The Effects of Participation on B-to-B Exchanges: a Resource-Based View

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Abstract

Many B-to-B exchanges have failed in recent years, but a few operators survived the hype and reached the break-even point. What can be the rationale for the persistence of such operators in the market?

The evidence suggests that these operators have enlarged their activity in recent years, integrating more services in their offerings, and now they are able to have an impact on the competitiveness of participant firms, which goes beyond the mere effect on transaction costs.

In fact, the success of B-to-B exchanges basically depends not only on the characteristics of the market maker but, above all, on the value they provide to participant organizations.

Focusing attention on firms, and using a resource-based approach, it is possible to determine the potential competitive effect of a firm participating in a B-to-B exchange.

Beyond the well-known effect on negotiation capabilities, firms may also extract value from internal activity management and from inter-organizational network participation, improving efficiency and exploiting partnership opportunities; specific resources support these drivers of value creation, with different competitive features.

For firms, research suggests that participation in a B-to-B exchange should become a deliberate long-term strategy to sustain their competitive position. For B-to-B operators, the shifted perspective indicates that their own competitiveness will always be linked to the competitiveness they provide to participants.

Introduction

B-to-B exchanges have been one of the most promising phenomena to emerge from the so-called "Internet economy." The original working model of these electronic markets was simple: build an organized virtual market where business-to-business exchanges might be realized using a digital platform, in order to improve the match between supply and demand. Their hypothesis for success was essentially based on the capability to reduce transaction costs for participants.[1]

Unfortunately, everyone knows what has recently happened: many of these B-to-B operators failed, since they were not able to reach a critical mass of participants to ensure enough liquidity, and the phenomenon has been rapidly filed among the undesirable effects of the Internet "bubble." In spite of this, some of the newcomers survived the hype and reached the break-even point, often through a change in their business model.[2]

Since a firm basically chooses to participate in a B-to-B exchange only if this participation creates value and boosts its competitiveness, it should be expected that the exchanges that survived were able to create a huge and wide competitive effect among participants, beyond the mere improvement on transactions.

The insights from a recent exploratory survey reveal how these marketplaces operate with different business models than those at their foundation, counting on a wider portfolio of services, and without paying attention exclusively to market transactions.

In addition, the empirical analysis shows how participation in a B-to-B exchange might have a multi-faceted impact on users, made up of:

– *Negotiation* effects, based on the well-known transaction cost hypothesis;

- *Efficiency* effects, based on the streamlining of internal processes; and
- *Partnership* effects, through the exploitation of strategic opportunities along with the value chain.

The theoretical background on B-to-B exchanges has been largely built around the first kind of effects, that of market transaction conditions, but successful marketplaces are broadening their own role to become enhanced virtual environments able to sustain both internal efficiency and value chain transformation. In addition, the attention of practitioners and academics has been largely dedicated to the potential role of B-to-B exchanges in reshaping industries, but very little has been said on how these marketplaces may influence the competition at the firm level.

Adopting a resource-based view, it is possible to understand the potential competitive effect of B-to-B participation, showing which strategic resources are mobilized, and which are the competitive features.

The analysis has different implications for both firms who participate in digital marketplaces and B-to-B operators. For the former, the main opportunity lies in the exploitation of the full competitive potential of participation, moving beyond the mere transaction costs dimension. For the latter, the analysis suggests a new scenario of multiple roles and a co-evolution perspective in the relationships with the users.

1. The evolution path of B-to-B exchanges: from specialization to integration

The point of departure is the observation of changes occurring in the service portfolios of B-to-B exchanges that survived the shakeout during these last few years.

This preliminary view helps in sustaining the hypothesis that participation in a digital marketplace is moving away from a simple effect on market efficiency.

In fact, a simple snapshot of services currently offered by a sample of European B-to-B exchanges reveals a composite articulation of the offering.

Insert figure 1

Other than services directly related to exchanges and negotiation (such as RFQs, RFPs, catalogues, and auctions), 40 percent of operators provide services impacting functional processes (human resources, logistics, finance), and a relevant number of marketplaces cover information and knowledge brokerage, creating virtual environments where participants may cooperate and exchange information on a wide basis (supply-chain services, content and information, consultancy).

This picture is quite different from the situation existing two or three years ago, when B-to-B exchanges focused their activity mainly on services supporting market transactions. In fact, the analysis of the evolution path of service portfolios offers further insights on this growing tendency.

Insert figure 2

B-to-B exchanges with a narrow offering (less than four services) decreased significantly, while the number of exchanges with a large service portfolio (more than seven services) grew; as a consequence, the average size of the portfolio increased from 4.4 to 5.6 services.[3]

Among the operators that, at the age of foundation, had the narrowest offerings, 9 could have been considered “pure exchange players,” since more than 50 percent of their

portfolios consisted of services supporting arms-length transactions (catalogues, auctions, and RFPs/RFQs). The analysis reveals that, at present, only 3 operators can be considered pure exchange players.

These insights indicate a trend toward a more integrated approach in B-to-B offering models. Surviving operators seem to combine services impacting market transactions with other kinds of services:

- Services focused on other functional processes, which end up within the firms, and
- Services dedicated to strategic partnerships, cooperation, and knowledge sharing, which are embedded in the value-chain networks.

2. Participating in a B-to-B exchange: an assessment of potential impacts

What should a firm expect when participating in a digital exchange and using its services?

From previous research, it is possible to identify a list of potential effects of such participation.

First of all, there are the canonical effects, which stem from improved market transactions: for sellers, the increase in the number of customers and the growth of sales; for buyers, the increase in the number of suppliers and the savings in purchasing costs.

In addition, there are the potential benefits from automation and outsourcing of internal procedures and complementary activities: process cost reduction, time saving, and improved quality (no errors, better information flows, etc.).[4]

Finally, the possibilities to get information and knowledge from the virtual environment, and the opportunity to cooperate, exploiting networking opportunities, must also be considered.[5]

In order to assess whether these impacts occur, we conducted a survey of 32 European marketplaces (see Appendix A for methodology issues). For each one of these potential impacts, the CEOs of the B-to-B exchanges made an assessment using a five-point semantic scale, from 1 (irrelevant) to 5 (extremely relevant),[6] evaluating what a firm could expect when participating in their digital marketplace.

Insert figure 3

Our findings show that each assessment exceeds the average value of three in the five-point scale, and the difference from the bottom to the top of the rank is only 1 point. The explorative evidence suggests that participation in a digital marketplace may provide a wide range of benefits, with no dominance of one over another.

In addition, these insights indicate the existence of a more complex impact on participating firms than that predicted by traditional transaction cost hypotheses.

To obtain a clearer picture of the effects, the assessments were subjected to an explorative factor analysis, leading to a smaller and more meaningful dataset (for details and outcomes of the factor analysis, see Appendix B).

These impacts tend to aggregate in a few main groups:

a) First of all, there is an *efficiency* effect, which relies on the automation of processes. In other words, beyond market transactions, internal activities can also be handled more effectively through B-to-B exchanges. The dimensions

explaining this factor are: the reduction in administrative costs, the time optimization, and the improved quality of processes.

b) A second kind of impact may be called the *partnership* effect. This effect leverages on the possibility of sharing information, learning from other's experience, and sharing knowledge. For example, a virtual community of interests may realize such an effect.[7] Second, there is a general effect on value-chain opportunities, which can be achieved through cooperative projects and long-term collaboration with other players. Supply-chain management practices are an example, since integration along with the supply-chain may be better achieved through cross-enterprise activities.[8]

c) The other two factors extracted represent typical *negotiation effects*, which work differently according to the nature of the participant. For sellers, the negotiation effects mean the possibility of finding new customers and increasing sales, leading to market exploitation. In this case, digital marketplaces make it easier to find new customers and new distribution channels, enforcing the market positioning of participants. For buyers, negotiation effects mean an increase in the number of suppliers, and savings on purchasing costs. It is basically an improvement in the bargaining power of participants, which may benefit from increased competition in the supply market.

As seen, participation in a digital marketplace might reveal a multifaceted impact on user firms, which goes beyond the negotiation effect on market transactions.

Insert figure 4

In fact, while negotiation effects have been largely recognized and emphasized by the background literature on B-to-B exchanges, the efficiency, and above all the partnership effect, shed a new light on the impact of such participation.

In any case, this does not mean that the effect on transaction costs is nonexistent or illusory, but that it is bundled and somewhat blended with other effects. For example, a firm increasing its own sales by participating in a reverse auction (negotiation effect from the seller side) may also have a further impact on inventory management (efficiency effect), while a strategic alliance with a supplier (partnership effect) usually follows a first contact through previous transactions (negotiation effect from the buyer side).

3. The shifting perspective: from transaction cost to firms' resources

The presence of efficiency, partnership and negotiation effects indicates that participation in a B-to-B exchange may have a huge impact on firms' competitiveness.

The existence of such different drivers of value creation cannot be fully captured by transaction-cost theory, since this approach has a different unit of analysis, the market transaction, and it does not involve other sources of value creation, such as innovation and reconfiguration of resources.[9]

Participation in a digital marketplace should be intended as a general strategy for value creation. To understand its effects, a theory focused on a firm's competitive advantage could be more useful; in this sense, the resource-based view of the firm (RBV) is able to provide an established framework to analyze the drivers of the firm's competitive advantage, both internally and externally to the firm.[10]

In a nutshell, according to the RBV:

a) A resource is any thing able to have an impact on a firm's performance, through some value-drivers;[11]
b) A firm's competitive position is based on resources it is able to control or share: the locus of value creation may be internal or external to the firm;[12]
c) In order to sustain a competitive superiority, resources have to possess certain features: they should be valuable, rare, and difficult to imitate or substitute.[13]

Following this perspective, efficiency, partnership and negotiation effects may be seen as the main value drivers of participation in a B-to-B exchange.

At this point, the RBV suggests looking at:

- What resources are behind these drivers, and where is the locus of value creation (b);
- And, above all, which are the competitive features of these resources (c), in order to evaluate their capability to sustain a competitive edge.

4. The efficiency effect: process governance capabilities

Looking at the *efficiency* effects on internal processes, a firm that participates in a B-to-B exchange may attain a superior capability to manage internal activities complementary to transactions (such as ordering, delivery, inventory, settlement, and billing).

The participation in a digital marketplace does not only affect the external activities of the value chain, but also the coordination of intra-functional activities within the firm (administration, logistics, operations, finance), and the coordination of inter-functional activities (logistics and marketing links, finance and logistics relations).[14]

This capability allows for integrated tasks, coordinated information flows, and improved workflow management, streamlining and transforming internal business processes. In this sense, firms may achieve improvements through a structured approach centred on the disciplined design and careful execution of a company's end-to-end business processes.

Through this superior capability, the labor division within the firm may be improved: internal processes use fewer resources, both financial and human, which can then be kept free as slack resources or shifted to core activities. This capability also supports a reduction in net working capital investments, which, in turn, guarantees a reduction of financial charges. In addition, it could support a time-based competition, because internal efficiency effects may reverberate on other boundary-spanning activities along with the value-chain. One example is the reduction in the time-to-market or in the lead times due to a faster replacement of inventory.

In this sense, by participating in a B-to-B exchange, firms may build a typical organizational resource, which may be called *process governance* capability. To a larger extent, this capability is made up of better routines, coordinated decision-making activities, and a strong integration of sub-processes.

The *locus of value creation is internal* to the firm; through this capability, a firm is able to extract value from improved corporate processes management.

Adopting the RBV perspective, this resource is clearly valuable, but it is rare and difficult to imitate only in the short term. In fact, once many firms participate in digital marketplaces, this capability ceases to be a distinctive resource, becoming a necessary condition to compete in the market.[15]

In the short term, its competitive effects are quite important, because the exploitation of its potential requires a strong integration of processes, which is costly, risky and time consuming. This may make a difference when the rate of adoption/use of ICT is not homogeneous, for example, when small and medium enterprises are slower in implementing technological innovations, as happens in many European countries.

Steeltrading.com, a European b2b exchange working in the steel industry, provides a good example of how digital marketplace sustains process governance capabilities (see the box). In addition to negotiation tools, it offers value-added services for logistics and finance activities that firms may adopt even if they do not make transactions in the marketplace. Potential participants may coordinate and integrate functional processes (logistics, administration and finance), reducing costs and improving productivity.

Steeltrading.com is the market leader of European B-to-B exchanges in the steel industry: it allows both steel buyers and sellers to initiate, negotiate, and conclude transactions on line, and it is based in Switzerland.

But its platform also provides other services, which directly impact firm complementary processes.

Through a partnership with Cosulich Logistics, a European operator of integrated and inter-modal logistics services with a long history of experience in the steel industry, Steeltrading.com is able to offer real time transport quotations and booking options for transport. The interesting thing is that these services are offered with or without a previous purchase of steel in the marketplace. In this case, users may benefit from integrating purchasing issues with logistics arrangements using the same digital platform, or achieve efficiency in complementary processes without running a transaction.

At the same time, through Coface, which is the world leader in export credit insurance, Steeltrading.com is able to offer to sellers a rating of potential buyers and insurance protection for credits originating in

marketplace transactions. In this case, sellers can reduce the financial risk associated with the transactions and improve the efficiency of administrative and financial procedures.

These two opportunities show how firms participating with Steeltrading.com can gain efficiencies through coordination and integration of complementary processes (logistics, administration and finance), reducing costs and improving productivity beyond the negotiation effects of market transactions. In addition, this is an unusual case where both buyers and sellers in the same exchange can realize efficiency effects.

5. The partnership effect: networking competencies

The second type of expected impact from participation in a digital marketplace has been called the *partnership effect*.

This is a largely underestimated outcome linked to the opportunity to *extract value from inter-organizational networks*; in this case, the locus of value creation is external, but it is different from the transaction market. With the partnership effect, participation in a digital marketplace may nurture *networking competencies*, which can lead firms to exploit the potential of B-to-B collaboration.

These competencies are made up of two kinds of capability:

- An increased ability to exploit value-chain opportunities; and
- An improved capacity to absorb and share knowledge with participants.

The first capability provides firms with relational rents, which stem from alliances in which participants move the relationship away from the attributes of market exchange. The regular patterns of inter-firm interactions permit the transfer, recombination or creation of specialized knowledge, thanks to self-enforcing mechanisms (e.g., trust).[16]

By participating in a B-to-B exchange, a firm may easily encounter potential partners with which they can exploit opportunities for alliances along the value chain. Repeated relations empower the knowledge of counterparts, as well as the sharing of routines, information, and projects. Taking advantage of these opportunities means, for example, exploiting the benefits from sharing complementary resources. Typical examples of these opportunities would be supply-chain co-makership, collaborative planning, forecasting and replenishment, or joint ventures devoted to product innovations.

The participation in a B-to-B exchange may also foster the legitimacy of a firm as an alliance partner. For example, reinforcing the corporate image is quite important for small and medium enterprises, which traditionally suffer from a lack of identity and legitimacy in their collaborations; in this sense, being perceived as technologically knowledgeable might be a relationship advantage.[17]

The capacity to absorb and share knowledge in the network is another capability supporting a networking competence.

Repeated interactions in a digital environment facilitate the accumulation of resources, especially those that are knowledge-based. In industries where the sources of knowledge are widely dispersed and developing rapidly, network relations may be employed to access the knowledge.[18]

In this sense, participation in a B-to-B exchange improves the absorptive capacity of the firm, namely the capacity to learn from other's experiences, and the ability to employ the knowledge in a more fruitful way.[19]

Following the RBV approach, the networking competencies are valuable resources, but they are also scarce and difficult to imitate or substitute for many reasons: the numbers of compatible partners for an alliance is strictly limited; the outcomes of the alliance may not be repeated by changing the partners; resources created in these networks are interconnected and indivisible; and the learning process and the knowledge management routines are firm-specific resources.

These competencies might sustain a real competitive superiority for participants. The valuable, unique, and inimitable synergy that can be realized by integrating complementary resources provides an opportunity for the firm to create competitive advantages that can be sustained for a long period of time.

An interesting example of how participating in a digital marketplace creates a networking competence is given by 1city.biz, the largest Italian auctioneer in the business-to-business segment (see the box). In addition to transactions, the exchange offers a virtual environment where purchase managers, academics and consultants can share knowledge, experience and future projects: even in this case, a company can participate without running auctions.

1city.biz is a digital platform, which primarily manages auctions for large customers, but recently it launched a new initiative, called the "Procurement Executive Circle," that may have a greater effect on the networking capabilities of participants.

The Procurement Executive Circle is similar to a community of interested participants, formed by:

- *100 people among CEOs and purchase managers from the largest Italian companies, even if their firm does not participate to the marketplace;*
- *A range of consultancies, with an expertise on supply-chain management issues; and*

– *Academics with both economics and engineering backgrounds, studying the procurement activities of the firm.*

Within this community, participants periodically share their opinions, experience and knowledge, participate in training courses, and promote projects and initiatives together with other partners.

Participants can learn from others' experience and exploit value chain opportunities using a digital platform.

One unusual element of this approach is that many large firms decided to participate in this community even if they do not currently run auctions in the marketplace. This means that the possibility of extracting value from inter-organizational networks is a real opportunity, not strictly related to the liquidity of the market, but to the quality of the participants.

A second unusual element is that the Procurement Executive Circle is pre-competitive, in the sense that participant firms come from heterogeneous industries, but it also provides competitive support to participants in their own industry.

6. The negotiation effect: market exploitation and bargaining power

The final impacts of participation in a B-to-B exchange are the already known negotiation effects.

In this sense, participating firms are able to increase their ability to extract value from market transactions. This ability stems from the traditional interpretation of the B-to-B exchange, aggregation and matching roles,[20] and the *locus of value creation rests in the arm's-length transactions*.

Participants should benefit from the improved efficiency of the market transactions, thanks to the digital technology potential,[21] both before the exchange is realized,

lowering the marginal cost for finding counterparts, and during and after the exchange, improving information and communication flows.[22]

As seen, the negotiation effects are of two types, according to the nature of the participant.

A seller typically may develop a *market exploitation* capacity, improving its positioning strategies and enlarging the range of customers it is able to serve. In effect, participants increase their visibility, realizing deals otherwise impossible.

Counting on a constant flow of exchange opportunities might be particularly important in industries with high sunk costs (such as metals and hotels), where economies of scale play an important role, and firms should saturate their plants' capacity to reduce inventories.

Traditionally, this capability is developed within the marketing department.

On the other hand, a buyer may increase its *bargaining power* capability, finding new supply sources, reducing the opacity of the market, and realizing savings in purchasing costs. Improved bargaining capabilities may help in particular environments, where the supply market is concentrated and asset specificity high.

This ability is typically developed within the procurement department.

The market exploitation and the bargaining power capabilities are resources which are rare and difficult to imitate, but sometimes they are not valuable since the negotiation effects are subject to a severe liquidity target in the marketplace, which, as seen, may be difficult to achieve for B-to-B exchanges.

First, it should be noted that competition on transaction costs is basically a zero-sum game, since one partner in the exchange may gain benefits only at the expense of the other. Sellers, who traditionally gain advantages from opacity of the market, have no incentives to participate in such a game.[23]

Secondly, in some environments, buyers choose to forego potential benefits from transactions, engaging in closer relationships with fewer partners, in order to establish a supply network with dense and consolidated links.

Bravobuild.com, an international digital marketplace working in the real estate industry, with offices in France, Spain and Italy, provides a classical example on how to sustain bargaining power capabilities for participants.

Analyzing data from recent activities of Bravobuild.com, it is possible to determine that, through a large auction for the construction of a new building, Vodafone, the European leader of mobile communications services, gained a reduction of 15% on the target price, concluding in a few hours a negotiation which usually takes more than two weeks to close.

Another customer of Bravobuild, the leading Italian construction company Pizzarotti, obtained a reduction of 4% on purchase costs running a large auction for the construction of a tunnel in the high-speed railway.

These potential effects stem from improved bargaining power capabilities of buyers, and they are well known. A peculiarity is that, within our sample, only large companies, which probably already count on a power asymmetry in the relationship with their suppliers, were usually able to deploy these capabilities.

7. An RBV of marketplace participation: a synthesis

A synthesis of the outcomes of the analysis is provided in the following table.

Starting with the eleven elementary effects proposed to CEOs for assessment, the factor analysis revealed three main expected impacts from participating in a B-to-B exchange: efficiency, partnership and negotiation.

The resource-based framework gave further insights into the competitive nature of these impacts: which firm resources may be mobilized, what is the locus of the value creation process, and what are the competitive features of such resources.

Insert figure 5

The main conclusions are the following:

1. The evolution path of surviving B-to-B exchanges reveals a tendency toward an enlargement of the service portfolios, in order to provide participating firms with services other than those supporting market transactions;
2. These services are potentially able to provide a multiple impact on the firms participating in B-to-B exchanges, along with the following dimensions:
   - Efficiency;
   - Partnership; and
   - Negotiation.
3. Behind these impacts there is a complex process of resource combinations. The participation in a marketplace might mobilize:
   - Process governance capabilities as organizational routines in the internal process management;
   - Networking competencies, made up of relational capabilities and knowledge-based resources; and

- Transaction capabilities, which become market exploitation abilities for sellers and bargaining power for buyers.

4. These resources have different loci and competitive potentials:
   - Process governance capabilities work within the firm and may support a competitive edge in the short-term;
   - Networking competencies operate in the inter-organizational networks and may drive a sustainable competitive advantage for participating firms; and
   - Transaction capabilities operate in arm's-length transactions, but they may often be subject to liquidity constrains.

The use of a resource-based framework sheds new light on the effects of participation in a digital marketplace. But adopting a competitive perspective permits another important consideration: to keep track of potentially negative effects. In fact, if a firm participates in an ineffective exchange, the framework indicates where it might lose a competitive advantage with respect to its competitors that participate in another successful marketplace, or do not participate in any B-to-B exchange.[24]

8. Managerial implications

What are the implications of the analysis for managers, users, and operator companies involved in B-to-B digital environments?

Starting with the users, the main insight lies in the fact that participation in a digital marketplace should be seen as a deliberate *competitive option*, not a technology investment with rapid returns.

The B-to-B landscape now has fewer operators than some years ago, with wider service portfolios. These services might be able to guarantee a relevant boost to competitiveness for users, but on one condition: users must shift expectations from transaction cost benefits to the whole set of effects that participation in a B-to-B exchange may provide.

Thus, market transactions should be seen as the keys to accessing benefits in a digital environment, but they are not the main consideration when measuring the effects of participation. Managers should consider participation in a digital marketplace as a long-term strategy, whose benefits will be assessed on the stock of a firm's resources rather than on transactions. Transactions are fundamental tools to achieve the wide competitive potential in the digital markets, since they are the basis both for future relationships and for efficiencies, but exclusively paying attention to transaction costs might negate the whole potential of participation.

A second implication relates to the fact that the sources of competitive advantage in digital environments are becoming more *boundary spanning*, and they are embedded in inter-firm resources and routines.

In this sense, participation in a B-to-B exchange may mobilize networking capabilities, which have not been widely considered in the traditional literature on digital marketplaces. These capabilities might have a high potential for firms' competitive edge and value-chain transformation. These are typical inter-organizational routines, which require an inclination toward mixed strategies to be implemented, such as competing against competitors in a digital environment while at the same time cooperating with partners.

For B-to-B operators, the resource framework suggests a strategy with *multiple roles*. Besides exchanging platforms, which essentially impacts on transaction capabilities, at least two other functions can be covered. The first is an outsourcing function, which may help firms to achieve a higher level of internal efficiency by delegating procedural activities. This function is quite important where (as in many European countries) there is a high share of small and medium enterprises, which do not make massive investments in digitalization. Another important function may be that of change enabler. The described effect on networking competencies suggests that digital marketplaces may create enhanced environments where firms may easily share knowledge and experiences, and catch up partnership opportunities. A B-to-B exchange, in the future, might act as knowledge broker, filling structural holes,[25] which otherwise would keep partners unconnected along with the value-chain.

A further implication is that, assuming a user's perspective, the resource-based framework pushes B-to-B operators to think in terms of a *co-evolution* perspective. Following this approach, the success of any intermediate activity lies in the capability to create value for users, through a resource combination fueled by the use of intermediate services.[26] In other words, this means that the competitiveness of B-to-B operators would depend upon the competitiveness induced by their users.

In a world of "distributed capabilities," the strategy of B-to-B operators should be addressed to create digital environments where their own services may sustain innovation and competitiveness for users; this automatically should lead to value-chain transformation and competitiveness for themselves. Offering an enhanced environment to

make sharing knowledge easier might be a key decision to stimulate changes in the value-chain architectures, which are otherwise impossible to implement in a pure market environment.[27]

FIGURES

Figure 1 – The presence of services in the B-to-B exchanges, at present

Rfp, Rfq	91%
Mro catalogues	56%
Direct goods catalogues	50%
Auctions	41%
Logistics services	44%
Financial services	41%
HR services	38%
ICT and connectivity	34%
Consultancy	75%
SCM services	22%
Content and information	72%

Figure 2 – The evolution path of service portfolios (n=32)

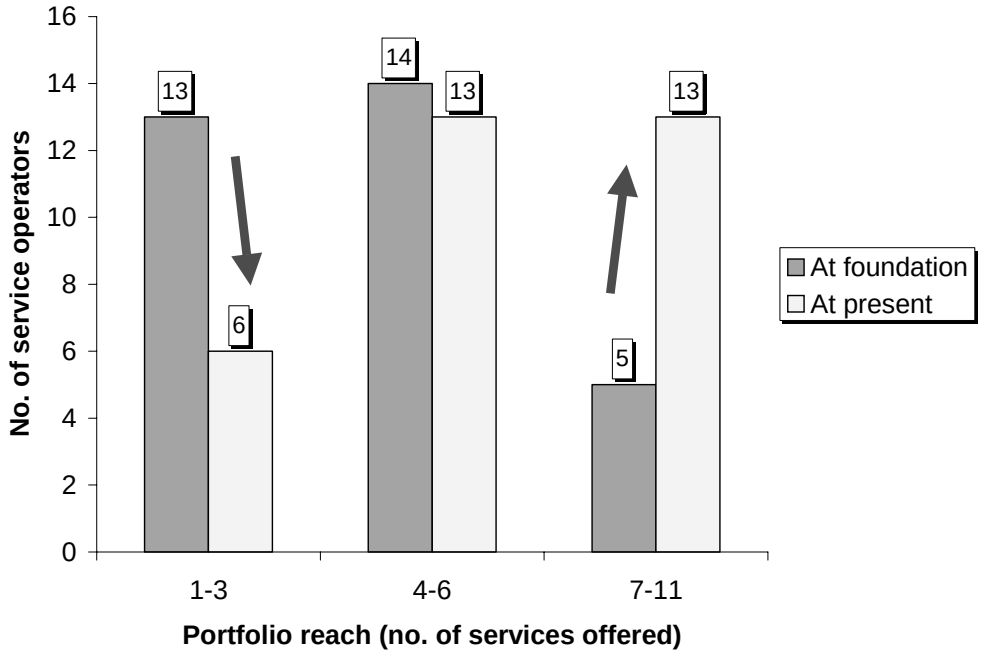

*Figure 3 - The perceived impact from participation in a digital marketplace (*mean values in a scale from 1= irrelevant to 5 =extremely relevant)

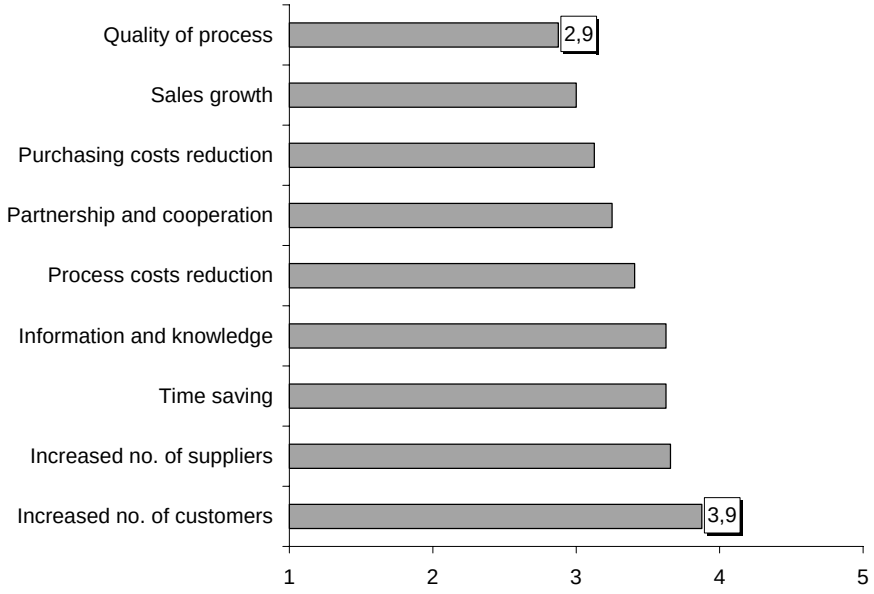

Figure 4 – Participation in B-to-B exchanges: the effects

Elementary effects	**Main impacts**
Process cost Time saving Process quality	*Efficiency*
Information and knowledge Partnership and cooperation	*Partnership*
Purchase costs reduction Increased no. of suppliers Increased no. of customers Sales growth	*Negotiation*

Figure 5 – Participation in B-to-B exchanges: from effects to resources

Elementary effects	Main impacts		Resources mobilized	Type of resources	Locus of value-creation	Features of resources
Process cost Time saving Process quality	Efficiency	→	*Process governance*	Organizational routines	Internal activities	Valuable, but rare and not imitable in the short-term
Information and knowledge Partnership and cooperation	Partnership	→	*Networking competencies* Value-chain opportunities Absorptive capacity	Relational capability Knowledge-based resource	Inter-organizational networks	Valuable, rare and not imitable
Purchase costs reduction Increased no. of suppliers Increased no. of customers Sales growth	Negotiation	→	*Market exploitation* *Bargaining power*	Transaction capabilities (Marketing and procurement)	Market transactions	Rare and not imitable, but sometimes not valuable

APPENDICES

A – Survey details

The empirical evidence used in this paper is based on a research survey of a sample of European B-to-B exchanges, with headquarters or commercial offices in Italy, and which were active operators at the beginning of 2003. [28]

The starting list of B-to-B exchanges was drawn by the census of the European digital marketplace held by the Italian Minister of Industry and Trade (www.emarketservices.it): from the full given list, a further analysis revealed 45 active operators.

First, these operators were studied by analyzing the information posted on their corporate sites, in order to have a full picture of the activities run by B-to-B exchanges.

Secondly, a very short questionnaire was designed and pre-tested in a small pilot study involving the five largest exchanges in the sample, and modifications were made accordingly.

Then the final version was sent by email to CEOs of every B-to-B exchange of the list, in order to assess the evolution path of these services and the perceived effects of these services on participant firms. A further open ended question was been added in order to capture effects not contained in the list provided.[29]

Since a part of the data comes from perception and is of a qualitative nature, a general prudence in the generalization of these outcomes is strongly suggested.

The response rate of the inquiry was 32 questionnaires out of 45, and the following box shows the final version of the questionnaire.

1 – Indicate which of the following services were offered in your marketplace at the time of foundation, and which are offered at present

	At foundation	**At present**
Content and information	☐	☐
Rfp, Rfq	☐	☐
Mro catalogues	☐	☐
Direct goods catalogues	☐	☐
Auctions	☐	☐
SCM services	☐	☐
Logistics services	☐	☐
Financial services	☐	☐
HR services	☐	☐
ICT and connectivity	☐	☐
Consultancy	☐	☐

2 – Indicate in a growing scale (1=irrelevant; 5=strategic) your perceptions about the impacts a firm may obtain participating in your exchange

Process costs reduction	1	2	3	4	5
Time saving	1	2	3	4	5
Quality of process	1	2	3	4	5
Purchasing costs reduction	1	2	3	4	5
Increased no. of suppliers	1	2	3	4	5
Increased no. of customers	1	2	3	4	5
Sales growth	1	2	3	4	5
Information and knowledge	1	2	3	4	5
Partnership and cooperation	1	2	3	4	5

3 – Please add further not-mentioned effects of B-to-B participation, providing the relative assessment (1=irrelevant; 5=strategic).

……	1	2	3	4	5
……	1	2	3	4	5
……	1	2	3	4	5

B –Factor analysis details

The following table lists the outcome of the exploratory factor analysis procedure, which led to discovery of the main impacts of B-to-B participation.

	Factors			
	1	*2*	*3*	*4*
Process costs reduction	**.797**	-.427	-.173	N.R.
Time saving	**.876**	N.R.	.165	N.R.
Quality of process	**.825**	.124	-.241	N.R.
Purchasing costs reduction	N.R.	N.R.	N.R.	**.944**
Increased no. of suppliers	N.R.	*.472*	.153	**.722**
Increased no. of customers	-.243	.110	**.886**	N.R.
Sales growth	N.R.	N.R.	**.882**	N.R.
Information and knowledge	-.256	**.771**	.112	N.R.
Partnership and cooperation	.198	**.838**	N.R.	N.R.
Share of variance explained *Total variance explained = 79,4%*	*25.0%*	*19.3%*	*19.1%*	*16.0%*
Factor meanings	***Internal Efficiency***	***Value chain Opportunities***	***Market Growth***	***Purchase Savings***

Factor analysis is a statistical technique used to estimate factors or latent variables and reduce the dimensionality of a large number of variables to a fewer number of factors. The exploratory approach examines the underlying structure of a collection of observed variables, when there are no a priori hypotheses about the factor structure.[30]

The factor analysis has been realized using the principal component method, which extracts only factors with a minimum capability to explain variance (Eigenvalues above 1); in this case, four factors have been extracted, together explaining nearly 80% of the total variance.

[1] Bakos, Y. (1998) The emerging role of electronic marketplaces on the Internet. *Communication of the ACM*, 41(8): 35-42.

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[3] The paired-test comparison is statistically significant at 95%.

[4] For a seminal contribution on the impact of IT on internal activity, see Zuboff, S. (1988) *In the age of the smart machine: the figure of work and power*, New York, Basic Books.

[5] For a recent contribution on the impact of b2b exchanges on value-chain transformation, see Day, Q., Kauffmann, R.J. (2002) Business models for Internet-based b2b electronic markets. *International Journal of Electronic Commerce*, 6(4): 41-72.

[6] This procedure requires an explanation, as it is basically the outcome of a trade-off choice. Since I asked B-to-B operators the assessment of potential benefits for users, the data may be biased by perception. But given the vertical nature of many exchanges, a survey on users should be limited to a single industry audience, and this would provide a different but more relevant bias than the previous one.

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[27] Wise, R., Morrison, D. (2000) Beyond the exchange: the future of b2b, *Harvard Business Review*, 78(6): 86-96.

[28] The analysis has been undertaken at the I-LAB, the Centre for Research on Digital Economy of Bocconi University, Milan, Italy, during the first months of 2003. The choice to select marketplaces located in Italy was only due to the ease of having direct information from operators -- the majority of these marketplaces face the EU as a target market, and outcomes may easily be extended to other countries, even outside the EU.

[29] Only one respondent used this option; in this sense, the list provided has been considered as definitive.

[30] Gorsuch, R. L. (1983). *Factor analysis* (2nd. ed.) Hillsdale, N.J.: Erlbaum.