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213/2003

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WIFO Working Papers, No. 213
December 2003

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2003/368/W/0

SMALL FIRMS IN CROSS-BORDER BUSINESS NETWORKS WITH THE CEEC: EVIDENCE FROM AUSTRIA

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Abstract

This paper analyses the co-operation activities of small Austrian firms with the CEEC and compares them to those of larger firms. Small firms are less likely to engage in cross-border co-operation than larger firms, more likely to co-operate in ownership based forms of co-operation but less likely to engage in production or sales activities. Finally, small firms are more likely to have small partners. I also find that small firms' co-operation probability depends more strongly on distance considerations and internal organisation of the firm but that small firms profit less from previous experiences with cooperation than larger firms. Differences in large firms' characteristics explain around 30% to 40% of the lower co-operation probability. The remaining 60% to 70% are due to differences in small firm behaviour. The paper concludes by drawing attention to the policy implications of these results.

JEL – Classification: D23, L10, R12

Key Words: Cross Border Cooperation, Small firms, Networks

* This research received financial support from the Gesellschaft d. Bundes f. Industriepolitische Maßnahmen (GBI) and the Interreg IIC Programme (Preparity). The Author thanks the participants of the WIFO Globalisation Seminar for helpful comments and suggestions. Maria Thalhammer, Andrea Hartmann and Andrea Grabmayer provided valuable research assistance. All errors remain in the responsibility of the author.

Introduction

Austria was undoubtedly one of the countries most strongly affected from the opening of Central and Eastern European Countries (CEEC) in the late 1980‘s and early 1990‘s. In the decade following political changes in these countries, Austrian exports to the region trebled, imports doubled and by 1998 around 30% of Austrian foreign direct investments abroad were invested in the CEEC. Furthermore, the Austrian experience of the 1990‘s suggests that a number of small and medium sized enterprises used the opening of the CEEC to internationalise their activities (ALTZINGER ET AL, 2000). Since a large literature (see: BALESTRI, 1994, BAYER, 1994, BOSCHMA, 1999, GRAZIANI 1998, KAUFMANN and TÖDTLING, 2000 and GROTZ and BRAUN, 1997) has found that regional networks based on tightly knit webs of contacts among primarily small and medium sized enterprises located close to each other influence regional development and innovation positively, one of the hopes associated with integration and accession of the CEEC in Austria was that cross-border networks could present a positive impulse to the Austrian economy, which is characterised by an industrial structure strongly focused on SME’s. The basis for this hope is, however, questioned by a substantial body of empirical evidence (see AMIR and WODERS, 1998, CAVES, 1996 and CASSIMAN and VEUGHELERS, 1998), which finds that small firms are less likely to co-operate with other firms in the first place.

This paper uses a data set on 505 Austrian firms to address the particularities of small firms (with less than 50 employees) in cross border co-operation with the CEEC. As earlier literature the paper finds that smaller firms are less likely to co-operate, however, it extends previous literature in two ways. Fist, it focuses on the differences in co-operation patterns between large and small firms for the case of cross-border co-operation between Austria and the CEEC. It shows that small firms are more likely to engage in co-operation based on ownership relations and less likely to co-operate in production or sales relationships. Furthermore, small firms given they co-operate are more likely to co-operate with firms in the CEEC which are small.

Second, I perform Oaxaca-Blinder decompositions (see: OAXACA, 1973) and BLINDER, 1973) to divide the differences in co-operation probabilities between large and small firms into two components: One which is due to differences in the characteristics of small firms other than size, and one that is due to differences in the behaviour of firms. This is important because a number of potential explanations for the low co-operation

probability of small firms voiced in the literature are associated with the differences in characteristics of small and larger firms. For instance small firms may be more likely to have a legal form less conducive to co-operation (see: CASSON and COX, 1992 and RALLET and Torre, 1998), or they may lack prior experience with co-operation (see: HUBER, 2003). Other explanations by contrast suggest that the behaviour of small firms may be different, for reasons such as differences in enterprise culture, internal organisation and limited organisational capacities or access to information of small firms (see: LORENZEN, 1998, SCHMIDT, 1998). Our decomposition allows us to address, what share of the existing difference in the co-operation probability between large and small firms is due to these two explanations. We find that between 30% and 40% of the difference in the co-operation probability between small and larger firms is due to differences in firm characteristics other than size and around 60% to 70% is due to differences in small firm behaviour. The next section of this paper presents the data, and some of the stylized facts referred to above, while section three describes the empirical strategy. Sections four presents the results and section five concludes.

Data

Our data stem from a questionnaire conducted among 505 Austrian firms.[1] These were asked whether they co-operate with a partner from the CEECs, and whether they were also co-operating with a partner from other countries or within Austria. Furthermore, firms co-operating with CEEC partners were asked detailed questions on the number of co—operations, the legal form of co-operation (majority ownership, minority ownership, franchising, licensing or other) and the goal of the most important co-operation (sales, production, service, R&D and others). In addition, firms were asked a set on questions concerning the size, location[2] and industry affiliation of their most important partner. [3]

Table 1 presents the number of firms sampled by size-category and the share of firms with at least one co-operation with the candidate countries, other Austrian firms and other countries. In general the sample of firms mirrors the size distribution in the Austrian economy, which is dominated by small and medium sized enterprises. Furthermore, the table shows the substantial interaction between CEECs and Austrian firms relative to co-operation within Austria or other countries. 41% of the firms sampled have at least one co-operation with a partner from the CEECs and over 50% with other countries. Cross border co-operation is more important than

co-operation within Austria. Only 36% of the firms have at least one co-operation partner within Austria. This finding is consistent with previous research on R&D co-operations and reflects the smallness of the country.[4]

{Table 1: Around here}

Table 1, however also documents that the probability of co-operation is substantially lower among firms with 50 employees or less, relative to firms with more than 50 employees. Only 21.9% of the former co-operate with the CEEC, while over 60% of the larger firms co-operate with partners from the CEEC. These differences between firms of different size seem to be slightly stronger than in co-operation with Austrian partner and of about equal magnitude as in co-operation with other international partners (see: Table 1).

Furthermore, the nature of co-operation differs between firm size categories. In a related paper HUBER (2003) suggests a typology of inter-firm co-operation which distinguishes between the role played by different forms of transaction costs and the importance of building and maintaining trust in a co-operation. This typology differentiates between forms of co-operation which are based on (majority and minority) ownership, where principal agent problems are an important aspect of the co-operation agreement, incentive contracts (such as franchising and licensing), where incentives are provided for by contract, and business relationships, which are not based on formal contracts and where building and maintaining trust will be more important. As evidenced by table 2 small firms (given they co-operate at all) given they co-operate are more likely to engage in ownership based relationships than either medium sized (firms employing 51 to 250 employees) or large sized firms (with more than 250 employees). They are also less likely than firms of other size categories to engage in business relationships.[5] Similarly small firms are more likely than firms of other size categories to enter co-operations (such as R&D co-operations), which do not have the purpose of sales or production (see Table 2).

{Table 2: Around here

Cross-border co-operation of Austrian firms in general and that of small firms in particular is thus characterised by a strong element of hierarchy. Overall more than half of the co-operations between all Austrian firms are

based on ownership relationships, and for small firms this share exceeds more than two thirds. This stylized fact mirrors earlier findings on East-West cross border enterprise networks in Germany (see: SCHMIDT, 1998) and may reflect technological factors – the existing production structure in the CEEC was often not geared towards high technology products and flexible production systems, which support less hierarchical co-operation in many market economies (see: ZYSMAN and SCHWARTZ, 1998 for evidence) – and the particularities of the institutional environment in the CEEC in the last decade, which was characterised substantial legal uncertainties. In a situation of lacking experience with the interpretation of laws and a lack of generally accepted business norms, property may be the safest way of co-operation. This may be a particularly important argument for small firms, who often lack legal know-how to administer more complex forms of co-operation.

There are, however, also differences as to the kind of partners small and large firms co-operate with. In the questionnaire co-operating firms were asked on the size of their co-operating partner (in terms of number of employees) and whether the partner is located within a distance of 100 kilometres from the border. In table 4 we merge information on the partners with the co-operating firms' characteristics. The results show that small Austrian firms are more likely to co-operate with small partners in the CEEC. Small firms are, however, not the most likely to find co-operation partners close to the border. Overall medium sized enterprises (with an employment of between 51 and 250 employees) are more likely to co-operate with partners from regions within 100 kilometres of the border, while the share of co-operating small firms which have a partner close to the border is slightly lower than for large firms. This "stylized fact" seems to result primarily from the low propensity of co-operation with CEEC firms close to the border of small Austrian firms located close to the border themselves. This thus casts doubt on the feasibility of cross-border co-operation based on contacts among primarily small enterprises located close to each other on the Austrian border to the CEEC.

{Table 3: Around Here}

Empirical Strategy

While these stylised facts suggest that the co-operation activities of small Austrian firms with CEEC partners differ in a number of respects from those of larger firms, a particular concern of this paper is with explaining the differences in the probability of co-operation between small and large firms. To this end we model the choice of co-operation as determined by the expected profit (π_{ik}) from co-operation of firm (i) in firm size group (k). Based on this profit the firm decides whether to co-operate or not. Furthermore, we assume that expected profits of co-operation depend linearly on the set $X_{ik} = \{X_{ik1}...X_{ikN}\}$ of exogenous firm characteristics. Thus:

(1) $$\pi_{ik} = b_k X_{ik} + \xi_{ik}$$

With b_k a vector of parameters to be estimated and ξ_{ik} a random variable, distributed independently across the choices (k). An appropriate econometric model for such a problem is a logit model. This estimates the probability that a firm is in one of two possible states (co-operation or non co-operation). Since descriptive analysis suggests a particularly low co-operation probability for firms with less than 50 employees, we perform these estimations for two subgroups of firms: small firms with less than 50 employees and other firms. As suggested for instance by NICKEL (1980) and more recently by BLACKABY ET AL. (2002) given estimates for the parameter vector for small firms (β_s) where we denote k=s for the group of small firms and (β_l) with k=l for large firms, differences in predicted co-operation probabilities (denoted by $P(\beta_k X_k)$ between large and small firms can be decomposed by:

(2) $$P(\beta_l X_l) - P(\beta_s X_s) = [P(\beta_l X_l) - P(\beta_l X_s)] + [P(\beta_l X_s) - P(\beta_s X_s)]$$

where the first term in squared brackets on the right hand side of equation (2) is the difference in predicted co-operation probability due to differences in the characteristics of small firms from large firms (i.e. under the assumption of equal coefficients for large and small firms) and the second term reflects differences in co-operation activities due to differences in parameters (i.e. behaviour) of small firms.

We focus on the role of the following variables in determining the probability to form a co-operation:

1) Road distance to the nearest border from the address of the firm under consideration – Since a substantial literature (see: DNES, 1996, KEHOE, 1998, LAFONTAINE and SHAW, 1996) suggests that the likelihood of co-operation depends negatively on distance, we use this variable as a proxy measure for the distance to the

nearest potential partner. This allows us to measure the impact of distance even for non-co-operating firms, where distance between actual partners cannot be measured. Since distance can be seen as a proxy for transaction costs in co-operation, and longer distances are associated with higher transaction costs, the coefficient of this variable should be negative.

2) Proxies for the organisation of firms – Since a number of studies (CASSON and COX, 1992, RALLET and TORRE, 1998) argue that enterprise culture and ownership form may have an impact on the choice of co-operation and that firms acquainted with more open information may find it easier to credibly communicate and co-operate with partners abroad, we use a dummy variable for unincorporated companies as a proxy for enterprise culture and openness to co-operation. The reference category is incorporated companies. The impact of this variable may be either positive or negative depending on which form of internal organisation (incorporated or unincorporated enterprise) is more affine to co-operation.

3) Dummies concerning the expected economic development in the CEECs. – Since in most models of foreign direct investment, the decision to invest inter alia depends on the expected future development of the country under consideration (CAVES, 1996), we formed a dummy, which takes on the value one if the firms` management expects a positive (i.e. either very good or good) development in these countries and zero else. One would expect firms more optimistic about the development in the CEEC to have a higher co-operation probability.

4) A dummy for previous experience with co-operation - we include a dummy to measure previous experience with international co-operation which takes on the value 1 if the respective firm stated that it also co-operated with partners from other non CEEC countries. This variable was included to account for potential increasing returns to scale in co-operation activities and should also influence co-operation probabilities positively.

Furthermore, we include a dummy variable if the firm is located in the south of Austria (Carinthia or Styria), because political problems of former Yugoslavia in the last decade may have prevented co-operation. Measuring distance to the border of Slovenia for the south could thus distort results. Finally, as further control variables we include dummy variables which take on the value of one if a particular firm belongs to a certain industry (of

eight industries) an zero else, to control for differences in the propensity to co-operate among industry groups due to differences in technology.[6]

{Table 4: Around here}

Table 4 reports descriptive statistics concerning these explanatory variables. Not surprisingly small firms are more likely to be unincorporated enterprises and less likely to have previous experiences with cross-border co-operation than large firms. Furthermore, small firms are more likely to be affiliated with the wood processing industry and less likely to be involved in both the furniture and construction industries than large firms. Other than this, however, differences in explanatory variables between small and larger firms seem to be small. In particular small firms are equally likely to be located in the south of Austria as large firms and are located at similar distances from the border as large firms. Also industry affiliation probabilities in the foodstuffs, textiles, paper, metal and vehicles industry are of a similar magnitude in small and large firms.

Results

Table 5 presents two sets of results for small and large firms respectively. In the first two columns I control for industry affiliation and in the second two these industry controls are dropped. Results including industry dummies (column 1) suggest that distance to the border and location in the south have the expected negative impact on the co-operation probability of small firms. The coefficient of distance, however, is small relative to other variables and only on the verge of significance. Thus even for small firms distance to the closest potential partner is not as important as other variables in determining cross-border co-operation. For large firms both the distance and location in the south have the expected sign but remain insignificant. Thus distance and location in the south have a much stronger impact on the co-operation probability of small firms than of large firms. This implies that small firms are more dependent on distance in their co-operation decision, and that the low co-operation probability of firms located in the south of Austria is due primarily to lacking co-operation of small firms, which may have been particularly susceptible to the political risks of co-operation involved with former Yugoslav countries.

The effect of firm organisation suggests that unincorporated enterprises have a slightly higher chance of co-operation than incorporated enterprises. The variable, however, is only on the verge of significance for small firms, while for large firms it is insignificant. Thus for small firms remaining unincorporated is more conducve for migration. Experience with previous international co-operation although having a significantly positive impact on the co-operation probability for both small and large firms, has a stronger influence on large firms. This suggests that such large firms can take advantage of the learning effects of previous international co-operation experiences more efficiently than small firms.

Finally, both expectations as well as individual industry dummies fail to be significant both for large as well as small firms, suggesting that these variables have no impact on co-operation probabilities. In column (2) thus industry dummies were excluded to test the robustness of our estimation. Differences to the original specification are small. The estimated coefficients of variables for both small and large firms retain significance and are of the same order of magnitude as in the original specification. The only important difference is that when controlling for industry affiliation, distance attains a higher significance level for the co-operation activity of small firms.

{Table 5: Around here}

In order to check on the robustness of these results a number of further estimations were also run (see Table A1 in the Appendix). In particular the insignificant expectations variable was replaced by dummy variable to take on the value of 1 if a firm was located in an urban agglomeration of more than 100 thousand inhabitants since co-operation activities may differ in such agglomerations if many headquarters are located in such cities. This variable remained insignificant for both small and large firms. Also a further variable (if a firm was located in the East of Autria i.e. Vienna, Burgenland, Lower Austria) to control for location of firms was included in the regressions. This variables prove to be marginally significant for the co-operation probability of larger firms but not for small firms. Furthermore, an additional specification was run excluding the insignificant expectations variable. The impact of this change (as well as other changes) on other variables included in the regression is small. In general changes in parameter estimates vary by around 0.1 or less between specifications.[7]

The robustness of estimation results also suggests that any decomposition based on equation (2) will be highly robust across specifications. The decompositions for both specifications reported in the bottom panel of table 5 suggest that only 33% to 34% of the difference in co-operation probability in large firms can be attributed to differences in enterprise organisation, previous experience with cross border co-operation and industry affiliation, while the remaining 67% to 66% can be attributed to differences in behaviour with respect to these variables. When moving to the other specifications reported in table A1 the appendix, this variance in results widens slightly. In all specifications, however, the share of the differences in co-operation probability attributed to differences in firm characteristics are in the realms of between 30% to 40%. Thus the remaining 60% to 70% of the differences in co-operation probability between large and small firms can be attributed to differences in the behaviour of small firms.

Conclusions

This paper is concerned with the particularities of small firms in cross-border co-operation activities. It uses the example of cross-border co-operation of Austrian firms with the CEEC to suggest that small firms are overall less likely to engage in cross-border co-operation than larger firms, but that small firms are more likely to co-operate in ownership based forms of co-operation and less likely to engage in production or sales activities in such co-operations. Furthermore, small firms given they co-operate are more likely to have small partners. Finally, results suggest that visions based on the emergence of networks based on small firms close to the border enhancing innovation and productivity in the immediate border regions may be somewhat unrealistic in the case of Austrian border regions, due to the low co-operation propensity of small firms close to the borders with partners just across the border.

In the econometric analysis the paper also finds that small firms' co-operation probability depends more strongly on distance considerations, internal organisation and location but that small firms profit less than large firms from previous international co-operation experience. I also find that differences of small firms from large firms with respect to these variables can explain between 30% and 40% of the predicted difference in co-operation probability between large and small firms and that when in addition to these four variables I control for the fact that small firms may have different industry affiliations this share does not change. In sum thus around 60% to

70% of the difference in predicted co-operation probability between large and small firms is due to differences in behaviour of small firms.

While these results apply only to one particular case of cross-border co-operation, and substantial further research into other cases has to be undertaken before they can be generalised, our results do have substantial policy implications for policy makers interested in fostering cross-border co-operation between Austrian firms and the CEEC. They suggest first that while the co-operation activities of larger firms are already substantial, focusing policy on small firms with 50 or less employees may be particularly rewarding. Second, our results suggest that the low co-operation activity of these firms is not exclusively due to the inherent characteristics of small firms, but primarily to differences of behaviour. Policy could thus achieve results if it focuses on changing the behaviour of these firms with respect to co-operation with the CEEC. Consultancy and awareness building of the opportunities offered by such co-operation could be important instruments in achieving this goal. Finally, our results suggest that such a policy could focus in particular on increasing small firm co-operation in production, sales and networks not based on ownership, in order to reduce the most obvious deficiencies in small firms' co-operation activities.

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Table 1: Co-operation activities of Austrian firms by size groups

Employees	Total firms sampled	Of this with at least one co-operation partner in CEEC	Share of firms cooperating with CEEC (%)	Share of firms cooperating with Austrian firms (%)	Share of firms cooperating with other countries (%)
0 to 50	265	58	21,9	23.8	34.7
51 to 250	162	101	62,3	46.3	64.2
250 or more	78	50	64,1	53.8	74.4
Total	505	209	41,4	35.6	50.3

Table 2: Forms and Purpose of co-operation by firm size categories

	Form of Co-operation		
	Ownership	Incentive	Other
0 to 50	67,8	13,0	19,3
51 to 250	47,8	9,7	42,6
251 or more	48,9	22,5	28,7
Total	53,6	13,6	32,8
	Purpose of Co-operation		
	Production	Sales	Other
0 to 50	39,6	32,8	27,6
51 to 250	43,2	47,9	8,9
251 or more	52,0	38,0	10,0
Total	44,3	41,3	14,4

Notes: Table reports the percentage share of co-operating firms in the respective form of co-operation. I.e. tables report probabilities conditional on co-operation. Unconditional probabilities can be calculated in by multiplying with number shown in table 1. Rows may not add to 100% due to rounding errors.

Table 3: Size and location of CEE partners of Austrian firms by size groups

	Size of CEEC Partner [a]			Share of partners within 100 kilometres of the border		
Size of Austrian Partners	0 to 50	51 to 250	251 or more	Austrian firm within 100 km of the border	Austrian firm outside 100km of the border	Total
0 to 50	80,7	8,8	10,5	6.7	16.7	9.5
51 to 250	61,7	25,9	12,3	38.4	50.0	42.1
251 and more	48,6	25,7	25,7	18.8	13.6	17.2
Total	65,3	20,2	14,5	19.4	20.6	35.7

Notes: Table reports the percentage share of co-operating firms with the respective partner characteristics I.e. tables report probabilities conditional on co-operation. Unconditional probabilities can be calculated in by multiplying with number shown in table 1. Rows may not add to 100% due to rounding errors. a) 36 answers were lost due to non-response.

Table 4: Descriptive Statistics of Variables Included by size groups

	all firms	small firms (less than 50 employees)	large firms (more than 50 employees)
Firms with a co-operation with the CEEC*	0.414	0.219	0.629
Distance to border	135.355 (152.706)	135.257 (152.579)	135.463 (153.165)
Unincorporated Enterprise*	0.158	0.226	0.083
Co-operation with other countries*	0.503	0.347	0.675
Located in southern Austria*	0.125	0.128	0.121
Construction*	0.044	0.030	0.058
foodstuffs*	0.087	0.091	0.083
textiles*	0.067	0.068	0.067
wood*	0.038	0.049	0.025
paper*	0.030	0.026	0.033
metal*	0.085	0.087	0.083
vehicles*	0.022	0.023	0.021
furniture*	0.079	0.038	0.125
Number of observations	505	265	240

Note: Numbers in brackets refer to the standard deviations. Variables Indexed by * are Dummy variables. Their standard deviation is given by the square root of (1-mean)*mean

Table 5: Estimation and decomposition results (dependent variable: Co-operation Probability)

	Including industry controls		Excluding industry controls	
	small firms	large firms	small firms	large firms
Distance to border	-0.0024* (0.0013)	-0.0009 (0.0011)	-0.0020 (0.0013)	-0.0005 0.0010
Unincorporated Enterprise	0.7509* (0.3994)	0.3887 (0.5999)	0.6928 (0.3912)	0.3861 0.5886
Co-operation with other countries	1.8055*** (0.3494)	2.3212*** (0.3386)	1.7293 (0.3358)	2.2561 0.3212
Positive Expectations	0.1891 (0.3629)	0.0861 (0.3592)	0.1629 (0.3541)	0.0502 0.3454
Located in southern Austria	-2.1693*** (0.7947)	-0.8542 (0.4764)	-2.1156 (0.7732)	-0.7842 0.4607
Construction	1.1639 (0.8457)	-0.3936 (0.6942)		
Foodstuffs	0.1145 (0.5788)	-0.0052 (0.5894)		
Textiles	0.7080 (0.7861)	0.7897 (0.7117)		
Wood processing	-0.3379 (0.8688)	-0.1951 (0.9756)		
Paper	0.0886 (1.1539)	0.0969 (0.8756)		
Metal	0.1139 (0.6329)	0.0807 (0.6135)		
Vehicles	0.1273 (1.2236)	-2.2588 (1.2074)		
Furniture	0.2839 (0.8650)	0.1296 (0.4867)		
Constant	-1.9992 (0.4116)	-0.8090 (0.4274)	1.8817 0.3864***	-0.8058 0.3847
Log likeliyhood	-117.11	-125.17	-118.31	-128,89
Number of Observations	265	240	265	240
	Decompositions of differences in predicted co-operation probability			
Total predicted difference %	41.03		41.03	
Due to differences in characteristics %	14.07		13.63	
Due to differences in behaviour %	26.96		27.40	
Share due to differences in characteristics %	34.28		33.21	
Share due to differences in behaviour %	65.72		66.79	

Dependent variable: Co-operation probability, numbers in brackets are standard errors of the estimate, *** (**) (*) signify significance at the 1% (5%) (10%) level respectively

Appendix 1: Robustness of results with alternative specifications

	including large city variable				including further regional variables				excluding expectations			
	small firms		large firms		small firms		large firms		small firms		large firms	
	coefficient	std. dev.	coefficient	std. dev.	coefficient	std. dev.	coefficient	std. dev.	coefficient	std. dev.	coefficient	std. dev.
Distance to border	-0.0025*	0.0013	-0.0009	0.0011	-0.0027*	0.0014	-0.0002	0.0012	-0.0025*	(0.0013)	-0.0009	(0.0011)
Unincorporated Enterprise	0.7369*	0.3985	0.4215	0.6034	0.7323*	0.3985	0.3598	0.5987	0.7385*	(0.3979)	0.4088	(0.5950)
Co-operation with other countries	1.8216***	0.3480	2.3771***	0.3447	1.8221***	0.3489	2.4214***	0.3507	1.8219***	0.3481	2.3256***	(0.3383)
Located in east of Austria					-0.3169	0.4404	0.8558*	0.4427				
Located in large city	0.0458	0.6016	-0.8936	0.5890								
Located in southern Austria	-2.1684**	0.8173	-0.8769*	0.4870	-2.2480**	0.8060	-0.5908	0.4942	-2.1542***	(0.7949)	-0.8511*	(0.4768)
Construction	1.1406	0.8431	-0.2723	0.7097	1.1918	0.8232	-0.1719	0.7024	1.1485	(0.8376)	-0.4028	(0.6912)
Foodstuffs	0.1605	0.5768	0.0611	0.5905	0.1897	0.5802	-0.0918	0.6012	0.1559	(0.5736)	0.0002	(0.5879)
Textiles	0.6860	0.7871	0.7412	0.7163	0.7257	0.7854	0.6385	0.7272	0.6834	(0.7864)	0.7798	(0.7121)
Wood processing	-0.3224	0.8711	-0.2668	0.9805	-0.3097	0.8706	-0.1406	1.0008	-0.3260	(0.8698)	-0.2055	(0.9758)
Paper	0.1207	1.1503	0.0699	0.8794	0.2062	1.1590	0.1698	0.8921	0.1197	(1.1503)	0.1073	(0.8734)
Metal	0.1442	0.6332	0.0803	0.6041	0.1368	0.6351	0.0809	0.5880	0.1469	(0.6317)	0.0573	(0.6040)
Vehicles	0.1065	1.2127	-2.2926	1.2214	0.2245	1.2122	-2.0746	1.2137	0.1065	(1.2131)	-2.2611	(1.2073)
Furniture	0.2768	0.8747	0.1728	0.4890	0.3201	0.8566	0.1813	0.4925	0.2880	(0.8620)	0.1234	(0.4870)
Constant	-1.8825	0.3397	-0.7192	0.3440	-1.7984	0.3550	-1.1251	0.4012	-1.8801***	(0.3382)	-0.7481**	(0.3426)
	Decomposition											
Total predicted difference (%)	41.03				41.03				41.03			
Due to differences in characteristics (%)	16.26				11.13				15.47			
Due to differences in behaviour (%)	24.77				29.90				25.56			
Share due to differences in characteristics (%)	39.63				27.13				37.71			
Share due to differences in behaviour (%)	60.37				72.87				62.29			

Dependent variable: Co-operation probability, numbers in columns labelled coefficient are coefficient estimates number in columns labelled std. dev. are standard errors of the estimate,
*** (**) (*) signify significance at the 1% (5%) (10%)level respectively

NOTES

[1] A detailed description of the data is available in AIGINGER and CZERNY (1998). A copy of the questionnaire is available from the author upon request.

[2] Questions on the location of the partner referred to one question as to the country where a particular partner resided and a question on whether the partner was located less than 100km from the Austrian border.

[3] Non co-operating firms were asked whether they were planning to co-operate, had already co-operated or were interested in co-operation. Furthermore, both co-operating and non-co-operating firms were asked detailed questions concerning problems and impediments to co-operation. These have been analysed in AIGINGER and CZERNY, 2000 and ALTZINGER et al 2002. We do not repeat this analysis.

[4] For instance, HUBER and KLETZAN (2000) report that 42% of the firms sampled in the community innovation survey co-operate with partners from the EU but only 36.6% with Austrian partners.

[5] This finding is also corroborated in more formal analysis. HUBER, 2003 focusing on the role of distance to the closest potential partner in the choice of form of co-operation finds that firm size, previous experience with co-operation and depth of integration with the most important partner are more important determinants of co-operation than distance to the closest potential partner.

[6] A total of 8 dummy variables taking on the value 1 if a firm was operating in construction textiles, wood processing, paper, foodstuffs, metal, furniture or vehicles industry respectively and zero else were included. Unfortunately other industry groups provide too few observations to receive sensible results

[7] Robustness of the results also pertains to the exclusion of industry dummies in these specifications (results are available from the author).

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