Exportation and Foreign Direct Investment in Visegrad Area: an Empirical Analysis.

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I. INTRODUCTION

This paper is an empirical analysis of the determinants of exportations and direct investments (FDI) in ex-socialist countries. We will verify the possibility to apply the approach, used to evaluate the determinants of direct investments and exportations all over the world, in these specific countries. It will also be our interest to define any possible relationship between these two forms of internationalisation.

Our methodology consists of a two-stage application. In the first part, basically, we try to fit quite well performing estimations for bilateral trade and FDI flows, while in the second part we verify the robustness of the previous outcomes through crossed estimations. Since we are acting in an empirical context, for the study of exportations, we will refer to the whole group of gravity models, as these ones fit better than other models in our purpose. On the contrary, for direct investment we will not refer to a specific setting, but we will merge different hints (as logically as possible) by the most adaptable theories.

In the last years the formerly closed markets of Central and Eastern Europe were opened to international trade and foreign investments. Capital flows toward these areas increased, quite immediately. At the same time important agreements in trade matters were concluded. In this new economic reality it is interesting to define the incentives for multinational firms to penetrate in these markets.

Our attention will be focused specially on Czech and Slovak Republics (hence defined as ex-CSFR), Hungary and Poland. These countries form the so-called Visegrad Area. This choice is determined by a double motivation. First of all, these countries have always had a special openness versus western economies, for their particular status in the general Socialist System[1]. Secondly, for these countries, we have quite complete economic data series which are not always available for all ex-socialist countries.

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[1] As ex-Yugoslavia too. It is impossible to refer also to this reality for the disruptive consequences of the most recent Civil War.

In the econometric setting for FDI, we take into account only one sector: Food & Beverage. This decision is sustained by two motivations. The first one is suggested by the availability of data and the second one is consistent with a specific choice: we were looking for a sector in which economic interests were sufficiently spread among a consistent number of foreign countries. This paper is organised as follows: the next Section includes some successful applications of gravity models for the estimation of the export flow in Visegrad countries. Section 3 contains an econometric analysis on the determinants of FDI in Visegrad area, whose main outcome reveals that the principal determinants to direct investment are specific variables such as cumulated experience or risk sharing conditions. In Section 4 we present the two-stage procedure for drawing any possible relation between export and FDI in the Food & Beverage sector and Section 5 concludes.

II. EXPORTATION TOWARDS VISEGRAD AREA.

International trade interests for Visegrad area have undoubtedly increased in these latest years. The opportunity of exploring new markets is really stimulating for multinational enterprises. Export-decisions could be evaluated as the first path for more consistent economic interests in this new area. Countries receiving a relative large proportion of local production from a particular country, also receive a relatively large proportion of exports coming from that country (Veugelers 1991). The limited knowledge about the economic structure and institutions in ex-socialist countries lets exportation be the best choice for compensating - at least initially- this structural lack.

Local governments often need the presence of foreign (and generally multinational) enterprises for sustaining the mechanisms of development. Therefore they force as much as possible the foreign interests in their areas (Mann 1991). In particular for Visegrad countries, the stipulation of special agreements between each country and the European Union has to be taken into account. The motivations behind these decisions are deeper than the simple trade setting. Former Czechoslovakia, Hungary and Poland are really interested to join the European Union and so they agreed to sign the so-called 'European Agreements' with EU in December 1991. These agreements establish a bilateral free trade of goods between the EU and the specific Visegrad partners within a period of 10 years. Generally, these agreements consist on the reduction of tariffs and/or quotas for trade between the two countries that signed the agreements. In fact the aim of EAs is to further the integration of the respective Eastern European economies with EU, by progressive steps towards the free movement of goods, services and factors in addition to other components[2] (Gros and Steinherr

[2] For instance the political dialogue, the harmonising legislation and co-operation in technological and scientific fields

1995). These Agreements explicitly recognise, as ultimate goal of Eastern European countries, joining to the European Community.

The sample of exporter countries has been chosen among the most significant countries present both in the trade setting and in the investment one. By our choice we point our attention on the following sample of exporters: Austria, France, Germany, Italy, Netherlands, Switzerland, United Kingdom and United States. Generally, the greatest exporters are US, Germany and France, but their ranking in importance is quite different in the total setting and in the specific one. In fact US, France and Netherlands are leading countries for exportations in F&B, while Germany has less weight in this sector. Turning to the specific analysis of Visegrad Area, we notice that Germany is the first exporter all over these countries. The first receiver country (in terms of amount of export inflows) is ex Czechoslovakia, even if any difference among all Visegrad countries is not so consistent. Considering the distribution of exporters, in the total export flow, we realise that in ex-CSFR and in Poland there is an absolute predominance of Germany, while in Hungary all exporters are significantly present. On the contrary, focusing attention only on F&B sector, there is a more equal trend in the spreading of exporters' presence, even if Germany is always the greatest one. Temporally we have an evolution in the trade flows and the great differentiation among exporters starts from 1992. All exporting countries have a common feature: their relative weight in F&B exportation flows (towards Visegrad Area), is always greater than their relative weight (always in Visegrad Area) in the total flows. The preferential destinations (and relative amounts) are quite different in the sample of countries. In the following tables we summarise these results, indicating by countries and by year the prior destinations.

TABLE 2.1
EXPORT DESTINATIONS IN VISEGRAD COUNTRIES (Source: Elaboration OECD data)

	1990	**1991**	**1992**	**1993**	**1994**
AUSTRIA	POLAND	POLAND	HUNGARY	HUNGARY	HUNGARY
FRANCE	POLAND	POLAND	POLAND	POLAND	POLAND
GERMAN.	POLAND	POLAND	POLAND	POLAND	POLAND
ITALY	POLAND	POLAND	EX-CSFR	EX-CSFR	EX-CSFR
NETHER.	POLAND	POLAND	POLAND	POLAND	POLAND
SWITZ.	HUNGARY	HUNGARY	POLAND	HUNGARY	POLAND
UK	POLAND	EX-CSFR	EX-CSFR	POLAND	POLAND
US	POLAND	POLAND	POLAND	POLAND	POLAND

TABLE 2.2
EXPORT DESTINATIONS IN VISEGRAD COUNTRIES FOR F&B SECTOR.
(Source: Elaboration OECD data)

	1990	**1991**	**1992**	**1993**	**1994**
AUSTRIA	POLAND	POLAND	POLAND	POLAND	HU./ex.CSFR
FRANCE	POLAND	POLAND	POLAND	HUNGARY	POLAND
GERMAN.	POLAND	POLAND	POLAND	POLAND	POLAND
ITALY	EX-CSFR	EX-CSFR	EX-CSFR	EX-CSFR	EX-CSFR
NETHER.	POLAND	POLAND	POLAND	POLAND	POLAND
SWITZ.	HUNGARY	HUNGARY	POLAND	HUNGARY	POLAND
UK	HUNGARY	EX-CSFR	EX-CSFR	EX-CSFR	HUNGARY
US	HUNGARY	POLAND	POLAND	POLAND	POLAND

These tables indicate that the distribution, among destination countries, is not always very uniform. The geographical proximity between the exporter country and the receiver one, that often emerges from these data, is interesting. We shall now to define a proper econometric model for explaining the possible determinants of these exportation flows. The approach which will be used for reaching our objective id the so-called 'Gravity Model'. The general form of a gravity equation may be properly expressed by the following logarithmic terms:

$$Ln\left(\exp.\ from\ i\ to\ j\right) = c + a\left[\ln\left(dist.i\ /\ j\right)\right] + b(adjacency\ dummy) + +d\left[\ln\left(GDP.\ j\right)\right] + e\left[\ln\left(per\ capitaGDP.i\right)\right]$$
$$+ f\left[\ln\left(per\ capitaGDP.\ j\right)\right] + k\left[\ln(GDP.i)\right] + g\left[\ln(area.i)\right] + +h\left[\ln\left(area.\ j\right)\right] + n(dummies) + \varepsilon \qquad (1)$$

The idea of this kind of econometric equation arises from the consideration that the amount of bilateral trade between two countries depends on their size and their distance. Theoretically, the larger the two countries are the more trade there should be between them and the greater the distance is, the less one might observe trade. In this kind of models, income, population and distance, together with dummy variables for other factors, normally explain over one-half of the total variance of the geographical distribution of trade (Gros and Steinherr,1995). These models are usually estimated on cross section data referring to a single year or an average of some years. In these settings, exportations from a country 'I' to a country 'J' are supposed to depend on national income (as a proxy for the supply of exportables) and national income in 'J' (as proxy for the demand for exportables in country J). Sometimes the level of per-capita output both for exporter and receiver countries (or equivalently the level of the population) may be introduced. It takes into account the idea of internal demand, i.e. a country with a higher per-capita income should trade more than a poor country. In this conceptualisation the national income of the exporter represents the supply, while the national income of the receiver represents the demand. The other variables take into account transport costs and eventually other obstacles or facilities to the trade flows. As transport costs we consider the geographical distance from a final destination, which has a negative effect on trade, and an adjacency dummy (which is positive for countries with sharing borders) that should influence trade positively. In the regression the two sizes of the exporter and receiver countries also appear. These values capture the transport costs from the hinterland to the economic centre. They should have a negative effect on trade. Finally, in the gravity equation there might be other variables, as dummy or not, which should capture other positive effects on trade flows, through more in specific characteristics such as bilateral agreements or historical and cultural linkages. In this analysis we consider quite all the previous type of variables, evaluating six different forms of specification (named from 'A' to 'F'). Our sample is composed of eight exporting countries (Austria France, Germany, Italy, Netherlands, Switzerland, United Kingdom and United States) for three destinations (ex- Czechoslovakia, Hungary and Poland) over a period of five years (from 1990 to 1994 included).[3] We apply the gravity model equation, building two kinds of cross sectional models both for the total bilateral exportation flows and for the specific F&B sector.

In the following tables we report our results. The first two tables (with models A, B, C, D, E, F) refer to the total export flows, while the second ones to F&B sector (with models A', B', C', D', E', F'). In the box 1.1 we express the meaning of the symbology adopted.

BOX 1

AJ: adjacency dummy
CEE: dummy variable for the membership of an exporter to EU
DU: dummy variable for special bilateral agreements.[4]
LAD : logarithm of the surface area of receiver country
LAI: logarithm of the surface area of exporter country
LDSTij: logarithm of the distance between the two capitals of countries i,j. (km)
LEIFSij: logarithm of value of exportations from country i to country j, in F&B.(millions of $)
LEXIDij: logarithm of value of the total exportations from country i to country j(millions of $)
LFDIS: logarithm of foreign direct investment flows in receiver countries (millions of $)
LGDPI: logarithm of nominal GDP for exporter country (millions of $)
LGDPIR: logarithm of real GDP of exporter country (millions of $)
LGDPII: logarithm of nominal GDP per capita for exporter country (millions of $)
LGDPIIR: logarithm of real GDP per capita for exporter country (millions of $)
LGDPS: logarithm of nominal GDP for receiver country (millions of $)
LGDPSR: logarithm of real GDP for receiver country (millions of $)
LGDPSI: logarithm of nominal GDP per capita for receiver country (millions of $)
LGDPSIR: logarithm of real GDP per capita for receiver country (millions of $)

[3] We used these data after having properly checked their non-autocorrelation. In these estimations we also applied methods for correcting cross-section equations from the heteoscedasticity errors.

[4] This dummy is defined for exports from Germany to Hungary (from 1991 to 1994) and for Italian exports in Poland in 1991 and 1992.

It has been defined after having observed, in correspondence with these relationships, exporting values over the standard average. Perhaps it is due to regional agreements bilaterally signed (outside EU) between these two countries.

LPD: logarithm of population of receiver country (millions)
LPI: logarithm of population of exporter country (millions)

TABLE 2.3

Estimation of gravity model using data on total bilateral trade in Visegrad Area (from 1990-1994).

Dependent variable : **LEXID** - Values in brackets : 2-tail sig.-Data source: IMF (1996) - OECD (1995)

	A	**B**	**C**
Constant	-15.954 (0.113)	- 11.72 (0.016)	- 2.245 (0.141)
AJ	1.268 (0.000)	1.32 (0.000)	1.229 (0.000)
LDST	- 0.373 (0.001)	- 0.31 (0.005)	- 0.336 (0.003)
DU	0.692 (0.011)	0.64 (0.017)	0.682 (0.010)
CEE	0.394 (0.011)	0.51 (0.000)	0.467 (0.000)
LGDPIR	0.150 (0.035)	0.12 (0.062)	0.177 (0.046)
LGDPSR	0.425 (0.001)	0.24 (0.080)	1.089 (0.000)
LPI	0.142 (0.250)		
LPD	- 1.814 (0.125)		
LAD	1.953 (0.084)	0.69 (0.002)	- 0.135 (0.471)
LAI	0.014 (0.879)	0.09 (0.197)	0.068 (0.361)
LGDPSI		0.95 (0.014)	
LGDPII		- 0.08 (0.398)	
LGDPSIR			- 0.372 (0.388)
LGDPIIR			- 0.252 (0.008)
R^2	0.6275	0.637	0.64
R^2 ADJ	0.5933	0.604	0.61
Observations	120	120	120

TABLE 2.4

Estimation of gravity model using data on total bilateral trade in Visegrad Area (from 1990-1994).

Dependent variable : **LEXID** - Values in brackets : 2-tail sig.-Data source: IMF (1996) - OECD (1995)

	D	**F**	**G**
Constant	-16.573 (0.019)	-14.08 (0.000)	- 12.19 (0.001)
AJ	1.492 (0.000)	1.53 (0.000)	1.629 (0.000)
LDST	- 0.296 (0.000)	- 0.25 (0.001)	- 0.227 (0.005)
DU	1.470 (0.000)	1.45 (0.000)	1.250 (0.008)
CEE	0.488 (0.000)	0.58 (0.000)	0.635 (0.000)
LGDPIR	0.128 (0.011)	0.09 (0.048)	0.057 (0.251)
LGDPSR	0.309 (0.000)	0.13 (0.182)	0.193 (0.057)
LPI	0.101 (0.240)		
LPD	1.723 (0.037)		
LAD	2.042 (0.010)	0.87 (0.000)	0.746 (0.000)
LAI	0.026 (0.691)	0.08 (0.069)	0.111 (0.031)
LGDPSI		1.00 (0.000)	
LGDPII		- 0.01 (0.856)	
LGDPSIR			0.852 (0.003)
LGDPIIR			0.006 (0.941)
R^2	0.807	0.819	0.809
R^2 ADJ	0.788	0.802	0.79
Observations	118	118	118

TABLE 2.5

Estimation of gravity model using data on total bilateral trade from 8 countries in Visegrad Area (from 1990-1994).

Dependent variable : **LEIDFS**- Values in brackets : 2-tail sig.-Data source: IMF (1996) - OECD (1995)

	A'	**B'**	**C'**
Constant	- 26.72 (0.058)	- 17.90 (0.009)	- 6.525 (0.003)
AJ	1.751 (0.000)	1.813 (0.000)	1.686 (0.000)
LDST	0.010 (0.947)	0.071 (0.641)	0.039 (0.797)
DU	0.753 (0.048)	0.749 (0.049)	0.761 (0.042)
CEE	0.822 (0.000)	0.935 (0.000)	0.860 (0.000)
LGDPIR	- 0.070 (0.474)	- 0.138 (0.150)	- 0.056 (0.649)
LGDPSR	0.519 (0.003)	0.356 (0.071)	1.187 (0.003)
LPI	0.088 (0.608)		
LPD	- 2.556 (0.122)		
LAD	2.673 (0.091)	0.716 (0.025)	- 0.114 (0.608)
LAI	0.022 (0.868)	0.095 (0.340)	0.052 (0.621)
LGDPSI		1.039 (0.068)	
LGDPII		0.025 (0.864)	
LGDPSIR			- 0.420 (0.491)
LGDPIIR			- 0.246 (0.067)
R^2	0.527	0.53	0.533
R^2 ADJ	0.484	0.487	0.49
Observations	120	120	120

TABLE 2.6

Estimation of gravity model using data on total bilateral trade in F&B in Visegrad Area (from 1990-1994).

Dependent variable : **LEIDFS**- Values in brackets : 2-tail sig.-Data source: IMF (1996) - OECD (1995)

	D'	**E'**	**F'**
Constant	- 24.19 (0.054)	- 18.617 (0.000)	- 8.036 (0.000)
AJ	1.660 (0.000)	1.732 (0.000)	1.618 (0.000)
LDST	- 0.101 (0.477)	- 0.042 (0.759)	- 0.066 (0.635)
DU	0.809 (0.017)	0.79 (0.002)	0.816 (0.015)
CEE	0.729 (0.000)	0.846 (0.000)	0.789 (0.000)
LGDPIR	- 0.044 (0.616)	- 0.096 (0.257)	- 0.039 (0.724)
LGDPSR	0.502 (0.001)	0.337 (0.054)	1.119 (0.001)
LPI	0.106 (0.490)		
LPD	- 2.083 (0.156)		
LAD	2.359 (0.094)	0.827 (0.004)	0.047 (0.843)
LAI	0.063 (0.592)	0.139 (0.118)	0.108 (0.251)
LGDPSI		0.978 (0.044)	
LGDPII		0.013 (0.918)	
LGDPSIR			-0.279 (0.607)
LGDPIIR			-0.230 (0.005)
R^2	0.63	0.635	0.636
R^2 ADJ	0.59	0.597	0.599
Observations	107	107	107

The previous tables describe some possible gravity models that identify the determinants of the bilateral trade towards Visegrad Area. There are two kinds of tables for each different dependent variable. In the first type the evaluation is done on all the sample, while the second one is built around a reduced sample, in which some observations are neglected because they are substantially different from the average trend of the sample. The first two tables give very significative outcomes. They are generally compatible with other studies as Aitken(1973), Havrylyshyn and Prichett(1991), Wang and Winters (1991) and Brenton and Kendall (1994), reported in Gros and Steinherr (1995). In the LEXID analysis[5], models A-B-C show that the distance is negatively related to the total export flows, while the adjacency dummy, the specific agreements as well as the supply and the demand of goods (LGDPIR and LGDPSR) are positively related to exportation inflows in Visegrad countries. More uncertainty is connected with the relative effects of geographical variables as surface area or GDP per capita. Turning to the models D-E-F (in which we don not take into account some outliers), the explicative power of these models is increased in comparison with the other specifications, but the results are substantially the same. However, in these specifications we have more information about variables that were less significant in the other ones. Surface area of destination countries and GDP per capita are positively correlated to the exportation inflows. This may mean that potential costs of transport do not influence negatively the flow trend at all. Considering the F&B sector, results are not always the same as in the general setting. While the dummy variables conserve the same correspondence to trade as in the previous case, distance is not significant at all for this specification This result reveals that, in this case, transport costs do not seem to matter to exporters [6]. In F&B sector real GDP of the exporter (supply) appears to be important, even at nominal per capital level, while in real terms it is the GDP per capita of receiver country that is significative. Finally the surface area of receiver countries is still positively related to trade flow. At the end of this part, some conclusions may be driven from these empirical models. Economic, institutional and geographic components account quite a lot in the description of trade flows. All these findings will be useful for better evaluating the relationship between FDI and exportation as presented in the second part of this study. Indeed, in our general scheme, these estimations are the first stage of a two-stage regression model for explaining the export flows, but before passing to the next stage, we need to state a proper estimation for FDI flows in Visegrad countries.

[5] Considering an upper bound at 10% for the level of significativity. This condition is kept for any other kind of regression.

[6] It could be a result related to this sector. Indeed, in F&B, trade flows are made of perishable goods that - by their nature- may distort the distance effect. Further comments on this feature might be drawn by comparisons with estimations in other sectors.

III. FOREIGN DIRECT INVESTMENT: AN EMPIRICAL INTROSPECTION

Foreign direct investments are a well known form of internationalisation for multinational firms. They are not intended as a simple placement of capital, but they involve the setting up of subsidiaries or participation in a foreign firm (Janssens 1997). At world level, their importance is becoming increasingly consistent. The sample of reference, evaluated for the exportation analysis, is also convenient for this context. In fact table 3.1 illustrates, clearly, that in the general trend of FDI, the eight countries named as principal actors account about 60% of total flow.

TABLE 3.1
OUTWARD FOREIGN DIRECT INVESTMENT TREND (Millions $)
Source : IMF (1996)

	1989	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**
WORLD	222883	235321	193379	190481	221873	227725	297264
% Quota							
US	16.5	12.7	16.2	22.3	35.2	23.9	32.1
Austria	0.38	0.72	0.66	0.98	0.66	0.52	0.38
France	8.74	14.7	12.3	16.4	9.28	10.0	6.30
Germany	6.84	10.2	12.2	10.3	6.88	7.32	11.7
Italy	0.96	3.14	3.58	3.41	4.17	2.47	2.32
Netherl.	6.68	6.53	7.01	7.48	5.27	7.35	4.05
Switzerl.	3.52	2.70	3.38	2.97	3.94	4.75	3.98
UK	15.9	8.21	8.43	9.97	11.50	12.4	13.5
Total % Quota	59.6	59.12	63.9	73.9	76.96	68.79	74.49

In table 3.2 we represent a further specification of the greatest direct investors in Visegrad Area, evaluated over a period of 5 years. This table underlines symmetries with exportation context. European countries are quite involved in investing in Visegrad Area, while the relative presence of US is less consistent than in export setting.

TABLE 3.2
GEOGRAPHICAL ORIGIN OF FOREIGN INVESTMENT IN VISEGRAD (from 1987 to 1991) AS % OF REGISTRATIONS

Source: Michalak W. Z. (1993)

Country of Origin	**ex- CSFR** % n. of Registr.	**HUNGARY** % n. of Registr.	**POLAND** % n. of Registr.	**TOTAL** % n. of Registr.
Germany	24.6	25.0	35.0	32.0
UK	3.1	4.8	5.2	5.0
Italy	4.0	4.6	4.7	4.6
Luxemb.	0.0	0.5	0.2	0.3
Netherl.	3.1	2.4	3.9	3.4
France	3.1	0.9	4.6	3.5
Denmark	0.4	0.8	2.6	2.1
Austria	35.1	25.5	7.1	13.3
Switzerl.	7.0	6.1	3.2	4.1
Sweden	1.8	2.3	9.2	7.0
Liechtenst.	0.0	2.1	0.9	1.1
Norway	0.0	0.2	0.8	0.6
Rest of EC	1.2	1.9	3.1	2.7
Rest of EFTA	0.8	1	0.7	0.9
Multinational	5.7	7.3	3.6	4.7
USA/Canada	1.8	8.2	9.3	8.6
Asia/Japan	0.9	1.4	2.1	1.8

There is not a single theory that could adequately explain FDI of enterprises. Beside the description of FDI in Visegrad countries is further complicated by a set of unique political and economic circumstances. The collapse of centrally planned systems has deeply reversed the policies in ex-Czechoslovakia, Hungary and Poland towards the inner flow of FDI (Janssens 1997). As a result of this new political wave, European countries are among the most important promoters of FDI in Visegrad (Mann 1991). At political level there is a double interest for investing in these new open markets. European government evaluates FDI as a tool for speeding the transformation of local markets into a truly market oriented economy, through their stabilising effect on macroeconomic transformations. On the other side, local governments repute FDI as a very important political and economic supporter to the transformation process (Michalak,1993). It is useful to present the very economic meaning that western investors attribute to FDI. As well described by Janssens (1997), the specific economic motivations to FDI in Visegrad area are in the following categories:

- Explore and access in new markets
- Achieve strategic positions in these markets
- Make use of cheaper local labour
- Exploit physical advantages
- Expect target country to enter in EU, and to derive further advantages from an integrated market.

On the receiver markets, the foreign presence has a clear role: it is an explicit warranty for providing better quality products, satisfying consumer demand and rescuing the waste and inefficiency of former centrally planned economies. However, investing in this area is not so good and easy as it may appear. There are some local problems or inefficiencies that make investments loose part of their potential profitability. The greatest problems come principally from the status of 'transition economics'. This means that investors often introduce themselves in markets not completely regulated and so, for instance, with great doubts on the effective appropriation of their profits. Both Michalak (1993) and EBRD Report (1994) present a clear summary of these possible problems, as it follows. There are three general macro-categories defined as Legal Problems, Macroeconomic and Microeconomic Level. In these categories we can insert the following elements :

- Ambiguities arising from regulation of foreign investments
- Bureaucratic problems
- Obsolete (and inadequate) infrastructural system
- Lack of local management and marketing expertise
- Irregular supplies of raw materials, good and services
- Inadequate financial system
- Limited convertibility of local currency
- Specialised local labour force, but not always well disciplined.

In the respect of previous ideas about the real motivations of investing, the main purpose of these estimations is to verify the real possibility to identify a few determinants of investment directions, taking also into account some geographical components. The empirical models that will be proposed in the following tables merge some variables taken by gravity models context of exportations, along with classical determinants to FDI will be considered (as in Veugelers 1991).[7] The availability of data leads the analysis to focus on a particular sector as F&B, over a period from 1991 to 1994. The lack of complete information on financial value of operations forces to consider as dependent variable not the investment value, but the number of bilateral investments realised yearly[8]. Another feature of this context is the riskness component that is afforded by investors. In the econometric analysis, the following regressors have been introduced to take into account explicitly this condition. The experience already

[7] A simple gravity model is not completely suitable because foreign direct investments are a more complex economic instrument of internationalisation than exportations. In fact they imply the permanent acquisition of economic interests in local markets of destination countries, while exportations do not involve a constant presence. Economically this condition can be interpreted with the presence of sunk costs in investments decisions.

[8] We built this variable so that it has a normal distribution.

acquired by investors[9] connected with the presence of other firms, which contemporaneously decide to invest in these markets, are evaluable as risk deterrent and so positively related to FDI flows. The first kind of variables (expressed as CU and DE) stress that the experience gained in a specific receiver market can become common knowledge and be shared by a group of enterprises. In particular this condition is stronger if these firms come from a same country (as embodied in DE) [10]. On the other hand the variable CU (i.e. the cumulative number of previous bilateral investments) reports a further connotation. It may be interpreted as a deterrent to further multinational entries, because it represents the total number of competitors already present in local markets. Therefore, in the following regressions we state which of these two effects may prevail for CU. We shall specify also the acquired experience on local markets in another way. We shall use, in substitution of CU, the correspondent of the total amount of the exportation inflows in F&B sector of the previous period. This variable is an indicator of acquired experience if we suppose that exports can serve as a learning mode before that substantial resources in setting on local production are committed (Veugelers 1991). According to this hypothesis, this indicator should record a positive relation with FDI. Finally, we introduce another dummy variable (MU) which evaluate the presence of multiple bilateral investments in a specific destination country. It focuses on the possible lobbying effect that a co-ordinated action between co-national investing firms can exert on local authorities.

On the whole we estimate this equation:

$$FDI_{ij} = c + a_1 CE + a_2 DU + a_3 MU + a_4 HJ + bDST_{ij} + dDWIDS_{ij} + eEIDFDR_{ij} + fAI + gAD + \\ + gGDPSR + \varepsilon_{ij} \qquad (2)$$

BOX 2

AI: surface area of the investor country
AD: surface area of receiver country
AJ: adjacency dummy between investor and receiver
CU: Cumulated presence of investor firms from a specific country in a destination area (of this sample) as number of total previous investments.
DE : Dummy for the experience acquired by an investor country in a specific destination, considered as the direct presence on the market;
DST : distance between the capitals of investor and receiver countries (in Km).
MU: dummy for yearly multiple bilateral investments [11].
DWIDS : difference in hourly wages in F&B between the investor and receiver counties (in $).
EIDFSR : value of export referred to the previous year from the investor to the receiver country (mill.$)

[9] Considered as cumulated number of investments from a country in a specific Visegrad country, in addition to the more general dummy that underlines the merely presence of some fellow-country corporations in a specific destination

[10] For instance through the intervention of a local governmental office that often tries to co-ordinate and sustain these types of investments.

[11] It is evaluated for countries that record more investments in a fixed destination than the total average.

FDI : number of direct investments realised in F&B sector in Visegrad area from 1991 to 1994.
GDPSR: current real GDP for receiver country (in millions $)
HJ: dummy for bilateral historical linkages

TABLE 3.3
DETERMINANTS TO FOREIGN DIRECT INVESTMENTS
Dependent Variable: **FDI** -Value in brackets : 2-tail sig.
Data Source: IMF (1996)-OECD (1995)- S.Alessandrini's Data Bank

	A	**B**	**C**
Constant	- 0.140 (0.776)	- 0.109 (0.826)	- 0.103 (0.830)
MU	4.825 (0.000)	4.758 (0.000)	4.750 (0.000)
AJ	- 0.693 (0.033)	- 1.037 (0.076)	- 1.088 (0.062)
DST	0.0001 (0.046)	0.0001 (0.043)	
DWIDS	0.0003 (0.071)	0.0003 (0.097)	0.0002 (0.157)
EIDFSR	0.003 (0.002)	0.003 (0.002)	0.0026 (0.034)
HJ		0.359 (0.477)	0.466 (0.365)
AI			6.6E-08 (0.057)
AD			1.15E-06 (0.209)
R^2	0.60	0.604	0.61
R^2 Adj.	0.58	0.578	0.579
Observations	96	96	96

TABLE 3.4
DETERMINANTS TO FOREIGN DIRECT INVESTMENTS
Dependent Variable: **FDI** -Value in brackets : 2-tail sig.
Data Source: IMF (1996)-OECD (1995)- S.Alessandrini's Data Bank

	D	**E**	**F**
Constant	0.13 (0.793)	- 0.550 (0.290)	- 0.527(0.303)
MU	4.727 (0.000)	4.842 (0.000)	4.897 (0.000)
AJ	- 0.227 (0.447)	- 0.461 (0.165)	- 0.1429 (0.604)
DST	0.0001 (0.055)	9.55E-05 (0.053)	9.97E-05 (0.04)
DWIDS	0.0003 (0.136)	0.0003 (0.113)	0.0019 (0.303)
EIDFSR		0.002 (0.139)	
GDPSR		1.22E-05 (0.031)	1.60E-05 (0.001)
DE			0.564 (0.021)
CU			- 0.103 (0.036)
R^2	0.55	0.623	0.639
R^2 Adj.	0.53	0.597	0.610
Observations	96	96	96

These results show clearly the importance of ad-hoc variables, built for transition economies. Models in tables 3.3 and 3.4 undoubtedly prove that the risk deterrent variables (DE, DU), as well as the difference in wages and local real GDP (GDPSR) (as proxy of local demand), motivate foreign investments. CU appears related negatively with the direct investment flow. This is meaning that the deterrent effect is stronger than the risk sharing one. The presence of other firms is truly a risk-deterrent component, but if this presence is too massive, the large amount of competitors in local markets may reduce the advantages obtainable by a FDI. Some peculiar findings come from the other variables. Historical linkages seem not to be important at all in this context, as adjacency dummy too. These results are quite original because they are totally opposed to the outputs of other analysis. Usually, the empirical analysis on FDI (as Veugelers (1991)) shows that social, cultural and historical linkages are really strong incentive for investment flows, since they represent the affinities between investor and receiver countries in market backgrounds. On the contrary these results state that the transition movement to a market economy deletes the effects of the previous type of linkages. Indeed a transition stage, such that in Visegrad countries, implies the intent of breaking off any relation with the ancient economic and social situations. In addition, in this analysis, the relationship between distance and direct investments is positive, while in export case the same variable presents a negative (but significant) coefficient. Theoretically, it is possible to justify these results admitting a sort of preferential substitution between investments and exports. The larger the distance the more direct investments will be preferred to exportations, in particular for a sector of perishables. These results stresses another original component of this analysis: even for the FDI flows the geographic variables matter. But what about a direct relation between exportation and direct investments ?

IV. CORRESPONDENCE BETWEEN EXPORTATION AND FDI IN THE F&B SECTOR

We try to offer a possible answer to the previous question in the following tables. We apply a sort two stage regression[12] for evaluating the nature of the (simultaneous) relationship between the exporting and FDI flow in the F&B sector.
As first stage we consider the results obtained in gravity models, defined for exports in Section 1. By these outputs [equation.(1)] we evaluate the best fitted value for exports (LEIFP) to insert (as a regressor) in the equation for FDI [equation.(2)] and vice-versa for exports. The same procedure is followed for inserting a fitted value of FDI (LFFDIS) in the export (for F&B) equation. In this way we obtain two new equations for estimating FDI and exportations. Defining the estimated equation of the first stage as:

- $LEIFP = c^* + b^*AJ + n^*DU + n_1{}^*CEE + d^*LGDPSI + e^*LGDPSR$
- $LFFDIS = c^* + d^*DWIDS + a_1{}^*CE + a_2{}^*DU + a_3{}^*MU + g^*GDPSR$

the results of the second-stage equations are the following ones :

[12] This application is driven by the very particular structure of the FDI variable and by the necessity of avoiding problems of collinearity.

TABLE 4.1
ANALYSIS OF THE CORRESPONDENCE BETWEEN FDI AND EXPORTATION
Dependent Variable: **FDI** -Value in brackets : 2-tail sig.
Data Source: IMF (1996)-OECD (1995)- S.Alessandrini's Data Bank

	A	**B**
Constant	-0.634 (0.175)	-0.568 (0.260)
DWIDS	0.0002 (0.213)	0.0002 (0.213)
DE	0.5768 (0.018)	0.5763 (0.019)
CU	- 0.104 (0.34)	- 0.103 (0.037)
MU	4.864 (0.000)	4.868 (0.000)
GDPSR	1.60E-05 (0.001)	1.66E-05 (0.001)
DST	0.0001 (0.021)	0.0001 (0.020)
LEIFP		- 0.050 (0.713)
R^2	0.638	0.639
R^2 Adj.	0.614	0.61
Observations	96	96

TABLE 4.2
ANALYSIS OF THE CORRESPONDENCE BETWEEN FDI AND EXPORTATION
Dependent Variable: **LEIDFS** -Value in brackets : 2-tail sig.
Data Source: IMF (1996)-OECD (1995)- S.Alessandrini's Data Bank

	A	**B**
Constant	-0.17 (0.966)	0.365 (0.930)
AJ	1.88 (0.000)	1.7923 (0.000)
DU	0.856 (0.023)	0.817 (0.032)
CEE	1.095 (0.000)	1.015 (0.000)
LDST	5.27E-05 (0.180)	
LGDPSR	0.593 (0.001)	0.575 (0.002)
LGDPSI	-0.368 (0.372)	-0.392 (0.348)
LFFDIS		0.0594 (0.646)
R^2	0.52	0.521
R^2 Adj.	0.48	0.489
Observations	96	96

In table 4.1 the variable LEIFP is the fitted value for exportation and F&B and in table 4.2 LFFDIS is the fitted value for FDI. Both of them are not significant in each of two specifications. These two equations state that we cannot define properly the direct correspondence between FDI and exports, probably because of the presence of some positive and negative compensating effects. This outcome is unsuccessful because we are not able to answer directly to the previous question. However, indirectly, by these two last tables we may draw useful comments. Indeed, these last estimations confirm that all our previous results are consistent since all the applied regressors keep the same sign in correspondence of the proper dependent variable. This condition establishes also that the magnitude of the correspondence between each variable and its depending variable is quite fixed. They also prove that our ad-hoc variables still keep their crucial role as regressors, jointly with their correspondent relation with the dependent variables.

V. CONCLUSIONS

An empirical investigation on exportation and foreign direct investment flows towards Visegrad Area offers interesting outcomes. In the empirical setting the integration of some peculiar variables (as riskness, cumulated experience and institutional agreements) in general models of reference reveals to be very useful in increasing the explanatory capacity of the adopted frameworks. As we could expect, in these countries, the large presence of competitors (already installed in local markets) is a deterrent for further direct investments. In both the cases the geographical distance matters quite a lot, even if in an asymmetric correspondence for exports and FDI. Supply and demand components are positive and consistent motivations for exports or direct investments in Visegrad Area. This means that the local demand for foreign goods is very active. In contrast to our expectations, transport costs are not a deterrent for both of these processes of internationalisation in Visegrad countries. This analysis does not clarify completely the correct relationship between direct investments and exportations, but it may give a channel of interpretation. It seems that exports towards these new countries are an initial condition for a more complete economic involvement in these new markets.

REFERENCES

Aitken N.D. (1973) : ‘The Effect of EEC and EFTA on European trade: a Temporal Cross Section Analysis’, *American Economic Review*, vol.63(5), pp. 881-892

Brenton P. - Kendall T. (1994): ‘*Back to the earth with the Gravity Model: further estimates for eastern European Countries’*, Centre for European Policy Study, Bruxelles.

E.B.R.D. (1994) : *’ Economic Transition in the Easter Europe and the Former Soviet Union. Transition Report'*,London.

Gros D. - Steinherr A. (1995) : *’ Winds of Change : Economic Transition in Central and Eastern Europe ’*, Longman Publishing Group, London.

Havrylyshyn O. - Prichett L. (1991): '*European Trade Patterns of the Transition'*, Working Paper n. 748, The World Bank, Washington.

IMF (1996) :'*International Financial Statistics* ' Washington.

Janssens S. (1997*): 'Globalisation, Wages and Employment in Industrialised Countries : An Overview*.' Discussion Paper on the Economic Transformation :Policy, Institution and Structure - Leuven Institute for Central and East European Studies - Working Paper n.61/1997.

Mann C.L. (1991) : 'Industry Restructuring in the East Central Europe : the Challenge and the Roll for Foreign Direct Investment *' American Economic Review*,vol.81, pp. 181-184.

Michalak W.Z. (1993): ' Foreign Direct Investment and Joint Ventures in East-Central Europe : a Geographical Perspective '*Environment and Planning, vol.25,* pp 1573-1591

OECD (1995): *'Foreign Trade by Commodities'*, Paris.

Veugelers R. (1991): 'Locational Determinants and Ranking of Host Countries: an Empirical Assestment' *Kyklos*, vol.44(3), pp. 362-382.

Wang Z.K. - Winters A. (1991): *'The Trading potential of Eastern Europe'* CEPR Discussion Paper n.610, London.

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Abstract: *Exportation and Foreign Direct Investment in Visegrad Area*.The main object of this analysis is to emphasise, empirically, some determinants to exportations and foreign direct investments in Visegrad Area. The interest is to verify whether it is really possible to model location decisions in these countries with proper references already adopted in literature. For exportations, our results are quite similar to the prediction given, in general, by gravity models. However we have different results for FDI. This analysis proves that investment decisions towards Visegrad countries, are substantially influenced by ad-hoc variables for CEECs.

Key-words: Gravity Models, Location Determinants.
JEL Classification: F1-F21-F16-F26.