

## Internet usage and competitive advantage: the impact of the Internet on an old economy industry in Spain

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### Keywords

Internet, Competitive advantage, Profitability

### Abstract

Since the beginnings of the computing era it has been suggested that firm performance could be enhanced by the use of information technology which would help firms to score better on such indicators as productivity, profitability and market share. TCP/IP or the Internet are examples of the technology that is now available to help firms pursue their strategic aims. So far, however, their effects remain uncertain. In this paper we attempt to provide some evidence regarding the impact of the Internet on competitive advantage in a non "dot.com" industry in Spain. We also offer some ideas that may help to explain the role of the Internet as a competitive tool in modern firms.

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### Introduction

Since the beginnings of the computing era (Kaufman, 1966; Licklider and Taylor, 1990) it has been suggested that the implementation of computing technologies would have a series of positive effects on the enterprise (McFarlan, 1984; Porter and Millar, 1985; Cash and Konsynski, 1985). These authors claim that internet technology (IT) may serve as a strategic tool: by modifying not only the conditions in which products are supplied and produced, but also the market structure itself and economies of production. IT has a potential effect on any of Porter's (1980) competitive strategies, whether it be cost leadership, differentiation or specialisation in a market niche.

According to Porter and Millar (1985, p. 14), IT can alter a firm's costs at any point in the value chain (Porter, 1980), since its effects come to bear on all the elements needed to manage information. It can also enhance a strategy of differentiation, by giving the product a distinctive character, or providing the company with speed, reliability of service, or additional information useful to its customers (Cash and Konsynski, 1985). Additionally, if the computing potential is combined with robotics to drive differentiation or lower costs for a specific industry, it will provide a basis for creating segmentation or focusing advantages.

To focus solely on the impact of TCP/IP technologies – Internet – on the organization, it is surprising to find that so few papers take the empirical approach in exploring how the competitive advantage of companies is affected by technologies of this kind (Amit and Zott, 2001). Most of the published work in this area is to be found in a wide range of general publications that extol the net profit gains obtained by those firms actively involved in the so-called virtual economy, knowledge economy, innovation economy, network economy, new economy, e-economy or digital economy (Margherio, 1998; Kling and Lamb, 1999; Mayer and Price, 1999).

The strategic management literature includes works by authors who stress the potential advantages of the virtual market, or marketplace over the traditional market, or marketplace (Rayport and Sviokla, 1995). Venkatraman and Henderson (1998) confirm that executives are



now aware of the potential and possibilities of the Internet as a strategic element, although this potential is not usually fully exploited. However, very few studies (e.g. Eid *et al.*, 2002) look at how widely used these advantages have become and to what extent they can be converted into economic profitability, market share or an improved perception of the organization on the part of the client.

We therefore, believe it to be worth investigating whether such benefits have indeed been attained. The aim of this paper is to determine whether Internet technologies have led to competitive advantage for companies operating in traditional industries. We have structured the work into six sections, including this introduction. In the next section we describe the methodology applied in the study, after which we discuss the theoretical relationship between Internet technologies and competitive advantage, using the resource based view (RBV) of the firm (Wernerfelt, 1984) as the main framework. We then state our hypothesis and describe the survey process. In the last two sections, we discuss the results and present a series of conclusions. We also discuss some limitations of the study and propose several directions in which to continue this research.

## Methodology

We use two main methods to model the relationship between use of the Internet and competitive advantage. The first consists of a review of the literature in which we describe the available evidence regarding the impact on competitive advantage. We present an analysis of several works published in leading management and IT journals from the 1970s up to the present day. When formulating our hypothesis, we take the RBV of the firm as the theoretical framework for the empirical investigation. The choice of this particular theoretical approach is based on its great impact in the field of competitive advantage in recent years (Barney, 2001). The RBV has also led to major research findings in the IT area (Bharadwaj, 2000) and these will provide the basis for our examination of the impact of the Internet on organizations.

Our second method is a survey designed to measure the relationship between the use of a number of Internet facilities and competitive advantage. We describe the population of firms surveyed in the empirical tests and then the variables included in the analyses. We also justify the statistical procedures used to extract the evidence needed to test the proposed hypothesis.

## Internet technologies and competitive advantage

In this section, we consider whether the use of Internet technology (INTi) in its current form is likely to generate sustainable competitive advantage, and how such an advantage might be achieved. For the purpose in hand, we take the Internet to refer to the international computing network that enables companies to interchange information internally and communicate externally with other organizations (Levitt, 1995; Laudon and Laudon, 1996). The Internet offers various useful tools for business communication, among which we might mention electronic mail, the World Wide Web, newsgroups, remote access, file transfer and text-based and voiced-based chat. For the purpose at hand, we shall consider only those forms of communication based on the Web, e-mails and file transfer, which, in fact, are the ones with the greatest impact on activity in Spanish firms (del Águila 2000).

Having limited our field of analysis, we now try to determine whether INTi can be considered a strategic resource for companies adopting it as a tool. If this is the case, companies making more intensive use of this technology may be likely to achieve a competitive advantage, which would lead to positive profit differentials or increased market share.

### Competitive advantage as seen from the RBV of the firm

The RBV states that not every technical, economic or human element can be guaranteed to generate competitive advantage. From the RBV perspective, a strategic or key resource must feature certain basic characteristics in

order both to generate and sustain income over a period of time (Barney, 1986). In order to become strategic resources, business resources, such as Internet usage in this case, must therefore fulfil certain conditions, which we shall now analyse.

The first condition suggested by the theory refers to the effective capacity to create value (Barney, 1995, 1996) and states that, in order to become a strategic resource, a business element, such as the Internet, must be first of all valuable (Prahalad and Hamel, 1990). The term "valuable" refers to the capacity of the resource to take advantage of opportunities, or stand up to threats posed by the competitive environment (Barney, 1991, p. 111). A resource can be said to generate value, or competitive advantage, if, and only if, it can reduce the company's prior costs or increase its prior income (Barney, 1996, p. 147).

Possession of a value-generating resource, however, is not, in itself, enough for a firm to improve its competitive advantage. If this critical resource is available to any rival it will be unlikely to lead to competitive advantage. There is therefore, a second condition concerning the scarcity of the element that is likely to generate improvements in competitive advantage (Grant, 1996). This condition has also been termed "heterogeneous diffusion of the resource" (Peteraf, 1993) or "relative scarcity" (Barney, 1995).

There are different ways in which the heterogeneous distribution of a key resource can be maintained between competing firms. Most authors consider that a third condition applies: which is that this unequal diffusion is sustained only as long as rivals remain unable to imitate the valuable resources or replace them with equivalent ones, or if the attempt to do so places them at a significant disadvantage (Peteraf, 1993; Dierickx and Cool, 1989).

The fourth and last condition that is required for a strategic resource to bring about sustainable improvement in competitive advantage, is for it to be complementary with other elements or resources in the organization (Barney, 1996). Thus, the complementary nature of the critical resource would reside in its complementary or synergetic effects, which would account for disproportionate gains in competitive advantage by firms using the

resources in conjunction, rather than in isolation. For example, EDI-Web technology combined with a high degree of client-provider confidence would lead to better firm performance than would be possible if the firm were to use the same technology without having sufficient confidence in the commercial transaction.

### **Internet technologies, background and hypothesis**

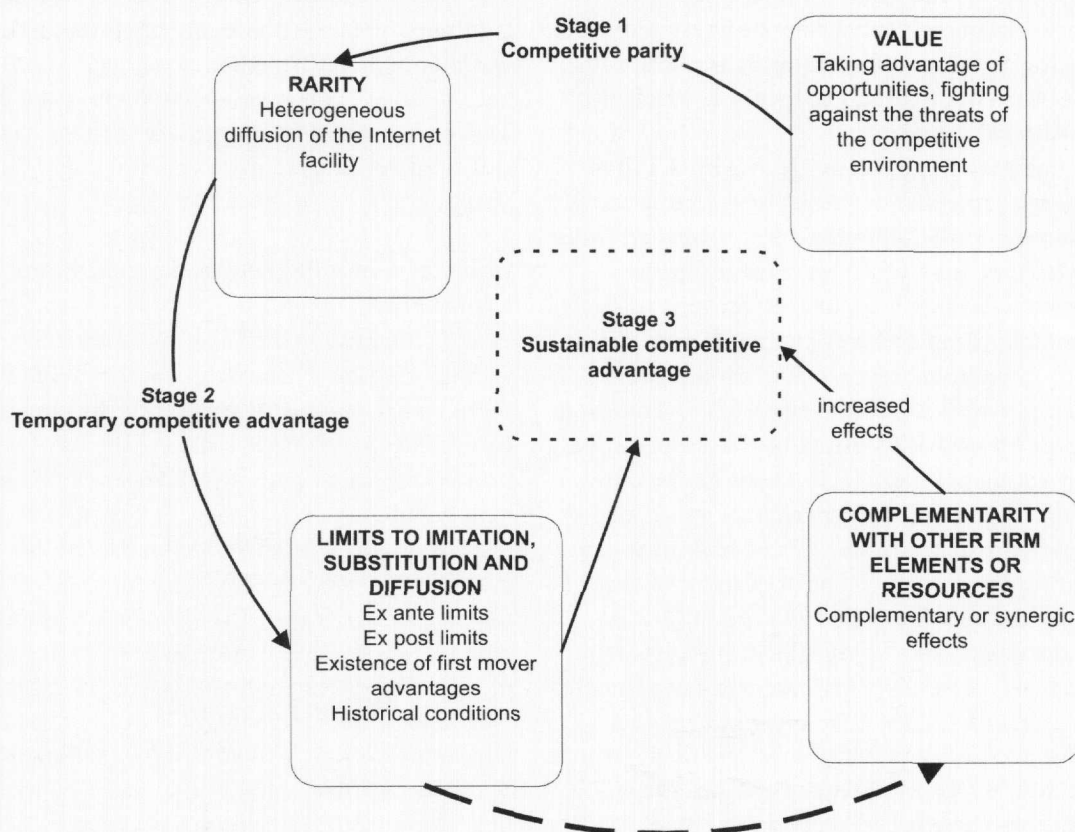
Having established the general theoretical basis, we might go on to consider whether INTi in particular is capable of generating sustainable competitive advantage. Figure 1 depicts the process by which a resource can provide a firm with competitive advantage. Following this line of reasoning, in order to be considered a valuable resource, the first essential requirement of Internet usage as a key resource is that it should be capable of generating income or reducing operating costs. If this is the case, use of the Internet will lead to at least a temporary competitive advantage (see stage 1). However, we have found no conclusive studies that empirically link Internet usage to value creation.

Even in the event that INTi proves to be a source of value, it would still need to satisfy the requirements of scarcity and difficulty of imitation or substitution (Barney, 1996). If this were the case, companies in possession of this valuable resource might achieve at least a temporary competitive advantage.

It will be difficult for them to sustain this temporary competitive advantage, however, unless there are barriers to the mobility, substitution or duplication of the resource (see stage 3 in Figure 1). In the case of the Internet, which is the universal media par excellence, such barriers to mobility or imitation do not appear to exist. In fact, the contrary appears to be the case; basic tools, such as the World Wide Web, e-mail, news groups and their derived utilities, have become widespread among firms of all kinds (Margherio, 1998).

What, then, are the elements that might turn tools based on TCP/IP into a source of sustainable competitive advantage? Certain studies suggest that such advantages can be achieved when the technology is used in conjunction with other resources owned by the

Figure 1 Internet utilization and competitive advantage. A resource-based view



organization. Mata *et al.* (1995) indicate that IT becomes a really effective tool when it is handled proactively by management. Additionally Ross *et al.* (1996) mention, among others, certain human factors as having a catalysing effect on the competitive capacity of IT. For example, firms with a creative technical team, possessing good teamwork skills, will be able to exploit the advantages that IT may offer, with a greater possibility of success.

Similarly, Powell and Dent-Micallef (1997) identify certain human and management factors that appear to be related to the beneficial effects of IT. Specifically, they claim that firms with less internal conflict, better managerial support for the development of technological tools and better organizational flexibility, achieve better results if, in addition, they make full use of IT. Finally, Bharadwaj (2000) concludes that organizations with a recognized capacity for innovation and technological management achieve better business results than their rivals.

We should remember, however, that though the above studies present solid findings, they

deal with the effects of IT in general and not the Internet in particular. More important still, even in the event of synergetic effects between Internet use and other resources, conditions relating to value, rarity and limits to diffusion must first be satisfied (Figure 1).

Within the theoretical framework discussed above, which was constructed mainly from the RBV, we can propose the following hypothesis to define the link between Internet technologies and sustainable competitive advantage.

*H1.* The intensive utilization of Internet technologies, considered in isolation, is not related with the presence of competitive advantage.

## Internet technologies and competitive advantage – a survey

### Survey background and procedures

In order to test *H1*, we conducted different quantitative analyses on a population of companies from a single industry (Rouse and



Daellenbach, 1999). The industry that was chosen was the group of pharmaceutical distribution firms that operate over a large area of the South and Centre of Spain. The reasons for this choice lie in the highly technological nature of these firms, which provides a suitable framework for studying the behaviour and inter-relations that affect the technological element in the organization. In addition, this sector was one of the pioneers in the introduction of robotics, telecommunications and computer technology in the organization, achieving a high degree of technological development from the early 1970s. The Pharmaceutical Distribution Industry in Spain brings together 77 organizations (Martinez, 1996, p. 129) with a total income of over €6,000 million in 1998 (Farmaindustria, 1999, p. 61). The main function of these organizations is to manage the complex flows of information that are needed in order to purchase, classify, store and dispense more than 20,000 references of highly specialized products. This industry can be defined as a mature industry (Porter, 1980) in which the processes and services are well defined. Also the number of competitors has remained stable throughout the last few decades.

The area covered by the survey includes all the provinces of the Andalusian region (Southern Spain), with the addition of Ciudad Real and Murcia (two provinces bordering Andalusia). This involves a population of 8,834,000 inhabitants in 2000, which is 22 per cent of the total population of Spain. Final pharmaceutical consumption in this area in 1998 reached a value of €1,384.2 million, which represents 22.4 per cent of the total consumption of pharmaceuticals in Spain. In the year 2000, a total of 16 firms were operating in the pharmaceutical distribution industry of the region. These included four of the five largest in the national market. There are no significant differences between the characteristics of the industry in Spain as a whole and in the area covered by the survey (Bruque, 2001) (mean size of firms, rate of cooperative firms, number of inhabitants per store and valid legal framework).

Based on the review of the literature and on a previous investigation (Bruque, 2001), in which three managers from three different firms took

part, we identified the main technological devices used in the firms. We also gathered additional information concerning the different ways in which competitive advantage could be measured in the analyses. Two different measures were eventually used. The first was a measure of the presence of INTi in the organizations included in the survey, the second, an estimation of the competitive advantage of each of the various companies.

#### *Internet presence variables*

After the preliminary study, we identified the following TCP/IP applications used by firms in the industry:

- the existence of a corporate URL-based Web site;
- the supply of technical and/or professional information through the Web site;
- possibility of access to the firm's Intranet via the corporate Web site;
- e-commerce of non-medical products through the Web site; and
- e-mail and file transfer between company departments.

Other Internet uses, such as EDI-Web systems or B2B portals (Ratnasingam, 2001) were rejected owing to the limited usage of such systems in this industry. Scores on each of the variables were determined by interviewing at least two managers and employees from each organization at the company's physical headquarters. The degree of usage of each type of technology was assessed by calculating the average of the levels reported by the interviewees. We used five-point Likert type scales in the questionnaire, which was distributed among members of the organizations that took part in the survey (a senior manager, an IT manager and an employee in the IS area). A score of 0 indicated that the organization was not interested in introducing the technology. A score of 1 indicated that the organization was interested in the development but had not yet got it under way and a score of 5 indicated that the technology had been fully implemented. Finally, we used a global variable INTi to measure Internet presence; this was calculated from the arithmetic mean of the scores on each type of Internet use for each organization.

### *The competitive advantage variable*

According to previous literature, competitive advantage is considered to exist when a company achieves a better economic performance than that of its rivals over a sustained period of time (Mehra, 1996; Miller and Shamsie, 1996). More recently, Barney (2001, p. 48) defined competitive advantage as a situation in which a firm engages in activities that increase its efficiency or effectiveness, while competing firms fail to do so. There are numerous studies that have used profitability ratios (ROI, ROA) to measure competitive advantage (Lee and Miller, 1999; Carpenter *et al.*, 2001). Owing to the growing phenomenon of cooperation within the pharmaceutical distribution industry, however, we do not consider profitability ratios to be effective indicators for the purposes of this study. Cooperative firms hold over 70 per cent of the entire Spanish market. These firms tend to engage in anticipated profit-sharing through price-cuts, with the result that measures based on profitability may be distorted (García-Gutiérrez Fernández, 1994). Also, the strategic management literature contains previous examples of the use of alternatives to profitability ratios (Henderson and Cockburn, 1994; Majumdar, 1998).

Our analysis of the literature leads us to propose a mixed approach, incorporating data from both primary sources (based on client perception) and secondary sources (based on market share variation) (see Majumdar, 1998). The competitive advantage index ( $Ic$ ) will be determined by taking the standardized sum of the mean inter-annual variation of market share over the period 1994-1998 ( $C_{194/98}$ ) and a subjective index based on client perceptions of service excellence ( $Vi$ ). By using these two indexes together, we are able to obtain a fuller picture of the nature of competitive advantage, while also avoiding the inconsistencies that arise when each index is used singly. The mean inter-annual variation of market share ( $C_{194/98}$ ) is based on gross sales income of the firms in the industry and was obtained from various secondary sources: Fomento de la Producción (1997, 1998, 1999a, b, 2000) and the database of the Subdirección General de Asistencia y Prestación Farmacéutica of the Spanish Ministry of Health.

The second variable ( $Vi$ ) was obtained by measuring customers' perception of the level of quality of service provided by the distribution company. To measure this, a postal questionnaire was sent to 1,060 pharmaceutical clients resident in the area under study. This yielded 231 valid replies, which is a reply rate of 21.86 per cent and comparable to that obtained in other similar studies (Hall, 1992; Powell, 1992; Powell and Dent-Micallef, 1997). The technical details of the survey are given in Table I. Finally, the competitive advantage index was obtained by adding the variables  $C_{194/98}$  and  $Vi$ , once standardized. In Figure 2 we present a summary of the variables used in the analysis. Usage of Internet technologies by each organization was measured by taking the arithmetic mean of the scores obtained in each of the five scales used in the survey.

### *Control variables*

Prior study of the different variables liable to influence competitive advantage enabled us to identify various factors, mostly of an industrial nature, which we propose as control variables:

- firm size;
- strategic orientation regarding territorial expansion; and
- regional differences in pharmaceutical consumption.

Of these, size (measured as the logarithm of mean income for the period 1994/1998) is the variable that was found to be most effective in explaining the differences in competitive advantage between companies in this industry (Bruque, 2001) and this is, therefore, used as a moderating factor in the analysis. Size is also included as a control variable in several previous empirical studies of competitive advantage (Hansen and Wernerfelt, 1989; Ramaswamy, 2001).

### **Data collected**

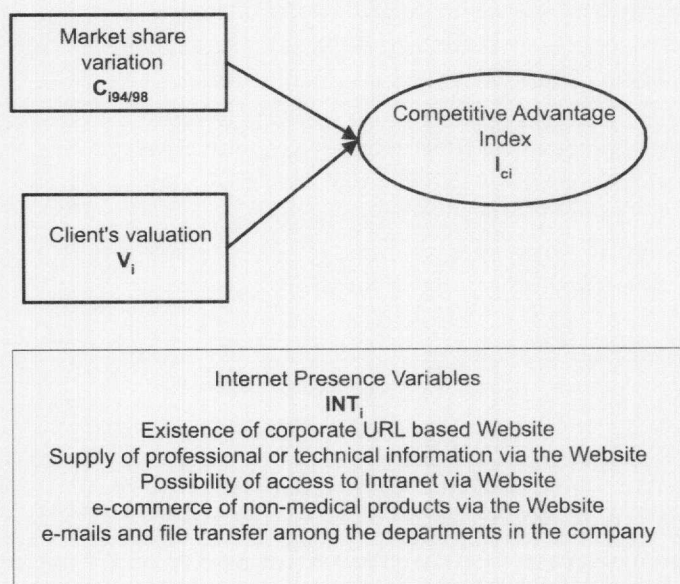
Table II shows the scores on each of the variables, as given by the companies surveyed.

In order to test  $H1$ , we calculated the Spearman correlation coefficients, which show the degree to which the technological variables relate to the index of competitive advantage achieved by the companies ( $Ic$ ). The Spearman parameter was chosen because the variables that measure technological presence (maximum

Table I Technical details of the survey

	Sampling
<b>Population</b>	Customers of pharmaceutical distribution firms in the Spanish regions of Andalusia, Murcia and the province of Ciudad Real
<b>Population frame</b>	Pharmacies in the above-mentioned geographical area
<b>Sample elements</b>	Customers of pharmaceutical distribution firms in the above-mentioned geographical area
<b>Geographical scope</b>	Provinces of Jaen, Cordoba, Sevilla, Huelva, Cadiz; Malaga, Granada, Almeria, Murcia and Ciudad Real
<b>Data gathering period</b>	June-September 2000
<b>Sample</b>	
<b>Sampling design</b>	Probabilistic, stratified random disproportionate sampling
<b>Sampling error</b>	Between $\pm 1.25$ and $\pm 0.10$ in absolute value of mean valuation for each item
<b>Sampling size</b>	623 valuations, generated by 231 different clients
<b>Data collection</b>	Mail questionnaires combined with personally administered questionnaires

Figure 2 Variables used in the analysis



test values Kolmogorov Smirnov  $Z = 0.405$ ,  $p = 0.997$ ) fail to satisfy the normality condition. The results of the correlation analysis are shown in Table III.

The results in Table III must, nonetheless, be viewed with caution. First, it is important to take into account the possible influence of variables outside the model (control variables). For this reason, we calculate a partial correlation of the links between the technological variables and competitive advantage, in which organization size is introduced as a moderating variable (see Table IV).

Table II Internet technology presence

Company	IT1	IT2	IT3	IT4	IT5	INTi
1	0	0	0	0	0	0
2	0.50	0.5	0.50	0	4	1.10
3	5	4	4	0	4	3.40
4	0	0	0	0	3	0.60
5	5	5	5	0	5	4
6	5	1.5	2	0.50	5	2.80
7	1	1	1	1	3.25	1.45
8	5	0	5	0	5	3
9	4.5	2	4.50	0	4.50	3.10
10	5	4.33	5	2.33	4.66	4.26
11	4	4.50	4.50	0	5	3.60
12	4	4	3.50	2.50	5	3.80
13	5	3	0	0	5	2.60
14	1	1	1	0	3	1.20
15	1	1	1	0	1	0.80
16	1	1	1	0	1	0.80
Mean	2.93	2.05	2.37	0.39	3.65	2.28

**Notes:** T11: URL-based Web site; T12: system of technical or professional information via the Web site; T13: access to Intranet via the corporate Website; T14: e-commerce of non-medical products; T15: e-mail and file transfer; INTi: mean presence of Internet technology

### Discussion of survey results

As Table II shows, most of the organizations use some form of TCP/IP technology. Among the most widespread of these technologies are e-mail, file transfer and ownership of a corporate URL-based Web site, which are present and fully implemented in nine organizations, that is, 56 per cent of the population. The fact that practically all the organizations have ruled out e-commerce, while striking, can be justified in view of the



**Table III** Correlation matrix technological presence and competitive advantage

	Ic	IT1	IT2	IT3	IT4	IT5	INTi
Ic	-						
IT1	0.485	-					
IT2	0.555	0.646	-				
IT3	0.189	0.698	0.588	-			
IT4	0.330	0.210	0.285	0.226	-		
IT5	0.347	0.768	0.593	0.577	0.294	-	
INTi	0.393	0.787	0.842	0.848	0.418	0.783	-

**Note:** It is not worth calculating the significance index because the data come from the whole population (there is no sample error)

**Table IV** Matrix of partial correlations between technological presence and competitive advantage

	Ic	IT1	IT2	IT3	IT4	IT5	INTi
Ic	-						
IT1	0.106	-					
IT2	-0.001	0.258	-				
IT3	-0.062	0.523	0.284	-			
IT4	-0.262	-0.469	-0.144	-0.204	-		
IT5	-0.300	0.678	0.240	0.363	-0.072	-	
INTi	-0.128	0.790	0.576	0.766	-0.146	0.778	-

**Note:** It is not worth calculating the significance index because the data come from the whole population (there is no sample error)

important legal and corporate obstacles that limit the expansion of business to consumer e-commerce in pharmaceutical products. The companies register medium scores on the remaining variables, with some using no TCP/IP technology at all (such is the case of company 1) and others displaying a high level of technology (company 10).

At first sight, it is possible to detect a certain link between some aspects of INTi and competitive advantage. IT1 and IT2, respectively, show an especially strong link with competitive advantage. However, the correlation coefficient is weaker if we consider the mean presence of INTi with competitive advantage.

If we compare Tables III and IV, however, results indicate that the initial positive effects that connect these variables are diluted when size is introduced as a moderating factor. The moderating effect of organizational size is especially strong, particularly in the case of IT1 and IT2, for which the degree of correlation drops in Table IV to levels below 0.1 and even to negative values. This suggests that the initial link between Internet usage and competitive

advantage may involve other effects totally unrelated to the impact of INTi, and possibly related to size. In short, it is not as yet possible to find any proof of a cause-effect relationship between Internet usage and improvements, perceptible to the client, that are liable to change the dynamics of competition within the industry.

## Conclusions

The above findings enable us to advance a number of interesting suggestions that may throw light on the influence of Internet technologies on competitive advantage among organizations. First, these results do not entirely support the academic literature, which assumes there to be a net positive effect of the Internet on the competitive advantage of the enterprise (e.g. Blinder, 2001). Nevertheless, there is some measure of agreement between our results and those obtained by supporters of the productivity paradox (Solow, 1987; Brynjolfsson, 1993), and with some reflections that appear in the technological works of Strassmann (1990, 1997).

It is also worth emphasizing the role played by the size factor in the Internet-competitive advantage relationship. The influence of size on competitive advantage is one of the most controversial issues discussed in the competitive advantage literature (Hansen and Wernerfelt, 1989). The size of the organization can be an indicator of favourable historical conditions or even of first mover advantages. First mover advantages (Lieberman and Montgomery, 1988) tend to favour firms that take early strategic or technological decisions. Size may also be related to the impact of a larger financial structure, more specialised management (Mintzberg, 1979), greater specialization in products or services (Mintzberg *et al.*, 1997) and fuller control over the competitive environment (Pfeifer and Salanzick, 1978).

It is also possible to account for the results from the RBV. This theoretical current provides a suitable framework for explaining why Internet usage has not produced a clear positive effect in this industry. The Internet technologies considered in this study do not seem to satisfy the necessary criteria to qualify as a critical resource in an organization. In our opinion, there is no support for the belief that the TCP/IP



technologies considered in this work will become income generators or improve competitive advantage for the organizations that most fully implement them. If we take into account the VRIO model proposed by Barney (1996), these technologies have still not shown themselves to be a valuable element in the organization, so that, except in very specific conditions, they are not a source of temporary or sustainable competitive advantage in the pharmaceutical distribution industry in Spain. Nor do we believe them to be tools that have become difficult for the companies in this industry to acquire, from which we can infer that there are no important barriers to their mobility.

It is possible that firms in this industry may be using the Internet not so much as a key means of increasing competitive advantage, but more simply as a complement to their existing business practices. Alternatively, the Internet may be serving as a necessary but insufficient tool for achieving competitive advantage. INTi may be adopted less with a view to obtaining a rapid positive return on the investment, in either financial or competitive terms, and more as a means of simply ensuring an organization's survival within the sector. As a value-generating tool, therefore, the Internet has been shown to be insufficient in itself. In order to ensure its effectiveness in this respect, firms need to turn their attention to how the potential of the Internet is managed, and discover how to make the best possible use of existing or innovative TCP/IP technologies, in order to boost value-creation and, thereby, competitive advantage.

There are four ways in which the Internet can lead to value-creation (Amit and Zott, 2001). First, it creates new transaction structures, with new contents and new participants. Second, it enhances the efficiency of transactions, either by reducing search costs, or by speeding up and simplifying the economic exchange. Third, it enhances the positive effect of other pre-existing human and management resources. Finally, the Internet can be used as a means of making it more costly and therefore, less likely for customers to change service, thus ensuring customer loyalty, or, alternatively, it can be used to gain customers' trust by integrating them into the organizational network. Our results suggest that all of these value-creating capacities may still be in their early stages in the

industry we chose to study. This may also be the case in other traditional industries, but much more empirical evidence will be needed before this assumption can be verified.

This study has some limitations that may give rise to further investigation. First, we have conducted an empirical analysis in a mature industry in which operations, market conditions, range of products and services and competition are relatively stable. We cannot certify, therefore, that the same results would be obtained in a highly changing environment with more dynamic conditions affecting competitive advantage. The social and cultural constraints affecting this industry must also be taken into account. The Spanish culture may influence the way in which clients value the services provided through the Internet. Internet usage may be more effective in other countries where differences in IT user habits or even the climate may make clients more likely to obtain a high level of utility from telecommunication tools. This conclusion may suggest a new line of research into the linkage between differences in social conditions and the economic effectiveness of the Internet.

Second, although we have analysed the whole population of firms that operate in this industry, the total number of firms is still limited (16 firms). We would, therefore, encourage other researchers to find new evidence from more numerous populations. Third, we must mention the technological variables used in the analyses. All of these were widespread, basic Internet uses, within the reach of almost all firms. We did not study more specific or advanced Internet uses, due to the low level of utilization in this industry. This may suggest that the results would differ in other industries in which competition is more closely connected to innovation in the Internet area. Analysis of differences in performance between firms using INTi in industries with different degrees of Internet development is, therefore, a line of research that remains open.

Finally, we should point out some limitations that may relate to methodological issues. Among these we might highlight the nature of the competitive advantage index used in this study. The fact that it is not based on profit measures may mean that results will differ from others founded on benefit or profitability ratios.

Second, the non-parametric tests used in this study limit the scope of the findings and the explanatory capacity of the analysis. Third, other theoretical frameworks can be used to explain the impact of Internet usage on organizational success. We might mention the use of theories such as transaction costs economics (Williamson, 1975) or strategic networks (Freeman, 1979) to determine the influence of the Internet on transaction mechanisms and on the building of strategic networks.

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