Productivity Gaps, Inward Investments and Productivity of European firms *

Davide Castellani
ISE-Università di Urbino

Antonello Zanfei
ISE-Università di Urbino

Version 2.2
June 2001

Abstract
Using a balanced panel of firm-level data on the manufacturing industry in France, Italy and Spain over the 1993-1997 period, this paper examines the impact of foreign presence on the productivity of domestic enterprises. We innovate on existing literature by using firm-level data comparable across countries. A generalisation of the results obtained for individual countries is attempted by introducing two key variables in the analysis of the impact of inward investments on domestic performances: productivity gaps between foreign and domestic firms, and productivity levels of MNEs. It is shown that it is the combination of high gaps and high levels of foreign productivity that has the most positive effects. This leads to a critical consideration of both the "catching up" hypothesis, which identifies a positive relation between the size of technological gaps and growth opportunities induced by foreign investments; and the "technological accumulation" hypothesis, which stresses the role of domestic absorptive capacity and of coherence between foreign and domestic technology as determinants of virtuous effects of inward investments. Based on these results, policy implications are drawn, concerning the selection and promotion of inward investments in advanced countries.

JEL: F23, L23
Keywords: Multinationals, Technology Gap, Productivity

---

* This paper is a contribution to the EU project on *Assessing the Impact of Technological Innovation and Globalization: the effects on growth and employment* (AITEG). The authors are grateful to Roberto Simonetti for supplying part of the data utilised in this work, and to Elisabetta Andreani and Elvio Ciccardini for research assistantship. We also wish to thank Paola Criscuolo, Simona Iammarino, Rajneesh Narula, Vincenzo Spiezia, Marco Vivarelli, and participants to the AITEG Meeting for helpful comments. Usual disclaimers apply.
Correspondence: CUSTOM-ISE Università di Urbino, Via Saffi, 42 - 61029 Urbino - Italy. E-mail: dcastell@guest.net and zanfei@econ.uniurb.it

1. *Introduction*

This paper addresses the issue of how inward investments affect the productivity of European firms. We concentrate our attention on a panel of manufacturing firms active in France, Italy and Spain over 1993-97. Using longitudinal firm-level data is a key asset of this study, in accordance with some of the most promising research lines developed on the effects of FDIs. In fact, earlier contributions using cross-sector data were typically unable to control for differences in productivity across sectors, which might be correlated with, but not determined by, foreign presence. More recent works, using firm-level data, were able to control for factors influencing productivity independent of foreign investments, and to isolate the effects of foreign presence on the performances of local firms (Aitken and Harrison 1999, Blomstrom and Sjoholm 1999, Barrios, 1999).

Building on this literature, the paper presents at least two motives of interest. First, it utilizes a combination of firm level data-sets which allows to compare the effects of multinational presence across different countries. The characteristics and comparability of the available data permit us to overcome one of the most recurrent limits of previous studies based on micro-data, which were typically focused on single host economies, and were thus unable to highlight country specific effects of inward investments. Empirical tests highlight that inward investments may have a different impact across countries: observed effects are positive for Italy, negative for Spain and non significant for France.

Second, a generalisation of results obtained for individual countries is attempted. We shall highlight how the technological level of multinationals and the distance between domestic and foreign productivity affect the generation of externalities by multinational enterprises. It is the combination of high technological levels of multinationals and of high gaps that leads to the most *positive* impact of inward investments in the case of the examined countries. This leads to a critical consideration of both the "catching up" hypothesis (Findlay 1978, Wang and Blomstrom 1992), which identifies a positive relation between the size of technological gaps and growth opportunities induced by foreign investments; and the "technological accumulation" hypothesis (Cantwell 1989), which stresses the role of domestic absorptive capacity and of coherence between foreign and indigenous technology (Kokko 1994) as determinants of virtuous effects of inward investments. In fact, it will be suggested that, once the discussion on the impact of foreign presence shifts from LDCs to more advanced countries as recipient of direct investments, it is more likely that domestic firms are close to, or even beyond, the foreign technological frontier. A mere consideration of technological gaps may then be misleading, and the actual technological level of foreign firms must be controlled for. Furthermore, market stealing strategies are most likely when peer level firms compete in the same market, thus reducing the potential for technology transfer and linkages between multinational and local firms when gaps are low.

The paper is organized as follows. Section 2 briefly summarises the theoretical and empirical literature background to this paper. Section 3 identifies the issues to be discussed and hypotheses to be tested empirically. Section 4 describes our data, variables and econometric specification. Section 5 discusses the main results of our econometric exercises. Section 6 concludes the paper and draws some policy implications.

2. *Background literature*

The past two decades have been characterised by a remarkable growth in flows of foreign direct investments by multinational firms, which have increased significantly faster than trade flows among the most developed countries, and became the largest source of external finance for developing countries. This process raises concerns about the role that multinationals play for host countries development and performances. Economic literature has identified both positive and negative effects of multinational presence on recipient economies. On the one hand, MNEs may positively affect local productivity by training workers and managers who may move or spin off from foreign owned firms and become available to domestic enterprises (Fosfuri et al. 2001); by demonstrating the feasibility of new technology, providing technical assistance, transferring patented knowledge, and generating opportunities for imitation of technological, organisational and managerial practices (Mansfield and Romeo 1980, Dunning 1993); by creating demand for local inputs, increasing the specialisation and efficiency of upstream and downstream activities and generating positive externalities for local industries (Hirschman 1958; Rodiguez-Clare, 1996; Markusen and Venables, 1999); and by exerting competitive pressures to improve the static and dynamic efficiency of domestic firms (Caves 1974, Cantwell 1989). On the other hand, foreign presence may negatively affect productivity of local firms, particularly in the short run, to the extent that MNEs can monopolise markets and draw demand from domestic firms, causing them to cut production and reduce their efficiency (Aitken and Harrison 1999). Multinationals can also substitute local suppliers with foreign ones, disrupting existing linkages (Lall 1978).

Whether the overall impact is negative or positive for host economies depends, by and large, on which of these tensions prevails. Rodriguez-Clare (1996) suggests that net linkage creation effects will be (positively) affected by the variety of intermediate inputs multinational firms can gain access to in local markets, as compared to their home market. It has also been argued that local capabilities and technical competencies spur multinational firms to interact with local partners, while they increase indigenous firms' availability and ability to enter collaborations with foreign firms (Dunning 1958, Cantwell 1989). Besides, anti-competitive and market stealing effects may be particularly high when inward investments take the form of acquisitions (UNCTAD 2000).

Empirical evidence concerning the overall effects of multinational growth on recipient countries is mixed. Using cross-country regressions Borensztein et al. (1995) show that FDI from developed countries stimulated domestic investment in LDCs, while UNCTAD (1999) reports that crowding in and crowding out effects of foreign investments tend to cancel out. Using cross-sector data, a number of studies have reported a positive impact of sectoral FDI on productivity (Caves, 1974, Globerman, 1979, Blomstrom, 1989, Imbriani and Reganati, 1997, 1999). More recently, using firm-level longitudinal data with specific reference to a few developing countries, one rather robust result is that domestic firms with some foreign ownership exhibit better performance, such as higher productivity and wages, than purely domestic firms (Aitken and Harrison, 1999; Aitken, Harrison and Lipsey, 1995; Blomstrom and Sjoholm, 1999). The hypothesis that multinational firms can act as export catalysts has also received some support (Aitken, Hanson and Harrison, 1997), while the effects of FDIs on domestic firms' productivity often turn out to be not significant, or even negative, when controlling for industry dummies (Aitken and Harrison, 1999; Aitken, Harrison and Lipsey, 1995; Haddad and Harrison, 1993). One exception is Blomstrom and Sjoholm (1999) who find evidence of significant economic benefits to domestic firms from sector FDI, but the degree of foreign ownership does not affect the extent of these benefits.

As far as the analysis of mechanisms underlying the positive or negative effects of multinational firms, the evidence is even less conclusive, and this is mainly due to lack of appropriate data. Using country level time series and panel data for a sample of OECD and non-OECD countries, De Mello (1999) finds that the extent to which FDIs are growth enhancing depends on the complementarity and substitution between FDI and domestic investment. A few studies based on firm level data have produced some evidence on the creation of linkages as a result of multinational presence (Dunning 1993, Blomstrom and Kokko 1998, Castellani and Zanfei 2001). However, the actual transmission from linkage creation to productivity and growth of domestic firms is not clearly documented. With reference to Venezuela, Aitken and Harrison (1999) show that the negative overall effect of foreign presence on the productivity of domestic firms is by and large determined by a contraction of domestic output, which they interpret in terms of a market stealing effect.

One oft-cited condition favouring a positive impact of inward investments on domestic firms' productivity has to do with the role of technological gaps between foreign and domestic firms. On the one hand, some works put forward the idea that the larger the productivity gap between host country firms and foreign-owned firms, the larger the potential for technology transfer to the former. We label this view as the "catching up hypothesis" (Findlay, 1978). Consistently with this hypothesis, Blomstrom and Wolff (1994) find evidence that the growth of gross output per employee of locally owned firms in Mexico in 1970-75, is positively related to a measure of FDIs and of initial labour productivity gap between locals and multinationals. In a similar vein, Driffield (2001) shows that changes in value added per employee in the foreign sector, over 1986-89, positively affect productivity growth of domestic firms in the UK, and interpret this as evidence of catching up of local manufacturers stimulated by higher level competitors. On the other hand, scholar have argued that the lower is the technological gap between domestic and foreign firms, the higher is the relative absorptive capacity of the former, the higher are the expected benefits in terms of technology transfer to domestic firms. We label this as the "technological accumulation hypothesis" (Cantwell, 1989). The analysis of the responses of local firms to the entry and presence of US multinationals in European markets over 1955-75 seems to suggest that the most positive impact occurs in industries where the technological gap is small (Cantwell, 1989). This is consistent with the view that relatively low technological differentials between domestic and foreign firms would grant higher ability of local economies to capture technological opportunities and to respond to the stimuli created by MNEs. Kokko (1994) focuses on 156 industries that hosted MNEs in Mexico in 1970 and finds evidence that in industries characterised by both large technological gaps and large foreign market shares, which he identifies as "enclave sectors", local productivity growth is significantly inhibited. His idea is that in such circumstances, MNEs are able to crowd out local competitors from the most important market segments, thus reducing the likelihood that positive benefits accrue to, and are captured by, local firms. In a more recent work on Uruguayan manufacturing plants Kokko, Tansini and Zejan (1996) find positive and statistically significant spillover effect only in the sub-sample of locally-owned plants with moderate technology gaps vis-à-vis foreign firms. They argue that small or moderate gap, in the case of Uruguayan plants, identify cases where foreign technologies are *useful* to local firms and where local firms possess the skills needed to apply or learn foreign technologies. On the contrary, large gaps may signal that foreign technologies are too different from local ones that local firms have nothing to learn, or that local firms are so weak that they are not able to learn. Imbriani and Reganati (1997), analysing the Italian manufacturing industry, find that value added of domestic firms in sectors where the productivity gap between local and foreign firms is high is negatively related to foreign presence, while the opposite occurs where productivity gaps are low. Preliminary evidence from Portuguese sectoral data supports the idea that positive effects from foreign presence might be associated with intermediate productivity gaps (Flores et al., 2001).

To complete this brief review on the role of technological gaps, one should also mention the puzzling results obtained by Sjoholm (1997). Using detailed micro data from the Indonesian manufacturing sector in 1980 and 1991, he finds that the effects of labour productivity differences (after controlling for capital intensities and scale of production) vary according to the specification he adopts, so that no clear conclusion can be drawn on this issue.

3. Methodological issues and hypotheses

Three issues are opened up by the reviewed literature and are worth some further empirical examination. First, it is apparent that the results of the examined studies cannot be easily compared due to the heterogeneity of data sources available, let alone the different methodologies adopted. Data heterogeneity is even more binding when the analysis is conducted at the firm-level, a problem which has often discouraged scholars from using micro-data for cross-country studies. Therefore, *using a uniform set of firm-level data* to examine these phenomena across different countries will *per se* imply a considerable advancement.

Second, obtaining sound evidence on the impact of FDIs on local firms requires the adoption of a *key methodological choice,* that is to control for fixed, time invariant factors which might affect productivity itself. As it is now widely acknowledged in recent literature, controlling for fixed effects is particularly important because FDIs typically follow a pattern of sectoral concentration towards more productive industries, implying that a positive association between foreign presence and the productivity of domestic firms could show up even if no spillover takes place. Failure to control for sector characteristics could then lead to mis-interpretations. The econometric specification adopted in this paper takes this issue into account (see section 4 below).

The third and final issue to be discussed before entering a detailed empirical analysis concerns the role of *productivity gaps* in the generation of externalities from inward investments. Most studies addressing this issue focus on LDCs as recipient countries. When the attention shifts to more advanced countries, the analytical framework must be modified from at least two points of view. On the one hand, one cannot presume that MNEs always represent the technological frontier as opposed to domestic firms lagging behind. When dealing with foreign investments directed towards developed countries, like the ones considered in this paper, technological gaps can thus be expected to be significantly lower, on average, than in the case of LDCs, with domestic firms often representing the most advanced ones in the market. Therefore, assessing the role of technology gaps as a determinant of FDI spillovers will not be possible without considering which of the firms – the foreign or the domestic one - is "stronger" in terms of productivity (see section 4 below for the statistical methodology we used to take this issue into account).

On the other hand, given the higher technological proximity between foreign and domestic firms active in Developed Countries (as opposed to the case of LDCs), competitive threats can be expected to be higher. Appropriation of rents stemming from high and increasing productivity thus appears to be more sensitive an issue in these markets. By contrast, degree of "appropriateness" of foreign technology, as constraints to innovation adoption and diffusion, is much less binding in the case Developed Countries (again, relative to LDCs).

The overall implication is that neither high productivity levels of foreign firms (which is the factor stressed by the catching up hypothesis) nor low technology gaps (which is the condition emphasised by the "technological accumulation hypothesis") can by themselves shape the effects of FDIs on domestic firms.

At the risk of drawing an over-simplified picture, we could identify two basic, opposite cases. The first one is characterised by both High Gap *and* High Foreign Productivity Level. Under this circumstance we may expect an overall positive impact of FDIs on domestic firm performances. In fact, High Foreign Productivity will ensure a considerable potential for technology transfer from foreign to domestic firms; while relatively High Gaps will guarantee MNEs that they will have to undergo relatively low efforts to appropriate the rents of their superior technology. This will increase their availability to supply technology to domestic competitors, e.g. through exchanges of knowledge assets against access to local markets.

The second, and opposite, case would be one characterised by Low Gap *and* Low Foreign Productivity Level. Under this circumstance, we can expect that FDIs will have an overall negative impact on local performances. In fact, Low Foreign Productivity implies that MNEs will have relatively little technology to supply to domestic firms: domestic firms' technology turns out to be more attractive for foreign firms, than viceversa, thus opening up take-over opportunities in the host market. Low Gap entails that MNEs will have to make great efforts to appropriate the rents of their own productivity: they will have to protect their own technology much better than in the previous case and this will further reduce the potential for technology transfers from foreign to domestic firms.

4. Data, variables and econometric specification

The empirical analysis is based on a sample of manufacturing firms active in France, Italy and Spain. The sample is the result of the intersection of two commercially available databases, Amadeus and Who Owns Whom[1]. From the former source we obtained most economic and financial data used for our analysis, while from the latter we gathered information on the ownership structure (domestic vs. foreign) of each firm. The overall sample contains 4,514 firms, out of which 2,121 are located in France, 1,226 are located in Italy and 1,167 are located in Spain. Foreign firms represent slightly less than one quarter of total firms in Italy, and between 35 and 40% in the other two countries (see Table 1 for other descriptive statistics on sample firms). A chi-squared test rejects the hypothesis that the sectoral distribution of firms in each country which we extracted from our database is significantly different from the distribution of the population of firms with more than 50 employees, as registered by different official sources of industrial statistics (Eurostat, and ISTAT)[2]. For every firm located in the 3 countries we were able to identify the ultimate parent company, and with this information we have distinguished foreign-owned firms (when the ultimate parent company is different from the country of registration) from domestic firms. Economic and financial data were available for a 5-year time span, from 1993 to 1997. Firms for which the complete series of data was not available were preliminarily dropped, thus the sample available for estimation is a balanced panel of 22,570 observations (of which 15,010 refer to domestic firms) for the three countries altogether. All data used for regressions and descriptive statistics are drawn from this combined data-set, unless otherwise specified.

Dependent variable: log(TFP)$_{it}$

The dependent variable used in estimation is the log of total factor productivity (TFP) of firm *i*, which has its core business in sector *j* (3-digit SIC), at time *t*. TFP is defined as the residual of a log-linearised Cobb-Douglas production function of the following form:

$$\log Y_{it} = c + a \ \log(L)_{it} + b \ \log(K)_{it} + g \ \log(M)_{it} + u_{it}$$
$$u_{it} = \log TFP_{it} = h_i + e_{it}$$

where Y is real value added, L is the number of employees, K is the stock of capital and M is the use of raw materials and energy. TFP is modelled as the sum of a time-invariant component *h*, which captures inter-firm differences in productivity that are constant over time, and a time-varying part *e*, which is assumed to be uncorrelated with input use and has the properties of the usual error term. Real values of Y, K and M are obtained by deflating respectively nominal value added (total turnover subtracted the cost of materials), book value of fixed assets net of depreciation, and costs of materials. The deflator used is the OECD-STAN implied sectoral value added deflator. Output elasticities of labour, capital and materials are estimated running within-group regressions for each country separately, and the TFP measure is calculated as the difference between actual and predicted output:

$$\hat{u}_{it}^{j} = \log Y_{it}^{j} - (\hat{c} + \hat{a} \ \log(L)_{it}^{j} + \hat{b} \ \log(K)_{it}^{j} + \hat{g} \ \log(M)_{it}^{j})$$

where
$i = 1, \ldots N^j$;
$t = 1993, \ldots 1997$;
j = Spain, France, Italy

[1] Amadeus and Who Owns Whom (D&B Linkages) are products of Bureau Van Dijck and Dun & Bradstreet respectively.
[2] We are grateful to L. Nascia for supplying background data for these comparisons.

The econometric specification used to test for the existence of productivity effects from inward FDI is the following:

$$\hat{u}_{ist}^{j} = a + d_1 FDI_{st}^{j} + d_2 X_{st}^{j} + l_{is}^{j} + n_{ist}^{j}$$

where *i*, *t* and *j* are as above,
s = 201, … 399 (3-digit SIC);

FDI is a measure of foreign presence in the 3-digit SIC, which represents the core business of firm *i*, X is a vector of time varying sectoral controls, l_{is} is an unobserved firm (and sector)-fixed effect, n_{ist} is the error term. Regression is performed using a standard within-group estimator, to avoid that correlation between the fixed effect and measures of FDI would cause a biased estimation of the FDI effect[3]. As it has been suggested earlier, FDIs might be attracted by the productivity levels of sectors thus failing to control for the average productivity of the firm (and the sector) will show up in a magnified coefficient on the FDI variable. In particular, if FDIs are attracted towards more productive sectors, OLS estimates are likely to find higher impact of FDIs on TFP [4]. On the contrary, if FDIs are attracted towards sectors where domestic firms are relatively laggard, one is likely to find robust evidence of negative impact of foreign presence. Indeed, correlation between the fixed effects and FDI variables is fairly high. In particular, in Italy we found evidence of a significant negative correlation, while in Spain we find evidence of positive correlation. These results suggest that foreign presence in Italy gravitate towards sectors where domestic firms are relatively less productive, while in Spain FDIs tend to be concentrated in more productive industries. Correspondingly, preliminary OLS regressions (not shown but available from the authors) support positive impact of inward investments in Spain and France and negative effects in Italy. Controlling for fixed effects, regressions yield significantly different results, shown in Table 3 and discussed in the next section.

Explanatory Variable

- FDI_Sector_{st}: is measured by the sum of workers employed at time *t* by all foreign-owned firms (in the sample) whose core business is in sector *s.* In this way we are specifying effects from foreign investments as a specific source of external (within sector) economies. Other scholars have measured foreign presence in absolute terms, i.e. as the overall size of foreign activity in a given country. For instance, Barrel and Pain (1997), analysing the effects of inward FDIs on labour demand in the UK and Germany, measure foreign activity as the absolute sectoral stock of FDIs. Branstetter (2000) , in her study of Japan-US technology transfers, measures FDIs as the cumulative counts of all Japanese subsidiaries in the US. Driffield (2001) criticises the use of absolute measures of FDIs (as opposed to relative measures, such as the number of employees of foreign firms *divided by* total employment in a given sector), because they will vary with the size of sectors and hence bias estimates. To solve this problem, we also control for Domestic Employment (see below). With this caution, our estimates should not be

[3] A random-effect model was tested against the fixed-effect model, but Hausman tests rejected the null for every subsample, even after controlling for sectoral dummies.
[4] In a preliminary work on sectoral panel data from Portugal, Flores et al. (2001) obtain exactly this result. OLS regressions, without controlling for fixed effects, yield positive (although still mixed) effects of foreign presence on domestic productivity. Once controlled for sector dummies, the coefficient on foreign presence turns out negative.

biased by the size of sectors, and we can disentangle the effect on domestic productivity of both foreign and domestic sectoral activity[5].

Control variables: X_{st}

- *Growth of Real Value Added* is the growth rate of the sectoral value added, obtained as the sum of value added of all sample firms in sector *s*. It is introduced to capture the effect on domestic firm's productivity that is due to changes in demand
- *Herfindal* is the concentration index of sector *s*, calculated as the sum of squared market shares of each firm in sector *s*. It is intended to capture the degree of competition in the industry, which should impact on domestic firm's productivity
- *Domestic Employment$_{st}$,* is the sum of employees at time *t* of all domestic firms in the sample whose core business is in sector *s.* It has been used to control for the possibility that a positive impact of this latter measure would not be simply the result of the size of the industry.

See Table 2 for a summary of the main descriptive statistics of these variables.

5. Discussion of results

Regressions were run with Total Factor Productivity (TFP) as a dependent variable. We used the Fixed Effects Model (Within Groups Estimator, WG) which allows to control for unobserved time invariant factors which may affect productivity, and enables to isolate the actual impact of Foreign Presence among other independent (control) variables. Table 3 shows the results we have obtained with reference to the three EU countries, France, Italy and Spain, which we have considered separately to highlight the specific impact of inward investments on domestic firms productivity. We find no evidence of effects of inward investments on domestic firms' productivity in France, a negative and significant impact in Spain and a positive and significant impact in Italy. There thus appears to exist a significant heterogeneity across countries as far as the impact of inward investment is concerned.

It is important to observe that significant impacts of inward investments do show up in the case of Italy and Spain (although with opposite signs) in the presence of important controls. Of these the most significant for all countries is the growth of sector Value Added, as a measure of demand dynamics, which appears to be a key driver of productivity growth. Domestic employment in the examined manufacturing sectors is here introduced as a scale factor. It is negative and significant in the case of Italy, possibly signalling that in those sectors wherein domestic activities are most extensive, that is mainly traditional sectors, domestic firms' productivity is lowest. Our measure of industrial concentration, the Herfindal Index calculated for each national market, is significant only in the case of Italy, where a negative impact is shown. It thus appears that, in the case of Italy, unlike the other two countries, the degree of concentration (which is obviously inversely related to the degree of competition) is a relevant inhibitor of productivity growth.

Why are we observing such differences in the actual impact of inward investments on TFP in the examined countries? There certainly are diversities in the institutional and structural features of the three economies which ought to be examined in details. Amongst other factors, important insights can be drawn from the analysis of how the three countries differ in terms of technological

[5] Alternatively, we used the share of foreign to total employment at time *t* in sector *j* (3-digit SIC). Such a measure of FDI, which has also been used extensively in works on spillovers from FDIs, proved to be more sensitive to model specification. Results of these regressions are not shown in this paper but are available from the authors upon request. Below in the text, we show results from regressions using the absolute size of foreign sectoral employment, which we consider as more stable and robust.

levels of both the domestic and the foreign firms. Table 4 highlights a fundamental difference emerging in this respect. Spanish firms exhibit the lowest average TFP, while French firms are characterised by the highest TFP, and Italian firms constitute an intermediate case. Foreign firms are very productive on average in Italy, although with a rather high variability, while in Spain foreign TFP is the lowest. If we now turn to examining TFP gaps which, for the time being, we will define as the difference between average foreign TFP and average domestic TFP (see below for a more careful definition used in regressions), it is shown that in Italy the distance between domestic firms' TFP and foreign firms' is the highest. In Spain and France, the two groups of firms are relatively close in terms of TFP. As already noted, however, in Spain the average level of foreign firms is lower. Details by broad sectors (resulting from the aggregation of the 3 digit sectoral distribution of firms adopted for our regressions) are offered in table 4, which also highlights that in a number of industries domestic firms do represent the technological frontier, with foreign firms lagging behind. This confirms our line of arguments in section 3, concerning the need of a careful consideration of gaps between foreign and domestic firms when advanced countries are examined.

The above description of stylised facts concerning the three countries induces us to attempt a generalisation of our results, which takes TFP levels and gaps into account. Table 5 illustrates this attempt. It contains a set of regressions we ran after dividing our sample into 6 sub-samples, combining domestic firms according to the average TFP level of foreign firms active in a given sector, and to the distance that we observe in each of these sectors between domestic firms and foreign firm productivity [6]. We then identified the impact of foreign presence in these sub-samples of domestic firms.

More precisely, Foreign Productivity level ($Foreign\_TFP_{jst}$) is defined as the mean of TFP of foreign firms in country *j* in a given sector *s* at time *t.* We have defined a sample of high (low) Foreign TFP firms, whose core business is characterised by a value of Foreign TFP (averaged over time) above (below) the median.

Productivity Gap (TFP_Gap_{ist}) is defined as the percentage distance between the TFP of firm *i* active in sector *s* from the indicator of foreign TFP we have described above ($Foreign\_TFP_{jst}$) in the same sector at time *t*

$$TFP\_Gap_{ist}^{j} = \frac{Foreign\_TFP_{st}^{j} - TFP_{ist}^{j}}{TFP_{ist}^{j}}.$$

It takes positive values if the average foreign TFP in the sector is higher than firm's TFP (i.e. if a sample firm is relatively less productive than the mean TFP of foreign firms in the sector), value zero if the (domestic) firm and the average foreign TFP are exactly equal, while it takes negative values if the domestic firm is more productive than the average foreign. In the extreme case of sectors where no foreign firms are active, TFP Gap takes value equal to –1. It is worth noting that *TFP_Gap* is calculated for each firm relative to a sectoral benchmark, represented by the average TFP of foreign firms in that sector. Therefore, gaps refers to firms more than to sectors and each industry we can find both domestic firms very close to foreign firms' average productivity or very far. We have defined High TFP Gap firms, those firms whose average TFP Gap (over time) is higher than the 66th percentile, Low TFP Gap firms when below the 33rd percentile (and Intermediate TFP Gap firms when between the 33rd and the 66th). Any criteria to split the sample would share some degree of arbitrariness, we have chosen the one which allows to build subsamples of equal size: one third of firms is in each of the three TFP_Gap groups and half of the firms is in the two Foreign_TFP groups. Unfortunately, when we use the two criteria jointly, the number of firms in each group need not to be equal. Comfortingly, the Chow-like test (developed in Appendix) for the division of the sample presented at the end of Table 5, soundly rejects the hypothesis

[6] To control for the appropriateness of this division of the sample, we have adapted a version of the Chow test to multiple breaks in panels, when breaking occurs over individuals rather over time (see Appendix for the exact specification of the test).

coefficients obtained in the 6 subsamples are equal to the coefficients estimated in the pooled regression, thus supporting our division of the sample.

Consistently with the hypotheses discussed in section 3, it turns out from Table 5 that it is the combination of (medium)-high gaps with high level of foreign TFP that is associated with a positive and significant impact of FDIs. This seems to correspond to the idea that, under these circumstances, MNEs have much technology to supply, and face relatively low costs at protecting their technology. They will thus be relatively available to enter linkages with local firms, to accept a certain mobility of workers, and even exchange skills and knowledge with domestic firms. This could roughly correspond to the story of Italy in our results of table 3.

The case of (low) intermediate gaps combined with low foreign TFP is associated with negative (or no) effects of foreign presence. This could be consistent with the expectations we have illustrated in section 3: A low potential supply of technology and high appropriation efforts, lead MNEs to avoid interactions with, and reduce transfers of knowledge to, domestic firms. This story could correspond to what we showed in the case of Spain in table 3.

We do indeed find evidence of a third category, characterised by Low Gap and High Foreign TFP, wherein the impact of FP is barely significant and negative. This corresponds to the lowest number of observations (267). Although this result is not as sound as the other ones, one might observe that the negative sign in this case could be revealing of the importance of appropriability regimes and of technology protection costs that are associated to environments characterised by high technological competition. These features may prevent closer and effective interactions between foreign and local firms.

To conclude this section, our results show that neither high foreign TFP levels (which was emphasised as a key condition in the “catching up hypothesis” discussed in section 3) nor the low gap (which was stressed by the “Technological accumulation hypothesis” discussed in section 3) can by themselves generate the conditions for a positive effects of FDIs on local firms. It is the combination of high foreign TFP levels with high gaps that increases the likelihood that local firms benefit from foreign presence.

6. Conclusion

This paper has attempted to provide a contribution to the debate on the impact of inward investments, a phenomenon that has been accelerating in Europe since the early 1990’s. We innovated on existing literature by providing a wide-spectrum analysis of this aspect of globalisation in three EU countries, using comparable data. We attempted a generalisation of the results obtained for individual countries by introducing TFP gaps between foreign and domestic firms, and TFP levels of MNEs as key variables determining the impact of multinational presence on domestic performances. It was shown that it is the combination of high gaps and high levels of foreign productivity that leads to the most positive effects of inward investments.

Based on these results, policy implications are quite different from the usual ones. When dealing with developed economies as recipient countries, as it is the case in this paper, it is not so much a matter of promoting FDIs in industries where local technology gaps are. This might be the case with LDCs as host economies, where governments face the key issues of improving the existing absorptive capacity, and of avoiding the imposition of less appropriate technology. Using the same approach would probably be misleading when considering Developed countries, i.e. economies that are characterised by a relatively high number of firms that are close to the technological frontier. Indeed, these countries are most likely to take advantage from a selection of multinationals carrying out high productivity activities in sectors wherein domestic firms would have a lot to learn, and new foreign technology to adopt. This means promoting the entry of MNEs that are active at the technological frontier, particularly where domestic manufacturers are relatively weaker, provided that appropriate antitrust and other competition policies are adopted to reduce the risks of monopolisation in these markets. This choice would not only increase the potential of technology that could be transferred from MNEs to local firms; it would also reduce the costs foreign firms would face in order to protect their own technology, which can be expected to increase their availability to actually supply and exchange knowledge and expertise to the advantage of local firms.

Of course, policies favouring positive externalities from inward investments cannot be limited to the selection of sectors in which multinational presence should be favoured. A whole set of measures could and should be utilised, such as the modernisation of infrastructures, human capital formation, "after-care" policies and the support of local firms, including suppliers of MNEs. It remains that investment selection and promotion, especially if combined with complementary pro-competitive and infrastructural policies, should be re-considered in the agenda of national and supra-national governments, as a key tool to enhance industrial growth.

Table 1 – Characteristics of our sample of French, Spanish and Italian manufacturing firms, by ISIC sectors at 1995

	Number of firms			Share of Foreign Firms			Foreign Employment			Foreign Employement (% of Total Manufacturing)			Foreign Employment / Total Employment		
Isic	**Spain**	**France**	**Italy**	**Spain**	**France**	**Italy**	**Spain**	**France**	**Italy**	**Spain**	**France**	**Italy**	**Spain**	**France**	**Italy**
Basic Metal Industries	51	102	73	13.7%	32.4%	12.3%	1.913	11.009	2.914	0.7%	3.6%	2.1%	9.3%	23.1%	12.4%
Chemical Products	194	245	152	64.9%	46.5%	45.4%	41.963	40.302	27.112	15.7%	13.1%	19.2%	67.0%	50.0%	48.1%
Electrical Machinery	93	176	97	57.0%	39.8%	29.9%	34.186	36.882	20.016	12.8%	12.0%	14.1%	64.7%	30.5%	38.7%
Food, Beverages & Tobacco	205	270	82	27.3%	17.4%	19.5%	34.795	23.913	20.645	13.0%	7.8%	14.6%	36.4%	26.3%	50.4%
Instruments	24	95	30	54.2%	43.2%	30.0%	4.225	16.982	1.264	1.6%	5.5%	0.9%	56.4%	44.5%	12.3%
Metalworking	64	172	98	29.7%	24.4%	24.5%	3.971	10.330	9.754	1.5%	3.4%	6.9%	21.7%	20.3%	35.4%
Non-Electrical Machinery	70	251	191	41.4%	47.0%	24.6%	18.638	59.642	24.913	7.0%	19.4%	17.6%	71.1%	55.1%	36.0%
Non-Metal	73	90	71	31.5%	34.4%	16.9%	11.985	12.114	6.491	4.5%	3.9%	4.6%	46.7%	32.9%	23.9%
Other Manufacturing	33	57	31	27.3%	21.1%	12.9%	3.402	3.506	775	1.3%	1.1%	0.5%	28.7%	23.7%	11.1%
Paper, Paper Products & Printing	104	193	65	29.8%	35.2%	16.9%	9.142	24.146	3.181	3.4%	7.9%	2.2%	32.3%	37.9%	12.7%
Petro	8	14	11	12.5%	64.3%	36.4%	754	5.186	2.827	0.3%	1.7%	2.0%	30.9%	32.2%	49.4%
Rubber	77	145	90	55.8%	53.1%	26.7%	27.001	27.500	13.056	10.1%	9.0%	9.2%	80.2%	53.1%	42.9%
Textiles, Apparel & Leather	68	165	171	17.6%	21.2%	3.5%	4.334	12.428	1.614	1.6%	4.1%	1.1%	15.4%	29.1%	2.9%
Transport	91	100	56	60.4%	46.0%	28.6%	70.840	20.427	7.013	26.5%	6.7%	5.0%	61.1%	13.6%	4.5%
Wood Products & Furniture	12	46	8		21.7%		-	2.370	-	0.0%	0.8%	0.0%	0.0%	23.0%	0.0%
Total	**1.167**	**2.121**	**1.226**	**40.9%**	**35.5%**	**22.8%**	**267.149**	**306.737**	**141.575**	**100.0%**	**100.0%**	**100.0%**	**50.2%**	**33.2%**	**24.1%**

Table 2 – Descriptive Statistics for regression variables

Variable		Obs.	Mean	Std. Dev.	Min	Max
Log(TFP)	Spain	3450	-0.04	0.46	-2.01	2.12
	France	6840	-0.02	0.52	-2.14	4.25
	Italy	4730	-0.03	0.52	-4.50	3.11
FDI_Sector[§]	Spain	3450	0.31	0.73	0	4.60
	France	6840	0.80	0.90	0	4.83
	Italy	4730	0.60	0.92	0	4.27
Domestic Employment[§]	Spain	3450	1.28	1.05	0.02	7.14
	France	6840	0.70	0.85	0.00	5.90
	Italy	4730	0.50	0.91	0.00	7.18
Growth of Real Value Added	Spain	2760	0.04	0.14	-0.96	0.85
	France	5472	0.05	0.13	-0.83	1.05
	Italy	3784	0.04	0.15	-0.65	0.93
Herfindal Index	Spain	3450	0.18	0.17	0.03	1
	France	6840	0.14	0.14	0.02	1
	Italy	4730	0.20	0.17	0.02	1

[§] FDI_Sector and Domestic Employment are normalised by their standard deviation. See section 4 for variable definitions.

Table 3 – The impact of sectoral foreign presence on domestic firms productivity in France, Spain and Italy, 1993-1997 (within-group estimates)

Dependent Variable: Log of TFP Sample: Only Domestic Firms	Spain	France	Italy
FDI_Sector	-.15**	.006	.13**
	(-2.58)	(.19)	(3.56)
Domestic Employment in 3-digit SIC[§]	.03*	.001	-.07**
	(1.67)	(.03)	(-2.51)
Growth of Sector Value Added	.18**	.22**	.24**
	(6.47)	(7.12)	(6.84)
Herfindal	-.02	-.10	-.54**
	(-.13)	(-.55)	(-2.44)
Time Dummies	Yes	Yes	Yes
N. obs	2760	5472	3784
N. firms	690	1368	946
F-slopes	7.49**	7.77**	9.83**
	(7, 2063)	(7, 4097)	(7, 2831)
F-fixed	45.25**	49.92**	19.41**
	(689, 2063)	(1367, 4097)	(945, 2831)
F-chow		3.20**	
		(16, 8988)	

[§] Expressed in standard deviation units
t-statistics are in brackets below estimates. Asterisks indicates significance values (**: $p < 0.05$; *: $p < 0.1$)
F-slopes and F-fixed denote tests for equality to zero of parameter estimates and of the fixed effects respectively. F-chow denote a “Chow-like” test for equality of coefficients across sub-samples (see Appendix). Degrees of freedom are in brackets below the statistic

Table 4 – Average TFP of domestic and foreign-owned firms from French, Spanish and Italian manufacturing firms and TFP Gaps, by ISIC sectors at 1995

	Average TFP of Domestic Firms*			Average TFP of Foreign Firms*			TFP Gap** (Foreign TFP - Domestic TFP)		
Isic	**Spain**	**France**	**Italy**	**Spain**	**France**	**Italy**	**Spain**	**France**	**Italy**
Basic Metal Industries	1.42	1.13	1.16	1.09	0.93	1.01	-0.33	-0.20	-0.14
Chemical Products	1.32	1.17	1.23	1.29	1.42	1.42	-0.03	0.26	0.19
Electrical Machinery	0.97	1.28	0.80	1.19	1.27	1.30	0.22	0.00	0.49
Food. Beverages & Tobacco	1.10	0.85	1.22	1.06	1.13	1.60	-0.04	0.28	0.38
Instruments	1.09	1.25	0.95	1.28	1.08	1.20	0.19	-0.17	0.25
Metalworking	0.94	1.07	1.14	1.01	1.00	0.96	0.07	-0.06	-0.18
Non-Electrical Machinery	0.88	1.27	0.90	1.06	1.53	0.99	0.18	0.26	0.09
Non-Metal	1.61	1.07	1.19	1.79	1.14	1.38	0.18	0.08	0.19
Other Manufacturing	1.00	0.85	0.99	1.08	1.04	1.02	0.07	0.19	0.03
Paper. Paper Products & Printing	1.33	1.51	1.25	1.10	1.38	1.04	-0.23	-0.13	-0.21
Petro	1.13	3.80	4.72	3.64	3.22	6.05	2.51	-0.59	1.33
Rubber	0.88	0.90	0.85	0.85	0.99	1.51	-0.03	0.10	0.66
Textiles. Apparel & Leather	0.82	1.11	1.25	0.88	1.19	1.02	0.06	0.08	-0.23
Transport	1.07	2.05	1.21	1.04	0.92	1.31	-0.03	-1.14	0.09
Wood Products & Furniture	1.25	0.81	0.95		1.01		-1.25	0.21	-0.95
Total									
mean	**1.07**	**1.16**	**1.12**	**1.16**	**1.21**	**1.34**	**0.09**	**0.05**	**0.22**
(s.d.)	**(.60)**	**(1.34)**	**(.77)**	**(.59)**	**(.85)**	**(1.82)**			

* For the purpose of these descriptive statistics, foreign and domestic TFP are defined as the mean of TFP of domestic and foreign firms in each ISIC sector. Totals are the mean (and standard deviation) over all firms. thus they do not necessarily equal the mean of the sectoral values.
** For the purpose of these descriptive statistics, TFP gaps are defined as the difference between mean foreign TFP and mean domestic TFP

Table 5 – The impact of sectoral foreign presence on domestic firms productivity. Subsamples by foreign TFP level and TFP Gap, 1993-1997 (within-group estimates)

Dependent Variable: Log of TFP Sample: Only Domestic Firms	**Low Gap and Low Foreign TFP**	**Interm. Gap and Low Foreign TFP**	**High Gap and Low Foreign TFP**	**Low Gap and High Foreign TFP**	**Interm. Gap and High Foreign TFP**	**High Gap and High Foreign TFP**
FDI_Sector[§]	.16	-.16**	.17	-.13*	.06**	.12**
	(1.34)	(-2.64)	(1.39)	(1.78)	(2.05)	(3.68)
Domestic Employment	.01	.006	-.07	-.03	-.03	-.01
in 3-digit SIC[§]	(.42)	(.12)	(-.94)	(.58)	(-.09)	(-.49)
Growth of Sector Value Added	.19**	.26**	.25**	.33**	.14**	.11**
	(6.84)	(6.51)	(3.48)	(4.47)	(3.60)	(2.77)
Herfindal	-.44**	-.35	.57	.11	-.51*	-.48
	(-2.62)	(-1.27)	(1.33)	(.24)	(-1.76)	(-1.54)
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N. obs	2896	2048	1076	1068	1912	3008
N. firms	724	512	269	267	478	752
F-slopes	12.14**	7.29**	3.34**	3.40**	4.06**	4.68**
	(7, 2165)	(7, 1529)	(7, 800)	(7, 794)	(7, 1427)	(7, 2249)
F-fixed	27.60**	7.84**	5.31**	30.05**	14.31**	11.78**
	(723, 2165)	(511, 1529)	(268, 800)	(266, 794)	(477, 1427)	(751, 2249)
F-chow	2.63**					
	(40, 8964)					

[§] Expressed in standard deviation units
t-statistics are in brackets below estimates. Asterisks indicates significance values (**: $p < 0.05$; *: $p < 0.1$)
F-slopes and F-fixed denote tests for equality to zero of parameter estimates and of the fixed effects respectively. F-chow denote a “Chow-like” test for equality of coefficients across sub-samples (see Appendix). Degrees of freedom are in brackets below the statistic .
Gap is defined as $GAP_{ist}^{j} = \left(Foreing\_TFP_{st}^{j} - TFP_{ist}^{j}\right) / TFP_{ist}^{j}$. where $Foreign\_TFP_{st}^{j}$ is the average TFP level of foreign firms in sector *s* and country *j* and TFP_{ist}^{j} is the TFP level of (domestic) firm *i*. which operates is sector *s* and country *j*. Firms are defined as low gap if the time average of GAP_{ist}^{j} is below the 33rd percentile (-.15). high gap if it is above the 66th percentile (.29) and intermediate gap if it is between the 33rd and the 66th percentile.
Firms are defined as being in High Foreign TFP sectors if $Foreign\_TFP_{st}^{j}$ is above the median (1.01). while are defined as Low Foreign TFP if $Foreign\_TFP_{st}^{j}$ is below the median.

Appendix – The test for break into groups of individuals

In this paper we break our sample into groups of firms with sharing common characteristics (e.g. nationality, TFP gap and TFP of foreign firms) thus we believe it is useful to test for the appropriateness of the various breaks. The following is an extension of the Chow test for structural breaks in the context of balanced panels (Baltagi, 1995 p. 49), when break is based on individuals rather than on time.
Given a linear fixed-effect specification

$y_{it} = b' X_{it} + h\ D_i + v_{it}$, for $i = 1, \ldots N$ and $t = 1, \ldots T$

where b' is a $1 \times K$ vector of parameters, X_{it} is a K x 1 vector of regressors, h is a 1 x N vector of individual effects, D_i is a N x 1 vector of individual effects (1 element is equal to 1 and N-1 are zeros), n_{it} is the error term, can be tested against a similar specification, which allows coefficients b to vary across groups of individuals.

For example,

$y_{it} = b_1' X_{it} + h\ D_i + v_{it}$, for $i = 1, \ldots N^1$ and $t = 1, \ldots T$

$y_{it} = b_2' X_{it} + h\ D_i + v_{it}$, for $i = 1, \ldots N^2$ and $t = 1, \ldots T$

…

$y_{it} = b_M' X_{it} + h\ D_i + v_{it}$, for $i = 1, \ldots N^M$ and $t = 1, \ldots T$

with $N^1 + N^2 + \ldots N^M = N$

A test of the first model (restricted) against the system of unrestricted equations implies

H_0: $b_1 = b_2 = \ldots = b_M$

The resulting test would be a standard F-test of the following form:

$$F - chow(MK - K, NT - N - MK) = \frac{\left(RSSE - \sum_{m=1}^{M} USSE_m\right) \Big/ (M-1) \times K}{\sum_{m=1}^{M} USSE_m \Big/ NT - N - MK}$$

where *RSSE* is the Sum of Squared Errors (SSE) in the unrestricted model, $USSE_m$ is the SSE in the m^{th} subsample, *N* is the number of individuals in the sample, *T* is number of time periods, *M* is the number of subsamples and *K* is the number of parameters to be estimated. The statistics is distributed as an F with degrees of freedom *MK–K* and *NT–N–MK*.

References

Aitken B., Hanson B., Harrison A.E. (1997) "Spillover, Foreign Direct Investment, and Export Behavior" *Journal of International Economics*, 43, 103-132

Aitken B., Harrison A. (1999) "Do Domestic Firms Benefit from Direct Foreign Investment? Evidence from Venezuela", *American Economic Review*, 89, 3, 605-18.

Aitken B., Harrison A., Lipsey R. (1995) "Wages and Foreign Ownership: A Comparative Study of Mexico, Venezuela, and the United States", NBER Working Paper 5102.

Barrel R., Pain N. (1997) "Foreign Direct Investment, Technological Change, and Economic Growth within Europe" *Economic Journal*, 107, November, 1770-1786

Barrios S. (2000) "Foreign Direct Investment and Productivity Spillovers. Evidence from the Spainsh Experience", *FEDEA Documento de Trabajo*, 2000-19.

Basu S., Fernald J. (1995) "Are apparent productive spillovers a figment of specification error", *Journal of Monetary Economics*, 36, 165-188.

Blomstrom M., Kokko A. (1998) "Multinational Corporation and Spillovers" *Journal of Economic Surveys* n.12, 247-277

Blomstrom M., Sjoholm F. (1999) "Technology Transfer and Spillovers: Does Local Participation with Multinationals Matter?", *European Economic Review*, 43, 915-23.

Blomstrom M., Wolff E. (1994) "Multinational Corporations and Productivity Convergence in Mexico", in Baumol W., Nelson R., Wolff E. (eds) *Convergence of Productivity: Cross-National Studies and Historical Evidence*, Oxford University Press.

Borensztein E., De Gregorio J., Lee J.W. (1998) "How Does Foreign Direct Investment Affect Economic Growth", *Journal of International Economics*, 45, 115-135

Branstetter L. (2000) "Is Foreign Direct Investment a Channel of Knowledge Spillovers? Evidence from Japan's FDI in the United States" *NBER Working Paper* No.8015, November

Caballero R., Lyons R. (1991) "Internal versus external economies in European industry", *European Economic Review*, 34, 805-830.

Cantwell J. (1989) *Technological Innovation and Multinational Corporation*, Basil Blackwell, Oxford

Castellani D., Zanfei A. (2001) "Multinational Experience and the Creation of Linkages with local firms. Evidence from the Electronics Industry", *Cambridge Journal of Economics*, forthcoming.

Caves R. (1974) "Multinational Firms, Competition and Productivity Convergence in Host-Country Markets", *Economica*, May, 176-193.

Caves R.E., Barton D.R. (1990) « Efficiency in US Manufacturing Industries », Cambridge, MIT Press

De Mello jr. L. (1999) "Foreign Direct Investment-Led Growth: Evidence from Time Series and Panel Data", *Oxford Economic Papers*, 151, 133-151.

Driffield N. (2001) "The impact on domestic productivity of inward investment in the UK", *The Manchester School*, 69, 1, January 2001, 103-119.

Dunning (1993) *Multinational Enterprises and the Global Economy*, Addison Wesley, Wokingham, England.

Dunning J.H. (1958) *American Investment in British Manufacturing Industry*, Allen and Unwin, London

Findlay R. (1978) "Relative backwardness, direct foreign investment and the transfer of technology: a simple dynamic model", *Quarterly Journal of Economics*, 92, 1-16.

Flores R., Fontoura M., Santos R. (2001) “Foreign direct investment spillovers: what can we learn from Portuguese data?”, mimeo.

Fosfuri A., Motta M., Ronde T. (2001) “Foreign direct investment and spillovers through workers’ mobility”, *Journal of International Economics*, 53, 205-222.

Globerman S. (1979) "Foreign Direct Investments and 'Spillover' Efficiency Benefits in Canadian Manufacturing Industries, *Canadian Journal of Economics*, Feb., 12 (1), 42-56.

Haddad M., Harrison A. (1993) "Are There Positive Spillovers from Foreign Direct Investment? Evidence from Panel Data for Morocco", *Journal of Development Economics*, 42, 51-74.

Hirschman A.O. (1958) *The Strategy of Economic Development*, Yale University, New Haven.

Imbriani C., Reganati F. (1997) "Spillovers Internazionali di Efficienza nel Settore Manifatturiero Italiano, *Economia Internazionale*, Vol. L, n. 4, Novembre.

Imbriani C., Reganati F. (1999) "Productivity Spillovers and Regional Differences: some Evidence on the Italian Manufacturing Sector", Centro di Economia del Lavoro e di Politica Economica, Università di Salerno, *Discussion Paper* n. 48, Giugno.

Kokko A. (1994) “Technology, Market Characteristics and Spillovers, *Journal of Development Economics*, 43, 2, 279-293.

Kokko A., Tansini R., Zejan M. (1996) “Local Technological Capability and Productivity Spillovers from FDI in the Uruguayan Manufacturing Sector”, *Journal of Development Studies*, 32, 4, April, 602-611.

Lall S. (1978) “Transnational, Domestic Enterprises and Industrial Structure in Host LDCs. A Survey” *Oxford Economic Papers* , vol. 30, n.2, (217-248)

Mansfield E., Romeo A. (1980) “Technology Transfer to Overseas Subsidiaries by US Based Firms” *Quarterly Journal of Economics*, 95(4) (737-750)

Oulton N. (1996) “Increasing returns and externalities in UK manufacturing: myth or reality?”, *The Journal of Industrial Economics*, XLIV, 1, March 1996, 99-113.

Rodriguez-Clare A. (1997) "Multinationals, Linkages and Economic Development", *American Economic Review*, 86, 4, 852-73 .

Sachwald F. (ed.) (1995) *Japanese Firms in Europe*, Harwood Academic Publishers

Sjoholm F. (1997) "Technology Gap, Competition and Spillovers from Direct Foreign Investment: Evidence from establishment data ", *SSE/EFI Working Paper in Economics and Finance No. 212*, December.

UNCTAD (1999) "World Investment Report: The Challenge of Development", United Nations, Geneva and New York.

UNCTAD (2000) *World Investment Report. Cross Border Mergers and Acquisitions and Development*, UN, New York

Wang J., Blomstrom M. (1992) "Foreign investment and technology transfer", *European Economic Review*, 36, 137-155.