through our model, how this real competitive environment can be understood under a theoretical perspective. For practitioners, this model presents a good insight to realize that physical retailers are indeed competing against e-tailers and that offering greater value through their supply chain bundles constitutes the basis for achieving and sustaining their competitive advantages.

This model presents collaborative initiatives between a firm and its suppliers to increase the total value offered as a whole entity as the basis to achieve the firm's

competitive advantage. This suggests that an empirical research is worthwhile to explore: to what extent supply chain members recognize their interdependence as parts of a whole system, to what extent they are implementing cooperative efforts (e.g. IOMS) to increase the total value offered for the final customer, and how they conceive customer value in order to figure out if they are taking into consideration the five dimensions presented here.

On the other hand, this model has some limitations. It is very reasonable to suppose that, apart from customer value, there are other factors affecting the customer's decision of buying from the e-tailer. George (2002) asserts that uncertainty plays a key role in a customer's decision to buy a product through the Internet. During the buying process, customers experience concerns about the reliability of the e-tailer (Vijayarathy and Jones, 2000; George 2004) and about the reliability of Internet as transaction medium (Liao and Cheung, 2001; George, 2002; George, 2004). This implies that the model has to be empirically validated and perfected previously to consider it as a prescriptive tool.

CHAPTER 4

THE IMPACT OF CUSTOMER VALUE, RELIABILITY CONCERNS, AND NETWORK EXTERNALITIES ON E-TAILING B2C E-COMMERCE

4.1. Introduction

In an exploratory study Hawk (2004) found out that the main external (to the firm) factors restraining the ramp-up of business to consumer (B2C) e-commerce in developing countries are: Lack of telecommunications infrastructure, low computer and Internet penetration, lack of Internet skills, low average income, distrust in payment options, and poor delivery infrastructure. However, although most of those factors were partially resolved in the USA during the “dotcoms fiasco” period from 1995 to 2000, there was a mass failure of e-commerce firms and only a small number of strong survivors managed to remain in the market (Razi et al., 2004). The dotcoms fiasco phenomenon suggests that even though the external environment affects firm performance, the internal initiatives undertaken by the firm determine whether it is going to survive. Although a part of the causes of dotcoms’ failures were uncontrollable by the firm, the principal controllable causes included inadequate response capacity and poor customer service (Kemp, 2000; Razi et al., 2004; Pandya and Dholakia, 2005).

The term “dotcom” is generally used to refer to a company using the Internet as the transaction medium to implement its business model; i.e. a dotcom is a company performing e-business activities (Razi et al., 2004; Laudon and Traver, 2004).

Geoffrion and Krishnan (2001) classify e-business activities in two main areas: consumer-oriented activity, and business-oriented activity. The consumer-oriented activities consist of business to consumer (B2C), consumer to consumer (C2C), and government to consumer (G2C) activities. The business oriented activities comprise business to business (B2B), business to government (B2G), and government to business (G2B) activities.

B2C is the most well known and familiar type of e-commerce model. It consists of the use of a variety of Internet applications that enable companies to sell or promote goods directly to a final consumer. B2C initiatives not oriented to the selling of goods have the goal of providing content or facilitating transactions, and produce revenues from subscription fees, transaction fees, or advertising. Table 4.1 summarizes the most common B2C e-commerce models.

Particularly the e-tailing market has been steadily growing since 2000, and accumulated revenues of e-tailers are expected to reach \$238 billion by 2007. The impressive expected growth of B2C e-commerce suggests that instead of aborting the e-commerce idea after the dotcoms fiasco at the end of the 1990s, firms are investing to solve the problems that caused previous failures.

Model	Modality	Description	Examples	Revenue Source
E-tailer	Virtual dealer	Online version of retail store	Amazon.com	Sales of products
	Clicks and Bricks	Online distribution channel for company that also has physical stores	Wal-Mart.com Sears.com	Sales of products
	Catalog dealer	Online version of direct mail catalog	Grizzly.com	Sales of products
	Manufacturer-direct	Customized sales made directly by a manufacturer	Dell.com	Sales of products
Service Provider		Selling users a service, rather than a product	Elearning.com	Sales of services
Portal		Offers an integrated package of services and content such as search, news, e-mail, chat, multimedia, and calendars. Seeks to be a user's home page	Yahoo.com Google.com MSN.com	Advertising Subscription fees Transaction fees
Content Provider		Information and entertainment providers	ESPN.com CNN.com	Advertising Subscription fees Affiliate referral fees
Transaction Broker		Processors of online sales transaction, such as stock brokers and travel agents.	Stockbrokers.com Travelocity.com	Transaction fees
Market Creator	Auctions and other forms of dynamic pricing	Web-based businesses to create markets that bring buyers and seller together	eBay.com	Transaction fees

The study of B2C e-commerce has been addressed under different perspectives such as: Macro-factors affecting the development of B2C market in different countries (e.g. Hawk, 2004); web-page features influencing customer motivation to purchase a product through the Internet (e.g. Dadzie et al., 2005; Constantinides, 2004); security concerns (e.g. Vijayarathy and Jones, 2000; Liao and Cheung, 2001; George 2002; George, 2004); mass customization attractiveness (e.g. Combe, 2002; Squire et al., 2004; Bardakei and Whitelock, 2004; Goldsmith and Freiden, 2004); marketing efforts (e.g. Jiang, 2000; Vijayarathy, 2002; Constantinides, 2004); personal values

and attitudes influencing B2C e-commerce behavior (e.g. Shih and Fang, 2004; Jayawardhena, 2004); and demographic factors affecting B2C e-commerce (e.g. Thomson, 2001). Since the principal controllable causes of failures of e-commerce companies during the dotcoms fiasco period included inadequate response capacity and poor customer service (Kemp, 2000; Razi et al., 2004; Pandya and Dholakia, 2005), which can be considered as supply chain management (SCM) failures, the main purpose of this study is to analyze the B2C e-commerce phenomenon under a supply chain (SC) perspective. Particularly, the present analysis is focused on the e-tailer model of B2C e-commerce and comprises its different modalities: virtual dealer, clicks and bricks, catalog dealer, and manufacturer-direct. We use the term e-tailer to refer to any company making revenues by means of using the Internet to sell a physical product to a final consumer.

The term of customer value (CV) is very frequently referred to in both academia and practice of supply chain management, but there remains a lack of consensus about its definition; Simchi-Levi et al. (2003) define CV as a function of: product conformance to specifications, product selection, price and brand, value-added services, and relationships and experiences; Bradley (1994) define CV as a function of product quality and price; Naumann (1995) define CV as a function of: product attributes, service attributes, transaction cost, life cycle cost, and risk; and Melnyk and Denzler (1996) define CV as a function of: product quality, delivery speed, flexibility to customize the product, objective costs, and subjective costs. Moreover,

those definitions are conceptual ones, but there is little or no empirical evidence of the existence of these concepts. This work contributes to supply chain theory by operationalizing the customer value concept and presenting empirical evidence of its existence in a customer's decision of buying a product through the Internet.

According to Combe (2002), network structures such as the Internet exhibit positive network externalities; i.e. the addition of a new user creates new potential benefits for old customers without a compensation being paid. Economides (1993) highlights the importance of a central exchange party to create network externalities within a market; the central exchange brings together the two complementary goods, "willingness to sell at price p " (the "offer") and "willingness to buy at price p " (the "counteroffer") and creates a composite good, the "exchange transaction". An e-market-maker is a company using the Internet to create an e-market that brings buyers and sellers together through a web-page (Laudon and Traver, 2004); examples of e-market-makers are eBay.com, Amazon.com, and Priceline.com. When a B2C e-commerce transaction is performed through an e-market-maker's web-page, a register of the customer's buying experience with the e-tailer is left within the e-tailer's historical record. Potential customers are able to review these previous customers' buying experiences and may know information about the e-tailer and the product they want to buy, which may reduce their uncertainty during the buying process (i.e. they receive a benefit). Since they do not have to pay for this information it is assumed that the phenomenon of network externalities is present within the e-tailer e-

commerce model. This work contributes to e-commerce theory by operationalizing the network externalities concept and presenting empirical evidence of its influence on a customer's decision to purchase a product through the Internet.

George (2002) asserts that uncertainty plays a key role in a customer's decision to buy a product through the Internet. During the buying process, customers experience concerns about the reliability of the e-tailer (Vijayarathy and Jones, 2000; George 2004) and about the reliability of Internet as transaction medium (Liao and Cheung, 2001; George, 2002; George, 2004). In addition to the influence of customer value and network externalities, we analyze the influence of e-tailer's reliability signals and customer's trust in the Internet as transaction medium on customer's level of Internet-enabled shoppings.

A research model is constructed to analyze the impact of customer value, reliability concerns, and network externalities on customers' level of product purchases through the Internet. Since a survey is conducted in Mexico to prove the research model, we additionally prove Hawk's (2004) asseveration that in developing countries, people's Internet skills and their level of income impact B2C e-commerce.

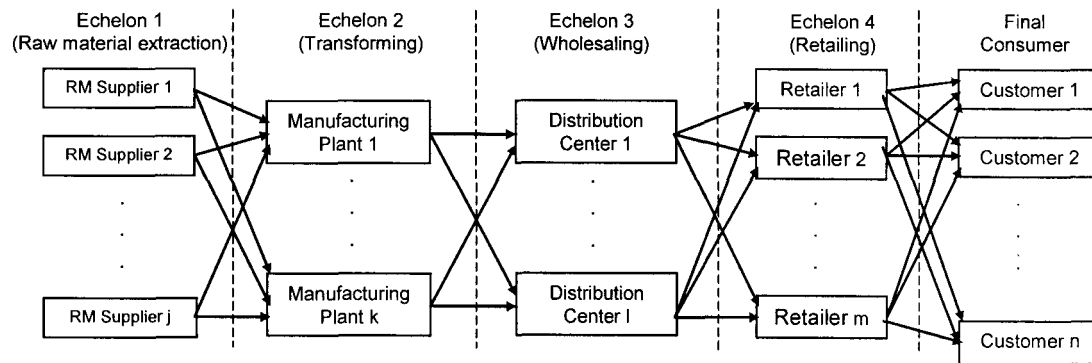
In order to assess the impact of customer value, reliability concerns, and network externalities on e-tailing B2C e-commerce this paper is structured as follows: Section 2 presents the implications of analyzing the e-tailing B2C e-commerce under a supply chain perspective, the concept of customer value is explained here. Section 3 describes the research model, including the hypotheses to be tested. Section 4 details

the methodology used to prove the research model, the results of factor analysis and linear regression analysis are presented here. In Section 5 we discuss how the empirical results prove the research model. Finally, Section 6 presents the conclusions drawn from this study.

4.2. The E-tailing B2C E-commerce Model: A Supply Chain Perspective

In the path from raw materials extraction to delivery a finished product for a final consumer, there are a set of interrelated firms performing different activities. Chopra and Meindl (2001) name the interrelated firms in this path as a supply chain. Simchi-Levi et al. (2003) classify those firms as: raw material suppliers, manufacturing plants, warehouses, distribution centers, and retailers. A supply chain is structured by several echelons (or stages) each consisting of a set of members of the same class; that is, a set of raw material suppliers constitutes the first echelon, a set of manufacturing plants constitute the second echelon, and so on (see Figure 4.1). The interactions among the participating firms construct a network instead of forming a chain. This is why a SC is also referred to as supply network or logistics network (Simchi-Levi et al., 2003). Since the supply chain term is the most broadly utilized, it will be used along this paper.

Figure 4.1: Simplified Supply Chain's Structure



Mentzer et al. (2001) assert that the implementation initiatives to manage a supply chain as a whole entity must be oriented to enhance customer value; i.e. the value offered for the final consumer at the last echelon of the chain. According to them, the increased customer value leads to improve supply chain performance as a whole entity and consequently it improves each supply chain member's performance.

Laudon and Traver (2004) assert that B2C e-commerce is primarily concerned with:

- (1) facilitating customers' shoppings by breaking time and place barriers, so that customers can shop at any hour of the day or night without leaving their home or office;
- (2) avoiding retailing costs and sometimes distribution cost also (i.e. disintermediation);
- (3) eliminating the cost of moving and storing the products near the final customer;
- and (4) participating in broader (e.g. national, or international) markets.

Even some predominant bricks retailers (i.e. retailers with physical presence) like Wal-Mart and Sears have moved to brick-and-clicks (i.e. implementing physical and Internet selling models) because of the benefits offered by breaking the time and place barriers. Since the retailing function of a local store is avoided in the

e-tailer model of e-commerce, the e-tailer is the last supply chain member of a truncated supply chain. Based on Mentzer et al.'s argument, the overall performance of the e-tailer's supply chain depends on the customer value offered by the e-tailer.

As it was previously stated, there is a lack of consensus about the definition of customer value; however, it is considered that Melnyk and Denzler's (1996) definition is more appropriated for the purposes of the present study. They define customer value as a function of *satisfaction* and *cost*; where *satisfaction* represents the customer's perception about the benefits he/she will receive from: the product's quality, the speed at which he/she will receive the product, and the flexibility to customize the product; and *cost* represents the customer's perception about the objective and subjective costs he/she has to incur to acquire the product. Craighead and Shaw (2003) assert that the supply chain's output is a supply chain bundle (SCB) whose value is the result of the combined capabilities of all SC members. Within the B2C e-commerce context, in accordance with Melnyk and Denzler's definition, one can consider that the value of the e-tailer's SCB can be measured according to five dimensions: product quality, delivery speed, flexibility, objective costs, and subjective costs. Thus, customer value is defined as the customer's perception about the benefits he/she will receive from the e-tailer according to issues related to: (1) product quality, (2) the speed at which he/she will receive the product, and (3) the flexibility to customize the product accordingly to his/her specifications; and the costs he/she will incur to acquire the product according to issues related to: (4) objective

costs (e.g. price, and shipping charges), and (5) the subjective costs (e.g. time required to locate a product, and the necessity to assist to a specific place at restricted attendance hours to acquire the product). It is important to notice that customer value is a customer's perception, which implies that two different potential customers may perceive different customer value for the same e-tailer's supply chain bundle.

4.3. Research Model

To analyze the impact of customer value, reliability concerns, and network externalities on e-tailing B2C e-commerce, we developed a set of hypotheses related to each one of these conceptual constructs. The term e-buy is used to refer to the customer's action of buying a product from an e-tailer. The model considers a single dependent variable, which is customer e-buying level (EBL). It represents how often the customer buys products through the Internet. The hypotheses composing the model are presented next.

4.3.1. Customer Value related Hypotheses

It is assumed that during the e-buying process, the customer's perception about the value offered by the e-tailer through each one of its supply chain bundle's dimensions influences his/her decision to buy the product from the e-tailer. How the customer assesses the value offered through each dimension is discussed next.

The product quality dimension of the e-tailer's SCB represents related issues of the product quality that provide benefits for the customer. They include the quality of the product itself, the inherent product quality related benefits of B2C e-commerce (e.g.

the possibilities of reaching a broader range of products, and dispose of more information about the product's quality), and the e-tailer's initiatives to let the customer know the product's quality (e.g. showing pictures and videos, and offering warranties). It is assumed that customers considering products offered through the Internet have good quality, and have greater appreciation for the inherent product quality related benefits of B2C e-commerce and the e-tailers' initiatives to show the quality of their products; will tend to exhibit higher e-buying levels. Then, the following hypothesis is formulated:

H1: The value offered by e-tailers through their SCB's Product Quality dimension positively influences customer e-buying level.

When customers want to buy a product, generally they are able to go to a local store and immediately acquire it, or they may buy it from an e-tailer and wait to receive it. The delivery speed dimension of the e-tailer's SCB represents the delivery speed related issues providing benefits for the customer. They include the speed at which he/she would receive the product, the inherent delivery speed related benefits of B2C e-commerce (e.g. because it is possible to reach a broader range of sellers through the Internet, the probability of shortage of a product is lower), and the e-tailer's initiatives to let the customer know when the product will be delivered (e.g. offering an order tracking option in its webpage). It is assumed that customers considering speed delivery as acceptable, and having greater appreciation for the inherent delivery speed related benefits of B2C e-commerce and the e-tailers' initiatives to let the customer know when the product will be delivered; will tend to exhibit higher e-buying levels.

Then, the following hypothesis is formulated:

H2: The value offered by e-tailers through their SCB's Delivery Speed dimension positively influences customer e-buying level.

The manufacturer-direct modality of e-tailer enables product customization. Dell.com is a well known example of this modality (see Dell and Fedman, 1999). Customizing the product allows customers to add extra capacities to the product and to drop unwanted ones, but this possibility implies that he/she has to invest time in designing the product's configuration. Since product customization requires the product to be manufactured and/or assembled according to the customer's specifications, when a customer decides to buy a customized product he/she generally has to wait extra time to receive it. Because product customization requires manufacturing and/or assembling the product and these processes are seldom performed in the retailer's installations, product customization is one of the main e-tailers' advantages vis-à-vis physical retailers that plays against waiting time (Laudon and Traver, 2004; Goldsmith and Freiden, 2004). The flexibility dimension of the e-tailer's SCB represents the flexibility related issues providing benefits for the customer. It is assumed that customers preferring customized products, and show a positive willingness to invest time in designing the product and to wait extra time to receive it; will tend to exhibit higher e-buying levels. Then, we formulate the following hypothesis:

H3: The value offered by e-tailers through their SCB's Flexibility dimension positively influences customer e-buying level.

Generally, in the e-tailer model of e-commerce the costs of moving and storing inventory in distribution centers are avoided, and the profit margins of distribution centers and retailers are eliminated. Consequently, e-tailers are able to offer lower prices vis-à-vis physical retailers. On the other hand, e-tailers generally rely on third-party (3P) service providers to deliver the products at the customers' selected destinations and shipping costs are generally charged to customers. The objective costs dimension of the e-tailer's SCB represents the issues related to the objective costs the customer pays to acquire the product. It is assumed that objective costs (e.g. price, and shipping cost) that customers have to pay to acquire a product through the Internet are lower than the objective costs (e.g. price, and transportation cost) they have to pay to acquire it in local stores; that is, there is an objective cost saving from buying a product through the Internet. Consequently, customers perceiving objective cost savings from buying a product through the Internet will tend to exhibit higher e-buying levels. Then, the following hypothesis is formulated:

H4: The value offered by e-tailers through their SCB's Objective Costs dimension positively influences customer e-buying level.

According to Laudon and Traver (2004), the use of the Internet to commercialize products facilitates customers' shoppings by breaking time and place barriers, customers can shop at any hour of the day or night without leaving their home or office. The subjective costs dimension of the e-tailer's SCB represents the issues related to the subjective costs the customer incurs to acquire the product. They include the time required to locate a product, and the necessity to assist to a specific

place at restricted attendance hours to acquire the product. It is assumed that customers save time and effort by using the Internet to acquire a product instead of going to a specific place at restricted attendance hours to acquire it; that is, there is a subjective costs saving from buying a product through the Internet. Consequently, customers perceiving subjective cost savings from buying a product through the Internet will tend to exhibit higher e-buying levels. Then, the following hypothesis is formulated:

H5: The value offered by e-tailers through their SCB's Subjective Costs dimension positively influences customer e-buying level.

4.3.2. Reliability Concerns related Hypotheses

During the e-buying process, customers experience concerns about the reliability of the e-tailer (Vijayasathya and Jones, 2000; George 2004). According to Vijayasathya and Jones (2000), customers consider those e-tailers who have physical presence (e.g. Wal-Mart.com, and Sears.com) or are a well known brand name whose products are sold in local stores (e.g. Sony.com, and Kodak.com) as more reliable than those who started their commercial activities through the Internet and do not have physical presence. In order to be more reliable, e-tailers implement initiatives enabling greater interaction between the e-tailer and the customer such as offering a customer-support account where the customers may send e-mails to solve their questions (Laudon and Traver, 2004). Being a well known brand name, having physical presence, or offering options for interaction between e-tailer and customer are considered as e-tailer's reliability signals, and it is assumed that customers having

greater appreciation for e-tailer's reliability signals will tend to exhibit higher e-buying levels. Then, we formulate the following hypothesis:

H6: E-tailers' Reliability Signals positively influence customer e-buying level.

According to George (2004), one of the main factors restraining potential customers from purchasing products through the Internet is the reliability of the Internet as a transaction medium. During the e-buying process, customers experience concerns about: hackers getting access to their financial information, the possibility of their computers being infected by a computer virus, and the possibility of spy software being installed in their computers (Liao and Cheung, 2001; George, 2002; George, 2004; Laudon and Traver, 2004). In order to give to the customers a signal of Internet's reliability, e-tailers protect their transactions with customers using encryption software (e.g. VeriSign, and Hacker-Safe) to secure communications and payments (Laudon and Traver, 2004). On the other hand, a steady increased number of Internet users are protecting their computers using anti-virus and anti-spy software (Laudon and Traver, 2004). It is assumed that Internet's reliability signals given by the e-tailer and the possibility to protect computers against computer virus and spy software increases customers' trust in the Internet as transaction medium. Thus, customers having greater trust in the Internet as the transaction medium will tend to exhibit higher e-buying levels. Then, we formulate the following hypothesis:

H7: Customer Trust in The Internet as transaction medium positively influences customer e-buying level.

4.3.3. Network Externalities Hypothesis

Customers not only experience concerns about the e-tailer's reliability and Internet's reliability when they buy a product through the Internet, but they also experience concerns about the impossibility of physically inspect the product's quality (Vijayasathy and Jones, 2000, Liao and Cheung, 2001). Network structures such as the Internet exhibit positive network externalities (Shapiro and Variant, 1999; Combe, 2002); i.e. the addition of a new user creates new potential benefits for old customer without a compensation being paid (Economides and White, 1994). Economides (1993) highlights the importance of a central exchange party to create network externalities within a market; the central exchange brings together the two complementary goods, "willingness to sell at price p" (the "offer") and "willingness to buy at price p" (the "counteroffer") and creates a composite good, the "exchange transaction".

An e-market-maker is a company using the Internet to create an e-market that brings buyers and sellers together through a web-page (Laudon and Traver, 2004); examples of e-market-makers are eBay.com, Amazon.com, and Priceline.com. When a B2C e-commerce transaction is performed through an e-market-maker's web-page, a register of the customer's buying experience is left within the e-tailer's historical record. These experiences include information about the e-tailer's reliability and products' qualities. Potential customers are able to review these previous customers' buying experiences and may know information about the e-tailer's reliability and the

quality of the product they want to buy, which may reduce their uncertainty during the buying process (i.e. they receive a benefit). Since they do not have to pay for this information, it is assumed that the phenomenon of network externalities is present within the e-tailer e-commerce model. By charging a transaction fee, the e-market-maker serves as impartial informer of the seller's reputation and reliable e-tailers are willing to participate in B2C e-commerce through an e-market-creator as a signal of their reliability. It is assumed that customers considering they receive a benefit from the possibility of reviewing previous customers' opinions about the e-tailer's reliability and the product's quality will tend to exhibit higher e-buying levels. Then, we formulate the following hypothesis:

H8: Network Externalities arisen in e-tailing e-commerce through an e-market-maker positively influences customer e-buying level.

4.3.4. Demographic Characteristics related Hypotheses

According Hawk (2004), the main causes restraining the ramp up of B2C e-commerce in developing countries include lack of Internet skills and low average income among customers. Since the present study was conducted in Mexico, it is considered that the customer's income level and his/her ability to buy a product through the Internet have an impact the customer's e-buying level. It is assumed that customers with higher income levels will tend to exhibit higher e-buying levels. Then, we formulate the following hypothesis:

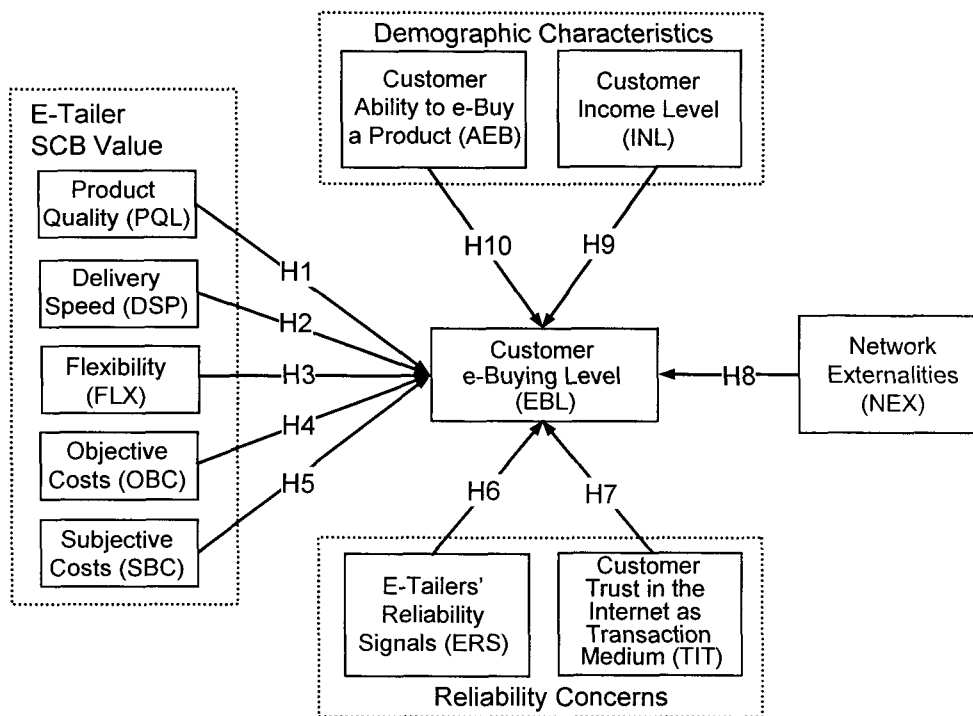
H9: Customer Income Level positively influences customer e-buying level.

It is assumed that customers encountering greater facility to buy a product through the Internet will tend to exhibit higher e-buying levels. Then, we formulate the following hypothesis:

H10: Customer Ability to e-Buy a Product positively influences customer e-buying level.

The research model composed by the ten hypotheses is presented in Figure 4.2.

Figure 4.2: Research Model



4.4. Research Methodology

According to Hawk (2004), the main requirements related to customer for B2C e-commerce development are medium to high customer's levels of: Internet skills and income. Based on that, the study population was selected as bachelor and master degree students from Monterrey Tech in Mexico who have ever bought a product

through the Internet. A sampling frame composed by 956 students who have ever bought products through the Internet was constructed including bachelor degree and master degree students from several courses imparted in different campuses across the country. A stratified, according to e-buying level, random sample was chosen for statistical analysis.

4.4.1. Research Instrument

Babbie (2004) asserts that surveys may be used for exploratory, descriptive, and explanatory purposes and they are appropriate for the study of large populations of individuals. Because in this study the dependent variable is customer's e-buying level, the inherent unit of analysis in the present model is the individual. Moreover, since our study population is composed by a large number of individuals, the survey research method was chosen to prove the research model. A first draft of the questionnaire was composed from the adaptation of several items taken from previous B2C e-commerce research works and the elaboration of new ones. Likert scales with range 1 to 5 were used to construct the items. To assess content validity, based on the methodology proposed by McGartland et al. (2003), the questionnaire was submitted to a group of experts composed of five research experts and four research subjects. The questionnaire evaluation's results showed an inter-rater agreement (IRA) index for the scale of 0.93 denoting the experts were consistent in their ratings, and a content validity index for the scale of 0.98 implying the experts considered that items in the scale were representative of their correspondent constructs. Additionally, the

experts gave concrete suggestions for improving the scale. After the modifications were done, a pilot study was conducted to assess construct validity; the questionnaire was applied to a group of 63 students who were let out of consideration for the final survey. Exploratory factor analysis, using principal components extraction, was conducted and the results showed that most items could be summated into their correspondent factors.

Since the e-tailer's SCB dimensions (i.e. Product Quality, Delivery Speed, Flexibility, Objective Costs, and Subjective Costs), e-tailer's reliability signals, customer's trust in the Internet as transaction medium, and network externalities are summated scale's dimensions (see Hair et al., 1998), factor analysis is needed to summate their corresponding items. According to Hatcher (1994), the minimal adequate sample size to perform exploratory factor analysis is five times the number of variables being analyzed. In order to exceed this minimum, since our questionnaire is composed by 49 variables (i.e. items) which should be summated into their correspondent factors, a sample size of 300 students was chosen.

After the data were colleted, exploratory factor analysis was conducted using Principal Component Analysis as the extraction method. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy for factor analysis was 0.901, which indicates that the data collected were very appropriate for factor analysis (Sharma, 1996). Following Hatcher's (1994) recommendations, items whose factor loadings were smaller than 0.40 were dropped. In order to obtain a meaningful interpretation of the

factors, the factor structure was rotated using Quartimax orthogonal rotation. Eight factors with conceptual meaning were retained and items that were summed into an inappropriate factor (i.e. they do not share conceptual meaning with the other items loading to that factor) were dropped. Forty of forty nine items were retained. Factors' structures for customer value scale are presented in Table 4.2. Factors' structures for reliability concerns and network externalities scales are presented in Table 4.3 and Table 4.4 respectively.

In order to assess internal consistency of the items summated into each factor, Cronbach Alpha reliability coefficient was used to assess the consistency for each factor. Since the alpha coefficients were greater than 0.70 for each factor (see Table 4.5), the items composing them are deemed reliable (Hair et al., 1998).

Item	Source	Comm.	Loading	Factor
I.7. The amount of product quality information offered by Internet-retailing companies is greater than the amount of information provided by local stores.	Adapted from Vijayasarathy (2002)	0.56	0.71	Product Quality dimension of the e-tailer's SCB
I.10. You may assess the quality of a specific product (e.g., the X brand Y model camera) more accurately through the Internet than in local stores.	Adapted from Vijayasarathy (2002)	0.53	0.65	
I.6. You may buy products through the Internet whose quality exceeds that of similar products sold in local stores.	Newly developed	0.50	0.61	
I.5. You can assess the quality of an Internet-marketed product through the information (e.g., technical specifications, manuals, photographs and/or demo videos, etc.) presented in the company's web-page.	Newly developed	0.50	0.57	
I.8. Offering a warranty for Internet-marketed products is a way to assure its quality.	Adapted from Cardenas (2002)	0.43	0.50	
III.3. Product information (e.g., technical specifications, user's manual, photographs and/or demo videos, etc.) available in the company's web-page motivates you to purchase products through the Internet.	Adapted from Cardenas (2002)	0.47	0.44	
I.12. Delivery times for Internet-purchased products are acceptable.	Adapted from AMIPCI (2004)	0.64	0.72	Delivery Speed dimension of the e-tailer's SCB
I.13. When local stores run out of a specific product, being able to purchase it through the Internet prevents you from having to wait for it for a long time.	Newly developed	0.58	0.70	
I.14. When you buy a product through the Internet, you can be sure that the product will be delivered within the time period specified by the Internet-retailing company.	Adapted from Vijayasarathy (2002)	0.57	0.61	
I.11. Local stores are more likely to run out of stock on a specific product (thus forcing you to wait for it) than all Internet-retailing companies selling it.	Newly developed	0.51	0.59	
I.15. The fact that Internet-retailing companies offer you an option to check on product delivery status effectively reduces your uncertainty as regards the time you will have to wait for it.	Adapted from Cardenas (2002)	0.55	0.52	
III.7. When local stores have run out of a specific product, being able to purchase it from Internet-retailing companies motivates you to purchase products through the Internet.	Newly developed	0.47	0.44	

Table 4.2: Customer Value Scale (continuation)				
Item	Source	Comm.	Loading	Factor
I.17. It is worth it to spend time to design a product through the Internet to be manufactured according to your preferences.	Adapted from Bardakci and Whitelock (2004)	0.82	0.86	<i>Flexibility</i> dimension of the e-tailer's SCB
I.19. Products manufactured to your preferences are a good purchase option for you.	Newly developed	0.76	0.78	
III.9. Being able to design a customized product through the Internet to be manufactured according to your preferences motivates you to purchase products through the Internet.	Adapted from Cardenas (2002)	0.64	0.74	
I.18. It is worth the wait to receive a product manufactured to your specific preferences.	Adapted from Bardakci and Whitelock (2004)	0.71	0.74	
I.16. The fact that you can design a product through the Internet to be manufactured according to your preferences enables you to request only the special features you are willing to pay extra for.	Adapted from Bardakci and Whitelock (2004)	0.66	0.66	
I.20. When a specific product is sold both through the Internet and at local stores, its price on Internet-retailing companies is lower than at local stores.	Adapted from Strader and Shaw (1999)	0.73	0.79	<i>Objective Costs</i> dimension of the e-tailer's SCB
I.23. The final cost of products purchased through the Internet (price + shipping charge) is lower than the price of the same products at local stores.	Newly developed	0.73	0.78	
I.21. When you want to buy a specific type of product (e.g., a digital camera, a PC, a watch, etc.), you may find cheaper products of that type through the Internet than at local stores.	Adapted from Vijayasathy (2002)	0.67	0.74	
I.22. Shipping charges for products purchased through the Internet are acceptable.	Adapted from AMIPCI (2004)	0.61	0.56	
III.2. Being able to buy a product without actually going to a store so as to save time (avoiding transportation and traffic delays) motivates you to purchase products through the Internet.	Adapted from Cardenas (2002)	0.60	0.71	<i>Subjective Costs</i> dimension of the e-tailer's SCB
I.3. Using the Internet to buy the products you need, allows you to save purchasing time.	Newly developed	0.56	0.63	
III.1. Having no attendance hours restrictions (everyday, at any time) to purchase products motivates you to purchase products through the Internet.	Newly developed	0.59	0.60	
I.4. The process of using the Internet to buy a product (locating a product, selecting it and entering your payment data) is more convenient than actually going to a store to buy it.	Adapted from Cardenas (2002)	0.45	0.58	
I.2. Using the Internet makes it easier to locate the products you want to buy.	Adapted from Vijayasathy (2002)	0.52	0.54	
I.1. Through the Internet, you may purchase goods with no attendance hours restrictions (you are able of purchase on any day, including week-ends; and at any time of the day, even during the night).	Newly developed	0.46	0.48	

Item	Source	Comm.	Loading	Factor
II.3. The fact that an Internet-retailing company is a renowned brand (e.g., Dell, Sony, Kodak, etc.) makes it more reliable as an Internet marketer.	Newly developed	0.74	0.77	E-tailer's Reliability Signals
II.2. The fact that an Internet-retailing company is physically present at a specific location (e.g., Sears, Sanborns, etc.) makes it more reliable as an Internet marketer.	Newly developed	0.68	0.77	
III.14. That Internet-retailing companies have a renowned brand name motivates you to purchase products through the Internet.	Adapted from Cardenas (2002)	0.61	0.66	
III.13. That Internet-retailing companies are also physically present in your local area motivates you to purchase products through the Internet.	Newly developed	0.48	0.66	
II.7. When you buy a product through the Internet, you can be sure that you will not fall prey to hackers.	Adapted from George (2002)	0.71	0.81	Customer's Trust in the Internet as transaction medium
II.6. You can be sure that your computer will not be affected by any virus when you purchase a product through the Internet.	Newly developed	0.64	0.75	
II.10. The Internet is a reliable medium to purchase products.	Adapted from George (2004)	0.69	0.71	
II.8. It is unlikely that, when you buy a product through the Internet, a spyware program may be installed without your consent on your computer to monitor your activities.	Newly developed	0.53	0.70	
II.9. The fact that an Internet-retailing company has an information system to guarantee transaction safety enhances the Internet's reliability as a safe transaction medium.	Adapted from Cardenas (2002)	0.45	0.40	

Item	Source	Comm.	Loading	Factor
III.12. Being able to review vendor evaluations provided by its customers motivates you to purchase products through the Internet.	Newly developed	0.73	0.68	Network Externalities
III.6. The fact that Internet-retailing companies offer an option to review product evaluations provided by prior buyers motivates you to purchase products through the Internet.	Newly developed	0.71	0.68	
I.9. The fact that you can check how other users feel about a product they have purchased on the Internet helps you to assess its quality.	Newly developed	0.68	0.63	
II.1. The fact that you can review other customers' evaluation on a specific Internet-based vendor helps you to assess its reliability.	Newly developed	0.66	0.63	

Related Hypothesis	Factor	No. Variables (Items)	Cronbach Alpha Coefficient
H1	<i>Product Quality</i> dimension of the e-tailer's SCB	6	0.768
H2	<i>Delivery Speed</i> dimension of the e-tailer's SCB	6	0.783
H3	<i>Flexibility</i> dimension of the e-tailer's SCB	5	0.883
H4	<i>Objective Costs</i> dimension of the e-tailer's SCB	4	0.815
H5	<i>Subjective Costs</i> dimension of the e-tailer's SCB	6	0.768
H6	E-tailer's Reliability Signals	4	0.797
H7	Customer's Trust in the Internet as transaction medium	5	0.791
H8	Network Externalities	4	0.864

Total: 40

4.4.2. Linear Regression Analysis

In this research model, the dependent variable is Customer's e-Buying Level (EBL). This is an observed variable (i.e. single item), adapted from George (2004). EBL is operationalized as how often the respondent buys products through the Internet. We use a Likert scale ranging from 1 to 5 to measure EBL, where: 1 = daily, 2 = weekly, 3 = monthly, 4 = twice a year, and 5 = very rarely. There are two other observed variables involved in the present model, they are Customer's Income Level (INL) related to H9, and Customer's Ability to e-Buy a Product (AEB) related to H10. INL is operationalized as the respondent's yearly income, and AEB is operationalized as how hard is for the respondent to use the Internet to buy products. We use a Likert scale ranging from 1 to 5 to measure both variables.

Based on the eight retained factors, computation of their correspondent factor scores for each registry (i.e. a student's responses to the questionnaire) are produced. These eight factor scores together with INL and AEB constitute the independent variables of our model. Thus, the following equation can be used to represent the

research model:

$$EBL = \beta_0 + \beta_1 PQL + \beta_2 DSP + \beta_3 FLX + \beta_4 OBC + \beta_5 SBC + \beta_6 ERS + \beta_7 TIT + \beta_8 NEX + \beta_9 INL + \beta_{10} AEB$$

The description of each variable is presented in Table 4.6.

Variable Name	Description	Measure	Conceptual Construct
EBL	Customer's e-Buying Level	Observed variable	How often the customer uses the Internet to buy products
PQL	Product Quality dimension of the e-tailer's SCB	Factor score	Customer Value offered through the e-tailer's supply chain bundle
DSP	Delivery Speed dimension of the e-tailer's SCB	Factor score	
FLX	Flexibility dimension of the e-tailer's SCB	Factor score	
OBC	Objective Costs dimension of the e-tailer's SCB	Factor score	
SBC	Subjective Costs dimension of the e-tailer's SCB	Factor score	
ERS	E-tailer's Reliability Signals	Factor score	Reliability Concerns
TIT	Customer's Trust in The Internet as transaction medium	Factor score	
NEX	Network Externalities arisen in e-tailing e-commerce through an e-market-maker	Factor score	Network Externalities
INL	Customer's Income Level	Observed variable	Demographic Characteristics
AEB	Customer's Ability to e-Buy a Product	Observed variable	

A Multivariate Regression Analysis with Ordinary Least Squares (OLS) was used to prove the model. The OLS results are summarized in Table 4.7.

Independent Variable	Regression Coefficient	T-Value (Ho: $\beta=0$)	Decision (5%)
Intercept	$\beta_0 = 3.2959$	39.6010	Reject Ho
PQL	$\beta_1 = 0.2528$	10.6706	Reject Ho
DSP	$\beta_2 = 0.1588$	6.8489	Reject Ho
FLX	$\beta_3 = 0.1858$	8.0843	Reject Ho
OBC	$\beta_4 = 0.2075$	9.0775	Reject Ho
SBC	$\beta_5 = 0.2002$	8.5456	Reject Ho
ERS	$\beta_6 = 0.1806$	7.8410	Reject Ho
TIT	$\beta_7 = 0.1794$	7.6819	Reject Ho
NEX	$\beta_8 = 0.1276$	5.5762	Reject Ho
INL	$\beta_9 = 0.1199$	7.2292	Reject Ho
AEB	$\beta_{10} = 0.1508$	3.9065	Reject Ho

The null hypothesis (H_0) was rejected in the t-test for all individual regression coefficients implying that all independent variables are statistically significant to explain the dependent variable's variations.

The Skewness, Kurtosis, and Omnibus test coincided and showed that the dependent variable's residual values are normally distributed. As it was expected in a cross-sectional study, there was no evidence of autocorrelation. The variance inflation factors (VIF) of each independent variable showed that there was no multicollinearity among them, which was expected because eight of the ten variables are the scores of orthogonally extracted factors. Since it is a cross-sectional study, special attention to the possible presence of heteroskedasticity was paid; the graph of predicted-Vs-residuals and all the graphs of each independent variable-Vs-residuals, showed that there was no heteroskedasticity. Additionally, the White test was used to seek for heteroskedasticity, the value of nR^2 was 78.22 and the value of λ^2 with 234 degrees of freedom and a probability of 5% was 270.68; since nR^2 was smaller than λ^2 , then the null hypothesis of homoskedasticity could not be rejected. The coefficient of determination, R^2 , was 0.73 which is fairly above the 0.5 value considered as a good fit for cross-sectional studies (see Studenmund, 2001). This implies that the relationship between the dependent variable (i.e. EBL) and the independent variables (i.e. PQL, DSP, FLX, OBC, SBC, ERS, TIT, NEX, INL, and AEB) can be properly explained by a linear regression equation.

4.5. Proving the Research Model

Once conditions for hypotheses testing through linear regression analysis were satisfied, we are now ready to prove our research model. The F-test showed that the equation has a significant overall fit implying that the equation as a whole indeed explains the variations of the dependent variable, customer e-buying level. The individual prove of each hypothesis is presented next.

4.5.1. The Impact of Customer Value on E-tailing B2C E-commerce

Since β_1 is statistically significant (see Table 4.7), the empirical results demonstrate that customers' perception about the value offered by e-tailers through their SCB's product quality dimension influences customer level of product purchases through the Internet. As it was expected, the sign of β_1 is positive (see Table 4.7), which implies that customers who consider products offered through the Internet have good quality, and have greater appreciation for the inherent product quality related benefits of B2C e-commerce and the e-tailers' initiatives to show the quality of their products (see items summated into this factor in Table 4.2) tend to more frequently buy products through the Internet. Being β_2 statistically significant, the empirical results demonstrate that customers' perception about the value offered by the e-tailer through its SCB's delivery speed dimension influences customer level of product purchases through the Internet. The positive sign of β_2 corroborates that customers who consider speed delivery is acceptable, and have greater appreciation for the inherent delivery speed related benefits of B2C e-commerce and the e-tailers' initiatives to let the

customer know when the product will be delivered (see items summated into this factor in Table 4.2) tend to more frequently buy products through the Internet. The statistical significance of β_3 implies that the empirical results demonstrate that customers' perception about the value offered by e-tailers through their SCB's flexibility dimension influences customer level of product purchases through the Internet. Again, the positive sign of β_3 confirms that customers preferring customized products, and manifest positive willingness to invest time in designing the product and to wait extra time to receive it (see items summated into this factor in Table 4.2) tend to more frequently buy products through the Internet.

The statistical significance of β_4 implies that the empirical results demonstrate that customers' perception about the value offered by e-tailers through their SCB's objective costs dimension influences customer level of product purchases through the Internet. The positive sign of β_4 confirms that customers perceiving objective costs savings from buying a product through the Internet (see items summated into this factor in Table 4.2) tend to more frequently buy products through the Internet. Since β_5 is statistically significant, the empirical results demonstrate that customers' perception about the value offered by e-tailers through their SCB's subjective cost dimension influences customer level of product purchases through the Internet. As it was expected, the sign of β_5 is positive which implies that customers perceiving subjective costs savings from buying a product through the Internet (see items summated into this factor in Table 4.2) tend to more frequently buy products through the Internet.

4.5.2. The Impact of Reliability Concerns on E-tailing B2C E-commerce

Since β_6 is statistically significant, the empirical results demonstrate that customers' perception about e-tailers' reliability signals influences customer level of product purchases through the Internet. As it was expected, the sign of β_6 is positive; which implies that customers having greater appreciation for e-tailer's reliability signals, such as being a well known brand name or having physical presence (see items summated into this factor in Table 4.3), tend to more frequently buy products through the Internet. The statistical significance of β_7 implies that the empirical results demonstrate that customer trust in the Internet as transaction medium influences customer level of product purchases through the Internet. The positive sign of β_7 confirms that customers having greater trust in the Internet as transaction medium (see items summated into this factor in Table 4.3) tend to more frequently buy products through the Internet.

4.5.3. The Impact of Network Externalities on E-tailing B2C E-commerce

The statistical significance of β_8 implies that the empirical results demonstrate that network externalities arisen in e-tailing e-commerce through an e-market-maker influences customer level of product purchases through the Internet. The positive sign of β_8 confirms that customers considering a benefit from the possibility of reviewing previous customers' opinions about the e-tailer's reliability and the product's quality (see items summated into this factor in Table 4.4) tend to more frequently buy products through the Internet.

4.5.4. The Impact of Demographic Characteristics on E-tailing B2C E-commerce

Since β_9 is statistically significant, the empirical results demonstrate that customer income level influences customer level of product purchases through the Internet. The positive sign of β_9 implies that customers with higher income levels tend to more frequently buy products through the Internet. The statistical significance of β_{10} implies that the empirical results demonstrate that customer ability to buy a product through the Internet influences customer level of product purchases through the Internet. Being β_{10} positive implies that customers encountering greater facility to buy a product through the Internet tend to more frequently buy products through the Internet.

4.6. Conclusions

The purpose of this study was to address the B2C ecommerce phenomenon from a supply chain perspective because the causes of early dotcoms' failures can be considered as supply chain management failures. From this perspective, the main intention was to analyze the influence of customer value on the customer's decision of buying a product through internet; however, in the first approach to the phenomenon, it was found that potential customers interviewed manifested reliability concerns as an important factor in their decisions. Some of them manifested they felt more confident when they were able to review previous customers' experiences. That led us to include in the model reliability concerns and the possible existence of network externalities within B2C e-commerce.

This investigation contributes to supply chain theory by operationalizing the customer value concept and presenting empirical evidence of its existence in customers' decisions of buying products through the Internet. The contribution to e-commerce theory, in addition to prove customer value influence in customer e-buying level consists in operationalizing the concepts: network externalities, e-tailers' reliability signals, and customer trust in the Internet as transaction medium, and proving their influence on customer level of product purchases through the Internet. Additionally, since the survey was conducted in Mexico, Hawk's (2004) asseveration that in developing countries people's Internet skills and income level impact B2C e-commerce was proved.

Regression analysis was used with the intention to prove the research model, and it served for this purpose. It was not a deliberate intention to present a predictive equation of customer's buying level. The 0.73 value of R^2 suggests that the regression equation could be used for predictive purposes, however a note of caution is important to suggest that since this R^2 value denotes that some other factors explaining customer e-buying level were let out of consideration in the analysis.

The empirical results demonstrate that customer value, reliability concerns, and network externalities, as well as the customer's income level and internet ability influence customers' frequency of product purchases through the Internet; that is, they impact the demand side of e-tailing B2C e-commerce. This brings up the inherent necessity of also observing its supply side counterpart and to inquire about:

To what extent are e-tailers aware about these customers' appraisals? Are they taking actions to increase the value offered for customers accordingly to the five dimensions presented here? Are they consciously sending reliability signals to customers? Is it possible for the e-tailers to increase customer's trust on the Internet as transaction medium? What motivates e-tailers to sell their products through an e-market-maker's web page? Are they aware about the existence of network externalities?

All previous inquiries motivate future research projects to analyze the implications of our findings in the supply side of the e-tailing B2C e-commerce. On the other hand, as it was presented in this work, customers have the possibility of buying products from physical retailers or from e-tailers, which implies that the physical marketplace's boundaries have been blurred because of the overlapping boundaries of e-markets. Consequently, brick-and-mortar retailers compete against e-tailers within the marketspace composed of the marketplace and the e-market. An analysis of this competitive environment would be worthwhile.

As all research projects, this study has some limitations. One limitation is that it is based on cross-sectional data, and may not account for some events affecting the captured relationships among the observed variables at that instant of time hence weakening conclusions of causality. However, it seems unlikely that this effect could be present in this particular study because at the moment that the survey was applied there were not significant events that could distorted the answers of the respondents.

The study population is composed by students who are geographically located

across an entire developing country, implying that their referenced local retailers could mark a difference on their level of product purchases through internet. A discriminant analysis would be relevant to prove whether geographical location establishes a difference in customer e-buying level.

Finally, a new questionnaire was constructed for this particular study. Even when a great part of the items were taken from previous ones, the questionnaire had to be translated from English to Spanish. The empirical results suggest that the questionnaire was appropriately proved before using it; however, we consider that it is necessary to prove the scales in other studies in order to consider them as standardized scales.

CHAPTER 5

CONCLUSIONS

5.1. Interrelation among the Three Articles

The three articles presented in second, third, and fourth chapters are related each other by means of considering that the supply chain output is a bundle whose value depends on the value added by the all members along the chain. That is; the supply chain is considered as a system of interdependent members whose participation impacts the overall value offered for the final customer (i.e. customer value) by the e-tailer through its supply chain bundle.

In the first article, a conceptual definition of supply chain management as a management philosophy was developed. The supply chain phenomenon was studied under an open systems perspective to explain why the non-rational motivations of the individuals composing the supply chain should be aligned across the social-psychological, the organizational structure, and the ecological levels of supply chain analysis.

In the second article, the e-tailer was considered as the last member of a truncated supply chain. The inter-organizational management systems implemented along the chain were considered as supply chain capabilities increasing the e-tailer's value offered for the final customer by increasing product quality, delivery speed, and flexibility to customize the product; and by decreasing objective and subjective costs incurred by the customer to acquire the product. Because of that, the IOMS are

deemed as the basis for achieving and sustaining the e-tailer's competitive advantage. The supply-side implications of the e-tailing model of B2C e-commerce were described and a model to analyze competition between retailers and e-tailers within the marketplace was developed under a resource-based view of the firm.

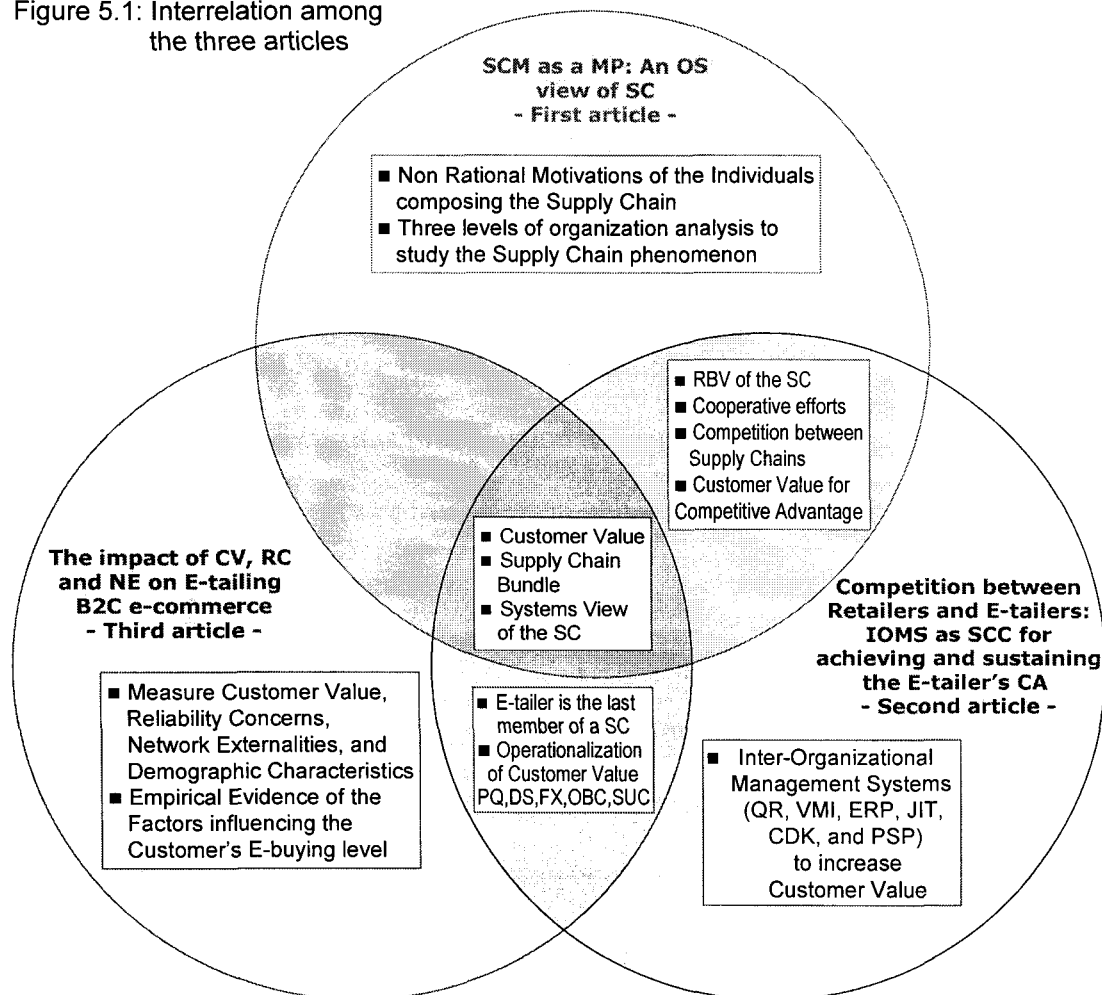
In the third article, the demand-side implications of the e-tailing model of B2C e-commerce were described and it was assumed that customers decide to buy products through the Internet based on: the value they receive from e-tailers, their reliability concerns related to the e-tailer and the Internet as transaction medium, and the existence of network externalities. A survey was conducted and the empirical results served to prove that the value offered by the e-tailer through its supply chain bundle indeed impacts the customer's decision of buying a product from the e-tailer. That is, the third article served to prove a part of the model developed in the second article.

The first and second articles share in common the idea that the prevailing competitive environments are characterized by competition between supply chains instead of competition between individual firms, and that such competition is based on the value offered for the final customer. In both articles, the resource-based view of the firm is used to explain how it is possible undertake cooperative efforts between the members of the chain to implement a competitive strategy for the entire supply chain to achieve a competitive advantage for the supply chain as a whole and, in turn, for its members.

In second and third articles, the e-tailer is conceptualized as the last member of a

truncated supply chain. In both articles, the impact of the value offered for the final customer by an e-tailer through its supply chain bundle is considered as a determinant of the customer's decision of buying a product through the Internet. And customer value is operationalized as a function of: product quality; delivery speed; flexibility to customize the product accordingly to customer specifications; objective costs such as price, and shipping cost; and subjective costs regarding time and location constraints to place an order. How the three articles relate each other is shown in Figure 5.1.

Figure 5.1: Interrelation among the three articles



5.2. Accomplishing de Research Purpose

The model developed in chapter 3 (see Figure 3.6) considers the value offered for the final customer by the e-tailers through its supply chain bundle, which is the common subject for the three articles, as the basis to explain how it is possible to achieve and sustain the e-tailer's resource-based competitive advantage. The inter-organizational management systems implemented along the chain constitute the supply chain capabilities helping to increase the value offered for the final customer through e-tailer's supply chain bundle. Offering greater value for the final customer vis-à-vis its competitors, enables the e-tailer to achieve a competitive advantage; and the degree of imperfect mobility of the IOMS supporting the e-tailer's competitive advantage will determine whether it will be sustainable. The presentation of this model served to accomplish the research purpose of this doctoral dissertation.

5.3. Limitations and Future Research Directions

As all research projects, this investigation has some limitations. Our definition of supply chain management as a management philosophy was theoretically constructed with basis on previous research works; this implies that there are several assumptions that should be empirically validated. Some questions arise that could be addressed on future research works: To what extent, supply chains in practice consider SCM as a management philosophy? Are there more collaborative or more bargaining relationships among the members of a supply chain? Are there in practice initiatives to align the goals of individuals, groups, and supply chain members? Can be supply

chain capabilities really considered as resource barriers to deter new potential entrants? Even though these limitations should be overcome, we consider that the purpose of developing a theoretically sustained explanation of why the supply chain phenomenon should be studied under an open systems perspective was satisfactorily accomplished.

The model developed in chapter 3 for the analysis of the competition between retailers and e-tailers has some limitations. It is very reasonable to suppose that, apart from customer value, there are other factors affecting the customer's decision of buying a product from the e-tailer. As it was found out in the third article, apart from customer value offered through the supply chain bundle, there are other factors such as the e-tailer's reliability, the Internet's reliability as transaction medium, network externalities, and the customers' demographic characteristics that influence the customer's decision of buying a product from the e-tailer. This suggests that this model has to be empirically validated and adjusted previously to consider it as a prescriptive tool for practitioners' purposes. On the other hand, this model presents collaborative initiatives between a firm and its suppliers to increase the total value offered as a whole entity as the basis to achieve the firm's competitive advantage. This suggests that an empirical research is worthwhile to explore: to what extent supply chain members recognize their interdependence as parts of a whole system, to what extent they are implementing cooperative efforts (e.g. IOMS) to increase the total value offered for the final customer, and how they conceive customer value in

order to figure out if they are taking into consideration the five dimensions (i.e. PQ, DS, FX, OBC, and SUC) of the supply chain bundle.

APENDIX I

SURVEY



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We would like to request your cooperation for a research project underway at the Management Philosophy Ph. D. Program of the Instituto Tecnológico y de Estudios Superiores de Monterrey – ITESM’s Business Management Graduate School (EGADE). The purpose of this study is to gain a better understanding of consumers’ Internet purchase decision-making processes.

You have been selected to take part in this study because you qualify as a potential consumer of Internet-marketed products, whether you have ever used Web-based purchasing services or not. Thus, we would greatly appreciate your answering the enclosed survey to determine why you would choose to purchase products on the Web or not.

Survey results will be forwarded to companies already offering or planning to offer their products through the Internet in Mexico, so that they will be able to tailor their offerings to your needs when it comes to Internet-enabled purchases. However, survey results will be aggregated, and respondents’ confidentiality will be preserved at all times.

Should you have any questions or comments on our survey, please do not hesitate to contact us by telephone at (81) 8625-6235 or by e-mail to jbrodriguez@itesm.mx.

Thanking you in advance for your kind cooperation to this significant research project, we remain

Yours truly,



Jesús Benjamín Rodríguez García
Business Management Philosophy Ph.D. Candidate
EGADE-ITESM



Dr. Fernando Mata Carrasco
Academic Director
EGADE-ITESM

Survey

Section I. This section refers to your perceptions on the value added offered by companies marketing their products on the Internet. Please indicate to what extent you agree or disagree with the following statements.

Mark your answer with an X in the appropriate box according to the following scale:

1 = Strongly agree	2 = Agree	3 = Neutral	4 = Disagree	5 = Strongly disagree
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	1	2	3	4	5
I.1. Through the Internet, you may purchase goods with no attendance hours restrictions (you are able of purchase on any day, including week-ends; and at any time of the day, even during the night).					
I.2. Using the Internet makes it easier to locate the products you want to buy.					
I.3. Using the Internet to buy the products you need, allows you to save purchasing time.					
I.4. The process of using the Internet to buy a product (locating a product, selecting it and entering your payment data) is more convenient than actually going to a store to buy it.					
I.5. You can assess the quality of an Internet-marketed product through the information (e.g., technical specifications, manuals, photographs and/or demo videos, etc.) presented in the company's web-page.					

I.6. You may buy products through the Internet whose quality exceeds that of similar products sold in local stores.					
I.7. The amount of product quality information offered by Internet-retailing companies is greater than the amount of information provided by local stores.					
I.8. Offering a warranty for Internet-marketed products is a way to assure its quality.					
I.9. The fact that you can check how other users feel about a product they have purchased on the Internet helps you to assess its quality.					
I.10. You may assess the quality of a specific product (e.g., the X brand Y model camera) more accurately through the Internet than in local stores.					
I.11. Local stores are more likely to run out of stock on a specific product (thus forcing you to wait for it) than all Internet-retailing companies selling it.					
I.12. Delivery times for Internet-purchased products are acceptable.					
I.13. When local stores run out of a specific product, being able to purchase it through the Internet prevents you from having to wait for it for a long time.					
I.14. When you buy a product through the Internet, you can be sure that the product will be delivered within the time period specified by the Internet-retailing company.					
I.15. The fact that Internet-retailing companies offer you an option to check on product delivery status effectively reduces your uncertainty as regards the time you will have to wait for it.					
I.16. The fact that you can design a product through the Internet to be manufactured according to your preferences enables you to request only the special features you are willing to pay extra for.					
I.17. It is worth it to spend time to design a product through the Internet to be manufactured according to your preferences.					
I.18. It is worth the wait to receive a product manufactured to your specific preferences.					
I.19. Products manufactured to your preferences are a good purchase option for you.					
I.20. When a specific product is sold both through the Internet and at local stores, its price on Internet-retailing companies is lower than at local stores.					
I.21. When you want to buy a specific type of product (e.g., a digital camera, a PC, a watch, etc.), you may find cheaper products of that type through the Internet than at local stores.					
I.22. Shipping charges for products purchased through the Internet are acceptable.					
I.23. The final cost of products purchased through the Internet (price + shipping charge) is lower than the price of the same products at local stores.					

Section II. This section refers to your perceptions on how reliable Internet-based purchases are. Please indicate to what extent you agree or disagree with the following statements.

Mark your answer with an X in the appropriate box according to the following scale:

1 = Strongly agree	2 = Agree	3 = Neutral	4 = Disagree	5 = Strongly disagree
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	1	2	3	4	5
II.1. The fact that you can review other customers' evaluation on a specific Internet-based vendor helps you to assess its reliability.					
II.2. The fact that an Internet-retailing company is physically present at a specific location (e.g., Sears, Sanborns, etc.) makes it more reliable as an Internet marketer.					
II.3. The fact that an Internet-retailing company is a renowned brand (e.g., Dell, Sony, Kodak, etc.) makes it more reliable as an Internet marketer.					
II.4. You can be sure that Internet-based vendors will not commit any kind of fraud (e.g., unspecified extra charges, failing to deliver a product, unauthorized use of personal information) when you provide them with your personal and financial data.					
II.5. The fact that an Internet-based product provider offers a company contact for you to consult adds to its reliability.					
II.6. You can be sure that your computer will not be affected by any virus when you purchase a product through the Internet.					
II.7. When you buy a product through the Internet, you can be sure that you will not fall prey to hackers.					
II.8. It is unlikely that, when you buy a product through the Internet, a spyware program may be installed without your consent on your computer to monitor your activities.					
II.9. The fact that an Internet-retailing company has an information system to guarantee transaction safety enhances the Internet's reliability as a safe transaction medium.					
II.10. The Internet is a reliable medium to purchase products.					

Section III. This section intends to assess several factors derived from the use of the Internet as a transaction means and from actions by companies marketing their products through the Internet in order to determine to what extent these drivers promote Internet-enabled purchases. Please indicate to what extent each of the following factors moves you to purchase products on the Internet:

Mark your answer with an "X" in the appropriate box according to the following scale:

1 = Greatly	2 = Moderately	3 = A little	4 = Very little	5 = Not at all
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	1	2	3	4	5
III.1. Having no attendance hours restrictions (everyday, at any time) to purchase products motivates you to purchase products through the Internet.					
III.2. Being able to buy a product without actually going to a store so as to save time (avoiding transportation and traffic delays) motivates you to purchase products through the Internet.					
III.3. Product information (e.g., technical specifications, user's manual, photographs and/or demo videos, etc.) available in the company's web-page motivates you to purchase products through the Internet.					
III.4. When you wish to buy a specific product (e.g., a digital camera, a personal computer, a watch, etc.), the fact that the quality of the product found on the Internet is better than that of similar products found at local stores.					
III.5. Vendor-provided product guarantees.					
III.6. The fact that Internet-retailing companies offer an option to review product evaluations provided by prior buyers motivates you to purchase products through the Internet.					
III.7. When local stores have run out of a specific product, being able to purchase it from Internet-retailing companies motivates you to purchase products through the Internet.					
III.8. A vendor-provided information system that enables you to check the status of product delivery.					
III.9. Being able to design a customized product through the Internet to be manufactured according to your preferences motivates you to purchase products through the Internet.					
III.10. The fact that the price found on the Internet for a specific product (e.g., book X) is lower than the price at local stores.					
III.11. When you wish to purchase a specific product type, the fact that the price for the product found on the Internet is lower than the price for any similar product types sold at local stores.					

III.12. Being able to review vendor evaluations provided by its customers motivates you to purchase products through the Internet.					
III.13. That Internet-retailing companies are also physically present in your local area motivates you to purchase products through the Internet.					
III.14. That Internet-retailing companies have a renowned brand name motivates you to purchase products through the Internet.					
III.15. That vendors offer an option for you to contact the company for inquiries.					
III.16. That vendors have an information system guaranteeing transaction safety.					

Section IV. General information questions. Please mark your answer with an "X" in the appropriate box next to the following questions.

IV.1. How hard is it for you to use the Internet? <input type="checkbox"/> Very easy <input type="checkbox"/> Easy <input type="checkbox"/> Neutral <input type="checkbox"/> Hard <input type="checkbox"/> Very hard
IV.2. How hard is it for you to use the Internet to buy products? <input type="checkbox"/> Very easy <input type="checkbox"/> Easy <input type="checkbox"/> Somewhat hard <input type="checkbox"/> Very hard <input type="checkbox"/> Impossible to do it by myself
IV.3. How often do you buy products on the Internet? <input type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Twice a year <input type="checkbox"/> Never / almost never
IV.4. In average, how much (in Mexican \$) do you spend on Internet purchases every month? <input type="checkbox"/> Over \$ 2,500 <input type="checkbox"/> \$ 1,000 - \$ 2,500 <input type="checkbox"/> \$ 500 - \$ 1000 <input type="checkbox"/> Less than \$ 500 <input type="checkbox"/> No money at all
IV.5. How likely are you to purchase a product on the Internet over the next 6 months? <input type="checkbox"/> Almost certain <input type="checkbox"/> Very likely <input type="checkbox"/> Likely <input type="checkbox"/> Unlikely <input type="checkbox"/> Very unlikely
IV.6. Currently, your consumption of Internet-offered products would rate as: <input type="checkbox"/> High <input type="checkbox"/> Above average <input type="checkbox"/> Average <input type="checkbox"/> Below average <input type="checkbox"/> No consumption
IV.7. How would you describe your education? <input type="checkbox"/> Elementary <input type="checkbox"/> High School <input type="checkbox"/> College <input type="checkbox"/> University <input type="checkbox"/> Master degree <input type="checkbox"/> Doctoral degree
IV.8. Please indicate your gender: <input type="checkbox"/> Female <input type="checkbox"/> Male
IV.9. Please indicate your marital status: <input type="checkbox"/> Single <input type="checkbox"/> Married <input type="checkbox"/> Common-law marriage <input type="checkbox"/> Separated <input type="checkbox"/> Divorced <input type="checkbox"/> Widowed
IV.10. Please mark your age box : <input type="checkbox"/> Under de 18 <input type="checkbox"/> 18-24 <input type="checkbox"/> 25-34 <input type="checkbox"/> 35-44 <input type="checkbox"/> 45-54 <input type="checkbox"/> 55-64 <input type="checkbox"/> 65-74 <input type="checkbox"/> 75 or more
IV.11. Do you use a credit or debit card? <input type="checkbox"/> Yes <input type="checkbox"/> No
IV.12. Please mark your yearly income box (in Mexican \$): <input type="checkbox"/> Below de \$90,000 <input type="checkbox"/> \$90,001 a \$180,000 <input type="checkbox"/> \$180,001 a \$270,000 <input type="checkbox"/> \$270,001 a \$360,000 <input type="checkbox"/> Over \$360,000

The End

Thank you very much for your valuable time and effort. We greatly appreciate your cooperation to this research project.

APENDIX II

SURVEY (SPANISH VERSION)



Av. Fundadores y Rufino Tamayo
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Por medio de la presente solicitamos su colaboración en un estudio que se está realizando a través del programa del Doctorado en Filosofía en Administración (DFA) en la Escuela de Graduados en Administración y Dirección de Empresas (EGADE) del Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM). El propósito de este estudio es comprender el proceso de decisión de compra de los consumidores de productos a través de internet.

Si a usted se le ha hecho llegar esta solicitud de colaboración es porque hemos considerado que es un consumidor potencial de productos comercializados a través de internet, independiente de si usted nunca ha utilizado internet para tales propósitos. Por ello es muy importante para nosotros que nos ayude contestando una encuesta a través de la cual se desea conocer las causas por las que usted decide comprar o no-comprar productos a través de internet.

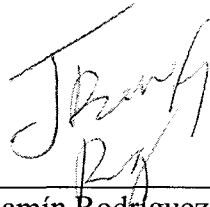
Los resultados de esta encuesta se harán llegar a las empresas que ya se encuentran ofreciendo sus productos a través de internet en México o están interesadas en hacerlo, de tal forma que eso les permitirá poder ofrecer lo que usted más valora al momento de analizar la posibilidad de comprar productos a través de internet.

Los resultados de esta encuesta serán presentados en forma agregada y nos comprometemos a preservar la confidencialidad de sus respuestas.

Si usted tiene alguna duda o comentario sobre esta encuesta, puede comunicarse con nosotros llamando al teléfono (81) 8625-6235 o enviando un mensaje a la cuenta jbrodriguez@itesm.mx.

Agradecemos enormemente su colaboración en este importante estudio. Reciba un saludo cordial.

Sinceramente,



Jesús Benjamín Rodríguez García
Candidato a Doctor en Filosofía en Administración
EGADE-ITESM



Dr. Fernando Mata Carrasco
Director Académico
EGADE-ITESM

Inicio de la encuesta

Sección I. Esta sección abarca los aspectos relacionados a la percepción que usted tiene respecto al valor agregado que ofrecen las empresas que comercializan sus productos por medio de internet. Por favor indique en qué grado está usted de acuerdo o en desacuerdo con las siguientes afirmaciones.

Marque con una "X" de acuerdo a la escala presentada a continuación:

1 = Completamente de acuerdo	2 = De acuerdo	3 = Neutral	4 = En desacuerdo	5 = Completamente en desacuerdo
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	1	2	3	4	5
I.1. Gracias al uso de internet es posible realizar compras sin restricción de horario (comprar en cualquier día, incluyendo fines de semana; y a cualquier hora del día, incluyendo la noche).					
I.2. El uso de internet hace más fácil la localización del producto que quiere comprar.					
I.3. El uso de internet para comprar los productos que necesita le ayuda a realizar sus compras en menor tiempo.					
I.4. El proceso de compra de un producto a través de internet (localizar el producto, seleccionarlo, e introducir los datos para pagarlo) es más cómodo que acudir a una tienda a comprarlo.					

I.5. Es posible conocer la calidad de un producto comercializado por medio de internet gracias a la información sobre éste (Ej.: especificaciones técnicas, manuales, fotografías y/o videos de operación, etc.) presentada a través de internet por el vendedor.					
I.6. Es posible comprar por internet productos cuya calidad sea superior a la calidad de los productos del mismo tipo ofrecidos en las tiendas de su localidad.					
I.7. La cantidad de información acerca de la calidad de un producto ofrecida por las tiendas que comercializan a través de internet es mayor que la cantidad de información ofrecida por las tiendas locales.					
I.8. Ofrecer una póliza de garantía sobre un producto que se comercializa a través de internet es una forma de respaldar la calidad del mismo.					
I.9. El hecho de que usted pueda revisar la evaluación sobre un producto que se vende a través de internet, emitida por quienes ya lo han comprado y usado, le ayuda a conocer la calidad de éste.					
I.10. Es posible conocer de manera más precisa la calidad de un producto específico (Ej. la cámara marca X, modelo Y) cuando éste se vende por internet que cuando se vende en tiendas locales.					
I.11. La probabilidad de que se agoten las existencias de un producto específico en las todas las tiendas locales (y en consecuencia tener que esperar para recibirlo) es mayor que la probabilidad de que se agoten las existencias de éste en todas las tiendas que lo ofrecen por internet.					
I.12. El tiempo de espera para recibir un producto comprado a través de internet es aceptable.					
I.13. Cuando se agotan las existencias de un producto específico en todas las tiendas locales, poder comprarlo por medio de internet evita que tenga que esperar demasiado tiempo para recibirlo.					
I.14. Cuando compra un producto por internet, usted puede confiar en que el producto será recibido dentro del plazo especificado por el vendedor.					
I.15. El hecho de que el vendedor de un producto por internet le ofrezca una opción para revisar el estatus del envío de su producto, le ayuda a reducir su incertidumbre respecto al tiempo que tendrá que esperar para recibirlo.					
I.16. El poder diseñar usted mismo un producto por medio de internet para que sea fabricado de acuerdo a sus preferencias, le permite agregarle a éste únicamente las características especiales por las que está usted dispuesto a pagar una cantidad extra de dinero.					
I.17. Vale la pena invertir tiempo en diseñar usted mismo por medio de internet un producto para que sea fabricado de acuerdo a sus preferencias.					
I.18. Vale la pena esperar para recibir un producto fabricado de acuerdo a sus preferencias.					

I.19. Los productos fabricados de acuerdo a sus preferencias son una buena opción de compra para usted.					
I.20. Cuando un producto específico se vende tanto por internet como en las tiendas locales, el precio por internet es menor que el precio en las tiendas locales.					
I.21. Cuando desea comprar un tipo de producto específico (Ej.: una cámara digital, una computadora personal, un reloj, etc.), usted puede encontrar por internet productos de este tipo más baratos que los que se encuentran en las tiendas locales.					
I.22. El costo de envío de un producto comprado a través de internet es aceptable.					
I.23. El costo total de un producto comprado por internet (precio + costo de envío) es menor que el precio de dicho producto comprado en una tienda local.					

Sección II. Esta sección abarca los aspectos relacionados a la percepción que usted tiene respecto a la confianza con que puede comprar un producto por medio de internet. Por favor indique en qué grado está usted de acuerdo o en desacuerdo con las siguientes afirmaciones.

Marque con una "X" de acuerdo a la escala presentada a continuación:

1 = Completamente de acuerdo	2 = De acuerdo	3 = Neutral	4 = En desacuerdo	5 = Completamente en desacuerdo
------------------------------	----------------	-------------	-------------------	---------------------------------

	1	2	3	4	5
II.1. El que usted pueda revisar la evaluación sobre un vendedor de productos por internet, emitida por sus clientes, le ayuda a conocer la confiabilidad de éste.					
II.2. Que el vendedor de un producto por internet tenga presencia física en la localidad (Ej.: Sears, Sanborns, etc.) lo hace más confiable como vendedor por internet.					
II.3. Que el vendedor de un producto por internet sea una marca reconocida (Ej.: Dell, Sony, Kodak, etc.) lo hace más confiable como vendedor por internet.					
II.4. Usted puede confiar en que el vendedor de un producto por internet no cometerá algún tipo de fraude en su contra (Ej.: cargos no especificados por anticipación, no enviar el producto, uso indebido de su información personal, etc.) al enviarle su información personal y financiera.					
II.5. Que el vendedor de un producto por internet ofrezca una opción para que usted pueda comunicarse con alguien de la compañía para aclarar sus dudas lo hace más confiable.					
II.6. Usted puede confiar en que su computadora no se infectará con un virus al comprar un producto por internet.					
II.7. Al comprar un producto por internet, usted puede confiar en que no será víctima de fraude por parte de los piratas cibernéticos ("hackers").					

II.8. Es poco probable que al comprar un producto por internet se instale sin su consentimiento un software espía ("spyware") que monitoree las actividades que usted realiza por medio de su computadora.					
II.9. Que el vendedor de un producto por internet cuente con un sistema de información que le garantice la seguridad de la transacción de compra, incrementa la confiabilidad de internet como medio de transacción.					
II.10. Internet es un medio de transacción confiable para realizar la compra de un producto.					

Sección III. Esta sección consiste en evaluar ciertos factores derivados del uso de internet como medio de transacción y de las acciones tomadas por las empresas que comercializan sus productos por internet, y determinar en qué grado éstos le motivan a realizar una compra por internet. Por favor indique en qué grado le motiva a comprar un producto a través de internet cada uno de los siguientes factores.

Marque con una "X" según la escala siguiente:

1 = Mucho	2 = Moderadamente	3 = Poco	4 = Muy poco	5 = Nada
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	1	2	3	4	5
III.1. No tener restricción de horario (cualquier día y a cualquier hora) para realizar una transacción de compra.					
III.2. Poder comprar un producto sin tener que acudir a una tienda de tal forma que pueda evitar: pérdida de tiempo en trasladarse, estrés por aglomeraciones y tráfico, etc.					
III.3. La información sobre el producto (Ej.: especificaciones técnicas, manual de uso, fotografías y/o videos de operación, etc.) presentada a través de internet por el vendedor.					
III.4. Cuando desea comprar un tipo de producto específico (Ej.: una cámara digital, una computadora personal, un reloj, etc.), que la calidad del producto encontrado por internet sea superior a la calidad de cualquiera de los productos de ese tipo encontrados en las tiendas locales.					
III.5. Que el vendedor ofrezca con una póliza de garantía sobre el producto.					
III.6. Que el vendedor ofrezca una opción para que usted pueda revisar la evaluación sobre el producto emitida por quienes ya lo han comprado y usado.					
III.7. Cuando se agotan las existencias de un producto específico en las tiendas locales, poder comprarlo por medio de internet.					
III.8. Que el vendedor cuente con un sistema de información que le permita a usted revisar el estatus del envío de su producto.					

III.9. El poder diseñar usted mismo un producto por medio de internet para que sea fabricado de acuerdo a sus preferencias.					
III.10. Que el precio encontrado por internet para un producto específico (Ej. El libro X) sea menor que el precio encontrado en cualquiera de las tiendas locales que los venden.					
III.11. Cuando desea comprar un tipo de producto específico, que el precio del producto encontrado por internet sea menor que el precio de cualquiera los productos de ese tipo encontrados en las tiendas locales.					
III.12. Que usted pueda revisar la evaluación sobre el vendedor emitida por sus clientes.					
III.13. Que el vendedor también tenga presencia física en la localidad.					
III.14. Que el vendedor sea una marca reconocida.					
III.15. Que el vendedor ofrezca una opción para que usted pueda comunicarse con alguien de la compañía para aclarar sus dudas.					
III.16. Que el vendedor cuente con un sistema de información que le garantice la seguridad de la transacción de compra.					

Sección IV. Preguntas generales. Por favor marque con una "X" el cuadro correspondiente a su respuesta para cada una de las siguientes preguntas.

IV.1. ¿Qué tan difícil es para usted el uso de internet? <input type="checkbox"/> Muy fácil <input type="checkbox"/> Fácil <input type="checkbox"/> Neutral <input type="checkbox"/> Difícil <input type="checkbox"/> Muy difícil
IV.2. ¿Qué grado de dificultad representa para usted el uso de internet para comprar un producto? <input type="checkbox"/> Muy fácil <input type="checkbox"/> Fácil <input type="checkbox"/> Un poco difícil <input type="checkbox"/> Muy difícil <input type="checkbox"/> No puedo hacerlo sin ayuda
IV.3. ¿Con qué frecuencia compra usted artículos a través de internet? <input type="checkbox"/> Diariamente <input type="checkbox"/> Semanalmente <input type="checkbox"/> Mensualmente <input type="checkbox"/> Un par de veces al año <input type="checkbox"/> Nunca/casi nunca
IV.4. En promedio, ¿Qué cantidad (en pesos) gasta usted al mes en compras a través de internet? <input type="checkbox"/> Más de \$2,500 <input type="checkbox"/> \$1,000 a \$2,500 <input type="checkbox"/> \$500 a \$1000 <input type="checkbox"/> Menos de \$500 <input type="checkbox"/> Nada
IV.5. ¿Qué tan probable es que usted compre algún producto a través de internet en los próximos 6 meses? <input type="checkbox"/> Casi seguro <input type="checkbox"/> Muy probable <input type="checkbox"/> Probable <input type="checkbox"/> Poco probable <input type="checkbox"/> Muy poco probable
IV.6. Usted diría que su clasificación actual como un consumidor de productos ofrecidos a través de internet es: <input type="checkbox"/> Alto consumo <input type="checkbox"/> Consumo arriba de promedio <input type="checkbox"/> Consumo promedio <input type="checkbox"/> Consumo debajo de promedio <input type="checkbox"/> Cero consumo
IV.7. ¿Cuál es nivel de estudios más alto que usted ha completado? <input type="checkbox"/> Primaria <input type="checkbox"/> Secundaria <input type="checkbox"/> Preparatoria/bachillerato <input type="checkbox"/> Licenciatura <input type="checkbox"/> Maestría <input type="checkbox"/> Doctorado
IV.8. Por favor indique su género: <input type="checkbox"/> Femenino <input type="checkbox"/> Masculino
IV.9. Por favor indique su situación marital. <input type="checkbox"/> Soltero(a) <input type="checkbox"/> Casado(a) <input type="checkbox"/> Unión libre <input type="checkbox"/> Separado(a) <input type="checkbox"/> Divorciado(a) <input type="checkbox"/> Viudo(a)

IV.10. ¿En cuál de los siguientes grupos de edad se encuentra usted?							
<input type="checkbox"/> Menor de 18	<input type="checkbox"/> 18-24	<input type="checkbox"/> 25-34	<input type="checkbox"/> 35-44	<input type="checkbox"/> 45-54	<input type="checkbox"/> 55-64	<input type="checkbox"/> 65-74	<input type="checkbox"/> 75 o más
IV.11. ¿Utiliza usted tarjeta de crédito o débito?							
				<input type="checkbox"/> Si	<input type="checkbox"/> No		
IV.12. ¿En cuál de los siguientes grupos de ingreso anual (en pesos) se encuentra usted?							
<input type="checkbox"/> Menos de \$90,000	<input type="checkbox"/> \$90,001 a \$180,000	<input type="checkbox"/> \$180,001 a \$270,000	<input type="checkbox"/> \$270,001 a \$360,000	<input type="checkbox"/> Más de \$360,000			

Fin de la encuesta

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