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# WHAT DETERMINES THE CO-OPERATIVE POTENTIAL FOR FIRMS IN WESTERN EUROPEAN AND CEE BORDER REGIONS? A COMPARATIVE MICRO-LEVEL ANALYSIS

BIRGIT LEICK\*

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**ABSTRACT:** *The present article investigates whether Eastern European enlargement influences the co-operative potential of firms in the borderland between Western and Central Eastern Europe more than of other firms, i.e. of those not being located in the borderland. Based on theoretical arguments as well as empirical evidence, we build a micro-level framework of factors, which determine a firm's likelihood of cross-border business co-operation. Using logistic regression, this framework is empirically tested and compared for two cross-sectional datasets of firms located in the border regions in Northern Bohemia (the Czech Republic) and Saxony (East Germany).*

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**Keywords:** *European integration, Border regions, Business co-operation, Czech Republic, East Germany*

**JEL:** F 15; F 23

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## 1. INTRODUCTION

The effects of economic integration within European border regions during EU enlargement have been the focus of a number of studies and a matter of intense debate with the majority of economists and regional scientists accepting that, in the long run, border areas along the former frontier between Western and Central Eastern Europe (CEE) should benefit from integration at a market, institutional and political level (Brühlhart *et al.* 2004; Niebuhr/Stiller 2004). However, this predominantly macro-economic perspective does not fully explain the underlying processes and mechanisms working at a micro level. Only some contributions made over the past few years, such as Petrakos/Topaloglou (2008); Huber (2003 a,b); Scharr *et al.* (2001); Riedel/Untiedt (2001), have directly addressed this level of analysis. In addition, the driving forces of the internationalisation of firms across borders were a focus of interest in related disciplines, such as the international business theories of firm internationalisation (Cagusvil 1984; Meyer/Gelbuda 2006). Nevertheless, the body of the existing literature lacks a micro-level analysis of

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the drivers of business collaboration within the context of Eastern European enlargement and with a focus on the border regions between Western European and CEE countries. Therefore, the present paper extends the research on this specific topic. Its central question is whether Eastern European integration influences the co-operative potential of firms in the borderland along the frontier between “East” and “West” more than of other firms, i.e. of those not being located in the borderland. The study uses a framework that merges theoretical considerations from the regional economics and international business literature with empirical findings at the micro spatial level. It elaborates a set of factors, which determine a firm’s likelihood of cross-border co-operation. The area of study is the cross-border region of Northern Bohemia (Czech Republic) and Saxony (Germany). Using logistic regression, this framework is empirically tested and compared for two cross-sectional datasets of firms from this region. The empirical results suggest that the pattern of the determinants of cross-border co-operation is not fully consistent for the firms in the two regions, although there are some similarities in their internationalisation choices. One important lesson from this study is that the individual perception of chances of economic integration can be identified as one determinant of cross-border co-operation.

The remainder of the paper is organized as follows: After the introduction, Section 2 identifies the micro-level drivers governing the internationalisation of the firms in general and the determinants of the co-operative potential for borderland firms in particular. Section 3 develops the research propositions. Section 4 introduces the datasets, the research design and the model variables, while Section 5 presents and interprets the empirical results. Finally, Section 6 discusses the results, gives the limitations of the study and identifies fields for future research.

## **2. THE CO-OPERATIVE POTENTIAL FOR FIRMS IN BORDER REGIONS BETWEEN WESTERN EUROPE AND CEE**

### **2.1. General determinants for business co-operation in the enlarged EU**

The Eastern European enlargement has been confirmed as a factor that drives the internationalisation of European enterprises (Brenton/Manzocchi 2002; Radosevic/Sadowski 2004). An increase in business activities within the enlarged European market is due to the elimination of physical border obstacles and, consequently, lower transportation costs as well as to the reduction of political, bureaucratic and administrative barriers which reduce transaction costs (Brenton/Manzocchi 2002).

Cross-border internationalisation in the EU takes place in various shapes, among them collaborative arrangements and business networks (see Buigues/Jacquemin 1989; Kay 1991). There are numerous taxonomies for inter-firm collaborative networks (for example, Contractor/Lorange 1988). Transaction cost economics (Williamson 1975, 1991) draw the various views on the business collaboration and network paradigm back to a broad definition of collaboration as long-term relational inter-firm arrangements bet-

ween the spot market and hierarchical integration of firms. In this paper, we follow this definition of collaboration. The most common types of international collaborative engagements beyond both arms-length contacts and hierarchical interaction are long-term trade relations and supply contracts, subcontracting and outsourcing relationships, franchise agreements, licensing or research and development agreements, and equity-based collaboration like joint ventures, or minority-owned firms. Theoretically combining flexibility and efficiency gains, firms collaborate across borders to maintain competitive advantage in the international market and to create value through their relationships with suppliers, business partners, allies and customers (Staber *et al.* 1996). More specifically, firms use international collaboration to gain access to foreign markets, to take advantage of international cost differences, or to exploit economies of scope and realize synergies with foreign partners (Dunning/Lundan 2008). Another motivation of business co-operation is access to resources through collaborative arrangements and networks, for example, capital, technology, managerial expertise, and local market knowledge. Similarly, mounting competitive pressure can be a driving force of business collaboration abroad.

In the case of collaboration of Western European and CEE enterprises, vertical linkages are of particular relevance (Naujoks/Schmidt 1994; Baldone *et al.* 2001). Cost or price differences may induce firms from the relative high-cost region in Western Europe to seek business activities with firms from the low-cost region in the CEE countries. Conversely, comparative cost advantages can increase the propensity of CEE firms to serve Western European markets. This pattern of motivation is strongly influenced by industry-specific factors. According to the European Commission (2003a), predominantly manufacturing industries in Western Europe and CEE are affected both positively and negatively by the EU integration. For export-oriented industries, chances of collaborating across borders are, in general, higher than for sectors that mainly serve domestic markets. Indeed, studies analysing the nature and intensity of co-operative relationships between Western European and CEE firms indicate a high incidence of sub-contracting and outward processing trade activities mainly in manufacturing industries with strong export-orientation (Naujoks/Schmidt 1994; Scharr *et al.* 2001). This vertical type of co-operation largely relies on long-lasting, significant cost differences (Baldone *et al.* 2001). According to Deardoff/Djankov (2000) and Radosevic (2001), technological and organisational learning within sub-contracting and outward processing trade agreements is only incremental. Provided that the CEE regions catch up towards Western Europe, such arrangements might become obsolete in the longer run. Hence, these processes will put pressure on firms to develop further their existing arrangements to a more sustained type of co-operation that adds more value to the firms and, indirectly, the regions.

In recent years, small- and medium-sized firms (SMEs) are becoming increasingly involved in international activities that were formerly driven by large and multinational corporations (European Commission 2003b; Bell *et al.* 2004; Hollenstein 2005). However, SMEs face specific shortcomings and difficulties in gaining access to international markets, as compared to larger corporations. Often, they lack the necessary resources

to start business abroad, specifically human resources, financial resources, managerial and organisational capabilities (Acs *et al.* 1997; Karagianni/Labrianidis 2001). Since foreign ventures require risk-taking, uncertainty plays an important role for SMEs with foreign ventures (Karagianni/Labrianidis 2001). As a result, their internationalization pattern crucially differs from that of large corporations with usually greater experience on foreign markets. According to the process models (Johanson/Vahlne 1977; Forsgren 2002) and the more recent network approach to firm internationalisation (Johanson/Vahlne 2003), the internationalisation of enterprises, notably of SMEs, follows a path of different stages, starting from domestic-based activities or simple exports to foreign markets. While operating abroad, firms gain experience and market knowledge, benefit from learning effects and, thus, are able to reduce transaction costs for either new international activities in other markets with different socio-cultural characteristics, or for deeper, more intensive activities with firms abroad (for example, co-operative arrangements). In a similar vein, network integration of enterprises facilitates foreign ventures. Both approaches propose that experimental learning drives the formation of co-operative relationships in foreign markets. Firms can use knowledge, organisational and managerial skills they have acquired through foreign ventures with partners from culturally similar markets to co-operate with enterprises from culturally more “distant” markets. However, empirical evidence also suggests that, in some cases, firms (and also SMEs) from knowledge-intensive or high-tech sectors do not fit the stylised path of a stepwise internationalisation but rather choose co-operation prior to trade activities (Bell *et al.* 2003). For these “born global” firms, internationalisation is rather driven by their innovativeness and entrepreneurial behaviour than by learning effects and former experience on international markets (Madsen/Servais 1997; Bell *et al.* 2003).

Although the EU accession of the CEE states reduces border-related impediments to market entries in the enlarged EU, barriers to internationalisation between CEE and Western markets continue to play an important role. According to the process models of firm internationalisation, differences not only in culture, language and mentality, but also in organisational, managerial and leadership style are referred to as the “psychic distance” between actors from different cultural backgrounds and *blocs* (Johanson/Vahlne 1977, 2003; Zanger *et al.* 2008). As a consequence, the transaction costs of cross-border collaboration rise for enterprises seeking ventures in foreign markets with strong differences. These differences act as barriers to internationalisation; they may result in problems, and render the neighbouring markets less attractive compared with other locations. Some empirical studies address the role of barriers to internationalisation applied to East-West-collaboration. A study by Dimitrov *et al.* (2003) for Greece and its neighbouring countries suggests that border impediments and other barriers exert a visible influence on local firms. For the border areas between Germany and the CEE countries, Krätke (1999), Lungwitz/Preusche (2002), and Zanger *et al.* (2008) find that socio-economic barriers, for instance, cultural and mentality differences are obstacles to co-operation for German and CEE enterprises.

## 2.2 Border-related determinants for business collaboration

Since a political-economic border may either act as a contact area or form a barrier to local firms (Anderson/O'Dowd 1999; Krätke 1999), there are two opposite effects associated with the existence of a national border that may influence the collaborative behaviour of firms in the borderlands. One effect is related to the notion of border regions as economically backward areas. According to this view, borders continue to impede in various ways the level of interaction of people and enterprises that are located close to the border. In reality, many border regions, indeed, typically exhibit substantial structural deficiencies and tend to lag behind more "central" or less "peripheral" areas. A number of border areas on the European periphery are at long distance from the EU core markets. This results in relatively low population densities, insufficient transport infrastructure, an unfavourable industry and firm structure with a prevalence of indigenous, domestically oriented firms, a lack of multinational corporations and a dominance of small enterprises. Krätke (1999) and Barjak/Heimpold (1999) illustrate these deficiencies of the German-Polish border areas, and Dimitrov *et al.* 2003 for the border regions between Greece, Albania, Bulgaria and the former Yugoslavia. However, border regions can also be regarded as opportunity areas. This view is linked to political-economic integration, i.e., a reduction of border-related impediments and administrative barriers. According to traditional location and trade theories, borders that are (partly-) closed hamper trade flows between regions, and thus narrow the market potential of firms within the border area (Niebuhr/Stiller 2004). Integrating these regions by opening up borders means that this former drawback turns into the advantage of being close to a new foreign market (*ibid.*). As a result, notably firms in the borderlands can benefit from close proximity to foreign markets through lower transportation costs, lower costs of trading and lower entry barriers in neighbouring markets. In summary, enterprises located close to a national frontier between Western Europe and CEE are confronted with opposing forces linked to economic integration effects that are perceptible at a firm level.

In this context, spatial proximity is considered as the key factor that determines cross-border internationalisation. From a theoretical stance, proximity of markets induces indigenous industries and firms to seek foreign ventures in the adjacent foreign market. This effect has been tested and confirmed with empirical studies. Most macro-level gravity approaches use spatial distance to explain welfare gains and increases in the trade potential for countries and regions bordering on the new EU members in CEE (for example, Bröcker/Jäger-Roschko 1996 and Buch *et al.* 2003). Although trade models seldom use the spatial unit of border regions, they hint at a positive relationship between physical closeness and positive integration effects for border regions and their industries. In regional economics, spatial proximity also explains the emergence of *Marshallian* agglomeration economies (Marshall 1966), which are often referred to as clusters or industrial districts (Storper 1995, Saxenian 1994). Co-operative and network activities within "regional clusters" provide a contrasting model to the network relationships established by larger domestic or multinational corporations in a border region context (Krätke 1999). Typically, regional network or cluster relationships (Martin/Sunley 2003; Enright 2003) are based on localised linkages between industries and firms across smaller spatial units

and are established by local enterprises rather than by multinational corporations. Another argument is that proximity facilitates the communication of non-codified (tacit) knowledge between individuals (Polyani 1966; Freeman 1991) and supports knowledge spillovers between firms and other actors within the region (Fujita *et al.* 2000). Some empirical studies, however, question the role of spatial proximity for the cross-border internationalisation and networking of CEE and Western European firms. For example, Krätke (1999) concludes from his analysis of the German-Polish border regions that clearly at least one side of the border area is leapfrogged by most business co-operation of East German and Polish firms. In reality, co-operative activities rather focus on the capital region of Poland and the more “central” German regions and agglomerations, instead (*ibid.*). This observation calls into question the relevance of firm internationalisation in the cross-border regions, especially as transportation and information costs become rather negligible and geographically distant markets more easily accessible in a globalised world.

Beyond geographical proximity, firm- and industry-specific factors determine the actual collaborative potential in the border regions as well. Economic integration facilitates entries in foreign markets notably for firms in the borderlands with very little business experience abroad and enterprises that produce non-tradable goods and services. However, due to different cultural backgrounds and uncertainty about foreign markets that have been politically and economically separated from their region for a long time, such enterprises face high firm-level risk of starting foreign ventures across borders. Moreover, competitive pressure in the border regions is likely to increase and force domestic industries to adjust to new competitors (European Commission 2003a). Adjustment problems should be particularly relevant for enterprises that serve only local markets and for industries which have been formerly shielded by the border (for instance, the construction sector or labour-intensive services).

Similarities in industrial structures can act as an incentive to seek business opportunities abroad within the same industry. For example, local cost and price differences between similar industries in the cross-border regions may force enterprises to cope with new competition in their local environment. Both case regions of Saxony and the northern Czech Republic heavily rely on manufacturing industries and industrial production (for example, textiles and clothing, mechanical engineering, machinery, automotive industries, etc.). For Saxony, it was observed during the 1990s that many Eastern German companies had been established by domestic or foreign corporations as so-called “extended workbenches” for producing or assembling goods. The business model of such plants is based on exploiting the comparatively lower wages in Eastern Germany with respect to Western German or European locations. With rising competition at the global and local level, corporate owners as well as Saxon subsidiaries are supposed to perceive the pressure to adapt this model to a changing environment, for instance, by they themselves using nearby low-cost locations for sub-contracting and outward processing trade activities. The Czech Republic, on the other hand, attracted high inflows of foreign direct investment starting from the period of privatisation in the early 1990s. In the years before the EU accession, the national investment agency “Czechinvest” subsidised many

cases of foreign direct investment across the country, particularly in manufacturing industries such as automotive, electronics and metal processing, or in the construction industry. Hence, manufacturing firms dominate the industrial landscape in Northern Bohemian as well and often serve as “workbenches” established by foreign investors. In a long-term perspective, these firms are supposed to adapt as well to a new development path, particularly given the higher productivity of many East German competitors.

Moreover, some authors note that, compared to, for example, Austrian enterprises with their activities in the cross-border regions of the EU, both East German and Czech enterprises were rather passive in initiating foreign ventures (Zeman *et al.* 1999; Scharr *et al.* 2001). It seems likely to assume that those enterprises were not able to reap first mover advantages associated with the Eastern European enlargement. Thus, a behavioural factor actually lowers their collaborative potential.

### **2.3. The collaborative potential of borderland enterprises: a synopsis**

In summary, several determinants of cross-border internationalisation shape the collaborative potential of Western and CEE firms in the cross-border regions. Drivers of cross-border internationalisation are mainly associated with lower transport and transaction costs due to EU integration. The empirical literature confirms that there is evidence of intensive collaboration between Western European and CEE enterprises, notably in terms of outward processing and sub-contracting, but also points at the importance of firm- and industry-specific factors. In the cross-border regions, spatial proximity of local markets and, hence, greater market potential as well as differences in regional prices or (production) costs can additionally induce local enterprises to seek business collaboration in adjacent foreign markets. Consequently, these forces should positively influence their propensity of the borderland enterprises to either start internationalising or to intensify their relationships within the border areas. At the same time, the collaborative potential for firms is adversely affected by the observed structural deficiencies of the majority of the border regions, specific firm and industrial structures, and socio-cultural differences and the resulting barriers to collaborate. These border-related factors rather dissuade enterprises from seeking business collaboration abroad.

## **3. THE DRIVERS OF CO-OPERATIVE ARRANGEMENTS AT THE MICRO-LEVEL: RESEARCH PROPOSITIONS**

Based on the aforementioned theoretical considerations and empirical evidence, the drivers that govern the co-operative behaviour of firms in a border region context will be derived as research propositions. The aim is to explore why a firm in the borderland is engaged in cross-border collaboration, or not. Three different categories of forces driving business collaboration are included in the framework: (i) drivers linked to integration effects perceptible at a micro level; (ii) network effects; (iii) and factors associated with the structure of the firms and the industries.

### 3.1. Drivers as the perception of chances and risks due to economic integration

We argue that the perception of the chances and risks due to the economic integration by firms in the borderland influences their likelihood of co-operation. Saxon firms should, for example, perceive chances, of gaining access to new markets or outsourcing part of their production abroad, as well as risks caused by new competitors from the neighbouring region. This perception may induce them to seek co-operative arrangements with enterprises from the neighbouring Czech regions. Northern Bohemian firms could, in turn, perceive the chances to access Saxon markets based on their relative low-cost advantages. At the same time, new competitors from the Saxon regions may put pressure on Northern Bohemian enterprises to upgrade their technological and organisational skills. Thus, this may constitute an incentive to collaborate with Saxon enterprises, for example, as long-term supply contracts, or production co-operation. In summary, the drivers of cross-border business co-operation are twofold and consist of a positive effect as the perception of opportunities or chances and a negative effect of the risk that firms perceive. Both effects may induce firms in the borderland to co-operate across borders.

#### *Proposition 1:*

- 1-1: A firm's likelihood of co-operating across borders is positively associated with its perception of chances created through economic integration.*
- 1-2: Similarly, the perception of risks due to economic integration has a positive impact on a firm's likelihood of co-operating.*

### 3.2. Network effects

Within this category of potential drivers, we include different factors which indicate the networking and internationalisation capacity of firms. Following the process approach to firm internationalisation, we assume that exports to the neighbouring region accompany or precede co-operative activities and can be regarded as a proxy for the network activities of the firms since they indicate foreign operations taking place at an early stage in the internationalisation process. In a similar vein, the co-operative experience of firms is included as a second driver within this group of network indicators. We argue that the co-operative experiences of firms may be indicative of the knowledge which firms have developed in previous or other acts of co-operation with domestic or foreign partners. As the knowledge previously acquired may help reduce transaction costs in collaborative arrangements and overcome barriers which are relevant for East-West-collaboration, we use the co-operative experience of firms as another proxy for a network effect.

#### *Proposition 2:*

- 2-1: Exports to the neighbouring border area are positively related to a firm's likelihood of co-operation across borders.*
- 2-2: Co-operative experience has a positive effect on a firm's likelihood of co-operating with the firms in the neighbouring regions.*

### 3.3. Structural effects

Structural characteristics are also supposed to determine the likelihood that borderland firms will co-operate, as the degree and intensity of international business activities are influenced by the structure of the firms and the industries in the specific border regions. First, we argue that relative to larger firms, small firms are less likely to co-operate with partners across borders. Secondly, corporate affiliation is addressed as a second structural factor that influences the likelihood of co-operation. According to the finding that multinational corporations (and their subsidiaries) were more active in the EU integration process, as compared to the independent smaller enterprise, we propose that corporate affiliation is positively associated with a firm's likelihood of co-operating in the neighbouring regions. In addition, with regard to effects on industry, we argue that the potential for co-operation is more evident for manufacturing industries than for other sectors, such as construction, the wholesale/retail trade, or services. As a fourth structural factor, we model firm innovativeness as a driver of internationalisation and, hence, argue that the innovativeness of the firms is positively related to the likelihood of co-operation. These assumptions are, in part, based on the industrial profile of the cross-border region under review (see Chapter 2).

*Proposition 3:*

- 3-1: *There is a positive relationship between the size of a firm and the likelihood of its being involved in co-operative arrangements across borders.*
- 3-2: *A firm's corporate affiliation is positively associated with its likelihood of cross-border co-operation.*
- 3-3: *Affiliation to manufacturing industries exhibits a positive effect on the likelihood of a firm co-operating in the borderland.*
- 3-4: *The innovativeness of firms is positively linked with the likelihood of a firm co-operating across borders.*

## 4. DATA AND METHODOLOGY

With a broad definition of co-operative arrangements (Chapter 2), we are able to catch the variety of the existing co-operative arrangements within the case regions. The datasets used in this study stem from two mail surveys among firms in the NUTS-2 level regions Chemnitz (DED1), conducted in 2004, and, in the northern Czech Republic, Severozapad (CZ04) and Severovýchod (CZ05), conducted in 2005. This fieldwork was carried out in co-operation with the local Chemnitz Chamber of Commerce and the Institute of Geography of the Czech University of Ústí nad Labem. Standardised questionnaires were sent out to a total of 4,959 firms in Saxony plus 2,000 firms in Northern Bohemia as random samples. The final sample consisted of 615 exploitable questionnaires for Saxony against 279 for Northern Bohemia, which corresponds to return rates of 12.4 and 13.9 per cent. The survey revealed that a total of 25.1 per cent of the firms in Saxony and 35.1 per cent of the Northern Bohemian companies are engaged in long-term cross-border co-operative arrangements.

In order to test the research propositions, logistic regression analyses was computed to assess whether the set of model variables can reasonably predict the likelihood of co-operation across borders. The model estimates for the independent variables can be interpreted in terms of direction and relative strength of influence on the dependent variable. The dependent variable in all binary logistic regression models is a dichotomous categorical variable “long-term co-operative business arrangements across borders”, as defined previously (Table 1).

With regard to the independent variables (Table 1), we use two measures to describe the perception of the chances and risks of economic integration as perceived by the firms. The metric variables CHANCES and RISKS result from exploratory factor-analysis models.<sup>1</sup> For the factor models, several potential effects perceptible at firm-level were considered as single items according to the questionnaire used. Positive effects as perceived by the firms are: better conditions for co-operating with firms abroad; a higher export potential; and lower transportation costs. Similarly, an increase in competition exerted by firms from the Saxon respectively Northern Bohemian region, an increase in competition exerted by other Western European/CEE firms, a greater pressure on firms to streamline and to adjust, and the demand for outsourcing and processing trade, were used as individual items to describe the negative perception of economic integration at the micro-level. Two factors emerge from the exploratory factor analyses that are interpreted as representing two opposite micro-level integration effects, as shown by Table 2. In terms of the total variance explained by the models, the factors that will be used as independent variables are acceptable for both samples.

Moreover, several binary variables are included in the model as control variables (Table 1). To measure network effects, two proxies are used: the variable EXPORTS indicating whether a firm exports to the neighbouring region, or not; and the variable COOPEXP, denoting whether a firm is involved in co-operative activities outside the neighbouring region, or not. Moreover, we control for firm size, using the dichotomous variable LARGE FIRM, which gives firms with more than 250 employees as the reference category. A second structural control variable denotes corporate affiliation (CORP INTEGR) and shows whether a firm is integrated in a (foreign or domestic) corporation or holding, or not. Thirdly, we use the variable MANUFACT to control for industry. Firms belonging to the manufacturing industries category are referred to with the dummy variable. Finally, we include R&D expenditures (R&DACT) as a proxy for firm-specific technological knowledge (table 1).

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<sup>1</sup> The original items are measured with 5 point Likert-like scales indicating the extent to which firms expressed affirmation or rejection of the respective item. With Cronbach alpha values equal to 0.823 (Saxon sample) and 0.828 (Czech sample), the item scales were found reliable. The goodness-of-fit of the factor models was assessed using tests of sphericity and Kaiser Meyer Olkin measures. According to these criteria, the variable selection for the analyses was found reliable as well, with Chi square=1,485.218 ( $p<0.001$ ) and KMO=0.829 for the Saxon data, and the values Chi square=1,419.496 ( $p<0.001$ ) and KMO=0.827 for the Czech sample.

TABLE 1: *Model variables*

Dependent variable	Categories	Interpretation
Cross-border co-operative arrangements	Nominal and dichotomous, 0 = no co-operation, 1 = co-operation	Long-term co-operative arrangements with Saxon respectively Northern Bohemian firms
Independent variables	Categories	Reference category
CHANCES	Metrical, z scores	Factor representing the chances of economic integration, as perceived by the firms
RISKS	Metrical, z scores	Factor representing the risks of economic integration, as perceived by the firms
EXPORTS	Nominal and dichotomous, 0 = no, 1 = yes	1 = yes Exports to the neighbouring border region
COOPEXP		1 = yes Co-operative arrangements outside the region
LARGEFIRM		1 = yes No. of employees > 250
CORPINTEGR		1 = yes Corporate integration
MANUFACT		1 = yes Manufacturing industries
R&DACT		1 = yes Positive expenditures for R&D

Source: Own illustration.

TABLE 2: *Exploratory factor analyses: Micro-level perception of integration effects*

	Items included with factor loadings > 0.50 in the...	
	Sample with Saxon firms	Sample with Northern Bohemian firms
"Chances due to integration"	<ul style="list-style-type: none"> <li>• Better conditions for co-operating with firms abroad</li> <li>• Higher export potential</li> <li>• Lower transportation costs</li> </ul>	<ul style="list-style-type: none"> <li>• Better conditions for co-operating with firms abroad</li> <li>• Higher export potential</li> <li>• Lower transportation costs</li> </ul>
"Risks due to integration"	<ul style="list-style-type: none"> <li>• Increase in competition by Czech firms</li> <li>• Increase in competition by other CEE firms</li> <li>• Greater pressure to streamline and to adjust</li> <li>• Demand for outsourcing and processing trade</li> </ul>	<ul style="list-style-type: none"> <li>• Increase in competition by Saxon firms</li> <li>• Increase in competition by other Western European firms</li> <li>• Greater pressure to streamline and to adjust</li> </ul>
Total variance explained	51,340 %	61,471 %

Source: Own calculation.

## 5. RESULTS OF LOGISTIC REGRESSIONS

Tables 3 and 4 show the results of the logistic regression analyses. Two models are presented: Model 1 contains all integration and network effect variables, as well as the structural variables for firm size, corporate affiliation and industry. Model 2 includes the same variables except for firm size, which is replaced by the variable R&DACT in order to avoid problems of collinearity. The models show fairly satisfactorily their

ability to reasonably predict the likelihood of co-operative arrangements for both regions, for three reasons: First, the values of Nagelkerke's R square as a measure of goodness-of-fit ranging between 0.404 and 0.476 are acceptable. Secondly, the percentage of correctly classified cases in the models is fairly satisfactory. Thirdly, an acceptable model fit is supported by non-significant Hosmer and Lemeshow tests for all models.

TABLE 3: *Logistic regression predicting Saxon firms' likelihood of co-operation with Northern Bohemian enterprises*

Variables	Model 1		Model 1a		Model 2	
	Beta (S. E.)	Exp (B)	Beta (S. E.)	Exp (B)	Beta (S.E.)	Exp (B)
<i>Integration effects</i>						
CHANCES	1,037*** (0,299)	2,820	1,089*** (0,252)	3,173	0,997*** (0,3088)	2,709
RISKS	0,224 (0,123)	1,251	0,156 (0,108)	1,169	0,225 (0,124)	1,252
<i>Network effects</i>						
COOPEXP	0,749** (0,262)	2,114	1,155*** (0,222)	3,173	0,702** (0,271)	2,017
EXPORTS	3,584*** (0,418)	36,034			3,559*** (0,441)	35,115
<i>Structural effects</i>						
LARGEFIRM	0,583 (0,589)	1,791	0,397 (0,528)	1,487		
CORPINTEG	0,911** (0,345)	2,487	0,789** (0,303)	2,200	0,958** (0,343)	2,607
MANUFACT	0,305 (0,270)	1,356	0,625** (0,227)	1,867	0,138 (0,286)	1,148
R&DACT					0,373 (0,298)	1,453
Constant	-5,144*** (0,780)	0,006	-4,625*** (0,667)	0,010	-4,641*** (0,596)	0,010
- 2 Log Likelihood	394,690		508,074		394,690	
R <sup>2</sup> (Nagelkerke)	0,476		0,239		0,475	
Chi square	207,557***		94,173***		199,272***	
Correctly classified cases	86,2 %		77,0 %		86,4 %	
Sample	536		536		515	

Significance levels: \*\*\* p < 0.001; \*\* p < 0.01; \* p < 0.05; Source: Own calculations

TABLE 4: *Logistic regression predicting Northern Bohemian firms' likelihood of co-operation with Saxon enterprises*

Variables	Model 1		Model 2	
	Beta (S. E.)	Exp (B)	Beta (S. E.)	Exp (B)
<i>Integration effects</i>				
CHANCES	0,492** (0,168)	1,635	0,477** (0,171)	1,612
RISKS	0,198 (0,157)	1,219	0,234 (0,164)	1,264
<i>Network effects</i>				
COOPEXP	0,159 (0,334)	1,172	0,042 (0,343)	1,042
EXPORTS	1,561*** (0,487)	4,762	1,674*** (0,498)	5,331
<i>Structural effects</i>				
LARGEFIRM	0,183 (0,563)	1,201 (0,746)		
CORPINTEG	1,033** (0,389)	2,809	1,131** (0,378)	3,098
MANUFACT	1,460*** (0,332)	4,308	1,251*** (0,344)	3,492
R&DACT			0,729* (0,331)	2,073
Constant	-6,198*** (1,060)	0,002	-6,105*** (0,997)	0,002
- 2 Log Likelihood	252,333		239,663	
R <sup>2</sup> (Nagelkerke)	0,404		0,416	
Chi square	91,731***		91,764***	
Correctly classified cases	81,0 %		79,5 %	
Sample	263		254	

Significance levels: \*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$ ;

Source: Own calculations

When interpreting the results, beta coefficients give the direction of the influence for statistically significant results, as a first step. Consistent with our expectations, the results of the logistic regression analyses suggest that the chances of economic integration, as perceived by the firms, do matter to them. In all the models presented, the CHANCES variable has a significant positive impact on the likelihood of co-operation. However, the RISKS variable is not significant. Thus, we find no evidence that firms that strongly anticipate or perceive the need, for example, to cope with (low-cost) foreign competitors are more likely to co-operate than firms without such strong perceptions. Thus, Proposition 1-1 is confirmed, while Proposition 1-2 finds no support. This pattern is the same for both the German and the Czech sample. Secondly, with regard to network effects, the COOPEXP variable has a statistically significant positive effect on the likelihood of

Saxon firms co-operating with Czech enterprises. In contrast, this relationship is not confirmed for Northern Bohemian firms. We find support for Proposition 2-2 only for the Saxon sample. The EXPORT variable is positively related to the likelihood of co-operation for both samples. In every model, the coefficients are highly significant. Proposition 2-1 is thus confirmed.

Thirdly, the results with regard to structural effects are mixed. Contrary to our expectations, the variable LARGE FIRM is not significant, in either the Saxon or the Czech Model 1. Hence, the relationship between firm size and the likelihood of co-operation is not confirmed with this study (Proposition 3-1). In contrast, corporate affiliation implying that a firm is integrated in a corporation, as opposed to an independent company, affects the likelihood of co-operation across borders. The variable CORP INTEG is significant for both samples and supports Proposition 3-2. These opposing results indicate that the structural variables corporate integration and firm size may be overlapping, i.e. corporately integrated SMEs from Saxony are actually large firms.<sup>2</sup> With regard to industry (variable MANUFACT), it can only be confirmed with a significant result for the Czech sample, in which manufacturing firms are more likely to co-operate with Saxon enterprises than firms from other sectors (for example, construction, trade, or other services). The coefficients in Models 1 and 2 for the Czech sample (Table 4) are highly significant. Contrary to what was expected, this relationship is not supported for Saxon firms. Therefore, Proposition 3-3 is only partially supported. The second model for Saxony, with the variable R&D ACT replacing the variable LARGE FIRM, does not produce any deviant results, compared to the initial Model 1. More specifically, the variable R&D ACT is not significant. Only in Model 2 for Czech firms is this variable seen to affect the likelihood of co-operation significantly (but only at a 5 per cent level). Hence, Proposition 3-4 only finds partial, and not very strong, support for the Czech sample.

Besides the direction of influence, logistic regression analysis allows us to assess the strength of the association between the dependent and individual independent variable using the Exp(B) values. Exp(B) values give the odds ratio, i.e., the relative likelihood of co-operation compared to the relative likelihood of non co-operation for a certain event, for example, for manufacturing firms (*versus* firms from other industries). Taking a closer look at the relative strength of relationship, as given with odds ratio values, a strikingly high odds ratio of 36,034 in Model 1 against 35,115 in Model 2 for Saxony is a surprising result at first sight (Table 3). It can be interpreted that, starting off from non co-operation, the likelihood of co-operation increases by 35 or 36, as soon as a firm exports to the Czech regions. In order to cross-check the robustness of the results of Model 1, Model 1 was modified as Model 1a excluding the EXPORT variable. As shown by Table 3, the model results are overall quite similar to Model 1 except for the industry variable MANUFACT, which is now significant, with manufacturing firms exhibiting a significantly higher likelihood of co-operation than firms from other sectors.

<sup>2</sup> Indeed, further computations suggest that corporately integrated Saxon firms with collaborative arrangements are significantly larger in size than independent collaborating enterprises from Saxony ( $t = -4,038$ ,  $p < 0.001$ ).

This striking finding of an extremely high odds ratio of the export variable might have several potential causes: first, it might be the consequence of a different understanding of the term “co-operation” by the interviewed firms included in the samples. Practitioners in regional management or business development tend to use terms like “co-operation” and “networks” to denote simple trade relationships or even policy initiatives. Since this understanding deviates from the academic definition, the broad working definition used in the present study might have resulted in a bias showing that part of the co-operative arrangements refers to exports without any actual co-operative elements. However, a second interpretation is based on evidence from follow-up case study interviews with selected firms.<sup>3</sup> The findings from face-to-face interviews in Saxony suggest that, with regard to the type of co-operation most often preferred, Saxon firms are particularly involved in sub-contracting and processing trade with Czech enterprises. Thus, another possible explanation of this finding might be that it indicates a high incidence of sub-contracting and processing trade between the firms. When domestic companies sub-contract abroad or outsource (part of) their production as outward processing trade to foreign markets, this type of co-operation is often accompanied first by the exportation of raw materials or semi-produced goods to the partner firms, and then, again, by the importation from the partner firms (Baldone *et al.* 2001). This explanation seems plausible, when one specifically considers the similarly high odds ratio value of 4,762 (Model 1) or 5,331 (Model 2) for the Czech sample (Table 4).

To a large extent, the results are consistent with our expectations. Overall, the models can explain the pattern of the determinants which influence the likelihood of a firm co-operating across borders; both the communalities and the differences between Saxon and Czech firms are illustrated.

The findings for the Saxon sample suggest that the factors which significantly increase the likelihood of a firm co-operating across borders are: the subjective perception of chances for co-operation, the co-operative experiences of the firms gained from ventures on other markets, exports to neighbouring Czech markets, and corporate integration. However, firm size and industry are not confirmed as determinants of the likelihood to collaborate in neighbouring markets. The likelihood of co-operation for Northern Bohemian enterprises is, in turn, influenced by: the perception of the chances of co-operating with Saxon firms, exports to neighbouring German markets, corporate integration, industry effects (referring to the manufacturing sector), and, with only weak support, the innovativeness of firms.

As a commonality in the internationalisation pattern between Saxon and Northern Bohemian enterprises, we find that the micro-level effects of integration as the perception of the chances matter and increase the likelihood of co-operation. In addition, exports strongly influence this likelihood. The structural variable corporate affiliation is likewise confirmed in both samples. However, we do not find support for the idea that the perception of the negative integration effects as a firm-level risk,

<sup>3</sup> Semi-structured in-depth interviews were conducted with representatives of 56 selected firms as non-random sub-samples.

for example an increasing competitive pressure, drives firms to seek small-scale co-operation abroad.

Differences between the firms are, however, evident. Co-operative experience is a relevant driver only for Saxon firms in our analysis. This measure expresses the knowledge that firms may have gained through collaboration in domestic or other foreign markets and serves as a proxy for the firms' networking capacity. Obviously, predominantly Saxon enterprises use experience and knowledge they have acquired in other collaborative engagements to actively initiate cross-border partnerships with Czech enterprises. Hence, Saxon firms act as leading partners in the cross-border relationships. Moreover, it is interesting that industry effects are valid only for Czech firms, as our expectation that manufacturing firms in Northern Bohemia were more likely to co-operate than firms from other sectors was confirmed. Moreover, the innovativeness of the firms does not influence the likelihood of Saxon firms co-operating with Czech partners, while we find, among the structural variables, that innovativeness is a driver of the likelihood of co-operation for Czech firms (although its significance is only at a level of five per cent).

## 6. CONCLUSIONS

The aim of this study is to investigate the relevance of micro-level drivers of internationalisation through co-operative relationships of firms in the border areas between Western Europe and CEE. With a comparative study of enterprises in the East German-Czech borderland, the analysis provides new insights into the determinants of the co-operative potential in the context of the Eastern European enlargement. Based on a review of both theoretical and observed effects on borderland firms in the regional economics and international business literature, the study focuses on enterprises in bordering districts in Saxony (Germany) and Northern Bohemia in the Czech Republic. Several propositions about the drivers that govern the internationalisation pattern of the firms are established. Logistic regression analyses are performed to identify and test these drivers, using datasets from fieldwork in Saxony and Northern Bohemia.

The results of the empirical analysis allow us to draw the conclusion that the pattern of the determinants for firms in the border areas under survey is not fully consistent, although there are some similarities in their internationalisation choices. One important lesson from this study is that the individual perception of chances of economic integration can be identified as one determinant of cross-border co-operation. This result supports the hypothesis that Eastern European enlargement broadens the co-operative potential for enterprises in the European border regions. However, the individual perception of the risks, on the part of the firms, that are associated with the Eastern enlargement of the European Union cannot be confirmed as a driving force of co-operation. Furthermore, the prominence of sub-contracting and outward processing trade activities is evidently reflected in the link between exports and co-operation. This finding is consistent with evidence from studies in other border areas between Western Europe and CEE (for example, between Germany and Poland) that hint at a predominance of foreign operations

motivated by making use of cost differences from the viewpoint of Western European companies. Moreover, the analysis reveals that the role of structural characteristics of firms as a driver of internationalisation in border regions remains unclear. The variables that are included in the model do only, to a limited extent, explain the likelihood of collaboration, a result which runs contrary to what was expected against the background of other studies and theoretical reasoning.

The empirical results also point to striking differences between the firms from the case regions. Saxon enterprises benefit from network effects associated with learning through collaborating elsewhere, and the knowledge acquired within other business activities that facilitates co-operation with Czech enterprises. While this dimension of a network effect is relevant for the Saxon enterprises, there is no evidence that shows that Czech firms benefit from similar effects. This finding suggests that learning and knowledge that is acquired through collaboration with other partners (than from the case regions) supports Saxon enterprises in initiating relationships with Northern Bohemian enterprises. As another difference, the empirical results highlight that for the Czech firms, manufacturing industries are more likely to be involved in cross-border collaboration, while other sectors are clearly less active in co-operation with Saxon markets. The effect of industry, however, does not matter for Saxon enterprises. Moreover, there is a weak support for the hypothesis that the innovativeness of Czech firms positively affects the likelihood of their co-operation with Saxon enterprises. In the light of this (limited) evidence of a relationship between the internationalisation and the innovativeness of firms in the Czech borderland, further research may seek to confirm this link.

In summary, the findings of the present study open the doors for further in-depth investigation of the micro-foundations of business networks within European border regions. Moreover, the conclusions drawn should be considered in the light of several limitations. First, the scope of the present study does not explicitly incorporate network-type relationships between more than two firms, but focuses exclusively on explaining the likelihood of business co-operation as one type of cross-border internationalisation. Thus, we cannot exhaustively address the issue of regional clusters and networks in a European enlargement context. Secondly, the drivers of firm internationalisation as included in the model framework are not exclusive. Besides geographical distance that is not addressed as a factor that influences the co-operative potential, we do not look into the different types and governance modes of co-operation and the motivation of the enterprises with this study. Given an obvious dominance of sub-contracting and outward processing activities, future studies should incorporate a differentiation between several co-operation types. In general, modifications of the model should include other or more structural characteristics of borderland firms than the ones used in this study. More specifically, the differences between independent (domestic) firms and multinational enterprises with collaborative relationships could be analysed to test a potential relationship between firm size and corporate integration. Similarly, it would be interesting to specify the risks or costs of (non-)collaboration for borderland enterprises in the model. Thirdly, the relationship between the type of co-operation and the competitive advantage that is created as well as the importance of cross-border business

networks for regional development are two other directions for future studies. As a final point, with cross-sectional data used, the empirical results need to be verified by taking the time dimension into account, for example, to investigate the relevance of barriers to collaboration and their inter-relationship with the firms' network integration from a dynamic perspective.

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