

# **ICT usage and the partner's location.**

## **The case of firms in Luxembourg**

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### **Abstract**

The Information and Communication Technologies (ICT) usages facilitate the contact of the firms with external structures. In consequence, firms can create new opportunities by finding new partners in other countries. In that changing context, we were wondering if there is a difference in the ICT usages between firms having partners only located in the same country and the ones that have partners exclusively located in other countries.

With data of a community survey, called "ICT Usages by Enterprises", done in 2003 in Luxembourg, the first part of this communication describes the characteristics of partnerships. In a second part, we focus on the effects of ICT's usages (e-mail, visioconference, group calendar...) on the probability to have a partner located outside Luxembourg.

**Keywords:** ICT usage, partnership, spatial organisation.

**JEL classification:** L86, L22

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### **Introduction**

The increase of the Information and Communication Technologies (ICT) over the last few years has lead to many changes in the relations between firms. By passing spatial and temporal constraints, enterprises have now new ways to communicate and work with their partners. And even if the ICT do not replace the face to face contact, they facilitate the contact inside the firm and also the contact of the firms with external structures. Both lead to a more flexible work organisation (Dibrell, Miller, 2002). Firms can therefore either strengthen the relationship(s) they already have (customers, suppliers...) or create new opportunities by finding new partners in other countries (Park, 1998).

In that changing context that pushes firms to go always further in the acquisition of new technologies, we were wondering if there exists a difference in the impact of the usages of ICT between firms having partners only located in the same country and the ones that have partners exclusively located in other countries. This is an essential question if we look at the spatial impacts, in the economic activity, of the ICT's usages. According to Lethiais and al. (2003), there is a link between the effects of ICT and the location of firms and also the spatial organization of their contacts. Given that ICT enable firms to decentralize their activities, they enable also the split of firms and the expansion of firms working in networks. The ICT can therefore imply a spatial reorganisation and organizational changes (Brousseau et al., 1997).

In order to analyse these questions, we will use the data of a community survey done in 2003, called "ICT Usages by Enterprises", in which we have added some questions concerning the joint activity of the enterprises acting in partnership. This survey, undertaken by CEPS/INSTEAD in collaboration with STATEC, has the advantage to give information about the usage of ICT by firms and about the characteristics of partnership(s) they have made. To collect this information, we didn't give to enterprises a specified definition of partnership in the survey. We have just asked the general question: "Have you already made a partnership with another structure" and different kinds of partners were proposed: one firm of the same group, strategic alliance, suppliers, client, subcontractor, consultant, university.

Our analysis will concentrate on the country where the partner of firms is located. We can distinguish three groups of firms: the firms that make partnership(s) with other structure only located in Luxembourg, the firms that make partnership(s) with other structure only located in a country other than Luxembourg, the firms which have partners in Luxembourg as well as in a foreign country.

In a first part, we will focus on the characteristics of these three kinds of partnership and more particularly on their usages of ICT which will lead us, in a second part, to analyse more precisely, the effect of ICT according to the distance between partners.

## **1. The characteristics of enterprises which have made partnerships**

In January 2003, among the 1814 respondents of our survey, 624 (34.4 %) declare to have already made a partnership with another structure<sup>1</sup>. In a recent paper, we have seen that the more workers there were in the firm, the more the firm was susceptible to form a partnership and that the sector which has made the most partnerships was the sector of business services.

### **Box 1: Description and methodology of the survey**

The survey « ICT Usage by Enterprises » is part of the program « eEurope 2005 ». The aim of this survey is to collect data concerning the usage of Information and Communication Technologies (ICT) by enterprises, data which will be comparable throughout the European Union. Therefore, each country of the European Union has settled this survey according to common methodology and questions previously defined.

This survey consists of seven parts. These various parts give us information on the enterprises' equipment (having a computer, usage of ICT...), the use of Internet, the electronic commerce via Internet (purchases and sells), the electronic commerce via EDI or other networks, and finally the confidence building practices for Internet and the barriers to e-commerce. These data describe the situation of enterprises in January 2003.

The sampling has been made by the CEPS/INSTEAD from the enterprises' repertory of the STATEC. A census has been carried out for enterprises of more than 50 workers and the rest of the sample is a random sample stratification determined by the method of proportional allocation. Strata are established from the crossing of the groups of economic sectors and the size of legal units' classes. Six sizes have been determined: 1-4 workers, 5-9 workers, 10-49 workers, 50-249 workers, more than 250 workers. Almost all the economic sector have been surveyed.

In 2003, there were 11 314 enterprises and our sample counted 4 870 enterprises. 1 814 answered our survey which gives us a response rate of 37.2 %.

### **1.1 General characteristics of enterprises which have made partnerships according to the location of their partners**

Among the enterprises which have already made a partnership, 593 have notified the country, or more precisely, the area, where their partners are located. We have distinguished three groups: the firms that have partners exclusively settled in Luxembourg, the firms that have partners exclusively settled in a foreign country, and the firms that have partners settled in Luxembourg and in a foreign country.

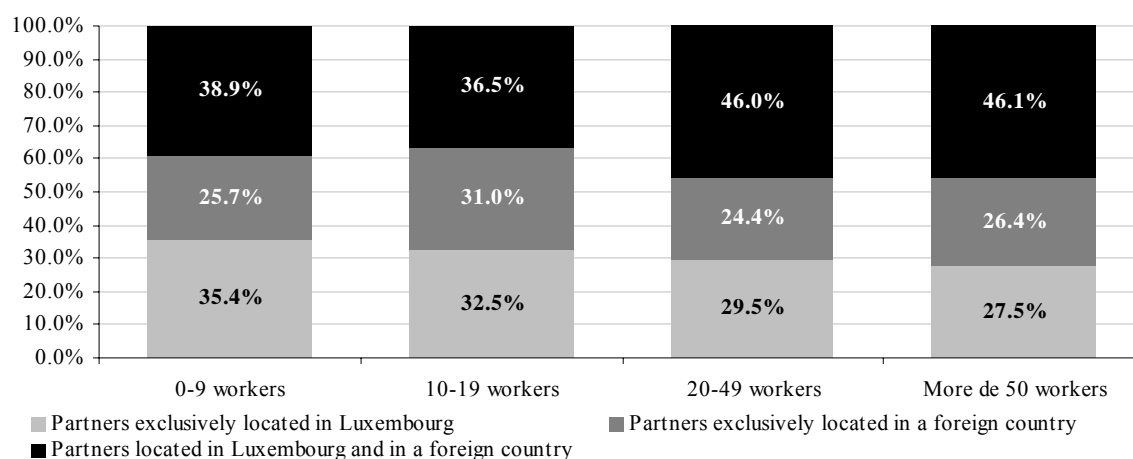
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<sup>1</sup> Poussing N, Leduc K, (2004), "The use of ICT and the joint activity of the firms acting in partnership, Luxembourg", colloque EMISA 2004 "Information Systems in E-Business and E-Government", 6-8 October 2004 ([www.emisa.org](http://www.emisa.org)).

From these 593 enterprises, 26.6 % have exclusively partners which are implemented in a foreign country, 30.7 % have partners that are establish only in Luxembourg and 42.7 % have partner implemented in both area.

By size, the small enterprises (0-9 workers) are 35.4 % to have partners in Luxembourg and 25.7 % to have only partner(s) located in another country (see graph 1). Among the medium (20-49 workers) and the big firms (more than 50 workers), nearly half of them have partners both in Luxembourg and in another country (respectively 46.0 % and 46.1 %).

**Graph 1:** Distribution of firms by size and according to the country where their partners are located



Source: CEPS/INSTEAD, CRP-GL, STATEC, Survey "ICT Usage by enterprises 2003"

Compared to other sectors, the firms from the construction sector are 64.6 % to declare to have partners exclusively implemented in Luxembourg and less than 10 % (6.3 %) to have partners only in a foreign country (see table 1). On the contrary, a majority of the enterprises (39.5 %) from the sector of industry has partners settled in a foreign country and 56.7 % of firms belonging to the business and computer services sectors and 46.2 % of firms of the financial sector have partners from both Luxembourg and other country. The proportions of enterprises in the trade sector are similar from one kind of partnership to the other.

**Table 1:** Distribution of firms by economic sector and according to the country where their partners are located (column percentage)

	Trade	Construction	Financial sector	Industry	Business & computer services	Other sectors
Partners exclusively settled in a foreign country	34.1%	6.3%	37.6%	<b>39.5%</b>	18.7%	27.7%
Partners exclusively settled in Luxembourg	31.8%	<b>64.6%</b>	16.1%	27.6%	24.6%	15.4%
Partners settled in Luxembourg and in a foreign country	34.1%	29.2%	46.2%	32.9%	<b>56.7%</b>	56.9%

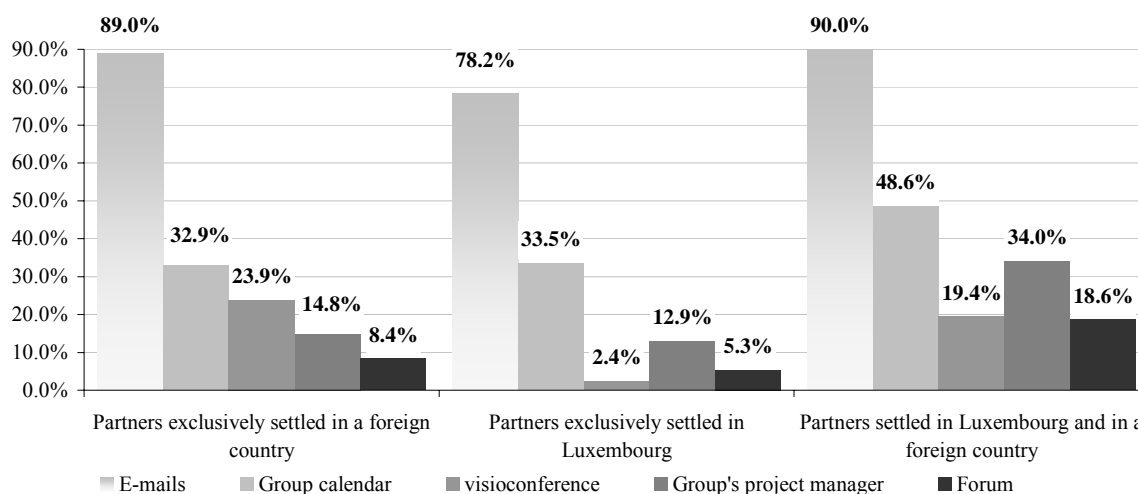
Source: CEPS/INSTEAD, CRP-GL, STATEC, Survey "ICT Usage by enterprises 2003"

## 1.2. The usages of ICT by enterprises which have made partnerships according to the location of their partners

Most of enterprises (98.7 %) which have already made a partnership are using a computer in 2002. A large majority of these enterprises (96.0 %) are also using Internet and more than three quarters of them have their own web site or home page. There is no significant difference according to the country where the partners are located.

Concerning the other ICT, we do not see significant differences for the usage of Intranet, LAN, Extranet, group calendar, forum, and group's project managers between enterprises which are making a partnership either with a structure implemented in Luxembourg or in a foreign country.

**Graph 2:** The usages of ICT according to the kinds of partnerships



Source: CEPS/INSTEAD, CRP-GL, STATEC, Survey "ICT Usage by enterprises 2003 »

On the contrary, enterprises having exclusively partner(s) in a foreign country use the e-mail more (89.0 % from them – see graph 2) than enterprises having exclusively partner(s) in Luxembourg (78.2% from them). The same observation can be made concerning the usage of visioconference: 2.4% of firms which have partner(s) exclusively in Luxembourg are using the visioconference against 23.9 % of firms which have partner(s) exclusively in another country.

### 1.3. The means of communication between partners depending on their location

If we look more precisely at the means of communication between our enterprises and their partners, we notice that despite of the distance, the traditional means of communication are the most often used. In more details, the telephone/fax remains the most often used means of communication between partners (more than 8 enterprises out of 10 in each group – see annex 1). The face to face meeting is also very often used between partners located in Luxembourg: 71.3 % whereas there are only 41.1 % of firms that have exclusively partner(s) in a foreign country to meet each other to communicate.

Concerning the ICT themselves, e-mail is the most often used by enterprises that have a partner in a foreign country: 68.8 % of enterprises that have only partner(s) from a foreign country and 63.9 % of enterprises that have partner(s) from Luxembourg and another country are using the e-mail to communicate compared to 42.8 % from the ones which have partner(s) only in Luxembourg. Even if the visioconference or the forum are used only sometimes by enterprises, we can however notice that these means of communication are more used by enterprises that have partner(s) in a foreign country (exclusively or not). For instance, if 1.7 % of enterprises having only partner(s) located in Luxembourg are using sometimes the visioconference, there are 25.0 % from the ones that have only partner(s) located in another country.

### 1.4. The usages of ICT as means of making electronic commerce

In general, the majority of firms have not made any purchases or sales via the Internet, EDI or other networks in January 2003. Nevertheless, we can see some differences in doing such commerce according to the location of the partner of the firm.

For instance, one quarter (25.2 %) of the firms having made a partnership with partners located in Luxembourg and in another country purchased during the year 2002 some goods and services via the Internet compared to 14.2 % of the ones which have made a partnership with partner(s) exclusively located in a foreign country (see table 2). Concerning the sales via the Internet, 24.1 % of enterprises

which had “Luxembourg located” partner(s) have sold products and services via this way and there are only 9.7 % of the firms that had a partner located in another country that have done so.

Electronic commerce via EDI or other networks is less common than via the Internet. And we notice that firms that have made partnership(s) with another structure located in Luxembourg were more willing to sell via EDI (14.5 %) rather than to purchase via EDI (4.6 %). The contrary is observed for the two other kinds of partnerships. For example, firms which had partners located in Luxembourg and in another country were 10.5 % to buy goods and services via the EDI and 6.9 % to sell via this network.

**Table 2:** Distribution of firms according to the location of their partner and their purchases and sales via the Internet, EDI or other network

	Purchases via the Internet	Sales via the Internet	Purchases via EDI or other network	Sales via EDI or other network
Partners exclusively located in a foreign country	14.2 %	9.7 %	7.7 %	2.0 %
Partners exclusively located in Luxembourg	20.1 %	24.1 %	4.6 %	14.5 %
Partners located in Luxembourg and in another country	25.2 %	14.0 %	10.5 %	6.9 %

Source: CEPS/INSTEAD, CRP-GL, STATEC, Survey “ICT Usage by enterprises 2003 »

## 2. Effects of ICT on the different kinds of partnerships

The first part of the paper has described the characteristics of partnerships. The descriptive statistics have distinguished the kinds of partnerships according to the four size classes and the economic sectors. We have also studied the ICT’s usages by enterprises according to the location of partner(s).

In this second part, we will focus only on two types of partnerships, and therefore on two types of enterprises: enterprises that have partners exclusively located in Luxembourg and enterprises that have partners exclusively located outside of Luxembourg. In doing so, we will be able to know if the usage of one ICT or another have an influence, *ceteris paribus*, on the probability to have exclusively non-local partners. It will then be possible to check if, as Cairncross (1997) mentioned, the « death of distance » is due to the ICT’s usages.

We will first describe the econometric model that we have used and then present the results of our analysis.

### 2.1 The econometric model, the correction of the selection bias

To analyse “*ceteris paribus*”, the effect of the usages of ICT on the types of partnerships, we will run a probit model where the dependent variable contrasts: having a partner located in a foreign country (value=1) against having a partner located in Luxembourg (value=0).

But, this model is estimated only on the firms that have already made a partnership, which can introduce a bias into the estimates. The fact to make a partnership or not with a partner located in a foreign country is, indeed, related to the fact of making a partnership. We will therefore have a selection bias if firms which have not made a partnership are excluded from the sample. The procedure of Heckman (1979) has been used to correct this selection bias.

This one consists, at first, in estimating the probability of making a partnership, and then to calculate, for each firm that have effectively made a partnership, the inverse of Mill’s ratio. Secondly, this ratio is inserted into the probit model of partnership according to the location of the partner as an explanatory variable. The estimated coefficient, associated to the inverse of Mill’s ratio, measures then the correlation of the errors between the two models: make a partnership and make a partnership with

partner located in a foreign country (Maddala, 1983, Breen, 1996). When this coefficient is significantly different from zero, one can conclude that there is a selection bias<sup>2</sup>.

We thus have estimated at first a probit on the fact to make a partnership or not. As explanatory variables, we have used the same socio-economic variables than those for the second stage (partnership according to the location of the partner): size of firms, the economic sectors and the fact to belong or not to a group. We have also included the same variables concerning the usage of ICT: the usage or not of LAN, Intranet, Extranet, e-mail, visioconference, and in the same group the forum, the calendar project and the group's project manager, the fact to make or not purchases and sales via the Internet, EDI or other networks.

## **2.2. Which are the factors that influence the probability to have a partner located in a foreign country?**

In our model, we have four kinds of variables: economic features of enterprises, ICT adoption and usages, kind of external connection to the Internet and finally the security facilities. Because of the correlation between the "use the Internet" variable and the "external connection or security facilities" variables, we have decided to work only on the enterprises that have already made a partnership either with partner(s) located in Luxembourg or partner(s) located outside Luxembourg **and** that are using the internet.

### 2.2.1. The variables included in the model

The first category of variables concerns the **economic features of enterprises**: class size, economic sectors, and the fact to belong to a group. All these variables are dichotomous variables.

We have four classes of firm size: from 1 to 9 persons, from 10 to 19 persons, from 20 to 49 persons and more than 50 persons. The six economic sectors in the model are: the business services and the financial sectors, the sector of construction, of trade, of industry (sector of reference in the model) and the other sectors. We have also included the fact to belong to a group of firms.

Given that, on one hand, many enterprises think they are too small to make a partnership with another structures, like for example in the construction sector (SES Infos rapides, 2004) or in the industry sector (Haag et al. 2004), and that, on the other hand, it is likely that the large enterprises are making partnerships the most often, especially in the "Manufacturing of machinery for food, beverage and tobacco processing" sector (Vinceneau et al., 2004), we can assume that the smaller will be the firm, the less this firm will have a chance to collaborate with another economic actor.

Concerning the fact to belong to a group of enterprises, we can expect that this characteristic will have a negative effect on the probability to have a non-local partner because enterprises which belong to a group may have the opportunity to find within their group what other firms try to find with a partner located beyond the boundaries.

The effect of the economic sector is hard to define a priori except for the construction sector. The activity of the construction sector is essentially a national activity (in that sense that it's not easy for a national firm to build something in another country because of the value added tax for example) and that's why we can think that belonging to this sector will have a negative effect on the probability to have a partner located in a foreign country.

The second category of variables take into account the **different networks used by enterprises**. Four networks are concerned: the Extranet, the Intranet, the Internet and the LAN. The Intranet and the LAN are networks that only exchange the data within the enterprise, that's why we think that to have that kind of network will have no effect on the probability to have partners exclusively located in a foreign country. On the contrary, we can assume that the usages of the Extranet and of the Internet will have a positive effect on that probability. The extend of the numeric data circulation implies indeed the growing usages of networks that can both facilitate the internal organization but also increase the exchange with external structures (Favre et al., 1998).

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<sup>2</sup> The correction of the selection bias can however lead to some problems of heteroscedasticity. To resolve this problem, STATA software uses the procedure of Huber/White.

The third category of variables focuses on the **Information and Communication Technologies' usages**: EDI, e-mail, visioconference, forum, group calendar, group's project managers, having a web site or a home page, making purchases and sales via the Internet or EDI (these two last variables are only integrated in the second model).

As the face to face meetings and the telephone/fax are the means of communication the most often used (see part 1 of the paper), we can assume that the ICT which have characteristics close to these two means of communication (easy to use, convivial) will replace this traditional means of communication in case it will be impossible to use them. In other words, when an enterprise will want to make a partnership with a partner located in a foreign country, it will use these ICT. For this reason, we can make the hypothesis that the usage of the e-mail and the visioconference will have a positive effect on the probability to have a partner located in a foreign country.

The use of technologies as forums, the Internet or EDI to purchase and sell goods and services, and to have a web site show that the enterprise is open to collaborate with others. And because of that, we can assume that using these technologies has a positive effect on the probability to have a partner located in a foreign country.

On the contrary, the group calendar and the group's project manager are systems used within the enterprise and that's why we could think that using these two technologies may have a negative effect on the probability to have a foreign-located partner.

The fourth category focuses on **the type of external connection** used by enterprises: wireless connection, analogue modem, ISDN connection, ADSL, and other broadband connection. Each kind of external connection is inserted in the model as a dichotomous variable but they are not exclusive. In other words, enterprises have declared that they were using, at the same time, different types of external connections to the Internet.

A priori, enterprises should use the Internet more often if their partners are located in another country because they won't be able to have face to face contacts. As a consequence, it is possible that enterprises will choose to use some external connexion with a high in order to improve the quality of work. We can therefore expect that to have a high speed connection to the Internet (such as ADSL, broadband connection) will have a positive effect on the probability to make a partnership with a partner located in another country.

The fifth category of variables takes into account the **security facilities** installed by enterprises. A firm which would like to exchange data with external actors must set-up security facilities that are more efficient than security facilities often used like firewalls or virus checking software. We can therefore suppose that to have a secure server, authentication mechanisms (e.g. electronic digital signature, PIN code) or to encrypt the data will have a positive effect on the probability to have a foreign located partner.

#### 2.2.2. The observed effects of ICT on the probability to have a non-local partner

Concerning the economic features, it appears that an enterprise belonging to the construction sector compared to the sector of industry decreases its probability to have exclusively partner(s) located in a foreign country (see annex 2). But another sector has also an effect on this probability. Indeed, belonging to the financial sector compared to the sector of industry has a significant and positive effect on the probability to have only partners located outside of Luxembourg. These results tend to confirm the results that we have found in the first part. These previous results have indeed shown that a large majority of firms belonging to the sector of construction have only partner(s) located in Luxembourg and that firms of the financial sector were more susceptible to have a partner located in another country rather than in Luxembourg.

We note also that the fact to belong to a group has a negative and statistically significant effect on the probability to make a partnership with a structure located in a foreign country compared to a partnership with a structure located in Luxembourg.

None of the variables concerning the ICT adoption (Intranet, Extranet, and LAN) has an effect on the probability to have only partners in another country than Luxembourg.

If we look at the effects of the ICT's usages, we notice that using e-mail and the visioconference have both a statistically significant and positive effect on the probability to have only partners located out of the Luxembourg. We can suppose that it is logical in that sense that if two partners are in the same country and quite close to each other then they are more susceptible to have face to face contacts than two partners that are located in different countries. On the other hand, it appears that to use a group calendar has a significant negative effect, which maybe can be explained by the fact that this type of technology, not really well known today, is used more often between workers of the same firm to facilitate their organization and communication.

If we look at the impacts of the type of external connection, we notice that only two of them have statistically significant effects on the fact to have a partner located exclusively in a country other than the Grand-Duchy of Luxembourg. On one hand, it appears that the wireless connection has a positive effect on that probability. On the other hand, firms connected to the Internet by the ADSL have less chance to make a partnership with partners only located in a foreign country, which is quite surprising because we could have thought (part 2.1) that to use a fast connection for the Internet facilitate the fact to have contacts outside the country.

Finally, we wanted to test the effect of the security facilities taken within the enterprises and, among the eight security facilities included in our survey, it appears that three of them have statistically significant effects. The secure server and the electronic digital signature have indeed a positive effect on the probability for an enterprise to have partners exclusively located in a foreign country. On the contrary, enterprises that have set-up off-site data back-up facilities to save their data or files decrease their probability to make a partnership with a non-local partner.

## **Conclusion**

In our population sample, we notice that a little more than four enterprises out of ten have partners implemented in Luxembourg as well as in another country, three out ten have partners that are established exclusively in Luxembourg and less than three out of ten have partners located only in a foreign country. We have noticed that e-mails were used quite often by every kind of enterprises making a partnership and that the visioconference was more used between partners located in different countries. If the traditional means of communication (face to face meetings and telephone) are still the main ways to communicate between partners, firms, and especially the ones which have a partner located in another country, have also often used the e-mail, the visioconference and the forum to stay in contact with their partners.

We have also noticed that there are various effects of ICT on the different kinds of partnerships. Some tend to confirm the descriptive results. A firm using the e-mail and the visioconference increase its probability to make a partnership with a non-local partner whereas the ones which are using the group calendar make this probability decrease. But some of these results are also quite surprising. It appears that enterprises using the high speed connection ADSL have a lower probability to make a partnership with a partner located outside of Luxembourg than firms which are not using it.

## **Limits and perspective**

In the future, we should be more precise about the definition of partnership because there can be various kinds of partnerships. We should, in particular, distinguish the average period of the partnership. Leamer and Storper (2001) mentioned indeed that the ICT are more adequate for maintaining a relationship than establishing new relationship.

It will also be necessary to take into account the main reason of the creation of the partnership. Kaufmann and al. (2002) have specified that "complex and uncertain situations – like innovation projects- usually require substantial knowledge inputs and the change of cognitive frames". This can hardly be done without informal face-to-face communication. Formal communication, like e-mail, is more adequate for a simple and stable communication environment (Daft, Lengel, 1986).

It should finally be also interesting to reproduce this analysis on a bigger sample of enterprises in order to obtain more valid results. Except some effects (belonging to the construction sector, using the

visioconference, e-mails and group calendar), the fact that an effect is statistically significant or not is largely influenced by the number of observations that are inserted in the models and by the way in which these variables are constructed.

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## Annex

Annex 1: Means of communication between firms and their partner according to the country these last are located.

Partners exclusively located in a foreign country			
	Often	Sometimes	Never
Face to face meeting	41.1%	50.0%	8.9%
Telephone - fax	88.0%	10.8%	1.3%
E-mail	68.8%	24.2%	7.0%
Forum	1.3%	10.3%	88.5%
Visioconference	1.3%	25.0%	73.7%

Partners exclusively located in Luxembourg			
	Often	Sometimes	Never
Face to face meeting	71.3%	24.9%	3.9%
Telephone - fax	85.1%	11.6%	3.3%
E-mail	42.8%	38.3%	18.9%
Forum	1.1%	1.7%	97.2%
Visioconference	0.0%	1.7%	98.3%

Partners located in Luxembourg & in a foreign country			
	Often	Sometimes	Never
Face to face meeting	54.4%	43.7%	2.0%
Telephone - fax	84.5%	14.3%	1.2%
E-mail	63.9%	29.8%	6.3%
Forum	2.8%	14.7%	82.5%
Visioconference	1.6%	19.8%	78.6%

Source: CEPS/INSTEAD, CRP-GL, STATEC, Survey "ICT Usage by enterprises 2003"

Annex 2: Determinants of the probability to have a partner located in a foreign country (probit)

<b>Dependant variable = Probability to have a partner located in a foreign country</b>		
	<b>Probability</b>	<b>Standard error</b>
<b>Economics features</b>		
1 – 9 persons employed	0.1958	0.2047
10 – 19 persons employed	0.2967	0.1871
20 – 49 persons employed	0.3272	0.1936
More than 50 persons employed	Ref.	
Services	-0.1088	0.2208
Construction	-0.9775***	0.3043
Business	0.0952	0.2176
Finance	1.0152***	0.2697
Other economic sectors	0.5146*	0.2862
Industry	Ref.	
Belonging to a group	-0.6299***	0.1916
<b>Information and Communication Technologies Adoption</b>		
Have the Internet		
Have the Intranet	0.0821	0.1633
Have the Extranet	0.0993	0.1685
Have a Local Area Network	-0.1360	0.1730
<b>Information and Communication Technologies Usages</b>		
Use the EDI	-0.1823	0.2125
Use e-mail	0.4162**	0.2110
Visioconference	1.4585***	0.3588
Use forum	0.2599	0.2420
Use group calendar	-0.3829**	0.1730
Use group's project managers	-0.0019	0.1915
To have a web site	-0.0845	0.1372
Purchase products/services via Internet or EDI	0.0887	0.1768
Sales products/services via Internet or EDI	-0.4498***	0.1942
<b>Type of external connection to Internet</b>		
Wireless connection	0.6901***	0.2434
Analogue Modem	-0.0040	0.1326
ISDN connection	-0.1794	0.1384
ADSL	-0.32901**	0.1621
Other broadband	-0.1639	0.2135
<b>Adoption of security facilities</b>		
Secure server	0.3671***	0.1586
Firewall	-0.1988	0.1544
Encryption of confidentiality	-0.2513	0.1862
Off-site data backup	-0.2347*	0.1380
Electronic digital signature	0.3631**	0.1698
Other authentication mechanism (e.g. PIN code)	-0.2117	0.1432
Virus checking or protection software	-0.2133	0.2376
Subscription to a security service	-0.1019	0.1320
Constant	1.3753***	0.3773
Population	286	
$\rho$	-0.96324***	
Log likelihood	-634.624	

Note: \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%. Ref.: reference variable

Source: CEPS/INSTEAD, CRP-GL, STATEC, Survey "ICT Usage by enterprises 2003"