2001 – n° 19
Décembre

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INTERNATIONALES

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SUMMARY

The theory generally recognises Foreign direct investment (FDI) as a key factor in integrating transition and emerging economies into the world-economy and in supporting economic convergence. While financial flows have often proved volatile, FDI are sought because of the large, positive externalities they are expected to carry with them. The main one is technology transfers, especially for transition economies, where there is often a large gap between a well-educated working force and the low technological level of the inherited equipment base: this would increase the potential leverage of technological transfers. Another dimension is the enforcement of strong market discipline, which can benefit strongly from a substantial presence of foreign-owned firms. When one turns from what the theory and the policy makers say to the results of empirical research, the picture becomes much less clear: attempts to measure the benefits of FDI for host-economies have come to mix, if not negative conclusions. The reason is simple: technological spillover may have large benefits for the overall economy, but the entry of foreign competitors on the domestic market may also have a balancing, negative impact as witnessed by a series of recent articles.

This paper is based upon a large data-base of Hungarian enterprises, which represent close to 90% of the manufacturing and construction sector, between 1992 and 1998. It shows that large FDI flows into this economy have had a substantial, net positive impact on the total factor productivity of all firms. However, two conditions are attached. First, foreign-owned firms should be mostly export-oriented: not because exports do have specific, productivity enhancing virtues: but because local producers have difficulties adjusting to foreign competition on the local market. In other words, producing close to each and selling on different markets is the key. Second, productivity spillover are geographically determined: they are much stronger in the northeastern part of country, between Budapest and the EU border, than in the other, less-developed regions. Moreover, this variable interacts with property rights structure: foreign and Hungarian-private firms share the same volume of externalities in the first region, while in the second one the benefits are reduced by 30% for the former and are not captured as all by the latter. Hence, FDI do contribute positively to the overall convergence of the Hungarian economy towards EU level of productivity, while having a negative impact on domestic, regional inequalities.

ABSTRACT

The impact of FDI on total factor productivity in Hungary during the 1990s' is assessed with a large enterprise panel. Foreign equity is associated with higher productivity levels and has a substantial, positive spillover effect on aggregate TFP growth. However, this benefit is significant only when associated with export orientation, while inward-looking FDI has negative side effects. Regionally, the north-western area, close to EU borders, benefits much more from FDI, whether foreign-owned or locally-owned private firms are considered. Otherwise, only the later absorb a reduced volume of externalities. Finally, State ownership implies lower levels of productivity, but does not hinder the capacity to respond to market incentives, including FDI induced externalities.

JEL Classification: G14, F21, L11, P31
Key Words: Foreign Direct Investment, Productivity, Hungary, Transition, Panel, localisation, property rights

LES INVESTISSEMENTS DIRECTS EN HONGRIE ET LA PRODUCTIVITÉ DES ENTREPRISES ENTRE 1992 ET 1999

RÉSUMÉ

La théorie défend généralement que les investissements directs étrangers (IDE) sont un canal privilégié de transfert du progrès technique vers les économies en développement ou en transition. Au plan international, ils devraient donc être un facteur de convergence des niveaux de productivité entre économies. Toutefois, les rares études empiriques réalisées sur la base de données microéconomiques (panels d'entreprises) aboutissent à des conclusions mitigées, voir négatives : des effets d'entraînements ou de spillover peuvent être observés, mais ils tendent à être compensés par des effets négatifs. En général on met en question la pression concurrentielle exercée sur le marché intérieur par des entreprises étrangères dont la productivité en niveau est nettement supérieure à celle de la moyenne des producteurs locaux.

La Hongrie présente ici un cas d'espèce intéressant puisqu'elle a été tout au long des années 1990 un des principaux bénéficiaires d'IDE en Europe de l'Est. Ceci tient notamment à ce que la privatisation du secteur exportateur moderne de l'économie s'est fait principalement en direction d'opérateurs internationaux, plutôt que d'*insiders* ou bien d'actionnaires locaux. En outre, une fois les privatisations achevées, le réinvestissement des profits et les implantations de type *greenfield* ont maintenu à un niveau élevé le flux de capital étranger investi dans le pays.

Afin de mesurer l'impact des transferts de technologie induits, on s'appuie sur les bilans et les comptes d'exploitation des entreprises de plus de 20 salariés, dans le secteur manufacturier et la construction, cela sur la période 1992-1999. Cet ensemble représente environ 90 % de la valeur ajoutée de ces deux secteurs, soit 4 500 à 5 000 entreprises par an. Les entreprises qui sont entrées ou sorties de l'échantillon en cours de période sont conservées (population non-cylindrée). On estime alors une fonction de production classique, de type Cobb-Douglas, afin de mesurer l'impact des IDE sur la productivité totale des facteurs.

La première conclusion est que les IDE ont globalement en Hongrie un impact positif sur le niveau moyen de la productivité : toutes choses égales par ailleurs, plus leur part dans la structure de propriété est importante, plus la productivité dans le même secteur sera élevée. Les IDE sont donc porteurs d'un effet d'externalité positif et économétriquement significatif en Hongrie.

Deux clauses restrictives doivent toutefois être ajoutées. D'abord, si la présence de producteurs étrangers en Hongrie a un effet positif, le marché sur lequel ils écoulent leur output est aussi important : confortant les hypothèses émises par d'autres auteurs, on

montre que les effets d'entraînement sont conditionnés par l'orientation vers l'exportation des firmes étrangères. Ceci ne tient pas à ce que cette activité dégagerait d'elle-même des gains de productivité, mais aux effets négatifs exercés par une « concurrence excessive » sur le marché intérieur. En somme, la règle serait de produire près les uns des autres, mais de vendre sur des marchés différents.

Seconde restriction, si les IDE contribuent à la convergence du niveau moyen de revenu avec celui des économies les plus développées, en revanche ils ont un impact négatif sur les inégalités interne, au plan régional. Non seulement ils sont concentrés dans le quart nord-ouest du pays, entre Budapest et la frontière avec l'UE, mais leurs effets d'entraînement reproduisent cet effet de localisation : ils atteignent un niveau maximal dans la partie historiquement la plus développée, et déclinent fortement dans le reste du pays.

Cet impact différencié est en outre sensible à la structure de propriété des firmes. Dans la région développée, les entreprises étrangères et hongroises bénéficient d'un même niveau d'externalité ; mais dans le reste du pays les premières ne les captent plus du tout, tandis qu'ils sont réduits de 30 % pour les firmes locales. Cela suggère que les firmes locales pourraient être sensibles à une forme spécifique d'externalités, qui ne souffre pas de coûts de transport élevés. On avance l'hypothèse que cet écart refléterait l'effet global de durcissement des contraintes financières du à l'entrée de producteurs étrangers dans l'économie, et à laquelle ces derniers par définition ne peuvent pas être réceptifs.

Enfin, il apparaît que les entreprises à capitaux publics ont un niveau moyen de productivité nettement inférieur à celui des autres producteurs, mais qu'elles ne répondent pas de manière très différente aux incitations de marché, en particulier les effets d'entraînement dérivés des IDE.

RÉSUMÉ COURT

On estime l'impact des investissements directs étrangers sur la productivité totale des facteurs d'un large panel d'entreprises hongroises (1992-1999). Globalement, ces effets sont positifs : le niveau des IDE dans un secteur est positivement corrélé avec sa productivité moyenne. Cela étant, les firmes étrangères doivent être tournées vers les marchés extérieurs plutôt que de faire concurrence aux producteurs nationaux sur le marché interne. Second restriction, les IDE ont un impact négatif sur les inégalités inter-régionales. Les effets d'entraînement sont concentrés dans le quart nord-ouest du pays, déjà le plus développé en niveau : les firmes étrangères ne captent pas d'effet d'entraînement dans les régions les moins développée, les firmes locales privées les voient décliner d'environ 30 %. Enfin, les entreprises publiques ont un niveau de productivité inférieur à la moyenne, mais semblent répondre correctement aux incitations de marchés.

Classification *JEL* : G14, F21, L11, P31
Mots-clefs : Investissements directs, productivité, Hongrie, transition, panel, localisation, droits de propriété.

DIRECT FOREIGN INVESTMENTS AND PRODUCTIVITY GROWTH IN HUNGARIAN FIRMS, 1992-1999

Jérôme Sgard[1]

1. INTRODUCTION

Foreign direct investment (FDI) is widely recognised as a key factor in integrating transition and emerging economies into the world-economy and in supporting economic convergence. While financial flows have often proved volatile and prone to recurrent misallocation, FDI are sought by many countries because of the large, positive externalities they are expected to carry with them. The main one is technology transfers, however varied the alternate sources through which they may be channelled (imported inputs and capital goods, direct licensing, learning from foreign buyers, accumulated experience, etc.)[2]. But the case for FDI is often considered as even stronger for transition economies. One reason is the contrast between a well-educated working force and the low technological level of the inherited equipment base: this would increase the potential leverage of technological transfers.

But an institutional dimension should also be taken into account. When compared to trading in patent rights, or subcontracting agreements, FDI are much less exposed to the weaknesses of the institutional environment which characterises transition economies. This is especially the case of intellectual property rights: when they are imperfectly enforced, it can prove more efficient for a foreign firm to integrate local production within a fully-owned subsidiary, rather than relying upon commercial contracts, which are more exposed to spoliation or rent-seeking. Conversely, foreign-owned firms would also play a decisive role in the enforcement of competition, strong market rules and harder budget constraints within these economies. In a microeconomic environment marked by widespread, collusive resistance to tougher market rules, this would provide a most welcome source of discipline. Indeed, one of the main reason put forward to explain the diverging results of economic reforms in Central Europe and Russia is the capacity of the former to import competition and disciplined producers, at an early date and on a large size (see, among others, Carlin et alii. 2001). Toth (1998) finds evidences that foreign-owned firms are a vector of harder budget constraints: they better resist the accumulation of inter-enterprise arrears and hence diffuse stronger financial discipline around them.

Although these transition-specific issues will remain in the background, this paper is mostly concerned with the relation between FDI and technological diffusion, measured via productivity growth. One issue is the technological endowment of the local subsidiary of a

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[2] See Blomström and Kokko (1996) for a review of the literature on the impact of FDI on developing countries, Tybout J. (2000) on the relative performances and dynamism of firms in the same region.

foreign firm, which can be expected to be superior to that of local producers. Other things equal, this would contribute, however marginally, to increasing the overall productivity of the economy. But the key issue is diffusion, or technological spillover, from foreign-owned firms to the rest of the economy, which is the very process through which overall economic growth can be accelerated in the long run. Here again, many channels of transmission have been proposed and sometimes observed, which range from local subcontracting, to the observation of competitor's practices ('demonstration effect'), or job turnover, with workers moving from foreign to local firms. Gonçalves (1986) shows for instance that multinational firms tend to develop more training programme than local firms .

This can also be interpreted as a property rights issue. As already mentioned, one the main motive of the multinational firm is to protect its know-how and technology. But then, if technology were protected by fully-enforced ownership, *i.e.* if it were fully internalised, without any enforcement leakage, then there would no spillover. Technology would diffuse to local producer only through formal contracting, which implies that the monopolistic rent would be priced in. In the same line of argument, foreign firms could ask for a subsidy as a compensation for the informal technological diffusion linked to labour turnover (see for instance Tybout 2001, Foster, Haltiwanger and Krizan, 2000). In other words, while there has been a relentless emphasis on strong property rights, as a key institution for successful transition, further long term growth require that they should suffer some dilution, at least when technology and know-know are considered.

When one turns from what the theory and the policy makers say to the results of empirical research, the picture becomes much less clear: attempts to measure the benefits of FDI for host-economies have come to mix, if not negative conclusions. Working on sector-level data, Blomström (1986) finds for instance that entry of new foreign producers into the Mexican market, that is an increase in the level of their competition, is not associated with a increase in the productivity level of local firms; that is, confronted with increased competition, the latter may try to adjust, but they fail to reach visible results. Then, working on the same country and the same population of firms, Blomström and Wolff (1989) find that sector with high *levels* of foreign equity-ownership have higher average productivity growth rates and faster convergence of productivity levels. In other words, this may suggest that a large presence of foreign-owned enterprise is indeed conducive to local firms moving closer to the production frontier, albeit an increase in their competition might be destabilising, in the short run.

A series of more recent articles have relied upon micro-level, longitudinal data basis, which have allowed for a more precise approach than sector-level ones, which were often the rule in the 1970s' and 1980's. Haddad and Harrison (1993), working on a panel of Moroccan manufacturing firms, also find that the dispersion of productivity levels in sector with large foreign ownership is smaller; but they don't find evidences that the entry of new competitors, after the liberalising reforms of the mid-1980's, have had an impact on domestic productivity growth. Aitken and Harrison (1989), working on Venezuelan firms find that foreign ownership is associated with 10,5% higher levels of productivity than the rest of the population, other things equal. On the other hand, locally-owned firms, in sectors with strong foreign-owned competitors tend to be *less* productive than in other sectors: an

increase by 10% in the share of foreign-owned capital reduces by 2,7 percentage points the productivity of the domestic firms. Hence, FDI is associated with a large negative impact, with the net effect being slightly negative.

In the case of transition economies, Djankov and Hoekman (2000), reach comparable conclusions in the case of the Czech Republic (1992-1996): foreign-owned firms and joint-ventures have a higher than average productivity, with a negative spillover effect on the rest of the firms. A 10% increase in the level of foreign ownership induces a 1,7% fall in the sales growth of local enterprises. Finally, Koonings (2000), with a methodology close to that of Aitken and Harrison, finds that in Romania and Bulgaria foreign firms do not have a clear productivity advantage, while they have a negative sectoral spillover effect on local firms. In Poland, results are comparable to those observed in the two previous, although they are derived from a small number of firms.

The main reason put forwards, in order to account for this ambiguous conclusion does not address property issues, or for instance the institutional variables that may hinder or facilitate spillover. The problem is interpreted as an issue of excessive competition on the output markets. If local firms, with large fixed costs or increasing economies of scale, suddenly face increased competition from a foreign producer, with lower marginal production costs, they may be confronted with a one-off loss of market share. The consequence would be an upward drift along their average cost curve, which would further affect their capacity to compete. If this demand-side effect is sufficiently widespread, it may translate into a net fall in the productivity level of domestic producers (see Aitken and Harrison, 1997). Moreover, in countries where labour markets and enterprise governance have a reputation of poor flexibility, as in transition economies, the delay and the cost of adjustment may prove large. Depending upon local conditions, the net effect of FDI, when taking into account both technological spillover and competition, may thus be prove either positive or negative.

This paper further this recent series of publications on the effects of FDI and deals with the special case of Hungary, which has received very large inflows of foreign equity since the early 1990s'. The main conclusion is that, contrary to earlier results on other countries in the region, foreign investments is strongly and positively associated with the growth rate productivity, for all types of firms (foreign, private-Hungarian, State-owned). But conditions are attached. First, a negative drawback appears when foreign firms sell on the local market (as opposed to exports), thus adding an element of competitive pressure. Second, FDI have adverse effects on regional inequalities. Section 2 sums up the Hungarian experience with FDI since the early 1990s' and underline their exceptional weight on the economy. Section 3 deals with the database and the method adopted. The following one presents and comments the econometric results, before reaching the conclusions, in section 5.

2. FOREIGN DIRECT INVESTMENTS AND THE HUNGARIAN TRANSITION

Hungary is one the most remarkable recent experience in export-led growth strategy, associated with a large inflow of direct investments. Among transition economies it ranks among the strongest performers in this field, if not the stronger, with regard to both the volume of capital inflows and the comparably long period of time over which they entered the country.

At the onset of transition reforms, this trend reflected i.a. the relative advanced level of institutional and economic reforms achieved during the 1970s' and 1980s'. Basic services, such as banking and trading, could be offered to foreign enterprises and traders, thus helping the country's establishing its position in the region as a platform for exchanges with the West: at that time when Czechoslovakia was much more closed and Poland was in a deep structural crisis. Another factor was obviously the large foreign debt: with the State unwilling to borrow more abroad and the corporate sector unable to directly tap foreign funds, direct investment provided an element of response to the funding needs of the economy. On an *ex post*, aggregate basis, and together with direct borrowing abroad by firms, FDI contributed largely to balancing the capital needs of the economy: during the first half of the 1990s' they helped supporting large current account deficits, and after the 1992-93 banking crisis and the 1995 macroeconomic stabilisation they made room for a steady reduction in the volume of the State foreign debt (see i.a. Bonin J., Schaffer M., 1995 and Szalavetz A., 1996). One consequence was a sharp reduction in the relative weight of interest payments in the balance of payment, while profit repatriation has been growing steadily.

Finally, the large inflows of FDI investments are also tightly linked to the decision, in the early 1990s', to privatise the largest State-owned firms, as soon as possible. This contrasted with the Polish-style, "heteroclite" and rather gradual strategy, or the Czech voucher programme which aimed at a large domestic distribution of share ownership. Confronted with a most limited pool of domestic private capital, Hungarian reformers decided as a priority to look for foreign capitalists, rather than to wait for domestic ones to emerge, or to attempt at producing them through social engineering. Two caveats should be added: first, "small privatisation" proceeded rapidly, as in other Central European economies, and the control of a large layer of SMEs was also transferred to managers and workers; then FDI inflows remained at a sustained levels in the second half of the 1990's when privatisation was basically finished: re-investment and green-field projects took up the main role.

The main consequence of this policy choices, as of the broader capacity of the country to attract investors, is that foreign capital has largely contributed to the recovery of the economy since 1995, which is also reflected in a sharp increase in all profitability indexes. The foreign sector now represents a key sector in the economy, which plays a dominant role in the modern, exporting sector: its relative share in export activities outweighs by far the contribution of the domestically-owned private firms (Table 1). On a consolidated basis, in 1998, foreign shareholders owned 54% of the total equity in the manufacturing and construction sector, against 30% for the Hungarian private sector, with the balance owned

by public entities. They also produce on an aggregate basis 62% of the total added value (resp. 32%) and 79% of exports (resp. 15%).

Moreover, foreign-owned firms show on average much higher levels of profitability than domestically owned ones: the trading profit of 100% foreign-owned firms represented 30,7% of total added-value in 1998, against 11,1% for firms where foreign investors had no stake. One consequence is that the former sector benefits from much larger resources to allocate between dividends and retained earnings: in 1998, it concentrated no less than 84% of the total retained profits in the manufacturing and construction sector. In other words the remuneration of foreign shareholders is much larger, but these firms also keep the capacity to increase their capital base. An implication is that the dynamic of both sectors, for the time being, may be quite divergent: the foreign one shows a much more dynamic feature, while the process of capital accumulation looks much more muted in the domestic, largely-inward looking sector. One element of uncertainty should however be taken into account here: anecdotal evidences strongly suggest that foreign-owned firms tend to locate profits in Hungary, via internal prices. The consequence would be to undervalue imports, production levels and profits, while growing the volume of dividends flowing through the balance of payments.

Table 1 – Relative Weight of Foreign Equity in Enterprises Performances
(on a consolidated basis)

Private foreign ownership	Share in total equity	Equity	Added value	Assets	Exports	Total sales	After-tax profits	Retained profits
1992	0,60	14	22	10	25	21	14	22
1993	0,65	18	27	13	33	26	13	29
1994	0,68	22	35	18	43	32	-694	10
1995	0,73	37	44	32	54	43	144	-142
1996	0,75	43	52	41	67	50	88	104
1997	0,77	50	58	51	75	57	81	80
1998	0,78	54	62	54	79	62	82	84

Primary source: Kopint-Datorg.
Note: This table has been computed on a consolidated basis, that is taking into account the share of foreign capital, in the equity of *each* firm. The first column ('share in total equity') indicates the average relative share of foreign capital in the equity of all firms with some foreign shareholders ; the second one its share in total sample. The other columns show the relative foreign equity in the total for the whole enterprise sample. For instance: in 1998, 78% of total exports corresponded to foreign shareholders.

3. PRODUCTION FUNCTION AND DATABASE

We rely upon an unbalanced database that includes all enterprises with more than 20 employees on average, over the 1992-1999 period; the total sample thus represents close to 90% of the total manufacturing and construction sector. Income Statements and Balance Sheets are complemented by additional information on employment, the share of exports in

total sales, sectoral and regional origin (23 and 7 aggregates resp.). The ownership structure differentiates between public, foreign and private-Hungarian shareholders (see Annex 1, for a presentation of the database). The average number of firms is close to 4600 each year but includes entries and exits. Hence, the panel data structure of this statistical source (which includes cross-section and time series) allows to proxy technological progress with Total Factor Productivity, which is calculated on the basis of a standard Cobb-Douglas production function. This allows to analyse the interaction between TFP growth on the one hand and direct investment and other possible determinants of productive efficiency, on the other.

This statistical source obviously has its own limits. The main one is that the sector brake-down is limited, with only 23 branches differentiated, with the consequence that market structures are poorly reflected by indices of concentration ratios, for instance. Moreover, in the absence of a price deflator for each firm, the differentiation between valuation effects and real terms variables is poor, in a country where there are evidences of important mark-ups (Halpern et Körösi, 2001), possibly linked to transfer prices by large foreign-owned enterprises. The consequence is that pricing behaviour cannot be distinguished from actual productivity growth (real term production). This drawback is common to almost all studies of this type, but may have a special impact here, although one which is difficult to control for. On the other hand, for each branch a specific deflator is available for domestic sales and exports respectively, which is certainly a positive advantage.

A log-linear production is estimated, using the ordinary least squares method, under the following general specification:

$$Y_{ijt} = C + \beta_1.X_{ijt} + \beta_2 DFI_{ijt} + \beta_3.Spill_{jt} + \beta_4.\ DFI_{ijt}^{*}\ Spill_{jt} + \beta_5 MktSh_{ijt} + \beta_6 B_{ijt} + e_{ijt}.$$

Y is the log of output measured as total sales plus change in inventories, X is a vector of inputs (tangible assets, total employment and material inputs, again in log terms). Nominal values are deflated by aggregate or sectoral producer prices indexes. DFI_{ijt} is the share of foreign equity in each firm i, at time t and varies from 0 to 1. It should come out positively if firms with foreign shareholders do indeed have a higher productivity level than the rest of the economy. $Spill_{jt}$ is respectively the share of foreign ownership in each sector j, at time t on a consolidated basis. $MktSh_{ijt}$ is calculated on the basis of sales. This is the critical variable which should reflect any correlation between foreign capital and productivity, once the impact of direct equity-holding by foreign investors in each firm is controlled for. It also varies between 0 and 1 and is estimated on the basis of total production (sales plus change in unsold inventories). B_{jt} is a vector of a fixed-effects variables for sector, time and regional origin. e_{ijt} is the white noise error term.

4. RESULTS

A. General Specification

Table 2 reports the results of equation (1). The first column provides *level* estimates of parameters and shows that foreign ownership has a large impact on TFP, which increases by

38,5% if foreign equity stakes raises from 0 to 100%. Spillover at the sectoral level is not significant, contrary to market-share, which impact is limited but positive and statistically significant: a 10% gain is associated with a 0,4% increase in the measure of productivity. One possible explanation is that large producers would be able to post substantial mark-ups, which would thus not reflect higher production and productivity, but market power. The alternate explanation is the presence of positive economies of scale, which would not be captured by the contributions of production factors. The marginal productivity of capital is indeed very low, a fact also observed in other transition economies (Djankov and Hoekman 2000, Koonings 2000), which can be explained by past overinvestment into now-obsolete equipments; as a methods, depreciation rules for capital invested before the reforms started is a source of large statistical uncertainty when working on transition economies.

The four next columns to the right, in Table 2, present first-difference and long-differences of equation 1. They provide a measure of the increase in the overall performance of firms over the short- to medium-term, when foreign equity enters their capital base and the sector to which they belong. While sector and regional dummies already limited the risk that FDI may be correlated with *ex ante* high levels of TFP, the estimates of parameter in differences allow to control more closely for residual fixed effect[3]. Here, the picture becomes a bit different than when in the case of the level estimate. The relative advantage of firms with foreign shareholders is still present over the medium term: productivity keeps increasing, which may be an indication that the transfer of technology and know-how is not a pure one-off effect. Either they benefit from more investment, or a learn-curve allows for further gains after investment.

Table 2 – The Impact of FDI on Total Factor Productivity

	Level impact of FDI	First difference $t - t_{-1}$	Second difference $t - t_{-2}$	Third difference $t - t_{-3}$	Fourth difference $t - t_{-4}$
K	.065 [26]	.081 [29]	.078 [29]	.077 [29.7]	.079 [30.6]
L	.403 [86]	.354 [68]	.385 [77]	.398 [81]	.405 [83.1]
M	.448 [154]	.486 [154]	.470 [151]	.46 [148]	.454 [148]
Plant-level effect: DFI_{ijt}	.374 [37]	.217 [15.3]	.25 [19.5]	.264 [21.9]	.271 [23.6]
Sector-level of DFI: $Spill_{jt}$	.042 [1.1]	.193 [6.4]	.21 [7.1]	.230 [7.6]	.194 [6.2]
Market share: $MktSh_{ijt}$	.041 [27]	.006 [4.9]	.01 [6.8]	.013 [7.9]	.016 [9]
Number of observations	33 033	30 037	29 790	29 675	29 686
adj. R^2	0.849	.757	.786	.798	.807
F value	5 828 [<.0001]	2 927 [<.0001]	3 418 [<.0001]	3 667 [<.0001]	3 870 [<.0001]

[3] See Blomström and Kokko (1996) for a review of the literature on the impact of FDI on developing countries, Tybout J. (2000) on the relative performances and dynamism of firms in the same region.

Dummy variables are included for sector, region and year.
T statistics are provided in brackets and are robust to heteroskedasticity.

But the most important point is that FDI is associated, in a large and robust way, to overall productivity growth in the sector. Contrary to most other studies of this type, these results shows that direct investments in Hungary do contribute to overall technological catch-up and growth, beyond the limits of the firms directly involved. Moreover, the coefficient for market-share is again positive and statistically significant, but it does not reflect a tangible economic effect: on a four-year span, an increase by 10% in the market share would imply a 0,16% higher growth in TFP. This suggests that larger firms are not able to translate their (small) relative advantage into persistently better performances. Results on regions will be dealt with latter.

B. Domestic vs. Export market

The measure of spillover in equation 1 relies upon the total *production* of firms with foreign equity, which means that it provides estimates of coefficients which are the closer to the actual productive performances of firms. But other factors can bear on management decisions, which are linked to the *markets* on which the firm sells its production, which for instance can be more or less competitive; this could then have a differentiated impact on the pace of adjustment. A key difference, from this point of view is between the export and the domestic markets. One could hypothesise that if foreign firms are mostly outward-looking, they could have some positive spillover effects while not pressuring local producers on their domestic market. Conversely, if the domestic competitive pressure remains too weak, the incentive to adjust may be too limited.

Still another issue is whether the export flows of foreign-owned firms are *per se* a source of faster productivity growth in the overall economy. Empirical surveys generally indicate that exporting firms are more productive than other, which is apparently also true in Hungary as witnessed in the first column of Table 3 (although in a rough specification): other things equal, when the share of exports increases by 10% in total sales, the level of productivity is 2,2% higher. The question, then, is whether the large role of foreign-controlled firms in the Hungarian export sector can have a specific impact on overall performances. For instance, these enterprises, which are often branches of multinationals, could act as "coaches" for locally-owned partners or sub-contractors. They would thus ease their way into foreign markets and help them along the related learning curve.

In order to get an insight into this issue, however a partial one, equation 1 has been calculated on the basis of sales, rather than production (taking out the change in inventories), with the former being split into two components: the domestic sales and exports. The first variable is estimated as the consolidated domestic market share of FDI, at the branch level (along the same line as in the previous case, but not with total production); the second one is approximated as the share of exports in the total sales of foreign-owned firms, again at the branch level. The export-share of the each individual firm is also included in the equation.

The results (table 3) are quite clear: only export activities are associated with a significant increase in TFP growth in the domestic sector; and externalities derived from entry into the domestic market appear to be negative in level terms, while in trend terms they have little significance, especially over the medium term (the interval of confidence on the fourth difference +/- 25%).

The contrast between the external and domestic impact of FDI suggests two opposite hypothesis. One is that TFP externalities in Hungary would be conditional upon export participation, which would only prove enough challenging for productive efficiency to increase, while the domestic market would present too much rents. Conversely, the key factor could be on the domestic side, under the form of the "competitive risk», mentioned by other authors: while FDI would be the source of positive technological spillovers, those confronted with foreign producers on their home-market would also be adversely, as they would loose market shares. In this case, the most important result in table 2 would be the level impact of FDI, which is significantly negative (confidence interval is +/-2.2%).

Table 3 – Domestic and Export Markets

	Level impact of FDI	Level impact of FDI	First difference $t - t_{-1}$	Second difference $t - t_{-2}$	Third difference $t - t_{-3}$	Fourth difference $t - t_{-4}$
K	.064 [26]	.064 [25]	.080 [29]	.077 [29]	.077 [29]	.078 [30]
L	.387 [81]	.383 [80]	.347 [66]	.376 [74]	.388 [78]	.393 [79]
M	.456 [156]	.456 [155]	.487 [154]	.472 [151]	.463 [149]	.459 [149]
Plant-level effect: DFI_{ijt}	.310 [29]	.303 [28]	.178 [12]	.205 [15]	.22 [17]	.221 [18]
Market share: $MktSh_{ijt}$	.044 [29]	.046 [30]	.006 [5.3]	.011 [7.3]	.014 [8.5]	.018 [9.7]
Dom. spillover: $Spill_{jt}$	-	-.118 [-2.3]	.095 [2.3]	.14 [3.3]	.082 [1.8]	.066 [1.5]
Export spillover: $Xspill_{jt}$	-	24.8 [5.5]	.114 [4.5]	.179 [6.1]	.207 [6.9]	.18 [8.8]
Exports in sales: Xsh_{ijt}	.222 [18]	.21 [17]	.144 [10]	.137 [10]	.127 [9.4]	.148 [11]
Export-on-export spillov.		-.001 [-.7]	-.001 [-.01]	.001 [2.4]	.001 [3.5]	.002 [3.8]
Number of observations	33 033	33 033	30 037	29 822	29 707	29 686
adj. R^2	.852	.851	.758	.787	.799	.807
F value	5 787 [<.0001]	5 390 [<.0001]	2 687 [<.0001]	3 233 [<.0001]	3 477 [<.0001]	3 665 [<.0001]

Dummy variables are included for sector, region and year.
T statistics are provided in brackets and are robust to heteroskedasticity

The last two variables included in table 2 provide arguments for the second hypothesis. On the one hand, when controlling for foreign ownership, exporters show a higher than average level of productivity, but the trend terms do not reflect a higher growth rate of TFP. On the other one, the interaction term between the export orientation of firms and that of FDI, in the same sector (*Xspill*, export-on-export spillover), is statistically significant over the longer differences but not tangible in economic terms. In other words, foreign firms *may* support the expansion of exports by domestic firms, but this does not translate into higher growth rate of productivity, as measured here. This strongly suggest that the spillover effect derived from the exporting activities of foreign firms *does not* reflect specific qualities attached to this outlet, which would explain the contrasting results observed between export and domestic-oriented foreign firms. The difference would rather be linked to the balance between positive and negative effects of FDI when the output is sold on the local market; that is, credibly, the difficulty of local producers to adjust to increased competition by foreign firms[4].

C. Local Dynamics

High levels of FDI in Hungary thus appear to be positively correlated with TFP growth: they are indeed a channel for technological transfer towards all, or a substantial part of local producers even if, as a rule, the firms which receive foreign equity benefit more. A further step is to ask whether spillovers effects are geographically distributed. That is, whether for instance a degree of agglomeration is a pre-condition, or an enhancing factor in the increase of average productivity levels linked to FDI inflows. The issue has a special relevance in the case of Hungary, which presents a sharply polarised economic geography: the region around the capital, Budapest, and westwards till the border with Austria (here region 1) has been historically more developed and richer than the rest of the country, in the south and the east, that is towards the borders with former Yugoslavia, Romania and Ukraine (region 2). Indeed, the dummy variable for region 1, in the first benchmark regression, presented in table 2, has a value of 12.1% which indicates that productivity levels are that much higher in this region, other things equal. There are also indications that this dualistic structure has strengthened over the transition period as direct investments and exporting firms are very much concentrated in the north-western part of the country.

One further problem is that, once the concentration of FDI in the first region is taken into account, both as a share of economic activity as of the total number of firms, there is a possibility that the benefits of spillovers may be absorbed by foreign firms only, or to a vast extent. In this case, the externalities associated with FDI, which have been identified above, would only increase the attractiveness of the country for foreign enterprises: but they would not have a corresponding impact on the domestic sector. This is indeed the conclusion reached by Aitken and Harrison (1999), in the case of Venezuela. In order to address this issue, estimates of spillover effects have been further differentiated; taking into account both the region and the property structure of the firms. Table 4 provides estimated

[4] The estimation of long differences is also the reason why the Method of General Moments was not used here: adding two years to derive instruments, to five years needed for the estimation of parameters would have sharply reduced the scope of results.

coefficients for the impact of total FDI, in each region, respectively for Hungarian private firms and foreign-owned firms. In other words, they indicate whether in each region, spillover effects are better captured by the former or the latter type of firms (or, more precisely, the former or the latter type of equity capital, identified by its origin).

The results are somewhat weaker than in the previous estimates, but they still come out robustly in most cases (Table 4). And what they tell is rather straightforward. First, for *both types* of enterprises, the correlation between FDI and productivity levels *and* trends is significantly stronger in the first region. Remarkably as well, this coefficient of this relation impact increases over time, which indicates that, in this region, spillovers are not a one-off effect, even a permanent one, but that they contribute over the medium to total productivity gains. This is the main difference with the effect of FDI *within* the receiving firms: on the one hand, productivity gains directly linked to foreign equity holding are mostly front-loaded and their further contribution to growth is muted; on the other one, externality gains are growing over the years and are even catching up the previous ones, after four year (note that this does not mean that TFP *levels* have converged, but that they are on a converging path).

Table 4 – Regional Differentiation Between Hungarian and Foreign-Owned, Private Firms

	Level impact of FDI	First difference $t - t_{-1}$	Second difference $t - t_{-2}$	Third difference $t - t_{-3}$	Fourth difference $t - t_{-4}$
K	.071 [28]	.083 [29]	.079 [30]	.079 [30]	.081 [31]
L	.415 [88]	.354 [68]	.385 [77]	.398 [81]	.405 [83]
M	.444 [153]	.487 [154]	.47 [150]	.46 [148]	.454 [148]
Plant-level effect: DFI_{ijt}	.545 [20]	.215 [15]	.248 [18]	.262 [20]	.272 [21]
Market share: $MktSh_{ijt}$	.042 [28]	.006 [4.8]	.011 [7]	.014 [8.1]	.017 [9]
Property/ geographical spillover					
Region 1, private-hungarian,	.647 [25]	.059 [2.7]	.169 [6.2]	.223 [7.3]	.28 [8.5]
foreign equity	.231 [4.3]	.073 [3]	.171 [5.4]	.242 [6.8]	.308 [7.9]
Region 2, private-hungarian,	.424 [16.1]	.033 [1.5]	.117 [4.1]	.16 [5]	.203 [6]
foreign equity	-.171 [-3]	.066 [2.2]	.107 [2.9]	.096 [2.3]	.062 [1.3]
Number of observations	33 033	33 0037	29 822	29 707	29 686
adj. R^2	.852	.757	.786	.798	.807
F value	5 588 [>.0001]	2 751 [>.0001]	3 214 [>.0001]	3 459 [>.0001]	3 647 [>.0001]

Dummy variables are included for sector and year.
T statistics are provided in brackets and are robust to heteroskedasticity.

The key implication is that the north-western part of Hungary is actually experiencing a strong dynamic of endogenous growth, in which FDI play a very significant role as a source of shared externalities; they thus contribute significantly to the convergence of the country towards EU levels of productivity. But FDI also tend to increases the existing differences in productive performances between firms belonging to the two regions. They thus seem to have a negative impact as regard regional imbalances within the country.

The other interesting element in Table 3 is the differentiated impact of FDI on foreign-owned and domestically owned enterprises, when geography is included in the picture. In region 1, their respective capacity to absorb FDI externalities are very close, with the foreign firms showing a marginal (7%), although econometrically significant, relative advantage. In region 2, for which results are less consistent, the overall growth environment comes out much weaker, especially when one looks at levels-estimates. But this time the two types of firms do not benefit evenly: Hungarian firms keep benefiting substantially over time from FDI, although the overall effect is reduced by about 30%, when compared with the previous region. On the other hand, foreign firms seem to loose most statistically significant capacity to absorb these externalities. Foreigners do not resist the melancholia of the Puszta.

Remember however that the geographical brake-down only applies to the localisation of firms at the receiving end of the spillover effect. Conversely, the weight of FDI in each branch is measured for the *whole* economy, whatever the localisation. In other words, markets are considered as unified over the country, and it is expected that since distances are not that large, their implied cost, while non-negligible, should not be an overwhelming factor. If these assumptions are correct, the results in table 3 would actually be consistent with the proposition that foreign capital, while often very mobile at the international level, is also sensitive to (comparatively) short-range localisation choices, *i.e.* to agglomeration effects. On the other hand, Hungarian firms seem able to absorb some spillover effects, even at a distance from the representative localisation of foreign firms in their own branch. The most obvious possible explanation is that local producers are less affected by an adverse environment. An alternate one is that local firms would derive specific benefits from FDI, which would be specific to the context of transition (thus not relevant for foreign firms), and which would travel easily within the country. Harder budget constraints are an obvious candidate, as well as better production standards or stronger competition. But, one would then have to explain why these comparative benefits do not show out in region 2. While a mix of both approaches may be a convenient answer, a more precise assessment of their respective contribution would probably require more precise, dis-aggregated variables.

D. State-Owned Entreprises

A degree of understanding has been reached as regard the differences between foreign-owned and domestically owned, private firms. What about State ownership? In all transition economies, the persistence of a large-size public sector, while a consequence of the many difficulties encountered in privatising them, is a large potential source of distortions and inefficiencies. An immediate problem is that their failure to adjust and restructure would maintain production factors in sub-standards units, thus weighing on

aggregate productivity, in level and in trend terms. But State-Owned Enterprises (SOEs) can also be the source of large, negative externalities; for instance if they crowd out private firms from the credit market, possibly till the banks go down. They may also systematically accumulate inter-firms arrears: this would drain their suppliers from their financial resources and, most dangerously, would make much more difficult the imposition of tougher budget constraints in the economy as a whole.

In the Hungarian case, the overall low productivity level of SOEs comes out neatly from a standard estimation of Total Factor Productivity, derived from equation 1: the first column of Table 5 shows that each 10% additional share of State participation into the equity of a representative firm is associated with a productivity *level* which is 3,6% lower. Market-share and regional origin do not weigh differently than in the rest of the population, but an additional 10% increase in the share of exports is correlated with a 2,9 higher productivity. In this case, the handicap of State ownership can be at least partially compensated.

The most noticeable result is that SOEs show a large, robust capacity to respond positively to the opportunities offered by FDI. Starting from a low level of productivity, the entry of a foreign shareholder into a State-controlled firm is associated with a larger impact on productivity than in private firms. This benefit stabilises after two years around 3,5% for each 10% share in equity capital (against an incremental gain of 2,6% for the total population, as seen on Table 1). Moreover, SOEs also prove able to benefit from spillover effects, to a larger extent than the other firms do, although these benefits seem to be declining over time. Finally, the geographical externalities associated to being located in region 1 also come out over the medium term, yet the respective coefficient is less significant than for the total population (table 1) and its magnitude is also lower. SOEs thus prove a not so different species of enterprises, controlling for their initially low level of efficiency. The implicit issue is whether, taken into account their actual capacity to respond to market incentives, it is worth to keep them working or why they should not be privatised.

Table 5 – The Impact of State-Ownership Total Market

	All firms	*Firms with more than 50% State equity*				
	TFP	Level impact of FDI	First difference $t - t_{-1}$	Second difference $t - t_{-2}$	Third difference $t - t_{-3}$	Fourth difference $t - t_{-4}$
K	.085 [35]	.004 [1]	.046 [6]	.051 [7.2]	.048 [7]	.035 [5.2]
L	0391 [81]	.386 [32]	.263 [18.7]	.314 [24]	.337 [26]	.376 [30]
M	.45 [153]	.578 [72]	.616 [68]	.565 [62]	.566 [64]	.557 [65]
State-ownership	-.358 [-32]	-	-	-	-	-
Share of exports in sales	.290 [25]	-	-	-	-	-
Foreign ownership	-	.726 [5.6]	.410 [8.7]	.359 [8.5]	.336 [8.5]	.35 [9.2]
Spillover from FDI	-	.088 [.9]	.413 [5.4]	.316 [4.1]	.263 [3.4]	.241 [3]
Market share	.046 [30.3]	.016 [7.6]	.001 [.5]	.003 [1.1]	.001 [.02]	.001 [.03]

Region 1	.140 [20]	.095 [6]	.027 [1.5]	.045 [2.1]	.063 [2.8]	.065 [2.8]
Number of observations	33 033	4 469	3 936	3 961	3 971	3 993
Adj. R^2	.852	.911	.825	.841	.853	.864
F value	5 938 [<.0001]	1 431 [<.0001]	582 [<.0001]	658 [<.0001]	721 [<.0001]	3 648 [<.0001]

Dummy variables are included for sector and year.
T statistics are provided in brackets and are robust to heteroskedasticity

5. CONCLUSIONS

This paper has relied upon a large database of enterprise accounts in order to assess the relations between foreign direct investments and total factor productivity, in level and growth terms, during the 1992-1999 period. A series of important conclusions highlight some reasons beyond the success of Hungary since the mid-1990s' and also the weaknesses beyond this success. The main element is that foreign-owned firms have a higher productivity than the average and that they produce substantial positive spillover effects on the other firms in the same sector. Two important restrictions have however been identified. First, exporting foreign-owned firms carry much more benefits for the economy (on top of balance-of-payments issues) than inward-looking ones: when FDI is associated with entry into the local markets for final products, the benefits of spillover seem to be balanced by the negative consequences of too strong competition. Thus, the key issue is less to compete against one another on the same final market, than to produce in the same place – even if production obviously entails contracts, competition and selection between producers.

Second, externalities associated with direct investments are geographically determined: they mostly benefit firms located in the most developed region, closer to EU borders. FDI thus have a negative impact on regional inequalities, while supporting overall international convergence. This strongly suggests that an agglomeration effect is at work. Considering the very high levels of accumulated FDI in this country, a hypothesis is thus that in order to have positive spillover effects, foreign firms have to represent a substantial share of the economy – either in volume or in terms of number of firms. Externalities would require that enterprises produce close to each others. This would be the main difference with the experience in the Czech Republic in the early 1990s' (Djankov and Hoekman, 2000) or in Bulgaria, Romania and Poland (Koonings, 2000). Finally, the differentiation between firms along property structure criteria have proved important but not so decisive: they tend to be stronger when productivity levels are considered, while trend terms, which may reflect adjustment to markets constraints and incentives, are often close. This does not imply that property rights are a secondary issue, but that their impact on the behaviour of firms is indeed conditioned by the overall economic environment in which they operate.

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DATA APPENDIX

The data used in this paper have been supplied by the Kopint-Datorg institute in Budapest. They cover enterprises with on average 20 or more employees over on the 1992-1999 period. 1992 was the first year when standard international accounting norms have been applied. The total population is on average of 4610 firms per year and includes a substantial number of entries and exits: it is not a cylinder base. Before 1995, it is considered that a large part of the movement in the population represents existing firms receiving a new identification number when being e.g.. privatised, or broken down into separate entities: this does not necessarily imply that they were considered insolvent and liquidated. After this date, exits from the database are considered as a much closer reflection of an exit out of the market, allowing measurement of firm turnover.

All yearly observations include the standard Income Statement and Balance Sheet figures, including the share of total sales due to exports. They also provide the total number of employees, a two-digit industry identification (22 manufacturing sectors plus construction), the regional origin of the firm (seven regions), its legal status and a brake-down of its equity base between state-owned foreign-owned, and Hungarian private capital (capital owned by local communities and non-profit foundation is also provided but has not been used here).

The database is highly representative of the overall Hungarian economy, whether one looks, on a sectoral basis, at the structure of added-value, employment or exports. Only the construction sector appears to be overweighed in the base, which may be explained by the often poor quality or informal of statistical records in this sector. This is not surprising, considering that the enterprise included in the base cover 86% of the total added value of the respective sector, 96% of employment and 91% of exports. On the latter point, on problem comes come from the fact that the sectoral classification of enterprises, in this data base, and that of exports, as reflected in the foreign trade statistics, do not follow the same standard: the former are based on the NACE nomenclature, while the latter follow CITC standards. The problem is accentuated by the fact that industries are here identified in rather broad terms, which does not allow for to bridge easily the statistical gap.

As regard the geographical structure of the economy, the database reflects the wide concentration of economic activity and employment in Budapest region and the north-western part of the country on the one hand (Central Hungary, Central Transdanubia and Western Transdanubia), and the rest of the country (Southern Transdanubia, Northern Hungary, Northern Great Plain and Southern Great Plain). This last element explains that this database, which does not include the primary sector, reflects a higher level of inequalities than overall, aggregate data, especially when added-value and GDP are taken into account. However, notwithstanding statistical problems and methodological options, this database should not be considered as a representative sample, but as a very close reflection of the actual economy, with the exclusion of the smaller enterprises.

At the branch level, the share of respectively foreign investors, Hungarian shareholders and public ownership (local, State and cooperative) in e.g. total sales, employment, or equity is calculated on a consolidated basis: a firm' sales are allocated to each type of ownership on

the basis of its respective share in the total equity. The main benefit of this approach is that the variables remain discrete and quantitative; the drawback is that the qualitative impact of *i.a.* one category of equity-holder getting majority voting is not taking into account at this stage.

Capital stocks (tangible assets) have been deflated by an investment price index. The latter differentiates between manufacturing and construction until 1997, and is a common, economy-wide index over 1998 and 1999. Wages and material inputs are deflated by the general producer price index.

The output is gross sales plus variation in unsold output. This may be less consistent from a theoretical point of view than added value, but the experience tells that this option provides more consistent econometric results when working on production functions; this is also the reason why the Cobb-Douglas functions include material input as an exogenous variable. The output of each firm has been deflated by a producer price index, based upon two branch-level indexes, respectively for domestic and export sales, with the relative part of each output market as weights. One problem, common to almost all productivity studies, is that it is not possible to identify exact firm level prices. Hence, different mark-ups margin cannot be accounted for. By the same token, this also makes invisible all forms of transfer prices used by foreign-owned firms when dealing with other parts of the same international group. Very high levels of accounted profits suggest that multinational firms tend to post profits in Hungary, rather than exporting them elsewhere via subcontracting or internal sales. This would indicate that real term production and productivity *levels* in foreign-owned firms are rather over-valued than under-valued, which would mean that the extent of the productivity gap with the domestically-owned sector is smaller than reflected by the firms' accounts. This distortion will be controlled for once estimations are made on first-difference basis, provided that there has not been changes over time in the way international groups address transfer prices when dealing with their Hungarian subsidiaries.

Another limitation of this database is the large size of each sector (22 manufacturing sectors plus construction). The implication is that a great number of output product-markets are included under each sectoral grouping, which probably do not present the same market structures. One consequence is that indexes reflecting the structure of each industry are of poor relevance in order to account for behaviours and performances.

Table A-1 – The Share of Foreign Equity in the Hungarian Economy

	1992	1993	1994	1995	1996	1997	1998	1999
Total sales	**20.1**	**23.7**	**29.0**	**38.5**	**46.0**	**53.4**	**58.7**	**59.8**
Added value	23.0	24.9	31.2	39.4	47.6	54.0	58.5	58.9
Exports	23.4	30.7	40.5	51.6	65.1	72.9	77.5	82.4
Employment	18.7	17.4	20.9	26.9	29.8	35.7	39.0	39.1
Wage payments	20.1	21.4	24.8	32.3	39.3	43.8	47.5	48.1
Equity	10.3	12.1	15.3	27.6	34.5	41.7	45.2	45.3
Trade profit	-50.7	34.0	50.5	46.1	64.7	69.8	72.7	72.6
After-tax profit	11.9	10.0	-911.5	138.4	87.0	77.9	78.6	75.3
Dividend	57.7	52.8	52.7	65.5	74.5	79.6	77.0	64.3
Net profit	18.7	27.3	3.6	-168.9	104.1	76.8	79.5	82.2

Tables A-2 – Structure of the Data-Base by Industry

Code	Denomination	Share in added value, D-base	Share in added value, Total economy	Share in employment D-base	Share in employment total economy	Share in exports D-base
15	Agro-industries	13.3	14.9	16.2	16.2	12.4
16	Tobacco products	1.0	0.6	0.3	0.3	0.5
17	Textiles	2.7	2.8	5.2	5.5	2.7
18	Wearing apparel, dressing and fur	2.5	3.3	7.3	7.7	2.3
19	Leather product	1.2	1.3	3.0	3.5	1.2
20	Wood & wood prod., exc. Furniture	1.4	2.2	2.2	2.1	1.2
21	Pulp, paper and paper products	2.2	1.6	1.3	1.3	0.9
22	Publishing & printing	4.5	3.3	2.7	2.4	4.2
23	Coke and refined petroleum	12.4	7.1	2.4	2.0	4.4
24	Chemical products	11.6	8.7	5.9	5.6	10.3
25	Rubber & plastic products	3.4	3.4	3.1	3.3	3.6
26	Non-metallic mineral products	4.0	4.0	4.2	4.3	2.0
27	Basic metals	2.7	2.8	3.6	3.7	4.4
28	Fabricated metal pdt., exc. mach.&eq.	5.3	5.9	6.0	5.4	6.1
29	Machinery and equipment n. e. c.	6.8	6.1	13.6	7.6	9.1
30	Office machinery and computing	0.4	1.2	0.4	0.8	1.2
31	Electrical mach. & apparatus n.e.c.	7.4	5.0	4.8	5.3	12.4
32	Radio, telev. & communication eq.	3.2	2.4	3.3	3.7	4.5
33	Medical, precision/optical instruments	1.6	2.6	1.9	2.0	1.4
34	Motor vehicles, trailers&semi-trailers	5.0	5.2	3.2	4.1	12.6
35	Other transport equipment	0.4	0.5	0.3	0.5	0.3

36	Furniture; manufacturing n. e. c.	1.2	2.0	2.4	2.6	1.1
45	Construction	5.8	13.1	6.6	10.1	1.2
	TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source : Statistical Yearbook of Hungary, edition 1996 and 1997.

Table A-3 – Structure of the Data-Base by Regions (1998)

Code	Denomination of the region	Share in added value D-base	Share in total GDP National acc.	Share in employment, D-base	Share in total employment, all sectors	Share in exports D-base
1	Central Hungary (yc Budapest)	49.9	40.9	32.1	30.9	34.4
2	Central Transdanubia	12.7	9.9	11.7	11.3	19.0
3	Western Transdanubia	12.5	10.1	12.8	11.1	21.3
4	Southern Transdanubia	4.0	8.0	6.8	9.3	4.2
5	Northern Hungary	7.8	9.3	9.5	10.9	7.1
6	Northern Great Plain	6.5	10.8	16.3	12.8	6.9
7	Southern Great Plain	6.7	11.2	11.0	13.6	7.1
	TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source : Statistical Yearbook of Hungary, edition 1996 and 1997.

Table A- 4 – Share of Foreign Equity in the Exporting Sector (1998)

Part of exports in total sales	Participation of foreign shareholders				
	0%	0 à 20%	20 à 50%	50 à 80%	80 à 100%
0%	55.9	26.3	23.2	13.6	12.6
0-20%	21.4	26.7	29.2	29.1	22.0
20-50%	9.5	19.3	17.6	17.8	12.4
50-80%	6.4	14.8	12.2	14.8	14.8
80-100%	6.7	12.9	17.7	24.6	38.0
Total	**100**	**100**	**100**	**100**	**100**

Table 5 – Share of Domestic Equity in the Exporting Sector

Part of exports in total sales	Participation of private shareholders				
	0%	0 à 20%	20 à 50%	50 à 80%	80 à 100%
0%	30.0	23.4	25.3	32.4	56.6
0-20%	21.8	24.2	29.3	29.4	20.8
20-50%	13.3	13.7	16.4	16.4	8.6
50-80%	11.7	15.2	10.8	9.6	6.2
80-100%	23.2	23.5	18.2	12.1	7.8
Total	**100**	**100**	**100**	**100**	**100**

Table A-4 – Financial Performance and Foreign Ownership

% for. Own.	Number of firms	Share in total add. Val.	% of exports/ total sales	Add.value/ workers	Interest rates	Trade profit/add. value	Retained earnings/ add. val.
100	543	27.6	53	5 350	3.8	30.7	21.7
[75-100[	260	18.3	47	3 970	5.5	20.0	4.4
[50-75]	121	16.9	38	5 023	5.8	27.8	17.4
[25-50]	204	7.8	32	3 450	5.9	23.0	4.5
[0-25]	77	1.9	28	2 838	11.2	6.7	-2.5
0	2 764	27.6	15	1 845	6.4	11.1	2.1

Source: Kopint Datorg.

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