

**Market concentration
and innovation.**

**Evidence from foreign affiliates
in Central and Eastern Europe**

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Research question, hypothesis

- **The main research question is whether the local market concentration, in a selected number of transition economies, influences the R&D and innovation activity of foreign affiliates operating on those markets.**
- H1. Foreign affiliates in more concentrated markets do more foreign trade within their foreign investor's network than foreign affiliates in less concentrated markets.
- H2. Foreign affiliates in more concentrated markets do more R&D than foreign affiliates in less concentrated markets.
- H3. Foreign affiliates in more concentrated markets do more basic and applied research than foreign affiliates in less concentrated markets.
- H4. Foreign affiliates in more concentrated markets transfer more technology from abroad than foreign affiliates in less concentrated markets.
- H5. Foreign affiliates in more concentrated markets do more product and process innovation than foreign affiliates in less concentrated markets.



Data

- Questionnaire-based survey, in five transition economies: Romania, Poland, Croatia, Slovenia and East Germany. The questionnaire was administered in the first half of 2007, to a representative sample of foreign affiliates in each of these five economies. We used the AMADEUS database, and the sample selection satisfied the following criteria: foreign capital, type of activity (manufacturing firms only), turnover and number of employees (we looked for a balanced distribution). There were 736 valid replies.
- The questionnaire was applied as a part of the FP6 „U-Know” project.



Methodology

- Discriminant function analysis (which is used to classify cases into the values of a categorical dependent, usually a dichotomy). Discriminant analysis helps investigating difference between groups, and it fits our research purpose to see differences in the innovation behaviour of firms operating in concentrated markets, compared to firms operating in non-concentrated markets.
- Stepwise procedure helps selecting most correlated independent variables.
- The dependent dichotomic variable is high market concentration:
Con_hi 0 for non-concentrated markets,
 1 for concentrated markets
- Concentrated markets defined by Herfindahl index (concentrated if index > 10%) – threshold used also by EC anti-trust policy



Methodology (cont)

- Concentrated markets: tobacco, coke refining, metallurgy, radioTV communication, and means of road transportation
- We split our data base in two groups: a larger one containing 625 firms from all sectors except for these five sectors; and a smaller one containing 111 firms from these five sectors.
- Independent variables also recoded as dichotomic

Type of variables: structure of sales and supplies	
Name	Definition
<i>Exp_finv</i>	Foreign affiliates' exports to its foreign investor network, as a share in total sale.
<i>Exp_ofor</i>	Foreign affiliates' exports to other foreign buyers, as a share in total sales.
<i>Sal_linv</i>	Foreign affiliates' sales to other domestic subsidiaries of its foreign investor, as a share in total sales.
<i>Sal_dom</i>	Foreign affiliates' sales to other domestic buyers, as a share in total sales.
<i>Imp_finv</i>	Foreign affiliates' imports from its foreign investor network, as a share in total supplies.
<i>Imp_ofor</i>	Foreign affiliates' imports from other foreign suppliers, as a share in total supplies.
<i>Sup_linv</i>	Foreign affiliates' supplies to other domestic subsidiaries of its foreign investor, as a share in total supplies.
<i>Sup_dom</i>	Foreign affiliates' supplies from other domestic suppliers, as a share in total supplies.
Type of variables: business functions	
<i>Production</i>	Production and operational management
<i>Marketing</i>	Market research and management
<i>Research</i>	Basic and applied research
<i>Product</i>	Product development (product innovations)
<i>Process</i>	Process engineering (process innovations)
<i>Management</i>	Strategic management and planning
<i>Investment</i>	Investment projects and finance
Type of variables: R&D	
<i>Rdexp</i>	Expenditures on R&D and innovation, as a share in total sales
<i>Know_acqa</i>	Importance of acquisition and purchase of external knowledge from abroad as a source for R&D and innovation in the foreign affiliate.
<i>Know_acqd</i>	Importance of acquisition and purchase of external knowledge from domestic suppliers as a source for R&D and innovation in the foreign affiliate.
<i>Tech_exist</i>	Importance of existing technology of your multinational corporation embodied in products already produced, as a source of technological knowledge for R&D and innovation in the foreign affiliate.

Group statistics

	Con_hi ,00		Con_hi 1,00	
	Mean	Std.dev.	Mean	Std.dev.
exp_finv	1,3065	,4618	1,5472	,5025
exp_ofor	1,2032	,4030	1,1132	,3199
sal_linv	1,0290	,1682	1,0189	,1374
sal_dom	1,4097	,4926	1,2830	,4548
imp_finv	1,2129	,4100	1,3396	,4781
imp_ofor	1,2419	,4289	1,2264	,4225
sup_linv	1,0452	,2080	1,0189	,1374
sup_dom	1,4742	,5001	1,2642	,4451
production	1,1032	,3047	1,0755	,2667
marketing	1,3903	,4886	1,5472	,5025
research	1,4419	,4974	1,5283	,5040
products	1,4387	,4970	1,3962	,4938
process	1,3742	,4847	1,2075	,4094
management	1,4097	,4926	1,4528	,5025
investment	1,4645	,4995	1,3962	,4938
rdexp	1,2581	,4383	1,2642	,4451
know_acqa	1,6032	,4900	1,4340	,5004
know_acqd	1,4645	,4995	1,2830	,4548
tech_exist	1,6290	,4838	1,7925	,4094

	Wilks' Lambda	F	Sig.
exp_finv	,968	11,982	,001
exp_ofor	,993	2,385	,123
sal_linv	1,000	,174	,677
sal_dom	,992	3,058	,081
imp_finv	,989	4,110	,043
imp_ofor	1,000	,060	,807
sup_linv	,998	,787	,376
sup_dom	,978	8,229	,004
production	,999	,389	,533
marketing	,987	4,625	,032
research	,996	1,359	,244
products	,999	,331	,565
process	,985	5,581	,019
management	,999	,345	,557
investment	,998	,849	,358
rdexp	1,000	,009	,926
know_acqa	,985	5,367	,021
know_acqd	,983	6,126	,014
tech_exist	,985	5,384	,021

Stepwise

Step	Entered	Wilks' Lambda	Exact F	Sig.
1	exp_finv	,968	11,982	,001
2	process	,950	9,472	,000
3	research	,933	8,645	,000
4	tech_exist	,922	7,622	,000
5	know_acqa	,904	7,561	,000

Five variables selected

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
	,904	36,085	5	,000

Discriminant function is significant at 1%

CON_HI	Rank	Log Determinant
,00	5	-7,878
1,00	5	-8,352
Pooled within-groups	5	-7,906

Box's M		14,540
F	Approx.	,935
	df1	15
	df2	33155,817
	Sig.	,524

Homogeneity condition is met

Canonical discriminant function coefficients

	Function
	1
exp_finv	,946
research	1,175
process	-1,598
know_acqa	-,947
tech_exist	1,000
(Constant)	-,978

Con_hi (more concentrated/less concentrated) = -0.978 + 0.946 exp_finv + 1.175 research - 1.598 process - 0.947 know_acqa + 1.000 tech_exist.

	Con_hi	
	,00	1,00
exp_finv	5,274	6,143
research	1,832	2,911
process	3,514	2,045
know_acqa	5,120	4,250
tech_exist	4,894	5,813
(Constant)	-15,964	-17,162

Fisher's linear discriminant functions

Casewise statistics

	Actual Group	Highest Group				
		Predicted Group	$P(D > d G = g)$		$P(G = g D = d)$	Squared Mahalanobis Distance to Centroid
Case Number			p	df		
1	0	0	,523	1	,733	,409
2	0	0	,523	1	,733	,409
3	0	0	,523	1	,733	,409
4	0	0	,829	1	,650	,047
7	1	1	,850	1	,562	,036
8	0	0	,759	1	,535	,094
9	0	0	,523	1	,733	,409
10	0	0	,386	1	,772	,751
11	0	0	,523	1	,733	,409
13	0	0	,758	1	,535	,095

68.9% of cases are correctly classified



Results

- **Foreign affiliates in more concentrated markets do export more to their parent company network than foreign affiliates in less concentrated markets.**
- **Foreign affiliates in more concentrated markets do more basic and applied research than foreign affiliates in less concentrated markets. However, they do not spend more money on R&D.**



Results (cont)

- **Foreign affiliates in more concentrated markets do less process innovation than foreign affiliates in less concentrated markets. There is no significant difference regarding product innovation.**
- **Foreign affiliates in more concentrated markets acquire less knowledge from abroad than foreign affiliates in less concentrated markets.**
- **Foreign affiliates in more concentrated markets use more of the existing technology already incorporated in the products of their foreign investor network.**



Policy implications

- Foreign affiliates in more concentrated markets seem more integrated in their foreign investor network: they export more within the network; they make less process innovation, as they probably replicate the processes used within their global network; and they use more of the existing technology already incorporated in the products of their foreign investor network, as they are not under competitive pressure to upgrade. Therefore, **the foreign affiliates in more concentrated markets act like implementing agents and the risk of using transfer pricing is bigger for foreign affiliates operating in more concentrated markets.**



Policy implications (cont)

- The fact that foreign affiliates in more concentrated markets do more basic and applied research, which does not influence product or process innovation, could mean that the research they finance is more local market-related, and its results are not replicable elsewhere, and are not product or process related. When combined to the above mentioned conclusion of higher network involvement, one could submit that foreign affiliates in more concentrated markets are not stimulating innovation; instead, **concentration is positively correlated with intra-network knowledge diffusion.**



Policy implications (cont)

- Foreign affiliates in less concentrated markets do more process innovation and acquire more technology from outside their foreign investor network. One could submit that **competition stimulates innovation and knowledge creation (at least process innovation); it also stimulates knowledge diffusion (absorbption) from outside the own network.**
- **If policy makers in transition economies want to stimulate innovation by subsidizing (in various ways) foreign investments, they should focus on foreign affiliates in less concentrated markets.**