# research paper series

**Internationalisation of Economic Policy Programme**

Research Paper 2001/20

## The Process of European Integration and the Determinants of Entry by non-EU Multinationals in UK Manufacturing

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**by**

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## Abstract

This paper seeks to evaluate the influence of the European Internal Market Programme on the relative significance of the determinants of entry (via acquisitions and start-ups) by non-EU multinationals in some 102 UK manufacturing sectors. The occurrence of FDI is modelled as a two-step process in which factors affecting whether a sector gets any entry by foreign plants are first considered, and the determinant of the count of entries for those sectors that attract positive flow of FDI are then investigated. The empirical estimates point to the conclusion that the parameters of the FDI functions have changed in response to the challenges and opportunities created by increasing economic integration, but with some interesting contrasts between the two types of entries. Acquisition FDI appears to have become more responsive to the size of the European market and unit labour costs relative to the rest of the EU, and less sensitive to the local market size. It is also increasingly being concentrated in sectors with higher intra-EU exports propensity, consistent with the predominance of vertical FDI. By contrast, the significance of the size of UK market has not diminished in the greenfield investment model, and the importance of agglomeration economies has more than doubled during the process of integration. Since the FDI consequences of European integration vary according to the mode of foreign entry, the policy implications of our findings also depend on the type of FDI under consideration.

## Outline

**Non-Technical Summary**

It is crucial for policy makers to identify the industry attributes that influence the volume and pattern of foreign direct investment (FDI). This will help inform the formulation of a policy that seeks to attract FDI not only to underdeveloped areas, but also to industries that lack sufficient foreign presence. One goal of this article is to examine the determinants of entry (via acquisition and greenfield investment) by non-EU multinationals in the UK manufacturing sector for the period 1981-1991. The second half of this period coincides with the initiation and implementation of the European Internal Market Programme (SMP) , and the second goal of this article is to test to what extent the U.K data supports the notion that SMP has led to a change in the investment strategy of multinationals.

Our findings point to the conclusion that the motives of FDI have changed in response to the challenges and opportunities created by increasing economic integration in the EU, but with some interesting contrasts between the two types of entries. Acquisition FDI appears to have become more responsive to the size of the European market and unit labour costs relative to the rest of the EU and less sensitive to local market size. It is also increasingly concentrated in sectors with higher intra-EU export propensity, consistent with the predominance of vertical FDI. By contrast, the significance of the size of UK market has not diminished in the greenfield investment model, and the importance of agglomeration economies has more than doubled during the process of integration. But the variation in relative unit labour costs is not found to be a significant determinant of the number of new entrants in those sectors that attract some FDI. Since the FDI consequences of the SMP vary according to the mode of foreign entry and the height of non-tariff barriers in the specific sectors, the policy implications of our findings also depend on the type of FDI under consideration.

## I.  Introduction

Between 1991 and 1995 some half a billion pounds was paid in grants for internationally-owned companies by the UK government under the Regional Selective Assistance scheme[1], costing around £17,500 per net job created. Regional development objectives aside, it is crucial for policy makers to identify the industry attributes that influence the volume and pattern of FDI. This will help inform the formulation of a policy that seeks to attract FDI not only to underdeveloped areas, but also to industries that lack sufficient foreign presence.  One goal, therefore, of this article is to examine the determinants of entry by foreign plants in the UK, using a disaggregated panel of manufacturing industries for the period 1981-1991. The second half of this period coincides with the initiation and implementation of the European Internal Market Programme (SMP). The aim of SMP was the abolition of all existing non-tariff barriers to trade in goods, services and assets between European Union[2] (EU) member countries[3] by 1992, and the creation of an integrated European market with a common external tariff.

A number of reasons were advanced as to why SMP would generate incentives for member and non-member countries to undertake FDI activities. Regional economic integration increases the size of the market and hence offers the opportunity for EU-based subsidiaries of multinational firms (MNEs) to attain efficient production via economies of scale, and capture part of the new market. Also, the threat of increased protection is expected to foster the conditions for outsider firms to establish subsidiaries in the EU to gain access to the integrated market and behave as insiders. Finally, increased economic integration is hypothesised to influence the distribution and volume of intra-EU FDI, as insider firms reorganise production in accordance with member countries' comparative advantages[4]. For these reasons, the investment strategy (or the FDI function) of multinationals locating in the EU can justifiably be supposed to have changed. The second goal of this article is to test to what extent the data supports this, by evaluating the impact of SMP on the relative importance of various determinants of entry.

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[1] See the official report at http://www.dti.gov.uk/regional/evaluationRSA91-95.pdf
[2] It used to be known as European Community at the time of  our sampling period.
[3] Belgium, Germany, France, Italy, Luxembourg, Netherlands, Denmark, Ireland, United Kingdom Greece, Spain and Portugal.

[4] Theory leads to no unambiguous predictions though (Dunning, 1997a).

This paper distinguishes itself from existing empirical work on the consequences of the SMP for FDI, in the following ways. First, the unit of analysis is the count of foreign plants that enter UK manufacturing industry, which is a direct measure of FDI activity, and avoids problems associated with the use of balance-of-payments data as a proxy for production owned and operated across borders. Since the FDI reactions to the SMP by insider and outsider firms are likely to be different, we only examine the dynamics of extra-EU FDI. Second, the data set assembled for this study offers the opportunity for a more refined investigation of the industry level determinants of entry as it spans 102 three-digit sectors. Third, we model the occurrence of FDI in a sector as a two-part process. At the first stage a binomial probability rule governs the binary outcome of whether the number of foreign entrants in a sector is zero or positive. Conditional on nonzero outcomes, the second stage involves the decision of how many plants to open in the relevant sector at each point in time. The conditional distribution of the positive FDI occurrences is specified as a truncated-at-zero count data model. Fourth, we distinguish between entry via acquisition of existing indigenous plants and greenfield investment. This is an important distinction because the motives for FDI are likely to be conditional on the type of investment being considered [Caves (1996), Buckley and Casson (1998)]. Generally acquisition entry is favoured when the foreign firm wants to have quick and low-risk access to the local market or internalise valuable assets in the host nation. On the other hand, the overriding motivation of greenfield entry is often hypothesised to be the exploitation of firm-specific advantages. Separate analyses of the determinants of investment in new start-ups and acquisition FDI is also relevant from a policy perspective. Recent evidence indicates that foreign acquirers tend to "cherry-pick" the best of UK plants (Harris and Robinson, 2000). If this is a widespread phenomenon, the supposed role of foreign acquisitions as "safeguarding" jobs might be overstated, and more emphasis should perhaps be placed on attracting greenfield FDI because it creates new jobs[5]. Fifth, and uniquely, we assess whether the SMP has brought about some significant and discernible changes on the *significance* of the determinants of inward investment. The emphasis we place on changes in the marginal effects of the FDI equation is in sharp contrast to previous studies which implicitly assumed that, apart from an intercept shift, the advent of the SMP has left the FDI response function unaltered.

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[5] The possible displacement effects of new foreign entrants should also be considered, however.

The rest of the paper is organised as follows. Section II reviews previous evidence on European Integration and FDI. Section III provides a brief review of theory on the determinants of foreign entry and sets out the specific research questions we wish to confront with the data. Section IV presents the empirical framework of the analysis. Section V reports the econometric results and discusses the significance of the some of the key findings. Section VI concludes.

## II. Previous Evidence on European Integration and FDI

Several studies attempt to isolate the influence of the SMP on FDI in the EU, and the consensus seems to be that economic integration has had a positive effect. Yannopoulus (1990) documents evidence of a considerable increase in intra-EU FDI. Pain (1997) and Pain and Landsbury (1997) investigate the dynamics of outward investment of the UK and Germany respectively, and conclude that European integration led to higher FDI. The simulation analysis of Baldwin *et al.* (1996) suggests that the SMP caused investment creation in the EU, and investment diversion from the European Free Trade Association nations. Dunning (1997b) presents some evidence showing that SMP has stimulated intra- and extra-EU FDI, the latter more significantly than the former, while Barrell and Pain (1999) find that Japanese FDI to individual EU countries was strongly influenced by the presence of trade barriers. Clegg and Scott-Green (1999) contend that the conventional determinants of Japanese FDI into the UK, France, Germany and the Netherlands during 1984-89 were all insignificant. They interpret this as evidence that Japanese firms' FDI was mainly a reaction to their experience of discrimination by the SMP. The more disaggregated analysis of Girma *et al* (2000) further corroborates this notion that trade barriers act as incentives for Japanese direct investment. Finally, Morgan and Wakelin (2001) report that the process of EU integration has played a positive role in increasing both intra and extra-EU FDI in the UK food industry.

## III. Theoretical Issues and Research Questions

In deference to the numerous works that deal with the determinants of foreign entry[6], we only present a very brief discussion of the theoretical literature, and concentrate on the specific hypotheses we wish to test in this paper. The OLI paradigm of Dunning (1980, 1988) usually provides the framework for analysing the motives of foreign entry and predicting firms that are likely to engage in FDI. Its basic argument is that cross-border

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[6] See Dunning (1993) and Caves (1996) and the references therein.

investment is undertaken to create wealth by internalising the MNEs ownership-specific advantages in a foreign location. These advantages may take the form of an ability to exploit economies scale, product differentiation, marketing or technological advantages. The uneven distribution of FDI across industries can therefore be explained by the fact that different industries offer MNEs different opportunities for exploiting the advantages they possess.

The literature on industry determinants of domestic entry [see Geroski (1995) for a summary] has established that high profitability and large market size are conducive to entry, while R&D intensity, advertising outlays, economies of scale, high concentration and high capital requirements act as entry barriers. But as Caves (1996, p. 84) observes " each source of barriers to [domestic] entry is linked to the reasons why MNEs exit in the first place". Thus insofar as the height of entry barriers varies across industries, we may also expect inter-industry differences in the pattern of foreign entry.

*Have foreign entrants become less responsive to labour cost differences?*

There is little controversy in the theoretical literature that labour costs in the host country exert an influence on the location decision by MNEs. However as Clegg and Scott-Green (1999) speculate, for outsider firms locating in the EU, labour cost-efficiency considerations might not be as decisive as the need for proximity to the market. If this is correct, one would expect the influence of labour cost variables on extra-EU FDI to be less discernible during the process of economic integration. This could have important policy implications. For example, fears over minimum wage legislation driving foreign investors away would be allayed if extra-EU FDI is shown to react less strongly to variations in unskilled workers wages. We therefore explicitly test whether entrants from outside the EU have become less responsive to differences in wage costs. Three indicators designed to reflect labour cost variability across industries are employed: the wage rates of skilled and unskilled workers, and U.K unit labour cost relative to a weighted EU average. The last partly captures the effects of labour productivity differentials between the UK and the rest of the EU.

*Has the role of domestic market size in attracting FDI diminished?*

Wage cost variables are not the only determinants of entry that are hypothesised to be less influential in attracting extra-EU FDI as a result of economic integration. Dunning (1997a,

p.9) conjectures that country-specific demand-related variables such as market size are also likely be less significant. Traditional FDI theory predicts a positive relationship between FDI flows and the size of the foreign market. But to the extent that extra-EU FDI to the UK is more and more aiming to serve the wider European market, the role of domestic market size as a leading determinants of FDI might not be sustained. This also suggests that the size of the EU market would start to play a more prominent role in explaining inter-industry differences in inward FDI. We test the validity of these predictions by including sector size in the UK and the rest of the EU in the list of regressors. If the data confirm these hypotheses, public policies affecting growth elsewhere in Europe will have an increasingly important impact on the flow of FDI into the UK.

*Has the SMP increased the export orientation of foreign entrants*?

Buckley and Atisien (1988) argue that the process of European integration and removal of trade restraints will lead to an increase in vertical integration within multinationals, because firms separate activities spatially as they seek to minimise location costs. This results in foreign subsidiaries of MNEs becoming more involved in intra-firm exports. Also as Balasubramauyam and Greenaway (1992) note, the dismantling of non-tariff barriers stimulate new 'bridgehead' investment in a specific location to be used as a base from which to serve the wider European market through exports. Pearce and Papanastassiou (1997) survey 190 MNE subsidiaries in the UK, and report evidence of a strong export orientation in their operation as a response to the SMP. In this paper we empirically investigate whether our data support the notion that European integration has increased the momentum towards increasingly export-oriented foreign entrants, using the sectors' exports intensity to the rest of the EU as a proxy for the plants' propensity to export. The policy importance of knowing the export orientation strategy of MNE subsidiaries stems from two considerations. First, if exporting is shown to be an important part of non-EU multinationals strategy, effort should concentrate on ensuring that the UK has the most conducive platform for exports, such as exchange rate stability and the supply of a skilled workforce (e.g. marketing personnel). Second, the indirect benefits of attracting exporting MNEs could be substantial. As the recent study by Sousa et al (2000) shows, UK-owned firms increase their export propensity in response to exporting activities of MNEs in their sectors. This export enhancing effect of FDI improves the international competitiveness of indigenous firms, thereby making a significant contribution to the long-term economic growth of the nation.

*Have agglomeration effects become more important as a result of the SMP?*

The final research question we wish to investigate relates to the impact of agglomeration effects on the probability of foreign entry. Krugman (1991) develops a theoretical model that explains geographic concentration of manufacturing firms. He finds that in order to realise scale economies while minimising transport costs manufacturing firms tend to cluster in the region with larger demand. It has also been observed in the empirical literature that the presence of similar firms raises the probability that subsequent entrants will choose that sector or region, mainly because of the availability of a pooled market for skilled workforce and the potential benefits from technological spillovers. Head et al (1995) present econometric evidence that industry-level agglomeration plays an important role in the location choice of Japanese manufacturing plants in the US. Driffield (2001) reports that variation in the past levels of inward investments is one of the most important factors explaining inter-industry differences in FDI in the UK. In discussing the FDI effect of the SMP, Dunning (1997a, pp.9-10) conjectures that economic integration will make agglomeration economies more important. SMP is likely to encourage the geographical concentration[7] of some types of industrial activities in specific locations, if MNEs operating inside those locations start enjoying increasing efficiency advantages. If this hypothesis is confirmed when confronted with data, the presence of agglomeration effects offers further justification for a policy of providing subventions to lure inward investment, as the presence of each additional MNE will make the UK an even more attractive location for prospective foreign investors.

In addition to the above determinants of entry whose changing significance we wish to test, our empirical specification also includes several variables that may explain inter-industry variations in FDI. These are R&D intensity, the relative importance of skilled workers in the labour force, the five-firm concentration ratio and minimum efficiency scale. The scale and concentration variables are interacted to explore whether the relationship between foreign entry and industrial concentration is conditional on the potential for economies of scale. Finally, one of the stylised facts highlighted about entry rates is that they are highly positively correlated with exit rates, leading Geroski (1995,p. 424) to conclude that "entry and exit seems to be part of the same process of change in which large numbers of new firms displace large numbers of older firms". We therefore include the proportion of foreign plants that have shut down in the previous year as a determinant of foreign entry.

## IV. Modelling Framework

As is evident from Table 1, there are a large number of sector-year cells without any FDI. This is sometimes referred to as an 'excess zeros' phenomenon in the count data literature (Cameron and Trivedi, 1998). Excess zeros could either be the result of an underlying process that has separate mechanisms for generating zero and nonzero counts or unobserved heterogeneity. If there is no separate model for the industries that did not evidence any foreign entry, a standard count data model is the most appropriate specification. A zero-inflated (or modified) model would be preferred, however, if there is a separate process for the zero counts (i.e. the decision not to invest). Using Vuong's (1989) general test for non-nested models, it is possible to statistically discriminate between the zero-inflated and the standard models. The test statistic is bi-directional and has a standard normal distribution with large positive (negative) values favouring the zero-inflated (standard) model. Values close to zero in absolute value favour neither model.

Let $y_{st}$ denote the number of entries in sector $s$ at time $t$, and consider the following discrete mixture distribution:

$$\Pr[y_{st} = 0] = z_{st} + (1 - z_{st})e^{-\lambda_{st}}$$
$$\Pr[y_{st} = r] = (1 - z_{st})\frac{e^{-\lambda_{st}}\lambda_{st}^{r}}{r!}, \qquad r = 1, 2, \ldots \tag{1}$$

In Equation (1) $z$ denotes the proportion of zeros in the population, and it is parameterised by a logistic transformation of $Z'\gamma$, where $Z$ represents the vector of variables determining the decision not to invest. The zero-inflated Poisson model emerges when the nonzero occurrences are modelled as conditionally Poisson (scaled by the proportion of nonzero outcomes) with

$$\lambda_{st} = \exp(\beta_0 + X_{st}\beta) \tag{2}$$

Where $X$ denotes the observable vector of the regressors, which is hypothesised to explain the inter-industry differential in the level of foreign entry into the manufacturing sector of the UK. Since we do not have strong priors about which variables explain zero FDI alone, the $X$ and $Z$ vectors coincide in our specification. The conditional mean and variance of the zero-inflated Poisson model are given as $(1 - z_{st})\lambda_{st}$ and $(1 - z_{st})(\lambda_{st} + z_{st}\lambda_{st}^2)$ respectively. Thus the zero-inflated formulation generates overdispersion in the model, the divergence between mean and variance being an increasing function of $\zeta$.

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[7] For example MNE can establish affiliated abroad to supply the parent company with inputs.

In the empirical implementation we also experimented with a zero-inflated negative binomial specification in the hope of more effectively controlling for heterogeneity-induced overdispersion in the data. Unfortunately we seldom manage to achieve convergence in the estimation algorithm, a problem which is also reported by List (2001) when he applied a modified two-step count data model to US FDI data.

The vector of regressors consists of the following industry specific variables: the total number of foreign plants, the proportion of non-EU owned plants that closed, market size in the UK and the rest of EU, R&D intensity, proportion of skilled workers, skilled and unskilled wages, relative unit labour cost, export intensity, minimum efficiency scale and the sectoral concentration ratio. All regressors are lagged by one period to avoid potential problems of endogeneity, and year-specific dummies are employed to control for aggregate shocks hitting the economy.

As mentioned in the introduction, a major goal of this paper is to test whether SMP has had any impact on the parameters of the foreign entry equation. This is achieved by augmenting a baseline FDI model by the interaction of a SMP dummy (set at unity for the period starting from 1987) with the relevant sub-vector of regressors. We confine ourselves to a subset of the regressors for two main reasons: (a) to focus on the specific research questions we set out to explore in the paper (b) because a more parsimonious specification helps avoid problems of convergence in the estimation algorithm. However for the SMP period, we do split the industries according to their sensitivity to the Single Market Program as documented by the EU Commission (Buigues et al, 1990). Industries most affected by EU92 are identified by experts chiefly on the basis of the level of non-tariff barriers, but also complemented by various industry indicators such as measures of intra-EU trade and price dispersions. From the point of view of the UK, 39 three-digit NACE industries accounting for half of manufacturing employment and value added were deemed to be most sensitive.

## V. Data and econometric results

*Data*

We use plant-level data taken from the UK Census of Production (the ARD) to identify the number of entries by subsidiaries of non-EU MNEs in some 102 three-digit sectors, during

the years 1981-1991[8]. This data set is available under controlled conditions from the Office for National Statistics and its salient features are discussed in Griffith (1999). When calculating the number of newly set-up or foreign-acquired plants, we ruled out a small proportion of plants classified as 'not in production' (e.g. head office). We also override plants that appeared to exit the same year as they were established, or those that changed ownership in successive periods. As described in Table 2 most of the industry-specific variables used in this study are derived from the employment, output and wages information contained in the ARD. On the other hand, the intra-EU export data are collected from the International Trade by Commodity Statistics CD-ROM provided by the OECD, after which they are aggregated up to three-digit SIC industry groupings. The relative unit labour cost, and the rest of EU market size variables are obtained from the STAN database provided by the OECD, whereas the source of R&D expenditure data is the Research and Development in Industry diskette produced by the same organisation.

Table 3 reports the temporal pattern and the average size of entry. Acquisition has been the preferred mode of entry, reflecting the increased international merger and acquisition activity ('mergermania') of the 1980s. For instance, Vasconcellos and Kish (1998) report that US firms have invested over $30 billion towards acquisitions in the UK during the early 1980s. This surge of foreign takeovers is largely attributed to the desire by MNEs outside the EU to gain fast access to the Single European Market as it evolves. The average employment in newly formed plants is lower than their acquired counterparts, consistent with stylised facts about entry (cf. Mata and Portugal, 1997). Also entrants in the sensitive sectors are in general bigger than those investing in the sectors deemed to be less sensitive to the SMP.

Table 4 presents estimates from the equation modelling the occurrence of zero FDI in a sector at a point in time, and Table 5 gives marginal effects from the second stage truncated-at-zero count data model. The marginal effects are defined as the derivatives of the conditional expectation function with respect to the relevant regressor, evaluated at the sample means. The Voung statistics reported in Table 4 are positive and significant, vindicating the two-step approach we utilised for modelling foreign entry. The remainder

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[8] In the In the ARD the SIC92 activity classification replaces the SIC80 one in 1993, so that a consistently defined industry panel that include later years is not available.

of this section will be devoted to the discussion of the key findings, starting with the determinants of the decision not to invest in a sector.

*Why do some sectors get zero FDI?*

It transpires that the variables hypothesised to influence foreign entry operate differentially when it comes to modelling why some sectors do not get any FDI, and determining the number of plants in sectors that attract positive FDI flows. Most notably, acquisition FDI is unlikely to be attracted to sectors with low R&D intensity. But once foreign firms decide to acquire in a sector, the number of plants they buy does not systematically vary with R&D intensity. Nonetheless this finding indicates foreign acquirers' desire to benefit from technological capabilities in R&D intensive UK industries. This markedly differs from the conclusion of Kogut and Chang (1999, p.411) that Japanese acquisitions FDI in the US are not more frequent in high-technology industries, and consequently the popular concern over foreign investment draining American technology might not be well founded. In the UK, this is clearly an area where more research with better quality data is warranted, as the findings will influence R&D and acquisitions policies. The picture emerging from the coefficients on the labour cost variables is a mirror image of the R&D variable: at 5% level of significance no sector experiences zero acquisition entry because labour costs are too high, but the number of acquired plants at the second stage is sensitive to variations in labour costs.

Table 4 also reveals that a high level of the unskilled wage rate deters greenfield foreign investment. But as Table 5 shows, in those sectors attracting new plant investment, labour cost variables do not seem to be important enough to affect the inter-industry variation in greenfield FDI. On the other hand, the decision of whether to invest or how much to invest via greenfield entry are found to be unrelated with the R&D intensity of the host nation, contrasting with the case of acquisition entry. This is consistent with the idea that greenfield entry signals the predominance of firm-specific assets and the exploitation of home country technology advantages.

There are a number of similarities between the models of zero FDI for the two types of entry though. First agglomeration economies are quite important, as the probability of getting no FDI is a decreasing function of past levels of FDI. Second the more the proportion of skilled manpower in the sector, the less likely the chance of being shunned by foreign investors. Third, there are signs (at 10% level) that relative unit labour costs have

started to play some role in determining zero FDI in the non-sensitive sectors during the process of European economic integration. Fourth, the exit rate by non-EU subsidiaries does not exert any influence on the probability of experiencing zero FDI as reported in

enter the U.K manufacturing sector via acquisition in sectors with positive FDI. The number of

*The role of economies of scale and sectoral concentration*

According to the first-stage estimates reported in Table 4, the higher the sector's

economies of scale do not play a significant role in deterring foreign entry. But as the negative coefficient on the concentration and scale interaction term suggests, the presence greenfield entry and concentration relationship. In other words, the probability of a highly concentrated sector greenfield FDI diminishes as economies of scale become important. On the other hand, the estimates from the truncated Poisson model given in Table 5 predicts a

subsidiaries entering in the U.K manufacturing sectors that have positive FDI flows. This relationship is found to be stronger in the determinants of

else constant, entrants via new start-ups are nearly ten times more responsive to differences in scale economies than acquisitions. Our finding of positive scale effects is consistent with

U.K data. But it does not lend empirical support for the prediction of negative scale-FDI relationship derived from new models of MNEs (Markusen and Venables, 1998). However,

variables is likely to be small. For example, the model predicts that an increase in a sector's minimum efficient scale variable by 1000 employees will only attract three more entrants.

The number of foreign plants established through either modes of entry is not sensitive to

(1999 & 2001) who reports a negative covariation between concentration and FDI flow.

industrial concentration lowers the marginal effect of the scale variable in the greenfield

FDI model. Since new entrants add to capacity in a sector, this is perhaps a way of avoiding aggressive responses from incumbents in highly concentrated sectors where economies of

interaction term is so small that no value of the concentration variable can induce a negative scale-FDI relationship.

The empirical estimates confirm the importance of agglomeration (or 'bandwagon') effects, as MNEs tend to cluster in sectors in which they already have a strong presence. As

baseline model with near unity elasticity. All else constant, the marginal foreign entry brings about one acquisition in the following year. Since EU countries are increasingly

cannot be overstated. We also uncover some differentials regarding the impact of SMP on the marginal effects of agglomerations. Acquisition FDI appears to have become less

levels of entries has more than doubled (relative to the baseline model) for greenfield FDI

crucial to have a first-mover advantage by attracting new foreign start-ups. As the results reported in Table 5 clearly demonstrate, the long-run effect of failing to attract a foreign

*Market size and the Single Market Program*

In the pre-SMP period, the rest of EU market size variable attracted negative albeit
greenfield FDI models. But as Table 5
reveals, the SMP has had asymmetric impacts on the two entry modes as far the marginal

highly protected) and non-sensitive sectors, the rest of the EU market size has become important, a 10% increase in this variable inducing a 2 to 3% growth effect on the number
greenfield FDI, however, this
variable turned out to be significant (with a somewhat smaller marginal effect) for the

some incentives for non-EU multinationals to base subsidiaries in the UK to gain from the enlarged EU market.

In contrast to the growing significance of the EU market size, inter-industry variations in the local market sizes have become less important in the acquisition FDI model. According

economic integration leads to a 2% increase in the number of foreign acquisitions in the sectors deemed to be highly sensitive to SMP. In the pre-SMP period this figure was nearly

characterised by higher non-tariff barriers, reinforces the impression that some of the FDI might be motivated by tariff-jumping considerations. However, the marginal effect of the greenfield FDI. In general, the U.K market size continues to be an important determinant of foreign entry, in

proximity to the local market is still desirable  for  some types of FDI where local brands and tastes are important (Morgan and Wakelin, 2001).

We have found unambiguous evidence that extra-EU acquisition FDI has become more and more concentrated export intensive sectors, consistent with FDI flows that are increasingly

attracted a negative coefficient, a result more in line with the predominance of horizontal FDI. This increase in the significance of the export variable further indicates that

gain  quick access to the EU market. Greenfield entry into the sensitive sectors has also exhibited a positive association with an increase in intra-EU trade, albeit to a much lesser

attract more FDI, the policy implication of this finding is that the government must ensure that the UK has an environment conducive to exporting. This could be achieved through

exchange rate stability.

*The changing sensitivity of FDI to labour costs*

contrasts between the two types of entries. Table 5 shows that the wage of skilled workers attracts a positive coefficient for acquisition FDI in the sensitive sectors throughout the

skilled workers, in spite of including a skill variable, is a strong indication that acquisition

SMP has made acquisition FDI sensitive to the skilled wage differences. The relative unit labour cost variable (which also controls for productivity differences) is found to have a

acquirers appear to have become more sensitive to inter-EU labour cost differentials. The marginal effect we uncover is also quantitatively (economically) significant. A 10%

acquired plants by about 77, ceteris paribus. As can be seen from Table 5, the significance of the unskilled wages variable did not experience any changes resulting from the SMP.

the number entries via acquisition. But this variable exerts no  influence  on the number of new plants set up by non-EU MNEs. This does suggest that
"efficiency-seeking", as further evidenced by the insignificant marginal effect of the relative unit labour cost variables. This particular finding supports the concern expressed by
Papanastassiou (1997) that governments might sometimes tend to over-emphasise cost-efficiency factors when formulating policies to attract foreign investment.

### Summary and Conclusion

This paper employs a plant-level data set that distinguishes between foreign entry via

integration on extra-EU FDI in UK manufacturing. In sharp contrast to earlier work, the Single Market Programme is allowed to influence some of the parameters of the model

disaggregated UK data to model foreign entry as a two-step count data process. Factors affecting whether a sector gets any entry by foreign plants are first considered, and the

then investigated.

The empirical estimates point  to the conclusion that the parameters of the  FDI equations

economic integration, but with some interesting contrasts between the two types of entries. Acquisition FDI appears to have become more responsive to the size of the European

size. It is also increasingly concentrated in sectors with higher intra-EU export propensity,

of UK market has not diminished in the greenfield investment model, and the importance of

variation in relative unit labour costs is not found to be a significant determinant of the number of new entrants in those sectors that attract some FDI. Since the FDI consequences

in the specific sectors, the policy implications of our findings also depend on the type of FDI under consideration.

investigation of the impact of European integration on the FDI strategy of EU multinationals in the UK. This will complement the present analysis and hopefully throw

second is modelling closure and divestment decisions by foreign plants in the UK. We are particularly interested in testing whether the move towards increasing European integration

it easier for multinationals to divest or close under-performing subsidiaries.

**References**

Balasubramanyam, V.N. and Greenaway, D. (1992). 'Economic Integration and Foreign Direct Investment: Japanese Investment in the EC', **Journal of Common Market Studies**, Vol. 30, pp. 175-93.

Baldwin, R E., Forslid, R. and Haaland, J.I (1996). 'Investment Creation and Diversion in Europe', **World Economy**, Vol. 19, pp. 635-659.

Barrell, R. and Nigel, P. (1999**).'** Trade Restraints and Japanese Direct Investment Flows', **European Economic Review**, Vol. 43, pp. 29-45.

Buckley, P.J. and Artisien, P (1988) 'Policy  Issues of Intra-EC Direct investment'. In Dunning, J.H and Robson, P.(eds.) *Multinationals and the European Community* (Oxford: Blackwell).

Buckley, P.J. and Casson, M.C. (1998) *.'*Analyzing Foreign Market Entry Strategies: Extending the Internalization Approach', **Journal of International Business Studies**, Vol.29, pp. 539-562.

Buigues, P., Ilzkovitz, F., and Lebrun, J.F. (1990). 'The Impact of the Internal Market by Industrial Sector: The Challenge to Member States', **European Economy**, Special Edition. European Commission, Brussels.

Cameron, A. C. and Trivedi P. K. (1998). *Regression Analysis of Count Data*. Cambridge, UK: Cambridge University Press.

Caves, R.E. (1996).  *Multinational Enterprise and Economic Analysis*. Second Edition. Cambridge: Cambridge University Press.

Clegg , J and Scott-Green, S .(1999). ' The Determinants of New FDI Capital Flows into the EC: A Statistical Comparison of the USA and Japan', **Journal of Common Market Studies**, Vol. 37, pp. 597-616.

Driffield, N. (1999).' Determinants of Entry and Exit in the Foreign Owned Sector of UK Manufacturing',  **Applied Economic Letters**, Vol. 6, pp.153-156.

Driffield , N (2001). 'Determinants of Inward Investment in the UK, A Panel Analysis'. Forthcoming in **Applied Economics**.

Dunning, J.H (1980) 'Towards an Eclectic Theory of International Production: Some Empirical Tests*'*, **Journal of International Business Studies***,* Vol. 11, pp.9-31.

Dunning, J.H. (1988), 'The Eclectic Paradigm of International Production: A Restatement of Some Possible Extensions', **Journal of International Business Studies***,* Vol.19, pp. 1-29.

Dunning, J.H. (1993).  *Multinational Enterprises and the Global Economy*. Addison-Wesley: Reading.

Dunning, J.H.(1997a). ' The European Internal Market Programme and Inbound Foreign Direct Investment: Part I', **Journal of Common Market Studies**, Vol. 35, pp. 1-30

Dunning, J.H.(1997b). ' The European Internal Market Programme and Inbound Foreign Direct Investment: Part II', **Journal of Common Market Studies**, Vol. 35, pp. 190-223.

Geroski, P.A. (1995) 'What Do We Know About Entry?', **International Journal of Industrial Organization**, Vol. 13, pp. 421-440.

Girma, S., Greenaway,D. and Wakelin, K (2000). 'The Impact of Antidumping on Employment: Evidence from Japanese firms in the UK', Mimeo. GLM, School of Economics, University of Nottingham.

Griffith, R.. (1999). 'Using the ARD establishment level data to look at foreign ownership and productivity in the UK', **Economic Journal**, Vol. 109, pp.416-442.

Harris, R and Robinson, C (2000).'The Impact of Foreign Acquisitions on Total Factor Productivity: Plant-level Evidence from UK Manufacturing, 1987-1992', http://www.pbs.port.ac.uk/~harrisr/. Forthcoming in **The Review of Economics and Statistics.**

Head, K., Ries, J., and Swenson, D. (1995). 'Agglomeration Benefits and Location Choice: Evidence from Japanese Manufacturing Investments in the United States', **Journal of International Economics**, Vol. 39, pp. 223-247.

Kogut, B and Chang, S.J (1991).'Technological Capabilities and Japanese Foreign Direct Investment in the United States', **The Review of Economics and Statistics**,Vol.73,401-413.

Krugman , P.R (1991). 'Increasing Returns and Economic Geography', **Journal of Political Economy**, Vol. 99, pp. 483-499.

McCloughan , P and Stone, I (1998). ' Life Duration of Foreign Multinational Subsidiaries: Evidence from UK Northern Manufacturing Industry 1970-93', **International Journal of Industrial Organization**, Vol. 16, pp. 719-747.

List, J.A.(2001). 'US County-level Determinants of Inbound FDI: Evidence from a Two-step Modified Count Data Model', **International Journal of Industrial Organization**, Vol. 19, pp. 953-973.

Markusen, J.R and Venables,A.J (1998). 'Multinational Firms and the New Trade Theory', **Journal of International Economics**, Vol. 46, pp. 183-203.

Mata,J. and Portugal, P,(1997) .' Pattern of Foreign Entry, Post-Entry Growth and Survival: A Comparison Between Domestic and Foreign Owned Firms', Mimeo.

Morgan , C.W. and Wakelin, K (2001). 'The Impact of European Integration on FDI: The UK Food Industry in the 1990s', Forthcoming in J.H.Dunning and J.L.Mucchieli (eds.) **Multinational Firms: The Global and Local Dilemma.** Harwood Publishers.

Pain,N.(1997). 'Continental Drift: European Integration and the Location of UK Foreign Direct Investment', **The Manchester School**, Vol.65, Supplement, pp.94-117.

Pain, N. and Lansbury,M.(1997). Regional Economic Integration and Foreign Direct Investment: The Case of German Investment in Europe', **National Institute Economic Review**, No. 160,pp.87-99.

Pearce, R. and Marina, P. (1997). 'European Markets and the Strategic Roles of Multinational Enterprise Subsidiaries in the UK'. **Journal of Common Market Studies**, Vol. 35 , pp.243-266.

Sousa, N., Greenaway,D. and Wakelin, K (2000). 'Multinationals and Export Spillover', GLM Research Paper 2000/14, School of Economics, University of Nottingham

Vasconcellos, G.M and Kish, R..J(1998). 'Cross-border Mergers and Acquisitions: the European Experience', **Journal of Multinational Financial Management**, Vol. 8 , pp.431-450.

Vuong, Q. H.(1989). 'Likelihood Ratio Tests for Model Selection and Non-nested Hypotheses', **Econometrica** , Vol. 57, pp. 307-333.

Yannopoulos, G.N. (1990). 'Foreign direct investment and European Integration: the Evidence from the Formative Years of the European Community', **Journal of Common Market Studies**, Vol. 28, pp. 245-59.

**Table 1**
**Frequency distribution and summary statistics of number of**
**plants  entering the manufacturing sectors: 1981-91**

| Count | Mode of entry | |
|---|---|---|
| | **Greenfield** | **Acquisition** |
| 0 | 692 | 525 |
| 1 | 188 | 182 |
| 2 | 91 | 107 |
| 3 | 53 | 71 |
| 4 | 21 | 55 |
| 5 | 16 | 28 |
| 6 | 7 | 26 |
| 7 | 4 | 18 |
| 8 | 6 | 13 |
| 9 | 3 | 13 |
| 10+ | 15 | 58 |
| Total | 2487 | 1037 |
| Mean | 0.946 | 2.269 |
| Variance | 4.28 | 21.62 |
| Percentage of zero  counts | 63.1 | 47.9 |

**Table 2**
**Description and summary statistics**
**of the sector level variables**

| Variable | Definition of variable (source of information ) | Mean (standard deviation |
|---|---|---|
| Agglomeration | Log of the count of all foreign-owned plants (ARD) | 2.78 (1.28) |
| Exit rate | Exit rate of foreign-owned plants (ARD) | .097 (.15) |
| OP Wage | Log of average wage rates of operatives (ARD) | 8.88 (.40) |
| ATC Wage | Log of average wage rates of administrative, technical and clerical workers (ARD) | 9.17 (.40) |
| RULC | Unit labour cost (total payroll divided by value of production) relative to rest of EU weighted average (STAN) | 1.01 (.005) |
| Skill | Percentage of administrative, technical and clerical workers (ARD ) | .31 (.10) |
| Size | Log of real output s (ARD) | 6.87 (1.21) |
| EU Size | Log of real output in the rest of EU (STAN ) | 16.32 (3.56) |
| R&D intensity | R&D expenditure divided by output ( OECD & ARD) | .034 (.081) |
| Concentration | Sales share of the top five firms (ARD) | 35.08 (25.30) |
| Scale | Minimum efficient scale defined as the average employment in the establishments accounting for 50% of industry employment (ARD) | 4734.6 (10535.5) |
| Export intensity | Exports to EU divided by output (OECD and ARD) | .114 (.132) |

**Table 3**
**Total number of plants and average**
**employment on entry :1981-91**

| Year | Sensitive Sectors | | | | Non-sensitive Sectors | | | |
|------|------|------|------|------|------|------|------|------|
| | Plants. | | Employment | | Plants. | | Employment | |
| | ACQ | GRN2 | ACQ | GRN | ACQ | GRN | ACQ | GRN |
| 1981 | 120 | 56 | 128.19 | 100.16 | 93 | 41 | 142.48 | 81.37 |
| 1982 | 80 | 43 | 136.48 | 61.30 | 122 | 25 | 100.71 | 50.84 |
| 1983 | 88 | 24 | 135.00 | 47.21 | 81 | 28 | 225.74 | 46.29 |
| 1984 | 211 | 61 | 167.17 | 206.21 | 222 | 51 | 156.52 | 56.55 |
| 1985 | 73 | 76 | 247.32 | 57.93 | 51 | 47 | 163.67 | 35.34 |
| 1986 | 23 | 44 | 283.35 | 97.93 | 35 | 25 | 334.57 | 72.40 |
| 1987 | 117 | 67 | 103.56 | 76.03 | 104 | 43 | 113.21 | 100.86 |
| 1988 | 127 | 48 | 150.06 | 162.13 | 169 | 42 | 121.66 | 40.79 |
| 1989 | 151 | 57 | 244.64 | 144.49 | 187 | 31 | 212.41 | 41.65 |
| 1990 | 95 | 87 | 277.18 | 83.72 | 100 | 51 | 213.33 | 72.67 |
| 1991 | 118 | 62 | 163.89 | 132.79 | 120 | 28 | 126.55 | 90.86 |

Note: The high number of acquisitions in 1984 figures are largely due to some huge acquisitions by North American MNEs in 5 sectors. In the empirical model we capture this problem of outliers via appropriately defined dummies.

**Table 4**
**The determinants of zero FDI:**
**First-stage estimates from the zero-inflated Poisson model**

| | Acquisition FDI | | | Greenfield FDI | | |
|---|---|---|---|---|---|---|
| | | SMP Effect | | | SMP Effect | |
| | Baseline model | Sensitive sectors | Non-sensitive sectors | Baseline model | Sensitive sectors | Non-sensitive sectors |
| Agglomeration | -.598*** (2.80) | .419 (1.03) | .146 (.51) | -1.05*** (2.61) | -3.49 (1.30) | -.329 (.62) |
| Exit Rate | .612 (.88) | | | .608 (.36) | | |
| OP Wage | -1.493 (1.44) | -.269 (.14) | .408 (.27) | 6.24*** (2.27) | -1.03 (.20) | -6.26 (.98) |
| ATC Wage | 1.156 (1.13) | .496 (.27) | .864 (.55) | -3.97 (1.48) | -3.15 (.60) | 3.94 (1.27) |
| RULC | 17.58 (1.10) | -5.347 (.51) | 11.67* (1.72) | 49.43 (1.18) | 7.89 (.24) | 41.71* (1.79) |
| Skill | -2.37* (1.71) | | | -3.59** (2.07) | | |
| Size | -.029 (.09) | -.788 (1.36) | -.291 (.70) | .210 (.26) | 1.59 (.76) | .023 (.02) |
| EU Size | -.357 (1.05) | .451 (.92) | .139 (.37) | 1.405 (1.59) | 1.49 (.93) | -1.19 (1.19) |
| Concentration | .024*** (3.83) | | | .026** (1.97) | | |
| Scale | -.0001 (.89) | | | .00001 (.33) | | |
| Scale*Conc* $10^7$. | 7.45 (.84) | | | -.226* (1.78) | | |
| Export intensity | -.849 (.54) | -3.34* (1.75) | -2.44* (1.69) | -15.08 (1.65) | 19.80 (.1.56) | 12.27 (1.28) |
| R&D intensity | -4.13** (2.09) | | | -3.77 (.75) | | |
| Voung Test | 5.83*** | | | 3.66*** | | |

Notes:
(i)     Absolute values of t-statistics are given in parentheses.
(ii)    The coefficients of the baseline model describe the average values over the entire period of the study (i.e. 1981-91). The SMP effects capture variations from these average values during the implementation of SMP (1987-91 in our sample).
(iii)   The full set of time dummies is included in all specifications.
(iv)   **(*)** significant at 10% level; **(**)** significant at 5% level ; **(***)** significant at 1% level.

**Table 5**

**The determinants of the number foreign entries:**
**Estimates from the truncated-at-zero Poisson model**

| | Acquisition FDI | | | Greenfield FDI | | |
|---|---|---|---|---|---|---|
| | | SMP effects | | | SMP effects | |
| | Baseline model | Sensitive sectors | Non-sensitive sectors | Baseline model | Sensitive sectors | Non-sensitive sectors |
| Agglomeration | .984*** (7.48) | - .356 (1.10) | - .363*** (2.68) | .365*** (4.41) | .439** (2.45) | - .078 (1.05) |
| Exit Rate | 1.02*** (3.16) | | | .520** (2.27) | | |
| OP Wage | -.622*** (3.25) | 1.31 (1.43) | 1.91 (1.33) | -.426 (.06) | .832 (1.34) | .642 (.39) |
| ATC Wage | .959*** (3.98) | -1.59 (-1.61) | -1.75** (1.99) | .423 (.61) | -.918** (2.10) | -.502 (.37) |
| RULC | 761.6 (.18) | -771.1** (2.10) | -777.6** (2.12) | -100.7 (.41) | 97.74 (.41) | 93.75 (.40) |
| Skill | 1.13** (2.19) | | | 1.12*** (3.43) | | |
| Size | .472*** (2.98) | -.212** (2.02) | -.047* (1.88) | .089** (2.01) | -.205 (.83) | .039 (.23) |
| EU Size | -.078 (1.62) | .172*** (2.96) | .333*** (2.32) | -.154 (.52) | .132*** (3.82) | -.052 (1.11) |
| Concentration | -.007 (1.12) | | | .001 (1.38) | | |
| Scale | .00004*** (2.35) | | | .0003** (2.26) | | |
| Scale*Conc*$10^7$ | -5.93 (1.23) | | | -1.16*** (3.61) | | |
| Export intensity | - 1.89*** (3.40) | 4.45*** (3.58) | 4.38*** (3.43) | 1.03 (.16) | 1.12*** (.343) | -.703 (.39) |
| R&D intensity | 1.95 (.33) | | | -.209 (1.01) | | |
| Observations (Nonzero observations). | 940 (492) | | | 940 (347) | | |
| Log likelihood | -1587.28 | | | -911.04 | | |

Note:
(i)     Marginal effects evaluated at the mean value of the vector of regressors are reported.
(ii)    Absolute values of t-statistics are given in parentheses.
(iii)   The marginal effects in the baseline model describe the average values over the entire period of the study (i.e. 1981-91). The SMP effects capture variations from these average values during the implementation of SMP (1987-91 in our sample).
(iv)    The full set of time dummies is  included in all specifications.
(v)     **(*)** significant at 10% level; (**) significant at 5% level ; **(***)** significant at 1% level.