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Export reorientation and transfer of know-how and technology: the case of Hungarian manufactured exports

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**Export Reorientation and Transfer of Know-how and Technology
– The Case of Hungarian Manufactured Exports –**

by

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I Introduction*

The regional composition of the foreign trade of Central European transition economies has changed profoundly since the late 1980s. The share of Western Europe in both Central European imports and exports has grown markedly at the expense of the former centrally planned economies. This reorientation of Central European trade from Eastern to Western markets was a result, first and foremost, of the elimination of most politically motivated barriers to East-West trade which included the preference for intra-regional trade among the member countries of the former Council for Mutual Economic Assistance as well as restrictions on OECD high-technology exports to Eastern Europe (Cocom). In addition to the liberalisation of trade and of the exchange rate regimes, Kaminski et al. (1996) show that the speed of adjustment also depended crucially on progress in systemic transformation in general, including price liberalisation, macroeconomic stabilisation, and deregulation. Overall, then, trade reorientation represented a return to the normalcy of regional trade patterns determined by market forces (Piazolo, 1996).

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However, from the point of view of individual firms based in transition economies, to start or to expand exports to Western markets was a far from trivial task. This applies especially to non-traditional exports, i.e. goods or product varieties that were either not produced locally at all or that needed substantial upgrading and differentiation to become marketable in OECD countries. Hoekman and Djankov (1996) find that such products account for the lion's share of the growth of Central European exports. Therefore, export growth required the acquisition of substantial managerial and technological knowledge by enterprises that had been relatively isolated, if not from Western markets, then at least from the stringent profitability requirements of market economies. In addition, substantial investments were frequently required in machinery, equipment, and marketing channels in order to enter West European markets.

Such a radical reorientation of exports would have been difficult to achieve even under favourable macroeconomic and institutional conditions. This is confirmed by the extensive empirical literature on firm-level determinants of export behaviour in market economies. Sunk costs that firms must incur when they enter export markets are often found to constitute significant entry barriers.¹ In the Central European transition economies, the expansion of non-traditional exports.

¹ This literature is surveyed, *inter alia*, by Aaby and Slater (1989) and Miesenbock (1988).

was further complicated at the firm level by macroeconomic instability, by the absence of a fully functioning banking system, and by the institutional uncertainties that went with enterprise restructuring and privatisation. Against this background, it was often even suggested that export subsidies and strategic industrial policies were required to give transition economy firms sufficient time and resources to adjust to the regime change in foreign trade.

This paper explores how, in spite of these difficulties and largely without the support of strategic trade or industrial policies, many Central European firms managed to increase their exports to Western markets substantially. First, the paper tests the hypothesis that close links between Central European and OECD country firms have been crucial for the growth of non-traditional exports to OECD markets. Such cooperation is defined to include any arrangement between firms that goes beyond an arm's-length relationship, e.g. direct investment, outward processing, or subcontracting.² An important role for importing country firms is suggested by the experience of developing countries where exporters of

² In a similar context, Radosevic (1997) uses the term 'sourcing' to refer to "hierarchical long-term relationships between either independent or dependent firms, where a (manufacturing; M.L.) firm in one country purchases sub-assemblies, components or processed materials produced by a firm located in another country". Thus this paper goes beyond the analysis of Hoekman and Djankov (1996) in allowing for several types of inter-firm linkages. Hoekman and Djankov base their analysis on aggregate data on trade and foreign direct investment (FDI). They find that FDI plays an important role only in a few export industries and conclude from this that trade between Eastern and Western Europe is mainly based on arm's-length relationships between firms.

non-standardised manufactures faced similar problems when they began exporting to industrialised countries. In many instances, developing country producers initially chose an export marketing channel where responsibility for product design, marketing, and distribution was left entirely to an industrialised country importer. Frequently, importers also provided extensive assistance with production organisation and quality control. Such arrangements not only reduced learning requirements for developing country firms to manageable proportions; they also provided for the transfer of the managerial and technological know-how that was still required (Wortzel and Wortzel, 1981; Keesing and Lal, 1992; Hobday, 1995; Hanson, 1996).

If this first hypothesis is supported by the empirical evidence, it may be concluded that the cost of entering a non-traditional export market need not be prohibitive even for medium-sized or small firms in transition economies because there exist alternative institutional arrangements for export marketing. Rather than being invariably large and indivisible, the cost of export market entry can be reduced to manageable proportions through the appropriate choice of export channels and inter-firm links. This would not only explain the rapid, positive response of the export supply to foreign trade liberalisation in Central Europe. It would also suggest to policymakers in less advanced Eastern European transition economies that enterprises will be able to expand their manufactured exports to

OECD country markets once systemic transformation is sufficiently advanced for firms to be able to make the required investments.

Second, this paper explores the hypothesis that, from a dynamic perspective, many Central European firms are continuously acquiring managerial and technological knowledge through exporting. Over time, this accumulation of human capital will enable them to expand into activities with higher value added per worker and to capture an increasing share of post-production value added. The accumulation of human capital may also lead to a reduced importance of links with importing country firms. This second, 'continuous learning' hypothesis is also suggested by the experience of developing country exporters that shifted their product portfolios upmarket or diversified their export markets and marketing channels as they accumulated experience in exporting (cf. Lücke, 1990 for the example of footwear exports from Brazil; Hobday, 1995, on electronics firms in Southeast Asia; Radosevic, 1997)).

If this second hypothesis is supported by the empirical evidence, this implies that the use of marketing channels in which importing-country firms play an important role does not necessarily assign a 'dependent' role to the transition economy firm indefinitely. Rather than having to remain low-cost manufacturers, transition economy firms may be provided with an opportunity for accumulating experience

that enables them to undertake activities of increasing value added within the firm. At the macro level, such accumulation of human capital in response to greater export opportunities (as well as to increasing import competition in the domestic market) is one way in which foreign trade liberalisation and increasing openness may contribute to economic growth in Central Europe.

The empirical evidence analysed in this paper is based on a survey of 61 Hungarian exporters of non-standardised manufactures undertaken in late 1995. Section 2 surveys the literature on firm-level determinants of export behaviour and develops the analytical framework for the subsequent investigation. Section 3 describes the sample and discusses its representativeness, and Sections 4 and 5 analyse the empirical validity of the two hypotheses set out above. Section 6 discusses the policy implication of this analysis.

2 Firm-Level Determinants of Export Behaviour

2.1 Modelling Approaches

Analytical interest in the firm-level determinants of export behaviour has arisen mainly in the business literature because export marketing presents a variety of managerial decision problems. This literature asks what determines the actual export behaviour of firms, what obstacles exist to fuller use of export markets, and what managerial strategies are most likely to overcome these obstacles.

Unfortunately, however, few robust findings have emerged from this literature in spite of the large number of contributions (Aaby, Slater, 1989; Bilkey, 1978; Miesenbock, 1988). This is mainly due to the lack of a generally accepted managerial model of export behaviour and, hence, the use of widely different sets of dependent and independent variables. Furthermore, data are usually collected especially for the purpose of the particular analysis at hand; samples therefore tend to be rather small (usually from less than one hundred to several hundred enterprises) and restricted to certain geographical areas and industries.

In spite of the frequently contradictory findings, some variables have gained a reasonable measure of acceptance as determinants of export performance if one is prepared to take a sufficiently broad view of the literature. Export performance itself is measured either on the basis of the distinction between exporting and non-exporting firms, or on the basis of the export share in total sales. Most studies find that export performance is positively related to enterprise size, and to characteristics of firms that reflect a country's comparative advantage (for example, high technology intensity in the case of firms in industrialised

countries).³ Unsurprisingly, export performance also depends on attributes of management such as an international perspective, willingness to take risks, etc.

Many marketing-type studies relate to firms in industrialised countries, especially to small firms or to firms in peripheral regions. However, there are also studies of the export behaviour of developing country firms from a managerial perspective that typically find that exporting, and the internationalisation of firms more generally, tend to progress in well-defined stages (Wortzel and Wortzel, 1981; Keesing and Lal, 1992; Paulsson, 1994; Hobday, 1995). As firms move through different marketing channels towards more sophisticated forms of export marketing, they acquire skills that enable them to increase, however gradually, their share in the value added of their products.

For example, exports by traditional labour-intensive industries (say, clothing or footwear) often started with sporadic export orders. Later, larger export volumes

³ These findings are confirmed by a much smaller number of studies that adopt a "microeconomic" rather than a managerial approach (for example, UN/ECLAC 1985; Aitken et al., 1994; Wagner, 1995). These studies are frequently based on large databases maintained by statistical offices or government departments, rather than on personal interviews or mailed questionnaires. Hence they do not include variables related to management behaviour. Otherwise, the explanatory variables are broadly similar to the managerially oriented studies and may include firm size (to account for possible economies of scale), agglomeration economies, technology intensity (as a proxy for comparative advantage), government subsidies, foreign participation, etc. Due to larger sample sizes, such studies can often distinguish between sectors while managerially oriented studies tend to be based on a single sector, or to neglect the sectorial distinction.

were initiated by foreign wholesalers who assumed responsibility for product design, provided working capital, controlled the exportation and distribution of products overseas, and deployed local agents to help firms with the choice of inputs, production management, and quality control. In the course of time, many (though not all) firms started to assume an increasing number of these functions themselves, diversifying their export markets, and sometimes producing and marketing their own designs.⁴

The empirical analysis in this paper uses the stages of exporting literature as a point of reference. While the technological sophistication of Central European enterprises at the beginning of the systemic transformation varied widely, it is plausible to assume that most of them had little experience of marketing their output in Western Europe under conditions of financial discipline. Even when enterprises had fully mastered their basic production technologies, the reorientation of production towards Western industrial customers and consumers frequently necessitated substantial changes in product design, increases in the number of product varieties, and associated changes in production planning. In this sense, it is plausible to state that transition economy firms found themselves

⁴ The role of specialised inputs in the location decisions of multinational enterprises is discussed in Rodriguez-Clare (1996).

in a position not dissimilar to that of developing country firms when these began to export to industrialised country markets.

2.2 Analytical Framework

The first hypothesis to be tested in this paper states that close cooperation between Central European and Western firms has been crucial for the growth of non-traditional exports of transition economy firms. The literature on stages of export marketing suggests that this may have occurred, broadly, in two ways: On the one hand, transition economy firms may have been able to choose among different export channels to fit their product portfolios, managerial competence, and financial strength. As a result, the demands made by export marketing on the firms' technological and managerial competence may have been kept within manageable limits by transferring certain operations to importing country firms.⁵ On the other hand, importing country firms frequently transfer managerial or technological know-how to transition economy firms as part of an exporting arrangement. In this sense, importers may become a source of crucial technological or managerial know-how.

⁵ For example, consumer goods may require more competence in marketing as well as a higher initial investment for export market entry than intermediate goods purchased by industrial customers. Small firms, in particular, may want to concentrate on manufacturing operations narrowly defined, and leave other managerial tasks to foreign partners.

Empirical evidence on these related aspects of the first hypothesis will be provided through an analysis of the export channels used by our sample of Hungarian exporters of differentiated manufactures. If a large proportion of firms use those channels in which foreign firms play an important role, and if foreign firms frequently transfer managerial and technological know-how as part of such inter-firm cooperation, this will be taken as support for the hypothesis.

The second hypothesis investigated in this paper states that, over time, firms accumulate substantial managerial and technological know-how through exporting. Many firms therefore move beyond low-value-added processing operations by incorporating more sophisticated activities that were initially performed by importing country firms. This hypothesis implies that, by providing opportunities for the accumulation of human capital, close cooperation with foreign importers during an initial stage of exporting may create favourable conditions for decreasing reliance on importing country firms later.

The second hypothesis is more difficult to test than the first because the reorientation of exports has only started quite recently. Hence only few firms can be expected to have undergone far-reaching changes in export channels or product portfolios already. However, the information gathered in our survey allows us to identify two groups of firms where substantial learning by exporting

can be expected: first, firms with an 'offensive' business strategy whose local managements actively seek to extend their competence in such fields as research and development, sourcing of inputs, diversifying marketing channels, initiating investment projects; second, firms that have entered a durable relationship with a foreign partner, usually with direct investment, where local managements respond to increasing requirements by their foreign partners even though they themselves may be taking few significant initiatives. Firms of the latter type may ultimately become wholly owned subsidiaries to which additional corporate functions are allocated by the foreign owners. The remaining, 'defensive' firms would be those where, after initial restructuring, local managements concentrate on maintaining the status quo and where no move into new corporate activities can be observed, prompted either from within the firm or from outside.

Empirical evidence on the second hypothesis will be provided by identifying the proportion of firms that pursue either an 'offensive' corporate strategy (first group) or are driven to extend their activities by their foreign partners (second group). If such firms constitute a large proportion of the total, this will be taken as support of the hypothesis.

3 Description of Sample

Much of the information required to test these hypotheses is qualitative in nature, such as the export channel and the nature of the relationship with the foreign partner. Frequently, also, such information can only be understood against the background of other qualitative information, e.g. company history. Information on the behaviour of firms was therefore gathered through in-depth interviews with senior company managers that lasted between one and two hours. A predetermined questionnaire was used that contained 55 mostly open-ended questions. Interviews were carried out between October 1995 and March 1996. The questionnaire was designed to provide both quantitative and qualitative information on enterprise performance, management strategies and foreign partners' contributions. The first section provides information on company history, legal status, and basic performance indicators (sales, export sales, main export markets and partners, export channel used). The second section investigates the firm's export history with a view to assessing accumulated experience concerning marketing channels and OECD market requirements; the most important difficulties faced by the company; and management strategies. The third section covers the foreign partners' contributions (if any): technology transfer; investment; intangible contributions like know-how transfer leading to cost reduction, production management sourcing; inclusion of Hungarian firm into

the partner company's global production and distribution network. The fourth, and last, section examines the learning process and adjustment of the Hungarian firm: management strategies, attempts to reduce dependence on foreign partner, acquiring new partners and export markets.

Because of financial constraints on the number of firms that could be visited, the sample was restricted to firms that did actually export. Thus it is not possible to compare the characteristics of exporting to non-exporting firms. Further, since the difficulty of entering West European and other OECD country markets can be expected to be greatest for non-standardised manufactures, survey firms were chosen from the engineering and light industries where product differentiation is particularly important. The sample includes 40 engineering and 21 light industry (mostly clothing) firms, roughly reflecting the relative weight of the two industries in Hungarian exports. The export intensity of both sectors exceeds the corresponding average for all Hungarian manufacturing substantially: in 1994, exports amounted to 65 per cent of output in the clothing industry, 48 per cent in engineering, and 32 per cent in total manufacturing. Furthermore, exports by light industry firms occur predominantly under processing agreements. This was the case even before the transformation of the economic system started, and applied to at least 85 per cent of clothing exports and more than 90 per cent of footwear

exports. By contrast, engineering firms export under a much greater variety of export channels and types of inter-firm cooperations.

The sample was selected at random from the Directory of Hungarian Exporters and Suppliers 1994-95 (ITD Hungary, 1995). The Directory lists the 3500 largest Hungarian exporters with exports in excess of HUF 10 million in 1993. Exports by these firms represented more than 90 per cent of total Hungarian exports. This information is drawn from the database of the customs authority. The Directory includes approximately 660 engineering firms and 750 light industry firms; of the latter, approximately 300 are in those sub-branches on which our survey concentrates (clothing, finished textile products, furniture). Of these firms, listed in alphabetical order, every third was included in a preliminary list. A structured sample was then created to reflect the ownership patterns characteristic for the chosen industry: Hungarian private; Hungarian state; predominantly foreign; partly foreign, partly Hungarian private or state. 15 per cent of the companies contacted were reluctant to provide us with detailed information concerning performance data or management strategies or the role of foreign partners. These firms were replaced by other firms from the preliminary list.

Table 1 describes salient features of the sample firms that allow some cautious

Table 1 — Description of Sample (number of firms)

	Engineering firms	Light industry firms	All firms
Sample size	40	21	61
Ownership pattern			
Hungarian private	17	9	26
Hungarian state	5	2	7
wholly foreign	12	6	18
partly foreign	6	4	10
Founded under			
old regime	16	18	34
(before 1989)			
new regime	24	3	27
(1989 or after)			
Employment			
(number of employees)			
median	210	310	221
minimum	3	75	3
maximum	2500	2100	2500
Export share in 1994			
(per cent)			
median	63.5	76	70
minimum	2	5	2
maximum	100	100	100
Share of wholly or partly	36.8	76.2	50.2
foreign-owned firms in			
exports of sample (per			
cent)			
Share of sample firms in			
total Hungarian exports			
(per cent)			
share in total exports	7.9	5.9	
share in general turnover	10.6	13.4	
incl. fee for processing			

Source: Data see text; own calculations.

conclusions as to how representative the sample firms are of Hungarian exporters in the two industries generally. Overall, the sample firms accounted for at least

8 per cent of the total exports of all engineering firms and 6 per cent of the total exports of light industry in 1994. In the case of processing operations, Hungarian export statistics distinguish between total exports which does, and the fee for inward processing which does not include the value of imported inputs. Although the questionnaire asked firms to indicate their 'exports', some firms have probably indicated their income from processing, rather than their total export value. In this case, the share of the sample firms in Hungarian exports could be closer to the 11 per cent and 13 per cent calculated on the basis of Hungarian exports defined as the general turnover of goods including fee for processing.

The average exports to sales ratios for the sample firms are very similar to the corresponding figures for the two industries as a whole (51 vs. 48 per cent in engineering and 64 vs. 65 per cent in light industry – mostly clothing). From 1992 to 1994, exports by the engineering firms in the sample grew by 59 per cent and those by the light industry firms by 36 per cent. Corresponding figures for total Hungarian exports are available only for the change from 1993 to 1994; they are 41 per cent and 24 per cent, respectively. Since total Hungarian exports declined somewhat from 1992 to 1993, it is likely that sample firms experienced somewhat more rapid export growth than Hungarian exporters generally. Again, this is unsurprising given the design of the survey. Wholly or partly foreign-owned firms in the sample account for 37 per cent of the exports of engineering firms and 76

per cent of the exports of light industry firms. This corresponds broadly to estimates that joint ventures account for approximately 70 per cent of total Hungarian manufactured exports. All in all, the sample firms can be expected to be fairly representative of Hungarian exporters in the engineering and light industries.

4 Export Channels and Contributions of Foreign Partners

This section describes the empirical investigation of the first hypothesis that close links between Hungarian and importing country firms have been crucial for the growth of non-traditional exports from Hungary to OECD countries. The hypothesis will be considered as being supported by the empirical evidence if many Hungarian firms have chosen marketing channels where most marketing functions are performed by importing country firms, or if many Hungarian firms have benefited from transfers of managerial or technological know-how.

Although marketing strategies depend on the product, a common classification consisting of five export channels has been adopted for both industries represented in the sample. 'Processing' is defined as in customs regulations to indicate the performance of manufacturing activities on imported materials that are wholly supplied by the foreign partner who also receives and markets all output. The second category is labelled 'MNC network' and involves integration

into the supply and distribution network of a multinational firm where significant managerial input is provided by the Hungarian firm (in contrast to 'processing' and also to the next category, 'subcontracting'). 'Subcontracting' may be performed either by local subsidiaries of foreign firms or by legally separate firms, and is distinguished from processing by the fact that the Hungarian firm typically assumes at least some responsibility for the sourcing of inputs, adaptation of the product design, or choice of production technology. The fourth category, 'several channels', involves substantially independent export marketing by the Hungarian firm along with significant processing or subcontracting. The fifth category, 'arm's-length relationships', implies a high degree of independence of the Hungarian firm from its customers.

In order to evaluate the empirical evidence with respect to our first hypothesis, it is useful to take a closer look at the degree of foreign involvement and technology transfer under each export channel. The following discussion deals with each channel in turn and covers general characteristics of the Hungarian firms (Table 2) as well as the type of technological and managerial know-how that is transferred (Table 3). The insights gained from this descriptive information are checked against the results of binomial probit regressions that identify the usefulness of selected variables in predicting whether a firm uses a certain export

channel or not (Table 4).⁶ While it would be tempting to describe these right-hand-side variables as determinants of export marketing behaviour, this is impossible without a stringent theoretical model that distinguishes clearly between cause and effect. No such model is available, however, in the export marketing literature (cf. Section 2.1). Therefore, the coefficients attached to the right-hand-side variables in the probit regressions should rather be looked upon as describing partial correlations that require further interpretation to be informative.⁷

The first major group of firms (14 out of 61) are those exporting mostly under processing arrangements. These firms have been founded mostly under the old regime and tend to be in light industry, rather than in engineering (Table 2). This

⁶ Since there are more than two marketing channels, the use of a multinomial regression method would be desirable. However, multinomial logit is not independent of irrelevant alternatives and is therefore not applicable because the distinction between the five marketing channels is somewhat arbitrary. Multinomial probit was technically difficult to implement.

⁷ A more detailed statistical analysis of these data is rendered difficult by the small size of the sample. Typically, one would wish to test for the independence of (vs. probabilistic interdependence between) the various qualitative variables. The standard test in this context is the chi-square test based on the difference between the actual and expected number of firms in each cell of the cross table (for an application in a similar context, see Hansen, Gillespie, Gencturk, 1989). However, with the limited number of observations in the present sample, the expected cell frequencies under the null hypothesis of statistical independence are often below 5 for a large proportions of the cells, and the chi-square test is therefore not applicable.

Table 2 — General Characteristics of Firms by Export Channel (number of firms)

	Export channel					All firms
	Processing only	MNC network	Sub-contracting only	Several channels	Arm's-length relationships	
Number of firms	14	9	6	26	6	61
Founded under old regime (before 1989)	11	5	0	14	4	34
new regime (1989 or after)	3	4	6	12	2	27
Industry						
engineering	3	8	6	19	4	40
light	11	1	0	7	2	21
Median employment (number of employees)	205.5	400	46.5	281.5	85	221
Median sales 1994 (million HFU)	190	1272	135	498	690	400
Median export share (per cent)	85.5	82	65	60	59	70
Link to foreign partner under old regime	3	2	2	10	2	19
Foreign ownership (in whole or part)	7	9	4	7	1	28
Foreign contribution to management						
none	1	0	2	18	6	27
initial only	9	1	2	6	0	18
continuous	4	8	2	2	0	16
Marketing strategy						
'defensive'	12	2	3	3	1	21
neutral	1	3	2	8	1	15
'offensive'	1	4	1	15	4	25

Source: Data and definitions of terms see text (Section 4); own calculations.

Table 3 — Role of Foreign Partner by Export Channel (number of firms)

	Export channel					All firms
	Processing only	MNC network	Sub-contracting only	Several channels	Arm's-length relationships	
Number of firms	14	9	6	26	6	61
Transfer of technology or equipment	12	8	4	12	0	36
Sourcing of inputs	14	7	2	10	0	33
Product design by foreign partner	13	1	2	9	0	25
joint	1	6	3	9	0	19
local	0	2	1	8	6	17
Production planning	7	5	2	4	0	18
Marketing						
partner transfers know-how	1	8	1	3	0	13
partner performs marketing function	13	1	3	13	0	30
no foreign contribution	0	0	2	10	6	18
Financial contribution						
investment and/or working capital	3	6	0	7	0	16
investment only	4	3	2	3	0	12
none	7	0	4	16	6	33
Quality control	3	2	0	5	0	10

Source: Data and definitions of terms see text (Section 4); own calculations.

Table 4 — Export Channels: Probit Regression Results

	Export channel		
	Processing	MNC network	All other export channels
	coefficient		
<i>Equation 1</i>			
C	-1.44***	-.84***	0.60***
PRODTYPE	1.50***	-0.83	-0.78**
Log likelihood	-25.19	-24.04	-37.87
Mean absolute percentage error	13.14	12.05	21.50
<i>Equation 2</i>			
C	-1.62**	-1.03	0.85
PRODTYPE	1.72***	-1.30*	-0.62
AGE	-0.01	-0.66	0.39
FOROLD	-0.97	-0.99	0.82*
SALES94	-0.00*	0.00	0.00
EXPSH	0.01	0.01	-0.01*
Log likelihood	-20.56	-19.76	-31.90
Mean absolute percentage error	10.90	10.01	18.19
<i>Equation 3</i>			
C	-2.42***	-1.73***	1.99***
PRODTYPE	1.37***	-0.91	-0.57
FORINI	1.65**		-1.82***
FORCONT	1.03	2.06***	-2.45***
Log likelihood	-20.65	-14.49	-24.71
Mean absolute percentage error	11.23	6.51	13.13

... to be continued

	Export channel		
	Processing	MNC network	All other export channels
	coefficient		
<i>Equation 4</i>			
C	-1.77**	-1.89***	1.39**
PRODTYPE	1.53**	-0.79	-0.43
FORINI	1.71**		-1.70***
FORCONT	0.78	2.06***	-2.44***
STRATMARKETD	-1.90***	0.20	0.87*
Log likelihood	-14.58	-14.44	-22.66
Mean absolute percentage error	8.13	6.42	11.80

* (**, ***) Significant at the 10 (5, 1) per cent level.

List of variables:
 C = constant.
 PRODTYPE = dummy for light industry (1) vs engineering (0).
 AGE = dummy for foundation year after regime shift (1) vs before regime shift (0).
 FOROLD = dummy for link with foreign partner under old regime.
 SALES94 = total sales in 1994 (million HFU).
 EXPSH = export share in 1994/1995.
 FORINI = dummy for initial contribution by foreign partner to management.
 FORCONT = dummy for continuous contribution by foreign partner to management.
 STRATMARKETD = dummy for 'offensive' marketing strategy by local management.

Source: Data and definitions of terms see text (Section 4); own calculations.

sectoral distribution is at least in part a result of customs regulations in importing countries; special quotas for imports into the EU after processing are much more significant for light industry than for engineering products. Furthermore, light

industry output consists mostly of final consumer goods for which marketing tends to be more demanding than for goods directed at industrial customers, such as many engineering products. Most 'processing' firms pursue a 'defensive' approach to marketing (12 out of 14), leaving this field along with the sourcing of inputs to their foreign partners (Table 3). In addition, nearly all firms have received a transfer of technology or equipment and half the firms have benefited from investment or working capital finance provided by the foreign partner. In spite of this extensive involvement of importing country firms, most 'processing' firms in the sample (9 out of 14) report only an initial contribution of their foreign partner in the field of management. Apparently, after initial restructuring, most firms managed their part of the processing agreement without continuing active involvement of the foreign partner.

By and large, the binomial probit regressions (Table 4) confirm these observations. The probability that a given firm uses processing as its main marketing channel (rather than any of the four remaining channels) increases significantly if it is in light industry as opposed to engineering (positive coefficient of PRODTYPE). Among the 'structural' variables included in the second equation, only firm size measured by turnover is statistically significant at all: smaller firms are marginally more likely to use processing as their main export channel. Furthermore, the presence of an initial (but not a continuous)

contribution by a foreign partner in management and a 'defensive' approach to marketing make it more likely that a given firm uses 'processing'. These observations suggest that many 'processing' firms concentrate on narrowly defined manufacturing operations. They have learned to manage these with the help of a foreign partner on who performs most export marketing and transfers substantial amounts of managerial and technological know-how.

The second major group of firms (9 out of 61) are those that are integrated into multinational supply and distribution networks ('MNC network'). All such firms in the sample are wholly or partly foreign-owned and have received investment or working capital finance from their partner (Tables 2 and 3). Nearly all are in engineering, and their foreign partners contribute to management functions on a continuous basis, particularly with respect to the transfer of technology or equipment or the sourcing of inputs. However, the pervasive role of foreign partners does not lead to a subordinate role of local management in critical corporate activities such as marketing: only 2 out of 9 firms are characterised by a 'defensive' strategy in this area, while the remainder adopt either an 'offensive' or an in-between approach. This is apparently due to the fact that inclusion in a multinational sales network leads to the transfer of marketing know-how to the Hungarian firm, which stands out in contrast to processing where the marketing

function as such is transferred to the foreign partner. Similarly, product design tends to be carried out jointly by the Hungarian firms and their foreign partners.

The probit regressions (Table 4) confirm these observations. Among the various right-hand-side variables, only the type of product and the dummy for continuous involvement of a foreign partner in management help to distinguish integrated firms from the rest of the sample. The marketing strategy dummy is insignificant, which implies that 'networked' firms do not differ much from the rest of the firms with respect to their approach to marketing. This is in contrast to 'processing' firms, most of which display a 'defensive' approach to marketing. In sum, 'MNC network' firms not only display extensive involvement of foreign partners in management and know-how transfer, but also a more active attitude by local managements than firms relying mainly on processing operations.

The remaining firms (38 out of 61) are treated as the third, and last, major group. They include 6 firms that rely mainly on subcontracting; 26 firms that use several export channels including significant processing or subcontracting; and a further 6 firms that maintain mostly arm's-length relationships with their customers. These three subgroups have been combined in the probit regressions because there are too few firms with 'subcontracting' or 'arm's-length relationships' to permit a separate analysis. Combining these firms into one group is justified because,

compared with either processing or integration into a multinational network, all three export channels imply greater independence of the Hungarian firm. Firms with 'several channels' and 'arm's-length relationships' can also be expected to show a particularly strong role of local management in critical corporate functions. Indeed, the regression results confirm that firms in this last major group had less involvement of foreign partners in management functions, either on an initial or on a continuous basis, than 'processing' and 'MNC network' firms (Table 4).

The cross-tabulations in Tables 2 and 3 present descriptive information for firms in each sub-group. Firms that rely mostly on 'subcontracting' are all in engineering and have been founded after the transformation of the economic system in Hungary. Median employment is far below that of the total sample, or of firms with several export marketing channels (Table 2). Presumably, subcontracting is used mostly by firms whose small size and limited experience render independent export marketing difficult.

By contrast, firms using several export channels and those with mostly arm's-length relationships with their customers are found in both industries. Firms in both sub-groups tend to pursue an 'offensive' approach to marketing. Foreign involvement in management is low in both groups: 18 out of 26 firms with several

export channels and all firms with 'arm's-length relationships' reported no significant direct contribution of foreign partners (Table 2). However, of the 26 firms with several export channels, 12 received technology or equipment from a foreign partner; 18 used foreign product designs or developed their products jointly with a foreign partner; 16 received marketing know-how or transferred part of their marketing function to a foreign partner; and 10 received investment or working capital finance. It is clear, therefore, that many firms with several export channels have benefited from a significant transfer of managerial and technological know-how although direct foreign involvement in their management is limited.

What conclusions do these findings permit with respect to the validity of the first hypothesis that close links between Hungarian and importing country firms have been crucial for the growth of non-traditional exports from Hungary to OECD countries? Foreign partners clearly perform crucial management functions and provide important technological and managerial know-how in relation to the exports of most 'processing' and 'MNC network' firms, which together make up more than one third of the sample (23 out of the total 61 firms).⁸ The same is true to a somewhat lesser extent for the 6 'subcontracting' firms. By contrast, firms

⁸ Processing and networked firms combined account for 30.5 per cent of 1994 sales and 38.5 per cent of 1994 exports of sample firms.

with several export channels are a large and rather heterogeneous group. Although direct foreign involvement in management is quite limited, however, roughly half of these firms delegate part of the marketing function to a foreign partner and receive significant transfers of know-how in one form or another. Only for the 6 firms whose links to foreign customers are characterised as arm's-length relationships is it possible to state unequivocally that foreign partners played no crucial role in facilitating export growth. It is safe to conclude, therefore, that for the majority of firms, the growth of non-traditional exports to OECD markets would have been impossible to achieve without close cooperation with importing country firms.

5 Learning by Exporting and Upgrading of Activities

This section describes the empirical investigation of the second hypothesis that over time, firms accumulate substantial managerial and technological know-how through exporting. Many firms can therefore be expected to move beyond low-value-added processing operations of the "extended workbench" type by incorporating more sophisticated activities that were initially performed by importing country firms. This hypothesis implies that, by providing opportunities for the accumulation of human capital, close cooperation with foreign importers in an

initial stage of export marketing may create favourable conditions for decreasing reliance on importing country firms later on.⁹

This hypothesis is tested by identifying two groups of firms where substantial learning by exporting can be expected (cf. Section 2.2): first, firms whose local managements pursue an 'offensive' business strategy by actively extending their competence in such fields as research and development, sourcing of inputs, diversifying marketing channels, initiating investment projects; second, firms that have entered a durable relationship with a foreign partner, usually with direct investment, where local managements respond successfully to more demanding requirements by their foreign partners even though they themselves may be taking few significant initiatives. The remaining firms would be those whose managements pursue a 'defensive' business strategy in the sense that, after initial restructuring, they concentrate on maintaining the status quo.

Learning and upgrading of activities may occur in different areas. Therefore, five important management functions are identified and a summary indicator of management behaviour is defined (Table 5). In each area, the approach chosen by

⁹ Hobday (1995) and Radosevic (1997) also emphasise the extent of learning by exporting in Southeast Asian countries.

Table 5.— Management Strategy by Management Function and Industry (number of firms)

	Engineering	Light industry	All firms
Number of firms	40	21	61
Overall strategy			
'offensive'	23	5	28
'neutral'	5	7	12
'defensive'	12	9	21
Product strategy			
'offensive'	17	7	24
'neutral'	6	5	11
'defensive'	17	9	26
Marketing strategy			
'offensive'	18	7	25
'neutral'	13	2	15
'defensive'	9	12	21
R&D strategy			
'offensive'	24	1	25
'neutral'	1	2	3
'defensive'	15	18	33
Quality control system in place	32	9	41
Share of Hungarian materials			
increasing	13	1	14
constant	19	10	29
decreasing	7	9	16
not available	1	1	2

Source: Data and definitions of terms see text (Section 5); own calculations.

a firm is classified as either 'offensive', neutral, or 'defensive' depending on whether firms actively seek to extend their competence or activities. A firm's overall approach is classified as 'offensive' if it chooses an 'offensive' approach in at least two areas plus at least a neutral approach in a third area. Overall, 23 out of 40 engineering firms but only 5 out of 21 light industry firms are classified as 'offensive'.

Among the individual management functions, the strategies of engineering and light industry firms differ particularly in the areas of R&D and the use of Hungarian materials. However, the share of firms with an 'offensive' strategy in engineering exceeds that in light industry also in the remaining management functions.

As discussed above, an 'offensive' management strategy is only one possible source of learning at the firm level. It is also conceivable that managements employing a 'defensive' strategy are driven by their foreign partners to expand their activities. In the terms of this analysis, such firms would show up as benefiting from continuous contributions of foreign partners to their management although they pursue a 'defensive' business strategy. However, there are only 3 such firms in our sample (Table 6). Most firms with 'defensive' strategies (12 out of 21) had only initial contributions from foreign partners. This observation suggests that the upgrading of activities requires the active participation of local management in order to be successful.

Thus we may conclude that roughly half the firms in the sample (28 with an 'offensive' approach out of 61) are actively seeking to extend their competence and activities. This finding represents only a partial confirmation of our second hypothesis. This raises the question of what distinguishes the 'offensive' firms

Table 6 — Continuous Learning: Firm Characteristics by Overall Management Strategy (number of firms)

	Management strategy			All firms
	'defensive'	'neutral'	'offensive'	
Number of firms	21	12	28	61
Foreign contribution to management				
none	6	7	14	27
initial only	12	3	3	18
continuous	3	2	11	16
Industry				
engineering	12	5	23	40
light	9	7	5	21
Founded under				
old regime (before 1989)	12	10	12	34
new regime (1989 or after)	9	2	16	27
Export share				
median	80	53.5	71.5	70
minimum	2	5	5	2
maximum	100	90	100	100
Export channel				
processing	9	4	1	14
MNC network	1	2	7	9
subcontracting	3	0	3	6
several channels	7	6	13	26
arm's-length relationships	1	1	4	6

Source: Data and definitions of terms see text (Section 5); own calculations.

from the rest. The probit regression results (Table 7) demonstrate that 'offensive' firms are less likely to be in light industry than in engineering (significant negative coefficient of PRODTYPE variable in equations 1 and 3); are less likely to have 'processing' as their main export channel, although this may partly be a result of

Table 7 — Management Strategy: Probit Regression Results

	Firms with defensive strategy	Firms with offensive strategy
<i>Equation 1</i>		
C	-0.52**	0.19
PRODTYPE	0.34	-0.90**
Log likelihood	-38.78	-38.8
Mean absolute percentage error	22.20	22.27
<i>Equation 2</i>		
C	-0.51**	0.15
PRODTYPE	-0.18	-0.37
XCHAN1	1.03**	-1.33**
XCHAN3	-0.66	0.67
Log likelihood	-35.03	-34.27
Mean absolute percentage error	19.38	19.24
<i>Equation 3</i>		
C	-0.78***	0.19
PRODTYPE	0.06	-0.82**
FORINI	1.17***	-0.73
FORCONT	-0.14	0.66
Log likelihood	-33.47	-34.54
Mean absolute percentage error	18.24	18.92
<i>Equation 4</i>		
C	-0.76***	0.05
FORINI	1.20***	-1.01**
FORCONT	-0.12	0.44
Log likelihood	-33.48	-36.74
Mean absolute percentage error	18.20	20.78

* (**, ***) Significant at the 10 (5, 1) per cent level.

PRODTYPE = dummy for light industry (1) vs engineering (0).

XCHAN1 = processing dummy.

XCHAN3 = MNC network dummy.

FORINI = dummy for initial contribution by foreign partner to management.

FORCONT = dummy for continuous contribution by foreign partner to management.

Source: Data and definitions of terms see text (Section 5); own calculations.

the large share of 'processing' firms in light industry (the coefficient of PRODTYPE becomes insignificant in equation 2 when the 'processing' dummy is included among the independent variables); and are less likely to have had only an initial contribution to management from a foreign partner (equation 4).

With respect to the role of foreign partners in the firms' choice of business strategy, the descriptive statistics in Table 6 show that firms with an 'offensive' strategy tend to have either no foreign contribution to management at all (14 out of 28 firms), or continuous contributions (11 firms). Only 3 firms had an initial contribution only.¹⁰ Apparently, firms that chose an 'offensive' strategy either had sufficient managerial and financial resources right from the start to manage on their own; or else they required a continuous inflow of managerial contributions from foreign partners to compensate for lacking resources. Furthermore, even some of those firms that managed on their own probably received significant transfers of technology and know-how although this did not constitute a contribution to management (see Table 3). These observations demonstrate that foreign involvement often complements, rather than displaces, the accumulation of human capital by local firms.

¹⁰ This is reflected by the negative coefficient of FORINI in equation 4.

With respect to differences in behaviour between the two industries, the descriptive statistics in Table 6 demonstrate that 23 out of 40 engineering firms, but only 5 out of 21 light industry firms have adopted an 'offensive' strategy.¹¹ This finding is probably explained by the fact that most clothing exporters still specialise in processing operations at the low-price end of the market. With profitability limited by the intense competition between potential processing locations in Central and Eastern Europe, it is likely that firms have few resources left to invest in the upgrading of activities through product or export market diversification etc. As long as access to the EU market for textiles and clothing is subject to MFA-type restrictions and Hungary enjoys a privileged position compared with CIS and developing countries, processing operations in Hungary may well be profitable enough to continue. It is likely, however, that in the long run capital goods industries offer greater opportunities for learning and, hence, sustained growth of non-traditional exports.¹²

¹¹ A chi-square test confirms that the observed difference in strategies between sectors ('offensive' vs. neutral and 'defensive') is statistically significant ($\chi^2(1) = 6.3$; probability = 0.012). Again, the same finding is reflected by the significant negative coefficients of PRODTYPE in equations 1 and 3 in Table 7.

¹² This conclusion is supported by the observation that vertical intra-industry trade, particularly in engineering products, is a driving force behind the growth of non-traditional exports from Central European transition economies (Hoekman, Djankov, 1996; Plucinski, 1996). There is anecdotal evidence that Taiwanese clothing manufacturers also found the step towards own brand manufacture a difficult one.

6 Conclusions

Our analysis of the marketing behaviour of Hungarian exporters of differentiated manufactures shows that exports take place under several organisational forms that entail different divisions of responsibility between Hungarian firms and their foreign customers. In this way, Hungarian firms of widely different abilities and resources are able to overcome potential barriers to entry into export markets. We find that many firms use export channels in which importing country firms take over important management functions and also transfer managerial and technological know-how, and conclude from this observation that close links with OECD country firms have been crucial for the growth of non-traditional Hungarian exports. Our findings imply that, given appropriate macroeconomic incentives and a liberal regulatory framework for foreign investment, there are no large indivisibilities in initial outlays for export marketing that could preclude the entry of particular types of firms into export markets. This helps to explain the rapid export supply response when incentives for supplying the domestic vs. various export markets changed dramatically with the onset of systemic transformation in Central Europe in 1989.

At the same time, we find evidence that many firms are actively extending their managerial and technological competence while exporting. Over time, this will enable them to upgrade their activities and capture an increasing share of post-

production value added. In many firms, an active approach to the diversification of products and markets is achieved with contributions by foreign partners in the field of management, while in other firms significant learning occurs without much foreign involvement. This suggests that foreign involvement may well enhance the accumulation of human capital in many Hungarian firms and may thereby contribute to the sustained growth of increasingly sophisticated manufactured exports, without confining Hungarian firms to a dependent position as low-value-added manufacturers.

What role do these findings leave for economic policy? First, in Central European transition economies where systemic transformation is relatively well-advanced, trade promotion measures (if any) should be aimed at eliminating barriers that may still exist for the diversification and upgrading of activities. Explicit or implicit subsidies for activities that require significant initial outlays with uncertain returns could help to bring upgrading into the reach of firms that are currently still preoccupied with ensuring their survival. Such subsidies could support participation in trade fairs, facilitation of contacts with foreign firms, advanced training of export managers, etc.

Second, in less advanced Eastern European transition economies, especially in the CIS countries, a continuing liberalisation of the trade and exchange rate

regime is likely to meet a favourable supply response from firms, provided of course that the macroeconomic and regulatory environment are also sufficiently favourable. The wide variety of export channels available render it likely that entry into export markets would be a viable option even for firms that have suffered from isolation from the world market for a long time. The experience of the sample firms further demonstrates that exporting (just like having to compete domestically with imports) may act as a catalyst for restructuring as well as a wide variety of learning processes at the firm level.

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