

**Hungary at the Turn of the Millennium
Strategic Research Programme
Hungarian Academy of Sciences**

**GREEN PATH
Hungary's Accession to the EU
Environmental Issues**

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I. Introduction

The Székesfehérvár region has been the most successful in Hungary in marketing its logistical, infrastructural and human resource advantages to attract new foreign and domestic investment. So successful has the city and its businesses been that there is now a labour shortage serious enough that new potential investors have been encouraged to chose alternative sites. Other areas - such as Győr, Szombathely, and the areas surrounding Budapest - are beginning to develop the same characteristics which Székesfehérvár was the first to gain. As such, the Székesfehérvár region can be used to predict trends which will be prevalent across the Hungarian industrial landscape in the coming years, large regional differences notwithstanding.

In this study, we wish to exploit the “model” role Székesfehérvár has come to acquire in order to carefully examine the evolving relationship between firms active in Hungary and the environment. We have developed a set of research instruments which lend themselves towards obtaining both the subjective and objective facets of company policies and plans regarding a wide number of factors which impact environmental quality. In addition to a questionnaire (completed in person with professional researchers) especially designed to elicit responses on environmental issues, we have utilized the data set from an European Union-funded project containing the same firms which provides a very detailed and wide picture of every firm. The EU REGIS project, based on the combination of in-depth interviews carried out on a sample of 75 firms and 13 institutions, focused largely on innovational profiles. By merging these two data sets, we are able to not only detail the current state of environmental awareness, action,

and attitudes prevalent in firms, but also profile the firm characteristics relevant to these issues.

The strength of this study is exactly this very detailed examination made possible by having such an extensive set of information on every firm in the study. Over 200 variables were available for analysis, which enabled us to isolate very specific correlations with outcomes regarding environmentally-friendly production.

Undoubtedly, the greatest weakness is the relatively small number of firms included in the final phase of the research - only 15. It is our hope, however, that this study serve as an inspiration to further research which allows for greater statistical significance and includes lagging, or weak, regions as well.

II. Firm Profiles

Fifteen firms were selected from the original 75-firm sample pool to participate in the environment study. A deliberate effort was made to choose firms with a strong manufacturing profile, both for methodological reasons, and because it is these firms' activities which stand to impact the environment most directly. Of the 15 firms, nine are in majority foreign ownership, which may appear at first to be rather high. However, half of the largest 200 firms in Hungary are now foreign-owned, and in the manufacturing sector (especially in the machine industry) this figure is even greater.

Table 1: General Characteristics of Sample

| | Greenfield | Brownfield | Employees | 1995 Turnover (1000 ECUs) | 1000 ECU per Employee |
|---------------|------------|------------|-----------|------------------------------|--------------------------|
| Hungarian | 1 | 5 | 631.2 | 21330 | 33.8 |
| Foreign-owned | 7 | 2 | 698.6 | 54415 | 78.1 |

The sample is representative of the Székesfehérvár region, where the vast majority of foreign direct investment has been directed not on privatisation projects, but on greenfield manufacturing sites. A well-trained, inexpensive workforce, a relatively well-developed infrastructure, and a variety of local and national investment incentives (including 5 and 10-year tax holidays on profits, no local taxes for five years, "off-shore" status, training subsidies, etc.) have attracted such leading-edge firms as Ford, IBM, Phillips, etc., which tend to concentrate their local activities on assembly operations. Hungarian domestic investment has lagged behind foreign direct investment (FDI), and as such, in Székesfehérvár, as in most of Hungary, the greenfield / brownfield differentiation can almost be used as proxies for domestic or foreign ownership.

While company sizes differentiated by ownership nationality are nearly the same, dramatic differences are seen in yearly turnover, with foreign-owned firms bringing in nearly 2.5 times more per employee than domestic firms. Separate studies have found that labour cost components as a percentage of gross production costs at foreign-owned firms in Hungary are considerably lower than those found in Hungarian-owned firms.

(Note bene: this does not mean, as shall be discussed later, that the on-site production/assembly processes themselves at foreign-owned firms can be characterised as high value-added).

This survey and others have found that foreign-owned firms in Hungary are growing at much faster rates than Hungarian-owned firms, which means that the human resource, research and development, and environmental management patterns utilised by foreign-owned firms are in relative ascendancy.

These differences will gain importance later in this study, as we consider where large differentials by ownership occur (the average age of machinery, and labour/capital ratios, export orientation, etc.), but also when we examine the areas where differences are surprisingly small. In other words, our findings - especially those regarding environmental policies of companies - to the extent that they reflect ownership nationality, must be considered within the context of relative company wealth.

One of the strongest, most significant set of differences between ownership nationality categories visible in the survey has to do with the import/export profile exhibited.

Managers were asked to give percentage scores for product inputs and output, differentiated by the Székesfehérvár region, Hungary, European Union, and finally, the rest of the world.

Table 2: Product Inputs and Outputs

| <i>Inputs</i> | Region | Hungary | Rest of World |
|---------------------|--------|---------|---------------|
| Hungarian Firms | 14.2% | 46.2% | 39.7% |
| Foreign-owned Firms | 11.8% | 18.1% | 70.1% |
| | | | |
| <i>Outputs</i> | | | |
| Hungarian Firms | 16.0% | 46.3% | 37.7% |
| Foreign-owned Firms | 16.0% | 20.7% | 52.3% |

The import/export profiles of firms in the region are important when considering not only individual firm success (dynamic, successful firms tend to have a stronger than average export profile), but the shape and intensity of a wide range of existing and emerging regional networks. Firms which utilise the region for only a small portion of their product inputs are unlikely to have a strong interest in helping develop a regionally-based set of institutions which promote inter-firm or public-private cooperation. Most importantly for the purposes of this study is the fact that a strong reliance on imported components can harm the environment, especially when one considers that the main mode of freight transportation into and out of Székesfehérvár is the lorry. This question shall be considered later in the paper, in conjunction with other environmental issues.

Foreign-owned firms, especially foreign-owned greenfield firms, report using very few Hungarian inputs (either components or raw materials) in the production process. On average, foreign-owned firms rely on the region for only 11.8%, and on the nation for only 18.1% of product inputs. Together, this gives a domestic content ratio of 29.9% (only 20.3% in the case of greenfield firms). By contrast, and not surprisingly, Hungarian firms demonstrate far heavier reliance on domestic component producers. Hungarian firms on average rely on the region for 14.2%, and on the nation for 46.2% of product inputs, yielding a domestic content ratio of 60.4%.

In accounting for such large disparities, one must consider that a great many greenfield sites were offered "off-shore" status, which grants duty-free importation of production components. Hungarian firms, and foreign-owned brownfield sites are generally not granted duty-free importation allowances. "Off-shore" status creates a very powerful

disincentive to search for regional or national supplier networks, especially as many of these firms have an already existing European or world-wide supplier network. (When queried as to why domestic content rates are so low, many foreign managers cite the lack of contacts among potential Hungarian firms, as well as quality concerns). Such a heavy reliance on imported components does come with a price, however. Logistical concerns having to do with on-time delivery of components (especially when one considers that 44.4% of foreign-owned greenfield companies rely on Just In Time inventory control systems) consistently rank as one of the biggest problems facing managers at foreign owned greenfield sites.

Multiplier effects are notorious vague and difficult to quantify, but it is obvious that such a heavy reliance on imported components (often those with the highest value-added), makes any such effects in the Székesfehérvár region, and Hungary as a whole, relatively modest. From the perspective of technological and environmental innovation, diffusion from high-tech, greenfield plants to domestic producers is severely limited by the heavy reliance on imported components. Again, from the ecological standpoint, such a situation is not without objections, as the distances imported components travel are much greater than domestic components.

It must be added, the temporal components associated with FDI flows should also be considered, and even at this early point in time, it is evident that the above-listed characteristics are beginning to change for the better. Networks - whether for supply, research and development, or distribution - do not arise spontaneously. As foreign-owned companies accumulate positive experiences manufacturing in Hungary, it is hoped they will gradually begin to expand local production beyond low value-added

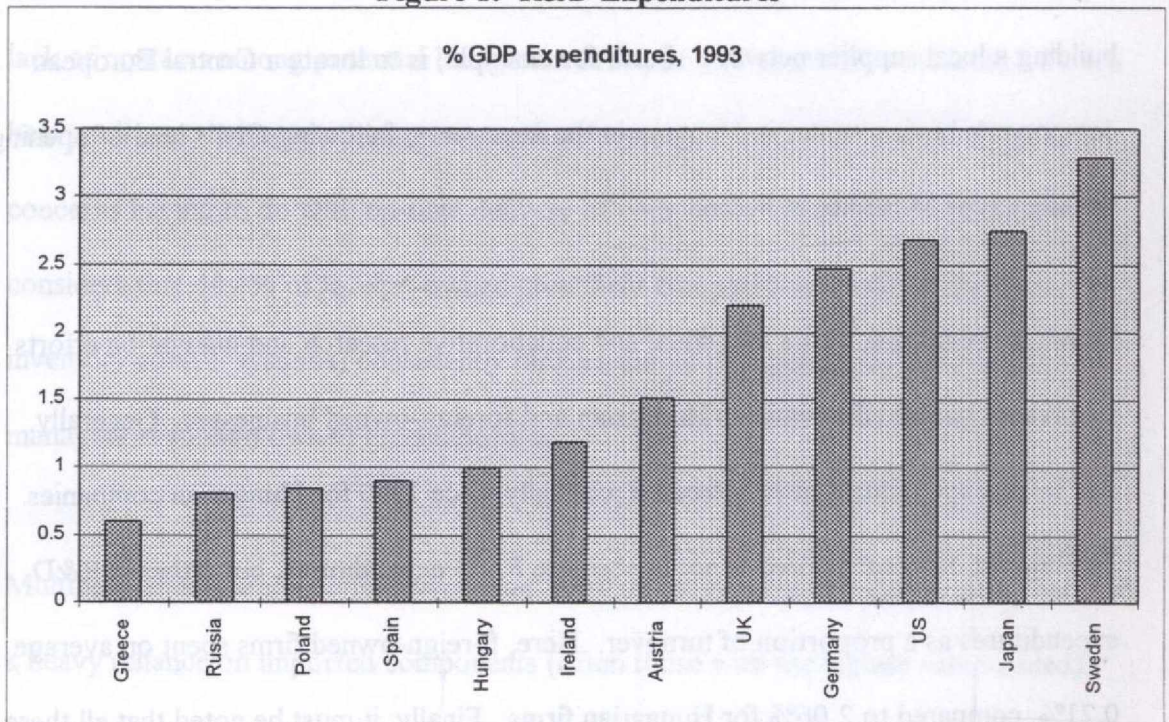
assembly operations. Audi and GE, for example, have begun to move some research and development facilities to Hungary to be closer to their production sites, and a number of foreign-owned companies have begun making the first moves towards building a local supplier network. Ford, for example, is to locate a Central European components buying center in Hungary in the next years, following GM's lead of opening the same type of facility in Poland.

Questions regarding firm's individual and collaborative research and innovation efforts also reveal sizable rifts between Hungarian and foreign-owned businesses. Generally, real R&D expenditures have increased gradually since 1990 for Hungarian companies. The biggest difference noted is not in absolute R&D expenditures, but rather in R&D expenditures as a proportion of turnover. Here, foreign-owned firms spent on average 0.21%, compared to 2.06% for Hungarian firms. Finally, it must be noted that all these figures are very small in the international context. Globally, the following chart illustrates national (public and private) R&D expenditures.

When asked how their firms sustain competitive advantage, noticeable differences were noted between Hungarian and foreign-owned firms on issues relating to innovation. Internal research and development activities were given as a reason for competitive advantage by 62.5% at foreign-owned firms, compared to only 45.8% at Hungarian-owned firms. Similarly, patent ownership was given as a reason 62.5% versus only 35.4%. As shall be discussed in more detail later, these differences can not be solely accounted for on the basis of on-site research and development, but rather, company-wide research and development. Larger, international corporations are able to garner

more advantageous economies of scale in research and development than smaller domestic companies, and this phenomenon is by no means limited to Hungary.

Figure 1: R&D Expenditures



Source: OECD

Therefore, for smaller, domestic companies collaborative research undertakings may be especially important as a way to lower initial costs and share risks. In this respect however, perhaps surprisingly given an intuitively greater need, Hungarian-owned companies seem to be less active than their foreign-owned counterparts. The latter category reports stronger scores not only in cooperation with EU entities (50.0% to 29.2%), but also in national (62.5% to 55.3%) and regional (54.2% to 43.8%) cooperative ventures. Hungarian-owned companies also rate cooperative agreements, generically and in the region, national and international contexts, as less important than do foreign-owned companies.

Managers were also asked what challenges they see their firm facing. Responses reveal that foreign-owned firms are slightly more pro-active, especially in regards to improving product quality, cutting personnel costs and product development. Averaging the scores for all possible challenges, foreign-owned firms responded in the affirmative 86.3%, compared to 76.7% for Hungarian firms. The smaller, newer Hungarian enterprises scored especially low on these questions.

The follow up query, "Does your company respond to the following challenges?", sheds further light on these Hungarian greenfield businesses, which returned the lowest scores of all categories in half of the responses listed. Of particular importance is the fact that only 33.3% of Hungarian greenfields plan any sort of product development (compared to a Hungarian average of 55.1% and a foreign-owned average of 75.0%), and only 22.2% plan and R&D cooperation with other firms (again, it is exactly the smaller firms which stand the most to gain from such ventures). Here also, foreign-owned firms reported higher scores (on average, 62.5% versus 57.9%), with particularly wide gaps being observed in responses such as increased outsourcing and product development. Of note is the fact that 61.2% of Hungarian firms plan to intensify internal R&D (compared to 54.2%), and that Hungarian firms place a greater importance on local R&D activities.

Table 3: Does your company respond to these challenges?

| Hungarian Firms | Cutting cost | Org Restructuring | Speeding up prod. dev. | Intensifying internal R&D | Outsourcing | Subcontracting | Marketing coop | R&D coop |
|-------------------------|--------------|-------------------|------------------------|---------------------------|-------------|----------------|----------------|----------|
| Privately owned | 93.5% | 74.2% | 54.8% | 61.3% | 25.8% | 38.7% | 61.3% | 35.5% |
| Private/State ownership | 87.5% | 87.5% | 50.0% | 62.5% | 37.5% | 12.5% | 75.0% | 37.5% |
| State owned | 100% | 88.9% | 55.6% | 55.6% | 55.6% | 33.3% | 55.6% | 55.6% |
| Greenfield | 100% | 66.7% | 33.3% | 66.7% | 22.2% | 22.2% | 44.4% | 22.2% |
| Brownfield | 92.5% | 82.5% | 60.0% | 60.0% | 37.5% | 37.5% | 67.5% | 45.0% |
| Total | 93.9% | 79.6% | 55.1% | 61.2% | 34.7% | 34.7% | 63.3% | 40.8% |
| Foreign Firms | | | | | | | | |
| Greenfield | 100% | 84.2% | 73.7% | 57.9% | 52.6% | 42.1% | 52.6% | 52.6% |
| Brownfield | 100% | 75.0% | 75.0% | 25.0% | 25.0% | 0.0% | 25.0% | 25.0% |
| Total | 100% | 83.3% | 75.0% | 54.2% | 50.0% | 37.5% | 50.0% | 50.0% |

Perhaps not surprisingly, given the above-listed figures, there is also a wide gulf in product outputs, with Hungarian-owned firms relying heavily on the domestic market, and foreign-owned firms (again, greenfield firms in particular) being especially active exporters. Hungarian-owned firms export, on average, only 37.7% of output, while foreign-owned firms export a dramatic 52.3% (59.9% for greenfield sites).

When asked if their company is supplying one or a few dominant suppliers, 66.0% of managers at Hungarian-owned companies replying "yes", as compared with 76.9% at foreign-owned firms (85.0% at foreign-owned greenfield sites). The follow-up question, which asked what share of sales goes to the most important customer, reveals 32.4% at Hungarian-owned companies and 56.8% at foreign-owned companies. The relatively greater dependence of foreign-owned companies on one or a few customers may be at least partially accounted for by the fact that many of the foreign-owned greenfield operations are often processors, producers or assemblers for their company's own world-wide production chain (i.e., there is a noticeable lack of on-site integrated

production processes at the foreign-owned greenfield plants, as it is part of company-wide vertically-integrated production process).

Three observations need to be made about the survey findings regarding export patterns. First is the overwhelming dominance of the EU as an export target of Hungarian firms. While having much to do with geographic proximity and buying power, this is also the result of the EU's trading regime which gives products coming from the CEE countries slightly preferential tariff status (due to the Association Agreements). To qualify for such preferential tariffs, the products must have a domestic and/or European Union content of over 50%. Many foreign-owned greenfield sites (as well as, for example, nearly all automobile manufacturers present in Hungary) qualify for preferential tariffs based on European Union, not domestic, content.

Secondly, one notices the marked collapse of any strong alternative market for Hungarian exporters. A mere seven years ago, the Soviet Union and CMEA trading bloc was the destination of the majority of Hungarian exports. The lapse of the ruble-based trading system, the collapse of buying power of consumers in these countries, as well as the very pronounced political guidance towards western markets has hurt Hungarian producers which relied on the CMEA markets.

Thirdly, and perhaps most importantly, one must be aware of the weakness of the domestic market. Consumer buying power and real wages have dropped sharply since 1989 (with a 15% drop in real earnings registered in 1995-1996), which has hurt Hungarian companies, which by size and tradition tend to be domestically focused, much more than foreign-owned companies. While slow improvements in buying power, and a

general stabilisation of macro-economic indicators, will have a positive effect on all sectors of the economy, this will be an especially welcome development for Hungarian

| | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| SMEs. | 39.5% | 41.7% | 44.8% | 47.1% | 49.3% | 51.5% | 53.7% | 55.9% | 58.1% |
| Manufacturing | 35.2% | 37.4% | 40.5% | 42.8% | 45.0% | 47.2% | 49.4% | 51.6% | 53.8% |
| Construction | 45.1% | 47.3% | 49.5% | 51.7% | 53.9% | 56.1% | 58.3% | 60.5% | 62.7% |
| Trade | 30.1% | 32.3% | 34.5% | 36.7% | 38.9% | 41.1% | 43.3% | 45.5% | 47.7% |
| Transport | 25.6% | 27.8% | 30.0% | 32.2% | 34.4% | 36.6% | 38.8% | 41.0% | 43.2% |
| Services | 38.7% | 40.9% | 43.1% | 45.3% | 47.5% | 49.7% | 51.9% | 54.1% | 56.3% |
| Total | 39.5% | 41.7% | 44.8% | 47.1% | 49.3% | 51.5% | 53.7% | 55.9% | 58.1% |

... of over 30%. Many foreign-owned greenfield sites (as well as, for example, ... in Hungary) ... quality for ...

... on European Union ... content ...

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... (30%) ...

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... This ...

... domestic ...

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... Hungarian ...

... more ...

III. Environmental Profiles

In designing our research instruments, we have very deliberately attempted to create a multi-dimensional approach which measures both subjective and objective, both firm-internal and firm-external factors affecting company and market behaviour. We have utilised groups of complementary questions to create macro-variables (tested for robustness) in the following categories:

- A) *Subjective views of environmental policies as reflected by value judgements*
- B) *Perceptions of the consumer (market)-oriented reactions to environmental modes of production*
- C) *Capacities of firms to produce in an environmentally-friendly manner*
- D) *Status quo of current production processes*
- E) *Firm-internal environmental awareness*
- F) *Perceptions of environmental awareness in region*

Before we discuss these macro-variables in more detail, it is worth mentioning that despite the large differences we have already noted between Hungarian and foreign-owned firms (turnover, domestic context, etc.), there are relatively modest differences in these variables according to ownership nationality. When one looks at means by ownership category alone, differences are in fact nearly invisible. Only when one uses correlation and regression factor by factor (and it precisely here that the very deep data set is so useful) can one extract the variables which do indeed have substantial impact.

Overall, managers were generally quite positive regarding these mostly non-specific statements. Robustness is demonstrated by the fact that negative statements (“The responsibility of companies in environmental pollution is often exaggerated.”) scored considerably lower than positive statements. It must be stressed, however, that these scores only indicate attitude, not firm policy or potential policy.

One potential surprise is the fact that so many companies agreed with the statement that firms “should be responsible for waste even after it leaves the factory.” While this concept is hardly new in western Europe, in Hungary it could be considered quite radical. This could indicate that a disposal-recycling system similar to “der Grüne Punkt” in Germany may not receive fundamental, conceptual opposition from Hungarian manufacturers. (It must also be pointed out that the majority of companies in the sample are foreign, coming from countries which obligatory disposal-recycling systems.)

In order to gain more specific information on how these attitudes might affect or be affected by other variables, we sought to isolate those factors which had the greatest correlation to the above-listed questions.

Table 5: Views of Environmental Policies

Strongest correlations with variables

| | |
|---|------|
| Plans to increase human capital development | .63 |
| Innovation-oriented corporate culture | .53 |
| Average age of production equipment | -.52 |
| Innovational strengths in human capital development | .49 |
| Cooperation with local firms | .47 |
| Foreign ownership | .42 |
| Capital / labour ratio (capital intensity) | .41 |
| Domestic content | -.41 |

The results are hardly surprising, but do serve to underline the very strong connection between innovative, forward-looking companies and progressive environmental attitudes. Firms which believe in increasing their internal human resource capacities are those firms which tend to have managers who feel strongest about environmental protection. It is entirely logical that the higher the capital-labour ratio and the lower the average age of machinery, the higher the environmental score.

Before we read too much into the above-listed statistics, we must again return to a basic question of assumptions. In a very real way, the above factors reflect the current success and financial resources of a company more than anything else. In other words, it would be a mistake to go too far with the assumption that the above factors are intrinsically linked with environmental attitudes. Rather, these environmental attitudes may be enabled by general company prosperity and by the "affordability" of such attitudes.

B. Perceptions of market-oriented reactions to environmental modes of production

Managers were asked about their own perceptions regarding the importance of environmental production as a marketing instrument. The four questions used are relatively marketing specific, and managers were asked to answer considering both their professional and private experience in this regard.

Table 6: Market-oriented Reactions

| | Don't agree | | | Agree |
|--|--------------------------|---|---|-------|
| | 1 | 2 | 3 | 4 |
| “Hungarian consumers consider a product’s environmental-friendliness to be important.” | ■■■■■■■ 2.00 | | | |
| “Our customers would be willing to pay 5% more for an environmentally-friendly product.” | ■■■■■■■ 2.00 | | | |
| “Emphasizing a product’s environmental-friendliness is important on the Hungarian market.” | ■■■■■■■■■■■■■ 2.73 | | | |
| “Advertising the environmental-friendliness of a product improves the environmental awareness of consumers.” | ■■■■■■■■■■■■■■■■■■■ 3.60 | | | |

The first three questions assess the current status quo of environmental awareness on the Hungarian market, and paint a generally negative picture. Managers have little faith in the ability of Hungarian consumers to put environmental concerns over price, for example. Comparing the results of question three, where the company is the focus, to question one, where the consumer is the focus seems to suggest that managers feel that firms are nominally ahead of consumers in this regard.

The last question rates the importance of advertising environmental-friendliness in raising the overall levels of environmental awareness among consumers. The results

suggest that companies do indeed believe in the power of marketers to change attitudes. This result also indicates that companies which embark on environmentally-focused marketing campaigns may well be successful on the Hungarian market, although probably only in the long-term.

At this point it is necessary to point out that the environmental attitudes of consumers are linked very strongly to the general prosperity of the country. This survey was conducted in July - August, 1997, at the beginning of the upswing in the Hungarian economy. It is conjecture at this point, but managers' perceptions of the willingness of the Hungarian market to accept environmentally-focused advertising may well change as the economy improves.

Table 7: Perceptions of Market Acceptance
Strongest correlations with variables

| | |
|---------------------------------|------|
| Cooperation with local firms | .56 |
| Competitive Advantage / Quality | -.48 |
| Competitive Advantage / Skills | -.36 |
| Competitive Advantage / R&D | -.33 |

Those managers working at firms with the strongest local networks are the most positive about consumer attitudes regarding environmental production. On the other hand, those firms with strong advantages in quality, worker skills, and R&D have relatively more pessimistic views regarding these issues. In other words, those companies with arguably the greatest capacity to produce in an environmentally-friendly manner show the greatest skepticism regarding market acceptance.

when it comes to the legal environment. Here, managers were reluctant to surrender further autonomy and agree to more legal mandates upon them.

Managers were surprising frank regarding firm-internal factors, with most agreeing that a more active position from owners is needed if changes are to take place. Technical solutions were seen as the most important among internal factors - not surprising, as technology is likely the least painful solutions. The relatively lesser importance given to a skilled workforce can be understood within the context of the recent re-industrialization of Székesfehérvár. Although the abundance of skilled workers is seen as a great advantage of the region, many managers complain that most of their workers are over-qualified. It is perhaps a sad irony that some of the high-tech, most capital intensive manufacturers in Székesfehérvár require workers with only basic skills, with a high capacity for repetitive tasks.

Table 9: Capacities / Barriers to environmentally-friendly production
Strongest correlations with variables

| | <u>External</u> | <u>Internal</u> |
|--|-----------------|-----------------|
| Trying to find local suppliers | .49 | .50 |
| Com. Advantage / Ecological production | -.48 | -.22 |
| Domestic content | .26 | .41 |
| Export orientation | -.21 | -.28 |
| Competitive Advantage / R&D | -.42 | -.05 |
| Competitive Advantage / Innovation | -.35 | -.11 |
| Competitive Advantage / Price | -.10 | -.45 |
| Foreign ownership | .03 | -.30 |

For the purposes of comparing correlations in this general category, negative and positive signs should be reversed, as the higher the score, the lesser the capacity.

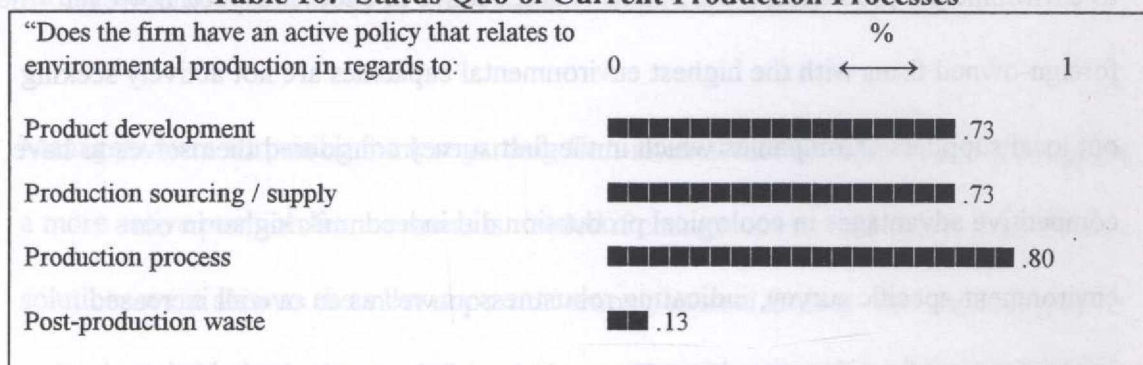
Firms which are actively searching for local suppliers face the strongest internal barriers to environmental production. This statistic is reflective of another aspect, however: the foreign-owned firms with the highest environmental capacities are not actively seeking out local suppliers. Companies which in the first survey considered themselves to have competitive advantages in ecological production did indeed rank higher in our environment-specific survey, indicating robustness as well as an overall increased consciousness of environmental issues.

Generally, firms which felt they had strong competitive advantages in several fields scored much lower on barriers to environmental production. This should not be altogether surprising: as we discussed in our introduction, successful firms tend to be more forward looking in regards ecological and human resource development issues. Similarly, foreign-owned firms also registered lower barriers than Hungarian firms. Both these findings can be grounds for guarded optimism in regards to the environment, as shall be discussed in our conclusion, as the slow but stable growth in Hungarian domestic buying power shall have the same beneficial effects on Hungarian-owned firms as the strong export performance has had on foreign-owned firms, and we can expect divergence (both in management style and performance) among ownership categories to shrink in the long-term.

D. Status quo of current production processes

Perhaps the best measures of the status quo are the variables which focus on the concrete activities which are already in place at firms. Company managers were asked where in the production process active policies are present.

Table 10: Status Quo of Current Production Processes



Managers gave themselves high scores on having environmental policies in the pre-production and production process. When asked about concrete examples, they listed items such as firm-internal recycling of wastes created during the production process, “environmentally-friendly” painting systems, and filtering air pollution caused by computer chip placement and manufacture. It must be recognized that many of these policies impact worker health very strongly, and may have been created with this as the primary motivation. Several managers did note that such environmentally-friendly policies have been shown to save on material costs in the long-term.

Table 11: Status quo of current production processes

Strongest correlations with variables

| | |
|---|------|
| Average age of production machinery | -.52 |
| Cooperation with local firms | .52 |
| Domestic content | -.47 |
| Plans to increase human capital development | .44 |
| Advantages / Human capital development | .37 |
| Advantages / Patents and Licenses | .36 |

Not surprisingly, top managers gave themselves top scores in this field. One item of interest is the fact that differences between top management and middle management is indeed quite small. This would indicate that the knowledge gulf on environmental issues between the strategic levels and “factory-floor” levels of management are not a large problem.

Table 13: Firm-internal environmental awareness
Strongest correlations with variables

| | |
|---|------|
| Plans to increase human capital development | .70 |
| Cooperation with local firms | .56 |
| Domestic content | -.47 |
| Average age of production machinery | -.41 |
| Capital / labour ratio (capital intensity) | .38 |
| Advantages / Patents and Licenses | .31 |

Firms which have the strongest human resource and technical profiles scored highest in knowledge of environmental laws and regulations. Capital intensity, newer equipment, and levels of cooperation with other firms all have strong, positive correlations with the general extent of environmental awareness. Again, firms with high domestic content - lower-tech, Hungarian-owned firms - scored the lowest. At these firms, the overall levels of awareness regarding environmental laws and regulation were the lowest.

transfer of technology and managerial competence to domestic firms. Multiplier effects normally associated with manufacturing facilities (many of which are high-tech and produce high value-added products) are largely absent from the Hungarian environment, at least at this relatively early point in time. We believe the results of this survey reveal surprisingly large gaps in a number of important areas between Hungarian-owned and foreign-owned businesses. There is the danger that, without increased interaction with local institutions and firms, foreign-owned companies may become “islands of technology” existing largely independent of the local environment.

Table 15: Has your company introduced the following?

| Have you introduced? | Hungarian-owned | Foreign-owned |
|--------------------------------|-----------------|---------------|
| Total quality management | 18.4% | 37.5% |
| Group work | 55.1% | 66.7% |
| Profit or cost centres | 44.9% | 62.5% |
| Interorganizational networking | 34.7% | 37.5% |
| Benchmarking | 4.1% | 37.5% |
| Flat hierarchies | 22.4% | 50.0% |
| Interdisciplinary design teams | 18.4% | 33.3% |
| Just in time delivery | 10.2% | 41.7% |
| Outsourcing | 8.2% | 29.2% |
| System suppliers | 10.2% | 20.8% |
| ISO 9000 | 34.7% | 62.5% |
| Information technology | 28.6% | 70.8% |

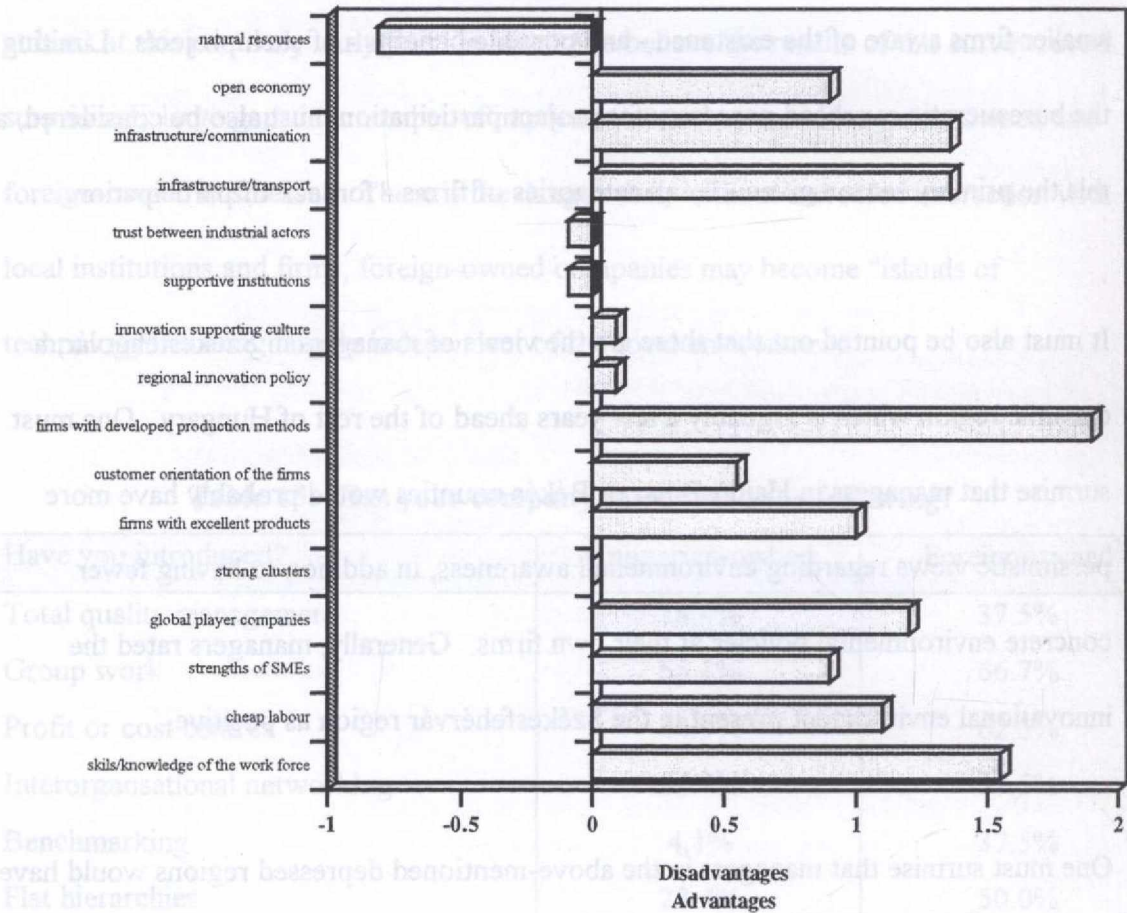
Hungarian greenfield companies, nearly all of which can be labeled SMEs, show a strong tendency towards technological, product and process stagnation, at least in the (admittedly broad) measures we have used. In addition to spending next to nothing on

R&D projects, not one Hungarian greenfield reported participating in any kind of technology or innovational or training programme. In any future efforts, these SMEs must be targeted, with heavy emphasis on an information campaign to make such smaller firms aware of the existence - and possible benefits - of such projects. Limiting the bureaucratic overhead necessary for project participation must also be considered, as this the primary reason given - by all categories of firms - for lack of participation.

It must also be pointed out that these are the views of managers in Székesfehérvár, a dynamic region which is arguably a few years ahead of the rest of Hungary. One must surmise that managers in Hajdú-Bihar or Békés counties would probably have more pessimistic views regarding environmental awareness, in addition to having fewer concrete environmental policies at their own firms. Generally, managers rated the innovational environment present in the Székesfehérvár region as positive.

One must surmise that managers in the above-mentioned depressed regions would have a darker image of the business environment in which they operate. On the other hand, the growth patterns being exhibited in the Hungarian economy do provide room for guarded optimism. In the space of a few years, there is realistic hope that the Székesfehérvár region will be more the rule, and less the exception. As Hungarian domestic buying power increases, so also will the choices open to Hungarian consumers. In addition to a wider range of products, a wider range of production methods will find market openings, and it is precisely here that companies may find opportunities to market progressive ecological policies they practise.

Figure 2: Advantages/Disadvantages of Székesfehérvár region compared with other regions in Hungary



This study has shown that there is a great need for targeted environmental information - and perhaps a subsidised re-tooling mechanism - for Hungarian firms which presently concentrate on domestic production. These are the firms which consistently registered the lowest scores on awareness, policies, and capacities regarding environmental production. Such initiatives need not be focused solely on the environment. Our study has also shown very clear correlations between upgrading human resources, machinery, exports and the environment. As such, targeted economic development programs -

including the new regional development initiatives - can be seen as having very positive influences on the environment, even when improving ecological production is not a primary target of such programs.

Videocon for production infrastructure. This provides an artificial barrier between production workers and IBM managers which can have both positive and negative implications for IBM. Positive, in that IBM is insulated from some of the more difficult issues regarding production. Negative, in that IBM is insulated from some of the more difficult issues regarding production. This provides an artificial barrier between production workers and IBM managers which can have both positive and negative implications for IBM. Positive, in that IBM is insulated from some of the more difficult issues regarding production. Negative, in that IBM is insulated from some of the more difficult issues regarding production.

Appendix: Two Székesfehérvár greenfield sites in detail

IBM

History:

IBM began production of hard-disk drives at the Székesfehérvár site in October, 1995, with one production hall operating. It has recently added a new production hall, which doubled capacity. Plans are to again double current capacity (and employment) by the end of 1997. This exponential growth attests to the success of the plant, as well as the substantial cost savings over the German production facility which the Székesfehérvár site has replaced. Initially, contact was established between IBM and Videoton as early as 1992, which eventually led to IBM's decision to make Hungary its center for European hard-disk production.

IBM was granted a variety of investment incentives by the Ministry of Industry and Trade, including off-shore status (and duty-free importation of all production components), a 10-year tax holiday on profits, and a variety of training subsidies. The City also granted IBM tax-free status, and very favourable terms for public services, as well as providing infrastructural improvements.

Characteristics:

Most striking about the IBM facility is the degree of out-sourcing. All production employees belong to Videoton, and most of the physical infrastructure is actually owned by Videoton (which was granted favourable terms of credit because of its involvement

with IBM). IBM has a world-wide strategy of providing the skeleton and brains of production, while local partners deal with non-core processes. Despite the very, very strict quality demands, and the high-tech nature of the work, IBM has chosen to rely on Videoton for production infrastructure. This provides an artificial barrier between production workers and IBM managers which can have both positive and negative implications for IBM. Positive, in that IBM is insulated from some of the more difficult aspects of industrial relations. Negative, in that loyalty is absent, which makes it more difficult to keep production employees. In this respect, and in other respects which will be discussed later, IBM places a low emphasis on keeping a stable workforce.

Currently, IBM has 350 direct employees, who are almost exclusively involved in administration or management. A fair number of these employees, around 50, come from IBM's German headquarters, although the German director of human resources stated that IBM would like to eventually replace nearly all foreign managers with Hungarian personnel. 1400 production employees are provided by Videoton, but this number is set to expand to between 2500-3000 by the end of 1997. The factory currently operates at 100% of capacity.

The IBM plant represents the classic example of an "island of technology". 100% of production components are imported, nearly all of them arriving by lorries from Germany. When queried as to why IBM uses no Hungarian components, quality and lack of connections were given as the most important factors. IBM has only recently begun considering to use Hungarian suppliers (although there are limited incentives to do so, given the duty-free importation rules). Very limited research and development

activity takes place at IBM's Székesfehérvár site, although as at other foreign-owned greenfield sites, R&D has increased recently.

Substantial shipping costs are incurred in importing 100% of assembly components, and exporting 100% of production. Interestingly, in the US, most studies of locational factors have found that nearness to suppliers and markets are usually judged by companies to be the most important, almost always outweighing government incentives. At IBM, investment incentives - including off-shore status and a 10-year tax holiday - were given as the most important consideration in IBM's decision to move to Székesfehérvár. Indeed, geographical proximity - both to markets and suppliers - was listed as the least important factor. This has not come without a price, however: production has occasionally been stopped because lorries from Germany have failed to arrive on time to supply the plant's JIT inventory system.

Labour relations:

The average wage for production workers - before any bonuses or overtime are considered - is 45,000 forints (\$220) gross. The workweek is 40 hours, but overtime is very common, averaging about two hours per worker per day, bringing the average workweek up to 50 hours (somewhat surprising, given the quality requirements, and also the distances which many workers commute daily). In Székesfehérvár, wage competition (bérversény) is beginning to emerge as a major headache for employees, and IBM workers can be lured away by offers just 3,000 forints/month better. Wage rates have not risen significantly as foreign employers in Székesfehérvár have an informal agreement that they will not try to "poach" (hunt) workers from each other, and many

plants - such as IBM - have a variety of programs designed to bring in workers from as far away as possible (including villages and towns some 80 km away). Gross labour costs make up 25% of production costs, down from 60% at the German site.

Despite the aforementioned high-tech and high quality nature of the production processes (the production facilities, for example are entirely dust-free, and workers must wear special white clean suits that cover the body), IBM has decided to follow a low wage, high-turnover strategy. Training is not as complicated or extensive as at most production facilities: a few days of intensive training is enough for new workers. (To IBM managers, a quality-oriented mentality - combined with patience - is just as important as solid skills). When questioned as to on what basis IBM chose Székesfehérvár, the cheapness of the labour was judged as more important than a well-trained workforce. Indeed, officials in the local labour office worry that the model of human resource management practised by IBM and similar plants may well lead to a de-skilling of the local labour force.

The average age of the production personnel is a mere 28 years old, with 80% being between the ages of 20-29. A young workforce seems to offer numerous advantageous characteristics to IBM, including: ease of training, greater willingness to work longer hours (because of family status, physical condition, etc.), and not least, a lessened possibility of organized resistance (younger workers are less likely to organize and act collectively).

The de-emphasis on formal training can also be seen in that fully 80% of hired workers are labeled as "unskilled", with skilled workers making up the remaining 20%. Most

skilled workers were unable to find a job in their learned trade, and came to IBM as unskilled workers. The assistant human resource manager labeled the IBM workforce as "over-trained", considered the work that is done. In general, IBM's human resource managers - both Hungarian and German - are very satisfied with the performance of the workforce.

There are possibilities for production workers to participate in language and management training courses, which are paid for by IBM. These courses can only be taken outside of working hours, however, and given that the average workweek is 50 hours, this severely limits the number of workers who can, and want to, participate.

The plant was recently unionized by the metal-workers union, which initially caused a great deal of anxiety among German managers, who had very bad memories of having to negotiate with the IG Metall union at the German site. Apparently, there have been no major conflicts between the union and management since the union's inception. The union is characterized as very weak, with no real influence over even the most elementary workplace issues.

(most production is sent to Germany), and the local infrastructure. The nearness to component makers and general ease of shipping were considered as the least important. There are signs this thinking has begun to change, however. The plant has encountered many problems with timely component deliveries, especially as many parts are sent by ship from North America. Ford Europe plans to open a Central European component buying center in Hungary in the next few years, just as GM plans to do in Poland.

Labour relations:

The average gross wage for production workers - before overtime or bonuses are considered - is 50,000 forints (about \$250). Overtime work is very common, however, and with extensive overtime some production workers are able to earn upwards of 90,000 forints. Despite operating at 100% of capacity, Ford is reluctant to take on new employees unless overtime provisions are exhausted.

Ford's workforce is given very high marks in terms of flexibility, reliability, teamwork, and work performance. A neutral score is recorded in the category of "attention to quality", and the only negative aspect listed is that the workers are difficult to keep. The wage competition among firms in Székesfehérvár gives Ford managers headaches.

Interestingly, Ford would rather pay for elaborate schemes to bring workers in from the countryside (schemes which are tax-deductible), than pay higher wages which insulate them from wage competition.

Ford's workforce is relatively young, with a full 60% being under the age of 30, and 83% being under 40. Approximately 25% of workers hired are skilled, with 75%

labeled as unskilled. Total gross wage costs make up only 4% of gross production costs.

Whether by coincidence, or because of Ford's employee selection criteria, no trade union yet exists at the Ford plant. Ford Székesfehérvár is one of the few (if not only) non-union automobile plants in Europe. When queried as to why no union has yet arisen, Ford's HR representative replied that while Ford has no official anti-union strategy, its human resource policies strive to make unionization unnecessary. To this end, there are only company-led initiatives - there is no formalized institution of worker interest representation. Ford, like IBM, also lacks the legally obligatory works council.

Isztvánffy István: A vállalkozások szerepe a gazdaságban

A vállalkozások szerepe a gazdaságban mindig is fontos volt. A vállalkozások a gazdaság motorjaként működnek, és a gazdaság fejlődését segítik elő. A vállalkozások a gazdaságban a legaktívabb szerepet játszó szereplők. A vállalkozások a gazdaságban a legaktívabb szerepet játszó szereplők. A vállalkozások a gazdaságban a legaktívabb szerepet játszó szereplők.

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Összefoglalás

A székesfehérvári régió fejlődésének modell értéke. A vizsgálatban szereplő vállalatok

Az elmúlt közel egy évtizedben a magyar gazdaság régiói közül a Székesfehérvár és közvetlen övezetének gazdasága sikeresen használta ki a rendelkezésre álló jól képzett és viszonylag olcsó emberi erőforrásaiból, valamint az előnyös logisztikai és infrastrukturális helyzetéből adódó előnyöket. A külföldi tőkebefektetések nagyságrendje meghaladta a 1,5 milliárd USD összeget, jelentős a magyar befektetések aránya is. A régióban, amely az 1980-as évek végén és az 1990-es évek elején az ország egyik 'válság-övezetként' vált ismertté - például a munkanélküliségi ráta a legmagasabbak közé tartozott az országban - a rendkívül dinamikus termelésnövekedés a 90-es évek végére számos területen jelentős munkaerőhiányt eredményezett. A gazdasági növekedés dinamikáját megalapozó beruházások növekedése rendkívül figyelemreméltó, például 1993 és 1996 között a beruházások közel háromszorosára nőttek, az ipari termelés ennél is nagyobb mértékben (három és félszeresével) emelkedett. Mindezek alapján egyáltalán nem meglepő az a minősítés, amely szerint Székesfehérvár és közvetlen környéke a kilencvenes évek közepétől a világ hat leggyorsabban fejlődő városa közé tartozik. A székesfehérvári régió fejlődését olyan „trendnek”, „modellnek” tekinthetjük, amely a felmutatott eredményekkel és gondokkal együtt, a magyar gazdaság más régiói számára is tanulságokkal szolgálhat.

A székesfehérvári régió „modell” szerepe a gazdasági szervezetek (vállalatok) környezetvédelmi beállítottságának, politikájának illusztrálásában több tényezővel magyarázható. Egyfelől, a termelés hagyományos (pl. élelmiszeripar, ruházati ipar stb.) és nemzetközileg is élenjáró szektorai (pl. számítógépgyártás, szórakoztató elektronika, autóipar) egyaránt megtalálhatók. Másfelől, a külföldi és magyar tulajdonban lévő cégek nagy számban fordulnak elő a térségben; tevékenységük szervezetében és technológiájában, továbbá termelési és piaci relációikban kimutathatóan jelentősek a különbségek. Jól azonosíthatók például a cégek környezettel szembeni felfogásában, a környezeti problémák iránti érzékenységében.

A környezettel kapcsolatos vállalati beállítottságok vizsgálata során jelentős mértékben építettünk annak a felmérésnek az eredményeire (75 vállalat), amely a regionális innovációs rendszer fontosabb dimenzióinak, összefüggéseinek azonosítására vállalkozott. (EU REGIS Projekt, 1996-1997). Az idézett felmérés eredményeinek újrafeldolgozása mellett a kiválasztott vállalatok egy kisebb (15 fős mintáján) a környezetvédelemmel kapcsolatos beállítottságok és politikák részletesebb vizsgálatára került sor. A kétféle vizsgálati módszer egyesített adatbázisának elemzése alapján igyekszünk a következőkben bemutatni a régióban található vállalatok vezetőinek környezeti érzékenységét, környezettel szembeni beállítottságait valamint az azokkal releváns vállalati tevékenységek jellemzőit.

A vizsgálatban szereplő cégek fontosabb jellemzői

A vizsgálatban szereplő cégeknek több mint fele külföldi, ez az arány első látásra magasnak tűnik. Meg kell azonban jegyeznünk, hogy a hazánkban működő 200 legnagyobb cég fele külföldi tulajdonban van. A feldolgozóiparban - s ezen belül a gépiparban - a külföldi tulajdonban lévő cégek aránya ennél is jelentősebb. A régióban működő külföldi cégek növekedési rátája magasabb, mint a magyar tulajdonban lévő

vállalatoké. Többek között ez azt jelenti, hogy a külföldi cégek által képviselt környezetvédelmi gondolkodás, kutatás-fejlesztési és emberi erőforrás gazdálkodási minták példa-teremtő szerepe jelentős.

A tulajdonforma hatásai egyes területeken jelentősek (pl. a gépek és berendezések átlagos életkora, a termelés tőke-, illetve munkaintenzív jellege, a cég import/export profilja), más területeken a tulajdonforma hatása minimális (pl. a vállalatvezetők különböző csoportjainak környezetvédelmi érzékenysége). A térségben nagy koncentrációban előforduló, külföldi cégeknél alkalmazott 'élenjáró' („leading edge”) vezetési módszerek és technikák - beleértve a környezetvédelmi gondolkodást - magyar cégek gyakorlatában való megjelenéséről rendkívül nehéz pontos képet adni. Az ún. multiplikátor hatás - vizsgálatunk kivitelezésének évében, 1997-ben - kevésbé érvényesült, ugyanis a külföldi cégek (főleg a jelentős hozzáadott értéket tartalmazó részegységeket) külföldi beszállítóiktól importálták. A nemzetközi technológiai és környezetvédelmi innovációk elterjedése a csúcstechnikát alkalmazó, ún. zöldmezős beruházások formájában működő külföldi cégektől a magyar cégek irányába nagyon korlátozott a külföldi beszállítók nagymértékű igénybevétele következtében.

A cégek környezetvédelmi profilja: markáns különbségek a külföldi és a magyar tulajdonban lévő cégek viszonyában

A vizsgálatban szereplő cégek környezetvédelmi profiljának azonosításánál a következő tényezők alakulását kísértük figyelemmel; a környezetvédelemmel kapcsolatos általános felfogások, a piaci orientáció és a környezetvédelem tudatosulásának színvonala, az ún. környezetbarát termékek előállításának ösztönző és akadályozó tényezői, a termelési gyakorlat jellemzői és a környezetvédelmi beállítottságok, a vállalati vezetés képviselői és a környezet-tudat fejlettsége.

A környezetvédelemmel kapcsolatos általános vélemények körében (pl. „a környezetszennyezés megelőzése kifizetődő a cégnek”, „a vállalatnak akkor is felelnie kell a termelés melléktermékeként keletkező hulladékért, amikor az a gyárkaput elhagyta”, stb.) a pozitív, környezetbarát vélemények dominálnak. A konkrét vizsgálat során arra kerestük a választ, hogy a környezettel szembeni beállítottságok milyen szoros kapcsolatot (korrelációt) mutatnak a következőkben felsorolt faktorokkal;

- a). emberi erőforrások fejlesztése,
- b). innováció-centrikus vállalati kultúra,
- c). a gépek-és berendezések átlagos életkora,
- d). az emberi erőforrás fejlesztésben rejlő innovációs lehetőségek,
- e). a helyi cégekkel kiépített kooperáció, külföldi tulajdonban lévő cég, az előállított termékek tőke intenzív jellege,
- f). a magyar beszállítások részaránya a gyártott termékekben vagy szolgáltatásokban.

A vizsgálatban szereplő cégek körében az 'innováció-orientált', valamint az 'emberi erőforrások fejlesztését' szorgalmazó cégek megkülönböztetett hangsúlyt helyeznek az környezetvédelmi szempontokra. A környezetvédelem minimális szerepet játszik a hazai eredetű termékek felhasználóinál, valamint az elavult gépekkel és berendezésekkel dolgozó vállalatoknál.

- Kiemelendőnek tartjuk a vállalatvezetők azon véleményét, amely szerint a magyar fogyasztók egyelőre kevésbé értékelik - azaz kevésbé hajlandók a magasabb árban is elismerni - a környezetbarát termékeket. Sőt, úgy tűnik, hogy a régióban működő vállalatok vezetőinek környezet-érzékenysége megelőzi a fogyasztókéét. Úgy vélik, hogy a környezetbarát vállalati marketing, ha ma még nem, de hosszútávon feltétlenül

kifizetődő a vállalatok számára. Ezzel összefüggésben meg szeretnénk jegyezni, hogy a fogyasztók részéről a környezetbarát termékek választása függ az ország általános gazdasági helyzetétől. Az idézett vállalati vizsgálatokra 1997 nyarán került sor, az ország gazdasági teljesítményének kedvező alakulását a fogyasztók még nem érzékelték. Említésre méltónak tartjuk azt is, hogy azok a (elsősorban külföldi) cégek ítélték meg legpesszimistábban a környezetbarát termékek piaci fogadtatását, amelyek a legjobban felkészültek a környezetkímélő termékek előállítására.

- A környezetbarát termelés „külső” és „belső” (azaz vállalaton belüli) tényezőinek vizsgálata a következő képet mutatja. A külső tényezők között a piaci igények módosulása jelenti a legjelentősebb kényszert a környezetvédelmi szempontok érvényesítésére, ez az a feltétel, amelynek alakulására a vállalatvezetésnek viszonylag kevés befolyása van. Érdekes módon a jogi szabályozás kényszerítő erejében a vállalatvezetők nem hisznek. A belső tényezők közül a tulajdonosi kezdeményezés, valamint a környezetbarát termékek előállítását biztosító ‘technikai megoldások’ elérhetősége jelenti a környezet-centrikus megoldások alkalmazásának előfeltételeit. A nagyobb tőkeigény és a kvalifikált munkaerő megléte a befolyásoló tényezők sorrendjében csak az előzőekben felsorolt tényezők után következik.

- A vállalati szervezeten belüli szereplők (a vállalati vezetés különböző szintű képviselői) környezetérzékenységének vizsgálata szerint nincs lényeges különbség a stratégiai döntéshozók és a felsővezetői döntések végrehajtásáért felelős ‘gyár- és műhelyvezetés’ szemléletében.

A környezetvédelemmel kapcsolatos jogi és egyéb szabályozókat a tőke-intenzív termelést folytató, kiemelkedő műszaki színvonalú cégek (előnyös licenccel és különféle szabadalommal rendelkeznek) jobban ismerik, mint az alacsony műszaki színvonalat képviselő, munkaigényes termelést folytató vállalatok. Ez egyúttal azt is jelenti, hogy a külföldi tulajdonban lévő cégek a hazai cégeknél - legalábbis az általunk vizsgált régióban - fokozottabb figyelmet fordítanak a környezetvédelmi szabályok megismerésére. (A környezetvédelmi szabályok ismerete önmagában természetesen nem garancia azok betartására. Az ezzel kapcsolatos tényleges vállalati magatartások elemzésére és tipizálására további vizsgálatokra, vállalati esettanulmányok készítésére lenne szükség.) Az alacsonyabb műszaki-technikai színvonalat képviselő, magyar tulajdonban lévő cégek kevésbé érzékenyek a környezetvédelmi előírásokra és szabályokra.

- A ‘környezetvédelmi tudat’ színvonala a régió olyan szereplői körében, mint a vállalatok, fogyasztók és a kormányzati tisztségviselők, változatos képet mutat: a vállalatvezetők a kormányzati tisztségviselőknél, főleg pedig a fogyasztóknál érzékenyebbek a környezeti szempontokra. Nyugtalanítónak tartjuk, hogy a vállalatvezetők számára a tevékenységük közegét alkotó fogyasztók minimális környezeti kihívást támasztanak. Ugy tűnik, hogy még az olyan dinamikusan fejlődő gazdaságban is, mint a székesfehérvári régió, egyelőre nem érvényesülnek a fejlett környezet-érzékenységet eredményező kölcsönhatások a fogyasztói igények és a termelési szféra relációjában.

A magyar vállalatok környezetvédelmi érzékenységének javítása: a multiplikátor hatás jelenleginél intenzívebb érvényesítése

A székesfehérvári régió külföldi és magyar tulajdonban lévő vállalatainál 1997 nyarán - végzett vizsgálat röviden ismertetett tapasztalatai alapján mind a régió tartós növekedésének fenntartása, mind pedig a vállalatok környezetvédelmi érzékenységének

javítása a következő tendenciák érvényesülését feltételezi. A külföldi tulajdonban lévő cégekben a magyar beszállítói arány növelése megkönnyítené az élenjáró vezetési és irányítási módszerek (ezen belüli környezetvédelmi normák) átadását, bevezetését a magyar cégek gyakorlatában. A magyar beszállítók markáns jelenléte a régióban tevékenykedő külföldi vállalatokban viszonylag rövid időn belül csökkenhetné a kimutatható jelentős differenciákat, amelyek például a szervezeti innovációk vonatkozásában jelenleg jellemzik a külföldi és a magyar tulajdonban lévő vállalatokat. Kezdetben a gyártási folyamatok, ezzel egyidejűleg vagy egy későbbi periódusban a magyar részvétel növelése a kutatás -és fejlesztés területén - a fent említett termelési együttműködéssel kombinálva - nagymértékben elősegítené a korszerű vezetési, szervezési, technológiai és környezetvédelmi módszerek és gyakorlatok elterjedését az általunk vizsgált régióban illetve a magyar gazdaságban. A multiplikátor hatás érvényesülése részben a helyi gazdaság szereplőinek, részben pedig a gazdasági fejlődés előfeltételeinek (pl. infrastruktúra, támogatások, foglalkoztatási, képzési politika stb.) alakításáért felelős országos intézmények akcióinak függvénye. A helyi és országos gazdaság szereplőinek összehangolt fellépése nyomán csökkenhetne a közvetlen tőkebefektetések révén létrehozott, élenjáró műszaki és szervezeti eljárásokat képviselő vállalatok tevékenységének „sziget-jellege”. Az ún. sokszorozódási effektus érvényesülése nemcsak az élenjáró vezetési és irányítási módszerek, környezetvédelmi normák hazai elterjedését gyorsítaná meg, hanem egyéb kedvező hatásokkal is járna. A foglalkoztatás bővítése mellett jelentős mértékben növelné a magyar gazdaság globalizálódásának esélyét.

Green Path

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The research project entitled Environmental Issues Related to Hungary's Accession to the European Union, the major research area initiated by the President of the Hungarian Academy of Sciences at the Department of Environmental Economics and Technology at the Budapest University of Economic Sciences. The research is primarily financed by Parliament, our programme receiving substantial additional support from the Ministry of Environment and Regional Policy.

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- The project investigates a number of topics (name of topic leaders in parentheses):
- I. State of the environment in Hungary, fulfilment of obligations under international environmental agreements (László Csécs, BME)
 - II. EU-coordinating environmental regulations (Gábor Láng, BUE; Péter Pócs, KTI)
 - III. Institutional structure and social involvement in environmental protection (Gábor Láng, BUE; Péter Pócs, KTI)
 - IV. Environmental risks: protection and foreign trade (Gábor Láng, BUE)
 - V. Environmental challenges facing the business sector (Gábor Láng, BUE; Péter Pócs, KTI)
 - VI. Energy management (Gábor Láng, BUE)
 - VII. Industry (nuclear and non-nuclear) (Gábor Láng, BUE)
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 - X. Transportation (Gábor Láng, BUE)
 - XI. Agriculture (Gábor Láng, BUE)
 - XII. European trends in environmentally friendly urbanisation and rural development (Gábor Láng, BUE)
 - XIII. Environmental protection and land utilisation (Gábor Láng, BUE)
 - XIV. National characteristics, design, tourism and environmental protection (Gábor Láng, BUE)
 - XV. Environmental awareness in education and the media (Gábor Láng, BUE)