FIW – Working Paper

FIW Working Paper N° 99
July 2012

Do MULTINATIONAL ENTERPRISES PUSH UP THE WAGES OF DOMESTIC FIRMS IN THE ITALIAN MANUFACTURING SECTOR?

Rosanna Pittiglio[1], Filippo Reganati[2], Edgardo Sica[3]

Abstract

The present paper aims to test the impact of incoming Foreign Direct Investment (FDI) on local wages in the Italian manufacturing sector by using firm level data from 2002 to 2007. Results initially show the lack of wage spillovers at both horizontal and vertical level, meaning that the effects of foreign investment are completely internalized within each firm. However, when the technology gap is taken into account, we find some evidence of a non-linear relationship between gap size and wage spillover. In particular, if the technological gap between local firms and foreign companies is too large, Multinational Enterprises (MNEs) face some difficulty in interacting with domestic suppliers and customers, with the consequence that they act like monads within the host country. We therefore believe that policies favouring the attraction of inward investments, should not be of the 'one for all' or 'one for always' type, but must be strongly directed towards the sectoral and local characteristics of the host country.

JEL : F21, F23
Keywords: Foreign Direct Investment, Multinational Enterprises, Horizontal Wage Spillovers, Vertical Wage Spillovers, Technological Gap

Authors

[1] Faculty of Economics, Second University of Naples
Email: rosanna.pittiglio@unina2.it
[2] Faculty of Communication Sciences, University of Rome 'Sapienza'
Email: filippo.reganati@uniroma1.it
[3] Faculty of Economics, University of Foggia
Email: e.sica@unifg.it

DO MULTINATIONAL ENTERPRISES PUSH UP THE WAGES OF DOMESTIC FIRMS IN THE ITALIAN MANUFACTURING SECTOR?

Rosanna Pittiglio[1], **Filippo Reganati**[2], **Edgardo Sica**[3]

[1]*Faculty of Economics, Second University of Naples, C.so Gran Priorato di Malta, 81043 Capua - CE (Italy)*
Email: rosanna.pittiglio@unina2.it

[2]*Faculty of Communication Sciences, University of Rome 'Sapienza', Via Salaria 113, 00198 Rome (Italy)*
Email: filippo.reganati@uniroma1.it

[3]*Faculty of Economics, University of Foggia, L.go Papa Giovanni Paolo II 1, 71121 Foggia (Italy)*
Email: e.sica@unifg.it

Abstract

The present paper aims to test the impact of incoming Foreign Direct Investment (FDI) on local wages in the Italian manufacturing sector by using firm level data from 2002 to 2007. Results initially show the lack of wage spillovers at both horizontal and vertical level, meaning that the effects of foreign investment are completely internalized within each firm. However, when the technology gap is taken into account, we find some evidence of a non-linear relationship between gap size and wage spillover. In particular, if the technological gap between local firms and foreign companies is too large, Multinational Enterprises (MNEs) face some difficulty in interacting with domestic suppliers and customers, with the consequence that they act like *monads* within the host country. We therefore believe that policies favouring the attraction of inward investments, should not be of the 'one for all' or 'one for always' type, but must be strongly directed towards the sectoral and local characteristics of the host country.

Keywords: Foreign Direct Investment, Multinational Enterprises, Horizontal Wage Spillovers, Vertical Wage Spillovers, Technological Gap.

Jel classification: F21, F23

1. Introduction

Over the last few decades, the importance of Foreign Direct Investment (FDI) by Multinational Enterprises (MNEs) throughout the global economy has increased dramatically. The ongoing liberalisation of trade and investment, as well as the radical technological developments in ICT, have certainly contributed to this rise. For instance, the global stock of inward FDI as a percentage of global GDP increased from less than 5% in 1980 to about 30% in 2010 (UNCTAD 2011).

Together with the growing worldwide increase in FDI flows, the number of jobs in the foreign affiliates of MNEs has also risen considerably. UNCTAD (2010) estimated that, in 2009, 80 million workers were employed in foreign affiliate firms, accounting for about 4 percent of the global workforce. The distribution of jobs in foreign affiliates of MNEs is generally skewed towards the manufacturing sector, thus suggesting that the activities conducted by MNEs in manufacturing tend to be relatively more labour-intensive than in other sectors (Arnal and Hijzen 2008).

In this regard, policy-makers tend to emphasize the potential benefits that FDI can bring to the host economies, by improving pay and working conditions. Such benefits may be direct or indirect. Direct benefits refer to benefits for employees in foreign-owned firms, whereas indirect benefits refer to benefits for workers in domestic firms. MNEs can provide higher wages because of their higher productivity which, in turn, is explained by greater technological know-how and modern management practices, which allow them to compete efficiently in foreign markets and offset the cost of coordinating activities across different countries. Similarly, MNEs can lead to indirect benefits by increasing the productivity of domestic firms, when the productivity advantage spills over from foreign affiliates to domestic firms (see Blomström and Kokko 1998; Smarzynska 2004; Dimelis 2005; Jordaan 2008; Hamida and Gugler 2009). In particular, the access to knowledge provided by MNEs to the host country may be enhanced if foreign enterprises' knowledge is absorbed by local workers, thus making the domestic workforce more productive (Aitken et al. 1996): if MNEs bring new ideas and knowledge to the host country, FDI can contribute to raising wages paid by local firms, since the marginal productivity of domestic

workers increases. Consequently, equilibrium wages in the domestic labour market should rise in response to the increase in inward FDI flows.

In this framework, the purpose of this paper is to test the impact of incoming FDI on domestic wages in domestically owned firms by using firm level data for the Italian manufacturing sector. In the last ten years, Italy has recorded an increasing flow of inward FDI, whose value increased from 6,911 million dollars in 1999 to 9,498 million dollars in 2010 (UNCTAD 2011). In particular, in 2009 the number of foreign-controlled firms was 14,155; they employed 1.2 million workers. In the manufacturing sector alone, the number of foreign firms was 3,897, whereas the number of workers employed amounted to 471,515 (ISTAT 2011). Since MNEs have performed better than their domestic counterparts (in terms of productivity, number of workers employed, profitability, etc.), it is worth exploring whether Italian firms have been able to exploit the presence of MNEs in terms of positive wage externalities. In this regard, we attempt to answer the following research questions: (i) Does FDI have any impact on domestic firms' wages (so called 'wage spillovers')? (ii) If so, to what extent is such an impact related to the existence of productivity spillovers arising from backward and forward linkages between domestic and foreign firms? (iii) Are wage spillovers sensitive to the size of the technological gap between domestic and foreign firms?

In particular, the present paper contributes to the existing literature on wage spillovers in several ways. Firstly, it is the first study which explicitly examines the presence of wage spillovers in the Italian case, as well as being one of the very few works which considers such an issue in a developed country. Secondly, it explores a void in the literature since the previous studies on FDI-related spillovers have generally considered only wages paid by domestic firms due to the presence of MNEs in the same industry (horizontal wage spillovers). To the best of our knowledge, only one study (Quoc Le 2007) has extended the analysis by considering the possible vertical linkages between foreign and domestic firms (vertical wage spillovers). Thirdly, since FDI-related spillovers depend upon a number of firm-, industry- and, country-specific characteristics, this paper investigates to what extent the level of the

technology gap between domestic and foreign firms matters for the likelihood of wage spillovers.

The rest of the paper is organised as follows. Section 2 reports the literature about the impact of FDI on wages. Section 3 depicts our estimation strategy. Section 4 includes some descriptive statistics about the database used. Section 5 describes our findings and, finally, section 6 ends with some concluding remarks.

2. FDI and wage spillovers: a literature review

Generally speaking, economic literature recognises the potential benefits that FDI from MNEs can bring to workers of (a) foreign and/or (b) domestic firms in terms of higher wages paid to employees with similar characteristics. The improved wage paid by MNEs is generally viewed as a 'direct' effect of FDI, whereas the impact on wages paid by domestic firms to their workers as a consequence of the presence of multinational firms is known as an 'indirect' effect. It is worth noting that the existence of possible wage benefits to some workers should not generally occur in a competitive labour market, unless firms employ more skilled workers or have to compensate the workforce for undesirable differences in the characteristics of jobs, such as lower job security (Arnal and Hijzen 2008).

Regarding the 'direct' effect of FDI, the presence of market failures may explain the reason why MNEs can offer better pay to their workers. In particular, MNEs may pay an efficiency wage in order to (i) reduce worker turnover, (ii) minimize the risk of their productivity advantage spilling over to competing firms, and (iii) motivate workers in the presence of high monitoring costs related to asymmetric information problems. Moreover, in the context of search frictions, the recognised productivity advantage of MNEs may give rise to rent: insofar as this rent is shared with workers, better firms promote better jobs. Finally, there may be institutional factors that provide incentives for MNEs to go beyond local labour practices. For example, in developing countries - where the rule of law is weak - MNEs may be more likely to comply with national labour laws because of reputational concerns and consumer pressure in their home markets.

As argued earlier, incoming FDI may also have an 'indirect' impact on wages. This may happen because the productivity advantage of MNEs spills over to local firms, or because the employment activities of foreign-owned firms affect the local labour market.

The literature recognizes at least four *channels* through which the productivity advantage of MNEs may spill over to local firms. The first is the so-called 'competition effect': the increased competition brought by MNEs' entry may stimulate domestic firms to increase their productivity by updating manufacturing technologies and adopting advanced management practices to meet the competitive challenge. Moreover, the presence of MNEs in domestic markets can provide domestic firms with an opportunity of 'learning by watching' that indirectly contributes to the rising intensity of domestic R&D. Secondly, spillovers can occur through imitation and demonstration of any activity by foreign technologies (Blomström and Kokko 1998). Through exposure to foreign firms' activities, domestic enterprises can observe such firms' technologies and management practices and can imitate them in their own operations, thus increasing their productivity. The third channel happens through domestic linkages both at backward level – i.e. by subcontracting activities between MNEs and local suppliers - and at forward level – i.e. between MNEs and domestic buyers. When MNEs build backward and/or forward linkages with domestic suppliers and distributors, knowledge from foreign firms is transmitted to suppliers and distributors, and ultimately domestic firms, through the same suppliers and distributors (Spencer 2008). The fourth channel is workers' mobility and training (which stem from the skills of workers, managers, engineers, etc.) acquired by foreign firms and then transferred to local plants.

The presence of MNEs in the local labour market may potentially affect both labour demand and supply. The entry or the expansion of foreign firms' activities may increase local labour demand, and consequently local wages. Moreover, to the extent that MNEs pay higher wages, incoming FDI may reduce

the supply of labour towards domestic firms that, consequently, have to pay higher wages to hire their workforce.[1]

With specific regard to the 'indirect' effect of FDI, it is worth noting that the empirical evidence is not as vast as that on productivity spillovers; moreover studies on this topic have often produced contrasting results. For instance, by using industry level data for manufacturing industries in Mexico, Venezuela and the United States, Aitken *et al.* (1996) find some evidence of positive effects on domestic firms' wages from the presence of foreign firms in the US, but negative wage spillovers in the case of the first two countries. In South Carolina, Figlio and Blonigen (2000) find evidence that the effect on aggregate wage levels of a large new foreign investment is not only the result of high wages in the foreign-owned plants, but may involve spillovers to domestically-owned plants. Their study differs from others in that it concentrates on geographical effects, not on effects within the industry of the investment. A study by Girma *et al.* (200l) of the UK manufacturing sector for the period 1991 to 1996 finds that, on average, when spillovers are assumed to be identical across industries and firms, there is no significant evidence for them. However, when the effects are permitted to vary across industries, wage spillovers are found and are higher in industries where the productivity gap between foreign and domestic firms is lower. Bedi and Cieslik (2002) analyse Polish manufacturing industries during the period 1994-1996 and find a positive link between wages and foreign presence in an industry. Similarly, Faggio (2003) explores the link between FDI and wages in three countries of Central and Eastern Europe: Poland, Bulgaria and Romania. Her results suggest that higher levels of foreign activity are associated with higher local wages in all countries, although FDI effects vary substantially across sectors; moreover, her findings indicate the existence of positive FDI spillovers from foreign to domestic producers in Poland, but not in Bulgaria and Romania. Using panel data at plant-level for the UK electronics industry, Driffield

[1] It is worth noting that the presence of MNEs may also contribute to decreasing the wages paid by domestic firms. The possible reason for negative wage spillovers is that foreign firms steal the best workers, i.e. high wage workers from the local firms (so-called labor-market crowding out); moreover, the competition between local and foreign firms in the product market decreases the profitability of local firms which, in turn, may lead to wage reductions in these firms (so-called product-market crowding out).

and Girma (2003) find that FDI has a large positive effect on wages in domestic firms through their impact on labour demand, as well as a small positive effect through their impact on labour supply. Moreover, wage spillovers appear to be larger for skilled than unskilled workers, which may reflect the relative scarcity of skilled labour.

Examining a cross-section dataset of Indonesian firms in 1996, Lipsey and Sjoholm (2004) find that wages in locally owned firms are higher in industries within provinces with a large foreign presence. Also, the spillover effect is the same for blue and white collar workers at the national level but, as the definition of the labour market becomes finer (the three digit and five digit levels), spillover effect for white collar workers is higher than for blue collar workers. Using plant level panel data for the Irish manufacturing industry for the period 1990 to 1998, Barry *et al.* (2005) find that, on average, there are unambiguously negative spillovers from foreign presence on wages paid by domestic exporting firms, but no effect on wages in domestic non-exporters. The authors attribute this result to the labour market crowding out effect. Hale and Long (2008) use a World Bank survey data set of 1,500 Chinese enterprises conducted in 2002. They find that the presence of FDI has both direct and indirect effects on the wages of skilled workers, although the indirect effect seems to be limited only to private firms.

When looking at the effects of *vertical* linkages from MNEs on wages in domestic firms, the empirical evidence is even poorer. Among the very few studies on vertical wage spillovers, we quote in particular Quoc Le (2007) who, using firm level data for Vietnam from 2000 to 2004, finds that domestic firms with backward linkages to foreign firms pay higher wages to their employees. Moreover his findings suggest that vertical wage spillovers vary across a number of firm and industry characteristics, such as the firm size, the ownership type of enterprises, and the technological level of industries.

3. Methodology

In order to investigate the effects of FDI for the wages paid by domestic firms, we start from the neoclassical equilibrium condition in the labour market:

$$W = P * MP_L \quad (1)$$

where *W* represents the wage rate, *P* the output price in each industry, and MP_L the marginal product of labour.

Following Aitken *et al.* (1996), and Bedi and Cieslik (2002), we assume that the production function is represented by the following Cobb-Douglas:

$$Y = TFP(FDI) * F(L, K) \quad (2)$$

where *Y* is the output, *L* the labour employed, K the capital, FDI the foreign presence, and *TFP* the total factor productivity which, in the presence of spillovers, is influenced by external investments.

Assuming that supply of labour *L(W)* is equal to W^v, where *v* represents the elasticity (that we assume to be positive), on the basis of equation (2) condition (1) becomes:

$$W = P * TFP(FDI) * F_L(L(W), K) \quad (3)$$

where $F_L(L(W), K)$ indicates the partial derivative of output with respect to labour.

By supposing that *A* is an exponential function of the foreign presence, the logarithmic transformation of equation (3) is:

$$\ln(W) = c + a_1 \ln(P) + a_2 FDI + a_3 v \ln(W) + a_4 \ln(K) \quad (4)$$

where a_3 and a_4 represent the input shares of capital and labour respectively. Re-arranging equation (4), we obtain the following regression specification:

$$\ln W_i = d + b_1 \ln P_i + b_2 FDI_i + b_3 \ln K_i + \varepsilon_i \quad (5)$$

where:

$d = c/(1 - a_3 v)$

$b_1 = a_1/(1 - a_3 v)$

$b_2 = a_2/(1 - a_3 v)$

$b_3 = a_4/(1 - a_3 v)$

Equation (5) controls for the effects of capital (both domestic and foreign) on wages: consequently, a positive coefficient b_2 implies a positive relationship

between wages and the presence of foreign firms as long as *v* is not infinitive (i.e. the labour supply is not perfectly elastic).

Since the aim of this study is to investigate whether a higher foreign presence is associated with higher wages offered by domestic firms producing not only at intra-industry (horizontal spillovers) but also at inter-industry level (vertical spillovers), we break down the foreign presence variable (FDI) into three components:

$$FDI = f(HSPILL, BACKSPILL, FORWSPILL) \tag{6}$$

where *HSPILL* represents the horizontal spillover (i.e. the spillover effect towards local firms in the same sector of foreign enterprises), *BACKSPILL* the backward spillover (i.e. the vertical spillover towards local firms that supply inputs to foreign enterprises), and *FORWSPILL* the forward one (i.e. the vertical spillover towards local firms that buy inputs from foreign enterprises). Moreover, we add *year d*ummy variables in order to control for macroeconomic shocks or unobserved time varying factors. All in all, we estimate the following *re*gression:

$$\begin{aligned} \ln(W)_{ijt} &= f + e_1 \ln(P)_{jt} + e_2 HSPILL_{jt} + e_3 BACKSPILL_{jt} + \\ &+ e_4 FORWSPILL_{jt} + e_5 \ln(K)_{ijt} + e_6 D_t + g_i + \varepsilon_{it} \end{aligned} \tag{7}$$

where the subscript *i* denotes firms, *j* industries, and *t* time, g_i is a time invariant plant-specific term estimated both as random and fixed effects. Finally, the error term $\varepsilon_{it} \sim$ IID $(0, \sigma^2)$ accounts for possible stochastic shocks at the firm level which may affect the dependent variable.

4. Data, variables and descriptive statistics

In this section we present the dataset (section 4.1), the variables specification (section 4.2), and some descriptive statistics (section 4.3).

4.1 Dataset construction

The empirical analysis has been conducted by using manufacturing firm-level data from the AIDA database (*Analisi Informatizzata Delle Aziende*), provided by the Bureau Van Dijk. AIDA, which has recently been used in an increasing number of empirical studies (e.g. Reganati and Sica, 2007; Colombo and

Stanca, 2008; Ferragina et al., 2011; Imbriani et al., 2011), collects the annual accounts of Italian enterprises and contains information on a wide set of economic and financial variables, such as sales, costs and number of employees, value added, fixed tangible assets, R&D, start-up year, sector of activity as well as the ownership status. In order to study the spillover effects of foreign firms on domestic firms, we have identified all Italian firms whose Global Ultimate owner is foreign.[2]

By omitting all observations for which the necessary data are incomplete, and after excluding outliers and having dropped unusual changes in observations that seemed to be possible errors,[3] we obtained an unbalanced panel of about 551,000 observations over the period 2002-2007.

The advantage of using such a dataset is twofold. Firstly, it is highly representative of the entire universe of corporate companies (e.g., in 2007, our sample covers about 87 per cent of total employees declared by the Italian National Institute of Statistics – ISTAT 2008). Secondly, our dataset reflects reasonably well the actual size distribution of firms in the Italian economy characterized by a large weight of micro and small enterprises. In order to measure the vertical spillovers, we employed an Input-Output matrix relative to the years 2002-2007, provided by ISTAT. Finally, each variable included in our database was deflated through the price index (3-digit industry level) also provided by ISTAT.

4.2 Variables' definition

Wages are defined as the log of average wages, computed at the firm level, as total labour costs over the number of employees. The capital stock variable (K) is defined as reported tangible fixed assets in millions of Euros by each firm. As a price variable (P), we use the producer price industry, at the Ateco 3-digit industry level.

[2] Although the AIDA database offers a flexible definition of ultimate ownership (over 25% or over 50%), in our analysis we consider only a share of 25%. Moreover, as the data were collected year by year, the ownership status variable is time-variant.

[3] Data for very small firms are often irregular and untrustworthy, and negative value of cost and number of employees might be an indication of misreporting.

In order to consider the wage spillover at both intra- and inter-industry level, we employ the following variables:

$$HSPILL_{jt} = \frac{\sum_{i \in j, i=MNEs} OUTPUT_{ijt}}{\sum_{i \in j} OUTPUT_{ijt}} \quad (8)$$

$$BACKSPILL_{jt} = \sum_{k,k \neq j} \gamma_{jkt} HSPILL_{kt} \quad (9)$$

$$FORSPILL_{jt} = \sum_{l,l \neq j} \delta_{ljt} HSPILL_{lt} \quad (10)$$

Specifically, HSPILL (horizontal spillover) captures the extent of foreign presence in sector *j* (3-digit industry level) at time *t*, defined as share of foreign output in the sector. BACKSPILL (backward spillover) is a proxy for the foreign presence in the industries that are being supplied by sector *j.* It is intended to capture the extent of potential contacts between domestic suppliers and multinational customers (γ_{jkt} is the proportion of sector *j*'s output supplied to sourcing sectors *k* obtained from the input-output table for domestic intermediate consumption - i.e. excluding imports). FORWSPILL indicates the forward vertical spillovers to local firms that buy inputs from foreign firms (δ_{ljt} is the proportion of sector *j*'s inputs purchased from upstream sectors *l*) (see Pittiglio et al. 2008, and Imbriani et al. 2011 for details). We also experiment with the employment share of foreign ownership. Results are robust for both measures of FDI activity. However, in our analysis we focus essentially on output rather than employment shares, since the latter might raise endogeneity problems given that the dependent variable is defined as total labour costs over employment.

4.3 Descriptive statistics

Table 1 compares the distribution of Italian firms by ownership status and size (small, medium and large firms), the latter measured by the number of employees.[4] According to the figures, domestic firms represent the largest percentage of Italian firms, and are mainly of smaller size, while the share of foreign firms is very small.

[4] Where small firms have 1-49 employees, medium firms 50-249, and large firms more than 250 employees

Table 1. Distribution of Italian firms by size and ownership status (percentages, sample average)

	Foreign Firms	Domestic Firms	**TOTAL**
1≤SIZE≤49	0.3	99.7	89.4
50≤SIZE≤249	3.3	96.7	9.3
SIZE≥250	11.7	88.3	1.4
TOTAL	**0.8**	**99.2**	**100.0**

(Source: Authors' elaborations based on the AIDA database)

As discussed in Section 2, many studies on wage spillovers from FDI have found that foreign firms pay higher wages than their domestic counterparts. In this section, through a simple descriptive analysis, we aim at investigating whether this also happens in the Italian manufacturing sector over the period taken into account. In table 2, we compare average wages paid by foreign and domestic firms (columns 1 and 2), the employment distribution between the two above-mentioned types of firms (columns 3 and 4), and then the share of foreign employment on the total workforce by sector (column 5). Moreover, we advance some hypotheses about the relationship between foreign presence and wages paid by Italian firms (Fig. 1).

Table 2: Descriptive statistics by ownership status and Sector of activity (sample averages)

	Wage (*)		Employment (%)(**)		Share of foreign employment on the total workforce by sector
	Foreign firms	Domestic firms	Foreign firms	Domestic firms	
	(1)	(2)	(3)	(4)	(5)
Food products and beverages	1.51	1.30	5.86	3.39	3.89
Tobacco products	1.68	1.26	7.76	10.05	13.71
Textiles	1.41	1.27	1.66	3.60	0.65
Wearing apparel, dressing and dyeing of fur	1.47	1.23	1.82	2.67	1.36
Leather, Leather products and footwear	1.41	1.27	1.91	2.64	1.14
Wood and products of wood and cork	1.53	1.25	0.52	2.22	0.13
Pulp, paper and paper products	1.48	1.29	6.35	4.06	7.26
Printing and publishing	1.46	1.28	3.01	2.53	1.40
Coke, refined petroleum products and nuclear fuel	1.53	1.52	6.99	7.23	18.01
Chemicals and chemical products	1.60	1.37	6.75	6.10	23.18
Rubber and plastics products	1.44	1.30	4.42	3.95	5.99
Other non-metallic mineral products	1.52	1.30	3.77	3.51	3.82
Basic metals	1.48	1.33	3.88	8.25	3.75
Fabricated metal products	1.48	1.31	2.77	2.98	2.00
Machinery and equipment	1.54	1.77	4.01	3.98	5.67
Office, accounting and computing machinery	1.63	1.27	4.08	2.40	7.82
Electrical machinery and apparatus	1.51	1.31	5.75	4.97	8.81
Radio, Television and communication equipment	1.54	1.81	5.90	4.39	11.13
Medical, precision and optical instruments	1.52	1.31	2.99	3.42	7.07
Motor vehicles, trailers and semi-trailers	1.84	1.33	12.27	9.05	17.08
Other transport equipment	1.55	1.39	4.40	6.02	3.25
Manufacturing n.e.c.	1.44	1.27	3.14	2.59	1.58
Total Manufacturing	**1.55**	**1.41**	**100.00**	**100.00**	**5.87**

Source: author's calculations based on AIDA database

(*) Log(Wage/1000)

***percentages of total manufacturing*

From table 2 we note that foreign firms paid 14% more than domestic enterprises in the period 2002-2007. Industries such as 'Motor vehicles, trailers and semi-trailers', 'Tobacco products', and 'Office, accounting and computing machinery' are those where foreign firms paid higher wages than domestic firms. Only with regard to 'Radio, Television and communication equipment' and 'Machinery and equipment', did domestic firms pay higher

wages than foreign companies, approximately 15% and 13% more, respectively.

Looking at the share of foreign employment on the total workforce by sector (column 5), we observe that sectors such as 'Chemicals and chemical products', 'Coke, refined petroleum products and nuclear fuel', and 'Motor vehicles, trailers and semi-trailers' are characterized by a higher percentage of employment in foreign firms.

By plotting the average wages of Italian firms and the foreign presence by industries (Graph 1), we observe a positive yet slight regression line slope that highlights a weak positive wage spillover effect. The correlation between the two variables is about 0.3.

Graph 1 - Ln(Average wages) of Italian firms and foreign presence by industries

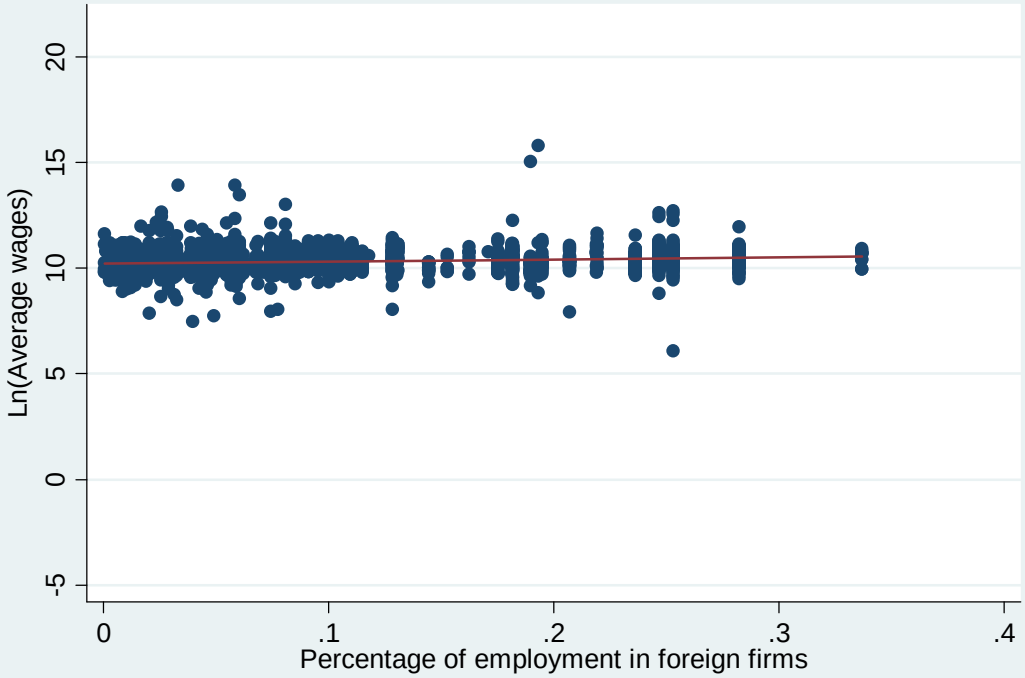

Table 3 provides the mean of the variables for the whole sample distinguished by ownership type, as well as comparison tests of means for the two groups of firms (domestic *versus* foreign firms). We focus our attention on a number of firms' level variables such as: size (i.e. number of employees), wage (i.e. average wages), TFP (i.e. residuals from a Cobb-Douglas production

function using the Levinsohn and Petrin estimation method), capital (i.e. tangible fixed assets), and age (i.e. difference between year *t* and the year of incorporation).The figures suggest that foreign firms are larger, more productive and capital intensive than domestic ones.

Table 3. Mean statistics and t-test of comparison of means of domestic *versus* foreign firms

	Mean			
	Domestic Firms	Foreign Firms	Diff	t
Size	28.63	220.22	-191.59	-39.35***
Wage	25617.12	35112.60	-9495.5	-0.18
TFP	9.51	10.41	-0.90	72.94***
K	12.12	14.21	-2.09	-65.51***
Age	23.44	24.42	-0.98	-0.49

4.4 Estimation results

In order to choose the appropriate estimation technique for the model, we first performed the Lagrangian Multiplier (LM) test developed by Breusch and Pagan (1979). Since the null hypothesis that the individual effect is zero was rejected at the 0.1% significance level, we deduced that the cohort effect is statistically different from zero and that the pooled regression is not appropriate for our model. Consequently, we implemented the F-test for the null hypothesis that the cross-sectional units all have a common intercept. The results obtained suggested rejection of the null hypothesis. This also means that the OLS estimator is biased and inconsistent so we accepted the presence of individual effects. Finally, we ran the Hausman test to decide between a random-effects

or a fixed-effects model.[5] The null hypothesis that the random effect model is more efficient (has smaller asymptotic variance) than the fixed effect model was rejected at the 0.1% level: thus, the fixed effect model was most appropriate to estimate our model. We also tested for possible panel-level heteroskedasticity and autocorrelation. Given the results from the Wald test for groupwise heteroskedasticity in the fixed effect model[6], we rejected the null hypothesis of homoskedasticity. In addition, the Wooldridge test for autocorrelation in panel data suggested that the errors are autocorrelated. Therefore, given the presence of heteroskedasticity and autocorrelation, in order to ensure validity to our statistical results, we followed other studies on panel data that adjust the standard errors of the estimated coefficients for possible dependence in the residuals (Hoechle 2007). Finally, we performed the F-test for the joint significance of the time dummies that rejected the null hypothesis of non-significance at 1 percent level. Estimation results of model (7) are reported in table 4 below.

[5] The Hausman specification test compares the fixed versus random effects under the null hypothesis that the individual effects are uncorrelated with the other regressors in the model. If correlated (i.e. if H_0 is rejected), a random effect model produces biased estimators, thus violating one of the Gauss-Markov assumptions. Consequently, a fixed effect model is to be preferred.

[6] Test implemented in Stata by Baum (2006).

Table 4. Results from estimation of equation (7)

Regressors	(i)	(ii)	(iii)	(iv)	(v)
ln(P)	0.263***	0.265***	0.267***	0.274***	0.277***
	(0.0123)	(0.0126)	(0.0119)	(0.0192)	(0.0154)
ln(K)	0.120***	0.118***	0.120***	0.115***	0.115 ***
	(0.0281)	(0.0278)	(0.0282)	(0.0286)	(0.0285)
HSPILL	0.0182	0.0174	0.018	0.023	-0.0545
	(0.0445)	(0.0448)	(0.0415)	(0.0452)	(0.0363)
FORWSPILL	0.0401	0.0417	0.0342	0.0329	0.0996
	(0.0472)	(0.0474)	(0.0453)	(0.0473)	(0.0828)
BACKSPILL	0.0872	0.0899	0.112	0.104	0.0737
	(0.219)	(0.221)	(0.212)	(0.223)	(0.025)***
ln(size)		0.00433***			
		(0.000854)			
Age			0.279***		
			(0.0153)		
Gap				-0.054***	
				(0.0082)	
gapHSPILL					0.0263
					(0.0107)***
gapFORWSPILL					-0.0192
					(0.0121)
gapBACKSPILL					-0.0758
					(0.0252)**
Constant	7.307***	7.315***	7.270***	7.319***	7.302***
	(0.398)	(0.395)	(0.423)	(0.439)	(0.419)
Year Dummy	Yes	Yes	Yes	Yes	Yes
N. obs.	500,635	500,575	488,753	475,037	475,037

Notes:
Robust standard errors in brackets
*** = statistically significant at 1 percent level.
** = statistically significant at 5 percent level.
* = statistically significant at 10 percent level.

Looking at column (i), wage spillover(s) coefficients (both at horizontal and vertical level) are not statistically significant. This means that the effects of foreign investment seem to be completely internalized within each firm. These results broadly confirm the lack of horizontal productivity spillovers in the Italian

case, as already found in the works of Reganati and Sica (2007), and Imbriani and Reganati (2004) who find evidence of positive but not statistically significant intra-industry spillovers. The coefficient on the 'capital' variable is statistically significant at the 1 percent level, meaning that it is highly correlated with wages: in other words, investment in new machinery and equipment has a positive impact on wages. This result was widely expected on the basis of the circumstance that the spillover coefficients should presumably capture wage increases, which are a reflection of a rise in workers' productivity, whereas the 'capital' coefficient should reflect the impact on new investment in physical capital on the firm's labour demand. Similarly, the coefficient on the 'price' variable is statistically significant at 1 percent level, thus implying a positive correlation between price level and wages.

Since the magnitude of inward FDI-related spillovers is potentially influenced by several factors, to check the robustness of our results, we re-estimated equation (7) by adding some control variables that might affect domestic firms' wages. Such determinants may enhance the mechanisms - depicted in section 2 - through which spillovers take place (competition effect, demonstration effect, etc.). On the basis of the main literature, determinants may be broadly classified in three groups:

a. MNE-related aspects: MNEs' country origin and/or level of MNEs' control on their affiliates (Zhang et al. 2010);
b. Host country and industry specific characteristics: level of financial system development (Massoud 2008), degree of openness to trade (Winters 2004; Romer 1994), degree of market competition (Sjöholm 1999; Kokko 1996);
c. Domestic firms' specific characteristics: size (Zhang et al. 2010; Kim 1998), age, percentage of ownership by foreign affiliates (Blomström and Sjöholm 1999), level of technology used in domestic firms compared to MNEs (Imbriani et al. 2011; Sjöholm 1999; Imbriani and Reganati 1997, Kokko et al. 1996; Kokko 1994)

In the light of this, we checked the robustness of our model by re-estimating equation (7), adding some of the above determinants.

First, we introduced a firm size measure defined as firm *i* sales at time *t* over average firm sales in the industry (3-digit level), expressed in logs, to control for

those cases when firms pay higher wages just because they have a larger market share (column ii). Again, we find that the presence of MNEs does not contribute to raising the wages paid by local firms, to their workers at either intra-industry level or vertical level. The coefficient on the firm size, as expected, is positive and statistically significant at the 1 percent level, meaning that large firms can earn higher profits that might be partly distributed to their employees.

Second, we considered whether the impact of foreign presence on domestic firms' wages is robust to the inclusion of an age variable, calculated as the difference between year t and the official year of incorporation of the firm (column iii). Once again, the coefficients of HSPILL, BACKSPILL, and FORWSPILL are not significant. On the contrary, the coefficient on the age variable is positive and statistically significant, thus indicating that wages are higher in older plants. This result is at odds with the hypothesis that newer firms are likely to employ more productive workers.

5 Does the technology gap matter for wage spillovers?

Finally, we considered the impact of the technology gap on wage spillovers. The relationship between the degree of spillovers and the size of the technology gap between foreign and local firms is a controversial issue in the literature. Some scholars (Wang and Blomström 1992; Wang, 1988; Findlay 1978; Koizumi and Kopecky 1977) have pointed out that spillovers grow with the size of the technology gap between domestic and foreign firms; from this viewpoint, a country's technical efficiency is an increasing function of its capital stock of foreign residents who are assumed to possess greater technical knowledge. The opposing position follows the technological-accumulation literature (Cantwell 1989), where spillovers are more likely to occur in those industries where the technology gap is small. When foreign affiliates invest in sectors which are centers for innovation, they are likely to have a positive impact on the host country economy since, through competition, they stimulate research and innovation in local firms. It is worth noting that the technological gap may be relevant both at horizontal and vertical level. At horizontal level, the magnitude of spillovers is likely to depend on the technological sophistication of local firms; similarly, at vertical level, the extent

of backward (forward) linkages between MNEs and local suppliers (buyers) of intermediate goods is likely to depend upon the stock of technological capabilities of domestic firms in supplying (buying) sectors.

In order to take into account the impact of the technological gap, we built the variable *GAP* defined in terms of TFP gap for each firm, i.e. as the difference between its total factor productivity and that of the average foreign firm in the same sector (Jabbour and Mucchielli 2007; Flores et al. 2007).[7] The results (column iv) do not change significantly: both capital and price are still positive and statistically significant at 1 percent level, whereas variables measuring both horizontal and vertical spillovers are still not statistically significant. The negative and significant coefficient of the technological gap variable suggests that negative wage spillovers occur in those firms that are technologically less advanced: in other words, when the technological gap between local and foreign firms is high, then the workers employed in domestic firms seem to suffer from the presence of foreign enterprises in terms of lower wages.

Another way of taking into account the foreign presence consists in interacting the FDI spillovers variables with the gap distance variable (column v). The backward spillover is now positive and significant at 1 percent level, although, when interacted with the technological gap, its sign changes. We also find that the variable HSPILL, when interacted with the technological gap, turns significant at 1 percent level.

Until now, our results seem to suggest that in the case of a technological gap, the presence of foreign firms contributes positively to the wages paid by domestic firms in the same sector, and negatively to the wages paid by local firms with backward linkages to foreign affiliates.

The fact that the technological gap affects domestic wages may be associated with its different levels across firms: in other words, the gap may

[7] Following the main literature on the topic, we use the terms 'productivity gap' and 'technology gap' interchangeably, although the concepts are not exactly the same. Indeed, technology gap can be defined as the difference in the techniques available for production, whereas productivity gap represents the difference in productivity when the same technology is used (Kathuria 2010). Since determining the technology gap is often tricky, most of the empirical work (including ours) has proxied the 'technology gap' through measures of 'productivity gap': the general idea is that a more productive foreign firm is a reflection of the technological gap between the foreign and the domestic firm.

matter for the diffusion of spillovers only within a certain range. For this reason, in order to explore the possible differences in the pattern of wage spillovers across different groups of firms (so-called conditional spillovers), we split our sample into three groups according to the technological absorptive capability of domestic firms. In other words, we selected some *ad hoc* values from the observations to split our sample into three sub-samples (low, medium, and high gap). Specifically, the group with low technological absorptive capability consists of firms below the 25th percentile; the medium technological absorptive capability group contains firms between the 25th and 75th percentile; the high technological absorptive capability group includes firms above the 75th percentile (Imbriani *et al.* 2011). The results of our estimation are reported in table 5.

Table 5. Group estimation according to the technological gap.

Regressors	Dependent variable: *ln(W)*		
	High Gap	**Medium Gap**	**Low Gap**
ln(P)	0.113	0.338	0.392
	(0.044)**	(0.034)***	(0.035)***
ln(K)	0.182	0.100	0.043
	(0.009)***	(0.006)***	(0.004)***
HSPILL	0.230	-0.070	-0.017
	(0.0827)***	(0.0598)	(0.1062)
FORWSPILL	-0.071	0.160	0.142
	(0.041)*	(0.040)***	(0.0735)**
BACKSPILL	-0.700	0.420	0.448
	(0.3431)**	(0.25)*	(0.4148)
Constant	7.206	7.187	7.802
	(0.2327)***	(0.1907)***	(0.1734)***
Year Dummy	Yes	Yes	Yes
N. obs.	148,159	242,712	109,766

Notes:
Robust standard errors in brackets
*** = statistically significant at 1 percent level.
** = statistically significant at 5 percent level.
* = statistically significant at 10 percent level.

Results from table 5 show that coefficients on the capital and price level variables are positive and highly significant, as expected. It is also worth noting that the size of the technological gap matters significantly for the wage spillover that follows a non-linear relationship. In particular, we find that

horizontal wage spillover is negative (although not significant) when the technological distance between domestic and foreign firms is low and/or medium, but it turns significantly positive when the size of the technological gap becomes larger. On the contrary, vertical spillovers (both at backward and forward level) are both positive in the case of low and/or medium gap, but negative when the technological distance between domestic and foreign firms is large.

To summarize our results, we firstly see that when domestic firms are technologically distant from foreign ones, an increase in the MNEs' presence at vertical level decreases average wages paid by domestic enterprises. This might simply reflect a negative impact on the productivity of local firms that are foreign firms-suppliers in upstream industries, or foreign firms-customers in the downstream industries. In the first case, the negative effect would occur because local firms are much less advanced and, consequently, MNEs prefer to import intermediate inputs or to source from other foreign companies, while in the second case (at forward level), inputs produced locally by foreign firms may be too expensive and/or less adapted to local requirements. Both the situations show that there is (a) little scope for interaction between MNEs and domestic suppliers and customers. A reverse situation seems to be true when the technological distance between domestic and foreign firms is low and/or medium: in this case, an increase in foreign firms' presence exerts a positive impact on domestic wages and this effect is particularly significant in the case of forward linkages.
In addition, considering firms operating within the same 3-digit industry, the positive and significant relationship between FDI and wages when domestic firms are technologically distant from MNEs suggest that foreign firms act as a discipline device, which is incremental for the productivity (and wages) of domestic firms, and/or that they are available to accept a certain mobility of workers and even exchange skills and knowledge with domestic firms.

6. Conclusions

The increasing flows of FDI at worldwide level may potentially affect local labour markets by improving pay and working conditions for domestic workers. By focusing specifically on the possible indirect effects of MNEs on wages paid by domestic firms to their workers, the present paper aims to test the impact of incoming FDI on local wages in the Italian manufacturing sector by using firm level data from 2002 to 2007.

Results initially show the lack of wage spillovers at both horizontal and vertical level, meaning that the effects of foreign investment are completely internalized within each firm. However, when considering the impact of the technology gap on wage spillovers, we find some significance on the spillover variables. Since the impact of the technological gap on domestic wages can be associated with its different levels across firms, we split our sample into three groups according to the technological absorptive capability of domestic firms (high, medium, and low gap). In this case, our findings suggest the presence of a non-linear relationship between gap size and wage spillover. In particular, horizontal wage spillover is negative (although not significant) when the technological distance between domestic and foreign firms is low and/or medium, and significantly positive when the size of the technological gap becomes larger. Vertical spillovers (both at backward and forward level) are both positive in the case of low and/or medium gap, but negative when the technological distance between domestic and foreign firms is large. From a policy perspective this is a potentially important result. It is often taken as given in the literature that FDI can bring potential benefit to the host economy by improving pay and working conditions. Our results here suggest that inward investment may indeed improve the domestic sectors, although such linkage is very complex and depends on the technological capabilities gap. In particular, when this gap is large, MNEs face some difficulty in interacting with domestic suppliers and customers, with the consequence that they could act as (a sort of) *monads* within the host country. In order to avoid this potential danger, policies favouring the attraction of inward investments cannot be of the 'one for all' or 'one for always' type but have to be strongly directed towards the sectoral and local characteristics of the host country. In addition, once the

sectors in which the multinational presence should be favoured have been selected, policy makers ought to combine investment promotion policies with measures able to support local firms, including the suppliers and customers of MNEs.

References

Aitken, B.; Harrison, A.; Lipsey, R. 1996. Wages and foreign ownership: a comparative study of Mexico, Venezuela, and the United States. *Journal of International Economics,* 40: 345-371.

Arnal, E.; Hijzen, A. 2008. The Impact of Foreign Direct Investment on Wages and Working Conditions. *OECD Social, Employment and Migration Working Papers 68, OECD Publishing*.

Barry, F.; Görg, H.; Strobl, E. 2005. Foreign Direct Investment and Wages in Domestic Firms in Ireland: Productivity Spillovers versus Labor-Market Crowding Out. *International Journal of the Economics of Business*, 12(1): 67-84.

Baum, C.F. 2006. An introduction to modern econometrics using STATA. *Stata Press*

Bedi, A.S.; Cieslik, A. 2002. Wages and wage growth in Poland: The role of foreign direct investment. *Economics of Transition,* 10(1): 1-27.

Blomström, M.; Kokko, A. 1998. Multinational Corporations and Spillovers. *Journal of Economic Surveys 112: 247-77*.

Blomstrom, M & Sjoholm, F, 1999. Technology transfer and spillovers: Does local participation with multinationals matter? European Economic Review, Elsevier, vol. 43(4-6), pages 915-923, April.

Breusch, T.S.; Pagan, A.R. 1979. Simple test for heteroscedasticity and random coefficient variation. *Econometrica* (The Econometric Society) **47** (5): 1287–1294.

Cantwell, J., (1989), *Technological innovation and multinational corporations*, Oxford, Blackwell. Colombo, E.; Stanca, L. 2008. The Impact of Training on Productivity: Evidence from a Large Panel of Firms. Working Papers 134, University of Milano-Bicocca, Department of Economics.

Dimelis, S. 2005. Spillovers from Foreign Direct Investment and Firm Growth: Technological, Financial and Market Structure Effects. *International Journal of the Economics of Business 12: 85–104*.

Driffield, N.; Girma, S. 2003. Regional Foreign Direct Investment and Wage Spillovers: Plant Level Evidence from the U.K Electronics Industry. *Oxford Bulletin of Economics and Statistics*, 65: 453-74.

Faggio, G. 2003. Foreign direct investment and wages in Central and Eastern Europe. *Flowenla Discussion Paper 10 Hamburg Institute of International Economics*

Ferragina, A.; Pittiglio, R.; Reganati, F. 2011. Multinational status and firm exit in the Italian manufacturing and service sectors. *Structural Change and Economic Dynamics,* doi.org/10.1016/j.strueco.2011.10.002

Figlio, D. N.; Bloningen, B.A. 2000. The Effects of Foreign Direct Investment on Local Communities. *Journal of Urban Economics*, 48(2): 338-363.

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

Flores, R.G. jr.; Fontoura, M.P. ; Santos, G.S. 2007. Foreign Direct Investment Spillovers in Portugal: Additional Lessons from a Country Study. *The European Journal of Development Research*, 19: 372–390.

Girma, S; Greenaway, D.; Wakelin, K. 2001. Who benefits from foreign direct investment in the UK?, *Scottish Journal of Political Economy*, 48: 119-133.

Hale, G; Long, C. 2008. Did Foreign Direct Investment Put an Upward Pressure on Wages in China? *Federal Reserve Bank of San Francisco, Working Paper Series 2006-25*

Hamida, L.B.; Gugler, P. 2009. Are there demonstration-related spillovers from FDI? Evidence from Switzerland. *International Business Review 18: 494–508.*

Hoechle, D. 2007. Robust standard errors for panel regressions with cross–sectional dependence. *Stata Journal Volume 7 Number 3*.

Imbriani C., and F. Reganati (1997), "Spillovers Internazionali di Efficienza nel Settore Manifatturiero Italiano", *Economia Internazionale*, 50: 583-95.

Imbriani, C.; Reganati, F. 2004. The Effects of Foreign Direct Investment on Local Firms: Some Evidence from Panel Data for the Italian Manufacturing sector. *The Journal of Current Research in Global Business* 9:18-24.

Imbriani, C.; Pittiglio, R.; Reganati, F.; Sica, E. 2011. How much do technological gap, firm size, and regional characteristics matter for the absorptive capacity of Italian enterprises? *FIW Working Paper N° 73*

ISTAT 2008. *Archivio Statistico delle Imprese Attive*. Italian National Institute of Statistics.

ISTAT 2011. Struttura, performance e comportamenti delle multinazionali italiane. Italian National Institute of Statistics.

Jabbour, L.; Mucchielli, J.L. 2007. Technology transfer through vertical linkages: the case of the Spanish manufacturing industry. *Journal of Applied Economics*, X: 115-136.

Jordaan, J. A. 2008. Intra- and Inter-industry Externalities from Foreign Direct Investment in the Mexican Manufacturing Sector: New Evidence from Mexican Regions. *World Development 36: 2838–2854*.

Kathuria, V. 2010. "Does the Technology-gap influence Spillovers? – A postliberalisation analysis of Indian Manufacturing Industries", *Oxford Development Studies*, 38: 145-70.

Kim, L. (1998) 'Crisis construction and organizational learning: capability building in catching-up at Hyundai Motor', *Organization Science*, 9 (4), pp. 506–21.

Koizumi, T. and Kopecky K.1977. "Economic growth, capital movements and the international transfer of technical knowledge", *Journal of International Economics*, 7, pp. 45-65.

Kokko, A. 1994 'Technology, market characteristics, and spillovers'. *Journal of Development Economics* 43 (2), pp. 279– 293.

Kokko A.; Tansini, R.; Zejan, M. 1996. Productivity Spillovers from FDI in the Uruguayan Manufacturing Sector. *Journal of Development Studies*, 32: 602-611.

Kokko, A. 1996. Productivity spillovers from competition between local firms and foreign affiliates. Journal of International Development, John Wiley & Sons, Ltd., vol. 8(4), pages 517-530.

Lipsey, R.E.; Sjöholm, F. 2004. Foreign Direct Investment, Education, and Wages in Indonesian Manufacturing, *Journal of Development Economics*, 73: 415-422.

Massoud, N. (2008) 'Assessing the Employment Effect of FDI Inflows to Egypt: Does the Mode of Entry Matter?'. Paper presented at International Conference on 'The Unemployment Crisis in the Arab Countries', 17-18 March 2008, Cairo, Egypt.

Pittiglio, R.; Reganati, F.; Sica, E. 2008. Horizontal and Vertical Spillovers from FDI in the Italian productive system. *DSEMS – University of Foggia, WP no. 08*

Quoc Le H. 2007. Foreign Direct Investment and Wage Spillovers in Vietnam: Evidence from Firm Level Data. *Working Paper Series No. 2008/10, Hanoi: Development and Policies Research Center.*

Reganati, F; Sica, E. 2007. Horizontal and Vertical Spillovers from FDI: Evidence from panel data for the Italian manufacturing sector. *Journal of Business Economics and Management 8: 259-266*

Romer, P. (1994) 'New goods, old theory and the welfare cost of trade restrictions'. *Journal of Development Economics*, vol. 43 (1), pp. 5–38.

Sjöholm, F. (1999) 'Technology gap, competition and spillovers from direct foreign investment: evidence from establishment data'. *Journal of Development Studies* 36: 53-73.

Smarzynska, J.B. 2004. Does Foreign Direct Investment Increase the Productivity of Domestic Firms? In Search of Spillovers Through Backward Linkages. *American Economic Review 94: 605-627.*

Spencer J. W. (2008). The impact of multinational enterprise strategy on indigenous enterprises: horizontal spillovers and crowding out in developing countries. *Academy of Management Review 33:* 341-361.

UNCTAD 2010. *World Investment Report 2010: Investing in a Low-Carbon Economy,* 184 p.

Available from Internet: <www.unctad.org/en/docs/wir2009_en.pdf>.

UNCTAD 2011. World Investment Report 2011: Non-Equity Modes of International Production and Development, 226 p. Available from Internet: http://www.unctad.org/Templates/WebFlyer.asp?intItemID=6018&lang=1

Wang, J. (1988), "Growth, technology transfer, and the long run theory of international capital movements", *Journal of International Economics,* 29, pp. 225-271).

Wang, Jian-Ye & Blomstrom, Magnus, 1992. "Foreign investment and technology transfer : A simple model," European Economic Review, Elsevier, vol. 36(1), pages 137-155, January.

Winters, A. (2004) 'Trade liberalisation and economic performance: an overview'. *The Economic Journal*, 114 (February), F4–F21.

Zhang, Y., Li, H., Li, Y. & Zhou, L. A. 2010. FDI spillovers in an emerging market: the role of foreign firms' country origin diversity and domestic firms' absorptive capacity. *Strategic Management Journal Early View* 31: 969 – 989.