Lithuania Information Technologies Burst and Spillover Effects

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The main aspects of spillover effects and IT market development are analyzed in the article. Spillover effects make an additional utility not only for customers, but also allow decreasing the costs of gathering information, controlling, and coordinating transactions, with variation being extremely significant among the goods in IT markets. The theoretical findings of spillover effects were proved by Lithuanian IT market research. The research results revealed that spillover effects are determined by some factors of the company transactional costs, connected with the search, production – technological operations, outgoing logistics, selection of intermediates, whose efficiency is mainly influenced by IT market development in Lithuania.
Keywords*: spillover effects, IT market.*

Introduction

As the economy becomes more interconnected, more products in computing, consumer electronics, and telecommunications industries exhibit *network externalities* (Yoffie, 1997). *Positive spillover effects* exist when a customer's utility for a product increases as the number of customers who use identical or compatible products increases. Extensive literature in economics has examined the strategic and welfare implications of network externalities (Economides, 1989; Farrell and Saloner, 1986; Katz and Shapiro, 1985). A consistent finding is that spillover effects alter customer behavior (e.g., before adopting the product, it is rational for people to wait for others to adopt the product) and have important implications for firm strategy. Previous studies have explored the implications on network externalities on (1) customer behavior and market structure (Frels, Shervani, and Srivastava, 2003; Goldenberg, Libai, and Muller, 2002; Shankar and Bayus, 2003); (2) product-related decisions such as preannouncements (Nagard-Assayag and Manceau, 2001), timing of product introductions (Padmanabhan, Rajiv, and Srinivasan, 1997), and product differentiation (Esser and Leruth, 1989); and (3) market entry (Gupta, Jain, and Sawhney, 1999; Xie and Sirbu, 1995).

Network externalities have been found to be important in the context of *IT market* development (Shapiro and Varian, 1998; Liebowitz and Margolis, 1994; Gulati, 1999). The strategic network perspective has been fostered by the economics of information of electronic networks where the cost of gathering information, controlling, and coordinating transactions with other economic actors, has been significantly reduced (Malone et al., 1989). Transacting in e-commerce industries may have significant effects on *transaction costs*. Direct and indirect costs may decrease as a result of an increasing frequency of transactions (due to open standards), a reduction in uncertainty (by providing more transaction-specific information), and a reduction in asset specificity (lower site specificity) (Amit and Zott, 2001).

The aim of the article is to evaluate the influence of IT market to spillover effects in Lithuania.

The spillover effects

To discuss the advances of this age of technology, the economist has invoked a concept of *externality*. Externality has been defined as the change in the benefit, or surplus, that an agent derives from a good when the number of other agents consuming the same kind of good changes (Bailey, 1995). M.M. Halgren and A.K. McAdams (1995) assume, that this type of economic goods that falls between pure private goods and pure public goods refer as goods with externalities. An unintended "spillover" of any good is called an externality (Baumol and Oates, 1975). If the spillover is positive, then it is a *positive externality* or a benefit; if the spillover is negative, then it is a *negative externality* or a cost to society. In some cases, the positive economic spillover may actually be of more benefit than the intended benefit of the good to its original creator, as often occurs with research (Halgren and McAdams, 1995).

Externalities are endemic to e-commerce and because of specific business experience problems of such industries and different characteristics from those that have business of more ordinary commodities, externalities are named as *spillover effects*. Given the increasing importance of spillover effects in the economy, extensive literature in economics has examined the strategic and welfare implications of network externalities (Farrell and Saloner, 1985; Katz and Shapiro, 1985).

The concept of network externality has been applied in the literature on standards, in which a primary concern is the choice of a correct standard (Farrell and Saloner, 1985, Liebowitz and Margolis, 1994). M.L. Katz and C. Shapiro (1985) consider *two types of positive network externalities*. First, they consider *direct network externalities* – those generated "through a direct physical effect of the number of purchasers on the quality of the product." Their example of direct externality is the number of homes attached to a telephone network. Second, they consider *indirect network externalities* or "indirect effects" such as complementary goods being more plentiful and lower in price as the number of users of the good increases. Their example here is better software as the number of computers of a particular type increases. They go on to consider another source of indirect network externality, the availability of post-purchase service for durable goods, such as automobiles.

In a similar vein, J. Farrell and G. Saloner (1985) observe: "There may be direct 'network externality' in the sense that one consumer's value for a good increases when another consumer has a compatible good, as in the case of telephones or personal computer software. There may be a market-mediated effect, as when a complementary good (spare parts, servicing, software etc) becomes cheaper and more readily available the greater the extent of the (compatible) market".

Although economists observe a distinction between direct and indirect externalities, this distinction does not figure into the existing theoretical analyses. In the theoretical treatments, both types of spillover effects are assumed to have the same consequences: direct and indirect interactions alike are embodied in payoff functions, regardless of their source. J. Farrell and G. Saloner (1985), for example, postulate a benefits function $B_j(S,Y)$ in which j denotes the firm, Y denotes the firm's technology choice and S denotes the size of the network (number of firms choosing Y). M.L. Katz and C. Shapiro (1985) specify that a consumer's net benefits are $v(x_1+x_2)-p$, where x_1 and x_2 are the sizes of the network in time period one and two and p is the price of a unit of the technology. In our opinion, direct and indirect spillover effects are fundamentally different and should not be modelled as equivalent.

From the modern perspective, the early twentieth-century debate on the nature of externalities may appear rather unusual due to the nonmathematical apparatus that it used. However, this unusual apparatus did ultimately manage to distinguish between *technological and pecuniary externalities*.

A consistent finding in the literature is that network externalities alter customer behaviour (e.g., before adopting the product, it is rational for people to wait for others to adopt the product) and have important implications for *transaction cost economics*.

Spillover effects and transaction cost

As the economy becomes more interconnected, more products in computing, consumer electronics, and telecommunications industries exhibit *network externalities* (Yoffie, 1997).

The use of IT has considerably changed the costs of gathering information, as well as controlling and coordinating market transactions. Electronic market places, electronically connecting buyers and sellers through a central database, reduce transaction costs for both buyers and sellers. Transactions are transferred from internally coordinated activities to market exchanges (Malone et al., 1989). Value chains are disintegrated by outsourcing activities (Evans and Wurster, 1997), and distribution channels disintermediate by eliminating intermediaries or reintermediate by existing intermediaries migrating to the electronic market places as market makers (Amit and Zott, 2001).

The importance of information-based resources and capabilities increase within e-business firms, accessing such resources through partnering and resource sharing agreements is more viable (Amit and Zott, 2001). These resource sharing organizational forms are commonly denoted *strategic networks*. Sociologists have focused on network structures in terms of density and centrality

(Freeman, 1979); strategic management has been concerned with trust (Lorenzoni and Lipparini, 1999) as well as resources and capabilities (Gulati, 1999); and economists have studied network effects such as *indirect network externalities* (Gupta et al., 1999) and *direct externalities* (Shapiro and Varian, 1999).

The idea of *network externalities* is based on the general impression that there is a large and increasing number of activities in which costs or benefits rise or fall as the number of participants increases. And this impression seems to apply particularly to new, high-tech industries, for instance e-commerce.

Transacting in e-commerce industries (over the Internet) may have significant effects on *transaction costs*. Direct and indirect costs may decrease as a result of an increasing frequency of transactions (due to open standards), a reduction in uncertainty (by providing more transaction-specific information), and a reduction in asset specificity (lower site specificity) (e.g., Amit and Zott, 2001).

Transaction costs are the costs, which emerge when commodities or services are exchanged, but they are not related to the production of a commodity or service. According to some authors, electronic commerce can reduce transaction costs due to lower: 1) *search costs* (Bakos, 1997), 2) *co-ordination costs* (Malone, et al., 1989), and 3) *payment processing costs* (Sirbu and Tyger, 1995). If using e-commerce reduces transaction costs to the point where they become lower than the costs related to transaction between the external and turn into the internal firm costs, an organisational change occurs: market transactions turn into internal firm transactions (transactions → intratransactions). In the opposite case, the number of *market transactions* is higher than that of transactions inside a firm. Since no detailed study of the effect of e-commerce on the transaction costs has been conducted, a deeper research can help to explain the factors, which can impact the change of transaction cost.

Transaction costs in the market without intermediaries. The most common transaction costs emerge in direct transaction between supplier and consumer. Supplier, consumer or both can cause transaction costs. As a result of the transaction cost effect, supply and demand curves shift to the left due to higher transaction costs. Since market is non-frictional, to conclude a transaction one of the parties has to pay an extra amount. Supplier can have the best commodity produced at lowest cost but not to be able to sell it because potential consumers are not aware of it. To make consumers to enter into transaction, therefore, supplier may have to advertise the commodity or to develop a web page. All costs related to disseminating the information to increase trade volume are transaction costs, which are covered by supplier. On the other hand, consumers may want to purchase the commodity, however they do not know whether it exists, whether anyone sells it and at what price. Before purchasing consumers have to search for information, to communicate and negotiate with potential suppliers. These costs covered by consumers are also transaction costs.

Transaction costs in the market with intermediaries. A third party, i.e. mediator, can also assume transaction costs. It is a firm that markets a commodity without producing or consuming it. Intermediaries compete with

other firms that can be involved in selling similar commodities or services. Intermediaries can be in better position to reduce transaction costs than suppliers or consumers. Since intermediaries participate in a number of repetitive transactions, they develop a network of relationships and accumulate experience, which allows reducing transaction costs. Besides, intermediaries can invest into technologies that require high fixed costs but allow reducing marginal costs of other transactions. High volumes of transactions enable intermediaries to absorb fixed costs.

Although intermediaries reduce transaction costs, it is not clear what is their role and importance. Researchers argue that a mediator is a participant of the transaction which co-ordinates transactions between consumer and supplier, however in more complex definitions mediator roles are not defined in an equally detailed way. Often intermediaries' role depends on the context since they perform different roles in different transactions. Mediator's role is characterised as changeable. Analysis of the intermediaries is often ignored in the literature (Bailey, 1998).

Intermediation and disintermediation defines inclusion or elimination of certain elements between supplier and consumer. Disintermediation occurs when a mediator is eliminated from the transaction. Intermediation emerges when a mediator appears. The process of disintermediation does not necessarily mean that the intermediation level in the value chain changes from n to n-1. For example, disintermediation occurs when market is shifting from the two-level to one-level intermediaries. However, a rather commonly held view that e-commerce causes decrease in intermediation services and stimulate disintermediation is unjustified (Gatautis, Neverauskas, Snieška, 2002).

Transaction costs and IT market. Transaction costs include costs that are necessary for market transaction to happen. As it has been mentioned above, these costs do not modify the commodity but help to assess the market. In physical markets these costs may be related to property, window case inventory, advertising, etc. For example, in e-commerce these costs are limited to advertising costs because retailers do not need to present the products physically to show the range they are offering. However, in this case other fixed costs emerge. They are necessary for e-commerce to cover market transactions happening in the virtual environment, e.g. the costs of maintaining a virtual store, Internet use costs, etc.

Fixed costs related to creating an on-line presentation can be lower than those incurred when organising physical presentation. In the latter case, to be able to attract customers one needs to choose a certain location with relevant infrastructure. Meanwhile Internet server can be located in a very remote place and even be shared with other suppliers and intermediaries. 'See and feel' buying is different in e-commerce, however costs related to creating an analogous atmosphere are much lower. Lower market entry costs stimulate entry of the new players and competition, which results in consumers being able to choose from a greater number of suppliers and commodities. When prices of physically sold commodities and of those sold on-line are identical, profit margins are different. When price falls while profitability remains the same, sales have tendency to increase.

Transactions in physical market are limited by territorial location. In the on-line space, suppliers and intermediaries can expect to attract also those consumers whose choice of products is limited due to high costs of searching for physical goods. When markets shift from physical to virtual environment, this can result in the intense competition and bigger choice. Therefore those who decide to operate in the virtual environment, will have to do so under conditions of more intensive competition because in this case firms compete in the broader market (both physical and virtual). In physical market, a certain correlation between sales volumes and geographical location is observed. This dependence illustrates Hotelling's (1929) so-called 'length city'.

Physical and electronic markets are different because e-commerce transactions do not depend on physical location. In the e-market distribution takes place along the dark line showed in the figure. Those retailers who prefer on-line presentation can compete in the bigger geographical space. Also, Internet makes it possible to enter the market for those suppliers whose market entry costs are too high and the scope of the geographical market is too narrow.

IT market and intermediation services. Sarkar, Butler and Steinfield (1995) argue that transactions can be grouped according to the functions performed by mediator. The co-ordinating role of the mediator in the exchange process is not the most important. Mediator performs various functions in the transaction process, and with emergence of e-commerce these functions change to a greater or lesser extent.

Transaction cost theory is often used to explain the effect of the e-markets on intermediation services. Transaction is defined as 'an exchange of commodities or services between sellers and buyers' (Williamson, 1979). Firms attempt to minimise transaction costs by reducing co-ordination costs. It allows to discontinue trade with external firms and hierarchical organisations. Sarkar's (1995) model is based on this theory. It is believed that Internet can be used to make pressure on hierarchical firms and that it will stimulate emergence of the new market players. This is especially true in case of intermediation. It could be explained by a simplified model of the transactions costs and mediator functions. In the market where mediator services are used, Tp-c is bigger than Tp-i+Ti-c. If e-commerce reduces transaction costs to zero, the situation changes, i.e. Tp-c gets smaller than Tp-i+Ti-c. So, producer can discontinue using mediator services. These conditions are based on the two theoretical assumptions: that Internet accessibility makes transaction costs equal to zero, and that transactions are very small (micro-transactions). However, taking into account these assumptions, Sarkar (1995) notes that:

- Transactions are different, and this leads to a greater number of possible forms of intermediation;
- The role of intermediaries as co-ordinators includes a lot of different functions.

Minimisation of transaction costs is related to the four types of intermediation:

- The first possibility is a process-taking place without intermediation (disintermediation). However, this process is limited due to various reasons (lack of knowledge, social and cultural characteristics of intermediaries, etc.).
- Re-intermediation implies performing already exist-

ing functions, only they are redefined on-line. Although these functions exist, other intermediaries can perform them in virtual markets.

- Internet causes increase in the number of virtual intermediaries (cybermediaries) that present new possibilities in the virtual values chains. They can be characterised as extra-intermediaries.
- Finally, information technologies supplement direct market: producers can expand in already existing markets by exploiting the IT advantages. For example, Dell.com is shifting from call centres to e-commerce.

Sarkar (1995) argues that the co-ordinating role of the intermediary in the transaction process involves a set of functions. These functions differ; therefore some of them are not affected by any electronic services enabled by IT. Traditional intermediaries perform many services and functions. Meanwhile the value of the virtual intermediaries lies in the fact that they facilitate operations in the e-market, which results in the increasing number of players joining this market. In addition, virtual intermediaries generate network effects.

Business in virtual environment is directly related to reduction in transaction costs (Malone, et al., 1989). This enables producers to revise their commodities and services. With increase in the number of functions, virtual market players expand their activities and in this way increase the number of market players. E-market enables higher market accessibility, which increases competition and gives intermediaries new specialised functions. Integration of e-services with products and services helps to create new transactions which serve consumer society (Buxmann, Gebauer, 1998).

IT market growth effect in Lithuania

Market turnover, computerization level, number of consumers, frequency of Internet use, etc characterize the changes in Lithuanian IT market and e-commerce. In 2002, the Lithuanian IT and telecommunications market amounted 1,035 billion LT (about 300 million EURO), and increased by 8-10 percent in 2003 (Figure 1). The turnover of telecommunications market reached 2,1 billion LT (about 610 million EURO) in 2003. The sector of mobile telecommunications increased by 11 percent in 2003. In 2002, the penetration of mobile telecommunications services reached about 47 percent of all Lithuanian population, at the end of 2003, it amounted already 62 percent.

The gross IT market increased by 8 percent in 2003, and amounted 528 million LT (153 million EURO). The overall Lithuanian IT export increased by 8,7 percent in 2003, and the export of largest companies increased from 40 to 80 percent. In 2002, the export of IT services amounted about 35 million EURO. The key markets of Lithuanian IT export are: Germany, Russia, Belarus, Finland, Denmark, USA, and Latvia.
By the data of the beginning of 2004, 695,7 thousand people in Lithuania used Internet at least once in a month, or it composed 26,5 percent of population of the age of 15-74 years. It is 31 percent more than at the same period last year (533 thousand or 20,3 percent) and 17 percent more

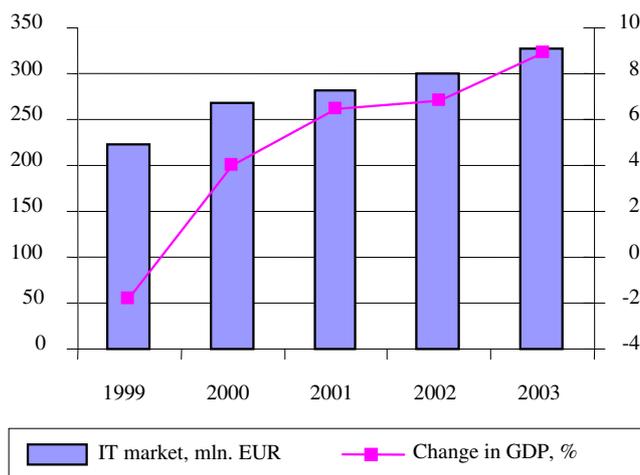than in autumn 2003 (593,3 thousand or 22,6 percent).

Figure 1. IT market development and changes in GDP in 1999-2003

In the January – February of 2004, 577,6 thousand people (22,2 percent) used Internet at least once in a week. It is 31 percent more than last year (443,7 thousand or 16,9 percent). 28,1 percent of respondents used Internet at least once in a half of year (in winter of 2003, this rate was 22 percent, in autumn – 24,7 percent). The more active users of Internet in Lithuania are young people. 43,2 percent from about 737,7 thousand people, who used Internet during the past half-year, was from the age group of 15-24 year, 25,1 percent – 25-34 year, 24 percent – 35-49 year, and 7,8 percent – 50-74 year.

It should be noted that such a rapid growth of Internet users (31 percent) exists in the same time with the growth of GNP by 9 percent (Figure 1). It indicates the evident (obvious) benefit for IT market and e-commerce of market changeover.
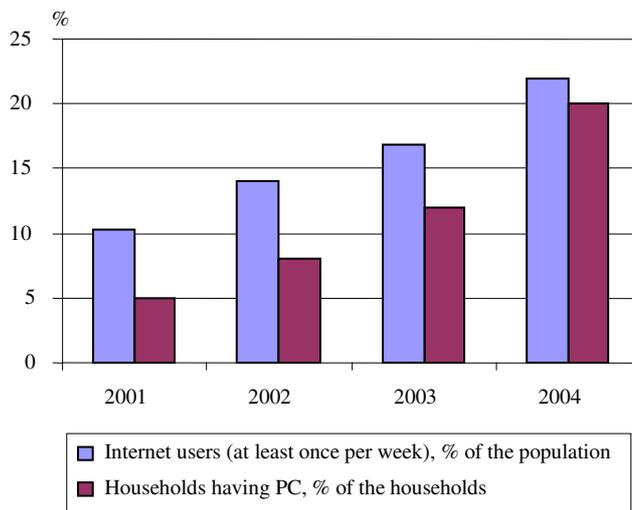

Figure 2. Internet users and the computerization level in Lithuania in 2001-2004

By the data of Statistical Department, in the 3rd quarter of 2003, one fifths of Lithuanian household (20 percent) had a PC at home (in 2002 – 12 percent) (2 Figure). The provision with computers, mobile phones and use of Internet has a direct reliance on the household income. Between the house-

holds where monthly income exceeded one thousand LT, 47 percent owned personal computer and 23 percent had Internet. The provision with PC among Lithuanian households had a notably rapid growth during the past three years. In 1996, only one of one hundred households had a PC at home; in the 3rd quarter of 2003 – every fifth household was "computerized".

Such a rapid growth of IT market has a direct influence on the development of e-commerce. Although recently the basis for e-commerce consists of Internet orders, this area is growing quite fast. By this time, there are about 100 networks of Internet commerce in Lithuania, most of which started their activity (work) in 1999-2000. The positive influence on the development of e-commerce has the increase in computerization level, spread of Internet, expansion of e-bank services and rapid speed of Internet advertisement growth. (In 2003, the market of Internet advertisement increased to 3.7 million LT or 1.5 times more than in 2002).

As a reaction to rapid IT development, intentions of business companies to develop e-commerce are emphasized. According to Infobalt association research, the interest in e-commerce opportunities among Lithuanian companies is notably growing (see Table1).

Table 1

Intentions among Lithuanian enterprises to develop e-commerce.

	Certainly begins in the next 6 months	Probably begins in the next 6 months
Will create/develop local network	8.7	17
Will develop use of Internet	13.8	25.7
Will begin to use Internet for communication	8.6	18.6
Will create/develop Internet sites	14.0	19.6
Will begin/develop Internet sales	2.4	13.2
Will begin to use/develop Internet advertisement	9.4	25.7

Even 25.4 percent of Lithuanian enterprises prepares to certain use of e-commerce for business expansion. It shows that enterprises understand the importance of electronic trade. Comparing the attitude to Internet and separate elements of e-commerce among Lithuanian enterprises, we can suggest that the majority (74.6 percent) absolutely agrees that communication over the Internet would be more intensive in the future; other 14.2 percent partially agrees. About a half of Lithuanian enterprises (48.2 percent) partially agrees, that Internet raises many concerns about data safety, 13.5 percent absolutely agrees with that.

Approximately one fourth of Lithuanian enterprises (24.7 percent) partially agree, that the purchase of goods or services by Internet is unreliable, and 41.3 percent does not have clear opinion about that. The biggest disapproval was on the statement that "internet rather aggravates than eases work": almost half of respondents (47.2 percent) partially disagree and almost one third (28.3 percent) absolutely disagree with this statement.

The analysis shows that rapid growth of IT and telecommunication markets constitutes the background for e-commerce development in Lithuania. The possibility to do shopping without a rush, lower prices and possibility to order the product 24 hours a day, motivates enterprises to use e-commerce in their performance. Such a positive attitude to e-commerce operating underlay the basis for spillover effects development.

Research methodology. Trying to assess conditions and presumptions for spillover effects emerged from the rapid growth of IT and e-commerce market in Lithuania, an empirical research has been made, using the method of expert assessment.

Research objective – to assess spillover effects, emerging from the IT infrastructure development that determined minimizing of transaction costs.

Research hypothesis H1 – spillover effects is induced by the minimizing costs of IT infrastructure development.

50 people, executives and managers from companies, that are establishing IT, were chosen to be the experts. The expert selection was based on assumption that IT companies establishing e-commerce decisions in various companies and are well informed about opportunities of IT use in e-commerce and its benefit to company.

The direct expert survey was carried out. The questionnaire was delivered directly to expert, asking to fill it out. This method is much more efficient than the post survey, because the probability of getting answers is bigger (the response rate is higher). The questionnaire comprised three parts: expert opinion about opportunities of e-commerce use, minimizing total costs of transaction; company transaction costs in its main activities and in the area of inter-organizational contacts.

Analysing the opportunities of e-commerce use, the experts gave 10 points for the most important factor, and accordingly 9, 8, …, 1 points to others. In case when several factors had the same importance, the same point (of importance) was given to them. The significance level of 0.05 was chosen when evaluating the significance of various factors.

Unanimity of experts' opinions was assessed by Kendal concordance coefficient W:

$$W = \frac{12S}{m^2(n^3 - n)} \tag{1}$$

where: S – sum of square deviation;
  n – number of factor groups;
  m – number of experts;

The Kendal concordance coefficient may vary from 0 to 1. When W=1, then all experts gave the same factor ratings, when W=0, we can suggest that experts' opinions differ. When $W \geq 0,6$, it means that the experts' opinion is unanimous and the results of expert assessment are reliable.

The reliability of questionnaire was assessed by Cronbach alfa coefficient:

$$\alpha = \frac{N\bar{r}}{1 + (N-1)\bar{r}} \tag{2}$$

where: N – number of experts;
  $\bar{r}$ – inter-item correlation.

In order to choose the correlation coefficient, the Kolmogorov –Smirnov test was done. It tested the hypothesis about the normal distribution. In case of normal distribution – Pearson, Kendall and Spearmen correlation coeffi-

cients were used; in case the distribution was not normal – Kendal and Spearmen correlation coefficients were used. All calculation was made using the SPSS software.

Results. Assessing the unanimity of experts' opinion, the Kendal concordance coefficient was W=0.62. Where the Kendal concordance coefficient was higher than 0.6, we can suggest that the experts' opinion is unanimous. The reliability of questionnaire was assessed by Cronbach alfa coefficient, which was 0.78 and ensured that the questionnaire was reliable. In order to define the presence of normal distribution of variables, relations between which was the point of our interest, the Kolmogorov-Smirnov test was done, indicating the level of significance.

The research results revealed that spillover effects are determined by some factors of company transaction costs, connected with the search and payment processing, production – technological operations, incoming and outgoing logistics, marketing and sales, intermediates selection and settle of optimal number of partners, efficiency of which is partly influenced by e-commerce growth in Lithuania.

Estimated Pearson, Kendall and Spearmen correlation coefficients evaluated the relation of e-commerce growth to spillover effects over transaction cost minimization varied from 0.357 (conformity costs) till 0.932 (production – technological operations); estimated level of significance done using Kolmogorov-Smirnov test showed the normal distribution of expert assessment. Also correlation coefficients showed that the use of e-commerce spread generates positive spillover effects and minimizes transaction costs especially in such areas as search costs, production – technological operations, outgoing logistics, intermediates selection.

Conclusions

1. Economic analysis of spillover effects shows clear possibility to get cost or benefit that the user of network derives from additional person using the same network.
2. It's quite complicated to distinguish and describe tangible effects of spillover effects in Lithuania.
3. The analysis of the conditions and perspectives of spillover effects of IT market growth in Lithuania should be analyzed and evaluated indirectly, because the comprehensive analysis of spillover effects is limited by: 1) monopolistic competition in telecommunication markets; 2) scarce quantity of e-commerce services; 3) lack of information about advantages of e-commerce.
4. The infrastructure of IT market development enables firm to reduce the co-ordination costs and as a result to increase the number of partners. A firm can minimize transactions costs by using such types of intermediaries as direct market, immediate market, new (virtual) intermediaries and re-intermediaries.
5. The research results revealed that spillover effects are determined by some factors of company transaction costs, connected with the search and payment processing, production – technological operations, incoming and outgoing logistics, marketing and sales, intermediates selection and settle of optimal number of partners, efficiency of which is partly influenced by e-commerce growth in Lithuania.

6. Estimated correlation coefficients showed that the use of e-commerce spread generates positive spillover effects and minimizes transaction costs especially in such areas as search costs, production – technological operations, outgoing logistics, intermediates selection.

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Informacinių technologijų „sprogimo" Lietuvoje pertekliniai efektai

Santrauka

Straipsnyje analizuojami pagrindiniai perteklinių efektų ir IT rinkos vystymosi aspektai Lietuvoje. Vystantis ekonomikai, tobulėjant technologijoms, dauguma ekonomistų pastebi vadinamuosius išorinius ekonominius tinklo efektus, pastaruoju metu ypač išryškėjusius informacinių technologijų rinkose tiek Lietuvoje, tiek visame pasaulyje. Išoriniai ekonominiai tinklo efektai ne tik teikia papildomą naudingumą vartotojams ir gamintojams, bet ir leidžia sumažinti informacijos rinkimo, kontrolės, sandorio kaštus. Į sandorio kaštus įeina kaštai, būtini mainams rinkoje įvykti. Fizinėse rinkose šie kaštai svyruoja nuo būtinos nuosavybės (turto) iki vitrinų inventoriaus ar reklamos kaštų. Tuo tarpu vienoje iš IT rinkos pavyzdžių – elektorininės komercijos rinkoje – šie kaštai apsiriboja reklamos kaštais, nes mažmenininkams nereikia fiziškai išdėstyti prekių, kad parodytų turimą asortimentą. Sandoriai fizinėje rinkoje yra ribojami dėl teritorinio išsidėstymo. Internetinėje erdvėje tiekėjai ar tarpininkai gali tikėtis patraukti ir tuos vartotojus, kurių prekių pasirinkimas yra ribotas, kadangi fizinių prekių paieškos kaštai yra aukšti. Kai rinkos pereina iš fizinės aplinkos į virtualiąją, gali atsirasti didelė konkurencija ir didesnis pasirinkimas. Todėl priimant sprendimą veikti virtualiojoje aplinkoje bus nuspręsta veikti intensyvesnėse konkurencijos sąlygomis, nes įmonės konkuruoja platesnėje rinkoje.

Sandėriai gali būti sujungti į atskiras grupes pagal funkcijas, kurias atlieka tarpininkas. Tarpininko kaip koordinatoriaus vaidmuo tarpusavio pasikeitimo procese nėra svarbiausias. Sandorio procese tarpininkas atlieka įvairias funkcijas, kurios daugiau ar mažiau keičiasi atsiradus elektroninei prekybai. Sandorių teorija dažnai naudojama aiškinant elektroninių rinkų poveikį tarpininkavimo paslaugoms.

Sandorių kaštų minimizavimas leidžia išskirti keturis tarpininkavimo variantus: 1) Pirmoji galimybė yra procesas, vykstantis be tarpininkavimo (angl. *disintermediation*). Tačiau šis procesas yra ribotas dėl įvairių priežasčių (žinių trūkumo, socialinių ir kultūrinių tarpininkų ypatybių); 2) Retarpininkavimas (pakartotinis tarpininkavimas, angl. *re-intermediation*) grindžiamas tuo, kad yra atliekamos jau egzistuojančios funkcijos, tik jos iš naujo apibrėžiamos tinkle. Nors šios funkcijos egzistuoja, kiti tarpininkai gali jas vykdyti virtualiosiose rinkose; 3) Tinklas sąlygoja gausėjimą virtualiųjų tarpininkų (angl. *cybermediaries*), kurie pristato naujų galimybių virtualiosios vertės grandinėse; 4) Galiausiai informacinės technologijos papildo tiesioginę rinką: gamintojai gali plėstis esamose rinkose,

išnaudodami IT privalumus. Tai rodo, kad kaštų mažėjimo aspektai ir sudaro prielaidas atsirasti išoriniams ekonominiams tinklo efektams, kurių geriausias pavyzdys yra IT rinkos.

Teorinius perteklinių efektų tyrimus patvirtina ir atliktas Lietuvos IT rinkos tyrimas, kurį nusako duomenys apie rinkos apyvartą, kompiuterizacijos lygį, vartotojų skaičių, naudojimosi internetu dažnį ir t.t. 2002 m. Lietuvos informacinių technologijų ir telekomunikacijų rinka sudarė 1,035 mlrd. litų (apie 300 mln. eurų), o 2003 m. išaugo 8–10 proc. Telekomunikacijų rinkos apyvarta 2003 m. siekė apie 2,1 mlrd. litų (apie 610 mln. eurų). Mobiliųjų telekomunikacijų sektorius 2003 m. padidėjo 11 procentų. 2002 m. mobiliųjų telekomunikacijų paslaugų skverbtis siekė 47 proc. Lietuvos gyventojų, o 2003 m. pabaigoje – 62 proc. IT didmenos rinka 2003 m. išaugo apie 8 proc. ir siekė 528 mln. litų (153 mln. eurų). Bendras Lietuvos IT eksportas 2003 m. išaugo 8,7 proc., o stambiausių bendrovių ūgtelėjo nuo 40 iki 80 proc. 2002 m. IT paslaugų eksportas buvo apie 35 mln. eurų. Pagrindinės Lietuvos IT eksporto rinkos: Vokietija, Rusija, Baltarusija, Suomija, Danija, JAV, Latvija.

2004 m. pradžios duomenimis, Lietuvoje internetu bent kartą per mėnesį naudojosi 695,7 tūkst. žmonių, arba 26,5 proc. 15-74 metų gyventojų. Tai 31 proc. daugiau nei prieš metus (533 tūkst., arba 20,3 proc.) bei 17 proc. daugiau nei 2003-ųjų rudenį (593,3 tūkst., arba 22,6 procento). 2004 m. sausio – vasario mėnesiais bent kartą per savaitę internetu naudojosi 577,6 tūkst. (22,2 proc.) gyventojų – tai 31 proc. daugiau nei prieš metus (443,7 tūkst. arba 16,9 proc.) Nors kartą per pusmetį internetu naudojosi 28,1 proc. respondentų (2003-ųjų žiemą šis rodiklis buvo 22 proc., o rudenį – 24,7 procento). Internetu Lietuvoje aktyviau naudojasi jaunesni žmonės. Iš maždaug 737,7 tūkst. naudojusių internetą per pastarąjį pusmetį žmonių 43,2 proc. buvo 15 – 24 metų, 25,1 proc. – 25–34 metų, 24 proc. – 35–49 metų, o 7,8 proc. –50–74 metų amžiaus.

Pažymėtina, kad taip sparčiai interneto vartotojų gausėja (31 proc.), kai BNP augimas siekia 9 proc. tuo pačiu laikotarpiu. Tai rodo akivaizdų rinkos persitvarkymą IT rinkos naudai.

Toks spartus IT rinkos augimas turi tiesioginę įtaką elektroninės komercijos plėtrai. Nors pastaruoju metu elektroninės komercijos pagrindą sudaro daugiau internetiniai užsakymai, tačiau ši sritis gana greitai auga. Šiuo metu Lietuvoje yra apie 100 internetinių prekybos tinklų, kurių dauguma pradėjo veikti 1999–2000 metais. Elektroninės komercijos plėtrai teigiamos įtakos turi kompiterizacijos lygio išaugimas, interneto paplitimas, internetinių banko paslaugų plėtra bei gana spartus interneto reklamos augimo tempai (2003 m. interneto reklamos rinka išaugo iki 3,7 mln. Lt, arba 1,5 karto daugiau nei 2002 m.). Kaip reakcija į sparčią IT plėtrą akcentuojamas verslo įmonių noras plėtoti e-commerce.

Kaip rodo atlikta analizė, spartus informacinių technologijų ir telekomunikacijų rinkų augimas sudaro prielaidas elektroninei komercijai plėtotis Lietuvoje. Galimybė apsipirkti neskubant, žemesnės interneto parduodamų prekių kainos ir galimybė prekes užsakyti visą parą skatina įmones taikyti elektroninę komerciją savo veikloje. Toks teigiamas požiūris į elektroninės komercijos funkcionavimą sudaro prielaidas formuotis išoriniams ekoniminiams tinklo efektams.

Siekiant įvertinti perteklinių efektų susidarymo sąlygas bei prielaidas, susidarančias dėl ypač spartaus IT ir elektroninės komercijos rinkos Lietuvoje augimo, buvo atliktas tyrimas ekspertinio vertinimo metodu.

Ekspertais pasirinkta 50 žmonių, dirbančių firmų vadovais bei vadybininkais, kurių firmos diegia informacines technologijas įmonėse. Ekspertų pasirinkimas grindžiamas prielaida, jog informacinių technologijų firmos diegia elektroninės komercijos sprendimus įvairiose įmonėse, todėl pakankamai gerai žino informacinių technologijų panaudojimo elektroninėje komercijoje galimybes bei įmonei teikiamą naudą. Ekspertų apklausa atlikta tiesioginiu būdu, asmeniškai įteikiant ekspertui anketą bei prašant ją užpildyti. Anketa sudaryta iš trijų dalių; vertinta ekspertų nuomonė dėl e-commerce panaudojimo galimybių mažinant bendrus įmonės sandorio kaštus, įmonės sandorio kaštus pagrindinėse firmos veiklose bei tarporganizacinių ryšių srityje. Ekspertai, analizuodami elektroninės komercijos panaudojimo galimybes, svarbiausiam veiksniui suteikė 10, o likusiems, priklausomai nuo svarbumo, 9, 8, …, 1 įvertinimus.

Tyrimo rezultatai parodė, kad išoriniai ekonominiai tinklo efektai yra sąlygojami tam tikrų įmonės sandorio kaštų veiksnių, susijusių su sandorio paieška, gamybinėmis technologinėmis operacijomis, išeinančiaja logistika, tarpininkų parinkimo procedūromis, kurių efektyvumą nemažai lemia spartėjanti e-commerce plėtra Lietuvoje.