

EXCHANGE COSTS AS DETERMINANTS OF ELECTRONIC MARKETS BEARINGS

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INTRODUCTION

The objective of this paper is to define a framework that explains wherefore electronic markets (henceforth EM) are arising. This purpose is attempted to accomplish drilling down on the nature of transactions using the so called Transaction Cost Economics. This branch of Economics is also titled "nanoeconomics" because the scope of the analysis is each transaction without any aggregation. The importance of Transaction Costs (TC) for EM are often quoted but there are not yet any study that systematise the influence of Transaction costs in EM. In this paper this systematisation is sought making use of an extended view of TC: the Exchange Costs. As Demsetz (1995) states, any service or product has production costs and exchange costs. Exchange costs is a three-fold construct that includes Information Costs, Ex-ante and Ex-post Transaction Costs.

In the Literature (e.g. Benjamin 1995) is usually stated that EM are feasible for products with low asset specificity and ease description. This paper extend the scope of EM. The underlying idea is: "electronic markets arise when exchange costs are lower than in traditional markets". This essay deals with questions like which products/services are more suitable for EM developments or when an EDI will evolve to an EM. The unique attributes of Internet as a *marketspace* (Rayport and Sviokla 1994) are expressly stressed: the World Wide Web (WWW) provides, as a competitive environment, not only multimedia capacities (images, sounds...) on different computer architectures but a universal system of communication between all agents. It gives birth to a global virtual market without location and time constraints, almost potentially.

EM AND EXCHANGE COSTS

In the following sections Exchange Costs components are briefly analysed in reference of EM transactions. Afterwards a summary of Exchange costs implications for EM is indicated.

INFORMATION COSTS IN EM

The presence of Information costs excludes pure accepting-price behaviours in markets. A very evident cause of information costs are Information asymmetries (Buyer-seller) about products' quality. At first sight, in an electronic environment there exists less "bandwidth" than in direct contact with product and seller. At EM is not possible to examine a physical product, only its representation. Hence, EM are supposed to increase information asymmetries and customers would discount the probability of buying a "lemon" (Akerlof 1970). However, this enlargement of the information asymmetry might not occur in those products that their quality can be delimited by a set of variables, i.e. commodities or branded products. Moreover, this information asymmetry disadvantage of EM is reversed for Information-based products. It is easier to scrutinise or test Information products in EM than in traditional markets.

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Information costs comprise also the cost of acquiring information about the products. Probably the most evident advantage of EM is that they lower searching costs. It is possible to browse quickly and at no-cost among different offerings. This decrease of searching costs will lead to "Efficient" markets for those products with a low Information asymmetry when marketed through EM. As Bakos(1991) asserts, EM reduce seller margins because they provide price information that will compel to fix prices at marginal costs. This effect will increase buyer welfare not only for commodities but even for more differentiated products because EM enable customer to locate suppliers that better match their needs.

Focusing the analysis on Internet as a *marketspace*, Internet has a unprecedented huge capability to accumulate data and Information. Simultaneously it has a user-friendly interface to access information and therefore to distribute it to whom request. The reduction in the cost of looking for information is both caused by the improvement of technological capabilities to search and by the overwhelming lowering in the cost of publishing information.

EX ANTE TRANSACTION COSTS

Ex ante Transaction Costs are those expenses entailed to drafting and negotiating an agreement (Williamson 1985). First of all it is necessary to indicate a drawback, the complete itemisation of contracts is a prerequisite for trading in EM. That represents a cost, moreover, a barrier to the extent of EM. Surprisingly, this compulsory specification is also one of the EM success factors. When contracts become standardised the marginal ex ante transaction cost is nearly reduce to zero. There are no variable costs (personnel) to be charged in each transaction. Contract specification represents a volume economy, which beyond a certain break even point makes the average ex ante transaction costs lower than in a traditional market.

In addition, EM provide important scale economies for Ex ante Transaction costs. The use of Information Technology almost introduces the no rivalry consume faculty: more than one client can be using it at the same time with no loss on quality of the service. In reality there is a limit in the bandwidth of the network and in the processing capability from computers, but the cost of increasing this capacity is negligible. These costs are certainly very much lower than enlarging negotiating capacity by traditional methods (i.e. more salesmen)

It is very straightforward that electronic links are suitable for highly repeated transactions. That is the basis of EDI systems and EM like airlines reservation systems or Stock Exchanges. Nevertheless, the latest improvements on information technologies have modified the trade off between volume and the cost of specify contracts. The WWW has dramatically lowered the cost of Electronic commerce developments and it has enabled for low-numbers transactions business (e.g. Electronic Product Catalogues). For this kind of business EM also reduce ex ante transaction costs. Information technology allows to standardise the difference, customising every contract with no variable costs (personnel) to be charged in each transaction.

Furthermore, EM lessen ex ante transaction costs reducing the costs of enabling negotiations. Computer terminals (or clients) provide some kind of ubiquity, agents save travelling costs switching them to cheap telecommunications. Time limitless in EM eases negotiation too, deals can be made (if wanted) 24 hours a day.

EX POST TRANSACTION COSTS

The assessment of Ex Post Transaction Costs is the most puzzling question around Electronic markets. The correct minimising of these Ex Post TC is the only way to exploit the capabilities of EM reducing Information and Ex-Ante TC. Ex-post TC include: maladaptation costs, haggling costs to correct ex post misalignments, set up

and running costs of monitoring governance structures and the bonding cost of effecting secure commitments (Williamson 1985).

The compulsory clarification ex ante of contracts in EM may reduce ex-post transaction costs. Standardisation and digitalisation of information permits to automate transaction control reducing also ex-post TC eliminating low-effective clerical work (like checking if invoices match with delivery notes). However, the biggest section of ex post TC can be consider as "friction" costs due to a lack of trustworthiness between contracting agents. Effective EM developments need users' confidence, wariness drives to risk premiums.

EM are limited by the perceptions about the reliability of Electronic commerce technologies. The target market is restricted to those who already trust in these technologies. EM are grounded on virtuality, doubts about reality of "images" render impossible EM trading. EM technology must be sure enough to convince users. EM are inefficient for unconvinced users because they ask for too high warranties.

Ex-post TC are essentially conditioned by the credibility of markets agents commitment in regard to do not pursue opportunistic behaviours. Possible information asymmetries on products' quality are a source of bigger ex-post TC (the buyer will ask for more warranties). The biggest trouble it is on experience goods, where there are ex-post information costs. Consequently, it is easier to reduce ex-post TC in EM for information products, commodities or branded goods.

A credible guarantee of contract fulfilment in EM may be derived from the presence of asset specificity, like substantial investments in EM technology or the settlement of warranties; e.g. In Stock Exchanges every agent must settle a important amount of money to participate in the EM. This investments act as "Hostages" that represent a credible commitment to do not act opportunistically. The risk of losing this

costly entry/exit barriers improves relationships based on mutual trust. Heck and Ribbers (1996) have observed asset specificity as a facilitator factor for the successful diffusion of EM. Another way to control opportunistic behaviours is the use of a counteracting institution that ensures or takes care of EM dealings (e.g. Reuters for currency trading).

Nevertheless, hostages is a too expensive assuring method for sporadic transactions as home shopping. In these cases, companies' reputation is a very forthright indicator of trustworthiness that reduces information costs and Ex-post TC. The trouble is how to obtain this reputation status on EM. Companies who already have a valuable brand name may use it as a scope economy and extend their operations to EM. It is nonetheless important to state that Internet is a new market environment, it is rejuvenating mature markets. New entrants can develop "Internet reputation" that represents a threat for well established brands (e.g. Amazon as a bookseller).

The presence of mistrust (mainly on technology security) restricts the range of business activities actually available on Internet. Internet users do not rely yet in payments on the Net. The majority of Internet businesses are not paid by customers but financed selling advertisement banners. In order to reduce mistrust the few payments made on Internet are established as third party payments. Both contracting parts use a third institution that acts as a trustee of the deal. This is the philosophy of e-cash and cybercash projects or in the security protocol for credit cards payments (SET).

EXCHANGE COST ANALYSIS

In table 1 the previous analysis is abridged. It is very evident the suitability of EM for Information-based products (news, software, financial services...). In these cases Information Costs and Ex ante TC are always lower than in the classical marketplace. Further, EM reduce the cost of transporting information based products to the customer (directly distributed by the elec-

tronic network). EM are also an appropriate market channel for commodities and well known branded products if searching and ex ante TC controlling capabilities are well employed. At least all the business that are already conducted by other trading mechanisms that permit exchange with no direct contact between seller and buyer (i.e. phone or mail) can be developed through EM. EM bring to lower Exchange costs speeding up, automating or enriching information.

As it may be inferred from the previous section, one of the EM success factors is to control Ex-post TC. There is not a unique strategy to accomplish this objective, each business must search its strategy and this capability will be its most valuable competitive advantage. The more intuitive approaches to this question are asset specificity (hostages), counteracting institutions and reputation. Ex post Transaction costs justify the renaissance of on-line malls. (The Economist 1997). The very first on-line malls were conceived only as web addresses to look for something. The majority of this kind of on-line malls had been a miss. Despite it is difficult to attract clients to a web site, the key success factor is to increase users' confidence. Nowadays on-line malls are acting as trustees of the business developments they include.

The Exchange-costs framework resolves a bizarre Internet fact, businesses either have exponential growth or they disappear. A plausible explanation is the so-called bandwagon effect: after a certain critical

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mass is surpassed individual demand depends positively on aggregate quantity of the good demanded. Success is a credible signalling device that acts as a measure of trustworthiness. Perception of a large aggregate demand increase value of an Internet business since success reduce ex post transaction cost (and Information costs too).

Exchange Costs can explain a wide range of EM bearings. Malone et al (1989) had pointed out the evolution from EDI systems to EM. EDI systems (electronic hierarchies) increase efficiency reducing exchange costs in repeated transactions. If ex-post TC cost has been reduced among participants it is a very evident economy of scope to extend the use of the EDI system to a broader range of products (e.g. SABRE from American Airlines tickets to everything related with travelling). This EDI migration behaviour is deepening since the majority of new electronic commerce developments are directly established as EM. EDI clearing houses officiate as a monitoring and opportunism controlling device, but their cost is excessive since Internet-like projects do not need specific users' investments in technology. Besides, EDI inflexibility is a significant Ex-ante TC.

In an EM customers do not make any difference among companies' geographical localisation, because localisation does not affect exchange costs. Consequently, firm's localisation in EM is not conditioned by customers' proximity but only directed by the search of lower inputs costs. As a consequence of EM implementation markets become contestable. Without the entry barriers that exchange costs represent, local companies cease to obtain monopolist rents. The characteristics of electronic linkages erode middlemen's value chains. Their tasks usually are mainly fasten on exchange costs. They exploit customer proximity, reducing information costs or minimising ex ante or ex post transaction costs.

Exchange Costs	Unhomogeneous Physical Products	Commodities or Well known Brands	Information-Based Products or Services
Information Costs			
Searching Costs	<	<	<
Information Asymmetry	≥	=	<
Ex Ante Transaction Costs	≤	<	<
Ex Post Transaction Costs	?	?	?

Table 1 Exchange Costs in Electronic Markets Vs Classical Markets

Successful EM developments control and reduce Exchange costs, then they shorten distribution channels. Present intermediaries must take advantage of their reputational assets reorienting their business to the management of information in order to create value.

De-localisation is possible whereas the cost of being a multinational is dramatically reduced by EM. As a matter of fact, globalisation is an economy of scope for business deployed at Internet. They can enlarge the target market at no-cost (there are no difference in the procedures for national or international deliveries by courier). Furthermore, when information is codified translation to different languages is not really an expensive investment. From another point of view the globalisation of competition through EM breeds specialisation. Adam Smith had stated that "The specialisation is determined by the extent of the market". Internet as a Global market with hundred of millions of potential customers will lead to much more specialised businesses.

Even the existence of the new Internet products can be disclosed from an exchange cost approach. The three principal new products are: searching engines, efficient market makers and webcasters (Perales and Vicente 1997). Their raison d'être is the reduction of exchange costs via a better management of information.

- ◆ The searching engines and directories (Yahoo, Infoseek, Altavista, Lycos...) create value mainly organising the huge amount of information in the Net, selecting and having a user-friendly interface to access to this information.
- ◆ The efficient market makers (Priceweb for computers, Bargains finder for CDs...) select the price and characteristics of the products from the Web pages and then they condense it in order to avoid the market inefficiencies

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(essentially geographic or information asymmetries).They act as mediating agents creating new links between producers and clients.

- ◆ The webcasting services (Pointcast, Crayon, Microsoft channels...) select and synthesise the information published on the web or in the news presenting to the user only the contents asked for.

These products play the role of intermediaries on Internet. The exchange costs of obtaining the information (loss of quality, unreliability, time expenditure...) directly through the market (Internet) is bigger than the cost of their use (via publicity viewed, subscription or pay per view).

CONCLUSION

During this essay, EM have been studied from an Exchange Cost approach. EM are arising from the inefficiencies of traditional markets. Successful EM reduce the effort required to move market elements in search of clearance. EM attributes reduce searching and ex-ante TC for the majority of products. Commodities, branded and Information-based products are particularly apropos for EM. Probably, ex-post TC are the most difficult issue to control in EM. In order to reach this objective the imperative is to achieve users' trustworthiness.

As it was beforehand illustrated, the Exchange Costs framework resumes many of the EM bearings. However, it would be too much schematic to reduce EM to an Exchange Costs economising mirror of present businesses. As Rayport and Sviokla (1995) assert, a better information management through Information Technology creates value. EM is a new competitive environment that leads new products and services. It is necessary to study EM economic foundations to exploit their capabilities.

In certain cases EM reduce not only Exchange costs but production costs as well. The most elementary example is information-based services. EM allow to split production of the service (information management) and its distribution to the final customer. This splitting permits to make use of economies of scale in production and/or in distribution of the Information service. The economies of scale proceed from the switch of labour to capital. EM facilitate increases in information services' productivity. Information Services on EM do not suffer the so-called services' productivity lag or Baumol's cost disease. Productivity in EM information services will not stagnate, their relative prices will be more and more competitive.