

**CENTRALISATION OR DISPERSION?: A SPATIAL ANALYSIS
OF THE IMPACT OF THE SINGLE MARKET PROGRAMME
ON THE ACTIVITY OF US MANUFACTURING AFFILIATES**

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RESUMEN

Durante la última década se han desarrollado muchos modelos teóricos sobre la distribución espacial de la industria, un campo conocido como la "Nueva Geografía Económica". Más recientemente varias investigaciones empíricas han pretendido verificar las hipótesis teóricas de dicha literatura. Sin embargo, se ha prestado relativamente poca atención a la actividad de las empresas multinacionales. Este estudio abarca un análisis espacial de la actividad de las filiales manufactureras de propiedad estadounidense durante el periodo previo y posterior a la puesta en marcha del Programa de Mercado Único (1987 -92). Contra los avisos de que el proceso de integración europea podría llevar a una concentración de la actividad económica en los países centrales de la Unión Europea, se concluye que las filiales estadounidenses están contribuyendo a una descentralización de la actividad manufacturera hacia los países periféricos.

PALABRAS CLAVES: Mercado Unico. Nueva Geografía. Económica. Empresas multinacionales. Integración Europea . Localización industrial. Inversión Extranjera Directa.

ABSTRACT

Over the last decade, much theoretical work has been carried out into the spatial distribution of industry, a field collectively known as the *New Economic Geography*. More recently, a number of empirical investigations have been published which have tested the propositions made in the theoretical literature. Nonetheless, relatively little attention in empirical research in this area has been given to the activity of the multinational corporations. This paper involves a spatial analysis of the activity of US manufacturing affiliates in the EU over the period prior and subsequent to the implementation of the Single Market Programme (1987-92). Against warnings that deeper integration may lead to a concentration of economic activity in the centrally-located countries of the EU, US-owned affiliates are found to be contributing to the decentralisation of manufacturing activity towards the European periphery.

KEY WORDS: Single Market Programme. Manufacturing Affiliates. Multinational Enterprises. European Integration. Location industrial. Foreign Direct Investment.

1. INTRODUCTION

In the last decade or so there have been a number of interesting attempts to formalise models which analyse spatial patterns of economic activity, attempts which collectively have become known as the “New Economic Geography” (NEG). Contributions by authors such as Krugman (1991), Venables (1996) and Baldwin (1998) have led to the development of an (ostensibly) novel approach to the way we think about location - the emphasis is now on agglomeration, on the way in which firms tend to cluster together and how regions are formed. In contrast to the partial equilibrium models which have characterised most previous analysis of industrial location, these new contributions involve *full general-equilibrium models*, wherein resource constraints are incorporated, and the geographical distributions of population, demand and supply are treated as endogenous (Krugman, 1998). One of the principal strengths of this new literature is the way it draws on a wide-range of intellectual sources for its elaboration; the theoretical work not only contains elements of structuralist models, from the viewpoint of cumulative causation (e.g. Myrdal, 1957), but also incorporates some neglected insights of economic geographers with regard to the importance of market potential (e.g. Christaller 1966).

More recently, a number of empirical investigations, based on employment and output data for EU member states, have been published which have tested the propositions made in the theoretical literature (Brülhart, 1996 and 1998; Amiti, 1998; Storper et al., 2000).¹ Although far from conclusive, the findings of these studies are generally favourable to the principle tenets of the NEG. Nonetheless, there has been an absence of a thorough consideration of the implications of the NEG for the activity of multinational enterprises (MNEs). This is counterintuitive. Bearing in mind much of recent relocation activity has taken the form of FDI, the spatial organisation of MNEs is all the more relevant to these models (Ottaviano & Puga, 1997). This paper represents an attempt to redress this oversight. It involves a spatial analysis of the activity of US manufacturing affiliates in the EU over the period prior and subsequent to the implementation of the Single Market Programme (SMP) (1987 -92). This is particularly pertinent to testing the findings of the NEG literature, because most models focus on the change in industrial location induced by a concerted policy change such as that produced by regional integration. The study uses data provided by the U.S. Department of Commerce, derived from their annual and benchmark surveys of affiliate activity. This source includes a wide range of variables related to affiliate activity (employment, capital investment, sales, value-added, etc.). The analysis covers all the majority-owned affiliates (MOFAs) legally required to provide information to the US Department of Commerce (i.e. with total assets, sales or net income greater than \$3 million) in the manufacturing sector.

The analysis of US-owned affiliates is especially apposite to the study of industrial location in Europe- in comparison with European MNEs, American firms have not hamstrung by national loyalties and consequently have been better able to resist political pressures to retain

¹ For an evaluation of the impact of regional integration in a North American context, see Hansen (1998).

inefficient operations. They have thus been able to seek out the best methods of production and locations (Lipsey, 1990:1). Additionally, " *US MNEs were the first ones to grasp the potential of the European Common Market, and to manoeuvre boldly amongst its idiosyncrasies*" (Wilkins, 1996). To the extent that this is true, and US MNEs have tended to reorganise their operations in the European market more rapidly than European firms, the analysis of the locational response of US affiliates to the SMP should provide us with valuable clues as to the future locational tendencies for EU industry as a whole.

2. CENTRALISATION AND DISPERSION- A CRITICAL REVIEW OF THE THEORETICAL AND EMPIRICAL LITERATURE.

In one of the first contributions to the NEG, Krugman and Venables (1990) explicitly address the question of how economic integration can impact on the geographical distribution of industry.² In that paper, a model is developed which distinguishes between two regions - a large "core" country and a smaller *periphery* country- with two industries: one monopolistically competitive (manufacturing) and one perfectly competitive imperfectly (agriculture). The paper explores the way in which economic integration can, by affecting the balance between centrifugal and centripetal forces, decisively affect the spatial location of economic activities. Before integration, trade costs are presumed to be high, and thus the distribution of manufacturing industry is dispersed between the two regions. After integration, however, trade costs fall, and this will provoke a relocation of industry.

Ceteris paribus, exactly how industry reacts to deeper integration essentially depends on the behaviour of two key variables - trade costs and the prevalence of scale economies. Were trade costs to fall to negligible levels, Krugman and Venables' model suggests that the periphery may well benefit from the process of integration; firms would be attracted to the lower costs of the periphery and would not have to face any additional access costs from being located there. But the outcome is more complicated at intermediate levels of transport costs. If regional integration is an imperfect process, and trade costs remain considerable, Krugman and Venables hypothesize a situation whereby it may be advantageous to concentrate production at the location with higher costs, but better access, so as to take advantage of scale economies in production. Because of the difficulty of reducing trade costs to a negligible level, *Krugman and Venables foresee the possibility of a sizeable re-allocation of industry in favour of Northern Europe, and away from the periphery, when trade liberalisation is incomplete.*

Although peripheral countries are unlikely to lose overall from the formation of the SMP (because the impact of lower consumer prices is felt no matter where the production of goods characterised by economies of scale takes place), there is thus a possibility that richer regions will gain most because of their enhanced attractiveness as locations for those industries, leading to a gradual divergence in average per capita income between centre and periphery (Barry, 1996: 348). The conclusion that some authors (for example, Corado, 1990) have drawn from

² Although Krugman claims that this article was the "genre's founding paper", the NEG literature can in fact be traced back to Faini (1984).

this kind of analysis is that it is necessary to deepen the integration process further still, so as to lower the costs of market access from the periphery and thereby make peripheral regions more attractive locations. Crucially, however, this interpretation relies on one's conception of whether or not trade or non-trade barriers can be eliminated, or at least minimised so as to have a negligible effect on location: if the answer to this *incognito* is negative and it is believed that significant barriers will remain, then, following the "*second-best theorem*", it may be better for peripheral countries to resist further integration.³

Indeed, other authors (e.g. Barry, 1996; Dignan, 1995) draw a quite different conclusion to that of Corado, warning that dedicating too many EU resources towards the development of transport infrastructure in the periphery could theoretically have a negative impact on the locational advantages of the peripheral regions - the advantages of a central location for industries where increasing returns are dominant would still not be overcome, and the improvement of transport provision in peripheral areas would simply facilitate access for centrally-located firms to sell their goods there.⁴ This represents a powerful and polemical argument: the reasoning is borne out to a certain extent by the empirical findings of Martin and Rodgers (1994) who note that, while there is a strong correlation within the regions of the EU between GDP per capita, telecommunications, educational infrastructure, and the share of intra-industry trade (which they identify with the location of increasing-returns industry), there is only a weak correlation between GDP per capita and the provision of transport infrastructure.

To what extent does the Krugman and Venable model, and subsequent work carried out by the "New Economic Geographers", represent a significant contribution to the debate over industrial location? Arguably, most of these models operationalize a series of variables which many analysts now consider of only marginal importance as determinants of industrial location. For instance, as far back as papers published by Kaldor (1970) and Balassa (1977), economists have been warning that that transport costs take on far too important a role in explaining the geographic distribution of industries; in most industries transport costs represent only a very small part of total costs and, what is more, the trend is clearly downwards.⁵ This is particularly true of the kind of high-value, low-weight products involved in most MNE transactions (Holland, 1976:154). Similar doubts have been voiced regarding the empirical importance of scale economies as a determinant of industrial location. Plausibly, as suggested by the growing literature on industrial districts, *external* economies of scale *are* important. Even in this context, however, there is theoretical uncertainty as to the level on which they may operate - whether at the level of the city, region, or even larger areas (Chisholm; 1995:80).⁶

³ On an intuitive level, the *second-best theorem* infers that, if an economy suffers from two or more distortions, their effects could be partially or wholly to neutralise each other. Removal of one of them (in our case, high transport costs) could thus result in an even more inefficient outcome. See Toye (1990:95-97) for a brief explanation of the second-best theorem.

⁴ This argument is not in fact new. See, for instance, the extensive empirical study by Stöhr and Tödting (1977).

⁵ For instance, a survey carried out by Touche Ross on a sample of 381 manufactures in seven European countries surveyed in 1994 found that transport costs accounted for only 1.5-2.0 per cent of sales revenues (cited in Mackinnon, 1997:348).

⁶ Unfortunately, little empirical work has been carried out to quantify the nature and magnitude of scale externalities. A recent exception is the comprehensive study by Henderson (1999).

A particularly scathing criticism of the NEG is provided by Martin (1999), who maintains that the basic line of analysis focuses excessively on the role of economies of scale, increasing returns and cumulative causation (a line of investigation which received considerable attention from economic geographers in the 1960s and 70s), while at the same time neglecting a host of other important forces that also influence the geographical distribution of industry and economic activity, such as the role of local infrastructure, local institutions, state spending and intervention, regulatory arrangements, foreign investment and divestment, and global competition. Indeed, it could be argued that, apart from a general predisposition towards agglomeration, these models predict very little - everything hinges on the parameter values assumed with regards to scale and agglomeration economies, transport costs and market preferences.

Krugman (1998:173) himself in fact concedes that these models “*are not at all easy to calibrate to actual data; in general, the tendency toward agglomeration is stronger in the models than it seems to be in the real economy!*” The obvious answer to this would be that the parameter values overestimate centripetal forces and underestimate centrifugal ones.⁷ In a subsequent paper, Krugman and Venables (1995) suggest that if integration is achieved principally through heightened intra-industry, rather than inter-industry, trade, then there may indeed be little overall change in the level of specialisation. Countries with similar development levels will simply become more specialised in particular sectors, and integration will have little or no effect on inter-country incomes. On this point, the empirical work is contradictory; whereas a study by Brühlhart (1996) suggests that one of the strongest trends in the economic geography of the EU has been the increasing specialisation of countries in different manufacturing sectors, a more recent paper by Stoper, Chen and De Paolis (2000) shows that, although intra-industry trade has risen, locational concentration and specialisation hardly changed at all over the period 1970-1995. Only in a very few industries had the spatial distribution changed substantially during the period studied.

Of all the empirical analyses carried out so far, however, it would appear that only two studies explicitly relate the NEG to the locational policies of MNEs. Barry (1996) focuses his analysis on changes in the share of industrial employment in Ireland and accounted for by foreign MNEs. Using the categorisation of Pratten (1988), Barry identifies a number of *increasing-return sectors* and breaks down figures for employment in these sectors between indigenous firms and MNEs (Table 1). He concludes that whereas indigenous firm employment has been falling in the IRS firms, contributing to a deindustrialisation process in the Irish periphery compatible with Krugman’s hypothesis, ***the converse is true of MNEs located in Ireland.*** Employment within MNEs in these same sectors rose from 16.2% to 30.5% of all manufacturing sector employment between 1973-93.⁸ In other words, it seems possible that foreign MNEs are

⁷ Puga (1996) argues that the lack of mobility of European workers limits the possibility of agglomeration. Junius (1996) elaborates a model inspired by the Krugman and Venables framework, but which explicitly takes into account centrifugal forces (land rents, adverse self-fulfilling expectations and congestion effects).

⁸ This is in fact lower than in the case of the central EU9 countries (including Spain), where employment in these sectors accounts for 57% of total employment, but, as Barry points out, the tendency is in the right direction, even though it would appear that indigenous employers are being squeezed out of the IRS sectors.

contributing towards offsetting divergent tendencies between centre and periphery, at least in terms of employment generation.⁹

Table 1. Employment in Increasing Return Sectors in Ireland, 1973-93

	1973	1980	1993
Indigenous employment	25,209	27,440	22,565
<i>% share of total manufacturing employment</i>	<i>12.5</i>	<i>11.9</i>	<i>11.6</i>
Multinational employment	32,735	50,114	59,055
<i>% share of total manufacturing</i>	<i>16.2</i>	<i>21.7</i>	<i>30.5</i>

Source: Barry, 1996:355

In a more recent study, Görg and Ruane (1999) examine the distribution of US manufacturing investment across individual EU Member States within a centre -periphery type framework. In the first place, they analyse the distribution of capital expenditures by US manufacturing firms in the EU12 countries, relative to GDP share in the EU, for the period 1983-95. With the exception of Ireland, they find that peripheral countries have, on average, attracted a lower share of US investment on a *pro rata* basis, and conclude that there is no evidence that the recent entrants - Greece, Portugal and Spain - have enjoyed significant increases in their ability to attract US investment. They argue that this confirms the expectation that peripheral locations in general are at a relative disadvantage compared with core countries in attracting US investment.¹⁰ In this sense, their findings confirm some of the predictions of the NEG. Görg and Ruane then calculate the degree of specialisation of US investment in the EU12 countries, using sectorial concentration indexes based on the Hirschman -Hirfindahl index. Although standard theory would predict that, in the larger single market, investment in different member countries would tend to specialise sectorially, reflecting different relative locational advantages across countries, Görg and Ruane find no evidence of increasing specialisation in the large core countries. Of the EU12 countries, only Spain and Ireland reveal a notable tendency towards sectorial concentration of the kind expected to occur following the creation of the Single Market. US investment would seem to be sectorially specialised only in small and peripheral countries, while the large core countries attract investment which primarily serves the local market and is relatively evenly distributed across sectors. Significantly, they conclude that, despite increasing integration, *individual country markets continue to be an important determinant of location.*

⁹ In view of the fact that the Irish operations of foreign MNEs are renowned for their high capital intensity, these employment figures surely underestimate the importance of MNE production in these sectors, and consequently the importance of their contribution to offsetting the simultaneous contraction of indigenous production.

¹⁰ It might be objected that locational preference is distorted by analysing locational choices in terms of capital expenditures as a share of EU12 GDP. What matters is not so much capital expenditures vis-à-vis the share of EU12 GDP (a value-added measure), but rather the share of total EU12 investment which the peripheral countries manage to attract (if GDP increases at a greater rate in the periphery, as it has tended to over the last 40 years, then ceteris paribus the share of capital investment in GDP will be smaller than in the central countries). Our own analysis carried out in Section III reveals that real capital investment has indeed increased in the peripheral countries compared to the central countries.

In summary, in spite of the aforementioned criticisms, and some empirical ambiguity, the NEG does illustrate how trade liberalisation may not necessarily lead to a more decentralised pattern of industrial production, but rather exacerbate regional differences. Indeed, as Baldwin stresses, one of the key lessons from the recent literature on economic geography is that the location of economic activity is marked by multiple outcomes. In other words, ***there is not a single constellation of economic concentrations towards which Europe is inevitably heading.*** There is an uncertainty about what it will look like (Baldwin, 1994:134).

A further and, from the point of view of this article, more important, issue is that although the new theories of trade and economic geography are concerned with plant location, they singularly fail to address the issue of *firm ownership*. As Barry (1996) points out, this is no trivial omission. On the contrary, through the repatriation of profits, the fact of whether a firm is foreign or nationally-owned can make a crucial difference to the outcome in welfare terms for the peripheral economies.¹¹ Indeed, the removal of trade barriers and the fall in transport costs have opened the possibility of MNEs selling their goods in the periphery without the need to produce there. The better human capital, infrastructure and location enjoyed by the core countries could offset the labour cost advantages of the peripheral countries. One of the fundamental contributions of the NEG literature is to alert us to this possibility.

3. Empirical Analysis

Most empirical studies into the spatial distribution of economic activity carried out by MNEs use FDI data. However, this is questionable on various grounds. Firstly, FDI represents simply one among many ways of financing overseas expansion, and thus it may be poorly correlated with other indicators of firm-level activity, such as employment, or value-added. Secondly, despite the importance commonly attached to FDI flows, there are still numerous definitional problems regarding what should be regarded as direct investment (*vis-à-vis* portfolio investment). For instance, some countries still do not apply the 10 percent minimum of share capital recommended by the OECD to distinguish between direct and portfolio investment. Similarly, not all countries include reinvested earnings or intra-company loans in their measures of FDI. Thirdly, companies often channel FDI through third countries, making it difficult or impossible to identify the ultimate source of the investment. Thus, for example, Ford may decide to expand its operations in Spain by financing FDI through Ford UK, a practice that would show up in the balance of payments data as an FDI from the UK to Spain, even though the ultimate owner of the share capital is an American company.

Bearing in mind these difficulties, this paper instead focuses on indicators of real firm activity, namely, investment, gross product and employment. In any in-depth analysis of locational choice, there are, of course, other indicators which should be considered, such as

¹¹ See, for example, Tironi's (1980) discussion of the concepts of *foreign profit creation* and *foreign profit diversion* by MNEs located within an integrated area. In this context, it is interesting to note that, due to profit repatriation and dividend payments of foreign MNEs, a large difference exists between GDP and GNP measures for Ireland, and the disparity is increasing over time. By 1996 southern Irish GNP was more than 13 percent lower than its GDP.

expenditure on R&D, sales data, etc. However, in this study we are fundamentally concerned with the distribution of foreign *production*, and thus ignore these alternative measures.

The analysis distinguishes between two groups of countries - the eight central countries (Belgium, Denmark, France, Germany, Italy, Luxembourg, the Netherlands, and the UK) and the four peripheral countries (Greece, Ireland, Portugal and Spain). Although admittedly a simplification, this distinction facilitates a better understanding of the dynamic changes taking place in the EU. By its very nature, centre-periphery analysis is a dynamic way of approaching spatial development; it implies discontinuity and change, something which is very much a characteristic of the operations of MNEs. More importantly still, the centre-periphery framework provides an extremely useful parallel to current research being carried out by the "*New Economic Geographers*". The models expounded by these authors have all been developed in terms of a centre-periphery construct. In principle, then, by adopting such a theoretical approach, it is possible to compare the results of the studies cited in Section II with the present analysis to see whether American MNEs are contributing towards the same processes of geographic concentration along central-periphery lines, or are, on the contrary, going against current trends and displaying locational preferences at odds with the patterns observed for national industries.

a) FDI and Capital Investment

Comparing the pre- and post-SMP periods for the whole of the EU12, we see that, whereas FDI inflows increased by 35 percent, capital investment increased by barely 11 percent. Capital investment has grown fastest in Ireland, where the yearly average between 1987-95 was almost double that during the period 1978-86 (from \$314 million to \$619 million). Portugal and Spain also enjoyed a notable increase in the rate of capital investment over the period, the laggard of the story being Greece.

Perhaps the most striking thing to transcend from this data is that capital investment growth in France or Germany, the two *powerhouses* behind the whole process of European integration, was low or negligible in the post-SMP period. Indeed, average annual capital investment fell by nearly 5 percent in Germany in the post-SMP period. This compares with a significant increase in FDI received by manufacturing subsidiaries based in France (nearly double), and a smaller increase in Germany. The conclusion is, then, that in terms of the growth of capital investment, the SMP had a very small net effect. Nor does staying out of the SMP, as Switzerland did, seem to have reduced the chances of attracting significant new investment by US manufacturing firms- average investment in Swiss subsidiaries increased by nearly 62 percent over the two periods.

It is interesting to note that the difference between capital investment figures and FDI is far larger for the central countries than for the periphery (Figure 1). This is in fact as one would expect- in the central countries, MNEs have access to larger, more liquid, capital markets, and therefore do not have to depend so much on FDI as a way of financing the expansion of activities in their affiliates. By comparison, the peripheral countries are far more reliant on FDI for new investment expenditure (indeed, in some years, FDI even exceeds capital investment).

The conclusion to draw is that an analysis of locational preference based solely on FDI data would systematically underestimate the importance of investment in central locations, giving a misleading impression with regard to the strength of centripetal forces within the EU.

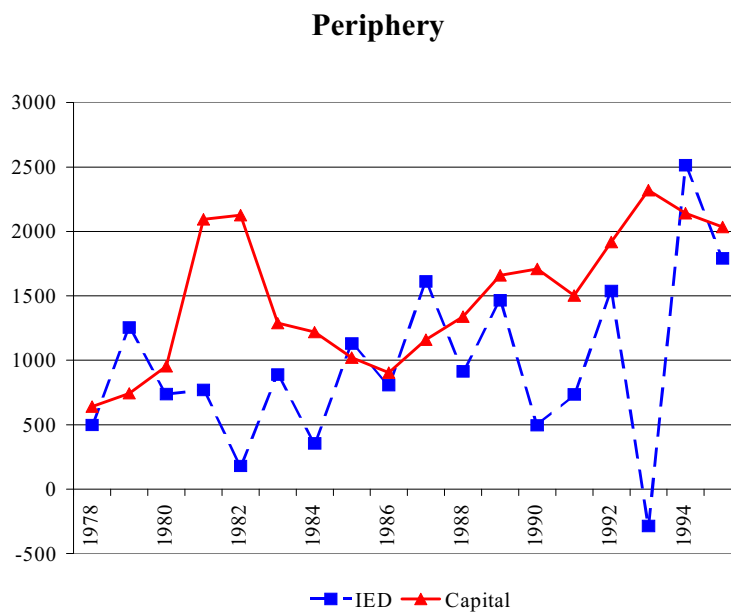
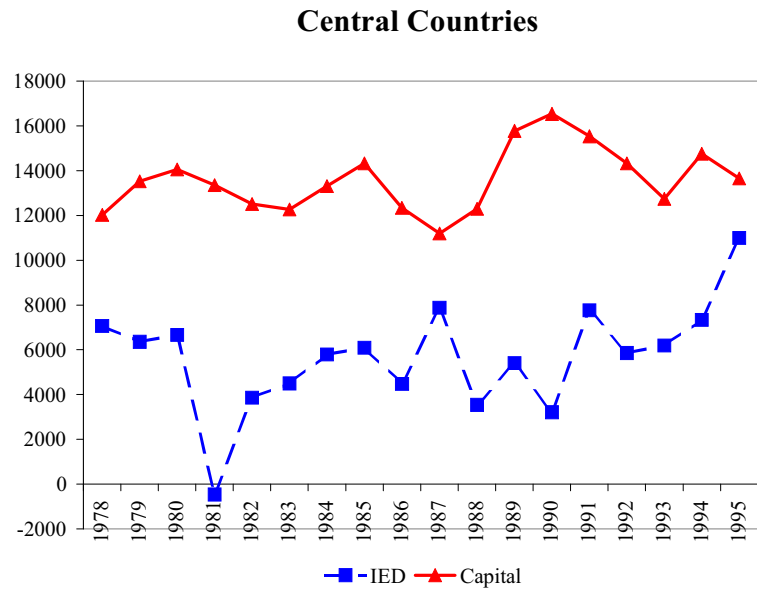
Table 2. FDI and Capital Investment by US manufacturing Affiliates, 1978-95

	FDI Inflows			Capital Investment		
	Annual Average		Total Increase	Annual Average		Total Increase
	1978-86	1987-95	(1978-86=100)	1978-86	1987-95	(1978-86=100)
Centre						
Belgium	164	568	347	611	919	150.4
Denmark	28	24	86	47	74	158.1
France	508	995	196	2045	2237	109.4
Germany	889	1050	118	4270	4069	95.3
Italy	780	1073	138	1239	1265	102.1
Luxembourg	15	120	800	84	95	113.2
Netherlands	539	739	137	998	1160	116.2
UK	2004	1894	95	3787	4273	112.9
Periphery						
Greece	-8	17	-226	36	34	94.3
Ireland	577	669	116	314	619	197.0
Portugal	11	43	376	56	80	141.2
Spain	155	468	303	814	1021	125.4
EU12	5663	7663	135	14302	15846	110.8
*Switzerland	123	690	560	101	164	161.6
Centre	4927	6465	131	13081	14092	107.7
Periphery	736	1198	163	1221	1753	143.6
Periphery/ % of EU12	12.99	15.63	-	9.3%	12.4%	-

*in millions US\$ at 1990 prices and exchange rates

Source: Own elaboration, from Department of Commerce data and OECD (1998).

Figure 1. Capital Investment in US Manufacturing MOFAs, 1978-95



* In millions US\$ at 1990 prices and exchange rates
 Source: Own Elaboration, from Department of Commerce Data.

b) Gross Product

Gross product is a measure of the value -added by the firm. As such, it can be measured as a firm's gross output (sales or receipts and other operating income, plus inventory change) less its intermediate inputs (purchased goods and services).¹² As the 1994 Benchmark Survey (US Department of Commerce,1994:17) notes, "*estimates of gross product rather than sales or other measures are generally preferred in assessing the impact of parents or affiliates on the entire host economy as well as on individual industries.*" Using gross product data permits a more focused analysis of the economic impact of affiliates because it measures only the affiliates *own* production, whereas sales do not distinguish between internal production and production originating elsewhere. In addition, gross product measures the value added to the economy during a specific period. In contrast, some sales in a given period may represent production from earlier periods (US Department of Commerce, 1998:17). To avoid relying on current price data (which can easily distort assessments of locational choice), estimates of real gross product were produced by first translating the current dollar figures provided by the US Department of Commerce into local currency, and then deflating by using the corresponding manufacturing price indicators.¹³ Finally, as for the FDI and investment data, value -added figures were translated back into US dollars using annual average exchange rates for 1990.¹⁴ On this basis, we compare the evolution of production in peripheral countries with the central countries.

Table 3. Gross Product of US MOFAs, 1982=100

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Millions US\$														
Centre	76,652	76,259	80,813	83,571	85,720	89,626	95,138	100,887	100,862	99,387	91,851	92,533	103,913	107,989
Periphery	5,596	6,277	7,312	7,793	7,748	9,842	11,030	11,445	11,231	11,382	10,743	10,691	12,358	14,051
Index (1982=100)														
Centre	100.0	99.5	105.4	109.0	111.8	116.9	124.1	131.6	131.6	129.7	119.8	120.7	135.6	140.9
Periphery	100.0	112.2	130.7	139.3	138.5	175.9	197.1	204.5	200.7	203.4	192.0	191.0	220.8	251.1

Source: Own elaboration from Dept. of Commerce data calculated at 1990 prices and exchange rates.

¹² In fact, the BEA follow an alternative method to calculate the gross product- the sum of costs incurred (other than for intermediate inputs) and profits earned in production. See Mataloni (1997).

¹³ The price deflators were taken from the OECD Indicators of Industrial Activities, (various quarterly issues). Unfortunately, they were not available for France, Italy and Portugal, and so in these cases the current price data were adjusted using consumer goods price deflators. This conceivably leads to an underestimate of the real gross product in these three cases (in view of the faster average productivity growth in the manufacturing sector, inflation is probably lower than for the rest of the economy). In the absence of the appropriate price indicators, unfortunately the problem is fairly intractable.

¹⁴ As a base year, 1990 provides a fairly good basis for comparison between countries- market exchange rates for the EU12 countries (with perhaps the exception of Italy) were fairly close to their PPP value.

What does this data set show? The evidence here is strongly in favour of the hypothesis of decentralisation towards the peripheral countries. In the first place, it is quite clear that value added in the peripheral countries has been growing at a faster rate than in the central group of countries. Taking 1982 production levels as 100, by 1995 production in the periphery had risen to 251, compared to 141 in the central countries (Table 3). In Table 4 the same data is shown on a country-by-country basis, and is compared with the evolution of value -added in the whole of the manufacturing sector (i.e. including national firms and MNEs from other countries). It is apparent that in a number of countries there has been a notable divergence in output between US firms and the rest of the manufacturing sector. In the cases where this is true (Belgium, Luxembourg, The Netherlands, and Spain), growth of value -added has been more dynamic in US MOFAs than the average for the whole of the manufacturing sector. This is particularly so in the case of for three of the four peripheral countries (Spain, Portugal and Greece). The exception to this story is the UK, where the cutback in output by US firms has been more pronounced than for the manufacturing sector as a whole. The conclusion, once again, is that the US manufacturing affiliates have been contributing to the decentralisation of production in the EU.

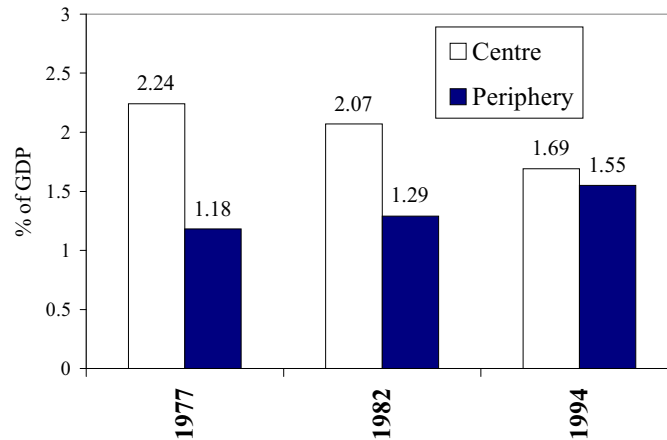
Table 4. Comparison of Gross Product of US manufacturing MOFAs to total Manufacturing Production Index, EU12 1982-95*

	US MOFAs	Total
<i>Centre</i>		
Belgium	200.7	139.2
Denmark	162.9	150.3
Germany	134.5	126.4
France	148.3	109.5
Italy	137.6	128.7
Luxembourg	259.2	150.8
Netherlands	212.7	137.2
UK	123.4	131.7
<i>Periphery</i>		
Greece	159.7	101.8
Ireland	321.6	303.0
Portugal	199.7	127.4
Spain	218.8	128.3

* 1982= 100 Source: Own elaboration, from Dept. of Commerce & OECD (1998).

This conclusion regarding the faster growth of production in the periphery is also supported by comparing the contribution of manufacturing MOFAs of centre and periphery countries *in current prices* to total value-added (i.e. GDP). Whereas the contribution to the GDP of the central countries has been gradually declining (from 2.2 percent in 1977 to 1.7 percent in 1994), American manufacturing MOFAs have become progressively more important in the peripheral countries (rising from 1.2 percent to 1.6 percent in 1994) (Figure 2).

Figure 2. Gross Product of US manufacturing MOFAs as Percentage of GDP, 1977-1994

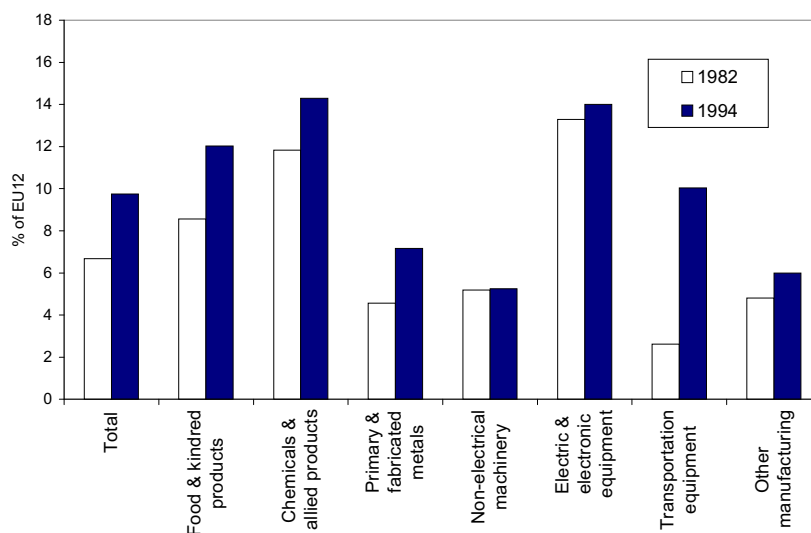


Source: As for Figure 2 but calculated at current prices and exchange rates.

So far, we have addressed the question of how to evaluate the evolution of value -added without considering sectoral changes. Yet the sector -specific impact of the SMP should not be underestimated. In the Annex, calculations are shown for the share of gross product by US manufacturing MOFAs located in the sectors which, according to the European Commission (Emerson *et. al.*; 1990), are highly or moderately sensitive to the SMP.¹⁵ These calculations reveal that *around 63 percent of gross product by US MOFAs in 1994 were found in these sectors*. Unfortunately, on a sectoral basis the Department of Commerce data is rather limited...detailed sectoral data is given on ly for the largest host countries or regions (e.g. Asia, Canada, Germany, UK, Mexico). As a consequence, the only division possible is within seven broad manufacturing categories, namely a) *food and kindred products* b) *chemicals and allied products* c) *primary fabricated metals* d) *industrial machinery and equipment* e) *electronic and other electrical equipment* f) *transportation equipment* and g) *other manufacturing*. Clearly, this level of aggregation limits the kind of locational analysis that can be carried o ut; unfortunately, the more detailed analysis of locational preference carried out by Amiti (1998) and Brühlhart (1998) or Storper *et. al.* (2000) for EU industry as a whole on trade data using NACE 2 -digit industrial classifications is not possible for US affiliates in Europe.

¹⁵ Because the required level of sectoral detail was not available for the EU12, the data was calculated on the basis of figures for Europe as a whole.

Figure 3. Share of Peripheral Economies in Value-added Activities of US Manufacturing MOFAs in EU12, 1982-94



Source: Own elaboration, from Dept. of Commerce (1982 & 1994)

On the information available, and in the absence of a complete set of sector-based price deflators, the share of the periphery in value-added at the sectoral level was calculated using current price data (Figure 3). In terms of the geographic distribution of value-added activities by US MOFAs, it is apparent that **in relative terms a pronounced shift of production towards the periphery has occurred in the period 1982-94**. The share of the peripheral economies in total gross product of manufacturing industries for the EU-12 rose from 6.6 to 9.7 percent during this period. In some sectors, the shift has been particularly pronounced - namely, in *transportation equipment, food and kindred products, primary and fabricated metals, and chemicals and allied products*. By contrast, relative growth was less notable in *non-electrical machinery and electronics*. It is worth stressing, however, that most of the gains in relative share of production was not at the expense of the centrally-located economies of Germany, France, Belgium or The Netherlands (all of which maintained or improved their own shares), but rather at the expense of the UK, which saw its share of total value-added in the manufacturing sector fall from 32.7 percent to 23.3 percent between 1982 and 1994.

c) Employment

Employment data is revealing not only because of the importance of the employment issue in itself, but also because it provides a useful stock-indicator of MNE activities in home and host countries which is not influenced by inflation and currency fluctuations, unlike figures on MNE output or FDI (Parisotto, 1993:33). For this reason such data has been widely used in previous studies into locational shifts of manufacturing industry in the EU (e.g. Brülhart, 1998; Molle, 1995). The principle problem with this approach to analysing locational change

(something which is often not sufficiently emphasised in empirical studies) is that the level of employment is affected by shifts in the production function (i.e. the relative capital/labour intensity of operations). In this sense, because of the widespread adoption of labour-saving strategies since the mid-1980s, the rapid growth in US FDI worldwide has not been reflected in a proportional increase in employment. Consequently, over time changes in the level of employment may have become less indicative of changes in real economic activity (Mataloni, 1995:33).

Table 5. Employment in US manufacturing MOFAs, 1977-95

	<u>Year</u>					<u>Compound Rate of growth</u>	
	1977	1982	1986	1990	1995	77-86	87-95
US Parents	11779	10533	10431	9805	9045	-1.3%	-1.5%
World	3773	3358	3092	3377	3659	-2.2%	2.4%
Centre							
Belgium	92	87	77	80	69	-2.0%	-0.6%
Denmark	7	7	8	7	9	0.7%	1.2%
France	290	209	183	208	220	-5.0%	2.5%
Germany	425	404	364	406	387	-1.7%	1.0%
Italy	165	131	118	130	122	-3.7%	0.7%
Luxembourg	7	7	8	6	7	1.6%	-0.2%
Netherlands	72	69	63	80	71	-1.5%	1.9%
UK	707	516	446	464	429	-5.0%	-0.1%
Periphery							
Greece	8	6	4	5	6	-7.5%	3.9%
Ireland	19	32	29	40	50	4.6%	6.2%
Portugal	8	14	11	14	19	4.5%	6.3%
Spain	106	92	84	94	91	-2.5%	0.6%
EU12	1908	1575	1395	1534	1480	-3.4%	1.0%
Centre	1767	1430	1267	1381	1314	-3.6%	0.8%
Periphery	141	144	129	153	166	-1.0%	2.7%
Periphery/EU12	7.4%	9.2%	9.2%	10.0%	11.2%	-	-
Rest of World	1866	1783	1697	1843	2179	-1.0%	3.4%

Source: Own elaboration, from Department of Commerce data.

What conclusions can be drawn from this indicator about changes in locational preference by US firms since the implementation of the SMP? In general terms, although employment growth in US manufacturing MOFAs has been stagnant, in relative terms the peripheral countries would seem to have been favoured by the process of deeper economic integration (Table 5). Although small in absolute terms (total manufacturing employment by MOFAs in the peripheral countries rising from 141,000 to 166,000), since 1977 the share of total EU12 MOFA manufacturing employment accounted for by the periphery has risen from

7.4 percent to 11.2 percent in 1995. In contrast, the central countries experienced a sharp cutback in manufacturing employment in the late 1970s-early 1980s, from 1.77 million in 1977 to 1.31 million in 1983. Employment thereafter was relatively stable in the central countries. It is also worth noting that the dynamism of employment generation by US manufacturing firms has been considerably greater outside the EU12 in recent years - in the rest of the world (ROW) group, employment growth has been much faster. Growth has been especially strong in the Asia and Pacific region, where there has been strong investment in labour-intensive industries such as electronics assembly (Mataloni, 1997:54).

In spite of this difficult context, and with the possible exception of Greece, it would appear that US MOFAs have generally contributed positively to the balance of total employment in the peripheral countries, especially in the period since 1987. This is particularly true from 1990 onwards, when US firms continued to increase employment in the periphery group of countries, despite the quite sharp recession of the European economy between 1990-93 and a corresponding contraction in total employment in the manufacturing sector. Prior to the SMP, American firms were cutting back employment in all four of the peripheral countries.¹⁶ The announcement of the SMP seems to have coincided with a significant upswing in the employment creation by US firms, particularly in Portugal and Ireland, but also in Spain and Greece (the same is also true of France and the Netherlands).

Indeed, from a historical perspective, the share of the periphery in total manufacturing employment in US MOFAs has been increasing since the 1960s - in 1966, it was only 3.8 percent, and in 1977 the share was 7.4 percent. Consequently, it is difficult to discern whether the changes are principally due to the formation of the SMP, membership of the EU, or simply a long-run process of relative catching-up with the central countries. On an empirical level, the most we can say is that there is little support for the proposition of Krugman (1991) that greater market integration in Europe has led to a gradual centralisation of production by manufacturing firms. This at least has been the experience of US firms located in the EU.

c) Indexes of Localisation and Specialisation

By the use of a simple indexes of specialization and localization, in this section we will attempt to evaluate the impact of the SMP on the degree of regional specialisation of US MNEs operating within the EU12.¹⁷ In a previous study into long-run changes in industrial location in Europe, Amiti (1998) uses value-added data. Unfortunately, this methodology runs the risk that shifts in the calculated specialisation and locational coefficients are due to exchange rate movements or changes in inter-sectoral prices rather than real underlying changes in the volume

¹⁶ This process which was particularly pronounced in the case of Greece, where the economic policies of the PASOK government and the nationalisation of the assets of EXXON led to a rapid withdrawal of confidence of US investors. Half the Greek manufacturing jobs which had existed in US MOFAs in 1977 had disappeared by 1986.

¹⁷ The data available does not allow us to directly test the propositions of the NEG. The NEG stresses that geographical concentration is likely to be higher in industries subject to scale economies and with a high proportion of intermediate inputs in final production. More industry and regional detail is needed than currently available to adequately test these hypotheses for the EU12.

of production. Instead of trying to control for these changes, and following the methodology adopted earlier studies on changes in industrial location in Europe by Molle (1995) and Brülhart (1996 & 1998), it was considered a more straightforward procedure to use employment data.¹⁸ The first step was to calculate the specialisation coefficient, defined as

$$SC_r = \frac{\sum_{i=1}^I |\sigma_{ir} - \sigma_i|}{2}$$

where

$\sigma_{ir} = e_{ir}/e_r$ is the share of the sector i in the total employment of US MNEs in the country r ; and $\sigma_i = e_i/e$ is the share of sector i in the total EU employment of US MNEs.¹⁹

The specialisation coefficient reveals the degree of sectoral diversity within the manufacturing sector in each of the EU12 member states - the closer the distribution of an industry i is to that of overall manufacturing in the EU, the smaller the index. If the predictions of the new economic geographers were correct, due to the interaction of falling transport and trade costs, and the possibility of taking advantage of scale economies, we would expect evidence of *increasing* specialisation within the manufacturing sector between the member states. From the results shown in Table 6, it is clear that there is a notable difference in the degree of diversification between the central and periphery countries as a group. The presence of US MOFAs is generally far more diversified in the central countries than in the periphery. That said, the absolute size of each economy seems to be the salient variable; for example, Denmark has a higher specialisation coefficient than Spain, and Luxembourg a higher coefficient than Greece.

However, there is some evidence of increasing specialisation in the peripheral economies. In Greece, Ireland and, above all, Portugal the specialisation coefficients have risen.²⁰ Only in Spain is there evidence of a tendency towards greater diversification. The other observable tendency appears to be that, with the exception of Belgium and Luxembourg, US firms in the central countries have been diversifying their activities. In that sense, there seems to be a clear dichotomy in the behaviour of US firms between the central locations and the peripheral ones. The difference is explainable by looking again at Figure 3 regarding the relative share of periphery countries in the value-added of US manufacturing MOFAs. The increases

¹⁸ Due to the need to protect confidentiality, employment data in some sectors for each of the four years analysed (1977, 1982, 1989 and 1994) were not always available for some of the smaller European countries. In such cases, to avoid the need to eliminate the sector from the analysis, it was decided to estimate the level of employment, on the basis of data points from adjacent years, or by extrapolating earlier observations. In most cases, this involved estimating the share of the known sectoral totals for the EU12 or EU10 for each of the deleted observations.

¹⁹ The specialisation coefficient is also often referred to in the literature as the *Balassa index*.

²⁰ Because some of the industry-level employment figures had to be estimated for the smaller European countries (where data was not always disclosed so as to respect the confidentiality of individual firms), some caution needs to be attached to the results for Portugal, Greece, Denmark and Luxembourg.

observed were principally due to the expansion of just two sectors, namely *food and kindred products*, and *transportation equipment*. In comparison, the other sectors enjoyed only modest increases.²¹

Table 6. Specialisation Coefficient for US manufacturing MOFAs, 1982-94

	1982	1989	1994
<i>Periphery</i>			
Greece	0.797	1.043	1.028
Ireland	0.466	0.448	0.500
Portugal	0.412	0.949	0.960
Spain	0.489	0.353	0.432
<i>Centre</i>			
Belgium	0.306	0.212	0.341
Denmark	0.882	0.739	0.637
France	0.326	0.345	0.286
Germany	0.309	0.313	0.280
Italy	0.342	0.248	0.246
Luxembourg	0.786	1.199	1.351
Netherlands	0.605	0.494	0.427
UK	0.141	0.084	0.095

Source: Calculated using data from Department of Commerce data.

To contrast these findings with analysis at the industry level, the *locational coefficients* were also calculated. These coefficients reveals the degree of geographical dispersion of each industry; the larger the localization coefficient, the more an industry is geographically concentrated; conversely, the closer the index is to zero, the closer the distribution is to that of overall manufacturing in the EU. The locational coefficient is defined as:

$$LC_i = \frac{\sum_{r=1}^I |S_{ir} - S_r|}{2}$$

where

$S_{ir} = e_{ir}/e_i$ is the share of the country r in the total EU -12 employment of US MNEs in the sector i ; and

$S_r = e_r/e$ is the share of country r in the total EU -12 employment of US MNEs.

²¹ It is interesting to compare this data to that presented by Amiti (1998) who has calculated the country Gini coefficients for manufacturing industry in the EU 11 (i.e. excluding Luxembourg) using current price production data for 27 industries over the period 1968-1990. Amiti finds evidence of diverse trends for the whole period-increased specialisation in Belgium, Denmark, Germany, Greece, Italy and The Netherlands, no significant change in Portugal, and a significant fall in specialisation in France, Spain and the UK. For the period 1980-1990, however, Amiti (1998:48) concludes that “*there was a significant increase in specialisation in all of them*”. Strangely, this conclusion does not coincide with the data she presents: the coefficients for France and Italy remain unchanged over this period, and actually decline in Denmark and The Netherlands (Amiti, 1998: 47, Table 1).

The results are shown in Table 7. The interesting thing that transcends from this data is that in all seven sectors, US firms have been gradually dispersing their activities. This finding is at odds with the conclusions of Brülhart's (1996) study of the dispersion of total industrial employment in the EU over the period 1980-90, who finds that in only four of the eighteen sectors studied has dispersal occurred (*food, beverages and tobacco; paper & printing; wood & furniture; and precision instruments*).

Table 7. Localisation Coefficients for US Manufacturing MOFAs, 1982-94

	Total Manufacturing	Food and Kindred Products	Chemicals and allied products	Primary and fabricated metals	Machinery (except electrical)	Electric and electronic equipment	Transportation Equipment	Other manufacturing
1982	0.210	0.522	0.391	0.347	0.361	0.201	0.867	0.216
1989	0.143	0.349	0.272	0.240	0.252	0.139	0.585	0.146
1994	0.107	0.244	0.197	0.183	0.186	0.094	0.465	0.104

Source: As for Table 3.

Our findings suggest that, far from being conducive to greater regional specialisation, US affiliates have generally contributed to the dispersal of manufacturing industries, particularly in *transportation equipment, food and kindred products, and chemical products*. Compared with the aforementioned study by Amiti (1998), our analysis therefore coincides better with the findings of Sapir (1996). Sapir bases his research on trade data over the period 1977-92 for France, Germany, Italy and the UK, and estimates changes in the degree of specialisation by calculating the Herfindahl index of export shares at the NACE 3-digit level. Only for France did the Herfindahl index increase markedly after 1986, and he thus concludes that "*the 1992 program does not appear to have generated a significant degree of specialisation in the largest EC member states*" (Sapir, 1996:460).

4. CONCLUSIONS

Locational change is complex, and the devil is in the detail. These issues cannot be resolved by simply looking at aggregate data. In this sense, as a conjecture it is possible that the much of the "excitement" over the NEG will dissipate as the realisation sinks in that the practical applications of such models are somewhat limited. This is especially true at the high level of aggregation that is inferred in the theoretical models - spatial reorganisation is inevitably highly sector-specific, and it may be misleading to lump together the whole of the manufacturing or industrial sector. We are, in other words, likely to witness highly divergent tendencies depending on the sector in question.

Be that as it may, the evidence compiled here regarding the impact of the SMP is not altogether unfavourable to the peripheral countries. In terms of production and investment, it appears that, in aggregate, US manufacturing firms have expanded their operations in peripheral countries at a greater rate than in the centrally located countries. The considerable numbers of authors who have predicted a concentration of MNE activity in the core regions (e.g. Savary, 1993; de Smidt, 1992, Batchler and Clement, 1990; Holland, 1976) would thus seem to have been overly pessimistic, at least as far as US manufacturing firms are concerned.²²

None of this is to suggest that an important *regional* clustering of industries has not taken place within individual national economies. On the contrary, even in such a small economy as Ireland, US investment has contributed to a strong level of spatial polarisation.²³ Similarly, in France, there has been a clear concentration of new greenfield manufacturing operations by US firms in the metropolitan area and surroundings (Île -de-France and Bassin Parisien) and the intermediate regions in the south (Méditerranée, Rhône-Alpes, Auvergne and Côte d'Azur) (Netherlands Economic Institute, 1993: 62). Nevertheless, at the national level of analysis, and in accordance with conclusions reached by Chisholm (1995:93), we can at least come to a firm negative conclusion that there is nothing in the recent history of US firms operating in the EU12 to suggest that centralisation processes necessarily dominate over processes which lead to a more dispersed pattern of economic activity.

²² With regard to Japanese manufacturing investment in the EU, the picture is in fact quite complicated. Darby (1996) reports that the European "semi-peripheral" areas (e.g. the West Midlands in the UK, or Madrid and Barcelona) have attracted a disproportionate share of total investment. On the whole, he argues that Japanese investors have been highly cost conscious and have been drawn towards areas with both good market access *and* low factor costs. They have consequently been less prepared to locate near the geographical extremes of the EU (e.g. Ireland, Greece)- rather, they have tended to be swayed by investment incentives in areas undergoing processes of industrial restructuring within the more centrally located areas.

²³ Breathnach (1998:313) reports that for the period 1993-96, 64 percent of new jobs in foreign-owned firms have been located in the East region (embracing Dublin), and for services projects the proportion is over 90 percent.

ANNEX

Share of Gross Product by US manufacturing MOFAs in Europe in high and moderate impact sectors, 1994 (Millions of current US dollars)

High Impact	
Beverages	4,775
Drugs	9,719
Office/Computing	8,990
Radio-TV communications	2,637
Electronic Components	3,919
Instruments	6,438
Total High Impact	36,478
Moderate Impact	
Other Food Products	6,196
Other Chemical Products	2,268
Other Machinery	5,051
Household appliances	1,347
Transportation Equipment	20,477
Textile Products and Apparel	1,568
Rubber products	2,035
Glass Products	730
Total Moderate Impact	39,672
Total Low Impact	45,382
Total Gross Product in Manufacturing Sector	121,532
Total high and moderate impact	76,150
Share of Total in High and moderate impact	62.7%

Source: Department of Commerce Benchmark Study 1994

* High and moderate impact sectors defined as in Emerson et. al. (1990)

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