

The Governance of Transactions by Commercial Intermediaries: An Analysis of the Re-engineering of Intermediation by Electronic Commerce

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ABSTRACT *Efficiency arguments explain why commercial intermediaries exist and will continue to be involved in the exchanges despite the spread of digital networks. Commercial intermediaries provide producers and consumers with a set of information, logistic, securization and insurance (and liquidity) services. By bundling these services and by dedicating assets and learning capabilities to their production, commercial intermediaries allow transaction costs to be reduced. Digital networks per se cannot allow transacting parties to benefit from such efficient providers of intermediation services. Rather than establishing direct relationships among producers and consumers, the Internet will support a re-organization of existing intermediation chains, because traditional intermediaries will reinforce their ability to provide these service by using ITs. The analysis of the role of commercial intermediaries thus leads to a better understanding of the future of e-commerce. In turn, e-commerce provides New-Institutional Economics with a stimulating case study.*

Key words: Transaction Costs; Commercial Intermediation; Distribution Channels; e-commerce; Bundled Services; Digital Economy.

JEL classifications: D23, L14, L15, L22, L81, L86, O33.

1. e-Commerce Development and Productivity Gains in Information Economies

The notion of electronic commerce (e-commerce) has been gaining in popularity with the rise of commercial activities on digital networks, especially on the Internet. In the academic world as well as in governmental organizations, many optimistic

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analyses see the Internet as a way to 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 and North, 1986; Jonscher, 1983, 1994)¹, while they were characterized by very slow progress in productivity. The Internet is often analysed 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 digital communication is cheap, and because it will suppress most intermediaries in marketing channels.

There is however a big gap between the optimistic forecasts about the potential of e-commerce and the reality (Brousseau, 2000 b). This gap is even greater when one compares actual facts to the notion of 'New-Economy' popularised by the press (e.g. *The Economist*, 1998; *Wired*, 1997). There are, indeed, interesting new ways of commercialising information and goods through the Internet and the commercial activity on the Network is growing (Brousseau and Curien, 2001). However, e-commerce represents only a very tiny share of all economic exchanges², and the firms that are really engaged in it are so few that the same ones are always quoted and studied. Moreover, existing e-commerce sites do not generate significant profits and many of those that were created in the late 1990s were simply not viable³. Last but not least, none of the frequently quoted examples illustrate the promised frictionless market without intermediaries, since most of them are commercial intermediaries, and since such services seek to provide customers with customised supply at the cost of price discrimination.

This hiatus is often analysed 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 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 and in Europe, huge efforts have been devoted to the development of electronic markets (e.g. Faulhaber *et al.*, 1986; Malone, 1987; Brousseau, 1993; Faverie, 1998). All these experiences demonstrate that there are many obstacles to the full 'digitisation' of commercial transactions. They also show that electronic markets usually maintain intermediaries (e.g. airline computer reservation systems and electronic trading systems in the finance industry).

The facts therefore seem to show that the development of e-commerce does not lead to the substitution of commercial intermediaries (commercial intermediation) by digital 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. This paper seeks to get a better understanding of what this path could be. From a 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, intermediaries also manage them. 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 transacting parties, 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 space of exchange (for an analysis of the role of institutions in electronic markets, see Brousseau, 2000a). 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. Section 3 proposes an analytical framework to assess the role of commercial intermediaries. It is used in Section 4 to understand the economics of commercial intermediaries, and in Section 5 to analyse the ability of Information and Communication Technologies (ICTs) to substitute for human or organizational intermediation. This will lead in Section 6 to a questioning of the paths of development of e-commerce.

2. Does e-Commerce lead to disintermediation?

As reported by Brynjolfson and Smith (2000), it is widely accepted that ICTs in general, and especially the Internet, will bring about major productivity gains in market coordination. Several (complementary) arguments are put forward. It is argued that ICTs will enable a decrease in distribution costs by allowing a more efficient management of resources (e.g. OECD, 1997 a, b, c, 2000; US Department of Commerce, 1998). It is held that ICTs will make the market more transparent, leading to the ousting of inefficient suppliers and intermediaries, and also a shift in market power from producer to consumer (e.g. Hagel and Armstrong, 1997; Yardeni, 1996; Crane, 1997). A further argument is that 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, 1998). Short distribution networks will enable major savings in (supposedly useless) labour costs and rent captures (e.g. Benjamin and Wigand, 1995)⁴.

A strong hiatus remains, however, between these assumptions and the reality in e-commerce. First, full digitization of the market is, and will remain, not the rule but the exception. Most of the so-called electronic transactions are only partially digitised. Price negotiation, payments and deliveries are often performed offline (cf. OECD, 1997a; Dang N'Guyen, 1999; Brousseau, 2000b). Second, 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 (OECD, 1997 a, b; Brousseau, 2003). Third, e-commerce does not systematically mean frictionless markets. Indeed, e-commerce is often used to discriminate between consumers (Gensollen, 2001) and search costs are not negligible on the digital networks (e.g. Bailey, 1998a; Lee, 1998; Brynjolfson and Smith, 1999; Friberg *et al.* 2001).

These facts seem to refute the traditional assumptions stating 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. First, there are

technical and strategic barriers to the full digitisation of transactions. On the one hand, technical means do not solve all the information exchanges problems that can be solved when transacting parties meet, and when potential consumers can be physically present with the transacted commodity (or the service provider). On the other hand, for strategic reasons, suppliers and consumers do not have any interest in displaying all their private information on digital networks. Second, commercial intermediaries provide transacting parties with services that bring transaction costs down. Digital network and/or information service providers are not automatically able to provide similar services.

In this paper, we focus on this second explanation and concentrate on the analysis of the B-to-C relationship. 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. In contrast, in the B-to-B segment, transactions occur among specialized parties that can dedicate resources and attention to the management of their exchanges and which serve a small number of markets. Disintermediated exchange is more frequent. This is also because transactions are often specific.

3. The Economic Role of Commercial Intermediaries

The core argument of this paper is that digital networks will not become a substitute for commercial intermediaries. 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 that line of analysis, intermediaries are assumed to play two roles:

- (i) The first is a purely *information* role whereby intermediaries are perceived as entities gathering, sorting and arranging information about both parties' plans in order to match them.
- (ii) The second is a *logistic* matching whereby intermediaries hold inventories and transports goods or service providing capabilities, because goods and services have to be stored and moved, when agents' plans do not spontaneously match in time and space.

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'⁵ 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 sets of coordination difficulties among parties:

- (iii) *Securization*: 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. Moreover, information asymmetries generate enforcement problems since enforcement mechanisms are also bound by information and knowledge asymmetries (resulting in unverifiability constraints).

- (iv) *Insurance and liquidity*: in a monetary and production economy, production plans have to be made before consumers' plans, while the consumers' ability to transform their demand into purchases depends upon their future liquidity constraints. Optimal plans are therefore not spontaneously fulfilled. Markets do not clear spontaneously and the markets equilibria reached can be sub-optimal.

When one considers these two additional 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. Since it is not a purely informational role, there are only partial substitution possibilities between digital networks and commercial intermediaries.

Commercial intermediaries address the four above listed coordination difficulties:

- (i) *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 consumers' problem of being informed of the supply structure and capabilities. Intermediaries can obtain economies of scale, scope and specialization in performing that function.
- (ii) *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 (or in delivering services) in a timely manner.
- (iii) *Transaction securisation*: 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.
- (iv) *Insurance and liquidity*: by buying the products from the suppliers before they reach 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. Moreover, by buying the production before consumers express 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.

To get a better understanding of how digital technologies could impact on the governance of the macro-transaction between the suppliers and the final consumers, it is however essential to go further in the analysis of the economics of commercial intermediation. At least two questions can be raised. The first relates to the cause of the cost advantage of commercial intermediaries as compared to the direct management of transactions by the parties, or by intermediaries that are not commercial (Section 4). The second addresses the possible ways along which digitized network or information service providers could provide transacting

parties with services that would enable them to bypass commercial intermediation (Section 5).

4. The Economics of Commercial Intermediation

What is the economics of commercial intermediation? This question is both quite simple to answer, and difficult to document. Indeed, while it accounts for a significant share of GDP and employment (Cf. note 4), 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 and Gautschi, 1993; Michael, 1994; Spulber, 1996). Moreover, 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. They rely on four main characteristics of commercial intermediation.

First, commercial intermediaries provide the four above quoted intermediation services on a bundled basis. This enables them to benefit from economies of scope. This also impacts on their incentives to provide those services efficiently. Second, by centralizing market operations, commercial intermediaries benefit from scale and scope economies, are able to pool risks, and can cross-subsidize or rearrange transactions to ensure market clearing. Third, by investing in specific assets, especially knowledge and ‘commercial relationships’, intermediaries are able to perform intermediation functions more efficiently. Fourth, by providing liquidity, intermediaries reinforce their ability to provide participants with the insurance and market clearing services they need.

Bundled Transactional Services

Bundling the four basic services required to match supply and demand is precisely what differentiates commercial intermediaries from other intermediaries, like infomediaries or logistic companies. Hackett (1992) and Spulber (1996) also insist on the importance of differentiating those agents that purchase and resell goods from those that facilitate exchanges without buying and selling goods. The former – including retailers, wholesalers and banks – are compensated with the residual surplus of the operation they manage, while the latter – including travel agents, real estate agents, and stockbrokers – are remunerated with a revenue-sharing commission. Bundling enables to provide the set of these services at a lower cost. Since it leads to a specific remuneration principle, it affects the ability to clear markets.

First, while different, these tasks are interdependent. The way each of them is managed impacts on the costs borne by the commercial intermediary in performing 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 retailers 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. Providing both information and logistic services

enables commercial intermediaries to benefit from economies of scale in choosing the best combination of services given spatial distribution of their clients. More generally, by designing their business models intermediaries provide consumers and producers with the combination of intermediation services that will enable them to transact at the lowest possible cost (leading to contrasted organization of distribution channels given the features of trade and the preference of the parties). Second, since they face a supply of bundled services, consumers cannot choose among each of these services. This enables the distribution firm to price the various services independently of their costs and therefore to provide the level of each of them that minimize transaction costs (Betancourt and Gautschi, 1993). Third, bundling has a 'single counter' effect that decreases producers' and consumers' transaction costs.

In addition to these direct impacts of bundling transactional services, the resulting remuneration scheme of commercial intermediaries has an incentive effect. Since they bear risks and are remunerated by the residual surplus, commercial intermediaries are better incited to provide the required quality of services than that provided by brokers. This is essential when those services have an influence on the level of demand (Hackett, 1994).

Lastly, since they hold property rights over trade, commercial intermediaries can decide to tax or subsidize transactions among the producers and the final consumers in order to get a better match among their plans (Spulber, 1996). 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.

Centralization of Market Operations

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:

- (i) Economies of scale in transacting when there are millions of potential partners, a central agent decreases search, negotiation and implementation costs. Moreover, the single counter facilitates the setting of a single market-clearing price (Spulber, 1996).
- (ii) Economies of scope: since there are redundancies among transactions, grouping them (e.g. simultaneously purchasing a set of goods, rather than buying them separately) allows the sharing of fixed transaction costs among several transactions.
- (iii) Cross-subsidization among transactors and among transacted goods: Since it is a central point in a set of transactions, the merchant can 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 and Satterthwaite, 1983; Spulber, 1988, 1996; Mookherjee and Reichelstein, 1992).
- (iv) Risk-pooling: intermediaries try to reduce market uncertainty by holding inventories. Inventories enable them to guarantee suppliers (respectively consumers) 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' risks (Lin, 1981).

- (v) **Rearrangement:** when producers' constraints do not spontaneously fit to consumers' needs, the central agent can try to match them by rearranging the provided set of goods and services. Indeed, consumers are seeking for features, not goods. Reconciling both sides of the market's wants is the role of financial intermediaries recognized by the literature (cf. Lewis, 1995).

The potential of going through a single central agent is limited by this agent's ability to manage complexity. Bounded rationality therefore limits the ability to centralize exchanges and explains the existence of numerous commercial intermediaries. In addition, the limited ability to concentrate resources in the hands of a small set of 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 that consolidate transactions have more chance to be able to reach the required level of trade to write off the investments than when direct trade occurs. Four categories of investment are concerned.

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 economies of scale because many consumers and producers can use it. Because they are central in the market, commercial intermediaries benefit from cost advantages in producing this information. For instance, large super-market chains are seriously challenging marketing survey providers because, thanks to the tracking of bills and payments, they have a good knowledge of their consumers' behaviour. Their central position also enables them to spread this information both to customers and to providers in the form of advice, requirements, behaviour channelling, 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, they will bear the consequences of insufficient efforts to reduce the associated risks (Diamond, 1984). Also, as pointed out by Biglaiser (1993), commercial intermediaries trade higher volumes than individual traders do. They therefore have stronger incentives to learn. Last, 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.

Mutual trust. intermediaries have a strong interest in investing in mutual trust with each of their partners. 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 is of interest for the suppliers (respectively buyers). On the other hand, this provides 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).

Reputation for fairness and efficiency: intermediaries have greater incentives than individual traders do to invest in reputation. 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. 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 and Friedman, 1994). Investing in reputation – especially through the development of a brand name – is also an essential means of securing investment in learning. Indeed, intellectual property rights do not protect the types of investment made 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 reputation⁶.

Physical assets: when it is necessary to invest in capabilities to transport, stock and distribute goods and services, commercial intermediaries can benefit from economies of scale and scope.

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. This helps to clear markets, smooth the patterns of demand and supply fluctuations and reduce the risks of exchange (Spulber, 1996). The problem of double coincidence exists as soon as there are fixed transaction costs that incite traders to transact only from time to time (Clower and Leijonhufvud, 1975). 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.

5. Can Digital Networks Bypass Commercial Intermediaries?

Can information technologies enable traders to bypass the services provided by commercial intermediaries to establish direct links among them? To answer, it is useful to identify the essential services provided by commercial intermediaries (information, logistics, security, insurance and liquidity), and to analyse how digital 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 digital networks. We will even argue that intermediaries have a competitive advantage in performing information tasks. This will lead us to the view that information networks will not replace commercial intermediaries, while these networks will probably enable them to perform their tasks more efficiently. However, the economics of the various intermediation services could evolve with ICTs. This can affect the optimal bundling of services for some categories of transacted goods or services, leading to a re-engineering of the distribution channels.

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. Moreover, because they manage long term commercial relationships with them, they benefit from privileged access to private information, from learning effects, and from potential mutual trust.

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. Its universality and its ability to support the use of automated search means (e.g. search engines)⁷ decrease search costs. 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 repeated relationships. Bypass possibilities will strongly depend upon the essential features of markets and goods. 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, it will be possible for traders to automate information searches and replies to requests to quote. In that case, the combination of competition and benchmarking will force both sides of the market to reveal information.

Whether digital networks are able to favour disintermediation of information management deserves however greater attention. Reduced communication and processing capability do not mean zero information costs (Brousseau, 1993). Consequently intermediaries can be necessary to file information efficiently, to bear and decrease search costs (thanks to economies of scale), to guarantee accuracy, and to protect privacy (Hagel and Singer, 1999; Avery, Resnick and Zeckhauser, 1995). The emergence of the so-called infomediaries on the Internet (Zwass, 1998; French Taskforce for Electronic Commerce (<http://www.finances.gouv.fr/>); US Department of Commerce, 1999) confirms this. Moreover many of the so-called internet merchants are only information brokers which are able to create businesses by reducing search costs in industry-specific segments (e.g. the cases of Realbid or Cattle Offerings Worldwide documented by Zwass, 1998). Industry segments with widely dispersed sellers and buyers, and offerings that lend themselves to simplification with a searchable database, are promising targets for this infomediation.

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. In the case of discounted travel for instance vendors do not want to reveal their discriminating behaviour⁸. 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. Guaranteeing 'anonymity' is another 'information' service that requires an intermediary.

In sum, commercial intermediaries' information services are potentially the most challenged by the abilities of digital networks. A number of reasons suggest however that intermediaries continue to be useful in handling information between the supply side and the demand side. Moreover, ICTs can be used by commercial intermediaries to increase their efficiency in providing traders with information handling services. Thanks to the tracking and matching capabilities of ICTs (and to

their central position in the market), traditional intermediaries are able to know customers' behaviour in more detail and on a customized basis. It enables them to provide suppliers with richer information about the demand side, and with a more efficient matching service. Consumers benefit from customized services, while these enable commercial intermediaries to discriminate them (Gensollen, 2001), resulting in a complex welfare effect.

Logistic Management and Electronic Intermediation

The logistic services provided by commercial intermediaries rely both on logistic assets (transportation means, storage capabilities) and upon their ability to manage them. This latter largely depends upon an efficient information network. Logistic assets have 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 US 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 stores rather than through mail order (which was more competitive in rural areas). This is how Sears and Ward's, 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 reduce costs. A next day delivery service is available only if customers agree to fetch the ordered goods from a 'delivery point' rather than having home delivery service. This has enabled mail order firms to concentrate and simplify their logistic flows and thus to stay competitive with retail stores in urban areas. These two examples confirm that the efficient management of logistic assets is a major service provided by commercial intermediaries. This is even clearer when one speaks of goods with specific characteristics (such as size, fragility, perishability, etc.), that require specific handling, storage or transportation operations.

What can digital networks change in the management of logistic operations? On the one hand, ICTs enable a more efficient management of networks of logistic assets. 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. Indeed, the existing distribution services on the Internet do not prove that they will be able to sustain competition from traditional retailers, apart from some niches. While documenting more cases would be worthwhile, two examples illustrate that concentrating the bulk of the distribution of tangible goods through retail stores generates logistics economies

Until 1997, the famous Amazon.com had no physical infrastructure (Bailey, 1998a & b; US Department of Commerce, 1998). Rent and depreciation represented less than 4% of sales compared to 13% for the traditional retailer, and its labour costs were lower as well. Amazon had less capital tied up in inventory: its books turned 20–40 times per year versus two to two-and-a-half times per year for the traditional retailer. This should have given a very strong cost advantage to this company as compared to retailers. However, Amazon's advertising and marketing costs were high relative to its sales volume. This was partly due to the cost of penetrating a new market. This is also a structural problem since on-line sellers have to permanently remind their customers that they should visit

their site⁹. This led Amazon.com to sell its books at a relatively high price. Amazon's gross margin (retail sales minus cost of goods sold) was however 19.5% of retail sales compared to 36.7% for traditional retailers. This poor performance is not only due to logistics. Traditional retailers benefit from discounts due to their large sales volume when they purchase their books from publishers, while up until 1997, Amazon purchased its books almost exclusively from wholesalers, paying mark-ups the traditional retailer largely avoids. Amazon had to follow another strategy when the traditional retailers entered the Internet business. By 1997, Barnes and Noble, a major book distributor in the US, had developed its own website to compete with Amazon. Since they were able both to optimize logistic operations and purchasing policy, Barnes and Noble had lower prices. This quickly led Amazon to align its prices and switch to another business model. Initially, Amazon was more an information broker than a commercial intermediary, ordering books on demand. Competition obliged Amazon to purchase large quantities from publishers, to hold stocks and to optimize logistic operations. Traditional retailers 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 including on-line orders. This is an important cost advantage since home delivery represents 8% of the price of the delivered goods¹⁰. While the traditional retailers versus on-line bookstores saga has only begun, one can expect that, thanks to their costs advantage, bookstores chains are 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 century¹¹.

Another case points out the strategic dilemma facing on-line retailers. Marcopoly is a French start-up that markets consumer electronics and domestic appliances¹². Like Amazon.com, it cannot sustain price competition against well-established large specialised distributors. 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 bargaining¹³. Marcopoly's strategy faces two problems. First, it is unable to provide its clients with a guarantee of timely deliveries, as it cannot hold inventories. Second, Marcopoly cannot provide its customers with competitive prices because it does not benefit from any rebates for large volumes or any economies of scale in logistics. The same dilemma occurred in on-line grocery. Customers seem to have different preferences when they buy on-line or in supermarkets. On-line retailing is associated to the ability to benefit from a wide range of products in order to get quasi-customized items. This obliged French supermarket chains that went on-line to reorganize their supplying policy. In several cases, the on-line department of the chain became an independent subsidiary, losing therefore a part of the advantages tied to large-scale orders (rebates, inbound guarantee, logistic costs, etc.; (Licoppe, 2001)).

To conclude, while innovation in the organisation of logistics chains could decrease the costs associated with direct shipment from producers to customers, it is doubtful whether commercial intermediaries will lose 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.

Transaction Securization and Information Networks

The provision 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 ways of enforcing formal and informal commitments (through the repetition and the bundling of transactions).

These can hardly be substituted by operations performed by digital networks. One can obviously imagine databases and rating systems that will track information about transactions and partners in order to provide traders with a rating of a given trader's 'reputation' (willingness) to be fair and efficient. Such scoring poses at least two problems. First, it is only information about the past, not about the future behaviour of the trader. It is partly useless, 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 a commercial intermediary has strong incentives to really stop purchasing or delivering. Second, users do not have any guarantee about the quality and the incentives of the information producers since they can hardly retaliate, while they often are in a repeated game with commercial intermediaries and can influence their local reputation, as well. While the Internet increases the ability to track information, it does not annihilate information costs. Opportunistic behaviours can therefore arise. Commercial intermediaries will thus continue to be useful in monitoring exchanges, even if network resources will potentially help them to perform this task better.

Insurance, Liquidity and Digital Networks

The provision 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 entice 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 digital networks could substitute for commercial intermediaries for the pure information aspect of the insurance function allowing direct trade between supply and final demand, they could hardly substitute for the other aspects of the intermediation services. Digital networks could however enable commercial intermediaries to widen their ability to get in touch with additional customers or providers, and therefore to enhance the efficiency in providing insurance of inbound and outbound flows.

Pure electronic intermediation will not be able to overcome traditional intermediation because commercial relationships and financial resources will continue to be essential resources to provide insurance.

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.

| | Information | Logistics | Security | Insurance and Liquidity |
|---|---|---|---|--|
| Essential Assets | Information Network <i>Commercial Relationship</i> | Information Network <i>Tangible Assets</i> | <i>Expertise</i> <i>Reputation</i> <i>Commercial Relationship</i> | Market Knowledge <i>Commercial Relationship</i> <i>Financial Resources</i> |
| Networks Potential Impacts on Commercial Intermediaries | Bypass + Automation of Information Management | Monitoring of Logistics Subcontractors | Databases Access | Widening Number of Potential Partners |

Roman = Assets for which services can be substituted by information networks.

Italic = Assets for which services cannot be substituted by information networks.

Figure 1. The impact of information networks on the functions of commerce.

Figure 1 sums up our argument. It points out that, except for information services, the possibility for traders to bypass the services provided by commercial intermediaries is limited. Many reasons seem to justify the continued existence of commercial intermediaries, instead of a complete disintermediation between producers and final consumers self-managing (thanks to digital networks) the provision of information, logistic, securization, and liquidity services.

6. The Future of Electronic Commerce

Does that mean that electronic commerce will not develop further? Does that mean that new intermediaries will not emerge? Does that mean that no transactions will be performed on-line? Certainly not. Our analysis of commercial intermediation lead to the view that traditional commercial intermediaries will continue to play an essential role in the evolution of the B-to-C commerce and e-commerce. However, ICTs could generate change in the relative costs of the various intermediation functions, and in the costs/benefits to bundle them, that could favour re-engineering of distribution channels. Moreover, it is clear that the rise of ICTs strongly challenge the usefulness of commercial intermediation on market of intangibles.

Physical Commercial Networks in the e-Economy

Commercial intermediaries will continue to be useful despite the rise of digital networks. Not only will commercial intermediaries continue to provide bundled transactional services to customers and producers, but also spatial proximity will continue to remain essential. Face to face meetings will continue to be unavoidable to exchange non-codified information and knowledge, and to establish inter-personal relationships that might be 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 its logistic operations.

However, this does not mean that commercial intermediaries will continue to perform as in the past. For the last 25 years, ICTs have allowed the speed of the flows of goods within distribution networks to accelerate. Moreover, they have made it possible to provide customers with many enhanced services. These will be reinforced thanks to the Internet. Additional services will be targeted both to add value to the service portfolio provided by intermediaries, and to discriminate consumers more subtly (Gensollen, 2001). Zwass (1998) quotes the interesting case of Marshall Industries, a distributor of electronic products, that developed value-added service to make itself indispensable to both its suppliers and its customers. In addition, the Internet has the advantage of being a hybrid between a mass-media broadcasting system and a support to point-to-point, customized and interactive communication. This makes it quite efficient in targeting commercial communications, and in managing advanced marketing techniques.

The above arguments support the view that traditional commercial intermediaries will play a major role in the development of e-commerce. This does not mean that "pure players" will not emerge. Some of them, like Amazon.com, 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, the firm that already has the know-how, the reputation, the logistics capabilities, (etc.) will benefit from a competitive advantage over new entrants. Three types of players seem to possess a significant competitive advantage (in order of decreasing advantage).

Supermarkets (and specialized distribution) chains benefit from logistics networks that are optimized according to the density of the population, well-known brand names and 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 have experience in at-a-distance selling, a recognized trademark to do it, and logistics systems to ship goods to customers. 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, OCP, 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. 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, and other services (Clemons and Row, 1988).

Recent evolutions in the development of e-commerce based systems, however, lead one to be cautious about the ability of established commercial networks to transform their potential competitive advantage into actuality. For instance, supermarket chains have to reorganize their local logistic capabilities, and sometimes their procurement policy, in order to be able to serve the niche market of at-home delivery of groceries. Many experiments failed (Licoppe, 2001).

As compared to these commercial intermediaries, two other categories of players seem to benefit from less competitive advantages, namely logistics companies and information service providers.

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 certain 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 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. They could provide on-line services facilitating transactions such as smart search tools in order to decrease traders' information costs. The sustainability of such services is however dependent of the traders' strategies (see Section 5). They could also provide certification services, but will compete with established rating and certification companies that benefit from their expertise and reputation.

In sum, marketing channels will continue to be dominated by companies that are specialized in providing 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. While there will be exceptions, new entrants will probably remain partners of those dominant commercial intermediaries. They master technical functions that are essential in the development of e-commerce, but 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.

Products, Markets and the Cost Function of Intermediation

This will however depend upon the evolution of the costs of providing the four commercial intermediation services. Indeed ICTs could impact both upon the individual costs of each function, and upon the costs and benefits of bundling them (see Section 4).

First, all these relative costs vary considerably for different goods and services. Present commercial systems are quite different when one considers the types of goods and services transacted and the characteristics of the clientele.¹⁴ This gives ICTs different scope in the various distribution systems that do not bear the same kind of costs. Indeed, in some market segments, specialized services providers could produce one or a set of the four intermediation functions by benefiting from a strong costs advantage due to a focussed and efficient use of ICTs. Moreover, consumers' heterogeneity has to be considered as well.

Second, with the rise of ICTs, the production function of the four intermediation functions could evolve in the sense that the level of economies of scope will decrease. Some of the example quoted in Section 5 could support the idea that this can occur for specific product and market couples. If synergies decrease, the benefit of bundling these services would decrease and the economics of commercial intermediation would evolve. Especially it would become quite difficult for commercial intermediaries to continue to cross-subsidize those functions, if possible profitable entries exist for the separate providing of at least some of these functions.

Third all the existing distribution channels are not always efficiently organized. This generates opportunities of entry by new entrants providing one or more intermediation services thanks to ICTs. All of these phenomena could result in contrasting paths of evolution in various industries resulting in different e-commerce systems and a diversified mode of intermediation. Especially, the possibility of unbundling the providing of intermediation services exists, at least in some specific niches. However, this is not the logic of disintermediation that prevails since markets will continue to be managed by intermediaries.

The Exception of Market for Intangibles

The logic of disintermediation characterizes, however, the market of intangibles. Indeed, goods and services that can be completely dematerialised do not require the same intensity of intermediation services. When these information goods and services do not have to be customised (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. Digitised 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 redundant. 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 law¹⁵ be tailored to digital communication, performing 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 useless.

This does not mean, however, that direct trade among producers and consumers will systematically occur. First, as pointed in section 5, 'infomediaries' 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 subjected to economies of scale and scope. 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, 1998). Due to the removal of the time and spatial constraints of co-ordination between 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 this vision. First, actual e-commerce is essentially targeted toward information goods that can be easily turned into intangibles (Brousseau, 2002). Second, the most successful new intermediaries – e-Bay, Auto-by-Tel, Degriptour, etc. – are information brokers and not commercial intermediaries. Even Amazon.com claims to be an informational intermediary rather than a commercial intermediary (Leadership Online, Harvard Business School).

7. Concluding Remarks

While it is difficult to analyse 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. 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. 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 favour of the large firms that already control dense and huge networks of commercial relationships and wide and efficient logistics systems. New types of intermediaries will however invade some market segments, and the traditional commercial intermediation will probably disappear for all the standardized information goods that can be dematerialized. Information brokers, rather than merchants, will probably organize the resulting new information markets. Deeper analyses of the cost function of the intermediation services (in relation to the features of the ‘macro-transaction’) have however to be performed in order to be able to propose more precise testable propositions on the evolution of the futures of economic commerce in various product and market segments.

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 assess transaction costs in our economies more accurately and understand their behaviour, commercial intermediaries’ activities have to be more precisely understood (cf. Wallis and North, 1986) as ‘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 analyse the economics of commercial intermediation. It is clear that our analysis has to be deepened both at the applied and theoretical levels.

Notes

1. These quantitative studies can be interpreted as follows. Since the end of the eighteenth century, the need to increase productivity has led to two major movements: the substitution of capital for labour and the division of labour. The latter led to the distinction of co-ordination and productive activities and the former applied only to production activities. For a long time, productivity gains were thus very low in the co-ordination 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 were primarily used to support internal (hierarchical) co-ordination, while, as pointed out in Jonscher (1994), the bulk of co-ordination activities are dedicated to market co-ordination. That is why the development of new means of co-ordination that can support exchanges among firms, and transactions between producers and the final customers represents potentially tremendous productivity gains.
2. The only reliable figures – those of the US Census Bureau of the Department of Commerce (2002) – point out that there was indeed growth since the first measure (last quarter of 1999) to the beginning of the year 2002, where it reached 1.3% of retail sales (up from 0.7%). However, the level and the pace of development of e-commerce, as the DoC computes them, are far below the forecasts of consultant firms. Moreover, on line retail sales fluctuate both in volume and in share of total sales. On the unreliability of many figures related to e-commerce see OECD (2000), Brousseau (2000b).
3. For instance, between 1996 and 2000, Amazon.com's sales rose from \$16 million to \$2,750 million but its cumulated losses over these five years reached \$588 millions. Amazon remained not profitable in 2001 (losses of \$567 millions over sales of \$3,122 millions). Figures are often worst for competitors. E-Bay seems to be the only profitable business (its profit reached \$90 millions over sales of \$748 million in 2001). However, e-Bay is not a retailer, but an infomediary.
4. Commercial intermediaries account for a significant share of our economies. In France, retailers, brokers or wholesalers account for 10.8% of the GDP, and employ 12.0% of the workforce (Source INSEE, French Census Agency, www.insee.fr). In the US, the retail and wholesale trade account for 15.84% of the GDP (Source Survey of Current Business, 1995).
5. 'Macro-transaction' stands for the complex set of transactions to bring a good from a producer to a final consumer. When considering the role of commercial intermediaries, this notion helps to get a better understanding of how governance is managed by the three generic parties: the supplier, the consumer, and the intermediary.
6. Of course, manufacturers have incentives to invest in reputation, as well. They especially try to create brand names associated to (objective or subjective) features that differentiate their products. In a sense, these investments in brand names can be considered as competing with the investment made by distributors. It is obvious that a company like Coca-Cola created a brand which reputation is relatively independent of its distribution channels. However, when the service provided by the retailer matters for the quality or the image of the product, the investment made by the retailer and the manufacturer are complementary. Commercial intermediaries' incentives to invest in reputation depends upon the importance of the service delivered by the retailer for the quality of the 'product-service' bought by the consumer.
7. The potential impact of search engines has however to be qualified. On-line retailers tend to prevent the access of smart agents used by search engines to compare posted prices. Moreover, most of the existing engines – which deal with very specific products; essentially electronic and computer components – identify retailers that adopt 'bait-and-switch' strategies. Beside the selected 'best price', they propose alternative offers designed to attract customers and capture a share of their surplus (Ellison and Fisher Ellison, 2000). Last but not least, the recognition of trademarks over the Internet prevented sophisticated search engines from developing. If brands and trademark were not enforced in the cyber world, the only way to develop e-commerce would have been to develop search engines able to compare various features of the products and price in a search model 'à la' Lancaster (1979).
8. Degriktour, now a subsidiary of LastMinute.com, is a French site selling discounted travel and touring services. The company is only a broker between tour operators, airlines and hotels that need to discount their excess capacities, and clients seeking cheap travel. In order to make it acceptable for the customers to pay different prices for close substitutes, these services are sold at last minute, are non-customizable, and their quality is difficult to assess. These make them quite different from the guaranteed and customised services provided through traditional distribution channels.

9. This is 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).
10. According to Goldman Sachs (1997) the average shipping charge is equal to 8% 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. The cost of the 'last mile' is especially of importance. In France in the year 2000, the average basket bought in on-line supermarkets ranged from Euro 110 (Telemarket) to 145 (Houra), while delivery costs ranged from Euro 15 to 45 per basket, depending upon the scope and the complexity of the delivery area. The competitive pressure and the consumer willingness to pay prevented on-line supermarket from charging more than Euro 7.5–10.5 for delivery. This seriously question the sustainability of many 'delivery at home' models (Source *Le Monde*, 01/04/2001; www.lemonde.fr).
11. By mid-2002, Amazon.com seems to be more successful that many of its on-line competitors, as Barnes and Nobles.com. However, the competition we are interested in does not occur among these dot.coms. We are dealing with the competition between business models; i.e. between the pure dot.coms – as Amazon – and well established book distribution chains – as Barnes and Nobles in the US or FNAC in France – that developed on-line services in addition to their traditional distribution channels.
12. Like other French case studies quoted in this paper, this case displayed in the Workshop 'Business Economic Models' organised by P.J. Benghozi in the Centre de Recherche en Gestion (CRG) of the Ecole Polytechnique, Paris, 1998–1999. These cases are documented in Benghozi (2001).
13. Large French distributors thus bring to the market only 60% of the possible supply of consumer electronics and 40% of domestic appliances. Note that this is also a way to bring customer's search costs down.
14. Indeed, it is easy to see that that there is a lot of real-world variation in the extent to which commercial intermediaries are relied upon. Some products are predominantly sold through commercial intermediaries (e.g. stereo equipment, sporting goods, groceries, popular books, records/CDs, shoes, furniture, etc.), while some others are sold by manufacturers (automobiles, sporting events, recreational activities, long distance telecommunications, etc.). Many products are even sold by both (real estate, clothing, computers, academic books, airline tickets). Moreover, the type of distribution network varies a lot ranging from specialized stores to general and department stores, and including mail order outfits, outlets organised in chain or not, etc. This implies that commercial intermediaries have greater economizing advantages for certain goods than others do, and that the type and organization of those intermediaries matter. Our analysis should therefore be deepened to understand the economics of alternative forms of commercial intermediation, and the potential impact of digital technologies on the distribution of various goods and services.
15. Even this condition could be useless if one takes into consideration the possibility to encrypt the exchanged information that allow the agreements over digitized information exchanges to be made self enforceable (Elkin-Koren and Salzberger, 2000).

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