# Participation in Business to Business Electronic Marketplaces

A MODEL OF THE FACTORS THAT AFFECT PARTICIPATION

*Master Thesis Erasmus University Rotterdam*


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## PREFACE

This Master thesis has been written as the concluding research project of my study Business Administration, major Strategic Management, at Erasmus University Rotterdam. Without the intensive assistance of my supervisors the results of this project would never have been possible. Therefore I would like to thank my coach, Simona Spedale *Ph.D.* for her indispensable guidance through this process and her valuable suggestions. I would also like to thank my co-reader, Otto Koppius *Ph.D.* for his intensive cooperation and the numerous valuable remarks on my work.

*Joost Buijsen*
*Rotterdam, November 2003*

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## EXECUTIVE SUMMARY

The goal of this thesis is to determine the factors that affect participation in business-to-business electronic marketplaces. A large amount of research has been publicized in the last decade about electronic marketplaces. There is however little research with a primary focus on participation.

This research effort starts with an analysis of electronic marketplaces. Electronic marketplaces are analysed in relation to market mechanisms, coordination flows, focus, stakeholders and ownership. It provides a short introduction to electronic marketplaces from these viewpoints in relation to participation.

Then I will place electronic marketplaces in the context of interorganizational systems. I place it in relation to EDI, and discuss the differences between EDI and electronic marketplaces. Existing models of participation in electronic marketplaces and EDI adoption are discussed, and the starting point for the development of my model is explained.

The core theoretical part of this research effort focuses on the development of the model. It builds upon the preceding chapters and it integrates existing literature with some of my own contributions. The model aims at presenting all factors that affect participation. After thorough literature research four constructs were identified: perceived benefits, perceived threats, organizational readiness, and external pressure. These constructs were further divided into fourteen sub-constructs. All constructs are explained in detail, and the distinction between buyers and suppliers has been made where necessary. A visualization of the proposed model is shown on page 50.

The empirical part of this research effort focuses on the application of the model. The model was tested among purchasing managers and marketing/sales managers in the utilities industry. An electronic survey has been used to gather the data. A response rate of 23% resulted in 71 responses. The model was tested on reliability with a Cronbach Alpha analysis. After one modification to the model the results proved to be reliable and were further analysed in SPSS. First, a thorough descriptive analysis was conducted. Significant results were discovered in two contexts: (1) participants and non-participants, and (2) buyers and suppliers. In addition, a

logistic regression was conducted to determine the relation between the four constructs and participation. The logistic regression itself did not deliver very significant results. However, in combination with the descriptive research very interesting findings were discovered. In addition, I conducted a second logistic regression to use my model in relation to distinctive levels of participation.

The constructs that appeared to be most highly associated with participation are external pressure and organizational readiness. Higher levels of external pressure and organizational readiness are associated with participation. The importance of external pressure should attract interest of researchers and industry practitioners, because it poses questions about the intrinsic motivations to participation. To my surprise there was no evidence for a positive relation between perceived benefits and participation. The negative relation between perceived threats and participation appeared to be hypothesized correctly, but it was insignificant. Another major finding is the support that has been found for an often-heard idea: buyers appeared to be significantly more positive towards the use of electronic marketplaces than suppliers. Buyers perceive more benefits and fewer threats than suppliers. This implicates that future research in this field should take notice of the difference in perceptions between buyers and suppliers.

The contribution of this research is focussed on the presentation of a model and on the empirical data that have been found. Because the sample was small, the timeframe was short, and the resources were very limited, one has to be cautious with the implications of this research. Nevertheless, I am quite convinced that this research report provides useful information for both scientific purposes and for industry practitioners.

# CHAPTER 1: INTRODUCTION

## 1.1 Background

Competitive organizations are always searching for ways to improve efficiency. Especially in periods of economic slowdown is it vital to survival. A viable way to achieve this is electronic commerce. One particular area in which we have seen exponential increase is business-to-business (B2B) electronic commerce. One customer order may trigger a very big number of underlying B2B transactions. Several analysts forecast B2B electronic commerce to reach a level of billions of dollars by 2005 (Tomak et al, 2002). According to Business Week (2000), the B2B sector is expected to be six times larger than the business-to-consumer one.

This thesis will focus on B2B electronic marketplaces, here defined as followed: "Internet-based electronic marketplaces represent an interorganizational information system that facilitates electronic interactions among multiple buyers and sellers" (Bakos 1991; Choudhury 1998; Grewal et al, 2001).

Market makers, the firms that manage and administer the market (Grewal et al. 2001), are confronted with a number of challenges. Klein and Quelch (1997) defined four generic challenges: Achieving critical mass, creating a business focus, customer ownership, and creating enduring competitive advantage.

A major contribution of this research shall be related to the critical mass challenge. I will do so by focussing on the participants' perspective. A better understanding of the participants' behaviour however, will also contribute to the other three generic challenges. Thereby enhancing the chances of survival for the marketplace. Nevertheless, very little research has been done so far from the participant's perspective. Previous research emphasizes the effect of new technologies on organizational processes (Glazer 1991, Heide and Weiss 1995), or focuses on the characteristics of the market maker (Bakos and Brynjolfsson 1993, Kaplan and Sawhney 2000)

There have only been few efforts to study participation in electronic marketplaces. A major research has been conducted by Grewal, Comer and Mehta (2001). The authors investigated the

antecedents of organizational participation in B2B electronic markets by distinguishing ability and motivation factors. Another model has been developed that addresses adoption of EDI (Electronic Data Interchange). These models will be used as a basis for my research. This will be further explained in chapter three and four.

## 1.2 Goal

To create a generic model of the factors that affect an individual firm's motivation to participate as a trading partner in a B2B electronic marketplace. By doing so:

1. Contributing to a better understanding into achieving a critical mass of participants for researchers and industry practitioners.
2. Providing a basis for further scientific research.

## 1.3 Problem definition

"What are the factors affecting an individual firm's decision to first participate as a trading partner in a B2B electronic marketplace?"

## 1.4 Research questions

In order to achieve the above-mentioned goal and answer the problem definition, the following questions have to be addressed:

Question 1: What are electronic marketplaces?

Question 2: Which factors are likely to influence an individual firm's decision to organizational participation in B2B electronic marketplaces?

Question 3: Which factors have highest influence on participation?

Question 4: What are the differences with regard to those factors between buyers and suppliers?

### 1.5 Definitions

In this paragraph I will define and explain several relevant issues. This is important in order to clearly define the focus of my thesis. Also the boundaries of my research will be outlined.

Participation

The focus in this thesis is on participation as a trading partner in electronic marketplaces. I do not focus my research on participation as an investor.

> "Participation is the totality of forms, i.e. direct (personal) or indirect (through representatives or institutions) and of intensities, i.e. ranging from minimal to comprehensive, by which individuals, groups, collectives secure their interests or contribute to the choice process through self-determined choices among possible actions during the decision process. " (Heller et al. 1998)

Electronic marketplaces

Several authors developed their own definitions of electronic marketplaces. Some use a narrow definition, others a broader one. Due to rapid changes in the business environment, is this research area a very dynamic one. As a result the scientific relevance would be very limited if I would choose a very narrow focus. It could become a part of history much to early. For this reason I have chosen to adopt a widely used definition of electronic marketplaces among scientific researchers.

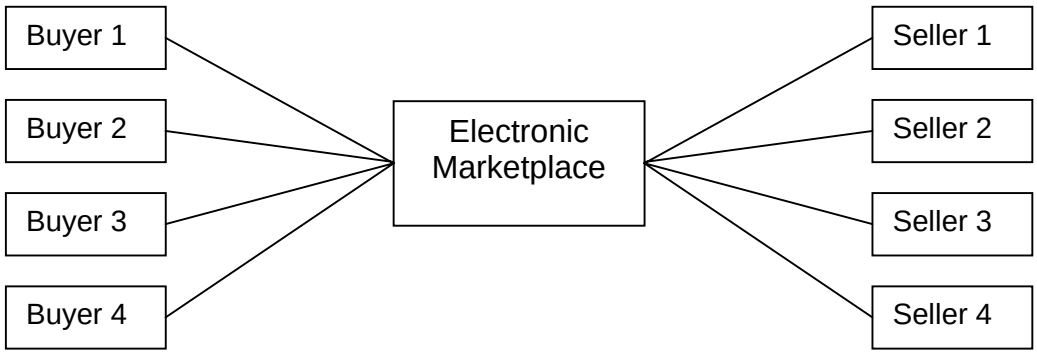
I will use the following definition of electronic marketplaces:

> "Internet-based business to business electronic marketplaces represent an interorganizational information system that facilitates electronic interactions among multiple buyers and sellers" (Bakos, 1991; Choudhury, 1998; Grewal et al, 2001).

The facilitation of electronic interactions means that electronic marketplaces extend their services beyond the sole process of matching buyers with sellers and vice versa. These additional services that support the transactions are included in my discussion of electronic marketplaces. As a result of this the model has been primarily designed for professional, internationally operating marketplaces that mostly offer a variety of market making mechanisms and coordination tools.

Several names are used for the same phenomenon. Kaplan and Sawhney (2000) use the term *E-hubs* for electronic B2B marketplaces. Choudhury (1998) uses the term *electronic markets*. Basically they all address the same idea. I prefer using the term electronic marketplaces, electronic markets, or just marketplaces. Figure 1 shows a visual explanation of an electronic market.

**Figure 1.1: Visual explanation of an electronic market.**




Source: Adapted from Choudhury et al. 1998

Participant segments

Typically, electronic marketplaces are defined in terms of participants, using acronyms B (for business), C (for consumers), and G (for governments) (Skjøtt-Larsen et al. 2003). The focus of this thesis is on business-to-business (B2B) electronic marketplaces. That means electronic marketplaces that facilitate electronic interactions between businesses. Table 1.1 will show an

overview of the different participant segments based on Coppel (2000). The focus of this thesis (B2B) is indicated in bold.

**Table 1.1: Participant segments**

| | Government | Business | Consumer |
|---|---|---|---|
| Government | G2G | G2B | G2C |
| Business | B2G<br>e.g. Gatetrade, eFederal | **B2B**<br>**e.g. Transora, Eutilia, Covisint** | B2C<br>e.g. Amazon, Letsbuyit |
| Consumer | C2G | C2B<br>e.g. Priceline | C2C<br>e.g. eBay |

Source: Adapted from Coppel, 2000

# CHAPTER 2: B2B MARKETPLACES

## 2.1 Introduction

Many different kinds of electronic marketplaces exist. That is the consequence of the dynamics in this research area. Marketplace operators adapt their services and business models to changes in the environment. As a result there is not one business model to focus on. The research would be outdated soon. In this chapter I will describe different aspects of electronic marketplaces. I do this to provide insight in the functioning of this phenomenon and to identify factors that can influence participation. In the last paragraph I will provide an overview with examples of the different kinds of marketplaces.

## 2.2 Market mechanisms

Electronic marketplaces conduct several different functions. The basic function of an electronic marketplace is matching buyers with sellers and vice versa. Several electronic marketplaces go beyond this. They aim at increasing efficiency by enhancing interfirm cooperation. García-Dastugue and Lambert (2003) distinguished between two primary functions of an electronic marketplace, the market mechanism and the coordination flows. The coordination flows will be subject to discussion in the next paragraph.

Just as in traditional markets, the market mechanism determines the way products are traded on the electronic marketplace. It is used to conduct a business transaction, to purchase or sell a good or service at a given price. Market mechanisms can be used to stimulate price competition among potential suppliers. As a result of this, market transactions are often one-time transactions. Different suppliers can be selected for each transaction. The information that is shared while using market mechanisms is generally limited to the terms and conditions of the transaction, delivery information and payment, in addition to the bidding process. Combinations of different market mechanisms on one marketplace are also possible. These so called “all-in-one markets aggregate multiple transaction mechanisms, often on a shared electronic platform, creating new opportunities for firms to take advantage of the best features of open-market and nonmarket

forms of exchange." (Kambil et al. 1999) Different market mechanisms can be selected for different products, and in different markets. There is no 'best market mechanism'; this can only be stated in a very specific context. As a result some marketplaces offer a wide variety of market mechanisms, in order to adjust the right mechanism for the right type of goods.

Among the market mechanisms that can be identified are different kinds of auctions (standard, reverse, multidimensional, etc), electronic tenders, fully automated exchanges, and a number of electronic purchasing aids such as electronic catalogues and purchasing groups. Certain goods are best suited for trade on a fully automated exchange, such as commodities; other goods need a more time consuming trading mechanism such as an auction.

The mechanisms are different, but the purpose is the same: enhancing efficiency in the trading process. Only the way to achieve it is different. Some specific benefits of electronic marketplaces are a direct result of these market mechanisms. The extent to which a marketplace offers market mechanisms that meet participants' demand, can be one of the factors that influence a decision to participate or not.

## 2.3 Coordination flows

Another functionality of electronic marketplaces is the facilitation of coordination flows between buyers and suppliers. Coordination flows aim at reducing the costs of coordination in long-term relationships. They are implemented to manage businesses more effectively by focusing on the relationships with other supply chain members rather than on individual transactions. (García-Dastugue and Lambert, 2003) These coordination flows are separate data flows, apart from the market mechanisms. Often, they are used to connect internal logistics systems with each other, for example to organize just-in-time delivery or to enable a Continuous Replenishment Program[2] (CRP) between a retailer and a supplier.

Coordination flows are used when managers do not need to search the market and evaluate each alternative. Information is shared and used to streamline supply chain management. These

coordination flows can also be used for joint product development. Because these coordination flows have a greater impact on the internal organization than market transactions, they are more suited for stable relations.

Electronic marketplaces are not the only way to establish efficient coordination flows. Interfirm coordination has been established for many years through the use of peer-to-peer EDI (Electronic Data Interchange). Actually, some electronic marketplaces use web based EDI technology for these purposes.

Participation in an electronic marketplace may depend on the possibility of establishing coordination flows between organizations. A typical benefit derived from coordination flows is a possible reduction of inventory levels. It will be mentioned in paragraph 4.2 as part of coordination cost reduction.

## 2.4 Stakeholders

The stakeholders in a marketplace determine the bias of the marketplace, the group it favours. Electronic marketplaces can be biased or neutral. I will explain them below.

Biased

Biased marketplaces can be biased on the supply-side or on the buy-side. The role of a buy-side marketplace is to aggregate buyers. Such marketplaces concentrate primarily on creating efficiencies for the corporate buyer. Buy-side networks generally have several objectives, that is, to drive procurement costs down from the participating buyers, to allow buyers to aggregate spending, to reduce administration costs, to increase visibility, and to facilitate global sourcing.

The supply-side aggregated marketplace concentrates on bringing multiple suppliers together into a central catalogue. The key to a supply-side marketplace is to provide multiple suppliers a forum to present their catalogues and conduct in trade with as many buyers as possible. In other words, to aggregate the content that will meet the buyers need. Supply-side marketplaces also

[2] In a CRP a retailer shares real-time inventory data with its suppliers in order to get continuous replenishment of its inventory by that supplier (Raghunathan and Yeh, 2001).

have the ability to aggregate their suppliers, acting as a public service provider, wrapping products and services together, and offering them to buyers, to marketplaces, and to buy-side aggregated networks directly. All types of relationships are aligned to increase benefits to suppliers. (Skjøtt-Larsen et al. 2003)

Neutral

Neutral marketplaces are operated by an independent third party. According to Kaplan and Sawhney (2000) these marketplaces can be seen as true market makers because they are equally attractive to sellers and buyers. These neutral electronic markets are the only real markets according to Malone et al. (1994). However, these marketplaces often face the "chicken and egg" problem: buyers do not want to participate unless there is a sufficient number of sellers, and sellers do not want to participate unless there is a sufficient number of buyers. At the moment these marketplaces are having a difficult time, without the backing of an industry.

Attaining financial investments can be problematic for neutral marketplaces, because investments from large buyers or suppliers can create a perception of bias. The market maker has to be very careful when attracting investors. Another problem for neutral marketplaces is the sellers' channel conflict, because sellers usually participate in these markets at the expense of their normal distribution channels. (Kaplan and Sawhney 2000)

The foregoing discussion about stakeholders is directly related to participation. Marketplaces that are biased on the buy-side can have difficulties attracting suppliers. Marketplaces that are biased on the supply-side can have difficulties attracting buyers. In addition, neutral marketplaces face the chicken and egg problem. In order to address this issue I will distinguish buyers from suppliers in my research where necessary.

## 2.5 Focus

The focus of the electronic marketplace determines the kind of market it services. It can be defined as horizontal or vertical, although combinations exist. Originally most electronic marketplaces did have a clear focus. Since several years, certain electronic marketplaces are offering all-in-one solutions (Kambil et al., 1999). They offer multiple trading mechanisms as well

as additional services that support the transaction. As a result the difference between a horizontal and vertical focus is getting less obvious. I will discuss the two extremes briefly.

Vertical

Vertical marketplaces serve a specific vertical industry, such as chemicals, foods, telecommunications, etc. These electronic marketplaces focus on understanding industry practices and resolving industry constraints, such as inefficiencies that lower margins. They try to automate vertical supply chains in order to make the market more efficient and create strategic advantage for its participants. Vertical marketplaces are being called 'industry focused'.

Horizontal

Horizontal marketplaces provide e-commerce capabilities that are common to many industries, such as maintenance, repair, operations procurement, web-based sales and marketing, human resource services, etc. Often, they seek to make these processes more efficient, approaching participants from different industries by using extension of ERP or other existing software tools. These marketplaces are also being called 'product focused'.

It is likely that the dependency relation between trading partners is different with regard to horizontal or vertical marketplaces. Trading partners in a vertical supply chain are often highly dependent on each other. As a result external pressure may play an important role in the decision to participate. The kind of services on which horizontal marketplaces focus are less industry specific and as a result more widely available. That could emphasize the importance of motives from an internal point of view, such as anticipated advantages.

## 2.6 Ownership

Private (closed) marketplaces are owned by a single company. Its goal is to support commercial interactions with its own known suppliers and/or buyers. It is often used to integrate a company's internal systems (such as an ERP system) with its external trading partners. For example in order to streamline the companies' purchasing process. Private marketplaces are often operated by companies that have a dominant position within its value chain, mostly large companies. This type of electronic marketplaces is considered as highly information sharing and

collaborative. As a consequence, private marketplaces are only accessible for pre-qualified suppliers. Private marketplaces attain relatively much value on the establishment of coordination flows.

Public (open) marketplaces are owned by industry consortia or independent operators with non-restricted memberships that are usually open to all companies in the industry. (Zhu, 2002) Security and authenticity are very necessary for public markets. The market itself is categorized by a low degree of information sharing and collaboration. The major focus of public marketplaces is on bridging market inefficiencies by facilitating the interactions of many buyers and many suppliers (Emarketservices 2003). Sometimes several companies join forces and form a consortium. Their advantages are a guaranteed source of transaction volume, financial strength, and an ability to develop standards. Primary focus of public marketplaces is on market mechanisms.

With regard to participation it is interesting to note that there are differences between public and private marketplaces. The level of dependency as well as the power balance between trading partners can influence a motivation to participate. It is likely that this differs between private and public marketplaces.

## 2.7 Examples

Table 2.1 shows an overview with examples of different kinds of marketplaces.

Table 2.1 Examples per classification

| Categorization | Electronic marketplace examples | | |
|---|---|---|---|
| Focus | *Vertical*<br>Chemconnect.com, Eutilia, Covisint.com | *Horizontal*<br>Freemarkets, Grainger.com, Techsmart.com | |
| Stakeholder | *Buy-side*<br>Covisint, World Wide Retail Exchange | *Neutral*<br>Chemconnect.com, Zonetrader | Supply-side<br>Transora |
| Market mechanism | *Auctions*<br>Chemconnet.com, Eutilia, MetroChemNet | *Exchanges*<br>Chemconnect.com, OFX.com | *Catalogues*<br>Papersite.com<br>Neofarma.com<br>Eutilia |
| Ownership | *Public (open)*<br>Chemconnect.com, Paperdeals Eutilia | *Private (closed)*<br>Envera, Eastmanmarketplace.com | |

Source: Adapted from Skjøtt-Larsen et al. 2003

# CHAPTER 3: THEORETICAL BACKGROUND

## 3.1 Introduction

In this chapter I have a glance at the background of electronic marketplaces. I will place it in the context of EDI and discuss the differences between EDI and electronic marketplaces. Next, I will discuss some major contributions to these phenomena, all direct or indirect in relation to participation. That will be the theoretical starting point for my model that I will propose in the next chapter.

## 3.2 Interorganizational systems & EDI

The rise of electronic marketplaces is no revolution. It is just a step in the evolution of ICT enabled communication. It is a new form of electronic business. Also electronic business is not new since the rise of the Internet. Many companies have been doing electronic business for several decades, especially in the purchasing process. Before the Internet hype, focus was on one-to-one relations, mainly in the form of Electronic Data Interchange (EDI).

An EDI system is one specific type of interorganizational systems (IOS). Electronic marketplaces are another type of interorganizational systems (Bakos, 1991). IOS are telecommunication-based computer systems that are used by two or more organizations to support the sharing of data, and sometimes applications, among users in different organizations (Barret and Konsynski, 1982; Iacovou et al. 1995).

EDI systems are co-operative interorganizational systems (IOS) that allow trading partners to exchange business information electronically between separate computer applications. (Swatman and Swatman, 1992) 'Separate computer applications' involve that users need a special piece of software to enter the EDI system. This is an independent application system, NOT a single application system that is used by multiple users. The integrity of the data exchange between

application systems of trading partners must be guaranteed by agreements concerning data coding and formatting rules. (Iacovou et al. 1995)

The so-called coordination flows in electronic marketplaces (paragraph 2.3) actually substitute for the exchange of business information. Some electronic marketplaces are even partly based on Internet enabled EDI, for example Covisint.[3]

### 3.3 EDI in relation to electronic marketplaces

Both EDI systems and electronic marketplaces are interorganizational systems. Following the description of EDI in paragraph 3.2, a number of differences can be identified between EDI and electronic marketplaces. These indicate the issues that have to be taken into account when comparing the EDI adoption literature with literature about participation in electronic marketplaces.

1. Main function

Matching supply and demand is the basic function of an electronic market. Coordination and exchange of information, such as enabling supply chain integration is an additional functionality. The latter is the primary aim of EDI.

2. Relationship configurations

With regard to EDI several types of configurations are possible. One to one (1:1), One to many (1:m), and many to many (m:m). (O'Callaghan and Turner, 1995) These configurations are also possible with electronic markets, however because EDI is relatively expensive to implement, electronic business through EDI on a many to many or one to many relation is not easy to achieve. This was a significant barrier to the widespread use of electronic business. Costs of adopting EDI are high; as a result a large majority of EDI systems is only operating between two companies (1:1) or several companies (1:m). Market making is not possible with so few participants.

[3] www.covisint.com

3. Trust

In open marketplaces participants are less known than in a closed EDI network. In the EDI network participants are invited to join, resulting in better knowledge about the participating firms, their aims, background etc. As a result of this, trust, anonymity, data transparency, and security may play a major role in (open) electronic markets than with regard to EDI.

4. Information transparency

"Data disclosure and information transparency was less a concern in the proprietary EDI context than in the Internet based B2B setting. Typically EDI does not provide market transparency as it is often conducted over proprietary value-added networks and controlled by one large buyer." (Zhu, 2002)

5. IT sophistication

Depending on the type of electronic marketplace to be joined, IT sophistication will be less important or equally important as in the EDI context. Availability of Internet is the basic requirement for many Internet enabled electronic markets. In general, integration with its internal system is no necessity. IT sophistication however should not be underestimated in the electronic marketplace context.

6. Costs

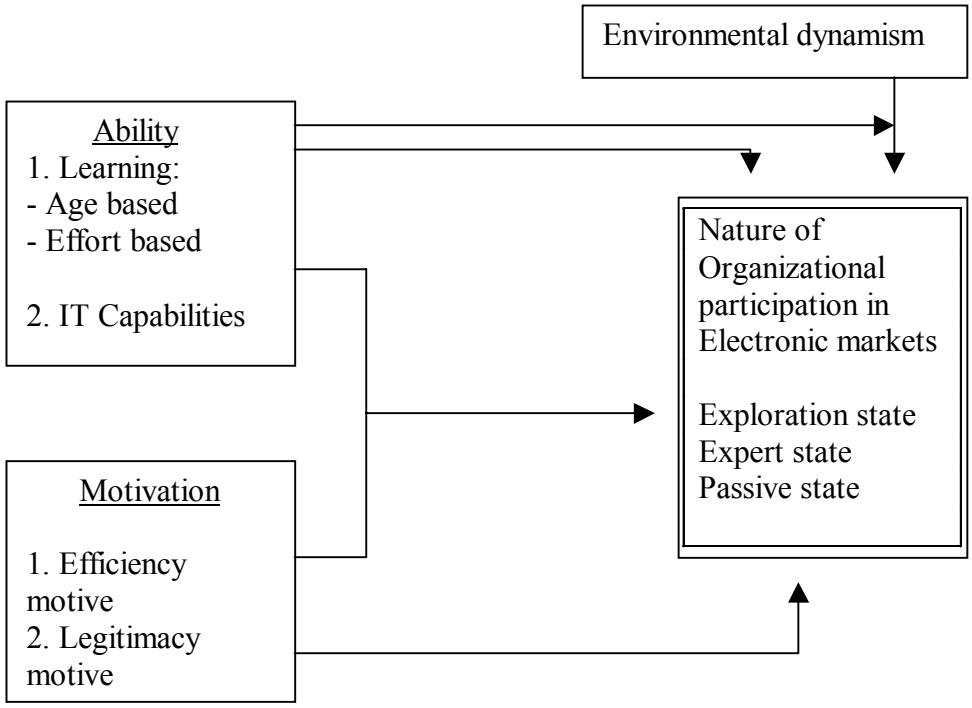
Joining an electronic marketplace can be cheaper than adopting EDI, but only if a low level of integration is applied. A fully integrated transaction mechanism will probably be at least as costly as the adoption of EDI.

### 3.4 Participation and adoption models

Participation in electronic marketplaces from the perspective of the participant is a field with little previous research. One of the few efforts has been conducted by Grewal, Comer and Mehta (2001). The authors developed a typology for the nature of organizational participation from a behavioural approach. Three different levels of organizational participation are being distinguished: exploration state, expert state, and passive state. The model hypothesizes that the nature of participation depends on organizational motivation, ability, and environmental dynamism. The authors conceptualise motivational factors in terms of efficiency and legitimacy motivations and theorize that ability results from the influence of organizational learning and information technology capabilities. Environmental dynamism refers to external factors that influence the ability of the firm, and consequently the level of participation. A visual explanation is shown in figure 3.1.

Figure 3.1 Framework by Grewal et al. (2001)




Source: Grewal et al, 2001, p. 20

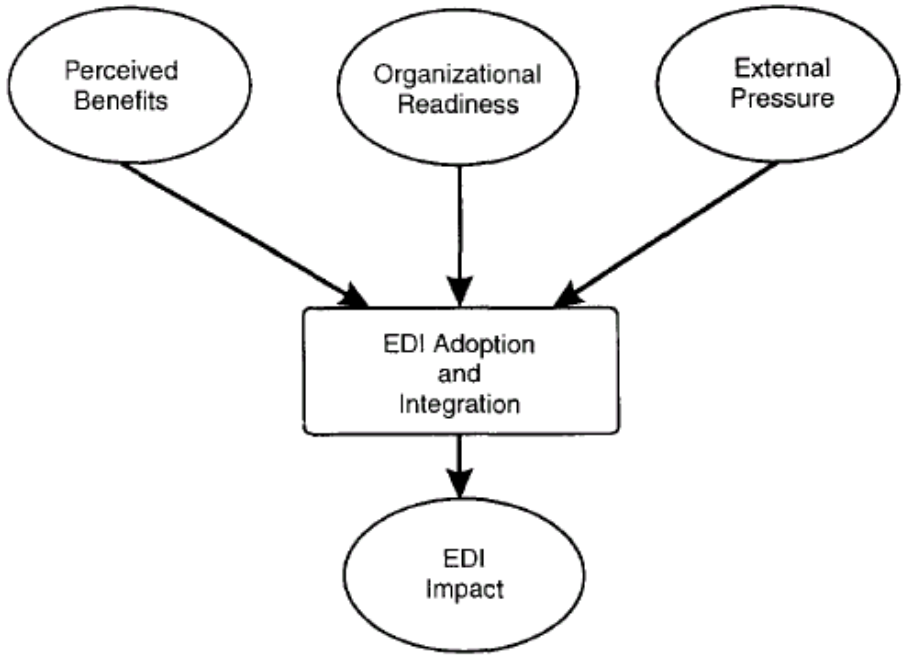
 

This framework may very well be suited as a basis for further theoretical and empirical research, but in my opinion does not provide enough clear insights to industry practitioners, such as market makers. The research is still quite exploratory, due to the limited availability of research in this field of expertise.

On the other hand an impressive amount of research has been conducted in the field of EDI adoption. (For example: Iacovou et al. 1995; Kuan and Chau, 2001) Although aware of the differences between EDI and electronic markets, many similarities do exist. I discussed these earlier in this chapter. When taking these differences into account, EDI adoption literature might be suited as part of a theoretical basis for participation in B2B electronic marketplaces.

One particular model seems to be especially interesting for use in the B2B electronic marketplace context. That is the model developed by Iacovou et al. (1995) and further developed and tested by Chwelos et al. (2001). The model posits three factors as determinants of the adoption of EDI: perceived benefits, organizational readiness, and external pressure. A visual explanation is shown in figure 3.2.

Figure 3.2 EDI adoption model




Source: Iacovou et al. 1995, p. 467

The authors predict that their research can probably be used for other forms of interorganizational systems. Quoted from Chwelos et al. (2001, p. 316): "…the core of this model has general applicability to other forms of IOS, particularly business-to-business electronic commerce…we hypothesize that the relationships predicted by our model will continue to hold".

Although these two models have a different approach, they have quite a lot in common. I'll explain it in order to show the applicability in the electronic marketplace context.

Perceived benefits refer to "the potential advantages that EDI technology has to offer" (Iacovou et al. 1995), or to "the anticipated advantages that EDI can provide the organization" (Chwelos et al. 2001). An anticipated or potential advantage is in fact a motivation to participate. This construct could refer to the motivations as identified by Grewal et al. (2001), especially to the efficiency motives. However, a motivation does not necessarily have to be a perceived benefit too. The Iacovou model presents additional motivations for participation, in the form of external pressure. Grewal would place external pressure probably under legitimacy motives or environmental dynamism.

Organizational readiness refers to "the level of (1) financial and (2) technological resources of the firm." (Iacovou et al. 1995) When the firm lacks resources, the firm will not be able to adopt EDI. This construct could refer to the ability construct from Grewal et al. (2001).

External pressure, according to the original authors, "refers to influences from the organizational environment". Referring to Grewal et al. (2001), environmental dynamism can be seen as the behavioural construct of, in essence, a construct that addresses the same phenomenon. Certain kinds of external pressure also provide a legitimacy motive to the organization, and correspond consequently to the motivational aspects of the framework.

In the next chapter I will build upon this framework in the B2B electronic marketplace context. I will pay attention to the differences between EDI and electronic marketplaces discovered earlier in this chapter, and propose a framework to the factors that affect participation in B2B electronic marketplaces. I conducted extensive literature research to adapt the model for the electronic marketplace context. First I will explain and discuss each construct separately and then I will present the whole model.

# CHAPTER 4: PROPOSED MODEL

## 4.1 Introduction

In chapter two I discussed different kinds of electronic marketplaces, electronic data interchange, and two important contributions with regard to participation in electronic marketplaces and the adoption of EDI. This chapter builds further upon that theoretical basis.

I will propose a model to participation in electronic marketplaces. The different constructs of the model will be explained in separate paragraphs. At the end of this chapter I will present the whole model. This is shown on page 50. The four constructs of the model are: *perceived benefits*, *perceived threats*, *organizational readiness*, *and external pressure*. They are divided in fourteen sub-constructs.

## 4.2 Perceived benefits

Perceived benefits refer to the anticipated advantages that participation in an electronic market can provide to the organization. In other words: the opportunities that one perceives as the consequence of participation in an electronic marketplace. Opportunities that are not being perceived, not known, do not provide an incentive to participation. For this reason I use the term *perceived* benefits.

Although the basics of the model were originally developed for EDI adoption, we can assume that these so-called anticipated advantages or perceived benefits also play a role with regard to participation in electronic marketplaces. Evidence for this exists in the academic literature where several authors addressed the benefits of organizational participation in electronic marketplaces (Bakos 1991, Klein and Quelch 1997, Presutti Jr 2002).

I define three different types of benefits. First, a number of benefits that are the logical consequence of the market mechanisms at the Internet. The market mechanisms offered by electronic markets are not all new, but they offer at least an electronic version at the Internet.

These consequences do I call 'market mechanism benefits'. They refer to benefits derived from the pure availability of the market mechanisms, but also to benefits derived from the fact that they are available on the Internet. For an overview of different types of market mechanisms I refer to chapter two.

The second group of benefits refers to increased efficiency of coordination in the supply chain. I call it coordination costs reduction. It refers to business processes that become more efficient. They refer to coordination costs with regard to market mechanisms and coordination flows.

In addition I mention a third group of benefits. These benefits refer to the value added services that many marketplaces offer. By offering all services to support a transaction, the marketplace functions as a centre of expertise.

A difference that has not been made by both Iacovou et al. and Chwelos et al. is the distinction between trading partners, buyers and suppliers. Benefits for participating suppliers do not have to be benefits for buying participants; they can even be a threat to them. Marketing and supply chain literature often makes the distinction between buyers and suppliers. This is logical because the process of selling is not the same as the process of purchasing. As a result the electronic marketplace has several specific perceived benefits for buyers on the one hand, and suppliers on the other hand. I made the distinction between these groups where necessary.

I predict that the construct 'perceived benefits' is positively related with participation. This means that someone who perceives more benefits will be more likely to decide to participate in an electronic marketplace than someone who perceives fewer benefits. This leads to the following hypothesis:

*Hypothesis one: perceived benefits are positively related with participation*

### 4.2.1 Market mechanism benefits

Market mechanism benefits are benefits that are derived from the new way of conducting trade on the Internet. They are new opportunities enabled by the electronic marketplace. Benefits for buyers can be threats for suppliers and vice versa. For this reason I will distinguish buy-side from the supply-side.

***Procurement benefits for buyers***

These benefits are typically for buying participants. As a consequence they can pose a threat for suppliers.

- True market driven prices

  The market transparency enabled by the marketplace and its market mechanism(s) fosters price competition among suppliers (Klein and Quelch, 1997; Gottschalk and Abrahamsen, 2002; Emarket services, 2003; Bakos, 1991; Bakos 1997; Zhu 2002).
- Bigger assortment, getting to know new suppliers (Klein and Quelch, 1997; Gottschalk and Abrahamsen, 2002). This is the result of the fact that electronic marketplaces are operating on the Internet. New suppliers can be detected without geographical barriers.
- Reduction of Maverick buying (Emarketservices 2003)

  By implementing routines and stricter control, each purchase is done through previously approved agreements through the electronic marketplace. This is especially true in a catalogue-based marketplace. Buyers pre-negotiate prices and terms of delivery with the suppliers. These suppliers will then become preferred supplier.

***Marketing and sales benefits for suppliers***

These benefits are typically for suppliers. As a consequence some of these benefits can work contrary for buyers and pose a threat to them.

- Additional sales channels for their products with no immediate disruption of existing distribution arrangements (Klein and Quelch, 1997). This is the consequence of using the Internet as sales channel.
- Option of unloading surplus inventory efficiently. (Emarket services, 2003)
- A means of comparing their own prices to those of other suppliers in real-time and on a market-by-market basis. (Klein and Quelch, 1997)
- The option of price discrimination by market segment (Grover and Ramanlal, 1999)
- Reduced credit risk in private network, because participants are screened. (Klein and Quelch, 1997)
- Volume increase in catalogue based marketplace. In catalogue based marketplaces suppliers pre-negotiate prices and terms of delivery with the buyers. These suppliers will then become preferred supplier. The reduction of Maverick buying enables this volume increase.
- Opportunity to test prices with minimum risk, but only if suppliers' offers are anonymous. (Klein and Quelch, 1997)

### 4.2.2 Coordination costs reduction

Coordination cost reduction is about increased efficiency of traditional processes. "Coordination costs include the transaction (or governance) costs of all the information processing necessary to coordinate the work of people and machines that perform the primary process." (Malone et al., 1994, p. 63) In relation to electronic marketplace, they include "determining the design, price, quantity, delivery schedule, and other similar factors for products transferred between adjacent steps" in a value chain (Malone et al., 1994, p. 63). The real time exchange of information through the use of market mechanisms and coordination flows in electronic marketplaces enhances efficiency in the procurement and sales process by reducing the costs of coordination. (Stockdale and Standing, 2002; Presutti Jr, 2002; Emarket services, 2003) The following benefits are the consequence of lower coordination costs:

- Lower information search costs (Bakos, 1991). As a result of market transparency it is easier and faster to search for alternatives, as a result information search costs decline. This is especially beneficial for buyers.
- Lower transaction costs. (Klein and Quelch, 1997; Bakos, 1991) Faster and accurate exchange of information enhances efficiency of communication and as a result lowers transaction costs. Parts of these lower transaction costs are derived from lower labour costs (Presutti Jr. 2002). In addition it can lower distribution costs of information-based services and products. The importance of this benefit is emphasized by an empirical research among Norwegian procurement managers (Gottschalk and Abrahamsen, 2002). Reduced transactions costs ranked number one as expected benefit in this research.
- Rapid procurement and sales process (Klein and Quelch, 1997). Electronic coordination enables faster coordination. This means that more coordination can take place in the same time. The consequence for buyers is a reduction of the sourcing cycle and ultimately a reduction of the time to market (Presutti Jr, 2002). In addition it enables a faster time to market for suppliers.
- Efficiency benefits enable purchasing and sales staff to spend more time on strategic activities, such as strategic sourcing or business development.
- Reduction of inventory levels (Presutti Jr, 2002, Emarketservices, 2003). Through faster and more accurate information exchange, just-in-time delivery can be adopted. The supplier can

adjust its output to meet changes in the client's demand. This is a typical result of the implementation of coordination flows between trading partners.

### 4.2.3 Value added services

Marketplace operators can increase the marketplace's attractiveness by offering value added services. The range of services found is very broad and can be very specialised. It is highly dependent on the target group and the kind of products that are being traded. In an increasingly competitive environment it is likely that the potential for knowledge sharing and collaboration will become increasingly important, and thus the importance of the value added services that support it. These value added services can for example consist of: electronic document exchange, industry expertise, community facilities, collaborative design platforms, shipping services, etc. (Stockdale and Standing, 2002)

### 4.3 Perceived threats

Perceived threats refer to the anticipated threats that participation in an electronic market can provide to the organization. In other words: the threats that one perceives as the consequence of participation in an electronic marketplace. Threats that are not being perceived, not known, do not provide a barrier to participation. Hence, the term *perceived* threats.

Regardless the other constructs, a major threat can be a reason for an organization to decide not to participate as a trading partner in an electronic marketplace. That is the reason why I present perceived threats as an independent, separate construct of this model. If an organization can benefit considerably from participating, but when it perceives the risks too high, it will probably not participate.

Academic research exists that focuses on threats or risks with regard to participation in electronic marketplaces. Mainly in the form of information transparency, trust, security and legal threats. (Zhu 2002, Sinha 2000, Klein and Quelch 1997, Schoder and Yin, 2000; Saeed and Leitch 2003) This attention provides me sufficient reasons to include: information transparency, trust, security, and legal issues as new sub-constructs of the model. Additionally I will use another sub-construct in the model that has been derived from an interview with an industry practitioner, namely: job security. In the following paragraphs I will discuss these topics and I will mention methods in which marketplace operators can reduce these impediments.

I predict that the construct 'perceived threats' is negatively related with participation. This means that someone who perceives more threats will be less likely to decide to participate in an electronic marketplace than someone who perceives fewer threats. This leads to the following hypothesis:

*Hypothesis two: perceived threats are negatively related with participation*

### 4.3.1 Information transparency

One of the key differences between traditional markets and electronic markets is the level of information or data transparency. This is the consequence of the very efficient exchange of information on electronic markets. Information transparency is defined as "the degree of visibility and accessibility of information" (Zhu, 2002). Direct result of information transparency is more available information and lower search costs to gather it.

The degree of information transparency is highly dependent on the specific electronic marketplace and its disclosure rules. Some electronic marketplaces provide participants the opportunity to gain comprehensive market information, such as real-time bidding information, accepted prices, quantities of goods available, bidding strategies, etc. "On Covisint, suppliers can see who is selling clutches and brakes, at what prices and on what quantities" (Zhu, 2002).

The market maker can influence the degree of information transparency by changing its data disclosure rules. It must be said however, that the data disclosure rules are linked to the technological capabilities of the marketplace, for example: reverse auctions and use of XML. Two main categories of disclosure rules exist, non-restricted and restricted. Under non-restricted disclosure, data can be accessible to all players in the industry, regardless of participation. As a result no real incentives are provided to join the electronic marketplace, in relation to market information. Under a restricted disclosure rule, transaction data is visible to trading members only. This type of disclosure rules does provide a real incentive to join in relation to market information. Sometimes participants can be kept in anonymity until the transaction has to be completed. This makes the collection of market information more difficult. On the other hand, the risk of buying from an anonymous supplier may be a disincentive to use the marketplace for buyers. Information transparency results in threats for both suppliers and buyers. I will discuss threats that are typical for supplying participants on the one hand, and for buying participants on the other hand, separately.

***Suppliers***

Information transparency gives buyers the possibility to compare prices and product specifications more easily. Buyers can get to know new suppliers in a very efficient way. The combination of better knowledge about products and prices offered, by suppliers that are easier to identify will result in the availability of more alternatives. The consequences can be (Sinha, 2000):

- Margin erosion and fear of losing customers
- Products and services become more difficult to differentiate, and shift towards commodities
- Weaker brand loyalty
- Possible reputation damage by creating perceptions of price unfairness

As a result of this it is likely that low cost suppliers will be stimulated to join the marketplace. The marketplace communicates to the buyers that the low cost suppliers have the best prices. Consequently, high cost firms will prefer to trade on the traditional market where they can hide their cost data more easily. (Zhu, 2002)

***Buyers***

Although buyers do benefit substantially by increased information transparency, it can also pose a threat to them. As mentioned in the discussion about its benefits, the electronic marketplace offers a wide variety of marketing related opportunities for suppliers. Price discrimination (for example by region or type of customer) is a possible threat for buying participants. Increased information transparency enables availability of market information that can be used for price discrimination.

Another threat is related to its willingness to pay. Through intelligent market research techniques an electronic marketplace can provide participants with comprehensive information about each other. Market transparency on an electronic marketplace makes it possible and cheaper, than on traditional markets to get this information. It may become clear to what extent the buyer actually needs the product and its willingness to pay for it. Consequently, the supplier can use this information in the negotiation cycle.

### 4.3.2 Trust, Security and Legal issues

Trust, security, and legal issues form an essential, interdependent, part of the participational question analysed in this thesis. Security measures are used to prevent illegal or other behavior that is not wishful. Trust is necessary when security measures are not adequate, possible, or wishful. The legal aspects come into sight when security and trust have not been sufficient to prevent illegal conduct.

According to a report from the Gartner Group (2000), security remains the biggest concern of firms moving to e-business. As a result, concern about security can still hinder the participation in an electronic marketplace. The importance of security is stressed by the fact that trust between trading partners in an electronic environment may be even more important than in the brick and mortar environment (Standifird, 2001).

Security measures would not be necessary if trading partners fully trust each other, and the governance mechanism. On the other hand a high level of trust between trading partners would not be necessary if the marketplace could guarantee 100% security. This is however a theoretical possibility, it will never be 'business as usual' in the marketplace. In order to explain trust, security, and the legal aspects I will focus on these topics separately.

***Trust***

Trust is a basic necessity for conducting business. A lack of trust between business partners means a threat for the interorganizational relationship. Several differences between ordinary markets and electronic markets emphasize the importance of trust in the electronic market. If we focus on the market mechanisms the following items emphasize the importance of trust:

1. Limited knowledge about trading partners exists. One of the perceived benefits of electronic markets is getting to know new business partners. As a result two companies that did not knew each other before, have not had the opportunity to build trust. This item however is not valid when the participants already know each other, or when brand awareness is large. Reputation damage would be significant.
2. Sequencing of events; the payment and delivery are often not simultaneously. (Standifird, 2001)
3. Little or no ability exists to examine products in advance (Standifird, 2001)

If we focus on the coordination flows as described in chapter two, the sharing of information may pose a threat. Data sharing about, for example, production schedules and inventory levels can leverage profitability in the supply chain. Participants may fear that its business partner will use these data to achieve competitive advantage at the cost of its own profitability. If this fear however exists, the question must be asked why these companies are trading partners, and why the trading partner should misuse the information, because they have much to lose. If this lack of trust would be a reason to not provide the 'coordination' data, it would result in less than optimal efficiencies. (Dai and Kauffman, 2003)

An important role for building trust between participants is dedicated to the marketplace operator. Empirical evidence exists that trust in the marketplace as an institution, facilitates trust between trading partners (Pavlou, 2002). The first is called 'institutional trust' and the latter is called 'interorganizational trust'. Also Zucker (1986) suggests that institutional trust is the most important method to create interorganizational trust in an 'impersonal economic environment without familiarity and similarity'. These are characteristics of electronic marketplaces.

The marketplace operator can build trustworthiness between participants by screening potential participants, by monitoring the activities on the marketplace, or by providing feedback ratings to individual participants based on evaluations of former trading partners. In addition it can use third party services, such as Escrow, that enables buyers to pay after the goods have been arrived. It can also check credit-worthiness like companies may do in brick-and-mortar trade.

The trading partners themselves can also conduct extra research to its trading partners, such as checking references, credit-worthiness, or demanding payment in advance, like in brick and mortar trade. This however reduces efficiency of the electronic marketplace. In certain circumstances companies are acting in anonymity at the trading platform, this may be a feature of an online auction. The marketplace operator has to create trust by securing that only trustful organizations are operating on the marketplace. He can do so by conducting an extensive check before admittance to the marketplace and by publicising the names of the trading partners on its portal. It may also be possible for the participant who issues the auction to select the potential trading partners in the auction, thereby starting the negotiation process with a selected list of pre-qualified suppliers.

The extend to which these measures can eliminate the possibility of opportunistic behavior by a trading partner, depends on the marketplace. The marketplace operator has to set priorities and build its structure to the best needs of the participants. It has to be noted, that opportunistic behavior can never be fully eliminated, just as in traditional trade.

*Erosion of the buyer-supplier relation*

Interorganizational trust does not just apply to new relations between buyers and suppliers. Conducting business through an electronic marketplace might also affect the traditional relations.

Companies in the supply chain that are doing business with each other can make implicit or explicit strategic agreements. Changing the way to do business with trading partners will interfere these *strategic agreements* (Harris, 2000). For example, the use of electronic auctions can have a negative effect on the trust relation between two trading partners who have been doing business with each other for an extensive period. This is regardless the type and existence of contracts between these trading partners. Erosion of this relation may be a risk.

***Security***

Security remains a big concern of firms moving to e-business. As a result, concern about security and privacy by trading on the Internet can still hinder the participation in an electronic marketplace. Saeed and Leitch (2003) identified two types of security risk: data security risk and authentication risk.

- Data security risk

If an organization wants to conduct trade on an electronic marketplace, it is necessary to provide transaction related data. This data will be necessary in order to fulfil a purchase order. If a company is involved in using additional coordination flows, for example related to supply chain integration, the flow of data will be even larger. This data can be of high value for competitors, clients and suppliers. As a result the possibility of another tapping the data transmission is real. In addition, the electronic marketplace may store this data, which may be subject to information theft by hackers and system failure (Han and Noh, 2000; Saeed and Leitch, 2003). Among others, encryption methods and firewalls can be used for security of data transmission and stored data.

- Authentication risk

Firms conducting business in an electronic marketplace do not always know the identity of the trading partner with 100% certainty. The marketplace has an important role in screening the participants, however this cannot guarantee that participants do not abuse the marketplace in order to obtain market information or receive payments for goods that will never be delivered. When large amounts of money are at stake, benefits of doing improper/illegal activities can exceed the perceived risks of these activities. This is especially possible in open marketplaces where screening is limited. A means to combat this risk is the use of security policies, control mechanisms, and authentication mechanisms. The same means that will facilitate interorganizational trust.

***Legal issues***

Research has pointed out that legal issues are a big impediment to online procurement (Schoder and Yin, 2000; Saeed and Leitch, 2003). The origins of these problems lay in the principle that electronic commerce has no territorial boundaries. The laws that govern rights and responsibilities of on-line transactions tend to be territorial, but countries are limited to the extent in which they can enforce laws outside their boundaries (Cordy, 2003).

"Inadequate means of tracing responsibility and verifying online transactions often results in a lack of legal liability. Contract signing procedures and their subsequent use as evidence must be considered. Such risks arise due to ambiguity about legal positions and options available to contracting parties" (Saeed and Leitch, 2003)

Although most B2B electronic marketplaces have a geographical focus that enables them to take local laws into account, and operators can screen the participants in order to select trading partners, still many legal aspects fall at least partly beyond its influence. Among the issues that have to be dealt with are contracts and jurisdictional issues.

- Contract law issues

The ability to create and enforce contracts is vital for electronic commerce. An increasingly important legal issue is how to establish on-line agreements that are binding and enforceable (Cordy, 2003; Mykytyn, 2002). A way to resolve this is to establish a master trading agreement, that is a contract, which the parties enter into at the outside of the relationship, signed on paper. This may be very helpful to enforce an agreement made by a simple mouse-click on the 'I agree' button. Technologies exist that are legally binding, such as digital signatures to digitally sign contracts, but the market maker and the participant have to decide whether it provides sufficient security and enforceability for its transactions.

- Jurisdictional issues

Participants would be less concerned with security and trust when the legal framework would be adapted to the types of crimes conducted in an electronic environment, hence when it is able to effectively and efficiently prosecute those persons or organizations that conduct illegal activities.

These illegal activities can for example consist of tapping confidential information or conducting auction fraud. Chances of getting caught are still low, but efforts are being made: "In an April 30th

2003 press release, the U.S. Federal Trade Commission (FTC) reported that its new initiative, called 'Operation Bidder Beware', has resulted in 57 criminal and civil law enforcement actions" (Bagner et al., 2003). The importance of auction fraud is emphasized by the fact that the FTC reported more than 51.000 auction complaints in 2002. It has to be noted however that these were related to both B2B and B2C auctions (Bagner et al., 2003).

### 4.3.3 Job security

If we take into account the benefits of electronic marketplaces as described in former paragraphs, it may be obvious that employees can get worried about something called job security. Coordination cost reduction that automates a lot of work traditionally done by employees, is a direct threat to their employment. As a result enthusiasm among purchasing and sales staff may be very limited. This will very likely be mainly true for operational staff, and less for strategic, senior management.

Marketing/sales and purchasing staff should be obliged to use the electronic marketplace by senior management. If they can choose themselves whether to use traditional methods or the electronic form, the use of the electronic marketplace might be very limited. This can slow down the participation of other companies, if they notify it when companies who invested heavily are hardly using it. Obligatory use of the electronic market within companies may fasten the adoption rate.

Because more work can be done with fewer people, the company as a whole will benefit from the electronic marketplace. Less personnel cost means increased operational efficiency. It can however create unrest and resistance among employees.

## 4.4 Organizational Readiness

This construct refers to the resources belonging to the organizations that are involved in the network context of electronic marketplaces, both the level and type of resources. These resources are internal factors that can hinder participation if they are not sufficiently available. They can be seen as a condition for participation in an electronic marketplace.

Resources necessary to participate in electronic marketplaces differ widely between the wide varieties of electronic marketplaces, but can be referred to as either financial resources or e-readiness. Financial resources are fees, and the costs to integrate business processes with the marketplace. E-readiness consists of factors related to technology, management, processes, and standards & norms.

Due to the network nature of an electronic marketplace it is necessary to have partners joining the network too. In the electronic marketplace context I will refer to this dependency as trading partner readiness. Another necessity is the availability of an electronic marketplace that comes to meet the desires of potential participants. I define this as marketplace readiness.

I predict that the construct 'organizational readiness' is positively related with participation. This means that an organization with a higher level of organizational readiness will be more likely to participate in an electronic marketplace than an organization with a lower level of organizational readiness. This leads to the following hypothesis:

*Hypothesis three: Organizational readiness is positively related with participation*

### 4.4.1 Financial resources

This construct refers to the financial resources that must be available in order to be able to participate. The costs of participation depend heavily on the electronic marketplace, ranging from several dollars to millions of dollars. A number of different costs have been identified.

***Fees***

A marketplace operator will design its revenue model in the way that supports its strategy best. This means that many different kinds of fees exist. In some cases only suppliers pay a fee, or the buyers pay a relatively small fee. In other cases the buyers pay the highest fees. For example in the Nordic market IBX the large buyers are paying 2/3 of the fees and the suppliers 1/3 (eMarket Services, 2003). The revenue model and the kind of fees a marketplace operator asks, has an impact on its attractiveness for participants. One or more of the following fees may be applicable to a particular marketplace, depending on its revenue model.

- Membership fees; this can be a yearly or monthly fee. (Iacovou et al. 1995)
- Transaction fees; this is a variable fee per transaction. (Iacovou et al. 1995)
- Application licensing fees; for specific solutions like Web-EDI and collaboration tools. (eMarket Services, 2003)
    - Hosting fees; e.g. catalogue hosting. (eMarket Services, 2003)

***Costs to integrate business processes with electronic marketplace.***

A certain amount of time and resources must be spent to integrate the participant's business with the electronic marketplace. (eMarket Services, 2003) This depends on the level of IT sophistication needed, and on the status of the internal business processes of the participating company. Examples of this kind of costs are:

- Costs to adapt the necessary IT infrastructure (Iacovou et al. 1995).
- Training of employees (eMarket Services, 2003)
- Updating information, for example in E-catalogues (Baron et al., 2000)

### 4.4.2 E-readiness

E-readiness is defined as the organizational readiness regarding the use of electronic business.
We can distinguish four different aspects of E-readiness: technological readiness, management readiness, process readiness, and standard & norm readiness.

***Technological readiness***

Technological readiness refers to the level of technological resources of the firm (Iacovou et al, 1995). This means the extent to which the company actually makes use of Information technology. Seven objectives for the use of information technology have been identified. (Paré and Raymond, 1991; Iacovou et al., 1995; Chwelos et al., 2001). I will use the extent to which IT is

used for the fulfilment of these objectives, as determinants of technological readiness. The determinants are: operational costs reduction, productivity improvements, improved access to information, personnel reduction, improved quality of decision making, improved competitiveness, improved service to customers.

In order to participate in a simple market making process, a company does not need to be highly technologically sophisticated. Often it only needs an Internet connection to be able to participate in the marketplace. However, if the marketplace focuses on supply chain alignment through the establishment of additional coordination flows between trading partners, such as inventory level data, a higher level of technological readiness will be required. For example an up to date ERP system. Due to the financial resources required for such a level of technological readiness, this may have more implications for small and medium sized enterprises than for large organizations.

***Management readiness***

This refers to the level of management understanding for using e-business in order to achieve organizational objectives (Iacovou et al, 1995; Chwelos et al., 2001). In order to participate in an electronic marketplace, support from management is essential. The company's management can function as a champion in this process. A champion can provide internal pressure to participation.

Although it may seem logical that technological readiness and management readiness are strongly interrelated, this does not necessarily have to be. Important is that the people who take the decision are in favour of these kind of solutions. A fully outsourced IT department can provide the company sufficient technological readiness, but it can take the interest for e-business away from the agenda of top management.

***Process readiness***

This refers to the readiness to delegate or decentralize the financial control process. To fully reap the benefits of e-commerce, electronic settlement should be an integral part of e-business. Until now however only little B2B trade is settled electronically. The processing costs of purchasing orders can be reduced by 50% if settlement occurs electronically (Gilbert, 2000).

Internal administrative procedures have to change drastically if a company wants to settle sourcing or sales electronically. I'll compare the traditional way with the new way.[4]

This is the traditional way:
A purchaser signs a purchase order (p.o.) and sends it to the administration or finance department. The administration or finance department waits until it receives an invoice, checks whether the p.o. and invoice match, and eventually waits for a goods received note, this depends on the negotiated terms and conditions. If the required documents match the responsible person at the administration or finance department will ask the bank to wire money from its own bank account to the suppliers' bank account. Control about expenditures is very good possible, because someone checks every purchase order with all the related documents and signs them.

In the case of electronic settlement the picture is rather different:
Certain employees/purchasers get authorization to buy items until a certain value. If the company needs product A, the purchaser looks in the electronic catalogue and selects the needed product. Then the procurement software checks whether this order is valid and sends an electronic purchase order to the marketplace. At the moment when goods are delivered it will send an electronic goods received note to the marketplace also. The supplying company sends the electronic invoice to the marketplace. When this three-way match occurs the marketplace, or its partner, wires the money from the purchasing company to the supplying company. Financial control is delegated / decentralized from the finance department to the marketplace.

If a company wants to use this kind of electronic settlement it has to change this process. The marketplace operator has to create sufficient institutional trust to convince the Chief Finance Officer to delegate this process to the marketplace operator.

***Standard & norm readiness***

This refers to the compatibility of standards and norms. The standards and norms that the participant embraced need to be adapted to the standards and norms that are being used by other organizations in its environment. Such as the accountant, the marketplace and the trading partners.

[4] Personal communication with industry practitioner, August 2003

- Accounting standards and norms

  The adoption problem of electronic settlement, as explained in the former paragraph is related with the verification process handled by the accountant. A company embraces certain accountancy standards, such as GAAP (Generally Accepted Accounting Standards) or IAS (International Accounting Standards). The companies' accounting procedures are based on these accountancy standards. In order to comply with the embraced accountancy standards large efforts are needed, as I explained in the former paragraph. Differences exist between the existing accountancy standards; it can be more difficult for one standard than for another standard. It is possible to comply with the embraced standard, but it costs time and efforts. However to fully reap the benefits of e-commerce, this step is a very important one.

- Classification standards

  A catalogue based electronic market uses a classification to describe the products that can be traded on the marketplace. A participant needs to use the same classification, otherwise it will not be able to purchase or sell the right products.

#### 4.4.3 Trading partner readiness

Trading partner readiness refers to the level of E-readiness and financial resources of trading partners. Due to the network nature of electronic marketplaces, organizations are dependent on other organizations in this network. Many companies just do not want to participate because its trading partners do not want to, or are not able to participate. As a result of this dependency, organizational readiness is relevant with regard to all participants in the network.

#### 4.4.4 Marketplace readiness

A necessity for a firm in order to participate in an electronic marketplace is the availability of a suitable electronic marketplace. With suitable I mean that the marketplace has to meet certain desires. Lack of suitable electronic markets may very well be possible in niche markets or markets with highly customized products, which are more difficult to trade electronically. (Klein et al., 1997) I distinguish the following characteristics of electronic marketplaces that determine its readiness:

***Assortment***

This refers to the kind of products that can be traded on the marketplace and its availability. For buyers this means the possibility to procure a certain product on the marketplace. At least one supplier has to be able to sell it. For suppliers it means the possibility to sell a certain kind of products on the particular marketplace. These products have to fit in the business model of the marketplace operator.

***Trading processes***

This refers to the possible methods to determine the price of goods. As discussed in chapter two various ways to settle prices are possible. The optimal trading process depends on the nature of the goods. Therefore, a fit must exist between trading processes and assortment.

***Number of participants***

This refers to the number of trading partners on the marketplace. As a result of the network nature of electronic marketplaces, the participants' benefits are directly influenced by its partners in the network. Benefits realized by individual participants in an electronic marketplace increase as more organizations join the system. This effect is known as network externalities (Katz and Shapiro, 1985). Especially the neutral marketplaces cope with a 'chicken and egg' problem. Buyers do not want to participate unless there is a sufficient number of sellers, and sellers do not want to participate unless there is a sufficient number of buyers. This can be a major impediment against participation in the marketplace, but also a threat against achieving critical mass for the market maker.

## 4.5 External pressure

In addition to the perceived benefits and threats that can motivate a company, and its ability in the form of organizational readiness, its environment will also influence the organizations' decision taking process. The environment will put a certain amount of pressure on the company. This can be low pressure that will not encourage participation, or it can be high pressure that encourages participation. Different forces form this environment. The relevant forces are constructs of the framework, as described below.

I predict that the construct 'external pressure' is positively related with participation. This means that an organization that receives a higher level of external pressure will be more likely to participate in an electronic marketplace than an organization that receives a lower level of external pressure. This leads to the following hypothesis:

*Hypothesis four: External pressure is positively related with participation*

### 4.5.1 Industry pressure

This construct refers to the pressure of the industry in which the potential participant is operating. Lisa R. Klein and John A. Quelch (1997) identified six market characteristics that favour electronic markets, although 'none of these alone is necessary or sufficient'. If a certain characteristic appears, industry pressure tends to increase.

The pressure that industry organisations place on its members can be interpreted as the direct form of industry pressure (number one), whereas industry characteristics that favour electronic markets make the industry more suitable for the use of electronic markets. They facilitate the use of electronic markets and in that way provide a kind of indirect form of industry pressure (number two to six).

1. **Trade association and lobby group involvement.** Trade associations play an important role within industry wide projects. By organizing its members trade associations can help an electronic marketplace to quickly establish economies of scale. An example is TRADEX's partnership with the Australian Chamber of Manufacturers (Klein and Quelch, 1997).

2. **Commodity-type products.** These are products with well-known specifications and are likely to be produced in large quantities. Price comparison is easier, and after sales service is minimal. This type of products can be traded more easily through digital sales channels than very customized products.

3. **Inefficiencies in traditional distribution channels**. If buyers cannot find all possible sellers or vice versa, prices will not be optimal. That will be an incentive to improve the market making process.

4. **Market fragmentation**. Markets with many geographically dispersed buyers and sellers are often operating inefficiently in terms of transaction costs. Marketing, sales and logistics costs tend to be higher due to the fragmentation of the market. As mentioned in the perceived benefits and threats, this can be improved through the use of an electronic marketplace.

5. **Minimum scale barriers.** In traditional markets, smaller suppliers may be boxed out of regular channels by large players who achieve economies of scale and exploit exclusive distribution relationships, either through formal contracts or through the application of channel power. In addition, there may be smaller customers who do not buy enough to qualify for normal quantity discounts through traditional distribution channels. (Klein and Quelch 1997) Electronic marketplaces provide a new sales channel to break with the existing channel power, and aggregation of multiple 'low value' buyers can provide quantity discounts.

6. **Short life-cycle products.** Short life cycles create large quantities of obsolete and discontinued items. Digital markets provide an economical way to sell this kind of products. Products with a short life cycle also benefit from a fast marketing and sales process. The electronic marketplace supports this.

### 4.5.2 Competitive pressure

This relates to the influence from competitive forces in the decision to participate in a given electronic marketplace. A high number of competitive firms already operating in an electronic marketplace can stimulate participation for the other firms. More in detail, the following issues influence participation from a competitive perspective.

***Mimicing behavior***

Organizations imitate or mimic the behaviour of companies that are perceived to be successful (DiMaggio and Powell, 1983). They do so because "Institutional theorists argue that imitation is an uncertainty reduction mechanism in the sense that when a firm successfully adopts a structural change, other organizations mimic the change while attributing their success to the nature of the structural transformation." (Grewal et al. 2001; Haunschild and Miner 1997). Stockdale and Standing (2002) referred to the same phenomenon while arguing that its reason is the "fear of falling behind in the electronic environment". Some firms are likely to participate just because competition is doing so.

***Image building***

The way third parties (for example: competitors, clients, suppliers) perceive the organization will be influenced by the companies' efforts to build a certain image. If companies try to portray an image of technological sophistication, participation in an electronic marketplace may be a step forward (Grewal et al. 2001). Although in a very conservative environment, it might send a wrong signal. The company might be viewed as a trend follower, instead of a company that acts strategically.

### 4.5.3 Dependency on trading partners

As a result of the buyer-supplier relationship in a trade environment, a certain degree of dependency exists between a supplying participant and its buyers, and vice versa. If an organization is going to take the decision whether or not to participate in an electronic marketplace, it has to take the relationship with its trading partners into account. This construct, 'dependency on trading partners' refers only to *current* trading partners, and not to possible new trading partners on the marketplace. The reason is that an organization, which is not yet participating in an electronic marketplace, will not be dependent on the potential new trading partners that it may encounter in the new electronic environment.

The importance of this relation increases when an organization gets increasingly dependent on its trading partner. For a supplier, *dependency* increases when the trading partner is responsible for a high percentage of its sales revenues. For a buyer, dependency increases when the supplier offers a unique product or when switching costs are high. In cases of high dependency it is likely that the initiator wants its trading partners to participate too. A lack of trading partner readiness may hinder participation in the electronic marketplace for all companies in the buyer-supplier relation.

Organizations can be dependent as initiator or as follower. An initiating organization wants its trading partners to participate too. It will invite these trading partners to join. The larger the percentage of trading partners that must be willing to follow an organization in its decision to participate, the larger is the dependency on trading partners. If 1% is enough, than the organization will probably find this one percent to follow, but if the organization needs 90% to follow it, then dependency is very high. The level of pressure placed on these trading partners is the topic of the next paragraph.

#### 4.5.4 Enacted trading partner power

The dependency between trading partners has been mentioned in the preceding paragraph. An organization can however stimulate its trading partner to participate in a given electronic marketplace. Following partners onto an electronic marketplace to continue the relationship is a clear motive to participation (Stockdale and Standing, 2002). Different levels of enacted trading partner power exist in a buyer-supplier relationship. I will use the three levels as proposed by Iacovou et al. (1995)

1. Recommendations

   This is the softest form of trading partner power. The powerful trading partner recommends doing business through the marketplace. He can do this implicit or explicit. By just telling the trading partner that he is participating in a marketplace, he makes an implicit recommendation. It will be a clear signal if communicated well. The trading partner can also make an explicit recommendation by providing information on how it will benefit the other organization. The trading partner tries to change the perception of how their organization might increase efficiency by using the marketplace.

2. Promises

If the firm starts using the marketplace, the powerful trading partner will reward them, for example with a discount.

3. Threats

This is the most powerful way of enacted force. Negative sanctions are applied unless, the mostly smaller, business partner will conduct business on the marketplace.

### 4.6 Overview proposed model

In the preceding paragraphs the model has been developed. Literature from various theoretical areas has been used in combination with my own contributions. In this paragraph I will show (1) the most important theoretical bases for my model, and (2) the full model. The most important theoretical bases for the development of the sub-constructs, and the grouping on construct level, is shown in table 4.1

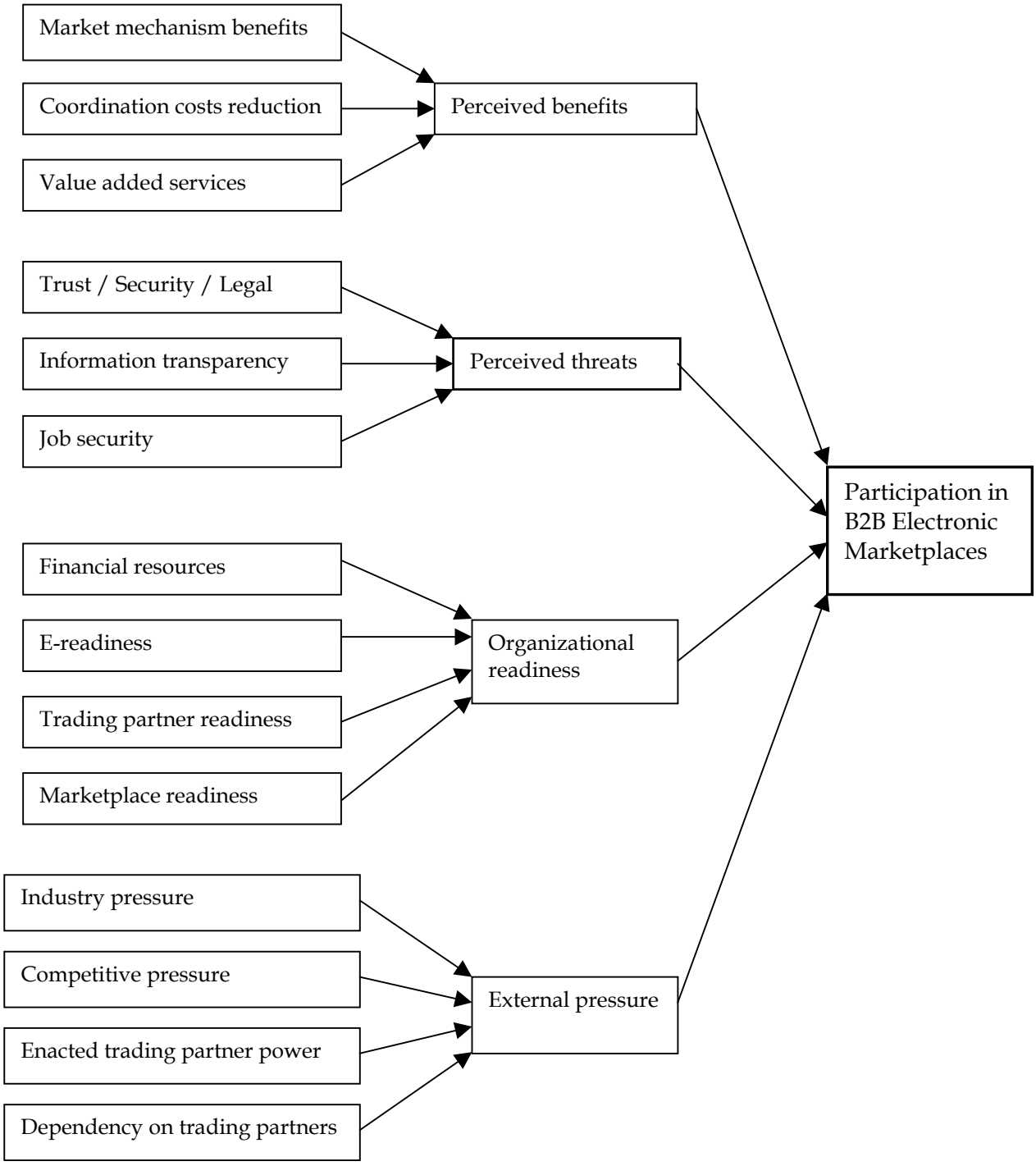
Table 4.1 Theoretical basis of the model

| Construct | Theoretical basis |
|---|---|
| **Perceived benefits** | EDI literature |
| Market mechanism benefits | Electronic marketplaces literature |
| Coordination cost reduction | Electronic marketplaces literature |
| Value added services | Electronic marketplaces literature |
| **Perceived threats** | Own contribution |
| Trust/sec./legal | Electronic marketplaces literature |
| Info transparency | Electronic marketplaces literature |
| Job security | Own contribution |
| **Organizational readiness** | EDI literature |
| Financial resources | EDI literature |
| E-readiness | EDI literature & own contribution |
| Trading partner readiness | EDI literature |
| Marketplace readiness | Own contribution |
| **External pressure** | EDI literature |
| Industry pressure (direct) | EDI literature |
| Competitive pressure | EDI literature |
| Enacted trading part. power | EDI literature |
| Dependency on trading part. | EDI literature |

On the next page, a visualization of the full model is shown in figure 4.1

Figure 4.1 Proposed model of participation in B2B electronic marketplaces.




Source: Adapted from Chwelos et al. (2001)

# CHAPTER 5: EMPIRICAL RESEARCH METHODOLOGY

## 5.1 Introduction

In the previous chapter I introduced my model. A large number of sources has been used to create the model. The use of many different sources should strengthen its tenability.

The second part of this research project focuses on an empirical test of the model. Reliability verification of the model is the first aim. Another aim is to describe the perception of the various constructs among respondents, both buyers and suppliers, and the differences between participants and non-participants. I will discuss these findings in the descriptive analysis. Finally I will conduct a logistic regression to identify the factors that determine participation.

## 5.2 Methodology

The empirical research had the form of a survey. By conducting a survey it is possible to test the model statistically. A survey is the most appropriate way to reach a large number of buyers and suppliers and consequently obtain a large quantity of information. The survey method was the way to attract the largest quantity of information possible, especially in relation with the very limited resources that were available for this project. The foregoing literature study provided sufficient qualitative information for a strong theoretical foundation.

The type of survey used is an electronic survey, a so-called Websurvey. I used the services from Surveymonkey (www.surveymonkey.com) to conduct the survey. Electronic surveys have some advantages over traditional surveys by mail. These include among others the simple, easy way to participate. Respondents do not have to open the envelope, and putting it in the nearest mailbox after completing it. Using a Websurvey, respondents get an invitation email, then have to click a link, and are guided through the Websurvey. It is less time consuming and that should increase the response rate. Another advantage is its cost effectiveness. No paper and stamps are required, only a subscription to the service provider. The third advantage is its time efficiency. Waiting for

responses is a matter of days instead of weeks. The response data are delivered electronically; this enables faster processing of the research results.

Appendix three shows a flow diagram of the survey and the coding of the questions. It explains how respondents were directed electronically through the survey. Appendix five shows all the questions that respondents were asked.

### 5.3 Data collection

The target group consists of 405 purchasing managers and marketing/sales managers in the utilities industry. These managers are located in about 25 different countries, most of them in Europe. This geographical dispersion makes use of proper English in the survey questions pivotal, because only a small proportion has English as native language. This might have been a barrier to participation in the survey. In order to increase the response rate I offered respondents a free copy of the research report and in addition, a chance to win an Amazon.com gift certificate.

### 5.4 Response rate

The total number of invitations was 405. The invitation was sent on Tuesday September 16th by email. 97 out of 405 proved to be undeliverable. This resulted in a remaining target group of 307 persons. On Sunday September 21st the total response was 50. That night I sent a reminder that resulted in 21 additional responses, bringing the total to 71 responses. As a result, the total response rate is 71/307, or 23%. The response rate changes between questions. The most important non-response concerns the dependent variable (participation), with 21 missing cases.
An overview with responses per day is shown is table 5.1.

Table 5.1 Response rates

| Date (September 2003) | Number of responses end of day | Cumulative number of responses | Comments |
|---|---|---|---|
| Tuesday 16th | 37 | 37 | Invitation sent early morning |
| Wednesday 17th | 5 | 42 | |
| Thursday 18th | 3 | 45 | |
| Friday 19th | 2 | 47 | |
| Saturday 20th | 0 | 47 | |
| Sunday 21st | 3 | 50 | Reminder sent |
| Monday 22nd | 13 | 63 | |
| Tuesday 23rd | 6 | 69 | |
| Wednesday 24th | 2 | 71 | |
| Thursday 25th | 0 | 71 | Survey closed at night |

# CHAPTER 6: RELIABILITY ANALYSIS

## 6.1 Introduction

Any research result cannot be interpreted correctly without conducting some measurement of reliability of the used method, here the tested model. For this reason I shall conduct a reliability test of my model. Before presenting the results I will discuss the theoretical background in order to be able to interpret the results.

## 6.2 Theoretical background

Nunnally (1967) defined reliability as "the extent to which measurements are repeatable and that any random influence which tends to make measurements different from occasion to occasion is a source of measurement error." (p. 206) According to Cortina (1993) different sources of measurement error exist. "If error factors associated with the passing of time are of interest, then test-retest or multiple administrations of parallel tests may be used. If error factors associated with the use of different items are of interest, then internal consistency estimates, such as coefficient alpha…may be used." (p. 98)

The focus of this thesis is on the construction of the model. As a result, selection of the correct items to test the model is essential. Therefore the latter category of error producing factors is important. Internal consistency estimates will be used as reliability analysis. Internal consistency refers to the degree of interrelatedness among the items (Crano & Brewer, 1973). The method I used to analyze reliability is the split-half reliability, in particular Cronbach Alpha. Split-half reliability analysis splits the group of items in two and calculates the correlation between these two groups. Because there are many ways to split the group in two, many split-half correlations can be computed. Cronbach alpha takes all these correlations, averages them and reports the average of these split-half reliabilities as the Cronbach Alpha. (Bobko, 2001) Cronbach defines his Alpha as the mean of all split-half reliabilities. (Cronbach, 1951) It measures the extent to which

the items in the survey are related to each other and provides an overall index of the repeatability of internal consistency in the survey.

Although there seems to exist some consensus that Alphas greater than 0.70 are acceptable, some precautions have to be made. Nunnally (1978) recommended the standard of 0.70 for early stages of research. "For applied, operational settings, Nunnally recommended higher standards." (Bobko, 2001, p. 73) This model however is still in a very early stage of research, and therefore a value of 0.70 could act as a proper guideline.

Cortina (1993) investigated the alphas and precision estimates for scales with different numbers of dimensions, different number of items, and varying average intercorrelations. (Displayed below in table 6.1) His research results are interesting for the interpretation of my results.

Table: 6.1: Alpha and precision estimates for scales with different numbers of dimensions, different number of items, and varying average intercorrelations.

| | Average item intercorrelation | | | | | |
|---|---|---|---|---|---|---|
| | $r = .30$ | | $r = .50$ | | $r = .70$ | |
| No. of items | $\alpha$ | Precision | $\alpha$ | Precision | $\alpha$ | Precision |
| | | | One dimension | | | |
| 6 | .72 | | .86 | | .93 | |
| 12 | .84 | | .92 | | .96 | |
| 18 | .88 | | .95 | | .98 | |
| | | | Two dimensions | | | |
| 6 | .45 | .04 | .60 | .07 | .70 | .09 |
| 12 | .65 | .02 | .78 | .03 | .85 | .04 |
| 18 | .75 | .01 | .85 | .02 | .90 | .03 |
| | | | Three dimensions | | | |
| 6 | .28 | .03 | .40 | .05 | .49 | .08 |
| 12 | .52 | .02 | .65 | .03 | .74 | .04 |
| 18 | .64 | .01 | .76 | .02 | .84 | .02 |

*Note.* Because the scales with one dimension are absolutely unidimensional, precision = 0 for all of them.

Source: Cortina, 1993, p. 102

As can be seen in table 6.1 Cronbach Alpha has to be interpreted with the number of items in mind. Alpha increases with the number of items when the average item intercorrelation remains the same. Alpha drastically lowers however when more dimensions are used. In my model constructs are formed by combining different theoretical perspectives. These perspectives form different dimensions, and as a result can explain a slightly lower Cronbach Alpha in some (sub) constructs.

## 6.3 Reliability results

It was not possible to calculate a Cronbach Alpha value for the whole model at once. This is the result of too little observations in comparison with the number of items. Instead I conducted a thorough analysis for each construct separately.

Perceived benefits

Separate questions were asked to buyers and suppliers to be able to analyze this construct from both perspectives. As a result separate Cronbach Alphas were calculated. These are very high for this construct. This can partially be explained by the large number of items, 11 for buyers, and 14 for suppliers. Lower internal consistency was found in the sub-construct market mechanism benefits. The cause for this is probably the wide variety of benefits that is grouped under market mechanism benefits in combination with the exploratory character of this research. With regard to value added services no Alpha Cronbach could be calculated because it consists from only one item.

Table 6.2: Cronbach Alphas perceived benefits

| Construct | Alpha buyers | Alpha suppliers |
|---|---|---|
| **Perceived benefits (overall)** | 0.88 | 0.90 |
| Market mechanism benefits | 0.67 | 0.65 |
| Coordination cost reduction | 0.85 | 0.89 |
| Value added services | N.A. | N.A. |

Perceived threats

Lower values are found here than with perceived benefits. The lower overall value for perceived threats is largely the result of relatively low values for trust, security and legal issues and the influence of job security. With regard to job security and information transparency (buyer part) no values could be calculated, because respondents had to answer only one question for this sub-construct.

*Modification 1:*

I will remove job security from the perceived threats construct and create a separate 'job security' construct. This results in an increase of the Alpha Cronbach overall value from 0.60 to 0.68 for buyers and from 0.68 to 0.72 for suppliers. Reasons for doing this are the following:

1. The question asked to determine job security was the following: "Do you believe that the use of an electronic marketplace will change the number of people employed in the purchasing/supply chain department?" The same question was accidentally asked to both buyers and suppliers. By mistake the focus on marketing/sales department for suppliers was not changed. This may have resulted in inconsistent answers among suppliers. Therefore only responses from buyers will be used.
2. Job security does not necessarily have to be a threat. It can be a threat when decision taking whether or not to participate, is conducted by the same people who use it. A loss of jobs however means efficiency increase, which is a benefit for management and for the company as a whole.

The relatively low values for trust, security and legal issues are very likely the result of multidimensionality in combination with only five items. As explained in the theoretical framework these items are related to each other, but they form different dimensions of many issues that are related to trust. As you can see in table 6.3 few items result in a lower Cronbach Alpha value than a larger number of items when the average item intercorrelations are kept constant.

Table 6.3: Cronbach Alphas perceived threats after modification

| Construct | Alpha buyers | Alpha suppliers |
|---|---|---|
| **Perceived threats (overall)** | 0.68 | 0.72 |
| Trust/security/legal | 0.64 | 0.68 |
| Information transparency | N.A. | 0.77 |
| Job security | Removed | Removed |

Organizational readiness

No overall value could be calculated for organizational readiness because of too few responses in relation to a relatively large number of items. One of the sub-constructs of organizational

readiness is E-readiness. This is in fact a multidimensional sub-construct. It is formed by four different types of readiness that together relate to dimensions of E-readiness. This multidimensionality results in lower values for Alpha than in a one-dimensional scale. All other values that could be calculated reach at least 0.70.

Table 6.4: Cronbach Alpha organizational readiness

| Construct | Alpha |
|---|---|
| **Organizational readiness (overall)** | N.A. |
| Financial resources | 0.70 |
| E-readiness | 0.63 |
| Trading partner readiness | N.A. |
| Marketplace readiness (participants) | 0.76 |
| Marketplace readiness (non-participants) | 0.92 |

External pressure

Cronbach Alpha analysis could only partially be conducted because of a low response for one of the questions. As a result no overall value could be calculated.

Very low values are likely the result of multidimensionality of these constructs in combination with a low number of items. Industry pressure for example exists out of four dimensions relating to very different aspects of the industry environment. Differences in the industry background of respondents may also be a reason for the low degree of internal consistency. Although all respondents are members of the –broadly defined- utilities industry, a wide variety of organizations is included among respondents. The organizations are operating in more than a dozen different countries, some already deregulated and others not or to a lesser extent. Some organizations are manufacturers of for example, electrical wire and others are oil companies researching and developing sustainable energy. A narrower defined industry may be necessary for more consistent results. Another problem is related to industry pressure about which I mentioned: 'none of these alone is necessary or sufficient'. This means that it can be very normal that a respondent answers "1" on question two and let's say "5" on question four.

Competitive pressure consists of imitation behavior and image, also two very different dimensions. As Cortina (1993) mentioned, Alpha values drastically lower when the number of items decreases. It is actually not suited for a two-item scale.

In my opinion it doesn't make sense to modify the model. No higher Alpha Cronbach values can be achieved, it is the result of multidimensionality in combination with the low number of items.

Table 6.5: Cronbach Alpha external pressure

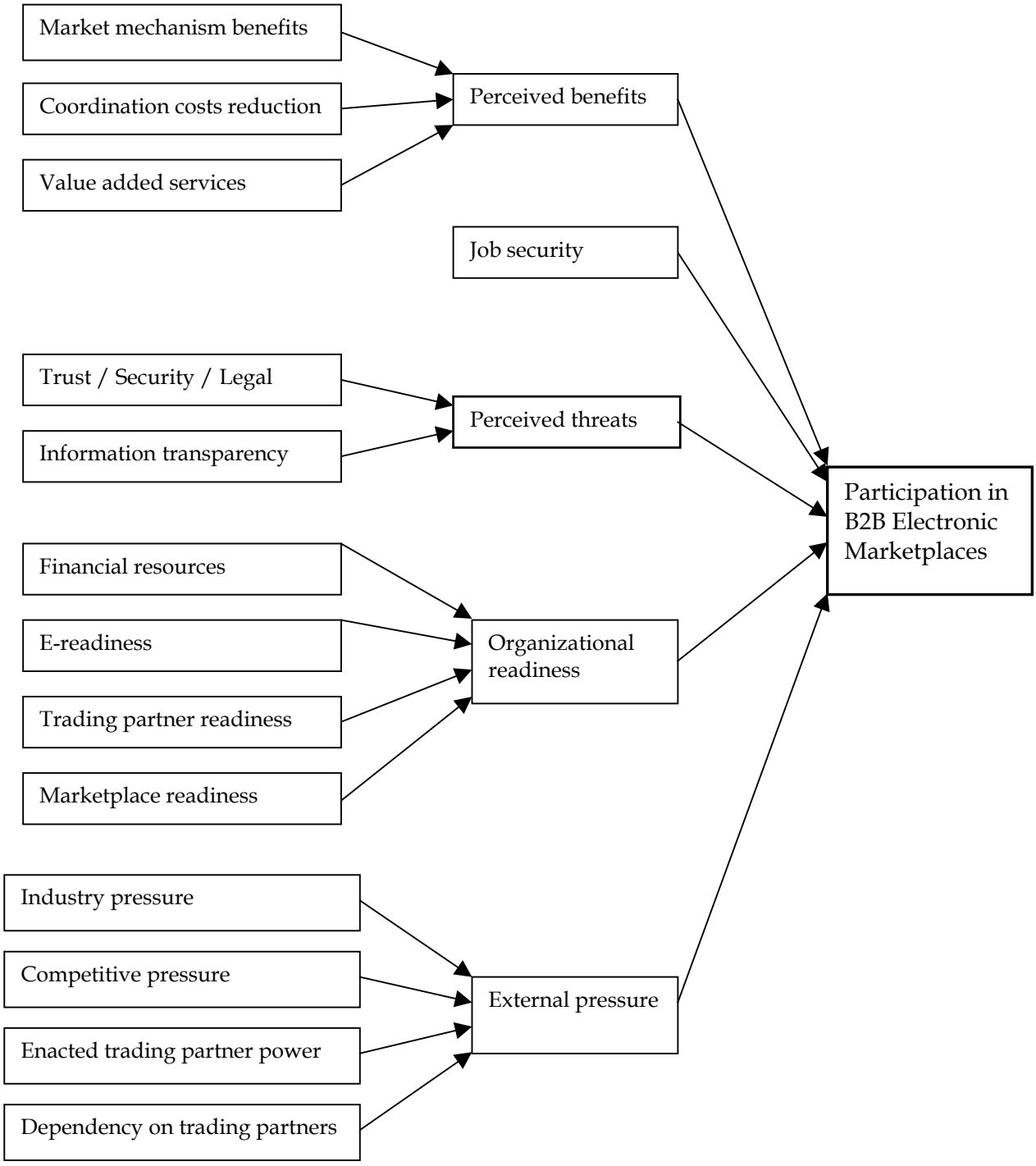
| Construct | Alpha |
|---|---|
| **External pressure (overall)** | N.A. |
| Industry pressure | 0.52 |
| Competitive pressure | 0.44 |
| Enacted trading partner power | N.A. |
| Dependency on trading partners | N.A. |

## 6.4 Adapted model after reliability analysis

Despite some parts of the model for which it was not possible to calculate a Cronbach Alpha value, the general conclusion is that Alpha values are sufficient. I made one modification to increase the model's reliability. Job security is separated from perceived threats and becomes an independent construct, as explained in paragraph 6.3. In addition some precautions have to be made in relation to external pressure. The adapted model is visualized in Figure 6.1 on the next page.

Figure 6.1 Adapted model after reliability analysis




Source: adapted from Chwelos et al. (2001)

# CHAPTER 7: ANALYSIS OF SURVEY RESPONSES

## 7.1 Introduction

In the previous chapter the reliability of the model has been tested. After modification of one construct I will analyse the survey results in this chapter. First I will conduct an analysis on the type of respondents. Then, descriptive data will be presented and discussed construct by construct. The survey results will be tested in a logistic regression. The statistical results will be summarized in a separate paragraph. In the last paragraph I will conduct an additional analysis on the level of participation; t-tests and another logistic regression will be used. This analysis is supplementary and goes beyond the actual aim of this research project. It provides however an interesting point of view.

## 7.2 Outliers

All questions were categorized in order to reduce the number of outliers. After observation of the dataset one respondent had to be removed from the data file. The reason is that all questions were answered with 'one'. No other outliers could be identified.

## 7.3 Identification respondents

Buyers and suppliers

Respondents were asked to their primary area of expertise. Buyers are defined as respondents with a primary area of expertise in supply chain management, procurement or purchasing. Suppliers are defined as respondents with a primary area of expertise in marketing or sales. From the total number of 71 respondents, 42 (59%) are buyers and 29 (41%) are suppliers. The non-response rate for this question was zero, because it was obligatory.

Table 7.1 Number of respondents for buy-side and supply-side of marketplace

| Buyer or supplier | Frequency | Percent |
|---|---|---|
| Buyers | 42 | 59% |
| Suppliers | 29 | 41% |
| Total | 71 | 100% |

Participants and non-participants

To distinguish participants from non-participants I asked to the percentage of total sales or purchases that is conducted through the use of an electronic marketplace. I identified participants in an electronic marketplace as those who are at least conducting 1% of sales or purchases through an electronic marketplace. From the total number of 50 respondents of this question, 16 (32%) are not participating in an electronic marketplace (non-participants), and 34 (68%) are participating in an electronic marketplace.

Table 7.2 Percentage of total sales/purchasing volume conducted through electronic marketplace.

| | % of total sales or purchases | Frequency | Percent | Valid Percent |
|---|---|---|---|---|
| Response | 0% | 16 | 23% | 32% |
| | 1% | 11 | 15% | 22% |
| | 5% | 9 | 13% | 18% |
| | 10% | 5 | 7% | 10% |
| | 20% | 2 | 3% | 4% |
| | 30% | 3 | 4% | 6% |
| | 50% | 2 | 3% | 4% |
| | 70% | 1 | 1% | 2% |
| | 80% | 1 | 1% | 2% |
| | Total | 50 | 70% | 100% |
| Non response | | 21 | 30% | |
| Total | | 71 | 100% | |

Company size

Majority of respondents is working for large organizations. Only 11 (16%) of respondents is working for an organization with a maximum of 200 employees, the so-called small and medium sized organizations (SMEs). 11 (15%) of respondents works in an organization with a number of people employed between 200 and 1000. Most respondents are working in an organization with at least 1000 employees (30 respondents, 61% of total). A total of 49 respondents answered this question, 22 leaving it blank. With so few respondents representing SMEs it is not possible to analyze differences between SMEs and larger organizations.

Table 7.3 Company size

| | Number of employees | Frequency | Percent | Valid Percent |
|---|---|---|---|---|
| Response | 1-10 | 2 | 3% | 4% |
| | 11-50 | 1 | 1% | 2% |
| | 51-200 | 5 | 7% | 10% |
| | 201-1000 | 11 | 15% | 22% |
| | 1001-10000 | 20 | 28% | 41% |
| | > 10000 | 10 | 14% | 20% |
| | Total | 49 | 69% | 100% |
| Non response | | 22 | 31% | |
| Total | | 71 | 100% | |

### 7.4 Descriptive analysis perceived benefits

As mentioned in the data summary a total of 53 respondents answered these questions. A Likert scale from one to five was used with one meaning "Not important at all", three meaning "Moderately important" and five meaning "Extremely important". Buyers assigned in general more benefits to the use of electronic marketplaces than suppliers. As you can see the mean score for buyers is 3,61 and 3,28 for suppliers. This is significant at 0,10. This means that benefits are perceived lower by suppliers than by buyers. Eleven questions were asked to buyers and fourteen to suppliers. Table 7.4 shows an overview of the aggregated results. The data are calculated by attaining equal weights to the sub-constructs

Table: 7.4 Data summary perceived benefits

| | | All | Buyers | Suppliers | Participants | Non-participants |
|---|---|---|---|---|---|---|
| Respondents | Valid | 53 | 34 | 19 | 33 | 16 |
| | Missing | 17 | 8 | 9 | 1 | 0 |
| Mean | | 3.50 | 3.61* | 3.28 | 3.43 | 3.58 |
| Std. Deviation | | 0.70 | 0.66 | 0.73 | 0.69 | 0.78 |

* Difference buyers and suppliers significant at 0,10

Market mechanism benefits

***Buyers***

A total of four questions were asked to determine market mechanism benefits for buyers. The data as described are average means of these four questions. Suppliers skipped these questions, which results in 35 missing values. When looking at the central tendency we see that the average mean is 3,69 on a scale from one to five. This supports the benefits that I discovered in my theoretical research. The highest scores were related to the items "reduction of maverick buying" (3,94) and "true market driven prices" (3,76). Both can be described as "very important".

***Suppliers***

A total of eight questions were asked to determine market mechanism benefits for suppliers. The data as described are averages of these eight questions. Buyers skipped these questions, and a great number of respondents already exited the survey, which results in 52 missing values.
When looking at the central tendency we see that the average mean is 3,35 on a scale from one to five. This provides support for the benefits that I discovered in my theoretical research.

Above average scores ranked "additional sales channel" (3,72), "trading with reliable pre-qualified partners in a private network" (3,69), "entering a new market" (3,65), and "increased sales volume" (3,53). Lowest support is obtained for "option of unloading surplus inventory efficiently" (2,69), and "opportunity to test prices with little risk" (2,76).

A significant difference exists between the mean score among buyers and suppliers ($\alpha$ = 0,10). This supports the often-heard idea that buyers in general are more positive about electronic markets than suppliers.

Table: 7.5 Data summary market mechanism benefits buyers and suppliers

| | | Buyers | Suppliers |
|---|---|---|---|
| N | Valid | 35,00 | 18,00 |
| | Missing | 35,00 | 52,00 |
| Mean | | 3,68* | 3,39 |
| Std. Deviation | | 0,64 | 0,53 |

* Difference buyers and suppliers significant at 0,10

The most notable differences between participants and non-participants on the buy side are found in question one (True market driven prices) and two (Bigger assortment, getting to know new suppliers). Participants adhere in particular more value on true market driven prices and less on "bigger assortment and getting to know new suppliers" than non-participants. A summary is shown in table 7.6. Because only 4 non-participating suppliers responded I cannot deepen this out.

Table 7.6 Market mechanism benefits for participants and non-participants

| | Buyers Participants | Buyers Non-participants | Suppliers Participants | Suppliers Non-participants |
|---|---|---|---|---|
| N Valid | 21 | 12 | 12 | 4 |
| Missing | 13 | 4 | 22 | 12 |
| Mean | 3,65 | 3,74 | 3,30 | 3,34 |
| Std. Deviation | 0,54 | 0,84 | 0,57 | 0,51 |

Coordination cost reduction

Coordination cost reduction is characterized by a highly significant difference in mean scores between buyers and suppliers. This can probably be attributed to a very low score on one of the questions among suppliers and several extremely high scores among buyers. See below for the scores.

***Buyers***

Six questions represent this sub-construct that focuses on efficiency increase by reducing coordination costs. The overall score is very high, higher than for market mechanism benefits (3,69). Above average scores rank "enables staff to focus on more strategic activities" (4,09), "lower transaction costs" (4,06) and "faster purchasing process" (4,00). No items have been identified with less than moderate importance (3,00) as mean score.

***Suppliers***

Five questions were asked to suppliers to analyse this sub-construct. We also see here that the average scores of suppliers are lower than those of buyers. But there is still support for the benefits that were discovered in the theoretical research. Above average rank "Lower labour costs in sales process" (3,59), "rapid sales process" (3,50), "Lower transaction costs" (3,50), and "Lower marketing costs per unit sold" (3,39). There is very little support for the idea that the use of electronic marketplaces can reduce inventory levels in supplying companies (2,06).

Table: 7.7 Data summary coordination cost reduction buyers and suppliers

| | | Buyers | Suppliers |
|---|---|---|---|
| Respondents | Valid | 34,00 | 18,00 |
| | Missing | 36,00 | 52,00 |
| Mean | | 3,86*** | 3,19 |
| Std. Deviation | | 0,73 | 0,95 |

*** Difference buyers and suppliers significant at 0.01

Participating buyers adhere more value to lower transaction costs than non-participants, average mean among participants is 4,35 and 3,82 among non-participants. Only 4 non-participants answered these questions, and as a result it is not possible to draw conclusions related to differences between participants and non-participants. Table 7.8 shows a summary of the descriptive data for participants and non-participants.

Table 7.8 Coordination cost reduction for participants and non-participants

| | Buyers Participants | Buyers Non-participants | Suppliers Participants | Suppliers Non-participants |
|---|---|---|---|---|
| N Valid | 21 | 12 | 12 | 4 |
| Missing | 13 | 4 | 22 | 12 |
| Mean | 3,82 | 3,96 | 3,15 | 3,25 |
| Std. Deviation | 0,67 | 0,88 | 1,14 | 0,34 |

Value added services

One question was asked to determine the importance of value added services. The question was the same for buyers and suppliers and the average mean response was almost exactly the same. Therefore I will not make a distinction between buyers and suppliers. The results support the idea that value added services are not among the most important benefits. However an average mean of 3,22 still means slightly above moderate importance.

Table 7.9 Data summary value added services

| | | All | Participants | Non-participants |
|---|---|---|---|---|
| N | Valid | 49,00 | 32 | 15 |
| | Missing | 21,00 | 2 | 1 |
| Mean | | 3,22 | 3,19 | 3,2 |
| Std. Deviation | | 1,10 | 1,18 | 1,01 |

## 7.5 Descriptive analysis perceived threats

As mentioned in the data summary a total of 50 respondents answered the questions belonging to perceived threats. I used a Likert scale for the questions relating to trust/security/legal, and information transparency, with one meaning "No threat at all", three meaning "moderate threat" and five meaning "Extreme threat ". Table 7.10 shows a data summary of the aggregated results. The data are calculated by attaining equal weights to the sub-constructs. It is interesting to see that the difference between buyers and suppliers is highly significant. ($\alpha$ = 0,01). This means that threats are perceived significantly larger among suppliers than among buyers.

Table 7.10 Data summary perceived threats

| | | All | Buyers | Suppliers | Participants | Non-participants |
|---|---|---|---|---|---|---|
| Respondents | Valid | 50 | 33 | 17 | 33 | 16 |
| | Missing | 20 | 9 | 11 | 1 | 0 |
| Mean | | 2.69 | 2.45*** | 3.15 | 2.60 | 2.79 |
| Std. Deviation | | 0.75 | 0.71 | 0.59 | 0.70 | 0.80 |

*** Difference buyers and suppliers significant at 0,01

Trust, security and legal issues

A total of five questions were asked to identify the attitude towards issues related to trust, security and legal aspects of electronic marketplaces. Questions were equal for buyers and suppliers, but answers were not. In contrary to buyers do suppliers perceive the issues related to trust, security and legal aspects as a, slightly above moderate, threat.

Table 7.11 Data summary Trust / security / legal

| | | Buyers and suppliers | Buyers | Suppliers |
|---|---|---|---|---|
| N | Valid | 49,00 | 33,00 | 16,00 |
| | Missing | 21,00 | 37,00 | 54,00 |
| Mean | | 2,84 | 2,75 | 3,01 |
| Std. Deviation | | 0,73 | 0,74 | 0,72 |

***Buyers***

All threats asked for did not reach moderate threat (3,00) as average mean. The average mean for this part is 2,75. Above this average are threats referring to "new trading partners" (2,91), "institutional trust" (2,82), and "interorganizational trust" (2,76). Below average are threats referring to "legal framework" (2,71) and "erosion of buyer-supplier relation" (2,55)

***Suppliers***

The average mean among suppliers for this part is 3.01, just a slightly moderate threat. "Erosion of buyer-supplier relation" proved to be the most important threat (3,14). Followed by "institutional trust" and "interorganizational trust" (both 3,06). Below average rank "legal framework" (3,00) and "new trading partners" (2,81).

It is interesting that erosion of the relation between buyers and suppliers ranks first threat among suppliers, and last threat among buyers. In addition, new trading partners rank first among buyers and last among suppliers. As you can see in Table 7.12 non-participants perceive trust, security, and legal aspects as a slightly higher threat than participants (if we compare average means). Differences are very small however and dispersion is high, especially among buyers.

Table 7.12 Trust / security / legal for participants and non-participants

| | Buyers Participants | Buyers Non-participants | Suppliers Participants | Suppliers Non-participants |
|---|---|---|---|---|
| N Valid | 21 | 12 | 12 | 3 |
| Missing | 13 | 4 | 22 | 13 |
| Mean | 2,73 | 2,80 | 2,90 | 3,08 |
| Std. Deviation | 0,65 | 0,90 | 0,70 | 0,62 |

Information transparency

Information transparency is characterized by a highly significant difference between buyers and suppliers.

***Buyers***

Respondents do not support the threat of information transparency among buyers. An average mean of 2,15 is situated between "no threat at all" and "moderate threat". Dispersion is however quite large. Two respondents indicated to perceive it as a big threat, but these respondents tend to perceive all threats larger than the average responses. Eleven out of 33 respondents indicated 'no threat at all', and another 11 indicated 'moderate threat'.

***Suppliers***

In contrary to buyers do suppliers perceive information transparency as a, slightly above moderate, threat. Above average mean are located "Margin erosion" (3,47), and "Weaker brand loyalty" (3,41). Below average rank "Products shift towards commodities" (3,19) and "Fear of losing customers" (2,94).

Table 7.13 Information transparency for buyers and suppliers

| | | Buyers & suppliers | Buyers | Suppliers |
|---|---|---|---|---|
| N | Valid | 50,00 | 33,00 | 17,00 |
| | Missing | 20,00 | 37,00 | 53,00 |
| Mean | | 2,84 | 2,15*** | 3,26 |
| Std. Deviation | | 0,73 | 1,03 | 0,80 |

*** Difference buyers and suppliers significant at 0,01

Table 7.14 shows an overview of the differences between participants and non-participants. Information transparency is perceived a higher threat among non-participants than among participants.

Table 7.14 Information transparency for participants and non-participants

| | | Buyers Participants | Buyers Non-participants | Suppliers Participants | Suppliers Non-participants |
|---|---|---|---|---|---|
| N | Valid | 21 | 12 | 12 | 4 |
| | Missing | 13 | 4 | 22 | 12 |
| Mean | | 2 | 2,42 | 3,15 | 3,5 |
| Std. Deviation | | 1 | 1,08 | 0,89 | 0,54 |

### 7.6 Descriptive analysis job security

This construct has been separated from perceived threats as discussed in chapter six. The scale has been recoded for internal consistency reasons. The mean is located around 3,5 and median and mode even reach four. This means that buyers expect a reduction of workforce. It is difficult to say however to what extent this would be a direct threat to participation. As mentioned in the reliability analysis, supply-side results will not be included in the analysis as a result of an error in the survey design.

Table 7.15 Data summary job security buyers

| | | All | Participants | Non-participants |
|---|---|---|---|---|
| N | Valid | 33,00 | 21 | 12 |
| | Missing | 37,00 | 13 | 4 |
| Mean | | 3,48 | 3,48 | 3,50 |
| Std. Deviation | | 0,80 | 0,81 | 0,80 |

## 7.7 Descriptive analysis organizational readiness

Organizational readiness is described by four sub-constructs: Financial resources, E-readiness, trading partner readiness, and marketplace readiness. If necessary the items have been standardized to a scale from one to five. Low values refer to a low degree of organizational readiness and high values refer to a high level of readiness. Table 7.16 shows an overview of the aggregated results. The data were calculated by attaining equal weights to the sub-constructs. A significant difference was found between mean scores among participants and non-participants. This suggests that organizational readiness is an important construct in determining participation.

Table 7.16 Data summary organizational readiness

| | | All | Buyers | Suppliers | Participants | Non-participants |
|---|---|---|---|---|---|---|
| Respondents | Valid | 49 | 33 | 16 | 33 | 16 |
| | Missing | 21 | 9 | 12 | 1 | 0 |
| Mean | | 2.65 | 2.60 | 2.74 | 2.78** | 2.36 |
| Std. Deviation | | 0.68 | 0.61 | 0.82 | 0.67 | 0.63 |

** Difference part. and non-part. significant at 0,05

Financial resources

This construct was recoded for internal consistency reasons. The scale has been reversed in order to let a higher value predict a higher degree of organizational readiness. A significant difference was found between mean scores among participants and non-participants.

Table 7.17 Data summary financial resources

| | | All | Participants | Non-participants |
|---|---|---|---|---|
| N | Valid | 48,00 | 33 | 15 |
| | Missing | 22,00 | 1 | 1 |
| Mean | | 2,61 | 2,79** | 2,23 |
| Std. Deviation | | 0,92 | 0,96 | 0,70 |

** Difference part. and non-part. significant at 0,05

Membership fees and other fees appear to be a smaller obstacle (mean 2,75) than the costs related to the integration of business processes with the electronic marketplace (mean 2,48).

E-readiness

E-readiness is formed by the degree in which organizations achieve readiness in four different dimensions. These dimensions are: technological readiness, management readiness, process readiness, and standards & norms readiness. Respondents seem to have achieved a high degree of technological readiness, the average mean reaches 4,04 on a 5-point scale. Management appears in general to be in favor of E-business solutions, with a mean of 3,58. Standards & norms readiness (2,90) and process readiness (2,85) appear to be just more than moderate problematic.

Table 7.18 Data summary E-readiness

| | | All | Participants | Non-participants |
|---|---|---|---|---|
| Respondents | Valid | 46,00 | 33 | 16 |
| | Missing | 24,00 | 1 | 0 |
| Mean | | 3,28 | 3,32 | 3,18 |
| Std. Deviation | | 0,54 | 0,47 | 0,67 |

Trading partner readiness

Surprisingly low values characterize trading partner readiness. Note that a different scale is used here. (1 = 0-20%, 2 = 21-40%, 3 = 41-60%, 4 = 61-80%, 5 = 81-100%) I assume that a higher percentage of trading partner that is ready, results in higher organizational readiness. 91,7% of non-participants, and 64,3% of participants estimate that less than 20% of its trading partners is ready to participate. A significant difference has been found in mean scores between participants and non-participants ($\alpha$ = 0,05), suggesting that trading partner readiness is higher among participants than among non-participants.

Table 7.19 Data summary trading partner readiness

| | | All | Participants | Non-participants |
|---|---|---|---|---|
| Respondents | Valid | 40 | 28 | 12 |
| | Missing | 30 | 42 | 58 |
| Mean | | 1,40 | 1,54* | 1,08 |
| Std. Deviation | | 0,84 | 0,29 | 0,96 |

* Difference part. and non-part. significant at α = 0,05

Marketplace readiness

Participants perceive a higher marketplace readiness than non-participants. Average marketplace readiness among participants and non-participants reaches just above moderate readiness. From one of the survey questions it appears that both participants and non-participants are most concerned about the number of trading partners already participating on the marketplace. This indicates that achieving a critical mass of participants still deserves top priority among marketplace operators.

Table 7.20 Data summary marketplace readiness

| | | All | Participants | Non-participants |
|---|---|---|---|---|
| Respondents | Valid | 41 | 30 | 11 |
| | Missing | 29 | 40 | 59 |
| Mean | | 3,11 | 3,26* | 2,70 |
| Std. Deviation | | 0,96 | 0,95 | 0,91 |

* Difference part. and non-part. significant at 0,10

### 7.8 Descriptive analysis external pressure

External pressure consists of four sub-constructs: Industry pressure, competitive pressure, enacted trading partner power, and dependency on trading partners. Some items have been standardized to a scale from one to five. Low values refer to a low degree of external pressure and high values refer to a high level of external pressure. The aggregated results are shown in table 7.21 The data are calculated by attaining equal weights to the sub-constructs.

Participants perceived a significantly higher level of external pressure than non-participants. A plausible reason for this is that pressure fulfilled its aim; the organization decided to participate as a consequence of external pressure. Suppliers also perceive a higher level of external pressure than buyers. Apparently, more pressure has been placed on suppliers than on buyers. This is not surprising because perceived benefits among suppliers are significantly lower and perceived threats are significantly higher than among buyers.

Table 7.21 Data summary external pressure

| | | All | Buyers | Suppliers | Participants | Non-participants |
|---|---|---|---|---|---|---|
| Respondents | Valid | 48 | 33 | 15 | 34 | 14 |
| | Missing | 22 | 9 | 13 | 0 | 2 |
| Mean | | 2.56 | 2.47* | 2.76 | 2.65* | 2.36 |
| Std. Deviation | | 0.56 | 0.58 | 0.49 | 0.59 | 0.44 |

* Difference buyers and suppliers significant at 0,10
* Difference part. and non-part. significant at 0,10

Industry pressure

As stated in the theoretical framework I make a distinction between direct and indirect industry pressure. Direct industry pressure is very low, with a mean of 1,77 on the five-point Likert scale. Almost 60% of 44 respondents responded that industry sources placed 'no pressure at all' on their organization. However, there is a very significant difference in direct industry pressure between buyers and suppliers. Mean score among buyers reached 1,50 and among suppliers it reached 2,36 (not shown in table, $\alpha = 0,01$).

Table 7.22 Data summary direct industry pressure

| | | All | Participants | Non-participants |
|---|---|---|---|---|
| Respondents | Valid | 44 | 31 | 13 |
| | Missing | 26 | 3 | 3 |
| Mean | | 1,77 | 1,87 | 1,54 |
| Std. Deviation | | 1,05 | 1,09 | 0,97 |

The central tendencies from indirect industry pressure however are located around three, which refers to moderate pressure.

Table 7.23 Data summary indirect industry pressure

| | | All | Participants | Non-participants |
|---|---|---|---|---|
| N | Valid | 44 | 31 | 13 |
| | Missing | 26 | 3 | 3 |
| Mean | | 3,03 | 3,11 | 2,85 |
| Std. Deviation | | 0,74 | 0,75 | 0,70 |

Competitive pressure

Competitive pressure consists of two questions, one related to imitation behavior, the other to the corporate image. The mean of imitation behavior scored just below moderate importance (2,87). Participation in an electronic marketplace seems to be positively related with image. It scored a mean of 3,69 on a scale from one (extremely negative) to five (extremely positive). (The scale has been adapted for internal consistency reasons)

Not a single respondent expected that participation would influence its image negatively. 41.3% expects no influence on corporate image, 21.7% expects a slightly positive influence, 23.9% a very positive influence, 10.9% expects an extremely positive influence on corporate image, and 2.2% did not know.

A significant difference exists between buyers and suppliers (not shown in table, $\alpha = 0,05$). Buyers scored on average 3,06 and buyers scored on average 3,67. Competitive pressure in combination with direct industry pressure seems to be responsible for the significant overall value for construct. Another significant result was found in the difference between participants and non-

participants. Competitive pressure has apparently influenced the decision to participate among participants.

Table 7.24 Data summary competitive pressure

| | | All | Participants | Non-participants |
|---|---|---|---|---|
| Respondents | Valid | 46 | 32 | 14 |
| | Missing | 24 | 3 | 2 |
| Mean | | 3,25 | 3,39* | 2,93 |
| Std. Deviation | | 0,87 | 0,86 | 0,85 |

* Difference part. and non-part. significant at 0,10

Enacted trading partner power / dependency on trading partners

Because of the interesting relation between these two sub-constructs I will discuss them together. It seems that most organizations do not perceive high levels of enacted trading partner power. 34 out of 48 respondents have not perceived any attempt from trading partners to let them participate in an electronic marketplace. No significant differences between buyers and suppliers, or participants and non-participants were found.

*Recommended to participate:*

11 out of 48 respondents have experienced this form of enacted trading partner power. Five of these trading partners were moderately important. Three organizations followed its trading partner in this recommendation, and two didn't. There are no clear differences in company size between the organizations that followed its trading partner and those who did not. All companies are very large. One trading partner was very important, this organization followed the recommendation. One trading partner was extremely important, this organization also decided to follow the trading partner in this decision. Another organization was faced with increased pressure. First it received a recommendation, but it was also faced with negative sanctions if it should not join.

*Promised rewards:*

Only one organization was promised rewards if it should decide to join, this trading partner was of moderate importance, and the organization decided to follow its trading partner in the recommendation.

*Negative sanctions:*

Three organizations were faced with sanctions if they should not decide to participate. Two of them were very important trading partners, and both decided to follow this recommendation. One of them was of moderate importance, and decided not to participate.

Table 7.25 Enacted trading partner power

| Type of pressure | Confirmative responses |
|---|---|
| Yes: recommended to join | 11 |
| Yes: promised rewards if we should decide to join | 1 |
| Yes: negative sanctions would have followed if we should not join | 3 |
| No: no attempt has been made | 34 |
| Total Respondents | 48 |

Another form of dependency on trading partners is related to the group of trading partners as a whole. The larger the percentage of trading partners that must be willing to follow an organization in its decision to participate, the larger is the dependency on trading partners. If 1% is enough, than the organization will probably find this one percent to follow, but if the organization needs 90% to follow it, then dependency is very high.

The percentage of trading partners that at least must be ready to participate before the respondent would participate is shown in table 7.26. As you can see in table 7.26, 29 respondents out of 44 indicated a value between 5% and 30%. 91,7% of non-participants and 64,3% of participants however estimate that less than 20% of their trading partners is ready to participate. This demonstrates the 'chicken and egg' problem.

Table 7.26 *Necessary* percentage of trading partners able to participate

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0% | 6 | 8,57 | 13,64 | 13,64 |
| | 1% | 2 | 2,86 | 4,55 | 18,18 |
| | 5% | 8 | 11,43 | 18,18 | 36,36 |
| | 10% | 7 | 10,00 | 15,91 | 52,27 |
| | 20% | 7 | 10,00 | 15,91 | 68,18 |
| | 30% | 7 | 10,00 | 15,91 | 84,09 |
| | 40% | 4 | 5,71 | 9,09 | 93,18 |
| | 50% | 2 | 2,86 | 4,55 | 97,73 |
| | 80% | 1 | 1,43 | 2,27 | 100,00 |
| | Total | 44 | 62,86 | 100,00 | |
| Missing | | 26 | 37,14 | | |
| Total | | 70 | 100,00 | | |

## 7.9 Logistic regression

A direct logistic regression analysis was performed on the model with 'participation' as outcome and four predictors; perceived benefits, perceived threats, organisational readiness, and external pressure.

Logistic regression allows one to predict a discrete outcome such as participation (yes or no) from a set of variables that may be continuous, discrete, dichotomous, or a mix. In addition, logistic regression has no assumptions about the distributions of the predictor variables. The predictor variables do not have to be normally distributed, linearly related, or of equal variance within each group (Tabachnick and Fidell, 2001). That makes logistic regression a better alternative for this research than ordinary least squares regression.

Job security could not be included in the analysis because supply-side observations had to be removed due to unreliability as a result of an error in the survey design. Including job security with only buy-side observations would have excluded all supply-side observations from this analysis.

The analysis was performed using LOGISTIC REGRESSION in SPSS version 11.5. The number of cases (valid responses) was limited to 46, a result of selective non-respons within the survey, especially in the dependent variable. This low number of cases restricts the logistic regression to the original four main constructs. A direct logistic regression to the 14 sub-constructs produced extremely large parameter estimates and standard errors. This is a well-known limitation of logistic regression. (Tabachnick and Fidell, 2001, p.522)

Significance

In order to measure the overall significance of the model, the 'Model Chi-square' significance was calculated. According to Tabachnick and Fidell (2001, p. 538) 'Model Chi-square' should be significant at a level of at least $p < 0,05$. The model reached a significance level of 0,105. That is not sufficient, but surprisingly high in relation to the significance levels of the separate constructs. Individual constructs are not significant at generally accepted levels, although organisational readiness and external pressure

are somewhat 'significant' at low levels of respectively 0.13 and 0.16. Significance level for perceived benefits reached 0.50 and significance of perceived threats reached 0.45. An explanation for these results is likely to be related to the number of cases, however the opposite cannot be proved and as a result insignificant results should be treated with care. In order to improve significance levels a number of actions were tried. First, a number of regressions were run on parts of the model, but no general improvements could be calculated. Second, perceived benefits and perceived threats have been transformed into one new variable 'net-benefits' and a logistic regression was run, but this did not improve significance levels either.

According to Menard (1995, p. 93) is it always questionable to make statements about the nature of a relationship that is not statistically significant and that may reflect nothing more than random sampling error.

Importance of constructs

According to Tabachnick and Fidell (2001), the statistically reliable predictors that change the odds of the outcome the most are interpreted as the most important. That is, the farther the odds ratio from 1, the more influential the predictor. This results in organisational readiness being most important in determining participation, followed by external pressure.

Interpreting the odds

"The odds ratio is the increase (or decrease if the ratio is less than one) in odds of being in one outcome category when the value of the predictor increases by one unit" (Tabachnick and Fidell, 2001, p.548). For example, an odds ratio of 3,37 shows that the probability of being a participant is 3,37 times as likely with a one-unit increase in organizational readiness (or 237% more likely). However an odds ratio of 0,68 shows that the probability of being a participant is 0,68 times as likely with a one-unit increase in perceived benefits (or 32% less likely). This is quite surprising, because the relation was predicted to be positive. It means that non-participants perceive the benefits associated with electronic marketplaces higher than participants. A possible explanation can be that expectations are too high. The relation of perceived threats was as expected, negatively. Both predictors however are non-significant and therefore we cannot attain much value on this result.

Interpreting the regression coefficients

The regression coefficients cannot be interpreted directly because they refer to the logit of participation. It provides the same information as the odds ratios in a different way. The sign of the regression coefficient and the importance of the predictor are however more intuitively understandable.

Strength of association

The Nagelkerke $R^2$ shows the proportion of the variation in the dependent variable 'participation' that can be explained by predictors in the model. The Nagelkerke $R^2$ is especially suited for small samples. It adjusts the Cox and Snell measure so that a value of 1 could be achieved (Tabachnick and Fidell, 2001). A value of 0,213 means that 21,3% of variance in participation is accounted for by the set of predictors.

Table 7.27 shows the regression coefficients, standard deviations, significance levels, and the odds ratios for each of the four predictors and the constant. Figure 7.1 visualizes the odds and the Nagelkerke $R^2$ in the model as tested.

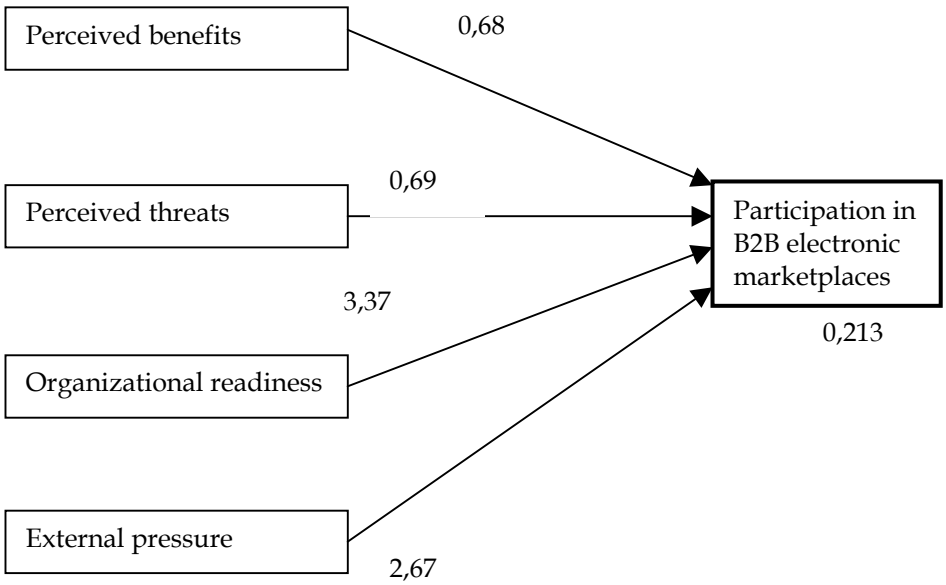
Table 7.27 Summary 'Logistic regression on participation'

| Variable | Unstandardized Coefficient | Standard error | Significance | Odds |
|---|---|---|---|---|
| Perceived Benefits | -0,386 | 0,57 | 0,50 | 0,68 |
| Perceived Threats | -0,376 | 0,50 | 0,45 | 0,69 |
| Organisational readiness | 1,214 | 0,80 | 0,13 | 3,37 |
| External pressure | 0,982 | 0,71 | 0,16 | 2,67 |
| (Constant) | -2,326 | 4,01 | 0,56 | 0,098 |
| Chi-square | 7,656* | | | |
| Nagelkerke $R^2$ | 0,213 | | | |

* Significant at 0,105 with four degrees of freedom

Figure 7.1 Results of the model 'participation in B2B electronic marketplaces'



## 7.10 Statistics summary

Table 7.28 displays a summary of key-findings from the statistical analyses. Included are:

- Hypotheses: the direction of the relation with participation.
- Odds ratios
- Unstandardized regression coefficients
- (In)significance of the regression coefficient
- T-test significance: Independent sample T-tests have been conducted on all constructs and sub-constructs. The difference in mean score between participants and non-participants was tested (shown as 'participation'), and the difference in mean score between buyers and suppliers was tested (shown as 'buy-supply'). In addition the level of significance is shown. For a more extended overview with significant t-test results and mean scores I refer to appendix 2.

Table 7.28 Statistics summary

| Construct | Hypothesis (relation with participation) | Odds | Regression coefficient | Significance regression | T-test significance (α) |
|---|---|---|---|---|---|
| **Perceived benefits** | + | 0,68 | - 0,386 (!) | 0,50 | Buy– supply (0,10) |
| Market mechanism benefits | | | | | Buy– supply (0,10) |
| Coordination cost reduction | | | | | Buy- supply (0,01) |
| Value added services | | | | | Not |
| **Perceived threats** | - | 0,69 | - 0,376 | 0,45 | Buy– supply (0,01) |
| Trust/sec./legal | | | | | Not |
| Info transparency | | | | | Buy– supply (0,01) |
| **Job security** | - | N.A.[1] | N.A.[1] | N.A.[1] | Not |
| **Organizational readiness** | + | 3,37 | 1,214 | 0,13 | Participation (0,05) |
| Financial resources | | | | | Participation (0,05) |
| E-readiness | | | | | Not |
| Trading partner readiness | | | | | Participation (0,05) |
| Marketplace readiness | | | | | Participation (0,10) |
| **External pressure** | + | 2,67 | 0,982 | 0,16 | Participation (0,10) |
| | | | | | Buy– supply (0,10) |
| Industry pressure (direct) | | | | | Buy– supply (0,01) |
| Competitive pressure | | | | | Participation (0,10) |
| | | | | | Buy– supply (0,05) |
| Enacted trading part. power | | | | | Not |
| Dependency on trading part. | | | | | Not |

! The direction of this relation is opposite the expected direction. [1] not available

## 7.11 Level of participation

Although the focus of the model is not on identifying the factors that affect the *level* of participation, a number of additional analyses were performed to analyze the extent to which the constructs of this model contribute to the level of participation. In order to achieve this, an additional logistic regression was performed and two new series of T-tests were run.

Logistic regression

A logistic regression was performed with the level of participation as outcome and the four constructs of the model as predictors. As a result of the low number of responses, only two levels of participation could be distinguished in this logistic regression.

The first level accounts for participants who conduct a maximum of 5% of their purchasing or sales volume through the use of electronic marketplaces. The second level accounts for all participants who conduct more than 5% of their purchasing or sales volume through electronic marketplaces. A summary with the results of the logistic regression is shown in table 7.29

Table 7.29 Summary 'Logistic regression on level of participation'

| Variable | Unstandardized Coefficient | Standard error | Significance | Odds |
|---|---|---|---|---|
| Perceived Benefits | -0,242 | 0,575 | 0,674 | 0,785 |
| Perceived Threats | -1,051 | 0,698 | 0,132 | 0,350 |
| Organisational readiness | -0,155 | 0,688 | 0,822 | 0,856 |
| External pressure | 1,125 | 0,780 | 0,149 | 3,079 |
| (Constant) | 0,552 | 3,839 | 0,886 | 1,737 |
| Chi-square | 3,883* | | | |
| Nagelkerke $R^2$ | 0,150 | | | |

* Significant at 0,42 with four degrees of freedom

The results show that significance levels are low, although perceived threats and external pressure are somewhat significant at respectively 0,132 and 0,149. As explained in the first logistic regression, an odds ratio of 3,079 shows that the probability of being a high level participant is

3,079 times as likely with a one-unit increase in external pressure (or 208% more likely). The odds ratio belonging to perceived threats shows that the probability of being a high level participant is 0,35 times as likely with a one-unit increase in perceived threats. Most important constructs in determining level of participation are *external pressure* and *perceived threats*, because the odds are located farthest from one.

Independent sample T-tests

Additional T-tests were conducted on all constructs and sub-constructs. Two different comparisons were made. First, the same groups were tested as in the logistic regression. Second, a number of extreme cases were tested.

*Level of participation*

The T-tests on the level of participation support the results of the logistic regression. Although the constructs are not significant, two corresponding sub-constructs are significant. They are: (1) trust, security and legal issues, and (2) enacted trading partner power. Trust, security and legal issues are likely the result of experience. It probably increased after a period of using in which one did not have problems in these areas. Reason to use the marketplace is likely to be related with enacted trading partner power. Significant differences between participants who are conducting between 1 and 5% (sample size = 13), or more than 5% (sample size = 20) of their purchasing or sales volume through electronic marketplaces are shown in table 7.30.

Table 7.30 Significant results level of participation

| Construct | Mean participants 1 – 5 % volume | Mean participants > 5% volume | Difference | Significance level |
|---|---|---|---|---|
| Trust / security / legal | 2,95 | 2,54 | 0,41 | 0,10 |
| Enacted trading partner power | 1,40 | 2,36 | 0,96 | 0,05 |

*Extreme cases*

An additional analysis was performed on a set of four extreme cases. Four respondents are conducting more than 30% of their trade volume through one or more electronic marketplaces. These four cases were compared with participants who are using the marketplace for levels

between 1 and 30% (30 respondents) of their purchasing or sales volume. Table…shows that enacted trading partner power and E-readiness are significant. The high levels of E-readiness are very likely the result of experience, because they are using the electronic marketplace for a large percentage of their trading volume. The very high significance of enacted trading partner power is interesting to note. It seems that these organizations are not using the marketplace out of their own reasons.

Table 7.31 Significant results extreme cases

| Construct | Mean participants 1 – 30 % volume | Mean participants >30 % Vol. | Difference | Significance level |
|---|---|---|---|---|
| Organizational readiness (overall) | 2,69 | 3,46 | 0,77 | 0,05 |
| E-readiness | 3,27 | 3,71 | 0,44 | 0,10 |
| Enacted trading partner power | 1,60 | 3,25 | 1,65 | 0,01 |

# CHAPTER 8: FINDINGS AND IMPLICATIONS

In this Master thesis a model has been built from theory and tested in practice. Both sides of the marketplace have been addressed, the buy-side and the supply-side. It provides a useful overview of the relevant factors that may influence participation. The model is explained in detail, and provides concrete issues that can help industry practitioners in taking the right decision. An electronic survey was used to test the model. The results of this empirical test help us identify those factors that are critical with regard to participation. It also provides insight in the different attitudes from buyers and suppliers about electronic marketplaces.

## Main research findings

*External pressure and organizational readiness highly associated with participation*

Two constructs stepped out to be highly associated with organizational participation: organizational readiness and external pressure. Both are positively related to participation as stated in hypotheses three and four. Therefore *support has been found for hypotheses three and four*. This means that higher levels of organizational readiness and external pressure enlarge the chance that an organization participates. The results of the logistic regression are supported by significant t-test results, both for external pressure and organizational readiness. Significant t-test results for organizational readiness include: financial resources, trading partner readiness, and marketplace readiness. The importance of external pressure is supported by its sub-construct competitive pressure. Additional support for external pressure has been found in a second logistic regression that was conducted on the level of participation. External pressure appeared also to be highly related to the *level* of participation.

One has to be *careful* with the relation between organizational readiness and participation. The positive relation does not mean that there is a causal relation between organizational readiness and participation. It is likely that a high level of organizational readiness is the result of experiences with electronic marketplaces. Participation seems to lead to organizational readiness and vice versa!

*No evidence for a positive relation between perceived benefits and participation*

The logistic regression showed a negative relation between perceived benefits and participation. This is somewhat surprising, but is not enough to support or reject *hypothesis one*. It is of very little value because it is highly insignificant and because of a lack of support from the descriptive analysis. This construct appears to be of higher value in the identification of the differences between perceptions of buyers and suppliers.

*Buyers more positive towards electronic marketplaces than suppliers*

This often heard idea was confirmed by the analysis of the survey results. Benefits are perceived higher among buyers than suppliers. Efficiency increase in the form of coordination cost reduction seems to be more important than lower prices as a result of market mechanism benefits. Suppliers also perceive higher threats than buyers. T-tests showed very significant results.

Additional research findings

*'Perceived threats' seems to be negatively related to participation*

Careful support has been found for hypothesis two: "perceived threats are negatively related with participation". The logistic regression supports the negative direction, but lacks significance. Additional support for this relation was found in the second logistic regression, concerning the level of participation.

*Information transparency no issue among buyers, big issue among suppliers*

Buyers seem not to be worried that information transparency could enable the availability of market information that can be used against them, for example in the form of price discrimination. On the other hand suppliers are quite concerned that it will lead to margin erosion and loss of customers.

*More external pressure on suppliers to participate than on buyers*

A lack of interest among suppliers may be the reason for increased pressure on supplying organizations to participate in electronic marketplaces. The overall construct, as well as industry pressure and competitive pressure are significant when comparing buyers with suppliers.

*Level of participation*

The second logistic regression focused on the relation between the four predictors and the level of participation. The model appeared to be not significant, but this is not surprising because it was not designed to determine *level* of participation. External pressure and perceived threats were however quite significant, and support from T-tests was also found. Support in this regression for external pressure, provides support for the finding in the first logistic regression that external pressure is an important predictor of organizational participation.

Limitations

As already mentioned several times above, the findings of my research have to be interpreted with low significance levels of the model and its constructs in mind. However the combination with significant T-tests results in valuable information. A plausible explanation for the low significance levels is likely related to the *low number of respondents*. Valid responses for the dependent variable were limited to fifty. This warns us to be careful in making statements, especially in relation to perceived benefits and perceived threats.

A potential source of bias finds its origin in a number of survey questions that had to be designed especially for this model. Where possible I used questions that had already been tested in other research projects, but this was not possible in many cases because of the exploratory character of my research. Another limitation lies in the fact that *job security* could not be tested. Critical information about job security could not be retrieved from the survey responses.

Majority of respondents was working for large to very *large organizations*. As a result, the information may not be fully applicable in relation to small and medium sized enterprises. In addition, one has to take into account that my responses were retrieved from industry professionals working in the *utilities* industry. These empirical results do not guarantee equal results in other industries. There are however no indications that relevant issues have not been addressed by the model. Respondents had the opportunity to give extra comments on the survey, and none of fourteen comments indicated missing constructs.

Theoretical implications and suggestions for further research

This research effort has identified several interesting problems. Additional research is necessary to determine the relation between perceived benefits and participation. My research indicated a negative relation. This can only be true when participation in electronic marketplaces does not come up to expectations. Whether the negative relation is really true, has to be investigated yet. Another interesting implication of my research is related to organizational learning. Organizational readiness is higher among participants than among non-participants. That could indeed be a valid predictor for participation, but the relation could also be opposite: organizational readiness may grow as a result of experience in electronic markets. I think that this is very likely. Other efforts are needed to test the construct of job security in relation to electronic markets. Further research in the area of marketplace use, or levels of participation would also be interesting as a supplement on participation. It is quite likely that there are additional constructs that influence the level of participation, such as experience.

Methodological implications

One of the major findings addressed the difference in perception between buyers and suppliers. This implicates that researchers should be aware that it is not wishful to view participants as one group. Without making the distinction between buyers and suppliers, it is very well possible that a research effort goes beyond essential differences. My second methodological implication refers to the Cronbach Alpha. It appeared difficult to obtain sufficient reliability for multidimensional constructs, such as external pressure and 'trust, security, and legal issues'. A higher number of items improves reliability. I can recommend the article written by Cortina (1993) to understand how to deal with this. In order to conduct a logistic regression on all fourteen sub-constructs of the model one needs to gain access to a larger sample. This would provide additional insights on participation. It is however not easy to gain access to this audience. I emphasize that researchers should calculate plenty of time to get into contact with this target group.

## Managerial implications

*Marketplace operators*

The model provides a tool for marketplace operators that can be used for strategic decision-making. It can be used to enlarge the empathic ability of the market maker by showing the issues that participants take into account when deciding to participate. The tool can also be used to analyse a potential customer base in order to obtain valuable market information. Concrete empirical information relevant for a marketplace operator has also been found. External pressure is likely to play a larger role in participation than perceived benefits and perceived threats. This means that it may be useful to spend resources to expose potential participants under pressure to participate. In addition, market makers should give top priority to attract suppliers. Attitude from suppliers towards electronic marketplaces is in general less positive than the buyers' attitude.

*Trading partners*

Electronic marketplaces are a fact and trading partners have to be informed about it in order to know what it means. This model can be used as a tool to conduct a 'participation scan'. It should address the relevant issues that have to be taken into account when deciding whether or not to participate. One of the conclusions from the empirical research is that external pressure plays an important role in participation. This emphasizes that trading partners may be exposed to external pressure. If an organization is very dependent on a couple of trading partners, it may not even have a choice to participate. In addition, buyers should take notice that competitors are quite positive towards the use of electronic marketplaces. On the other hand, suppliers are likely to be less interested. Suppliers have to take notice that one of their clients may ask to participate in an electronic marketplace. Buyers are in general more positive towards this phenomenon than suppliers.

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## APPENDIX 1: SPSS DATA LOGISTIC REGRESSION

**Case Processing Summary**

| Unweighted Cases(a) | | N | Percent |
|---|---|---|---|
| Selected Cases | Included in Analysis | 47 | 67,1 |
| | Missing Cases | 23 | 32,9 |
| | Total | 70 | 100,0 |
| Unselected Cases | | 0 | ,0 |
| Total | | 70 | 100,0 |

a If weight is in effect, see classification table for the total number of cases.

**Dependent Variable Encoding**

| Original Value | Internal Value |
|---|---|
| 0 No participation | 0 |
| 1 Participation | 1 |

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 7,656 | 4 | ,105 |
| | Block | 7,656 | 4 | ,105 |
| | Model | 7,656 | 4 | ,105 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 49,595 | ,150 | ,213 |

**Classification Table(a)**

| Observed | | | Predicted | | |
|---|---|---|---|---|---|
| | | | Participation devided in two groups | | |
| | | | No participation | Participation | Percentage Correct |
| Step 1 | Participatie devided in two groups | No participation | 4 | 10 | 28,6 |
| | | Participation | 2 | 31 | 93,9 |
| | Overall Percentage | | | | 74,5 |

a The cut value is ,500

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1(a) | PBALL | -,386 | ,566 | ,466 | 1 | ,495 | ,680 |
| | PTALL | -,376 | ,499 | ,566 | 1 | ,452 | ,687 |
| | ORGRALL | 1,214 | ,801 | 2,297 | 1 | ,130 | 3,368 |
| | EPALL | ,982 | ,706 | 1,933 | 1 | ,164 | 2,670 |
| | Constant | -2,326 | 4,012 | ,336 | 1 | ,562 | ,098 |

a Variable(s) entered on step 1: PBALL, PTALL, ORGRALL, EPALL.

**Correlation Matrix**

| | | Constant | PBALL | PTALL | ORGRALL | EPALL |
|---|---|---|---|---|---|---|
| Step 1 | Constant | 1,000 | -,694 | -,526 | -,672 | -,304 |
| | PBALL | -,694 | 1,000 | ,366 | ,280 | -,165 |
| | PTALL | -,526 | ,366 | 1,000 | ,119 | -,128 |
| | ORGRALL | -,672 | ,280 | ,119 | 1,000 | -,011 |
| | EPALL | -,304 | -,165 | -,128 | -,011 | 1,000 |

**APPENDIX 2: SIGNIFICANT T-TEST RESULTS**

Significant independent sample t-tests results are shown in the following tables:

Table A1: Significant differences buyers and suppliers

| Construct | Mean buyers | Mean suppliers | Difference | Significance level |
|---|---|---|---|---|
| Perceived benefits (overall) | 3,61 | 3,28 | 0,33 | 0,10 |
| Coordination cost reduction | 3,86 | 3,19 | 0,67 | 0,01 |
| Market mechanism benefits | 3,68 | 3,39 | 0,29 | 0,10 |
| Perceived threats (overall) | 2,45 | 3,15 | 0,70 | 0,01 |
| Information transparency | 2,15 | 3,26 | 1,11 | 0,01 |
| External pressure (overall) | 2,48 | 2,76 | 0,28 | 0,10 |
| Competitive pressure | 3,06 | 3,67 | 0,61 | 0,05 |
| Industry pressure direct | 1,50 | 2,36 | 0,86 | 0,01 |

Table A2: Significant differences participants and non-participants

| Construct | Mean participants | Mean non-participants | Difference | Significance level |
|---|---|---|---|---|
| Organizational readiness (overall) | 2,78 | 2,36 | 0,42 | 0,05 |
| Trading partner readiness | 1,54 | 1,08 | 0,44 | 0,05 |
| Financial readiness | 2,79 | 2,23 | 0,56 | 0,05 |
| Marketplace readiness | 3,25 | 2,69 | 0,56 | 0,10 |
| External pressure (overall) | 2,65 | 2,36 | 0,29 | 0,10 |
| Competitive pressure | 3,39 | 2,93 | 0,46 | 0,10 |

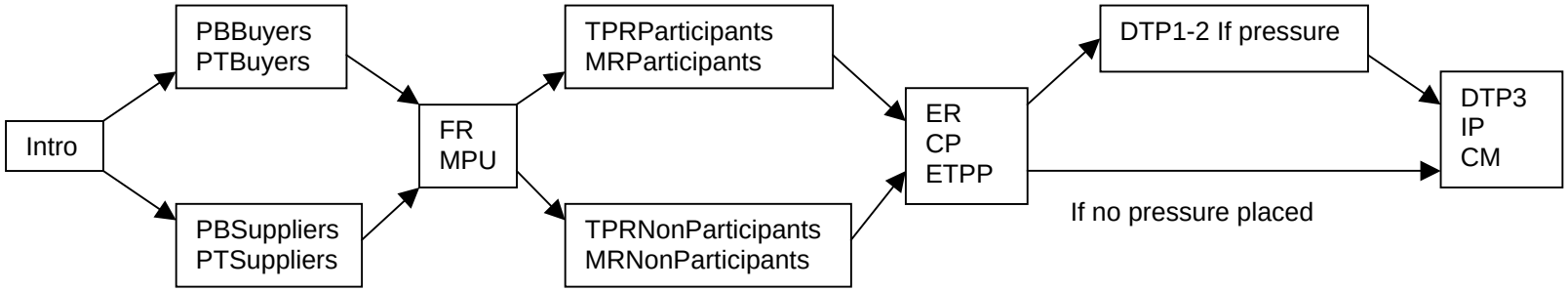
## APPENDIX 3: FLOW DIAGRAM OF THE SURVEY

- Please turn page -

Flow diagram of the survey

This diagram shows how the respondents have been directed through the Internet survey.




PBBuyers = Perceived benefits buyers
PTBuyers = Perceived threats buyers
PBSuppliers = Perceived benefits suppliers
PTS = Perceived threats suppliers
FR = Financial resources
MPU = Marketplace use
TPRP = Trading partner readiness participants
MRP = Marketplace readiness participants
TPRNonparticipants = Trading partner readiness non-participants
MRNonparticipants = Marketplace readiness non-participants
ER = E-readiness
CP = Competitive pressure
ETPP = Enacted trading partners power
DTP = Dependency on trading partners
IP = Industry pressure
CM = Current methods

**APPENDIX 4: INVITATION LETTER**

Dear [CustomData] [LastName],

I would like to invite you to participate in this online survey; it will take approximately five to ten minutes. The topic of this survey is "Participation in business to business electronic marketplaces" and I am very interested in your opinion about electronic marketplaces. This survey is an important part of my master thesis that I am writing at the Faculty of Business Administration at Erasmus University Rotterdam.

As a reward for your efforts I will send you a free electronic copy of the research report. It provides you:

- A model that helps you to decide why you should (not) participate.
- Extensive information about the use of electronic marketplaces that allows benchmarking with the industry average.

In addition you have the chance to WIN one of two Amazon.com gift certificates with a value of USD 25,- each! I emphasize that all results are anonymous and individual responses will not become publicized. If you have any questions don't hesitate to contact me or my supervisors.

Here is a link to my survey: [SurveyLink]

Thanks for participating in my survey!

Joost Buijsen
Mobile:
Email:

My university supervisors are:

Simona Spedale, Ph.D.
Assistant Professor of Strategy, Erasmus University Rotterdam
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## APPENDIX 5: SURVEY QUESTIONS

### Definition

"Internet-based business to business electronic marketplaces represent an interorganizational information system that facilitates electronic interactions among multiple buyers and sellers"

### Identification

I1. If you wish to receive the research report, please fill in a valid email address.
E-mail:_____

I2. What is your primary area of expertise within the organization you are working for? (Please choose only one option)

Supply chain / procurement / purchasing ◘
Marketing / sales ◘

 

**Perceived benefits buyers**

PBB1-11. Please rate the importance of each of the following potential benefits of electronic marketplaces in terms of your organization's decision whether or not to participate in an electronic marketplace. (1: "not at all important", 7: "extremely important", x: "don't know")

| | | |
|---|---|---|
| 1. | True market driven prices | 1 2 3 4 5 x |
| 2. | Bigger assortment/getting to know new suppliers | 1 2 3 4 5 x |
| 3. | Easier to search information about prices and products | 1 2 3 4 5 x |
| 4. | Lower transaction costs | 1 2 3 4 5 x |
| 5. | Faster purchasing process | 1 2 3 4 5 x |
| 6. | Lower labour costs in purchasing process | 1 2 3 4 5 x |
| 7. | Reduction of inventory levels | 1 2 3 4 5 x |
| 8. | Trading with reliable, pre-qualified suppliers (private netw.) | 1 2 3 4 5 x |
| 9. | Enables purchasing staff to focus more on strategic activities | 1 2 3 4 5 x |
| 10. | Reduction of maverick buying | 1 2 3 4 5 x |
| 11. | The use of value added services, such as community facilities, industry expertise, etc. | 1 2 3 4 5 x |

**Perceived threats buyers**

Data transparency

PTB1. To what extent do you perceive it as a threat that your participation in the electronic marketplace makes it easier for suppliers to obtain market information that can be used against you (for example by analysing your buying behavior and use it for price discrimination)?

| No threat at all | | Moderate threat | | Extreme threat | Don't know |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | x |

Interorganizational trust

PTB2. To what extent do you perceive a lack of trust in the other trading partners operating on the electronic marketplace as a threat?

| No threat at all | | Moderate threat | | Extreme threat | Don't know |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | x |

Erosion of buyer-supplier relation

PTB3. To what extent do you fear that the relationship with your trading partners could erode when you would decide to conduct procurement with these suppliers through an electronic marketplace?

| No fear at all | | Moderate fear | | Extreme fear | Don't know |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | x |

Institutional trust

PTB4. To what extent do you fear that the electronic marketplace is not able to take sufficiently care for issues related to the security, trustworthiness, and the legal aspects of conducting trade on the marketplace?

| No fear at all | | Moderate fear | | Extreme fear | Don't know |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | x |

New trading partners

PTB5. To what extent do you perceive the fact that you may be conducting trade with new, unknown trading partners on a marketplace as a barrier to participation?

| No barrier at all | | Moderate barrier | | Extreme barrier | Don't know |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | x |

 

Home countries' legal framework

PTB6. To what extent are you concerned that your home country's legal framework does not provide sufficient means to combat illegal behaviour on the electronic marketplace, such as auction fraud?

| No concern at all | | Moderate concern | | Extreme concern | Don't know |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | x |

Job security

PTB7. Do you believe that the use of an electronic marketplace will change the number of people employed in the purchasing/supply chain department?

| Strong reduction | | no change | | | | strong enlargement | don't know |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | x |

## Perceived benefits suppliers

PBS1-14. Please rate the importance of each of the following potential benefits of electronic marketplaces in terms of your organization's decision whether or not to participate in the electronic marketplace (1: "not at all important", 3: "Moderately important", 5: "extremely important", x: "don't know")

1. Increased sales volume 1 2 3 4 5 x
2. Lower transaction costs 1 2 3 4 5 x
3. Reduction of inventory levels 1 2 3 4 5 x
4. Additional sales channel 1 2 3 4 5 x
5. Entering a new market 1 2 3 4 5 x
6. Rapid sales process 1 2 3 4 5 x
7. Option of unloading surplus inventory efficiently 1 2 3 4 5 x
8. Means of comparing prices with competition 1 2 3 4 5 x
9. Option of price discrimination 1 2 3 4 5 x
10. Trading with reliable, pre-qualified trading partners (in private network) 1 2 3 4 5 x
11. Lower marketing costs per unit sold 1 2 3 4 5 x
12. Lower labour costs in sales process 1 2 3 4 5 x
13. Opportunity to test prices with little risk 1 2 3 4 5 x
14. The use of value added services, such as community facilities, industry expertise, etc. 1 2 3 4 5 x

## Perceived threats suppliers

PTS1-4. Electronic marketplaces provide buyers the possibility to compare prices and product specifications more easily. Buyers can also get to know new suppliers in a very efficient way. The combination of better knowledge about products and prices offered, by suppliers that are easier to identify will result in the availability of more alternatives. To what extent do you perceive the following possible consequences as a threat?

(1: No threat at all, 3: Moderate threat, 5: Extreme threat, x: don't know)

1. Margin erosion 1 2 3 4 5 x
2. Fear of losing customers 1 2 3 4 5 x
3. Products shift towards commodities. 1 2 3 4 5 x
4. Weaker brand loyalty 1 2 3 4 5 x

 

New trading partners

PTS5. To what extent do you perceive the fact that you may be conducting trade with new, unknown trading partners as a barrier to participation?

| No barrier at all | | Moderate barrier | | Extreme barrier | Don't know |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | x |

Interorganizational trust

PTS6. To what extent do you perceive a lack of trust in the other trading partners operating on the electronic marketplace as a threat?

| No threat at all | | Moderate threat | | Extreme threat | Don't know |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | x |

Erosion of buyer-supplier relation

PTS7. To what extent do you fear that the relationship with your trading partners could erode when you would decide to conduct trade with these clients through an electronic marketplace?

| No fear at all | | Moderate fear | | Extreme fear | Don't know |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | x |

Institutional trust

PTS8. To what extent do you fear that the electronic marketplace is not able to take sufficiently care for issues related to the security, trustworthiness, and the legal aspects of conducting trade on the marketplace?

| No fear at all | | Moderate fear | | Extreme fear | Don't know |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | x |

Home countries' legal framework

PTS9. To what extent are you concerned that your home country's legal framework does not provide sufficient means to combat illegal behaviour on the electronic marketplace, such as auction fraud?

| No concern at all | | Moderate concern | | Extreme concern | Don't know |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | x |

Job security

PTS10. Do you believe that the use of an electronic marketplace will change the number of people employed in the marketing/sales department?

| Strong reduction | | | no change | | | strong enlargement | don't know |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | x |

## Organizational readiness

Financial resources

FR1-2. To what extents are the following financial costs a barrier against participation of your organization in an electronic marketplace? (1: no barrier, 3: moderate barrier, 5: extreme barrier, x = don't know)

1. Membership fees, transaction fees, application licensing fees 1 2 3 4 5 x
2. Costs to integrate business processes with electronic market 1 2 3 4 5 x

SIZE1. Approximately how many people are employed in your company?

1-10 ◘
11-50 ◘
51-200 ◘
201-1000 ◘
1001-10.000 ◘
> 10.000 ◘

 

Marketplace use

MPU1. Approximately what percentage of your organizations' total sales/purchasing volume is conducted with the use of one or more electronic marketplaces?

0%, not active on electronic marketplace
1%
5%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

Trading partner readiness (participants)

TPRP1. What percentage of all your trading partners is ready to participate in an electronic marketplace?
0-20%
21-40%
41-60%
61-80%
81-100%
Don't know

Marketplace readiness (participants)

MRP1-3. To what extent does the marketplace in which you are participating, satisfy your expectations in terms of: (1: Not at all, 3: Moderately, 5: Extremely well, x: don't know)

| | |
|---|---|
| 1. Assortment | 1 2 3 4 5 x |
| 2. Available trading processes | 1 2 3 4 5 x |
| 3. Sufficient number of participant | 1 2 3 4 5 x |

Trading partner readiness (non-participants)

TPRNP1. What percentage of all your trading partners would be ready to participate in an electronic marketplace?
0-20%
21-40%
41-60%
61-80%
81-100%
Don't know

Marketplace readiness (non-participants)

 

MRNP1-3. To what extent does the marketplace that best meets your desires comply to your demand in terms of: (1: Not at all, 3: Moderately, 5: Extremely well, x: don't know)

1. Assortment 1 2 3 4 5 x
2. Available trading processes 1 2 3 4 5 x
3. Sufficient number of participant 1 2 3 4 5 x

E-readiness

*Technological readiness*

ER1-7. Information technology can be used for a number of objectives. To what extent is information technology important for the fulfilment of the following objectives in your organization? (1: not at all important, 3: moderately important, 5: extremely important, x: don't know)

1. Operational cost reduction 1 2 3 4 5 x
2. Productivity improvements 1 2 3 4 5 x
3. Personnel reduction 1 2 3 4 5 x
4. Improved access to information 1 2 3 4 5 x
5. Improved quality of decision making 1 2 3 4 5 x
6. Improved competitiveness 1 2 3 4 5 x
7. Improved service to customers 1 2 3 4 5 x

*Management readiness*

ER8. Please rate the attitude of your top management toward the deployment of E-business in your organization.

| Very negative | | | neutral | | | Very positive | don't know |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | x |

*In order to fully reap the benefits of e-commerce, electronic settlement should be an integral part of e-commerce. To achieve this, internal administrative processes may have to change drastically.*

*Process readiness (10), Standards & Norms readiness (9, 11)*

ER9-11. To what extent would it be problematic in your organization to adopt these internal company processes to the system that is operated by the marketplace? (1: No problem at all, 3: Moderate problem, 5: Extreme problem, x: don't know)

9. In terms of adhering to your accountancy standards? 1 2 3 4 5 x
10. In terms of reorganizing internal processes? 1 2 3 4 5 x
11. In terms of adapting a different classification standard? 1 2 3 4 5 x

**External pressure**

Competitive pressure

CP1. Would the sole fact that your competitors are participating in an electronic marketplace influence your decision to participate?

| No influence at all | | Moderate influence | | Extreme influence | Don't know |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | x |

CP2. Please rate the extent to which participation in an electronic marketplace may influence the image of your company positive or negative.

| Extremely negative | | | no influence | | | extremely positive | Don't know |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | x |

 

Enacted trading partner power

ETPP1-4. Does or did any of your trading partners attempt to influence your organization's decision to participate in an electronic marketplace? (More answers are allowed)

1. Yes: recommended to join ◘
2. Yes: promised rewards if we should decide to join ◘
3. Yes: negative sanctions would have followed if we should not join ◘
4. No: no attempt has been made ◘

Dependency on trading partners

DTP1. Please rate the importance of this trading partner to your organization at the time that your organization was being encouraged to participate in an electronic market.

| Not at all important | | Moderately important | | Extremely important | don't know |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | x |

DTP2. We followed our trading partner in the decision to participate in an electronic marketplace.

Yes / no

DTP3. Please estimate the percentage of your trading partners that at least must be ready to participate in an electronic marketplace before you can participate (please choose percentage).

0%
1%
5%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

Industry pressure

IP1. What is the level of pressure placed on your organization by industry sources, such as trade associations, to participate in an electronic marketplace?

| No pressure at all | | Moderate pressure | | Extreme pressure | Don't know |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | x |

IP2. Please place the products you are currently buying or trading in the customized or commodity continuum.

| Highly customized | | | | Pure commodities | Don't know |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | x |

IP3. What is your opinion about efficiency in your traditional sales channel?

 

| Not efficient at all | | Moderately efficient | | Extremely efficient | Don't know |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | x |

IP4. Please indicate the extent of market fragmentation in your industry.

| Highly concentrated | | Moderate | | Highly fragmented | Don't know |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | x |

Current methods

CM1-6. Could you please further specify what percentages of your companies' purchasing/sales volume is conducted with the use of the following tools? (total sum = 100%)

1. Traditional methods (face to face, telephone, fax)
2. Electronic marketplace (incl. Automated transaction fulfilment)
3. Electronic auctions & eRFX
4. Electronic catalogs
5. EDI connection
6. Companies' Webshop

CM7-9. If you have no objections please fill in the names of these tools that you are using:

7. Electronic marketplace (incl. Automated transaction fulfilment) _____
8. Electronic auctions & eRFX _____
9. Electronic catalogs _____

*Thanks for participating in this survey. We really appreciate your input. The results of the survey are expected in November 2003.*

If you have any additional comments on this survey, please fill in here:

 