

## THE GOVERNANCE OF TRANSACTION BY COMMERCIAL INTERMEDIARIES: AN ANALYSIS OF THE RE-ENGINEERING OF INTERMEDIATION BY ELECTRONIC COMMERCE

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### 1. Introduction

The notion of electronic commerce (E-commerce) has been gaining in popularity with the rise of commercial activities on electronic networks, especially on the Internet. In the academic world (e.g. Brynjolfson & Smith [1999], Shapiro & Varian [1999]) as well as in governmental organizations (e.g. OCDE [1996-19998], Lorentz [1998], US Dept. Of Commerce [1998, 1999]), many optimistic analyses see the Internet as a way to completely re-engineer the relationship between the producer (good manufacturers and service providers) and the final consumer, leading to major productivity progress in transactional activities. This is essential since those activities became dominant in developed countries during the twentieth century (Porat [1977], Wallis & North [1986], Jonscher [1994]), and they were characterized by very slow progress in productivity. The Internet is often analyzed as a medium that will enable the establishment of a direct electronic relationship between producers and manufacturers. This is supposed to dramatically reduce transaction costs, because electronic communication is cheap, and because it will suppress most intermediaries in marketing channels.

There is however a strong gap between the above quoted optimistic discussions and forecasts about the potential of E-commerce and the reality. This gap is even greater when one compares actual facts to the notion of "New-Economy" popularized by the press (e.g. The Economist [1997], Wired [1999]). There are indeed interesting new ways of commercializing information and goods through the Internet and the commercial activity on the Network is skyrocketing. However, when one looks at the actual figures, E-commerce represents only a very tiny share of economic exchanges (around 1 percent in the US according to the Dept. of Commerce (June 1999)) and the firms that are really engaged in it are so few that the same ones are always quoted and studied :

Amazon.com, Auto-by-tel, Cendant Corp., Dell, 1-800-Flowers, etc. Moreover, most existing E-commerce sites do not generate significant profits. Amazon.com has around 2 million clients all over the world, but does not make a dollar of profit. Last but not least, none of these examples at all illustrate the promised frictionless market without intermediaries, since most of them are commercial intermediaries.

This hiatus is often analyzed as a simple transition problem. The technology, suppliers' strategies, and consumers' habits have to evolve to enable the realization of the full potential of electronic intermediation. This interpretation is however only partially satisfying since

many experiments in E-commerce have been being carried out over the last twenty years. Indeed, the idea of bypassing commercial intermediaries, establishing direct links among producers and customers, and selling worldwide thanks to telecommunication networks is not new. In the US (e.g. Faulhaber et al [1986], Malone [1987], Brousseau [1993]) and in Europe (Brousseau [1990], OECD [1998b], huge efforts have been devoted to the development of electronic markets. All these experiments demonstrate that there are many obstacles to the full "electronization" of commercial transactions (both because strong adverse selection and moral hazard problems occur). They also show that electronic markets maintain, most of the time, intermediaries (e.g. airline computer reservation systems, electronic trading systems in the finance industry, etc.).

The facts therefore seem to point out that the development of E-commerce does not lead to the substitution of commercial intermediaries (commercial intermediation) by electronic networks (electronic intermediation). This obviously does not mean that electronic commerce will not develop, but rather that it will probably develop along a different path than the one often forecast today. The aim of this paper is thus to get a better understanding of what this path could be. From a more theoretical point of view, this paper relies on a New-Institutional assessment of the role of commercial intermediaries. Indeed, markets and transaction chains are not only organized by institutions, they are also managed by intermediaries. The essential difference between an intermediary and an institution is that the former is a market player, while the latter is a market organizer. Indeed, as pointed out by Spulber [1996], intermediaries ensure the liquidity of markets by holding inventories and cash. They are actual counterparts in transactions among economic agents because they temporarily hold the property rights that are transferred between transactors, and therefore take risks. This is not the case for institutions. They are neutral within each transaction. Their role is to provide transactors with more transparent and less costly market places (for an analysis of the role of institutions in electronic markets, see Brousseau [1999]). From a theoretical point of view, the organization of E-commerce is interesting since it shows the essential economic role of intermediaries in fields other than finance, whereas the bulk of the economic literature is dedicated to financial intermediaries (see the collected papers by Lewis [1995]).

The paper is organized as follows. In section 2, some essential facts about the development of E-commerce are highlighted. This will enable me to clarify some definitions and to specify the purpose of the paper. Section 3 will be dedicated to an analysis of the reasons why many transactions are not fully electronized. The boundaries of the technology will thus be highlighted.

Section 4 will develop a theoretical analysis of the role of commercial intermediaries, which will be used in Section 5 to analyze the ability of Information and Communication Technologies (ICTs) to substitute for human or organizational intermediation. This will lead me to interpret in Section 6 the path of development of E-commerce. Concluding remarks will follow.

## **2. E-commerce development and productivity gains in information economies**

E-commerce is not an anecdotal issue. It has to be linked to two major features of growth in our modern economies: the rise of an information- and knowledge-based economy and the spread of information technologies. Initiated by Machlup [1962], Bell [1973], and Lamberton [1974], the thesis of a rise of an information society was more deeply investigated by Porat [1977] and Jonscher [1983, 1994] who studied the evolution of the workforce allocation in the US in the long run. This pioneering work was confirmed by Davis & North's [1986] work on the transaction sector. Indeed, Jonscher's findings can be summarized as follows:

- In the long run, the growth of information activities has been being much stronger than that of productive activities, and the former became dominant in the US by the end of the 1970's. The ratio of information worker per productive worker rose from 0,22 in 1900 to 1,13 in 1980 1 .
- The vast majority of information workers perform coordination activities. Indeed, those activities that can be considered as producing knowledge (R&D, creation and design, education and training) employ less than 20 percent of information workers.
- Most of the coordination workforce is dedicated to market coordination. Indeed, Jonscher points out that it is possible to establish a distinction between those activities that are dedicated to hierarchical coordination (accounting, supervision, etc.), and those jobs that are market oriented (sales agents, marketing, supply management, etc.). He points out that the ratio of the latter over the former jumped from 1 in 1900 to 1,65 to 1970. These led to the following interpretation as regards the ICTs revolution. Since the end of the eighteenth century, the need to increase productivity has led to two major movements: the substitution of capital for labor and the division of labor. The former led to the distinction of coordination and productive activities and the latter applied only in production activities. For a long time, productivity gains were very low in the coordination activities, and this began to be a major problem by the middle of the twentieth century when these activities became significant, then dominant, in most developed countries. This explains the raise of ICTs and their rapid spread in the whole economic system. Historically however, ICTs where primarily used to support internal

(hierarchical) coordination, while, as pointed out in the above quoted data, the bulk of coordination activities is dedicated to market coordination. That is why the development of new means of coordination that can support exchanges among firms, and transactions between producers and the final customers represents potentially tremendous productivity gains. Similarly, the rise of the Internet struck analysts, decision-makers and public opinion. Indeed, while corporations have been using inter-firm data networks (since the mid 1970's), and the telephone, the fax and a wide set of other technologies (for several decades), to support inter-firm coordination and market oriented activities, the Internet provides a support for worldwide multi-media communication that can potentially support a wide range of information exchanges. This is why since the mid-90's the notion of E-commerce has been becoming an essential issue for many public and private decision-makers. ICTs in general, and especially the Internet, are thus supposed to bring about major productivity gains in market coordination. Several (complementary) arguments are put forward:

- ICTs will enable a decrease in distribution costs by enabling a more efficient management of resources (e.g. US Department of Commerce [1998], OECD [1997-1999]):
- Thanks to a better management of information, just-in-time order and delivery processes will enable a substantial decrease in the level of inventories, the volume of unsold and returned goods, etc.
- Many commercial activities will become virtual by limiting their operations to advertising and marketing, site content, establishing relationships with manufacturers or distributors, accounting functions and customer services. Rent and depreciation, store personnel, utilities and other expenses of physical infrastructures will be almost entirely avoided.
- ICTs will enable the substitution of capital for labor in many clerical tasks usually performed by the sales force. Moreover, many decisions (such as ordering, granting a rebate, etc.) will be automated, or at least supported, by means of ICTs. When the good or service can be fully dematerialized, cost reductions can become dramatic. For instance, one estimates the cost of buying software over the Internet at \$0.20-0.50 per transaction, as opposed to \$5 for a telephone order, and \$15 for a traditional retailer (OCDE [1997])
- ICTs will make the market more transparent, leading to the ousting of inefficient suppliers and intermediaries. Thanks to information networks like the Internet and smart technologies, consumers will be able to search among thousands of merchants for the lowest prices, thereby increasing the downward pressure on prices and leading to a shift in market power from producer to consumer (e.g. Hagel and Armstrong [1997], Yardini [1996], Crane, [1997]);

• ICTs will enable customers to bypass commercial intermediaries because they will be able to get in touch with the suppliers directly, and vice versa. Actual markets will thus replace networks of intermediaries, as has happened at the London Stock Exchange or the Swiss Electronic Exchange when electronic commodity and stock exchanges squeezed some intermediaries out of the trade (Zwass [1999]). Short distribution networks will enable major savings in (supposedly useless) labor costs and rent captures (e.g. Benjamin & Wigand, 1995). It must be recalled that commercial intermediaries account for a significant share of our economies. In France, 1 million of the 1,8 million companies are retailers, brokers or wholesalers; they account for 10,8 percent of the GDP; and they employ 12,0 percent of the workforce (Source INSEE 1994 & 1998). In the US the retail and wholesale trade account for 15,84 percent of the GDP (Source Survey of Current Business, 1995) Moreover, distribution costs account for up to 60 percent of the price for certain goods such as books and music records (Source EITO 1997) As reported by Brynjolfson & Smith [1999], who cite several illustrative quotations <sup>2</sup>, these arguments are today widely accepted. The Internet is supposed to bring us a frictionless and intermediary-less economy, based on a ubiquitous information network that will support the performing of an almost perfect Walrasian market. A strong hiatus remains however between this assumption and the actual reality in E-commerce. Indeed, E-commerce is still marginal, the business models it supports have not proved their economic viability, and commercial intermediaries play a major role in E-commerce. When one looks into the facts, it is necessary to point out, first, the difficulty in getting an accurate view of what is happening. This is due, first, to the speed of changes. Around 3 million people around the world were connected to the Internet in 1993. By mid-1999 the US Department of Commerce estimates that there are approximately 200 million. The number of domain names (Internet sites) has jumped from 26,000 in 1993 to 5 million today, and traffic on the Internet has been doubling every 100 days. This creates a lot of fuzziness. Moreover, since many new uses are tested, it is quite impossible to benefit from stable and recognized definitions that will enable us to gather and consolidate facts and figures, and more simply, to speak a standardized language. Last but not least, the economic stakes are huge. Many players on the market, especially the suppliers of ICTs and the new service providers, have an interest in spreading misleading, or at least incomplete, information <sup>3</sup>. Consequently, most figures are doubtful. One does not know exactly what is measured, and how it is measured. Most circulating figures are estimations and forecasts and range along a scale from one to five <sup>4</sup>. In the same spirit, most facts are known through very incomplete case studies that provide us with anecdotal evidence, but never with detailed

and completed figures. Moreover, the end of the story of most of these start-ups is, by definition, unknown. This stimulates all kinds of speculation. Does this mean that nothing can be said? Surely not. First by compiling and comparing sources one can reach a reasonable level of information about the most studied cases, like Amazon.com, Dell, etc. In addition, many cases seem to evolve along similar paths. Second, the rise of E-commerce did not begin with the rise of the Internet. Indeed many experiments have been carried out in the US and in Europe since the mid-1970's. Dedicated communication networks – the so-called Value Added Networks – were used to develop electronic markets and to manage transactions, essentially among firms (see. Faulhaber & al [1986], Scott Morton [1991], Brousseau & Quelin [1996], Brousseau, Petit, Phan [1996]). Today, most financial transactions, airline and touring reservations are carried out by these electronic systems. In specific industries, such as the automotive industry and wholesale-retail channels, the Electronic Data Interchange (EDI)<sup>5</sup> has enabled the automation of a significant share of inter-firm transactions (Brousseau[1994])<sup>6</sup>. Moreover, France has wide experience of B-to-C electronic commerce thanks to its Teletel-Minitel system <sup>7</sup>. In other words, we do have some long-term experimental data. Even if Internet technology makes the new information networks more flexible, more user friendly, less costly and more universal, one can draw interesting conclusions from the past. Lastly, even if figures can be considered doubtful, they can still give us some idea of the magnitude of the phenomenon we are investigating. Let us thus analyze the facts in order to draw some stylized facts about the nature of E-commerce. While growing quite fast (over 200 percent annually according to the OECD [1997a]), E-commerce is still marginal as compared to other forms of distribution <sup>8</sup>. The US Department of Commerce estimates that it now accounts for 1 percent of the exchanges in the US <sup>9</sup>. This level far exceeds the figures for European countries where the total sales on the Internet represent only the annual sales of a large super-market <sup>10</sup>. These figures however have to be cautiously interpreted since, most of the time, their producers consider that any operation where the web is partially used is electronic commerce. Thus, they compile cases in which clients search for a retailer address on the Web and then do regular shopping, with cases where the transaction and the payment are fully processed on-line. In fact, the latter is still very rare today. Whenever the transaction is only partially or fully performed on the network, E-commerce is clearly more important and more dynamic when it concerns inter-firm trade (B-to-B), than when it is question of retail sales (B-to-C) (Cf. OECD [1997a]. For instance the OECD estimates that General Electric did more B-to-B electronic commerce in 1996 than all the individual B-to-C activities and most of the estimated electronic commerce totals. Most private

institutes estimate that B-to-B commerce is ten times more important in value than B-to-C (Cf. Dang N'guyen [1999]). This is not surprising since professionals can dedicate more means and have a greater ability to trade and to use ICTs than final customers. Moreover, the bulk of their exchanges is generally concentrated on small communities of business partners that can easily adopt common practices, mutually supervise and trust each other. The scale changes radically when it is question of retail commerce. E-commerce is more efficient and dynamic for certain types of goods and services, typically those goods and services that could be dematerialized <sup>11</sup> and that are easy to describe. Although much of the popular press has focused on electronic commerce merchants that sell tangible products (e.g. books, wine, flowers and computers), the largest segments (with the possible exception of computers) are in fact intangibles like entertainment and software (OECD [1997a]):

- Within the B-to-C segment, the leading activity is entertainment. This category is currently led by three activities: adult entertainment, online games, and gambling. The largest segment of business-to-consumer electronic commerce is for those intangible products that can be delivered directly to the consumer's computer over the network. This immediacy of ownership is one of the key attributes of electronic commerce

- In the B-to-B markets, digital products such as software, travel services, entertainment and finance are the leading electronic commerce products. The B-to-C E-Commerce is still dominated by traditional retailers. In 1997, OECD pointed out that the main tangible products sold electronically were computers, clothing and food/drink. Many of these categories are dominated by traditional retailers that have established electronic commerce operations such as the USA's Dell, La Redoute in France, Marks & Spencer in the UK and supermarkets in the Netherlands. Behind these broader categories are a group of specialty item merchants of books, flowers and CDs (music) that add value to a product by providing a wider selection, more information about a product or convenience of access. However, as will be pointed out below in the case study on Amazon.com (§ 5), most of these new business models have not proved that they are viable. Shamaweb <sup>12</sup> is a good illustration of these small startups that experiment new businesses models but that are not at all profitable. This company developed Web sites to support the sales of its client companies. After the first two years of activity, the company was just able to cover its material costs, but not wages. When it decided to price its services according to full costs, most customers left because the tariffs became ten times more expensive. This rise in prices no longer enabled Shamaweb's clients to turn there Web-generated-sales into profits. Whether E-trade makes

markets more transparent and brings the prices down is still an open question. It is first of all a difficult phenomenon to assess since the services provided by Internet vendors and by traditional retailers are different. Secondly, actual prices are not always easily known by investigators. Whatever the difficulties, one gets contradictory results. A first study performed by Bailey [1998] is based on nearly 24,000 prices collected in 1997 in the US for books, music compact disks and software. It concludes that prices are not lower on the Internet than in physical stores, that there is a wider range of prices on the Internet than in physical stores and that the Internet prices change more frequently than those in physical stores. According to Bailey, this is partly because the Internet users, and therefore customers, tend to be affluent, well-educated males aged 25 to 39 (Goldman Sachs, 1997) that are consequently subject to a loose budget constraint. They use the Internet because it is convenient, not because it is cheaper. Moreover, many specialists point out the high search costs – put another way, the long search delays – on the Internet <sup>13</sup>. On-line prices are higher than off-line prices because consumers' preferences and specific constraints (i.e. time scarcity) allow merchants to extract more consumer rents than through traditional marketing channels. E-commerce can therefore be interpreted as a means of discrimination that will increase the array of products that could be marketed in such a way that different prices are charged to different categories of consumer. Bailey's results are confirmed by several other studies : Degeratu, Rangaswamy, and Wu (1998) on online grocery sales; Shankar, Rangaswamy, and Pusateri (1998) on travel ticketing; Lee (1997) on used cars, Clemons, Hitt and Hann (1998) on airline tickets. All these studies point out that prices are often higher, and at least quite dispersed, on the Internet. It is however difficult to assess if this is due to differentiation or to discrimination strategies. On the other hand, the most recent study by Brynjolfson & Smith [1999] seems to contest these results, at least at first sight. It is based on books and CD markets and relies on 8,500 prices. They finds that prices on the Internet are 9-16 percent lower than prices in conventional outlets, that Internet retailers' prices adjustments over time are up to 100 times smaller than conventional retailers' price adjustments, and that the level of price dispersion depends importantly on the measures employed (i.e. posted prices are more dispersed on the Internet, while when those prices are weighted with the market share, dispersion is lower). According to the authors, this last result reflects the fact that Internet markets are highly concentrated, but the retailers with the lowest prices do not receive the most sales. This suggests that the Internet does not lead to such a transparent market. Even if the Internet markets have become more competitive, search costs on the Internet are still quite

high and branding, awareness, and trust remain important sources of heterogeneity among Internet retailers. To conclude it is possible to draw three major stylized facts:

- Full electronization of the market is and will remain, not the rule, but the exception. On the one hand, despite years of experience and strong growth, E-commerce is and will remain for a long time a marginal way to market products and services. On the other hand, most of the so-called electronic transactions are only partially electronized. Price negotiation, payments and deliveries are often performed offline.

- E-commerce does not suppress commercial intermediation, especially on the B-to-C segment where the vast majority of exchanges is still performed through traditional commercial networks and where the Internet retailers are most of the time major players in traditional distribution.

- E-commerce does not systematically mean frictionless markets. Indeed, E-commerce is often used to discriminate between consumers and search costs are not negligible on the electronic networks. The remaining sections of this paper will be dedicated to the interpretation of these facts. Indeed, in my opinion they refute the traditional assumptions about Internet supported commerce, ie that the Internet will support a fully electronic market that will directly link producers and final consumers. There are at least two reasons why this will not happen:

- There are technical and strategic barriers to the full electronization of transactions (section 3)

- Commercial intermediaries play economic roles such as financing, insurance, and logistics management that are useful in the sense that they bring transaction costs down. They will continue to provide their services (section 4 and 5) This is why I will concentrate on the analysis of the B-to-C relationship. Indeed, in these relationships at least one party is unskilled and cannot invest in a specific technical system, and there are systematically a very large number of players. This is why exchanges are often mediated. On the other hand, in the B-to-B segment, transactions occur among specialized parties that can dedicate a lot of means and attention to the management of their exchanges, and that play on a small number markets. Disintermediated exchange is more frequent. This is also because transactions are often specific.

### **3. Barriers to the Electronization of the Seller/Consumer Relationship**

Will markets become virtual, enabling economic agents to become totally independent of their physical locations? If we look at the considerable experience we have already had on professional and retail markets, the answer is clearly no, except for a very specific set of standardized intangibles (such as music pieces, news, mass consumption pictures and video, literature, etc.). Indeed, despite the huge and incessant evolution of ICT

capabilities, several transactional operations will continue to be performed offline. Buyers and sellers will continue to need face to face meetings and the physical presence of the complex products or services to be transacted. Moreover, vendors do not always have an interest in making markets more transparent. As pointed out by most applied studies, the items that are exchanged on the Internet are principally very standardized items such as PCs, software, books, music CDs, etc. (OECD [1997a], Bailey [1998], US Department of Commerce [1998]), Moreover, the only real virtual markets were developed for securities and airlines tickets, which are typically products that can be described along a reduced number of dimensions, because they differ only on those few dimensions. The complexity of goods (products or services) – complex in the sense that they are characterized by a great number of non-standardized dimensions – is indeed an obstacle to online transactions. Two reasons explain this:

- First, ICTs automate information handling. This requires, however, programming. If a customer wants to compare a set of products along a specific dimension and a seller wants to target the customers that are looking for this or that specific feature, these various Lancaster features have to be described (and on a systematic and standardized basis) in the various computer files that are processed and stored in the network. This leads to two problems:

- On the one hand, it is technically difficult, and costly, to describe products that can vary along a wide set of dimensions because this means that complex languages have to be designed and manipulated by both sellers and buyers. Moreover, it would become quite difficult for search tools to handle the many dimensions that would be necessary to compare the various offers or demands.

- On the other hand, when goods can vary along many dimensions, it becomes easier to hide information. Adverse selection and moral hazards are thus more likely to occur. That is what potential buyers want to audit the good or the team that will provide them with a service before entering a deal. Brousseau [1991a] reported two cases in which attempts to build virtual markets for complex goods failed. In the mid 80's, an attempt was made to build an on-line used-car market among car dealers in the US. Strong adverse selection phenomena occurred, and only Lemons were traded. Just as predicted by Akerlof [1970], the market quickly disappeared. In France, a similar phenomenon occurred on an E-market among real estate agents. Indeed pictures and standardized descriptions can be manipulated and it is in real estate agents' interests to display only the most-difficult-to-sell goods on the network (so as not to reveal the trump cards of their portfolio to their competitors). Potential clients knew that they should not trust the information circulating on the network. They were

consequently obliged to continue to visit agents and to examine apartments and houses by themselves to assess them  
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•Second, when products are complex, it becomes difficult for an inexperienced consumer to select them. Indeed, consumers do not know exactly what they need. Put another way, following Lancaster [1979], consumers do not express needs in terms of products and services, but in term of use features. Consequently, they often need advice to match their needs with the supply. They moreover need advice to identify their actual needs. When products are complex and non-standardized, this often requires a face-to-face meeting because needs are not expressed along a systematic line. This was for instance experienced by DEC in the late 80's. This computer manufacturer tried to launch a "virtual store" for its professional clients. In principle it was possible to buy all the DEC lines of product through this virtual store, but in fact only consumable items were bought (laser cartridge and other computers' consumables, cables, keyboard and screens to be replaced, etc.) Indeed, when the clients had to buy new computers, especially those networked computers sold by DEC, they had to design their information system, and therefore to assess complex needs and to match them with a tremendous amount of possible combinations of material and software (Cf Brousseau [1991a]) Obviously one could argue that opportunist buyers could go to the next-door shop to examine products, try them and get professional advice, and then buy online. However, it is clear that this is not a viable strategy in the end if it is massively followed, because those next-door shops will quickly be expelled from the market. Moreover, one can expect that the next-door shopkeepers will stop giving free advice before this expulsion. Not only does the potential client need offline interactions, but the vendor's willingness to enter into fully electronic transaction is also doubtful. Indeed, vendors can fear the development of electronic markets. When one looks at what happened in the airline industry, the computerized reservation systems greatly increased competition (e.g. Faulharber et al [1986], Copeland & Mckenney [1988], Humphreys [1990], Dang N'Guyen [1996]) As compared to a traditional decentralized and physical market, a computerized worldwide market place strongly decreases consumers' search costs and providers' search and menu costs. Consequently, the competition becomes more intense and more based on prices. Indeed differentiation strategies are harder to sustain because prices are genuinely describable and comparable, while quality is not. This led airlines to standardize their services in order to compress costs. That standardization reinforced price competition. Moreover, the ability to discriminate between consumers also benefited the final user. Indeed, as differentiation is difficult, companies had to adopt parallel pricing policies and this led to an extension of the market. This

is because the cost structure of airlines led to the provision of cheap prices to a wide set of potential clients that had a low willingness to pay high prices for airline tickets. What is a dream for consumers can be a nightmare for producers. That is exactly why most of them develop strategic behaviors to avoid the development of such perfect and transparent electronic markets. This is why they promote E-commerce systems which aim is to avoid the development of an electronic market place. Their strategy is based on two pillars:

- Maintaining an ability to differentiate. In the US insurance industry, for instance, insurance agents and small insurance companies tried to develop a transparent market place in the mid 80's. The IVANs project was supposed to link all the agents and all the companies, in order to enable the former to send requests to quote to the latter, and to choose the better bid. Large companies decided not to join the project because they did not want to be pressured by price competition. Their counter-attack consisted in developing dedicated services enabling agents to provide their customers with enhanced services. Many other similar cases are quoted in Brousseau [1991a] and many vendors' services on the Internet simply enable clients to get in touch with a sales representative that will try to channel his behavior. Web sites can also support the sale of specific goods in order to target specific market niches. This is the strategy followed by Degriftour, a French site selling discounted travel and touring services (Workshop "Business Economic Models", 1998-1999, Cf. Note 12). The company is only a broker between tour operators, airlines and hotels that need to discount their excess capacities, and the clients that are seeking cheap travel. In order to make it acceptable for the customers to pay different prices for close substitutes, these services have to be differentiated. Selling discounted travel on a "take it or leave it" basis is one way to do it. Touring services provided on the Web are last minute, non-customizable and difficult to assess travel. They are therefore quite different from the guaranteed and customized services provided through face-to-face meeting by travel agents. Tour operators or airlines sell discounted capacities on the Web only when they become perishable. Moreover, they do so on an anonymous basis.

- Displaying only biased information. While producers are very much in favor of displaying promotional information about their products and services on a wide scale, they are reluctant to broadcast any kind of information that would enable consumers to compare the various offers on the same basis. Most of the existing Web sites are designed in a showcase spirit. Promotions and special rebates are displayed, while they do not perfectly reflect the rest of the catalogue in terms of price, availability, service, etc. As mentioned above, customers are often required to go

to a next-door shop, or to call a call-center, in order to be taken charge of by a sales representative. Bailey [1998] also quotes the "bait-and-switch" tactic. A retailer may advertise the lowest price on a given good (for example, on the UVision Web site), but when customers visit the Web site for that product, they are shown a substitute product at a higher price. The "bait" is the very low price, which draws customers into the store; the "switch" is the higher-priced product actually offered. He points out that this tactic is less efficient when it is performed on the Web because it is very easy for a customer to press the "back" button and switch to another retailer, whereas in physical retail stores, the customer engages in conversation with a persuasive salesperson that can "size him up" and find his "weak points". That strongly incites vendors to bring customers into their physical stores. Obviously, one could expect that smart informational intermediaries could try to bypass those producers and physical distributors' strategies by developing services that would simplify customers' searches and make the market transparent despite the willingness of the supply side. This would be true if the producers and major vendors did not have any means of reacting to these strategies. However, they did. We already mentioned the fact that many on-line merchants blocked access to their site by the intelligent shopping agents (Cf. note 13). We can also mention the case of Marcopoly, a French site that sells consumer electronic and electrical appliances, and which has been submitted to strong pressure from the manufacturers that asked the Web retailer not to make means of information— such as comparative tests — available on its site to help its customers to choose among the products and compare the alternative offers (Workshop "Business Economic Models", 1998-1999, Cf. Note 12). In fact, as pointed out by Brynjolfson & Smith [1999], if such sellers' strategies were impossible one would wonder why investors would place such high valuations on Internet retailers such as Amazon.com and CDnow who sell undifferentiated products, and why large distribution chains and major manufacturers would make million dollar deals for the right to showcase their products on major Internet portals and content sites. Thus, beyond the unavoidable development and adoption delays, fully electronized markets do not exist because both on the demand side and on the supply side there remain strong incentives to perform transactions through face to face meetings, or at least interpersonal relationships. This does not mean, obviously, that a part of the exchange could not be fully electronic. Nor does it mean that electronic intermediation will not play a role in the not fully electronic transactions. This however points out that the ability to physically access the customer will continue to play an essential role in the distribution of goods and services. This also leads to getting a better understanding

of the role played by commercial intermediaries, in that respect and others.

#### **4. The Economics of Commercial Intermediation**

The core argument of this paper is that electronic intermediation will not become a substitute for commercial intermediation. The opposite popular thesis relies on the assumption that intermediaries exist because of information asymmetries among producers and final consumers. Intermediaries are needed because the former do not know what the quantities, features and schedules of the latter's consumption plans are, and vice versa (consumers do not know the producers' production constraints). According to this line of analysis, intermediaries are assumed to play two roles:

- A purely information role whereby intermediaries are perceived as entities gathering, sorting and arranging information about both parties' plans in order to match them. The fact that they are partners in the exchanges is purely incidental. It is a way to be remunerated by taking a commercial margin. Since they act as brokers, they should and could be remunerated by a fee.

- An economic matching role in which one considers that intermediaries do not have the ability to perfectly match producers' and consumers' plans. They consequently hold inventories and perform other logistic functions in order to match these plans in a universe where perfect matching is impossible. They therefore have to bear risks. That is why they are partners in the exchanges. In both cases, providing the customers and the producers with efficient means of information will enable them to spontaneously match their plans and will transform commercial intermediaries into useless third parties. This would be true if the "governance" (Williamson [1996]) of the "macro-transaction" linking producers and consumers was just a problem of matching both parties' plans (which remains however a huge optimization problem when there are millions of parties). However, in addition to those problems one can mention two other essential coordination difficulties among parties:

- First, information asymmetries cannot be reduced to asymmetries among plans. In a decentralized economy, players do not know the same things, and know that they can draw profit from these asymmetries. This leads to the well known adverse selection and moral hazard problems, linked to the difficulty in assessing the actual return one will get in the exchange, and to the difficulty in evaluating the level of the return the other will accept to give. Moreover, there are many enforcement problems linked to these information asymmetries since enforcement mechanisms are also bound by information and knowledge asymmetries.

- Second, there are incompatibility problems. Indeed, there is no reason why the optimal plans of agents should spontaneously match. For instance, production plans can be

completely disconnected from the customers' schedules. If ready-to-wear clothes exist, this is partly because most of us cannot wait for the whole production cycle before wearing the cloth we tried on in a shop. This is the same with many of our consumption decisions that are more or less instantaneous and impulsive, while most goods and services need time to be produced and bring to the final consumer. In a monetary economy, this miss-match among plans is stronger because of agents' liquidity constraint. When one considers these two aspects of the coordination difficulties among producers and final consumers one gets a different picture of the role of commercial intermediaries in a market economy. Obviously, intermediaries make it possible to coordinate plans by managing information, but they also perform other economic functions such as market liquidity management (market clearing), securing exchanges, managing the logistics of exchanges, etc. Moreover, the fact that they do not only play an information management role, provides us with a different picture of the impact of the development of information networks. Indeed, there are only partial substitution possibilities between electronic information management capabilities and commercial intermediaries. Let us go back to the role played by commercial intermediaries. From a New-Institutional perspective, the role of commercial intermediaries can be interpreted in terms of "governance" of the "macro-transaction" that links the producers to the final consumers. Commercial networks ensure the adjustments (in terms of volume, quality, availability, etc.) among producers and consumers, but they also secure the transaction, ensure the market liquidity, (etc.) by taking charge of five functions.

- Information Management: by constituting a single counter between producers and consumers, and by compiling and filtering information, they *de facto* simplify the producer's problems of acquiring information about the demand, and the consumer's problem of being informed of the supply structure and capabilities. Intermediaries can obtain wide economies of scale, scope and specialization in the performing of that function.

- Logistics Management: by specializing in the sorting, packaging, transportation, and stocking of goods they enable both sides to benefit from economies of scale, scope and specialization in the difficult task of conveying goods from their production sites to their consumption sites in a timely manner.

- Transaction Securization: a safety role, by controlling (and guaranteeing) the quality of products delivered to consumers and by guaranteeing payment to the producers, commercial networks enable both sides to overcome the adverse selection and moral hazard problems that characterize any transaction.

•Insurance: By buying the production before consumers expressed their needs and by guaranteeing the final consumer that he will get the goods whatever happens on the supply side, intermediaries play an insurance role. Indeed, thanks to their knowledge about both sides of the market and their relationship to these sides, they are able to assume the commercial risk in place of the producer and to provide the consumer (respectively, the supplier) with an inbound (outflow) guarantee of having the goods delivered (to dispose of its production.)

•Liquidity: By buying the products from the suppliers before they reaches the final consumer (often as soon as they are manufactured) and by lending money if need be to the consumer, intermediaries are guaranteeing systematic market clearing despite both sides' liquidity constraints. Before going back to the economics of these various tasks held by commercial intermediaries, it can be useful to point out two important elements: First, while different, these tasks are interdependent in the sense that the way each of them is managed impacts on the costs borne by the commercial intermediary to perform the others. For example, there is arbitration between information costs and logistic management costs. Michael [1994] documents this when he compares the relative efficiency of mail order companies vs. Retail stores in the 1910-1940 period. He points out that the former bore less information costs since they did not provide their customers with an extensive information service about their products, while this was the case of retailers, that had to dedicate time to help their customers to choose and get a better idea of the products' features. However, mail order companies suffered from a larger return of goods than retail stores. That is why such services are usually bundled when provided by commercial intermediaries. The economic role of commercial intermediaries and marketing chains is precisely to define business models and implement them through networks of intermediaries in order to provide consumers and producers with a set of intermediation services that will enable them to transact at the lowest possible cost. Second, the bundling of those services is precisely what differentiates commercial intermediaries from simple brokers. Hackett [1992] and Spulber [1996], while using different terminologies, also insist on the importance of differentiating those agents that purchase and resell goods –our "commercial intermediaries" qualified as "merchants" by Hackett [1992], and "marketers" by Spulber – from those that facilitate exchanges without buying and selling goods. The former – including retailers, wholesalers and banks, second-hand dealers, energy marketers, etc. – are compensated with the residual surplus of the operation they manage, while the latter – including travel agents, real estate agents, insurance agents and stockbrokers – are remunerated with a revenue-sharing commission. Both authors

insist on the idea that, because these two types of intermediary differ both in the way they hold property rights and in their remuneration principle, they do not play the same role in market clearing. First, since they bear risks and are remunerated by the residual surplus, commercial intermediaries are better incited to provide the required quality of additional services than that provided by brokers. This is essential when those additional services have an influence on the level of demand (Hackett [1994]). Second, as pointed out by Spulber [1996], commercial intermediaries can decide to tax or subsidize transactions among the producer and the final consumers in order to get a better match among their plans. This is essential when these plans do not easily match because the production process is difficult to control or because the demand is evolving randomly. In addition, we think that the bundling of information, logistic, transaction securization, insurance and liquidity services is also an essential difference since it has a "single counter" effect that decreases producers' and consumers' transaction costs and enables commercial intermediaries to benefit from economies of scope. Betancourt & Gautschi [1993] also take the bundling of services to be an essential feature of commercial intermediaries, explaining both their existence and the nature of their remuneration. Since they face a bundled service supply, consumers cannot choose among each of these services. This enables the distribution firm to price the various services independently of their costs. Cross subsidies among products and consumers can have positive welfare effects in some circumstances. For at least these three reasons, commercial intermediaries must not be confused with information brokers. What is the economics of commercial intermediation? This question is both quite simple to answer, and difficult to document. Indeed, while it account for 15 percent of the US GDP (Spulber [1996]) and a significant part of employment (as mentioned in section 2), commercial intermediation has not captured the attention of economists. The existing literature is primarily concerned with financial intermediation, and its central focus is on providing portfolio diversification to traders (Cf. Lewis [1995]). Only a few contributions are dedicated to the analysis of intermediation for goods and services (e.g. Hackett [1992], Betancourt & Gautschi [1993], Michael [1994], Spulber [1996], etc.). Moreover, figures, facts and applied studies are all quite scarce. Following Spulber [1996] as well as other contributions one can however point out the economic advantages of intermediated exchanges. Commercial intermediaries enable both the supply and the demand side to benefit from lower transaction costs because of:

- Centralization. This notion has to be understood in two ways. First intermediaries are a single counter among many consumers and several suppliers. Second, intermediaries

intervene in transactions concerning different sets of goods and services. These have five main effects:

- Economies of scale in transacting: when there are millions of potential partners it is less costly to concentrate relationships among them through a central agent. A single counter decreases search, negotiation and implementation costs. Moreover, the single counter facilitates the setting of a single market-clearing price (Spulber [1996]).

- Economies of scope: since there are often many redundancies among transactions, the ability to group transactions (e.g. the ability for a buyer to simultaneously purchase a set of goods, rather than buying them separately) enables the sharing of fixed transaction costs among several transactions.

- Cross-subsidization among transactors and among transacted goods. As pointed out above, since it is a central point in a set of transactions, the merchant can favor matching among supply and demand by cross-subsidizing transactions in order to play on the various consumers' willingness to pay and suppliers' opportunity costs. When there are information asymmetries and search costs, cross-subsidization of transactions can increase welfare because it enables traders to save costs and to improve the chances that trade will take place (Myerson & Satterthwaite [1983], Spulber [1988, 1996], Mookherjee & Reichelstein [1992]).

- Risk-pooling. Intermediaries try to reduce market uncertainty by holding inventories. Inventories enable them to guarantee suppliers (respectively consumers) with a guarantee that their output will be taken away (respectively delivered). In order to protect themselves against the risk of holding inventories, retailers diversify by purchasing and reselling a variety of products. They thus pool suppliers' risk (Lim [1981]).

- Rearrangement: when producers' and consumers' wants do not spontaneously match, the central agent can try to match them by rearranging the provided set of goods and services in order to tailor them better to the demand. Indeed consumers are seeking for features, not goods. By being able to rearrange the output of the productive system, commercial intermediaries can try to match producers' constraints to consumers' needs when they do not immediately fit. This is the role of financial intermediaries recognized by the literature (Cf. Lewis [1995]). The potential of going through a single central agent is obviously bounded by this agent's ability to manage complexity. Bounded rationality therefore limits the ability to completely centralize exchanges and explain the existence of numerous commercial intermediaries. In addition, the limited ability to concentrate resources in the hands of a small set of economic agents is another reason for the existence of several intermediaries. Indeed,

intermediation necessitates being able to advance financial resources and to move goods and services across time and space.

- Investment in specific assets: when transactions require investments in specific assets to be efficiently performed, specialized intermediaries have the possibility and the incentives to invest because consolidating transactions through intermediaries make these investments profitable, which is not always the case when direct trade occurs. This enhances efficiency because those investments negatively affect transaction costs, and because, everything remaining equal, the efficient level of investment is more often reached (especially because for a part of these investments there are increasing returns to scale). Three types of investments are performed:

- Investment in transactional knowledge: In a non-Walrasian world, consumers do not know the features of the good supplied and producers do not know consumer needs. Discovering this information is costly, but generates strong economies of scale because many consumers and producers can use it. Because they are central in the market, commercial intermediaries benefit from some cost advantages in producing this information. For instance, large super-market chains are seriously challenging today the marketing survey providers because, thanks to the tracking of bills and payments, they have a very good knowledge of their consumers' behavior. However, their central position also enables them to spread this information both to customers and to providers in the form of advice, requirements, behavior channeling, etc. As far as adverse selection and moral hazard are concerned, intermediaries are incited to dedicate means to the identification of their clients' and suppliers' characteristics. Since they are residual claimants (because they hold property rights), they will bear the consequences of insufficient efforts to reduce the associated risks (Diamond [1984]). This is an argument that is parallel to that made by Alchian & Demsetz [1972] about the advantages of central monitoring. Second, as pointed out by Biglaiser [1993], commercial intermediaries trade higher volumes than individual traders. They therefore have strong incentives to learn. Third, commercial intermediaries can learn faster and more efficiently because they have a greater propensity than individual traders to repeat the trading game with each trader. In sum, commercial intermediaries have both strong incentives and the ability to generate economies of learning that enable them both to more efficiently match demand and supply and to reduce the negative consequences of opportunism.

- Investment in mutual trust: intermediaries have a strong interest in investing in mutual trust with each of their partners. Indeed, it enables them to perform their intermediation task better. On the one hand, by

establishing a repeated relationship with a buyer (respectively a supplier) they decrease information and enforcement costs (repeated game), while they secure their outbound flows and increase their ability to discriminate. This will be of some interest for the suppliers (respectively buyers). On the other hand, this will provide the customer (respectively the supplier) with a supply (respectively a demand) tailored to its needs, and a kind of implicit assurance of delivery despite contingencies (respectively an insurance to dispose of its output).

- Investment in a reputation for fairness and efficiency: intermediaries have greater incentives than individual traders to invest in reputation. First, since they are central in the market, the probability of re-transacting with each trader is greater than the probability of re-contracting between two individual traders. Second, since intermediaries handle the products of more than one supplier, their incentives to sell a lower quality good differ from that of individual suppliers. Indeed, the selling of a low quality product will generate a loss of reputation for all the other products traded (Biglaiser & Friedman [1994]). Third, investing in reputation – especially through the development of a brandname – is an essential means of securing investment in learning. Indeed, Intellectual Property Rights do not protect the types of investment that are performed by commercial intermediaries to provide both parties with efficient trading services. There are therefore positive externalities between the incentives to invest in knowledge (and organization) and the incentives to invest in building a commercial reputation.

- Investment in physical assets: when it is necessary to invest in specific means to transport, stock and distribute goods and services, commercial intermediaries can benefit from economies of scale and scope. By studying the evolution of distribution costs in the US from 1910 to 1940, Michael [1994] was able to show how commercial intermediaries optimized their means of distribution to decrease these costs as the spatial distribution of the population changed.

- Providing Liquidity: as industrial investors enable the financing of the production cycle, commercial intermediaries finance the distribution cycle. This avoids the problem of double wants, in which a buyer and a seller need to want and to be able to transact at the same time. As pointed out by Spulber [1996], this helps to clear markets, smooth the patterns of demand and supply fluctuations and reduce the risks of exchange. As pointed out by Clower & Leijonhufvud [1975], the problem of double coincidence exists as soon as there are fixed transaction costs that incite traders to transact only from time to time. The synergetic management of the various functions quoted above, enables commercial intermediaries to finance

the distribution cycle at a lower cost than financial companies will be able to do. Let us now analyze how ICTs affect the economics of commercial intermediation.

### **5. Can Electronic Networks Bypass Commercial Intermediaries ?**

Can information technologies enable traders to potentially bypass the services provided by commercial intermediaries in order to establish direct links among them ? To answer this question, it is useful to assess what are the key resources to manage each of the five functions we identified as the essential services provided by commercial intermediaries (information, logistic, security, insurance, liquidity), and to analyze how electronic networks can impact on them. We will point out that, except for information management, the value added by commercial intermediaries relies on assets that cannot be substituted by electronic networks. We will even argue that intermediaries are useful and efficient in performing information tasks. This will lead us to claim that commercial intermediaries will not be replaced by information networks, while these networks will probably enable them to perform their tasks more efficiently.

### **5.1. Information Networks and Information Management**

The ability of commercial intermediaries to efficiently manage information is primarily due to their central position in the transaction chain between suppliers and customers. Indeed, it enables them to be directly "connected" to these various information providers and seekers. Moreover, because they manage long term commercial relationships with them, they benefit from privileged access to private information. Indeed, they benefit not only from learning effects, but also from the positive externalities of mutual trust. It is clear that a universal, low cost and "intelligent" network like the Internet can enable both the producers and the sellers to bypass the information services provided by commercial intermediaries. Indeed, Internet decreases search costs both through its universality and its ability to support the use of automated search means (e.g. search engines). This is however true only for the information that both parties agree to reveal. Private information – such as consumers' willingness to pay or producers' reservation prices – will not be displayed on the network, whereas a commercial intermediary is often able to extract it through its commercial relationships. In fact, bypass possibilities will strongly depend upon the essential features of markets and goods. As pointed out in section 3, if the traded goods and services are easily describable, and if no market player is able to prevent the formation of an electronic market place, such a market place will emerge and it will be possible for traders to automate information searches and reply to requests to quote. In this case, the combination of competition and benchmarking will force both sides of the market to reveal information. Whether

electronic networks are able to favor disintermediation of information tasks deserves greater attention however. Indeed, as mentioned above, reduced communication and processing capability costs do not mean zero information costs. Hagel & Singer [1999], point out that intermediaries will be necessary even for the information market in order to file information efficiently, bear and decrease search costs (thanks to economies of scale) and to protect the privacy of cyber-consumers. Avery, Resnick & Zeckhauser [1995] make a similar point: "The information superhighway brings together millions of individuals who could exchange information with one another. Any conception of a traditional market for making beneficial exchanges, such as an agricultural market or trading pit, or any system where individuals respond to posted prices on a computer screen is woefully inadequate for the extremely large number of often complex trades that will be required. Electronic brokers will be required to permit even a reasonably efficient level and pattern of exchanges. Their ability to handle complex, albeit mechanical, transactions, to process millions of bits of information per second, and to act in a demonstrably even-handed fashion will be critical as this information market develops." Similarly, Zwass [1999], the French Mission for Electronic Commerce ([http://www.finances.gouv.fr/mission\\_commerce\\_electronique](http://www.finances.gouv.fr/mission_commerce_electronique)), and the US Department of Commerce [1999] document the emergence of these new types of electronic intermediaries (so-called cybermediaries or infomediaries) that become valuable by facilitating product search, evaluation, and distribution. In fact, most of the existing so-called internet merchants are only information brokers which are able to create businesses by reducing search costs in industry-specific segments. Realbid has created a site (<http://www.realbid.com>) that brings together the buyers and sellers of commercial real estate. The firm's offering consists in removing the need for the buyer to study multiple long proposals to find likely purchase candidates (Cf Zwass [1999]). In another industry, Cattle Offerings Worldwide posts on its site the pedigree and genetic traits of cattle embryos and lets cattle buyers bid on them (Zwass [1999]). Industry segments with widely dispersed sellers and buyers, and offerings that lend themselves to simplification with a searchable database are promising targets for this intermediation. When one takes into account marketing strategies, there are other reasons to maintain intermediaries. Indeed, they can protect privacy of information by hiding the identity of traders. Indeed, as pointed out above in the case of discounted travel (Degriftour case, § 3), vendors do not want to reveal their discriminating behavior. That is why, in practice, they often sell under various trademarks and through different marketing channels. This is the same for consumers who do not want to be too tightly targeted by product and service providers according to their willingness to pay. Going

through a third party that guarantees "anonymity" is another "information" service that requires an intermediary. In sum, while commercial intermediaries' information tasks are potentially the functions that are the most challenged by the ability of ICTs and digital networks, there are a number of reasons that suggest that intermediaries will continue to be useful in handling information between the supply side and the demand side. Moreover, it has to be taken into account that ICTs can be used by commercial intermediaries to increase their efficiency in providing traders with efficient information handling services.

## **52. Logistic Management and Electronic Intermediation**

The logistic services provided by commercial intermediaries rely both on logistic assets (transportation means, grouping and degrouping platforms, storage capabilities) and upon their ability to manage them. This latter largely depends today upon the mastering of an efficient information network. It has to be pointed out that the set of logistic assets has to be tightly tailored to the characteristics of the goods distributed and to the features of the traders, especially their spatial distribution. As pointed out by Michael [1994] in his study on the competition between marketing channels at the beginning of the century, mail order firms developed retail stores in urban areas, because in those areas there were strong cost advantages to sell through retail stores rather than to sell through mail order (which was more competitive only in rural areas). This is how Sears and Wars, that were primarily mail order firms, became major players in retail distribution. A similar phenomenon has occurred in France over the last 15 years with mail order firms like La Redoute or Les 3 Suisses. Moreover, they have also developed new delivery techniques to try to benefit from economies of scale. They have provided customers with a next day delivery service that is available only if customers agree to withdraw the ordered goods at a "delivery point". Since the delivery otherwise requires a one to three week delay, most customers in urban areas are incited to agree to delivery elsewhere than at home. This has enabled mail order firms to concentrate their deliveries and therefore to considerably reduce their costs. They have thus stayed competitive with retail stores. These two examples point out that the efficient management of logistic assets is a major service provided by commercial intermediaries. This is even more clear when one speaks of goods with specific characteristics (such as size, fragility, perishability, etc.), that require specific handling, storage or transportation operations. What can intelligent networks change in the management of logistic operations? On the one hand, it is clear that ICTs enable a more efficient management of networks of logistic assets. For the last 30 years, the ability to move goods faster and cheaper has been being largely linked to

the ability to optimize the management of logistic means though the use of data networks which enable logistic companies to deploy their means preventively, to assess the actual state of the system just in time, and to reoptimize the allocation of means permanently. On the other hand, it is not clear whether this trend will lead to an ability to bypass the logistic services provided by commercial intermediaries. In the professional think tank, it is often argued that customers and producers will be able to directly coordinate with logistic subcontractors to directly ship goods between them. What will be lost in term of efficiency (because the logistic capabilities will no longer be tailored to the specificity of the goods or of the population), will be saved thanks to a higher rate of use of non-specific capabilities. Moreover it is often argued that less physical capabilities will be needed and that this type of distribution process will be less resource consuming (Cf. § 2). These are however, speculations and the facts seem to contradict such an optimistic vision. Indeed, the existing distribution services on the Internet do not prove that they will be able to sustain competition from traditional retailers. This does not mean, obviously, that they will be unable to serve some niches. It only means that it is not sure that the logistically-disintermediated model of sales is a viable way to support the bulk of B-to-C commerce. Let us quote two examples: books and electric appliance distribution. The famous Amazon.com <sup>15</sup> has no physical store infrastructure. Rent and depreciation represent less than 4 percent of Amazon's sales compared to 13 percent for the traditional retailer, and its labor costs are lower as a percentage of sales. Amazon has less capital tied up in inventory: its books turn 20-40 times per year versus two to two-and-a-half times per year for the traditional retailer. This should give a very strong cost advantage to this company as compared to retailers. However, Amazon's advertising and marketing costs have been high relative to its sales volume. This is partly due to the high cost of penetrating a new market. Nevertheless, this is also a structural problem since on-line sellers have to permanently remind their customers that they should visit their site. This is for instance a well-known characteristic of the service providers on the Minitel system in France where advertising expenditures represent a significant share of costs. Mail order companies also bear significant advertising and marketing costs (Cf. Michael [1994]). This led Amazon.com to sell its books at a relatively high price. Despite these high prices, Amazon's gross margin (retail sales minus cost of goods sold) was 19.5 percent of retail sales compared to 36.7 percent for traditional retailers. This was also partly due to the fact that traditional retailers purchase their books from publishers and benefit from discounts due to their large sales volume, while up until 1997, Amazon purchased its

books almost exclusively from wholesalers, paying markups the traditional retailer largely avoids. Amazon had to follow another strategy when the traditional retailers entered the Internet business. Indeed, by 1997, Barnes & Noble, a major books distributor in the US, had developed its own Web site to compete with Amazon. Since they were able both to optimize logistic operations and purchasing policy, Barnes & Noble were able to propose lower prices. This quickly led Amazon to align its prices. This led Amazon.com to switch to another business model. Indeed, at the beginning of its story, Amazon was more an information broker than a commercial intermediary. It ordered books on demand from dealers. When it had to face the competition of actual intermediaries, they were obliged to purchase large quantities from publishers, to hold stocks and to optimize logistic operations. Barnes & Nobles continue to benefit from a strong cost advantage because they are able to avoid the costs of delivering all their products directly to the customers. Their Web site is an additional display case, but they can incite their customers to go to their shops to get delivery from their on-line orders. This is an important cost advantage since home delivery represents 8 percent of the price of the delivered goods.<sup>16</sup> While, the Barnes & Noble vs. Amazon.com saga has only begun, one can expect that thanks to its costs advantage, Barnes & Noble is likely to prevail as price leader. Amazon will have to choose between staying a broker that will dominate some niches on which large retail distributors do not have any competitive advantage (e.g. rare books, academic books and books delivered abroad), or become a retail distributor as was the case for mail order firms in the US at the beginning of this century (Cf. Michael [1994]). Another case illustrates the efficiency of traditional retail intermediation. Marcopoly is a French startup that tries to market consumer electronics and domestic appliances (Workshop "Business Economic Models", 1998-1999, Cf. Note 12). The viability of its business model is in question. Like Amazon.com, it cannot sustain price competition against well-established large specialized distributors that benefit from low purchasing prices from manufacturers because of the large volume they sell. Consequently, Marcopoly tries to provide customers with a larger range of choice. Indeed, large suppliers concentrate sales on a restricted range of products so as to benefit from economies of scale in terms of logistics and bargaining. They thus display only a part of the available products in order to channel consumer choices <sup>17</sup>. Marcopoly's strategy faces two problems. First, Marcopoly is unable to provide its clients with a guarantee of timely deliveries. Indeed, it cannot hold inventories because it would be economically incompatible with the logic of customized sales that lead to sell small amounts of a very broad range of items. It therefore purchases on demand small quantities from the manufacturers, which therefore do not want to guarantee

Marcopoly any commercial advantages like delivery guarantee (and obviously rebates). Second, Marcopoly cannot provide its customers with competitive prices because, as pointed out above, they do not benefit from any rebates for large volumes. Moreover, since they do not benefit from any economies of scale in logistics because they ship only small volumes on a delivery to delivery basis, they have to face huge logistics costs (up to 15 percent of their sales) because logistics subcontractors do not grant them reductions. Clearly these two examples can only be taken as suggestive; it would certainly be worthwhile to look at more cases. Moreover, they do not only point out commercial intermediaries' competitive advantage in terms of logistics. At the same time, they clearly point out that there are some logistics advantages in concentrating the bulk of the distribution of tangible goods through retail stores. This was documented by the above quoted history of the mail order industry in the US (Michael [1994]), where firms had to set up their own store networks in order to stay competitive in of large density population areas. Moreover, industry specialists point out that today large manufacturers (such as Miele or Sony) are hesitating to launch their own Web sites to market their products since they identify that it could be harmful for distribution chains that will inevitably remain their partners. Indeed, these chains provide them with efficient logistic services (including after sales services), and they do not want to dedicate huge means to the management of the related problems. To conclude, while innovation in the organization of logistics chains could decrease the costs associated with direct shipment from producers to customers, it is doubtful whether commercial intermediaries will loose their cost advantage in organizing the physical movement of goods and the delivery of services. Moreover, these intermediaries can rely on ICTs to increase the efficiency of their logistics operations.

### **53. Transaction Securization and Information Networks**

The providing of transaction securization services by commercial intermediaries clearly depends upon their expertise, their reputation and their commercial relationships that enable them to decrease the level of information asymmetries among traders and to benefit from means of enforcing formal and informal commitments (through the repetition and the bundling of transactions). These can hardly be substituted by operations performed by electronic networks. One can Obviously imagine databases and rating systems that will track information about transactions and partners in order to provide traders with a kind of rating of a given trader's "reputation" (willingness) to be fair and efficient. This kind of quotation however poses at least two problems. First, it is only information about the past, not about the future behavior of the trader. Put another way, this is not information whose credibility is high, because it is not associated with a credible threat

of retaliation (other than a potential decrease in rating) if the trader is unfair or inefficient (while the commercial intermediary can and has strong incentives to really stop purchasing or delivering). Second, users do not have any guarantee about the quality and the incentive of the information producers. If this is a rating system, several questions arise: what is the rating method? What are the assessor's motivations? Is he honest and independent? etc. If it is a simple database system, the questions are: How can one use the information provided by the database? Is this information exhaustive and unbiased? etc. Put another way, the ability to track information more efficiently through networks like the Internet clearly increases market transparency and thus decreases the level of adverse selection and moral hazard problems. However it does not stop them since information costs are not annihilated (there are still huge costs to intelligently process information), and because much opportunistic behavior can arise off line. For instance, if the quality of the good delivered is below that promised, this will not be systematically detected through the information circulating on the Web. To conclude, commercial intermediaries will continue to play an essential role in monitoring exchanges, even if network resources will potentially help them to perform this task better.

#### **54. Insurance, Liquidity and Digital Networks**

The providing of inbound and outflow insurance is due, first of all, to the specific knowledge of commercial intermediaries that are able to know both production and consumption opportunities. This is reinforced by their ability to require assistance (on a fair's fair basis) from their business partners. To avoid falls in deliveries, a merchant can ask for additional volume of deliveries. To decrease the volume of unsold goods, he can incite his clients to buy higher volumes than planned. His investments in commercial relationships are therefore of interest in providing this security to having the goods delivered or disposed of. Last but not least, its financial capabilities enable it to hold inventories. Again, while networks could substitute for commercial intermediaries for the pure information aspect of the insurance function, they could hardly substitute for the other aspects. Electronic networks could however enable commercial intermediaries to widen their ability to get in touch with additional customers or providers. Pure electronic intermediation will not be able to overcome traditional intermediation because commercial relationships and financial resources will continue to be essential to match supply and demand because on both sides wants do not automatically coincide. The liquidity guarantee is provided by commercial intermediaries thanks to the same set of assets that inbound and outbound guarantees. This leads to a similar conclusion in terms of traders' ability to bypass commercial intermediaries thanks to network capabilities.

It is important to recognize the essential role of this liquidity service in our actual economies. Indeed, even if production cycles have been reduced in many industries and even if production capabilities are more flexible than in the past, production constraints are still far from instantaneity and total flexibility. Put another way, most of the time production has to be planned and launched long before customers express their wants. In the automotive industry, for instance, the production cycle is still several weeks (as any customer can experience when he orders a car with a special set of options). Moreover, since there are still strong economies of scale to produce large series of standardized cars (because of the costs of readjusting production lines), car manufacturers continue to plan their production on a yearly basis and use several marketing techniques to channel the demand according to the production requirements. This industry is therefore far from being organized according to the "production on demand" model. This explains why car dealers are required to order cars on a yearly basis, and to pay for them on delivery (long before they are sold to customers). Since the automotive industry is probably the one that has pushed the furthest towards "just-in-time", the idea that a direct connection between supply and demand will make it possible to suppress commercial intermediation because it will enable manufacturers to produce on demand, thus avoiding the associated inventories, risk and liquidity constraints, seems irrelevant. \* \* \*

#### **6. The Future of Electronic Commerce**

Does that mean that electronic commerce will not develop ? Does that mean that new intermediaries will not emerge ? Does that mean that no transactions will be performed on-line ? Certainly not. In this paper we have tried to demonstrate that commercial intermediaries will continue to be useful in an information society, and therefore that the future of E-commerce must not be assimilated to a worldwide digital Walrasian market. Not only will commercial intermediaries continue to provide bundled transactional services to customers and producers, but also physical locations will continue to remain essential. Indeed, face to face meetings will continue to be unavoidable to exchange non-codified information and knowledge, and to establish interpersonal relationships that are often of importance to solve transactional problems (informal commitments, trust, etc.). Moreover, a customer's ability to physically access goods is essential to assess them. It is also essential for the vendor, because he can simplify and optimize his logistic operations. This explains why traditional wholesalers and retailers will continue to play an essential role in the information society. However, this does not mean that they will continue to perform as in the past. Digital networks are an essential tool to re-engineer their processes in order to become more efficient (or at least to survive in

the competitive race). For the last 25 years, ICTs have already made it possible to reengineer marketing channels. They have made it possible to considerably accelerate the speed of the flows of goods within distribution networks, contributing to significant progress in productivity. Moreover, they have made it possible to provide customers with many enhanced services. This trend will probably be reinforced with the rise of the Internet. It will first enable commercial intermediaries to better manage their own internal operations (optimization of logistics operations, cash management, information handling on supply and demand, etc.). It will secondly enable them to provide their customers with additional services that will be targeted both to add value to the service portfolio provided by intermediaries, and to discriminate between them more subtly. For instance, those customers who do not want to spend time gathering products in super-markets will be able to have their basket prepared and even home delivered (but supermarkets will continue to exist for those customers who will not want, or who will be unable, to pay for this type of labor intensive service). Zwafft [1999] quotes the interesting case of Marshall Industries, a distributor of electronic products. Its Web makes software available that can be downloaded to the customer's site in order to design virtual chips that will work with the chips distributed by Marshall Industries. The software code describing the newly designed chips can in turn be uploaded to the distributor, who immediately burns the designs into prototypes that are mailed to the customer. By developing such a value-added service, the intermediary makes itself indispensable to both its suppliers and its customers. In addition, Web sites and cyber means will be a major support for advertising and marketing operations. The Internet has indeed the advantage of being a hybrid between a mass-distribution network (and therefore a mass-media broadcasting system), and a telecommunications network (that enables point-to-point customized and interactive communication). This makes it quite efficient to be used in targeting commercial communications. The above arguments lead to the idea that traditional commercial intermediaries will play a major role in the development of E-commerce. As has been pointed out several time in this paper, many of the major player in that industry are not new entrants, but traditional commercial intermediary firms. This does not mean at all that new intermediaries will not be able to emerge. Some of them, like Amazon.com, seem to have already discovered relevant niches. However, since E-commerce will be essentially a set of services that will add features to the traditional marketing channels (rather than a totally new marketing channel), the firm that already controls those marketing channels will have a strong competitive advantage over new entrants. Indeed, they have the know-how, the reputation, the logistics capabilities, (etc.) to distribute products and services. In that respect, it seems

that three types of players benefit from significant competitive advantages. All of them are essential players in actual distribution networks. Let us cite them according to their decreasing ability to play an essential role in E-Commerce:

- Supermarkets (and specialized distribution) chains benefit from logistics networks that are optimized according to the density of the population, well-known brand names and good knowledge of supply and their customers. Moreover, they have strong financial capabilities thanks to their ability to be paid in cash and to pay their suppliers on credit.

- Mail Order Companies generally have unique experience in at-a-distance selling and a trademark to do it. Moreover, they have also optimized logistics systems to ship goods to customers (Cf. the cases of La Redoute and Les 3 Suisses quoted above, Cf. § 52). They also maintain relationships with and have good knowledge of their customers who will probably be the most interested in buying on-line.

- Wholesalers master the backbone logistics networks and are those who hold the financial resources that finance the bulk of the distribution cycle. In France, the OCP that is one of the major pharmaceutical products wholesalers was able to easily respond to the competitive pressure of the new entrants that were relying on the Internet capabilities to penetrate the hospitals and drugstore market. Indeed, it easily developed in several months a service that makes its supply even more attractive than before. In the US, the famous McKesson company was able, long before the rise of the Internet, to become an essential service provider to the healthcare industry because its information network enabled it to provide industry members not only with an efficient delivery service, but also with marketing and management advice, and financial, (etc.) services (Clemons & Row [1988]). As compared to these commercial intermediaries, two other categories of player seem to benefit from less competitive advantages:

- Logistics companies will certainly be essential partners in the development of E-Commerce, as illustrated by the cases of UPS and Federal Express. However, it is not sure that they will be able to be anything other than subcontractors. Indeed, they do not have the commercial know-how to match consumers' demand and manufacturers' supply, they do not have a brand name associated to distribution services, etc. They could however benefit from some advantages in some niches. Moreover, they will definitely be included in many alliances, joint-ventures and other long-term relationships to develop specific services sustaining the development of E-commerce based services.

- Information service providers and information brokers will also be able to exploit some specific niches. It is more doubtful whether they will be able to compete with

traditional distribution channels for the bulk of the future commerce. Several case studies cited in this paper – Amazon.com, Degriftour, Marcopoly, etc. – seem at least to confirm this. Like logistics companies, information service providers will become essential partners in the development of E-commerce applications, but not their organizers. Indeed, they could provide on-line services facilitating transactions such as:

- Smart search tools in order to decrease traders' information costs. We however pointed out that the efficiency of such services is very much dependent of the traders' strategies (§ 3 & 51)

- Certification services: third party of confidence can authenticate information providers, guarantee the accuracy of the information broadcast on the Web and ensure that information providers enforce specific rules. Information providers can develop such services. They will however be competing with traditional rating and certification companies that are often already well established thanks to their expertise and reputation.

- assistance service to negotiate and conclude trading agreements. On line, services can indeed provide traders with useful information about average price, required contractual clauses, etc. to help them make efficient deals.

- Filing and other notarial services to ensure that the deal has been made and to support the settlement of conflicts. In sum, digital networks will probably modify the organization of marketing channels. They will continue to be dominated by companies that are specialized in the providing of commercial intermediation services, but the corporations that will control these channels will probably be those companies that are already organized in networks and that can combine economies of scale with physical closeness to consumers. These companies will probably reinforce their competitive advantage as compared to independent retailers and small wholesalers<sup>18</sup>. While there will be exceptions, new entrants will probably remain partners of those dominant commercial intermediaries. While they master technical functions that are essential in the development of E-commerce, they do not own the know-how, the network of commercial relationships, the reputation and the physical assets that are necessary to efficiently intermediate between supply and demand. What has been argued in this paper is however relevant only for goods and services that are partly tangible. Indeed, goods and services that can be completely dematerialized do not require at all the same level of intermediation services. Indeed

- When these information goods and services do not have to be customized (i.e. when it is question of recorded music, general information or literature rather than consultancy services, R&D results, etc.), they can be produced

instantaneously on demand. Indeed digitized information can be duplicated almost just in time and cheaply. Instantaneity of production suppresses the complex problems of the coincidence of double wants, and the providing of inbound-outflow insurance and liquidity services becomes useless;

- Intangibles can be moved at electron speed over digital networks at a quasi-zero cost. This suppresses most logistical requirements.

- If network service providers secure electronic communication (privacy, authentication, etc.) efficiently, the transmission of all the information regarding the transaction of intangibles will *de facto* secure transactions. Indeed, on condition that the Law be tailored to digital communication, the performing of the whole transaction over the network (meeting among traders, negotiation, agreement and actual exchange), will enable quasi perfect verifiability. The securization traditionally performed by commercial intermediaries will become less useful. This does not mean however that direct trade among producers and consumers will systematically occur. First, as pointed in § 51, "informediaries" could be helpful to handle the huge quantity of information that will be exchanged. Second, ensuring on-line distribution requires a lot of expertise, and is submitted to economies of scale and scope. Indeed complex software systems have to be designed to ensure the providing of efficient and secured services. New intermediaries will therefore have some chance of emerging in these new markets to organize them. They will provide services based on the packaging and enhancement of information-based goods (Zwass [1999]). However, due to the removing of the time and spatial coordination of demand and supply, these intermediaries will not need to be merchants. They will act as brokers rather than as commercial intermediaries.

Two sets of fact seem to support these various assessments:

- First, actual E-commerce is essentially targeted toward information goods that can be easily turned into intangibles. As pointed out several times in this paper, while the on-line distribution of cars and wine is often reported by the press, the bulk of exchanges is due to information based goods. A recent report rating the top-50 Web shopping sites based on February 1997 usage found the top five sites to be shareware.com (software), download.com (software), columbiahouse.com (music and video), Amazon.com (books); and hotfiles.com (software) (Morgan Stanley [1997] quoted by Bailey [1998]). Since books and other printed material as well as music and video records can be easily dematerialized (Cf. note 11), there is little doubt that they will become massively distributed through on line systems in the next year... and that the exchanged goods on the Internet will primarily be such non-customized intangibles.

•Second, the most successful new intermediaries – Amazon.com, Auto-by-Tel, Degriftour, etc. – are information brokers and not commercial intermediaries.

### **7. Concluding Remarks**

While it is difficult to analyze the rise of E-commerce, because we are just at the beginning of its emergence, this paper is an attempt to assess how digital networks can support a re-engineering of the distribution networks. It is based both on an attempt to identify the relevant trends in the development of the Internet based systems, and on an analysis of past experiments of E-commerce on dedicated data-networks (Financial trading systems, Airlines' computerized reservation systems, Electronic data interchange networks, French Minitel-Teletel system, etc.). Regarding the E-commerce issue, this paper points out that digital networks will not become the universal market place that will enable a disintermediated relationship among producers and final customers. Indeed traditional commercial intermediaries provide many other services in addition to information services. These services will continue to be essential for the exchange of all goods and services that are not completely intangible. Consequently, the rise of digital networks will essentially support a reorganization of existing marketing channels in favor of the large firms that already control dense and huge networks of commercial relationships and wide and efficient logistics systems. Traditional commercial intermediation will however probably disappear for all the standardized information goods that can be dematerialized. However, information brokers will probably organize the resulting new information markets. From a theoretical point of view, this paper is an attempt to focus the attention of scholars on the economics of intermediation. For a long time, intermediation remained a sub-discipline of finance. Commercial intermediation deserves greater attention than it aroused in the past. To better assess transaction costs in our economies, commercial intermediaries' activities have to be more precisely understood and studied (Cf. Wallis & North [1986]). Moreover, to better understand some essential issues, the way commercial intermediaries contribute to reduce transaction costs has to be analyzed. Indeed, "markets" and transactional systems are organized not only by institutions, but also by these particular economic agents. In the spirit of New-Institutional Economics, we pointed out the importance of property right allocation. The fact that commercial intermediaries hold property rights over the traded goods (as opposed to institutions and brokers) enables them to provide a set of bundled transaction services, which decreases the cost of transferring goods from producers to consumers in a decentralized economy. Unbundling those services will in many cases raise transaction costs, and limit the ability to provide those services to traders. This paper is however, a first attempt to analyze the economics of

commercial intermediation. It is clear that our analysis has to be deepened both at the applied and theoretical levels.

## NOTAS

1 Castels & Aoyama [1994] tried to confirm this at the G-7 level. They pointed out that despite the observance of the same kind of trend, the phenomenon was significantly different in the other developed countries, especially because the ICT sector did not create as many jobs as in the US. Jonscher's thesis has therefore to be qualified.

2 *"The Internet is a nearly perfect market because information is instantaneous and buyers can compare the offerings of sellers worldwide. The result is fierce price competition, dwindling product differentiation, and vanishing brand loyalty."* Robert Kuttner in Business Week, May 11, 1998 *"...industry titans such as Bill Gates, the boss of Microsoft, regale the world's leaders with the promise of 'friction-free capitalism.'" The Economist, May 10, 1997 "All of this brings you closer and closer to the efficient market."* Robert MacAvoy, President Eastman Consulting

3 One-fifth of Cisco's \$US 3.3 billion sales, are due to the fact that it is the major provider of Internet routers. As mentioned by the OECD (1997 a), this makes Cisco's Internet related revenues more important than most of the estimates of "total" electronic commerce. Amazon.com is valued at \$ 20 billion by stakeholders, while it makes only \$ 610 million of sales, with losses around \$ 125 million.

4 For instance, the French Mission for Electronic Commerce reviewed existing assessment on the volume of Business-to-Consumers commerce (B-to-C) volume worldwide. The various estimations go from  $\approx$  3 to 15 billion for 1998. This kind of problem is also documented by the US DoC [1999] (which points out that current private estimates of 1998 online retail trade range between \$7.0 billion and \$15 billion), the OECD [1997a], the French Government ([http://www.finances.gouv.fr/mission\\_commerce\\_electronique](http://www.finances.gouv.fr/mission_commerce_electronique)), and various specialists (e.g. Brousseau & Rallet [1999], Haltiwanger et al [1999]). The following illustrates perfectly the type and accuracy of the figures that are circulating: *"Analysts believe that Internet retailing (where sales are actually completed on the Internet) will grow quickly, but they vary widely on just how quickly. On the conservative end, it is expected to reach \$7 billion by the year 2000. If mail order sales are used to determine the potential for Web retail sales, as some suggest, the figure could reach \$115 billion in five to eight years. If online shopping provides customers with a larger assortment, better prices, and greater choice than mail order companies, the figure may even exceed that projection"*. (US Dept of Commerce [1998])

5 Electronic Data Interchange (EDI) consists in the interchange of structured and standardized data between computers belonging to parties involved in a business relationship. The dematerialization and the automation of document transmission are a source of major time and money savings. However, the main interest of EDI is that it makes the automation of inter-firm communications and associated information handling processes possible, allowing business partners to substitute capital for labor in the management of their relationships, to increase the accuracy of their exchanges, and to accelerate them. EDI is an efficient and reliable technology, well suited to the processing of large orders. Companies using EDI commonly save 5-10 percent in procurement costs (Source: US Dept of Commerce [1998]).

6 In France, around  $\approx$  120 billion are transacted through EDI systems essentially among manufacturers and distributors (62,5percent) and in

the automotive industry (25 percent) (Source EdiFrance). The US Dept of Commerce [1998] estimates that businesses already trade well over \$150 billion in goods and services using EDI over VANs. According to Forrester Research, of the 17 percent of the value of orders of large companies that are currently carried out by digital networks, the Internet accounts for 8 percent, and the EDI networks 7 percent.

7 The Teletel system is a dedicated data communications network that was launched in France at the beginning of the 80's at a time when PCs were just beginning to spread among professional users. This is why France Telecom distributed a specific dedicated terminal – the Minitel – to professional and domestic users. More than 6 million terminals were distributed over a period of ten years and 20 percent of households own a terminal through which they can access more than 25.000 services. Today PCs can be also used to access this network that supports many E-commerce applications that have been performing for years. According to the French Mission for E-commerce, the volume of sales generated on the Minitel system is near  $\text{€}$  1,1 billion; while the sales of the top 500 commercial internet sites do not reach  $\text{€}$  75 million. See Brousseau [1991b], OECD [1998b]

8 Even in term of Internet traffic, commercial applications are still in a minority on the WWW. In June 1999, the US Department of Commerce pointed out that, while there is a growing importance of the commercial Internet (e.g. in 1996, education sites dominated the top 15 lists of most visited sites, which did not include any E-commerce sites, in 1999 nearly all of the top web-sites offer content, communications, community, and commerce) sending or receiving email, obtaining information about a hobby, general news, and information for business continue to outrank online shopping as popular online activities.

9 This is also true for the revenues generated by advertising on the Internet, which is generally considered to be a major source of revenue on this medium. In the US the revenues generated by advertising on the Internet were about \$ 730 million in 1998, approximately 1 percent of the market. In France the  $\text{€}$  15 million of advertising revenues represents only 0,2 percent of the market (Source Mission Commerce Electronique:

[http://www.finances.gouv.fr/mission\\_commerce\\_electronique](http://www.finances.gouv.fr/mission_commerce_electronique))

10 IDC forecasts that the Western European market for Internet E-commerce will rise from  $\text{€}$  900 million in 1997 to  $\text{€}$  26 billion in 2001. The EC-financed CONDRINET study carried out by CAP Gemini suggests that  $\text{€}$  500 billion in annual sales will either be directly transacted across, or facilitated by electronic networks (Chapell et al :[1999]) The B-to-B market (excluding EDI and Minitel) is estimated at  $\text{€}$  15 billion in the US as compared to  $\text{€}$  300 million for France ((Forrester) and  $\text{€}$  840 million for Germany (eco-Verbandes); source Mission Commerce Electronique, ([http://www.finances.gouv.fr/mission\\_commerce\\_electronique](http://www.finances.gouv.fr/mission_commerce_electronique))

11 Typically, information goods and services can be totally or partially dematerialized. In music, MP3 coding and compression technology enables today the transport of recorded pieces of music on the Internet. Major Music Editing Companies strongly fear the emergence of a black market that will bypass their sales of CDs. They are therefore thinking of the development of on-line sites that will enable their customers to download music records and engrave CDs (or to store them on their hard disks). Adaptation of the Copyright legislation is however needed. It is the same for books. Several book distribution networks have announced that they will install Sprout Inc.'s digital print-on-demand technology in their distribution centers. This new technology provides the ability to produce single-

copies of bound paperback books. This just-in-time production reduces the cost of storing and shipping books (US DoC [1999]).

12 Like other French case studies quoted in this paper, this case study was displayed in the Workshop "Business Economic Models" organized by P.J. Benghozi in the Centre de Recherche en Gestion (CRG) of the Ecole Polytechnique, Paris, 1998-1999

13 One popular method to decrease these search costs is to go through a so called "intelligent agent", which is in fact a service provider that relies on sophisticated search tools to find the best offer, or the best reply to a call for tender. However Bailey [1998] reports that electronic merchants tend to prevent "intelligent agents" from accessing their sites. A study conducted in January 1997 in the United States found that one-third of the on-line CD merchants blocked access to their sites by the intelligent shopping agent, BargainFinder (DeLong and Froomkin, 1997).

14 The services that "trade " cars or housing on the Internet work more like sophisticated ad systems than like markets. Indeed, services like Auto-by-Tel, AutoVantage, AutoWeb, do not enable clients to buy a car online but to match demand and supply. They rely on networks of vendors that post their used cars on the site. The buyer can identify the vendor who is selling a car that meets his or her needs, but then they have to deal directly with him. Obviously, this enables them to examine the car in detail, compare it to alternative offers, etc.

15 This case was documented by Bailey [1998] and The US Department of Commerce [1998]

16 According to Goldman Sachs [1997] the average shipping charge is equal to 8 per cent of the cost of goods purchased on the Internet. According to the same study, the price paid to UPS to deliver a basket of various items purchased on the Internet leads to the same result: around 8 percent of the bill.

17 Large French distributors thus bring to the market only 60 percent of the possible supply for consumer electronics and 40 percent for domestic appliances. Note that this is also a way to bring customer's search costs down. Indeed, large distributors select the best quality/price ratio for various levels of price and quality, reducing the selection efforts of consumers.

18 The strategic counter-attack of these independent small businesses could be to try to organize themselves in networks to benefit from synergy and leverage effects.

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