
Inter-country FDI Distribution Patterns in the EU

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Abstract

The aim of this paper is to examine the impact of economic integration on intra EU FDI. More specifically, a model is employed regressing country relative intensities of inward FDI originated from within the EU against a set of variables expected to affect the FDI inter-country distribution. Trade appears to be a significant and positive factor mobilizing intra regional inward FDI in almost all cases. The next important determinants of intra EU FDI are supply cost variables. Capital productivity and development level considerations seem to have played a minor role in determining patterns of intra-EU FDI.

JEL classification: **F15, F21, F23.**

Key words:

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1. Introduction

The emergence of a single market in the European Union (EU) is expected to have contributed to the growth of trade and investment, between

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the countries of the Union. Economic integration is supposed to have set in motion a process of convergence and/or divergence within the EU, which either balances or amplifies inter member country differences related with supply side conditions, e.g. wages, interest rates, external economies, etc., and economic policies, and through them to influence intra-regional foreign direct investment (FDI) flows.

There is considerable theoretical and empirical research on the relationship between the Single Market and FDI into the EU. Clegg (1998) suggests that the growth of intra-EU FDI is linked to the adoption of a pan-European FDI strategy by EU firms, largely prompted by EU market integration. Neary (2002) extends the theory of multinational corporations identifying distinct influences of internal trade liberalization by a group of countries on the level and pattern of inward FDI. There are also other studies concerned with economic integration and FDI (Balasubramanyam, Sapsford & Griffins, 2002; Neven & Siotis, 1996; Pain & Lansbury, 1997). The aim of this paper is to examine the impact of economic integration on intra EU FDI. More specifically, a model is employed regressing country relative intensities of inward FDI originated from within the EU against a set of variables expected to affect the FDI inter-country distribution.

Economic theory suggests that the abolition of tariffs and other trade barriers between two or more countries raises the bilateral or regional trade volume (Viner, 1950). Enhanced trade would partly substitute defensive FDI sourced in the member countries of the customs union and motivated by a strategy of penetrating protected national markets, especially large ones (for an analysis of the exporting vs. local production in the presence of tariffs see Horst, 1973 and Hirsch, 1976). As opposed to that, efficiency seeking FDI (for the categorization of FDI see Narula, 1996) is possible to expand. An emerging single market increases competition, and economies of scale and scope through liberalizing both the access of firms to the constituent national markets and the mobility of production factors. Therefore, it rises the scope for production rationalization (Cantwell, 1988; UNCTC, 1990) and the building of a regionally integrated network of affiliated firms under common ownership that locate production phases or the manufacturing of different varieties of the same product according to local supply conditions. Such a production network would take advantages from free intra-firm trade, lower cross border coordination costs effected through the inter-country convergence of institutions, policies, attitudes, codes of behavior and the deregulation of market transactions, and finally of economies of scale through marketing to an enlarged regional market.

A liberalized single market through free trade and access to factor, product and services market may also favour strategic asset seeking FDI, which tries to get access to skills, technologies, R&D facilities and other intangible

resources, most of which are country and firm idiosyncratic in nature and subject to culture, institutions and agglomeration economies. In addition, a unified single regional market may facilitate the transfer across national boundaries of intangible firm specific income and market power generating resources, such as brand names, managerial expertise and other non-codified information intensive assets, for which market failure is high. Therefore, full economic rents may better be extracted via common ownership, viz. FDI rather than licensing or other arm's length transactions (see the internalization theory of FDI, indicatively Buckley and Casson, 1976; Rugman, 1980, 1985; Dunning 1981; Hennart, 1982).

2. Towards building a model: Hypotheses and variables

The creation of a single regional market may result to intensified trade between the member countries. That means that the share of intra-regional trade to total international trade of the region (intra plus extra regional trade) would increase. In this context the relative volume of intra-regional trade may approximate the degree of completing the single regional market and an increasing share may indicate an increasing integration of the individual national markets of the region. In turn, the deepening of regional integration is expected to promote a regional in scope business and investment strategy of firms advancing the motives for both the efficiency and strategic seeking FDI. It is also expected that a single regional market nullify the motives for defensive FDI. However, this is rather a once and for all effect occurring in the initial stage of building a unified regional market. In this respect the overall effect is assumed to be rather positive, especially because in the EU case a customs union preceded the single market program, thus any substitution effect should have been exhausted well before 1985, when the single market program was launched. Therefore, the hypothesis may be formulated as it follows:

H1: A member country's further integration with the EU's single market, as it is approximated by the ratio of this country's intra EU exports plus imports over its total (intra plus extra EU) exports and imports, is assumed to have a positive effect on the country's inward FDI originated in the EU.

The unification of the EU's internal market spurs competition across the enlarged market, thus triggering industrial restructuring according to national competitive advantages, as they are manifested in supply conditions. With free mobility of production factors and inputs value added activities would locate in the most cost efficient sites, according to the nature of each activity.

That may create clusters of similar activities located in specific or neighboring areas. Such clustering may give rise to agglomeration economies the type of which differs across countries and sub-regions reinforcing the inflow of similar investments. In any case, inward FDI would depend on individual countries supply conditions, with countries having relatively more favorable supply conditions receiving higher proportions of inward FDI. Therefore, the formulation of the second hypothesis may be formulated as following:

H2: The relative proportion of intra-regional FDI flowing into a member country would be increasing as the country's supply conditions are becoming more advantageous relatively to these of other member countries.

It is assumed that supply cost approximates supply conditions and in this context two measures are proposed for relative supply cost of a member country i at a time t :

- Real unit labor cost in country i over the EU average real unit labor cost
- Labor productivity in country i over the EU average labor productivity

As the value of the second ratio increases so it does the relative cost advantage of a specific country within the EU, hence the expected sign is positive. On the contrary, as the value of the first ratio increases the relative cost advantage of an individual country tends to decrease, so the expected sign is negative.

Economic theory predicts that in a unified regional market free capital mobility, the accompanied deregulation of individual country capital markets, and the harmonization of codes, procedures, and standards may result to the equalization of the marginal efficiency of capital prevailing in the constituent national markets. Investment would flow from countries of relatively lower capital productivity to these with relatively higher one. Economic theory suggests further that marginal efficiency of capital becomes equal to interest rates, which also tend to be equal between countries under a perfect capital mobility regime. In this context interest rates may be used as proxies for the marginal efficiency of capital, and to the extent that interest rates, hence marginal efficiencies of capital, differ between member countries, FDI would continue to flow from countries of low capital productivity to countries with a higher return on investments. The following index is proposed to measure the degree of interest rate differentiation of a member country:

$$\sum_i (R_i - R_{EU})^2$$

Where:

R_i is the long term interest rate of country i .

R_{EU} is the EU average long-term interest rate.

An increasing value of the index reveals increasing divergence of the interest rate of the country compared with other member countries. The hypothesis may take the following form:

H3: An increasing interest rate divergence of a member country from the union's average may be interpreted as an increasing divergence of this country's marginal efficiency of capital compared with that of other member countries. Hence, intra-regional FDI is expected to show an increasing tendency to be directed towards this specific member country.

Inter country differences in demand structures, as they are expressed by per capita income deviations from a region average, may induce FDI in marketing intensive sectors in cases where more sophisticated structures are being created, or discourage FDI in cases where demand structures tend to downgrade. At the same time, per capita income differences may manifest differentiation of the development level between countries, hence different availability of resources, especially created ones, as well as different levels of agglomeration economies and business opportunities in each country. These differences as they are eliminated or pronounced by the advancement of a country's development may benefit FDI motivated by the existence of resources complementary to firm specific ownership advantages. The ratio of GDP per capita of country i over the EU average GDP per capita may be used for measuring the relative development position of a country within the EU. The hypothesis may be formed as it follows:

H4: As a member country advances its development level relatively to that of the others, intra-regional FDI would be increasingly motivated to flow into this country.

Finally, the dependent variable is the ratio of intra-EU FDI flowing into a member country over total intra EU inward FDI. An increasing ratio reveals an increasing tendency of intra EU FDI to concentrate in the specific member country.

3. The model

The model function can be summarized as it follows:

$$FDI = F(YN, DI, L, W, XM, D1, D2, D3)$$

Where:

FDI = ratio of inward FDI coming from EU over total intra EU FDI.

YN = relative GDP per capita = GDP_i over GDP_{EU}

GDP_i = GDP per capita of country i

GDP_{EU} = EU average GDP per capita

DI = $\sum_i (R_i - R_{EU})^2$ = long term interest rate convergence-divergence index

R = long term interest rate of country i ($i=1 \dots 15$)

R_{EU} = EU average long term interest rate

L = relative labor productivity = l_i over l_{EU}

l_i = labor productivity in country i

l_{EU} = EU average labor productivity

W = relative labor cost = w_i over w_{EU}

w_i = real unit labor cost in country i

w_{EU} = EU average real unit labor cost

XM = ratio of intra EU exports and imports over total exports and imports of country i . That variable represents trade integration in EU.

D₁ = dummy variable for the EU enlargement in 1986 (Spain and Portugal enter EU).

The dummy takes the value of 0 prior to 1986 and the value of 1 after.

D₂ = dummy variable for the EU enlargement in 1996 (Austria, Sweden and Finland enter EU). The dummy takes the value of 0 prior to 1996 and the value of 1 after.

D₃ = dummy variable standing for the German unification in 1989. The dummy takes the value of 0 prior to 1990 and the value of 1 after.

4. Estimation methodology, data and results

The log linear form of the equation presented in section 3 is estimated using OLS for each country separately with annual data for the period 1980-2000. The equation has a log linear form because under this specification elasticities given by the estimated coefficients are constant. The equation is estimated for the following EU members: France, Germany, Italy, UK, Spain, Denmark, Ireland, Austria, Finland Belgium-Luxembourg, the Netherlands and Sweden. The model is not estimated for Portugal and Greece because of extensively missing data in the FDI series.

The GDP per capita, long term interest rate, real unit labor cost, labor productivity and exports data have been sourced from *Eurostat*, while FDI data from the *OECD FDI statistics*. The results are presented in Table 1.

The model is not performing at all in the cases of Germany, the Netherlands and Sweden. Therefore, the discussion of the results will focus on the other counties. The Durbin-Watson statistic indicates the presence of auto-correlation in the cases of France, Spain, Denmark, Ireland, Belgium and Finland. The Cochrane-Orcutt technique was used for correction.

Trade appears to be a significant and positive factor mobilizing intra regional inward FDI in all but Ireland cases. Internal EU trade has been proved complementary to intra regional FDI, and the opening of markets has facilitated the relocation of economic activity and the formation of production and marketing networks within the region.

Supply cost considerations are significant determinants in the cases of Italy, the UK, Ireland, and Finland with the focus being on relative labor cost in the case of the UK, and in relative labor productivity in the case of Finland while both cost variables are significant in the cases of Italy and Ireland. The impact of supply conditions on intra-regional FDI is as expected.

Relative development level is a statistically significant determinant in three cases, namely the UK, Belgium-Luxembourg and Denmark. In all cases it has the expected relationship with the dependent variable.

Divergent marginal efficiency of capital seems to be a significant and positive factor influencing intra regional FDI in three cases, namely France, Spain and Austria.

In the case of Austria its EU membership *per se* seems to have a positive impact on receiving FDI originating in other EU member countries.

Table 1: OLS Estimates of Inward FDI Ratio for Period 1980-2000

	Con	YN	DI	L	W	XM	D1	D2	D3	R2	F stat.	DW
France	-1.94* (8.99)	-0.08 (0.58)	0.1** (1.95)	-0.40 (1.10)	3.96 (1.07)	1.34* (3.44)				0.59	3.16*	1.75
Germany	3.44 (0.65)	-0.44 (0.76)	-0.56* (2.22)	-0.22 (0.27)	33.15 (0.85)	5.97 (0.83)			-1.5** (1.83)	0.47	1.52	2.30
Italy	-0.36 (1.07)	-0.08 (0.68)	0.001 (0.07)	0.03** (1.88)	-0.5** (1.72)	0.4** (1.75)				0.45	2.5**	2.05
UK	1.0** (2.01)	0.78* (3.71)	-0.01 (0.89)	-0.03 (1.36)	-2.5* (3.87)	1.56* (3.19)				0.71	7.67*	1.84
Spain	-2.00 (1.10)	0.21 (0.39)	0.04* (5.12)	-0.01 (0.23)	1.48 (1.40)	9.76* (2.12)	0.03 (0.1)			0.79	8.60*	1.78
Denmark	-5.71* (5.31)	7.64* (3.53)	0.008 (0.28)	0.02 (0.66)	0.02 (0.66)	0.78* (3.70)				0.46	2.6**	2.20
Ireland	0.38* (2.51)	-0.05 (1.47)	0.001 (1.29)	0.004* (2.10)	-0.33* (2.92)	0.003 (0.09)				0.62	2.7**	2.04
Austria	5.61* (9.95)	1.74 (1.44)	0.05* (2.76)	0.24 (0.82)	-8.51 (1.01)	2.2** (1.84)		0.10* (3.50)		0.62	3.90*	1.84
Finland	26.7* (3.32)	-14.14 (1.03)	-0.12 (0.39)	1.97* (5.84)	-0.55 (0.84)	31.1* (3.55)		0.20 (0.04)		0.77	6.04*	1.79
Netherlands	-0.40 (0.80)	-0.001 (1.09)	-0.003 (1.03)	-0.001 (0.06)	0.73 (1.58)	-0.18 (0.87)				0.38	1.37	2.08
Belgium- Luxembourg	0.49 (0.74)	0.21* (1.97)	0.01 (0.89)	-0.009 (0.45)	-0.55 (0.84)	-0.09 (0.19)				0.51	2.1**	1.31
Sweden	-4.30 (1.70)	-3.27 (1.11)	0.08 (1.73)	-0.32 (0.74)	9.92 (0.74)	-1.01 (0.24)		1.5** (1.90)		0.47	1.98	2.03

* means significant at 5% level. ** means significant at 10% level. The values in parenthesis are t-statistics.

5. Conclusion

In all performing cases but Ireland the formation of the single market, to a lesser or greater extent, appears to be the most powerful mobilizing factor of intra-regional FDI. The latter seems to complement intra-regional trade flows and in some cases to follow cost advantages of different locations. In the Irish case though, only supply cost factors seem to be the main determinants of FDI flows coming from within the EU. Such considerations are absent in the case of Spain contrary to the belief that the relatively low labor cost in this country should have been one of the major attractions for foreign investment. In general, the free mobility of goods, services, and factors of production has benefited the majority of member countries in terms of attracting increasing proportions of intra-regional FDI.

Capital productivity considerations seem to have played a minor role in determining patterns of intra-EU FDI. This may be due to the fact that factors influencing the efficiency of capital are usually parts of the FDI package transferred across national boundaries. This transfer is even more frictionless in the framework of the single market. An even more minor role is attributed to development levels. Although there are differences in the per capita income of the member countries these differences are not so acute as to create the need for major adaptations of marketing strategies and types of product. Demand structures are rather similar between the member countries and they do not represent major factors in determining the pattern of intra EU FDI.

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