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**COUNTRY, INDUSTRY AND
FIRM SIZE EFFECTS ON
FOREIGN SUBSIDIARY
STRATEGY.
AN EXAMPLE OF FIVE CEE
COUNTRIES**

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COUNTRY, INDUSTRY AND FIRM SIZE EFFECTS ON FOREIGN SUBSIDIARY STRATEGY. AN EXAMPLE OF FIVE CEE COUNTRIES

Katrin Männik¹, Helena Hannula², Urmas Varblane³

Abstract

The aim of the paper is to analyse the contribution of FDI to knowledge and technology transfer into five CEE economies (Estonia, Hungary, Poland, Slovakia, Slovenia) by examining the influences of country, industry, firm-size and foreign ownership on the choice of the subsidiaries' strategies. Only the autonomy of subsidiaries across business functions is focused in the current analysis. Proceeding from the results of the analysis one can see many differences in the autonomy of subsidiary.

Subsidiaries from the more developed CEE countries Slovenia and Hungary had the highest scores for the autonomy, especially in terms of management and financial autonomy.

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Analyses supported also hypothesis that minority foreign owned subsidiaries are more autonomous than majority owned, even taken into account all other variables. More productive manufacturing industries have more autonomous subsidiaries only in the case of more developed countries (Slovenia and Hungary). Only in Poland, Hungary and Estonia there exist more autonomous subsidiaries among large firms. In Slovenia and Slovakia the smaller firms have higher autonomy. Generally no some common pattern of subsidiary mandates could be presented in all five CEE. The role of subsidiary is above all industry and firm size specific.

Drawing parallels between the received results about the autonomy scores for business functions and three subsidiary roles, 'World/Regional Mandate' strategy is most pronounced in Hungary and less extent in Slovenia, 'Specialised Contributor' in Slovenia, Estonia and Slovakia, and 'Local Implementer' in Poland.

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Introduction

In the course of intensifying the integration of Central and Eastern European (CEE) countries into the economic region of the EU, firms in Central and East Europe are gradually being integrated into international production and technological networks. The conventional view assumes that foreign direct investment (FDI) has a significant role in technological development as an accelerating factor of economic growth. FDI is automatically accompanied by a technology transfer of material and immaterial assets to the local unit – subsidiary – of the host country. Indeed, it has been shown in many studies that opening the CEE countries to trade and FDI have been beneficial during the initial stages of transformation. However, the problem is much more complex when it comes to longer-term effects (e.g. technological advance) on the economy.

The latest empirical works of FDI impacts on the host country's economy have tried to explore more deeply the determinants of the expected effects of FDI, from both the demand and supply side (see Marin *et al.*, 2003). The aim of the new approach is to trace more carefully the origins of the FDI effects. The results of the empirical evidence at the same time reinforce understanding of the importance of absorptive capacities for the domestic environment, presumably domestic firms (for the demand side of the FDI effects), and the importance of the subsidiaries' strategy (for the supply side of the FDI effects). As a core question, it is necessary to examine by whom, how, where and why knowledge will be created, disseminated, used and absorbed.

The aim of this paper is to analyse the contribution of FDI to knowledge and technology transfer into the CEE economies by examining the influences of country, industry, firm-size and foreign ownership on the choice of the subsidiaries' strategies. It

is important to note that autonomy of subsidiaries is only focused in the current analysis. The autonomy is measured through decision-making process between the subsidiary and mother company across all business functions. The task of the current paper is to bring out the distinctions of the autonomy across business functions by country, industry sector, firm size and foreign ownership; then to make the generalisations of different subsidiary types.

The analysis is based on a survey performed for the manufacturing industry sector in five countries: Slovenia, Poland, Hungary, Slovakia and Estonia under a European Union (EU) research project for the Fifth Framework Programme Project called "EU Integration and the Prospects for Catch-Up Development in Central and Eastern European countries (CEEC): The Determinants of the Productivity Gap".

This paper is structured as follows: the first section deals with the theoretical framework. The second section develops the conceptual framework and research hypothesis. In the third section, the research method is described. This is followed, in the fourth section, by principal component factor analysis, ANOVA and MANOVA along all business functions and variables for country, industry, firm size and foreign ownership. Finally, conclusions about the types of subsidiary in the countries under examination are made and implications and further questions for the knowledge and technology transfer in terms of different subsidiary strategy are drawn.

1. Theoretical framework

Foreign direct investment as a mechanism for technology transfer

The contribution of FDI to economic growth has been debated extensively. The "new" argument is that, if growth determinants are taken as endogenous, and FDI thought as a composite bundle of capital stocks, know-how, technology, there are

different ways in which FDI can be expected to affect growth in theoretical models (De Mello, 1997). Theoretical literature points to the role of FDI on growth as endogenous as it generates increasing returns to production through the channel of international technology transfer. The impact of FDI is greater, the greater the value-added content of FDI-related production, and productivity spillovers associated with FDI. The FDI spillovers are expected to take place more intensively in the firms and/or industries with the higher foreign ownership (see Koizumi, 1977). There is growing evidence that FDI enhances technological change through technological diffusion, for example because multinational firms are concentrated in industries with a high ratio of research and development (R&D) relative to sales and a large share of technical and professional workers (Markusen, 1995).

Empirical literature has confirmed that multinational corporations (MNC) may lead to increases in the rate of technology transfer and diffusion (Blomström *et al.*, 2003). Studies have showed that foreign MNCs may contribute to efficiency first by breaking supply bottlenecks. Second, they introduce new know-how by demonstrating new technology and training workers. Third, they transfer techniques for inventory and quality control and standardization to their local suppliers and distribution channels. Finally, they force local firms to increase their managerial efforts, or to adopt some of the marketing techniques used by MNCs, either on the local market or internationally. The latter may be classified under knowledge transfer, through which FDI is expected to augment the existing stock of knowledge in the recipient economy through labour training and skill acquisition and diffusion, on the one hand, and through the introduction of alternative management practices and organizational arrangements, on the other (De Mello, 1997).

But as can be seen from the literature the impact of FDI depends on the type of investment, the conditions that prompted it, the existing competitive advantage of the host country, and the economic policy pursued by the host and other governments

(Dunning, 1994). There is growing strand of literature, which looks at the different characteristics of the host country. It is argued that the host countries capacity to absorb FDI productivity is linked to their GDP per capita. Host countries with a better endowment of human capital are supposed to benefit more from FDI-induced technology transfers as spillovers from foreign affiliates to local enterprises are more likely (see Borenztein *et al.*, 1998; De Mello, 1997). Balasubramanyam *et al* (1996) stress the openness of trade is essential for positive growth effects of FDI. Also, the extent to which MNCs transfer modern technology and know-how to their foreign affiliates may depend on the host countries' institutional development which captures such factors as intellectual property rights arrangements, limitations on foreign firms, tax system, infrastructure and so on (De Mello, 1997; Nunnenkamp *et al.*, 2003).

However, all these studies do not consider the endogeneity problem (higher economic growth causing higher FDI flows), the finding that host-country characteristics matter for the growth effects of FDI may also be sensitive to the choice of the explanatory FDI variable. Therefore the host-country characteristics are not always the best to explain the effects of FDI on growth as the level of aggregation is too high. This creates a need to differentiate between specific manufacturing industries in which FDI takes place.

Recent literature has pointed out following industry characteristics which do matter in studying the effects of FDI on growth as the technology intensity, factor requirements, linkages to local and foreign markets, and the degree of vertical integration of the foreign affiliates (Nunnenkamp *et al.*, 2003). Based on the data of US FDI stocks in major sectors and specific manufacturing industries in a large number of developing countries Nunnenkamp and Spatz (2003) find that link between FDI and economic growth is stronger in the services than in the manufacturing sector. At the same time, the growth effects of FDI also differ between manufacturing industries. These differences are related to industry

characteristics such as factor requirements, export orientation and integration into corporate networks via intra-firm trade. The interplay of host-country and industry characteristics suggests that positive growth effects of FDI are more likely when the technological gap is relatively small. That means they reached the same conclusion as De Mello (1997), who finds that the larger is the technological gap between the host and the home country of FDI, the smaller is the impact of FDI on economic growth.

In the level of industry sectors among high-tech industries technology transfer and diffusion expected to take place more intensively compared to low-tech industries⁴. It is important to consider that sectors differ greatly in the sources, rates and directions of their technological activities (Patel *et al.*, 1996). Based on the Pavitt` classification of industries: science-based, specialized-supplier, scale-intensive and supplier-dominated industries (see Pavitt, 1984), the more intensive technology development and diffusion could be apparent in science-based and specialised suppliers` manufacturing sectors that indirectly influence related industries such as supplier dominated and scale intensive sectors⁵. However, generally there are expected differences by industry types between developed and developing countries.

The above literature shows that new inputs, knowledge and technology transfer are expected to be the most important mechanism through which FDI promotes growth and productivity in the host country. It, however, does not deal with the processes by which productivity is generated, i.e. the mechanisms by which companies grow and integrate into global

⁴ According to OECD classification high-tech sectors are following industries: 24.4, 30, 32, 33, 35.3; medium-high-tech: 24.0-24.3, 24.5-24.7, 29, 31, 34, 35.2, 35.4-35.5; medium-low-tech: 23, 25, 26, 27, 28, 35.0-35.1; low-tech: 15, 16, 17, 18, 19, 20, 21, 22, 36, 37 (NACE industry codes, 2003 European Innovation ...)

⁵ Knell (1999) has respectively made parallels between Pavitt` classification and high-tech, medium-high-tech, medium-low-tech and low-tech industries.

networks. In this paper the interest is more on knowledge creation, how it will be disseminated, used and absorbed within foreign subsidiary. The international business literature offers several answers for that.

Subsidiary specific features of FDI

Birkinshaw and Hood (1997) have said that the point, at which traditional “internationalization” ends, i.e. with the first incidence of FDI, is thus the point where subsidiary development begins. They refer to the three drivers of subsidiary development as: 1) parent company management; 2) subsidiary management; and 3) host-country policy makers. The parent company typically exerts considerable influence on the activities undertaken in the subsidiary such as the lines of reporting, access to capital, areas of accountability, reward mechanisms and so on. While subsidiary management clearly faces constraints from their parent company in terms of decision-making autonomy and technology generation, there is strong theoretical and empirical evidence that they can also influence their own destiny through the control of critical resources (see Forsgren *et al.*, 1992; Ghoshal *et al.*, 1991; Hedlund, 1986).

There exists a substantial body of literature concerned with various aspects of multinational subsidiary management (for example Birkinshaw *et al.*, 1995; Birkinshaw *et al.*, 1997; Birkinshaw *et al.*, 1998; Poynter *et al.*, 1984; Roth *et al.*, 1992; Taggart, 1997). In the past ten years the basic focus of such research has been on the different roles taken by subsidiaries. As said by Lorentzen, Mollgaard and Rojec (1998) subsidiaries differ with respect to the influence they yield within their group. This relates to the involvement in decision-making processes.

Poynter and White (1984) point out five types of subsidiaries forms or strategies. First, the ‘Miniature Replica’, a common strategy in protected markets, where local manufacturing subsidies exist, or are low to moderate economies of scale. The second strategy is ‘Marketing Satellite’, these companies range

from simple importing firms to sophisticated marketers with extensive distribution, marketing, sales, and customer support services. Third, 'Rationalized Manufacturer', where developmental activities are undertaken by the parent, but occasionally specific process improvements may be developed at the local plant. Fourth, 'Product Specialist', develops, produces and markets a limited product line for global markets. The subsidiary is generally self-sufficient in terms of applied R&D, production and marketing. Finally, 'Strategic Independent', has the freedom and resources to develop lines of business for either a local, multi-country, or global market.

The first three strategies involve developmental activities of subsidiaries, which are undertaken mainly by the parent company. In that case, the positions of subsidiaries in MNCs are of marginal importance. Therefore, Birkinshaw and Morrison (1995) categorize these strategies as 'Local Implementer's. The two other strategies both engage subsidiary into global production system. Even the 'Product Specialist' (called by Birkinshaw *et al.*, 1995 as 'Specialised Contributor') is responsible for a relatively narrow-defined activity, and decision-making autonomy is relatively constrained, it allows subsidiary to be part of international networks. The 'Strategic Independent' (called by Birkinshaw *et al.*, 1995 as 'World Mandate') subsidiary is responsible for an entire line of businesses within the MNC, and has a relatively high level of autonomy. Roth and Morrison (1992) examine 'Global Mandate' (similar to 'World Mandate') subsidiaries in France and find that in case of 'Global Mandate' the subsidiary works with headquarters to develop and implement strategy. The subsidiary is given worldwide responsibility for the complete set of value activities for a product or product line.

Thus, in a broad sense exists three types of foreign subsidiaries such as 'Local Implementer', 'Product Specialist', and 'World Mandate'. Looking at the autonomy and procedural justice⁶

⁶ Autonomy is based on decisions about: market supplied, product range, advertising and proportion, R&D, production, manufacturing

among foreign subsidiaries, the first is the main concern of this paper, the Taggart (1997) study on the foreign firms manufacturing in UK is used. He divides subsidiaries into 'Collaborators' and 'Vassals' (essentially 'Local Implementer's in the Birkinshaw *et al.*, 1995 approach), who have restricted value-added scopes and lowest levels of autonomy, 'Militant' ('Specialized Contributor'), and 'Partner' subsidiaries ('World Mandate'), which have the highest levels of autonomy and the highest value added scope. Taggart found in his study that higher levels of autonomy may be associated with higher levels of responsiveness, market, product and value added-scope, and with lower levels of integration, configuration and coordination. So, at lower levels of autonomy the subsidiary will be more co-operative.

The latter conclusion leads to the question what is more useful for the host country from the perspective of technology transfer and the subsidiary development? Looking at the innovation literature, it is strongly suggested that one of the critical success factors of innovation is the establishment of good internal and external communication (Rothwell, 1992). Successful innovation is the question of effective co-operation between the links inside and outside corporations. Interdisciplinarity plays a significant role in R&D and innovation. To conclude, the high level of autonomy might be not the best solution in terms of technology transfer and innovation.

An analysis of Swedish subsidiaries showed that high intra-network transfers of goods and market share of the affiliate were factors most likely to reduce subsidiary autonomy, while increased autonomy flowed from larger subsidiary size (Hedlund, 1981). Another important aspect appeared from Goshal and Bartlett (1988) that the autonomy facilitated the creation and diffusion of locally developed innovations but not vice versa, the adoption of parent company innovations.

technology; Procedural justice is based on: communication with headquarter (HQ), challenging HQ views, HQ has local knowledge, HQ accounts for decisions, HQ makes consistent decisions.

Finally, the role of parent company, subsidiary and host country in the development of subsidiary is studied. The subsidiary types are not sustained as static to the headquarters. It appeared from the study of Taggart and Harding (1998) that international companies may pursue a number of different strategies units simultaneously. Therefore, MNCs try to find appropriate solutions for subsidiary type of depending on the evolution of the host country, host industry and related industries, firm size etc. During the last two decades the globalization of the business has initiated significant changes in terms of subsidiary roles (see Birkinshaw, 1996). From one side, the intensive globalization of business activities has given an influence for higher value-added functions that are taken in the subsidiaries. From another perspective more intensive business competition induces of the centralization of many strategic decisions (like market segments, R&D) (see Lorentzen *et al.*, 1998).

Birkinshaw and Hood (1997) have identified two basic phases of development of the subsidiary. The first phase is the period from founding to the achievement to the satisfactory performance. The control imposed by head office is relatively tight in that period. The second phase is building sustainability. This phase of development was predicted on the observation that the fulfilment of the subsidiary's basic mandate is a necessary, but not sufficient, condition for long-term sustainable survival. Birkinshaw (1996) argues that subsidiary mandates are a dynamic phenomena, often changing in form of time, the mandates being gained and lost; and proposes that mandate sustainability is positively associated with strategic relatedness and distinctive value-added of the mandate activity.

Empirical evidence points to a number of implications for the subsidiary evolution process in general. First, autonomous subsidiary behaviour (Burgelman, 1983) appears to be a potent force for subsidiary development because it leads to the planned development of resources and capabilities. Second, head-office support appears to be a necessary, but not sufficient, condition for subsidiary-driven development. Third, subsidiary decline

gets essentially no consideration in either the theoretical or the empirical literature.

In summary, it is in accordance with the Birkinshaw and Hood (1998) view, that subsidiary is the result of an accumulation or depletion of capabilities over time. In this respect, it may look at the subsidiary as ‘mechanisms by which firms accumulate and dissipate new skills and capabilities’ (Teece *et al.*, 1997). To some extent, capabilities are accumulated and stored as organizational routines that have emerged over time, but the process also can be strongly influenced by various subsidiary, corporate, and local environment factors, many of which were discussed earlier.

2. Conceptual framework

Proceeding from the Birkinshaw and Morrison (1995) classification of the subsidiaries, as stated in the theoretical section, three types of subsidiary strategies will be used in this paper. The approach presented by Birkinshaw *et al* appears to be the clearest way to make some generalisations based on the questionnaire survey in this paper. Birkinshaw *et al* approach brings clearly out the differences in the autonomy level between the subsidiary roles. The specific features of each subsidiary type are summarized in Table 1. The findings of Birkinshaw *et al* are based on an explanatory study carried out among 578 subsidiaries in six countries (U.S., Canada, U.K, France, Germany, Japan). This paper has a number of limitations and is more applicable to developed countries, although here the theories will be applied to the transition countries of Central and Eastern Europe.

Table 1

Structural context of subsidiary roles

Local Implementer	Specialised Contributor	World Mandate
<p>* Low strategic autonomy</p> <p>* High product dependence on parent</p> <p>* High inter-affiliate purchases</p> <p>* Low international configuration of manufacturing</p> <p>* Low international configuration of downstream activities</p>	<p>* Medium strategic autonomy</p> <p>* High product dependence on parent</p> <p>* High inter-affiliate purchases</p> <p>* High international configuration of manufacturing</p> <p>* High international configuration of downstream activities (distribution, sales, service, advertising etc)</p>	<p>* High strategic autonomy</p> <p>* Low product dependence on parent</p> <p>* Low inter-affiliate purchases</p> <p>* Medium international configuration of manufacturing</p> <p>* Medium international configuration of downstream activities</p>

Source: Based on Birkinshaw *et al.*, 1995 (figure 3 p.748).

Referring to Taggart (1997), autonomy may be regarded as a decision-based process that evolves through bargaining between centre and periphery in an organization. Thus, the autonomy of subsidiary is its position in relation to parent company by all business activities (R&D, marketing etc). As concluded earlier 'World Mandates' have resulted with the highest scores in terms of autonomy, 'Specialized Contributors' the medium and 'Local Implementers' the lowest level of autonomy.

Business globalization over the last decades has given subsidiaries more local power (although it is also more specialization), especially in more developed countries. More autonomous subsidiary types such as 'World Mandate' have received a considerable attention (Birkinshaw, 1996). Birkinshaw argues that mandate sustainability is positively associated with strategic relatedness and distinctive value-added of the

mandate activity. Very low strategic relatedness will be associated with divestment or mandate decline, and very low distinctive value-added will be associated with the phasing out of the mandate in the subsidiary. Birkinshaw concludes that it is a danger of having the full-scope world product mandate because it is possible to become strategically marginal. The real engine for subsidiary growth is its distinctive capabilities.

In this paper the focus is only given to the level of autonomy of the subsidiaries (the first factor in the approach of Birkinshaw *et al.*, 1995). The authors are aware of the risks of not including other indicators to be sure of the existence of special type of the subsidiary strategy but the current paper will be limited to bring out the distinctions of the autonomy by country, industry group, firm size and foreign ownership instead of generalisations.

Based on the theoretical framework, the conceptual framework for this paper will use the research hypotheses presented below. It is important to note that the following analysis is also explanatory and it is rather the aim to focus on one of specific aspects of the FDI impact through the choice of subsidiary strategy depending on the interests of both parent firm and affiliate in some specific business environment.

Hypothesis 1 (H1)

More developed CEE countries have more autonomous subsidiaries

First hypothesis is derived from the idea that the FDI impact on the host country depends heavily on the absorptive capacity of the host country. Absorptive capacity is connected with the economic development of country. Referring to Lorenzen *et al* (1998) the promotion of indigenous innovatory potential in the host country is successful when the global strategy of the MNC overlaps with the local capabilities of the subsidiaries. The autonomy ratio of the foreign subsidiaries might have a strong relation to the development level of the host country. The more developed the host country the more responsibility could be

given to the local unit of the multinational company. It might also be true in the context of the transition countries that better absorptive capacity (endowment of human capital, etc) of the country is linked with the higher autonomy of the affiliates and higher probability of FDI spillover effects.

Hypothesis 2 (H2)

More productive manufacturing industries have more autonomous subsidiaries

Similar to H1, one can expect higher rates of the autonomy among the subsidiaries in more productive industries. More productive subsidiaries are assumed to have higher level of the capacity included in R&D and innovation. Although it is sometimes argued to be as a controversial approach the productivity level of the industry sectors is taken as the proxy for technological level in the current analysis. To show the industry features the most applied taxonomy for four types of sectors by the technology intensity is used. The manufacturing industries are divided into high-tech, medium-high-tech, medium-low-tech and low-tech sectors according to OECD classification (see footnote 4).

Hypothesis 3 (H3)

More autonomous subsidiaries are expected to be present in high-tech industries

It is a little controversial claim in comparison with four types of industry sectors and secondly, in comparison of developed and less developed countries. In developed countries one can expect more ‘World/Regional Mandates’ as this type of affiliate requires not only some competence, but also scale and scope of the activities (production, R&D, etc). In less developed countries, especially in these five CEE countries one can assume rather more intense presence of ‘Specialized Contributors’. The latter ones could be self-sufficient in terms of applied R&D (e.g. very specific research question),

production and marketing but smaller in scale compared to ‘World/Regional Mandates’. Knowing of the low level of the business R&D in CEE countries the last argument could be reasonable.

Hypothesis 4 (H4)

More autonomous subsidiaries are expected to be among large firms

In terms of firm size one can expect to have more autonomous subsidiaries among large firms. ‘World/Regional Mandate’ strategy requires the appropriate scale and the scope of the affiliate to compete globally. Although again similar to the previous hypothesis, one can assume the presence of small firms with high autonomy in the context of transition countries, especially in specialized supplier sector of the industry.

Hypothesis 5 (H5)

More autonomous subsidiaries are expected to be among minority-share foreign ownership

There is an expectation that the larger the foreign ownership the bigger the responsibility of the parent company to take care of the affiliate. The statement might be also controversial. Why could not be independent majority owned subsidiary if it had a competence in R&D, marketing or production? Furthermore, the interest of the MNC is, in a majority of cases, to own the control over the activities, at least in relation to ownership.

3. Research method

Sample description and representativeness

The following analysis is based on the database created as the result of the work in the EU Fifth Framework Project: “EU Integration and the Prospects for Catch-Up Development in Central and Eastern European countries (CEEC): The Determinants of the Productivity Gap”. A special survey questionnaire for Foreign Investment Enterprises (FIEs) was undertaken in 2001–2002. The target group was manufacturing enterprises with foreign ownership in Estonia, Hungary, Poland, Slovakia and Slovenia. In Estonia and Hungary only firms with foreign majority (51% and more foreign ownership) were selected (although minority ownerships were also reported in the survey), in other countries minority foreign owned firms (10–50% foreign ownership) were also included. From all firms in sample only 14.5% are minority foreign owned. The latter fact has to take into account in hypothesis testing. The return rate was 19.7% or 433 questionnaires. The highest response rate was in Slovenia (34.4%), followed by Slovakia (30.2%), Estonia (30.0%), Poland (18.8%) and Hungary (10.6%).

Focusing on the size of the firms in our sample, distribution is well balanced (see Table 2). The structures of Polish and Hungarian sample differ from other countries. The share of firms with more than 500 employees is around 25% in both countries. Small firms with less than 100 employees are prevailing in Estonia. The size of a country obviously has a major role in firm size. A comparison of mean ranks of the number of employees in the sample of FIEs by using the Mann-Whitney test (see Majcen *et al.*, 2003) shows statistically significant differences of individual countries from the total sample average in the case of Slovenia and Hungary. Slovenian firms are significantly smaller and Hungarian firms significantly larger than total sample firms. A comparison of manufacturing sectors shows significantly higher than average number of employees per company only in food, beverages and

tobacco and transport equipment. In all the other manufacturing sectors there are no statistically significant differences in the number of employees.

Table 2

Distribution of sample FIEs by number of employees; %

No. of employees	Total	Slovenia	Slovakia	Hungary	Poland	Estonia
Up to 10	6.5	9.72	7.89	1.18	7.84	4.26
11 – 50	19.9	29.17	26.32	12.94	16.34	19.15
51 – 100	13.2	12.50	17.11	10.59	10.46	21.28
101 – 200	16.4	19.44	13.16	16.47	14.38	23.40
201 – 500	23.6	15.28	19.74	34.12	26.14	14.89
501 – 1000	10.2	8.33	7.89	15.29	9.80	8.51
more than 1000	10.4	5.56	7.89	9.41	15.03	8.51

Source: Majcen *et al.*, 2003.

The biggest number of responses (153 or 35.5% of all) came from Poland, followed by Hungary with 78 firms or 18% of responses, Slovakia 78 answers (16.6%), Slovenia 72 (16.6%) and Estonia 50 (11.5%) (See Table 3). By industries, the biggest share in the total sample of responses is in electrical and optical equipment branch (16.4% of total), followed by metals and metal products (14.1%), food, beverages and tobacco (10.2%), non-metal mineral products (9.0%), chemicals and man-made fibres (8.5%), rubber and plastic products (6.9%), clothing and textiles (6.5%).

There are significant differences among the countries as far as sectoral distribution of sample FIEs is concerned. These differences in the sample represent satisfactorily differences in the distribution of the stock of FDI between different countries.

Table 3. Structure of the sample by manufacturing branches in total and by individual countries

NACE 2	ESTONIA*		HUNGARY		POLAND		SLOVAKIA		SLOVENIA		TOTAL	
	Firms	Share, %	Firms	Share, %	Firms	Share, %	Firms	Share, %	Firms	Share, %	Firms	Share, %
15-16	9	18.0	14	17.5	16	10.5	3	3.8	2	2.8	44	10.2
17-18	7	14.0	8	10.0	5	3.3	5	6.4	3	4.2	28	6.5
19	0	0.0	2	2.5	0	0.0	2	2.6	2	2.8	6	1.4
20	5	10.0	2	2.5	1	0.7	4	5.1	1	1.4	13	3.0
21-22	4	8.0	1	1.3	3	2.0	4	5.1	2	2.8	14	3.2
23	4	8.0	1	1.3	0	0.0	0	0.0	0	0.0	5	1.2
24	0	0.0	7	8.8	16	10.5	6	7.7	8	11.1	37	8.5
25	2	4.0	9	11.3	10	6.5	4	5.1	5	6.9	30	6.9
26	4	8.0	4	5.0	20	13.1	6	7.7	5	6.9	39	9.0
27-28	5	10.0	6	7.5	21	13.7	13	16.7	16	22.2	61	14.1
29	1	2.0	5	6.3	12	7.8	8	10.3	11	15.3	37	8.5
30-33	5	10.0	16	20.0	29	19.0	10	12.8	11	15.3	71	16.4
34-35	0	0.0	4	5.0	14	9.2	1	1.3	5	6.9	24	5.5
36-37	4	8.0	1	1.3	6	3.9	0	0.0	1	1.4	12	2.8
Unknown	0	0.0	0	0.0	0	0.0	12	15.4	0	0.0	12	2.8
Total	50	100.0	80	100.0	153	100.0	78	100.0	72	100.0	433	100.0

*23 and 24 combined. Source: Authors calculations based on sample data.

The following Table 4 gives data about the stock of FDI in the manufacturing industries of all five countries. In addition, the shares of individual countries from the total stock of FDI manufacturing of five countries in total were calculated. The last two columns give the share of individual countries from the total sample by number of firms and employment. The comparison of the shares of individual countries in terms of employment is biased by the lack of data on FIEs employment for Slovakia. Nevertheless, Table 4 indicates that Poland is most strongly represented both by the number of firms and employment, which is in accordance with the high share of Poland from the total stock of FDI in manufacturing. Slovenia and Estonia are moderately overrepresented and Hungary slightly underrepresented.

Table 4

Representativeness of the sample

	FDI stock in manufacturing (2001, mill USD)	Share in the total stock of five countries (%)	Share of firms responded from the total sample (%)	Share of employment from the total sample
Estonia	506	1.9	11.5	7.8
Hungary	6362	23.4	18.5	13.7
Poland	16412	60.4	35.5	70.3
Slovakia	2672	9.8	17.9	n.a.
Slovenia	1235	4.5	16.6	8.1
TOTAL	27187	100	100	100

Source: Authors calculations based on UNCTAD World Investment Directory http://r0.unctad.org/en/subsites/dite/fdistats_files/WID.htm and sample data.

In addition representativeness could also be evaluated comparing the number of firms included into the sample with the total number of firms with FDI in individual countries. From that point of view, sample firms represent 4.9% of all FIEs in the analysed countries. The highest share (23.8%) is in

Slovenia, followed by Estonia with 12.4%, Poland with 3.5% and Hungary with 2.1%. Employment of the sample represents no less than 22.6% of total FIEs employment in the analysed countries; as much as 53.3% in Estonia and 50.8% in Slovenia, 29.5% in Poland and 7.9% in Hungary.

As the following analysis also requires some proxy about the development level of these five sample countries and differences between the types of the industry sectors (see explanation in the next section), the value added (in % of total value added in Table 5) and the productivity level is shown by the countries and industry groups (see Table 6).

The structure of manufacturing industries of the countries analyzed in the paper is very different. The role of high-tech industries in the producing manufacturing value added varies from 9.6% in Slovenia down to 1.8% in Estonia and 1.6% in Slovakia. At the other end, the low-tech sectors were giving 58 % of value-added in Estonia or 44 % in Poland.

Table 5

The role of industry sectors in the creation of the total manufacturing value added (in % of total value added)

Industry group	Slovenia (2001)	Hungary (2001)	Slovakia (1999)	Estonia (2001)	Poland (2000)
High-Tech	9.6	8.4	1.6	1.8	2.4
Medium - high Tech	29.5	29.7	27.1	13.1	24
Medium-Low tech	25.2	26.8	20.5	21.2	29
Low tech	35.7	34	31.2	58.2	44.4
Not identified	0	1.1	19.6	5.7	0
TOTAL	100	100	100	100	100

Source: Authors calculations based on UNIDO Statistical database (<http://www.unido.org/geodoc.cfm?cc=POL>) and Slovenian National Statistics.

The following Table 6 presents a brief overview about the productivity of manufacturing industries of the analyzed countries. The data are obtained from UNIDO database, but unfortunately 2001 data were not available for all countries. Also it should be taken into consideration that all results are converted into USD. However even this comparison indicates clearly that Slovenia and Hungary are far ahead by the value added per employee in all categories of industries. The result is in compliance with the level of GDP per capita. Slovenian PPP based GDP per capita formed 74% of the EU average in 2002, Hungary 57%, Slovakia 47%, Estonia 42% and Poland 39% (Eurostat 2003).

Table 6

Value added per employee in the manufacturing industries of five accession countries (in. thsd. USD annually)

Industry group	Slovenia (2001)	Hungary (2001)	Slovakia (1999)	Estonia (2001)	Poland (2000)
High-Tech	18849	14750	5290	6897	20508
Medium - High Tech	23485	30446	8395	10198	13360
Medium-Low Tech	18210	18383	8029	9746	14954
Low Tech	15870	10128	6970	7334	12063
TOTAL	18993	18753	7687	8263	13451

Source: Authors calculations based on UNIDO Statistical database (<http://www.unido.org/geodoc.cfm?cc=POL>) and Slovenian National Statistics.

Interesting results are obtained from Table 6, which indicate that medium-high industries are with much higher productivity than high-tech industries. In case of Hungary, the difference is 2.1 times and in Slovenia 1.2 times. A similar pattern was also found in Slovakia and Estonia. Poland was the only country, where the high-tech sectors were with the highest productivity. Another interesting result concerns the bigger dispersion of productivity levels between low, medium-low and medium-high

tech industries in Slovenia and Hungary. In other countries there were only minor differences in productivity levels.

Analysis method and variables

In the current analysis the autonomy of subsidiaries is measured by business functions. The current analysis is only focusing on one of the questions that was asked about the decision making process between the local affiliate and the parent company. The question asked was: Which business functions are being undertaken: a) on your own only, (b) mainly on your own, (c) mainly by your foreign owner, or (d) by your foreign owner only? From the survey answers were received for 13 business functions: product development, process engineering, determining the product price, supply and logistics, accounting and finance operations, investment finance, market research, distribution and sales, after sale services, advertisement, marketing, operational management, strategic management of planning. The autonomy of different business functions will be estimated and finally the generalisations for different subsidiary roles are made depending on the features of country, industry, firm size and foreign ownership.

The analysis was carried out in two phases. The first phase involved principal component factor analysis to group 13 business functions by countries for which average estimations were received from the survey. On the next step was used also information from the original survey other 14 questions asked about the performance of subsidiaries, their relations with the parent company, with other affiliates, with local firms. In addition, general information about industry type, firm size and share of foreign ownership was also asked in survey and was used in the current research.

Analysis of principal component factor was performed both at the level of each country and all countries together. Proceeding from the latter approach, we received four new factors (see Table 7).

Table 7

Rotated Component Matrix

Business functions	F1 – FACT-MARK	F2 – FACT-TECH	F3 – FACTMAN	F4 – FACTFIN
Product development	0.381	0.769	0.165	0.003
Process engineering	0.003	0.865	0.220	0.115
Determining product price	0.657	0.395	0.243	0.179
Supply and logistics	0.381	0.518	0.153	0.400
Accounting and finance oper.	0.136	0.008	0.009	0.903
Investment finance	0.234	0.168	0.383	0.545
Market research	0.877	0.169	0.138	0.005
Distribution, sales	0.868	0.118	0.007	0.187
After sale services	0.836	0.120	0.008	0.138
Advertisement	0.875	0.152	0.215	0.144
Marketing	0.866	0.153	0.237	0.142
Operational management	0.007	0.248	0.794	0.259
Strategic man. or planning	0.382	0.187	0.783	0.006

After analysing the factors scores four factors were identified: marketing group (determining the product price, market research, distribution & sales, after sale services, advertisement, marketing); technology group of business functions (incl. product development, process engineering, supply & logistics); management group (operational management, strategic

management or planning) and financial group (accounting and finance of operations, investment finance).

For the further analysis the averages of all the new factor groups were calculated based on the original firm-level questionnaire data, and the variables were called: FACTTECH, FACTMARK, FACTMAN and FACTFIN (see table 7).

In the second phase, analysis of variance (or ANOVA) and multivariate analysis of variance (or MANOVA) were used to identify significant differences among the four groups of the factors and to distinguish country, industry, firm size and foreign ownership features in CEE manufacturing subsidiaries. In relation to factor groups four dummies, for country (variable: DCOUNTRY), industry type (DACTIVITY), firm size (DEMPLOY) and foreign ownership (DEQUITY) were used as categorical dummies in the analysis.

The countries under consideration were: Slovenia, Poland, Hungary, Slovakia, and Estonia. Industries were grouped into four types of sectors: high-tech, medium-high-tech, medium-low-tech and low-tech using 3-digit NACE level classification of manufacturing industries (see footnote 4). Firm size was divided into two groups: small and medium size enterprises (below 250 employees), and large enterprises (250 and more employees). Finally, foreign ownership was distinguished by minority (below 50%) and majority (equal and above 50%). Factor component scores close to 0 indicate higher autonomy. Concerning categorical values, the categories for countries will be seen: 1 – Slovenia, 2 – Poland, 3 – Hungary, 4 – Slovakia, 5 – Estonia; for industries: 1 – high-tech, 2 – medium-high-tech, 3 – medium-low-tech, 4 – low-tech; for number of employees: 1 – SME, 2 – large firms; for foreign ownership: 0 – minority share, 1 – majority share.

The ANOVA test was performed individually for each categorical variables and the MANOVA test in a compound way (all variables taken into the test) across all four factors. The tests were controlled for univariate normality of the dependent variables (FACTTECH, FACTMARK, FACTMAN,

FACTFIN) and a post-hoc procedure (Bonferroni, Tamhane's T2 tests) was processed to get the appropriate answers for distinguishing significant differences between pairs of variables. What concerns normality test the first and two latter factors showed similarities with normal distribution. The FACTMARKET is positively skewed showing too many locally independent affiliates in the five CEE countries. This departure might create problems in further analysis. But it has to take into consideration that there is no test for multivariate normality and we could not make any serious conclusions of biases from normality tests. It is usually argued, if even all variables passed the univariate test that would not guarantee that multivariate normality would also be satisfied.

4. Results

After the procedure of receiving appropriate scores for four factor groups ANOVA and MANOVA testing was performed. In analysis, attention should first be turned to the individual means of each categorical variable by all factor groups. The results are illustrated in Figures 1 to Figure 4 and mean ranks are included in Appendix 2. Different subsidiary roles by their autonomy depending on country, industry, firm size and also foreign ownership are presented on the figures.

Country differences

ANOVA test proved that only differences in marketing, management and financing received significant means ranks in comparison between five analysed countries (see Appendix 2).

On average, FACTFIN shows the highest autonomy (0.27) in subsidiaries of five CEE countries (see Figure 1 and Appendix1).

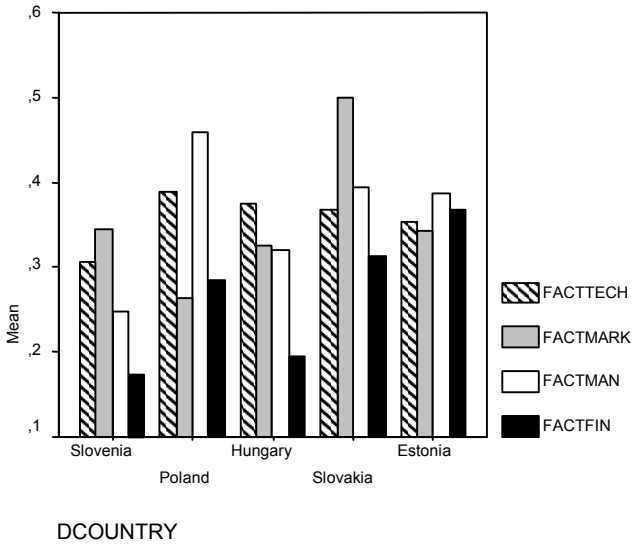


Figure 1. Comparison of means of countries across four factor groups (ANOVA).

From the data by financial autonomy, most autonomic subsidiaries exist in Slovenia (0.18) and Hungary (0.22). Furthermore, by management autonomy Slovenian (0.25) and Hungarian (0.34) subsidiaries lead others. Comparing other countries, management autonomy is lowest among Polish (0.45) and financial autonomy among Estonian (0.37) subsidiaries. It appears that marketing autonomy is relatively similar across all countries except in Slovakia (0.50). Subsidiaries in Slovakia have a very high dependence on the parent company in terms of marketing. In Poland, with much bigger local market compared to the other four CEE countries, the local subsidiaries have received the highest autonomy in marketing, whilst the management autonomy has the lowest scores in all of the countries. It may indicate to the complexity of management in the subsidiaries in Poland, but also signal about the still low level of management skills in these subsidiaries. Although

results about marketing autonomy between the four countries seem not differ greatly, one could still support the argument of a stronger relationship between marketing autonomy and a large domestic market.

Results at the country level showed that differences in subsidiary roles between the more and less developed CEE countries under consideration are statistically significant. In Slovenia and Hungary, economically more developed countries, the foreign affiliates are more autonomic, preferably in terms of management and financing decisions, but also in technology and marketing. Estonia and Slovakia have less autonomy but its level is more balanced between four factors of business functions. Concluding about the country differences in subsidiary roles, there are no subsidiaries in any country with higher autonomy in all four business activities compared to others. Based on the present results and taking into account the size of the countries and industry structure one can expect more 'World/Regional Mandates' in Hungary and less extent in Slovenia, more 'Specialised Contributors' in Slovenia, Estonia and Slovakia and more 'Local Implementer' in Poland.

Industry differences

Next, moving to the level of industries (Figure 2 below), differences in subsidiary strategies by industry groups can be seen. It appears that subsidiaries in high-tech sector are least independent from the parent firm, especially in the case of technology and marketing factors.

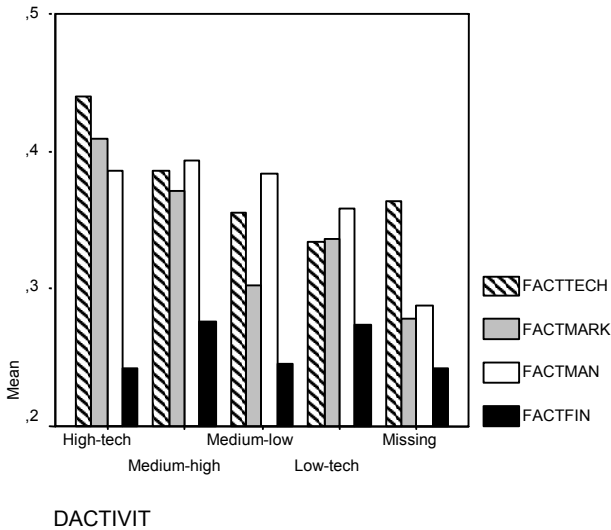


Figure 2. Comparison of means of industries across four factor groups (ANOVA).

Whilst high-tech and medium-high-tech industries are also more productive (see descriptive analysis) one would expect to get the opposite results (see H2, H3). Again, financial independence is most pronounced by all industry groups. Although performing ANOVA tests only for industry groups in relation to all factor clusters there were no statistically significant differences in mean ranks for any industry groups. This negative result had very interesting implications in the future research. It turned out that differences between industries are statistically significant combining country and industry categories. See later analyses on page 36.

Firm size differences

The firm size performed statistically significant role on the autonomy of subsidiaries only in case of marketing (see FACTMARKT on the Figure 3 and Appendix 2). Analysis

shows that larger subsidiaries are more dependent from the parent firm in terms of marketing decisions. This leads to the conclusion that the role of marketing increases in relation to firm size.

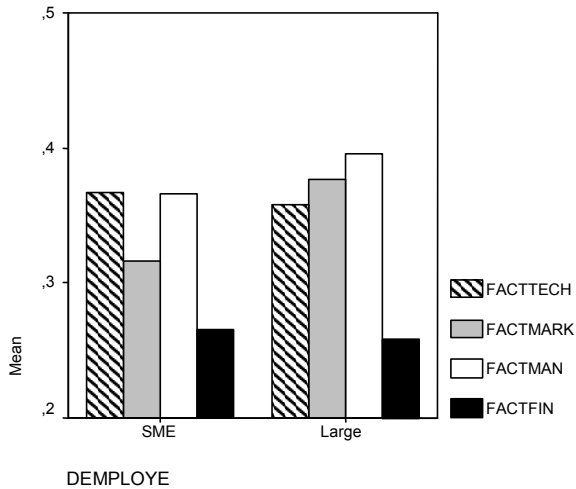


Figure 3. Comparison of means of firm size across four factor groups (ANOVA).

Foreign ownership differences

Finally, analysing the degree of foreign ownership in relation to the four factor groups, the majority owned foreign subsidiaries have lower autonomy by all factor groups (see Figure 4 and Appendix 2). This supports the argument of H5 that more autonomous subsidiaries are expected to be among minority-share foreign ownership. ANOVA tests give statistically significant mean scores for all (technology, marketing, management and financing) factor clusters. Although it is necessary to point out that only 14, 5% of a sample firms are minority-owned. The results might be some extent biased due to the latter circumstances.

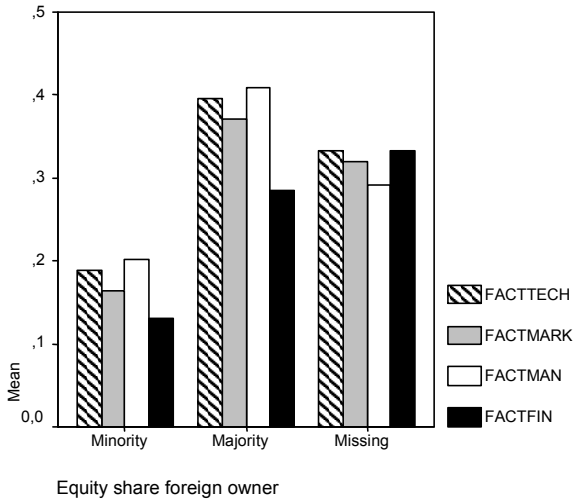


Figure 4. Comparison of means of foreign ownership across four factor groups (ANOVA).

Previous analysis shows the possible distinctions between subsidiary roles by all types of autonomy only measuring all variables individually. In order to understand the influences between variables on the subsidiary strategy, integrated analysis involving all four categorical variables by all factors was used (see results in figures in Appendix 3 and in tables in Appendix 4). In Appendix 3a-3c, estimated marginal means of factors are presented for five countries in relation to industries (3a), to firm size (3b) and to foreign ownership (3c). The tables in Appendix 4 support the understanding of results in illustrations. Table 1 in appendix 4 presents the results of analysis with three categorical and four dependent variables and in Table 2 Appendix 4 gives results from the analysis with four categorical and four dependent variables.

MANOVA tests with three categorical and four dependent variables resulted in significant differences in mean ranks again for country and firm size dummies (see Table 1 in Appendix 4).

Although management autonomy showed some departures from the first results (F-statistic is significant only at a 10% level). Taking into account only country features, the subsidiaries in five CEEs previously showed very clear differences in terms of management autonomy. If more variables are integrated, the single variables could start to diverge depending on the relations with other variables.

Differences in combinations between country and industry type

By interpreting results of the role of industry on the autonomy of subsidiary we discovered that difference of means ranks were not statistically significant. Now after combining industry and country categories industry sectors start to play significant role in terms of technology and management autonomy (p-value 0.000 in case of technology, p-value 0.020 in the case of management) and firm size in terms of technology autonomy (p-value 0.009) of subsidiaries (see also Figures Appendix 3a-3b). Furthermore, the three categorical variables together give significant mean rank for technology factor group. The activities related to product development, process engineering, supply and logistics appear to significantly determine the role of subsidiary in five countries.

Interpreting the results, concerning technology and management decisions in subsidiaries, the characteristics of countries and industry type jointly determine relations between the local subsidiary and the parent company in terms of autonomy. Marketing and financing are not significantly pronounced. From Figure 1 (Appendix 3a), one can conclude that biggest contributions (impact) by countries are for Slovenia and Poland. Slovenian subsidiaries have the biggest differences in the four types of autonomy in terms of industry sectors. In the area of technology and production (FACTTECH), their autonomy is the lowest in the high-tech sector compared to other countries, highest in the medium-low-tech sector, lowest in the low-tech sector, and highest again in the medium-high-tech sector. Polish subsidiaries diverge from the other countries in the low-tech

sector; subsidiaries are much more autonomous in low-tech industries in Poland. It may indicate that technology used is rather simple and standardised, which requires little intervention from the mother company. Contrary to the Slovenian results, among different industries Estonia has the lowest autonomy in the medium-high-tech and medium-low-tech sectors. This might show that subsidiaries in more developed countries have more autonomy at least in medium-tech industries and in terms of technology component of the activities.

Referring to the earlier results, of all the countries Slovenia had one of the highest scores of autonomy especially in relation to management and financing. This shows that subsidiaries in Slovenia have an appropriate level of skills in management and financing to guarantee the performance of subsidiaries. Therefore Slovenian case indicates that stronger economic base favours decisions made in subsidiaries, but autonomy is highly industry specific.

Looking at the managerial autonomy in the three dimensional area (see Appendix 3a) the picture shows again the largest diversities between autonomy across four areas of business functions in Slovenia and Poland, and in comparison with all industry groups inside medium-high-tech and medium-low-tech subsidiaries by five countries. From Figure 1 it was seen that Poland diverges from others in terms of very low management autonomy. Now it is more clearly seen that in general managerial decisions are made by the parent companies in medium-tech sectors. In case of Poland the reason of very low autonomy in the field of management is explained by the medium-tech as the prevailing industry type.

It is also understood that taking into account industry characteristics, the more economically developed is the country, the more autonomy it has in all levels of autonomy, especially in medium-tech sectors. Taking into focus Poland, Estonia and Slovakia, there is much lower autonomy compared to Slovenia and Hungary. Subsidiaries in Poland are most pronounced from the perspective of managerial dependence, especially in the

medium-high-tech industry sector. Managerial skills play a crucial role in choosing the subsidiary strategy in CEE.

What can be concluded about subsidiary roles in terms of combination between country and industry variables? Earlier it was shown that neither country nor industry features alone showed significant differences in terms of technology autonomy. However differences in autonomy by technology (FACTTECH) become statistically significant combining country and industry categories. In general in more developed countries there are more autonomous subsidiaries among medium-tech sectors. Medium-tech sectors are also more productive (see Table 6 p.13). The high-tech sector is the most reluctant in giving autonomy to local subsidiaries in all countries. Poland differs from other less developed CEE economies with high technology autonomy in the low-tech sector and the lowest management autonomy in the medium-high-tech and medium-low-tech sectors. Local Implementers might be most prominent in medium-tech sectors in Poland.

As a conclusion about country and industry specifics, generally there exist more autonomous subsidiaries in more developed countries (especially in Slovenia) in medium-high-tech and medium-low-tech industries that are also more productive. Drawing parallels with subsidiary roles, the more autonomic subsidiaries (World/Regional Mandates, Specialised Contributors) might be seen more in Hungary and Slovenia, but it is strongly related to industry type. In high-tech industries the performance of more autonomous subsidiaries is not the case in the transition countries. One cannot conclude based on the general pattern a case for supporting or not supporting H2 and H3. Subsidiaries in Slovenia and Hungary are more autonomous in industries with higher technology intensity and with higher productivity.

Differences in combinations between country, industry and firm size

Firm size in combination with industry features determines the role of subsidiary in the five countries in the level of technology autonomy (see FACTTECH in Appendix 3b). In Slovenia and Slovakia, among large subsidiaries the autonomy of subsidiaries in technology area is smaller compared to other countries. Polish, Hungarian and Estonian subsidiaries indicate quite a similar pattern (in larger firms more independence). Earlier it was found that within the Polish and Hungarian sample there were more large firms compared to other countries; also in the Slovenian sample firms are significantly smaller and in the Hungarian sample firms significantly larger than total sample means.

Based on the descriptive analysis and MANOVA tests there are some different patterns in terms of firm size (compared to previous results). If country features are introduced, one could find some support for H4, that more autonomous subsidiaries become visible in the case of large firms and at least in terms of technology autonomy. In terms of marketing, there was a higher autonomy among large firms not taking into account country features. Now Hungary, which has significantly larger companies in the sample, has the highest autonomy and Slovenia, which has smaller companies, has the lowest autonomy in a sample about technology (see also descriptive analysis). In Poland one can also see relatively high independence from the parent company among large firms. Estonia is a specific case, small firms prevailing in the sample. Small firms have less autonomy in technology than bigger firms. In Estonia, the significant number of SMEs in the manufacturing industry could reduce by average the general autonomy level among subsidiaries compared to other countries. In Slovakia and Slovenia could H4 not be supported, as there are smaller firms more independent compared to large firms. Smallest firms in Slovenia might be the reason for lowest technology autonomy in high-tech sector (see FACTTECH in Appendix 3a). Consequently characteristic for Slovenia is the

presence of small high-tech companies, which are rather dependent on the mother company. There might be more ‘Specialised Contributors’ in Slovenia and Estonia compared to other countries.

To make any clear conclusions about the relations between firm size and industry type (H4), one should refer first to the combination between country, industry and firm size variables (see Table 1 in Appendix 4). As MANOVA tests give significant results (p-value: 0.054) for technology factor, one could conclude that all three variables have to be taken into account in determining the subsidiary roles in CEEs. Examining the relation between industry type and firm size (see Figure 5) a relation between firm size and industry technology intensity is seen (with one exception). The higher the technology activity of the industry, the larger the subsidiary (the exception being the low-tech sector). What could one generalise based on these outcomes? Larger firms are more dominant in industry sectors with highest and lowest technology activity. Probably country specifics and their importance in the sample (with Poland and Hungary dominating) play a role here.

Finally, foreign ownership does not show any departures from the preliminary results in relation to other variables (see Figures 1–4 in Appendix 3c and Table 2 in Appendix 4). It appears that in any case, the bigger the foreign stake, the less autonomous local subsidiaries become in CEE economies.

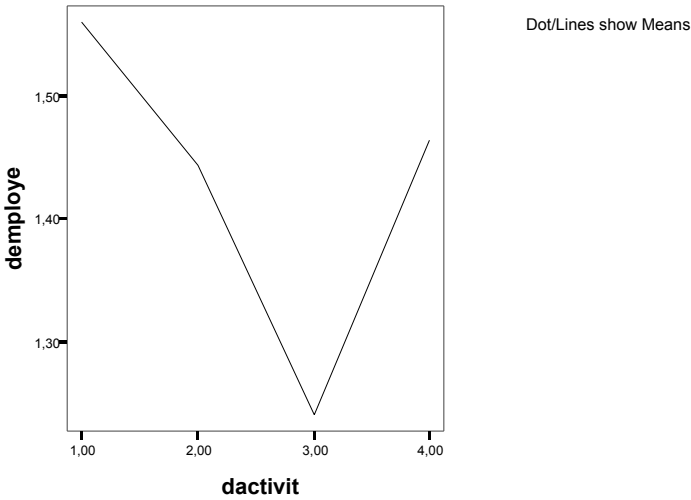


Figure 5. Combination of means by firm size and industry type for all factors.(dactivit – 1 high tech ... 4 low tech; dactiv – size of the firms).

Conclusions about the hypothesis

One can see many differences in choice of subsidiary strategy in Central and Eastern Europe depending on the country, industry, firm size and foreign ownership characteristics. The following is a presentation of the summary of main findings according to the presented hypothesis H1-H5 in the conceptual framework of the paper. Distinctions by country, industry, firm size and foreign ownership (complementary see argumentation in previous section of the analysis):

- More developed CEE countries (Slovenia and Hungary) have more autonomous subsidiaries compared to other countries (Poland, Slovakia, Estonia), especially in terms of financing and management autonomy.

- More productive manufacturing industries have more autonomous subsidiaries only in the case of more developed countries (Slovenia and Hungary).
- More autonomous subsidiaries appear only in more developed countries (Slovenia, Hungary) and in medium-high-tech and medium-low-tech industries.
- More autonomous subsidiaries exist among large firms only in Poland, Hungary and Estonia. In Slovenia and Slovakia the smaller firms have higher autonomy.
- More autonomous subsidiaries are present among minority-share foreign ownership in terms of all types of autonomy.

Generalisations about the subsidiary role ('World Mandate', 'Specialised Contributor', 'Local Implementer'):

- 'World/Regional Mandate' appears to be the most used subsidiary type especially in the case of Hungary. Slovenian subsidiaries are smallest by average in the sample, which could to a great extent determine the role of subsidiaries in a value chain of the MNCs. Comparing technology and production orientation in subsidiaries in two countries, Hungarian subsidiaries seem to be more technology and Slovenian ones more production focused. One might conclude that in Slovenia there are more significant numbers of autonomous 'Specialised Contributors' compared to 'World/Regional Mandates'. It is also seen from the results about industry characteristics that Slovenian subsidiaries have the highest autonomy in medium-high-tech and medium-low-tech sectors. The size of firm does not play so great a role in less technology intensive sectors, even in terms of technology autonomy.
- In Poland a bigger share of 'Local Implementers' seems to appear in the manufacturing industry, especially in medium-low-tech industries. Compared to the other four countries, Poland has the highest

local market that can be the most important feature for subsidiary roles by the MNC. Poland has the highest autonomy in marketing and the lowest autonomy in management. Local market-oriented FDI could give a higher marketing autonomy to local subsidiaries. From another side, low managerial skills require support from foreign owners.

- In Estonia and Slovakia the foreign subsidiaries are less autonomous taking into account all factors. Based on firm size, one could expect more ‘Specialised Contributors’ compared to other forms of subsidiary roles in both countries, above all in Estonia. Contrary to the Slovenian pattern among different industries, Estonia has the highest dependence from the foreign owner in medium-tech industries (but not in high-tech and low-tech industries). As the Estonian firms are also very small, there is assumed to be a large number of ‘Specialised Contributors’ in Estonia, although they are controlled by foreign owners, at least across technology and management activities. In Slovakia subsidiaries are more independent compared to the Estonian subsidiaries. The main difference between Slovakian and Estonian subsidiaries becomes visible in firm size. In Estonia larger firms are more autonomous; in Slovakia smaller firms more autonomous. It can be shown that there is more ‘World Mandates’ in the high-tech sector in Estonia compared to Slovakia.
- Technology autonomy appears to be the most critical factor of subsidiary strategies in all countries, both in terms of industry and firm size. Even in Hungary and Slovenia where the development level of the economies is higher compared to other three countries. Technology autonomy does show significant patterns in combination with country, industry and firm size effects.

CONCLUSIONS

The current paper was focusing on the knowledge and technology transfer through FDI from the perspective of subsidiary strategy in the host country. It is largely argued that the impact of multinational companies on the local economy is subsidiary-dependent. Subsidiary strategy plays the endogenous role in expecting positive spillovers from FDI to the local environment. In the literature it is examined that in the host countries with higher level of economic development relatively bigger FDI effects are assumed, especially in terms of FDI spillover effects. Spillover effects are appearing in local enterprises through backward or forward linkages between foreign and local companies. The higher the absorptive capacity of local affiliates and other local companies the higher FDI influences might be expected in the host country. The higher the technology intensity of the sector the more active exchange of knowledge and technology is foreseen.

Going into the level of foreign subsidiary firm-specific characteristics like firm size, the share of foreign ownership and the strengths of business activities start to determine the role of strategy taken by the parent company. In the conceptual part of the paper it was followed the approach of the subsidiary roles presented by Birkinshaw et al (1995). Followed this classification three types of subsidiaries could be under discussion: 'World/Regional Mandate', 'Specialized Contributor' and 'Local Implementer'. Autonomy as one of the main measure for examining the differences along the types of subsidiaries, appears most prominent in case of 'World/Regional Mandate' and least significant in 'Local Implementer'. The first one has the highest freedom in relation to the parent company and highest levels of value-added scope in terms of business functions of the subsidiary. The mandates for subsidiaries can evolve over the time.

The empirical analysis of the paper concentrated on the functional autonomy of the subsidiaries, measuring the autonomy by the decision-making process between the parent and local unit across four factor clusters (received through principal component factor analysis): technology, marketing, management and financial autonomy. The analysis integrated the influences of countries, industries, firm size and foreign ownership on the subsidiary role in five CEE countries. The analysis was based on the survey data carried out in manufacturing sector in Slovenia, Poland, Hungary, Slovakia and Estonia.

Based on the results from the analysis there was found significant differences in the choice of subsidiary strategies by countries, industries, firm size and foreign ownership.

Subsidiaries from the more developed CEE countries Slovenia and Hungary had the highest scores for the autonomy, especially in terms of management and financial autonomy. Analyses supported also hypothesis that minority foreign owned subsidiaries are more autonomous than majority owned, even taken into account all other variables.

Other two variables (industry, firm size) show significant differences in compound analysis. More productive manufacturing industries have more autonomous subsidiaries only in the case of more developed countries (Slovenia and Hungary). Again, more autonomous subsidiaries become significant only in Slovenia and Hungary and in medium-high-tech and medium-low-tech industries. Finally, more autonomous subsidiaries exist among large firms only in Poland, Hungary and Estonia. In Slovenia and Slovakia the smaller firms have higher autonomy. More distinctions were made in the summary of findings in the last section. Generally no some common pattern of subsidiary mandates could be presented in all five CEE. The role of subsidiary is above all industry and firm size specific.

Drawing parallels between the received results about the autonomy scores for business functions and three subsidiary

roles, 'World/Regional Mandate' strategy is most pronounced in Hungary and less extent in Slovenia, 'Specialised Contributor' in Slovenia, Estonia and Slovakia, and 'Local Implementer' in Poland. Subsidiaries are by average rather production oriented. Technology autonomy comes out the most critical one in terms of subsidiary strategies.

Now we should ask which strategy could be the best one in terms of knowledge and technology transfer incl. technology spillover effects in these five transition countries. It is argued in the literature that strategic relatedness and distinctive value-added of the mandate activity are positively related with the mandate sustainability (Birkinshaw 1996). Thus, lower levels of autonomy could be more co-operative both with the parent company and may be also local companies. The co-operation is the keyword of achieving the more intensive R&D and innovation activities in any country. Therefore in all other factors being constant, could we expect more intense technology and knowledge transfer in case of 'Specialised Contributor' and 'Local Implementer' compared to 'World/Regional Mandate' in those five countries? Could the high ratio of autonomy be the technology transfer inductive or rather an impeding factor of the indigeneous development of the host country? Based on the previous works done in the field of FDI impacts on the host country one can not conclude of seeing some general pattern of productivity growth and decrease in productivity gap between foreign and local firms. As continuation of the current paper in the following research the behaviour of subsidiary autonomy in relation to business links (with local companies, other affiliates, foreign owner, other foreign firms), business input (competitiveness areas and sources) and output (sales, exports, productivity in foreign and local firms etc) will be explored.

Finally turning attention to some shortcomings of the current analysis the problems related to the representativeness of the countries in a sample might be presented. Poland was most strongly represented, Slovenia and Estonia moderately overrepresented and Hungary underrepresented. The results

might be biased in favour of one or another country features. Second, there might be appropriate to use of some other taxonomy of industries different from the current one of bringing out the technology intensity in the manufacturing sector. Third, it is suggested to use also other measures different from functional ones for estimating the autonomy in the subsidiaries by the features of countries, industries, firm size and other factors. Fourth, it could be appropriate to examine also other factors different from autonomy in terms of subsidiary strategies and from the perspective of technology transfer.

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Appendix 1

Means for categorical variables by four group of functions (ANOVA)

Cat. variable	FACT- TECH	FACTMARK	FACTMAN	FACT- FIN
Country:				
Slovenia	0.31	0.34	0.25	0.18
Poland	0.40	0.26	0.45	0.29
Hungary	0.37	0.33	0.34	0.22
Slovakia	0.37	0.50	0.39	0.31
Estonia	0.35	0.32	0.37	0.37
Total average	0.37	0.34	0.38	0.27
Industry:				
High-tech	0.43	0.39	0.37	0.25
Med-high- tech	0.39	0.37	0.40	0.28
Med-low- tech	0.36	0.30	0.38	0.26
Low-tech	0.33	0.33	0.37	0.28
Total average	0.38	0.35	0.38	0.27
Firm size:				
SME	0.37	0.32	0.37	0.27
Large	0.36	0.37	0.39	0.26
Foreign share:				
Minority	0.21	0.16	0.22	0.14
Majority	0.40	0.37	0.41	0.29

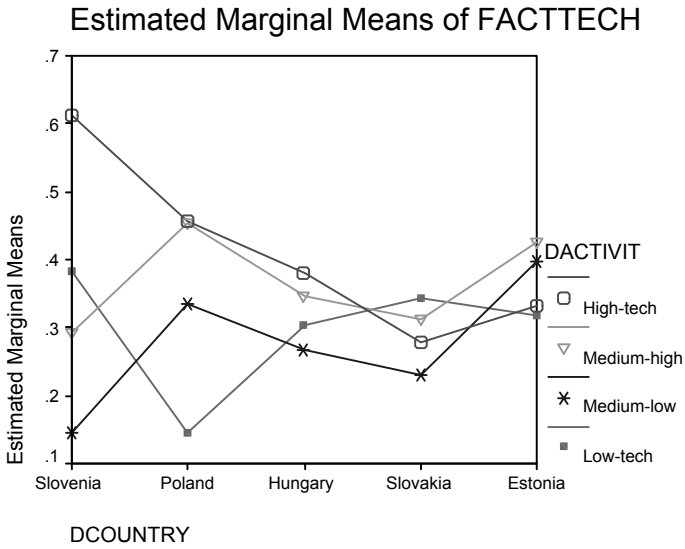
Appendix 2

Statistically significant means for categorical variables by four group of functions (ANOVA)

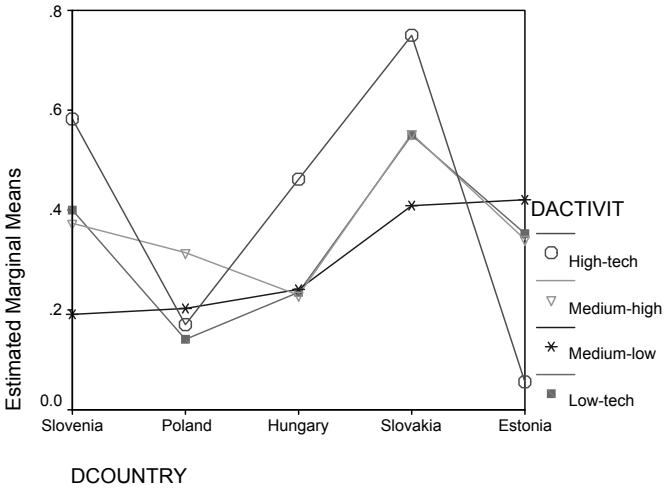
Cat.variable	FACT-TECH	FACT-MARK	FACTMAN	FACTFIN
Country		F-stat: 7.617 p-value: 0.000 Differences: SVK>SLO, POL, HUN, EST	F-stat: 10.234 p-value: 0.000 Differences: SLO<POL, EST, SVK; POL> HUN	F-stat: 9.273 p-value: 0.000 DiffVKerences: SLO<POL, SVK, EST; POL>HUN; HUN<SVK
Firm size		F-stat: 3.843 p-value: 0.051		
Foreign ownership	F-test: 37.279 p-value: 0.000	F-stat: 24.778 p-value: 0.000	F-stat: 38.128 p-value: 0.000	F-stat: 27.288 p-value: 0.000

Appendix 3a

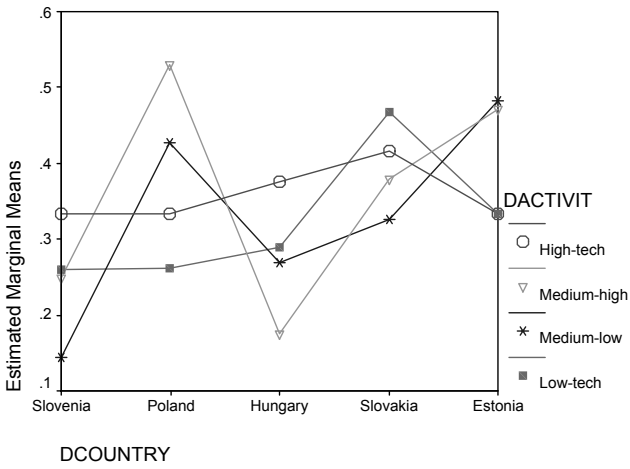
Estimated marginal means between country and industry dummies by group of functions (MANOVA)

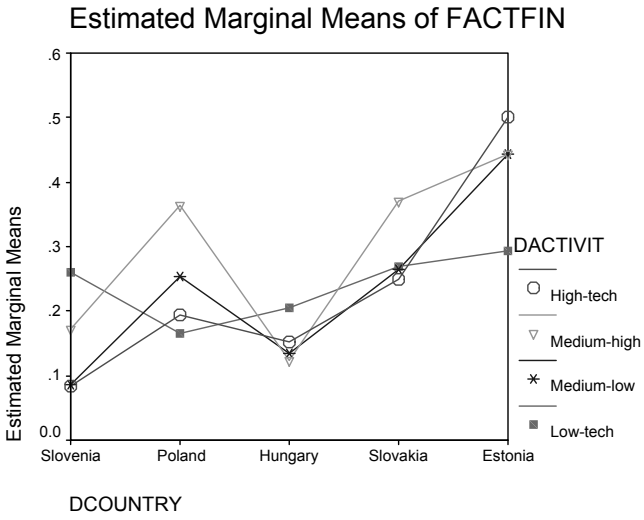


Estimated Marginal Means of FACTMARK



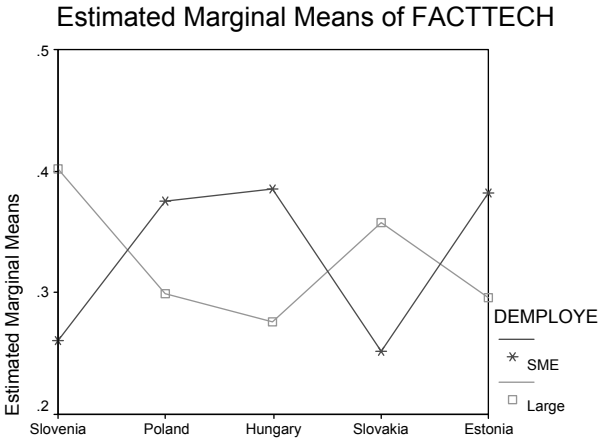
Estimated Marginal Means of FACTMAN



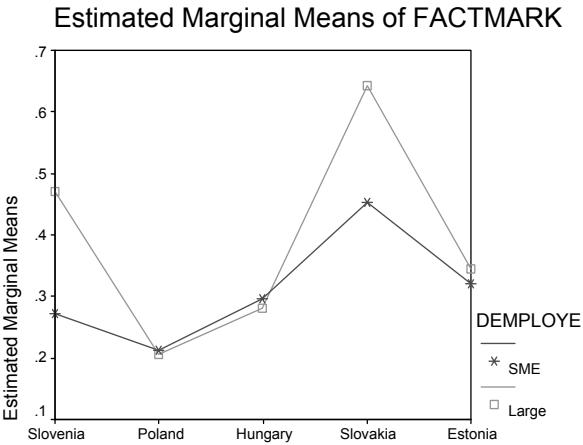


Appendix 3b

Estimated marginal means between country and firm size dummies by group of functions (MANOVA)

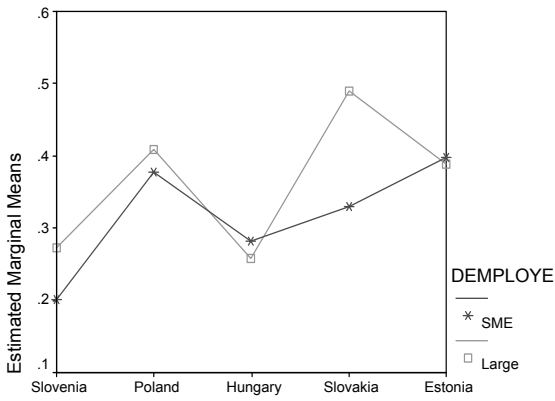


DCOUNTRY



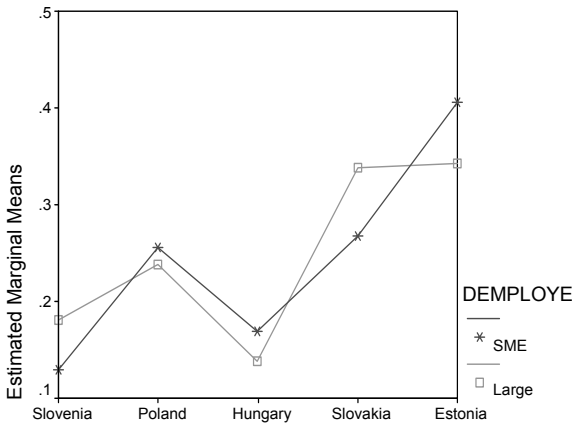
DCOUNTRY

Estimated Marginal Means of FACTMAN



DCOUNTRY

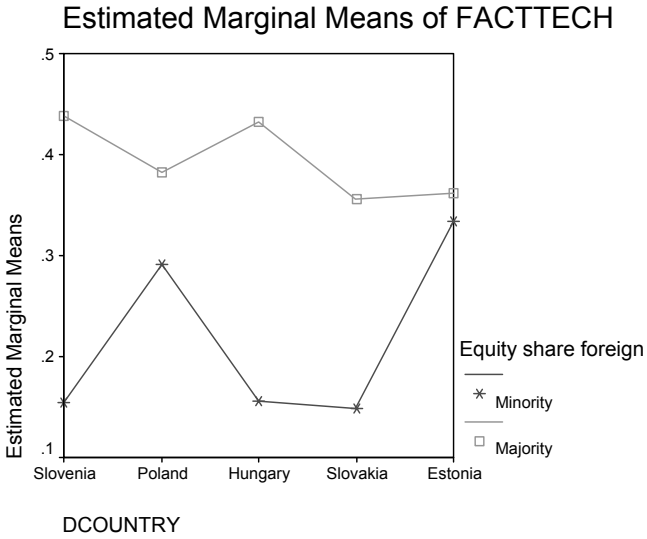
Estimated Marginal Means of FACTFIN



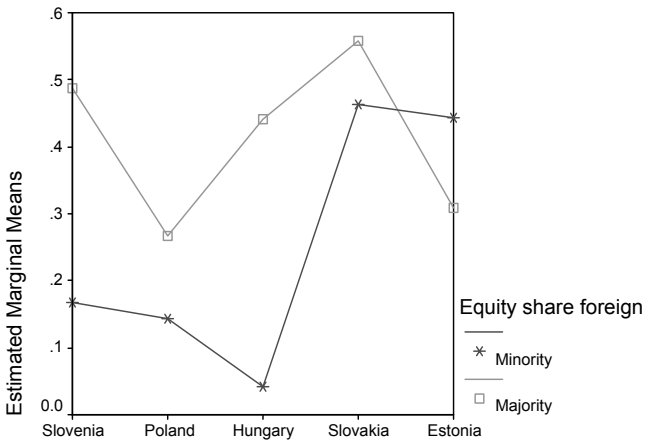
DCOUNTRY

Appendix 3c

Estimated marginal means between country and foreign ownership dummies by group of functions (MANOVA)

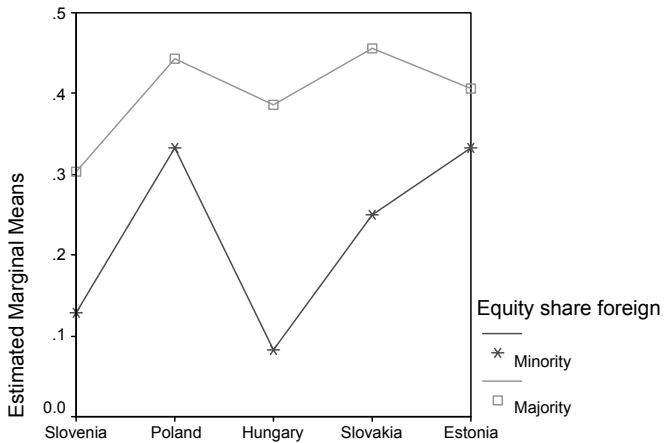


Estimated Marginal Means of FACTMARK

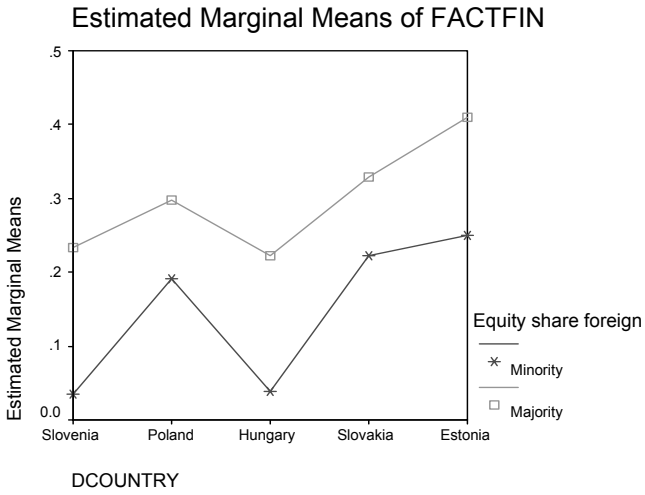


DCOUNTRY

Estimated Marginal Means of FACTMAN



DCOUNTRY



Appendix 4

Table 1

**Statistically significant means for categorical variables
(country, industry, firm size) by four group of functions
(MANOVA)**

Integration between cat. variables	FACT-TECH	FACT-MARK	FACT-MAN	FACT-FIN
Country		F-stat: 7.188 p-value: 0.000 Differences SVK>SLO, POL, HUN, EST	F-stat: 2.243 p-value: 0.064 (sign.10% level) Differences SLO<POL, EST, SVK; POL>HUN	F-stat: 5.035 p-value: 0.001 Differences SLO<POL, SVK, EST; POL>HUN; HUN<SVK
Firm size		F-stat: 5.223 p-value: 0.023		
Country * Industry	F-test: 3.133 p-value: 0.000		F-stat: 2.051 p-value: 0.020	
Firm size * Industry	F-test: 3.932 p-value: 0.009			
Country * Firms size * Industry	F-test: 1.880 p-value: 0.054			

Table 2

**Statistically significant means for categorical variables
(country, industry, firm size, foreign ownership) by four
group of functions (MANOVA)**

Integration between cat. variables	FACT- TECH	FACT- MARK	FACT- MAN	FACT- FIN
Country		F-stat: 3.512 p-value: 0.008 DifferencesS VK>SLO, POL, HUN, EST	F-stat: 2.594 p-value: 0.037 Differences SLO<POL, EST, SVK; POL> HUN	F-stat: 3.315 p-value: 0.011 Differences SLO<POL, SVK, EST; POL>HUN; HUN<SVK
Foreign ownership	F-stat: 11.966 p-value: 0.001	F-stat: 8.687 p-value: 0.003	F-stat: 9.183 p-value: 0.003	F-stat: 8.931 p-value: 0.003
Country * Industry	F-test: 1.910 p-value: 0.033			

KOKKUVÕTE

Riigi, tööstusharu ja suuruse mõju välisettevõtete allüksuste strateegiatele viie Kesk- ja Ida Euroopa riigi näitel

Antud töö oli suunatud Kesk- ja Ida Euroopa riikides multinatsionaalsete ettevõtete allüksuste strateegilise rolli analüüsimisele. Töös kontsentreeruti peamiselt allüksuste funktsionaalse autonoomia analüüsile. Analüüs viidi läbi küsitluse andmetel, mis toimus 2001–2002. aastal Eestis, Poolas, Ungaris, Sloveenias ja Slovakkias. Vastuseid laekus kokku 433 ettevõtte kohta. Küsitluse tulemusena saadi informatsiooni ettevõtete otsustusportsessi autonoomsuse kohta erinevate ärifunktsioonide lõikes (tootmine, turustamine, operatiivne, strateegiline ja finantsjuhtimine).

Empiirilise analüüsi käigus viidi algul läbi komponentanalüüs, millega suruti informatsioon 13 ärifunktsiooni kohta kokku neljaks komponendiks. Seejärel viidi läbi diskriminantanalüüs kasutades ANOVA ja MANOVA meetodit. Nende abil oli võimalik hinnata riigi, tööstusharu, ettevõtte suuruse ja ka välisosaluse suuruse mõju neljale autonoomsuse erinevat aspekti kajastavale komponendile.

Peamiste tulemustena selgus, et allüksuste autonoomia on väga riigi- ja tööstusharuspetsiifiline. Kõige autonoomsemad olid multinatsionaalsete ettevõtete allüksused rikkamates riikides — Sloveenias ja Ungaris. Samuti olid suurema autonoomiaga kõrgema tootlikkusega tööstusharude ettevõtted, kuid seda jällegi vaid Sloveenias ja Ungaris. Poolas oli kõige suurem autonoomia turunduse osas, kuid kõige väiksema autonoomiaga juhtimise osas. Sloveenias ja Slovakkias omasid väiksemad ettevõtted suuremat autonoomiat, aga samas olid Sloveenias kõrgetehnoloogiliste sektorite ettevõtted väikese autonoomiaga.

Tuues sisse Birkinshaw poolt 1990ndate aastate keskel rakendatud liigituse, võib väita, et "Maailma/Regiooni Mandaati" kui strateegiat allüksuste rajamisel kasutatakse kõige rohkem Ungaris ja veidi vähem Sloveenias. "Spetsialiseeritud panustaja" strateegiale vastavaid ettevõtteid on palju Sloveenias, Slovakkias ja Eestis ning Poolas tegutsevad peamiselt "Kohalikud täitjad".