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AGGLOMERATIVE FORCES AND FOREIGN MNES: ARE THE INDUSTRIAL DISTRICTS STILL ATTRACTIVE?

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ABSTRACT

This paper explores the competitiveness of economic areas at a cluster level in terms of their capacity to attract the location of MNCs. In particular, the study investigates what are the agglomerative forces that drive the location choice of MNCs toward Industrial Districts (IDs).
To this aim, two streams of studies are considered: the first regards the location decisions of MNCs and the second the new theories on the ID competitive advantage.
Based on these studies, four hypotheses concerning the knowledge-based conditions driving the location choice of MNCs in IDs are formulated. To test the hypotheses, an econometric analysis on the 156 Italian IDs, using a OLS model, is conducted.

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1. Introduction

The research on industrial districts (IDs) in the recent years is focusing more and more on issues concerning the competitiveness and the survival of these local production systems. The main open questions are "(Biggiero, 2006; Crouch *et al*., 2001; Rabelotti *et al*., 2009)":

- Can the IDs, whose competitive advantage seems to rest on the co-location of various phases of production, survive?
- How can IDs face the challenges due to the globalization and digitalization phenomena?
- Can the delocalization and relocation processes determine the ID's recession or decline?

The agglomeration economies associated with the spatial concentration of production and based on "(Marshall, 1920)" the readily available specialized and skilled labour, the privileged access to local suppliers that offers a great variety of highly specialized inputs, and the easy and rapid access to specific technical knowledge, are cost-based benefits for co-located firms (pecuniary externalities). But in a global economy firms can gain a cost based competitive advantage delocalizing their production processes in low cost countries.

This phenomenon has involved some IDs determining a process of hollow-out and has led scholars to theorize a decline of this production model.

Nevertheless the cases of declining IDs, there are examples of successful IDs that continue to grow and that attract the localization of multi-national corporations (MNCs). Examples of such IDs come from: the Montebelluna sportswear system "(Sammarra and Belussi, 2006)" that is marked by the presence of some of the most important multinational companies in the sports shoe sector (e.g. Rossignol, Lange, HTM, Nike); the so-called Etna Valley technology district located in Sicily, which origin was strongly linked to the localization of the ST Microelectronics and now its success is also due to the large presence of important multinational companies, such us Nokia and Omnitel; the Mirandola biomedical district that, thanks to the considerable accumulation in the area of specialized knowledge and high quality technical know-how combined with the typical advantages of an ID, has now attracted several multinational companies including Baxter, Mallinkrodt, Braun Carex, Biofil and Hospital Dasco.

In this context where opposite trends are observed, the following research question arises: Is the ID production model still attractive?

This paper explores the attractiveness of IDs in terms of their capacity to draw MNCs that are making location choices. In particular, the main interest of the present study is to investigate what are the agglomerative forces that drive the location choice of MNCs toward the IDs.

To this aim, two streams of studies are integrated: the first regards the location decisions of MNCs and the second the new theories explaining the competitive advantage of IDs. In a knowledge-based economy where knowledge is considered to be a firm's most important competitive asset, firms that make location choices are interested to search for new sources of knowledge to sustain their competitive advantage. Agglomeration of firms within a geographically bounded area increases the effectiveness of knowledge exchanges among ID firms and enhances the processes of new knowledge creation so creating a competitive advantage for the individual firms as well as for the entire ID "(Chung and Alcacer, 2002; Kalnins and Chung, 2004)". According to these two perspectives, it is possible to argue that MNCs will prefer to locate in the IDs where the amount of knowledge and the possibility to acquire knowledge are high.

The proposed analysis goes beyond general studies on MNCs in IDs. These in fact have mainly investigated the importance of MNCs for the ID growth due to their connecting role between the ID and to external source of knowledge and their capacity to bring in complementary and not contextual knowledge "(Bagella *et al*., 1998; Helg, 2003; Menghinello, 2004; Shin *et al*., 2006)". On the contrary, very few studies have investigated the benefits that MNCs can gain by locating within IDs as well as the determinants of their location choices "(McCann *et al*., 2002; De Propris *et al*., 2005)". In line with these studies, the paper investigates the importance of two determinants for MNCs location in IDs: the amount of knowledge stock and the level of knowledge transfer characterizing the ID.

The paper is organized as follows. The next section briefly presents the two theoretical streams of study on which the research is based. The third section describes the conceptual model developed to explain the attractiveness of IDs towards firms that are making the location decision. In this section four hypotheses on how the ID knowledge characteristics affect the ID attractiveness towards MNCs are formulated. Then we describe the empirical analysis carried out on the 156 Italian IDs. The methodology section consists of the description of data, variables and the empirical results, and it is followed by a discussion and conclusion.

2. Theoretical background

2.1 The industrial districts

IDs are geographically defined production systems, characterized by a large number of small and medium sized firms that are involved at various phases in the production of a homogeneous product family. These firms are highly specialized in a few phases of the production process, and

integrated through a complex network of inter-organizational relationships "(Becattini, 1990; Becattini *et al*., 2009; Maskell, 2001; Porter, 1998)".

Diverse streams of study have developed a variety of perspective to explain the IDs competitive success and investigated the different sources of their competitive advantage.

In particular, the studies of economic geography have underlined the benefits associated to the "agglomeration external economies", mainly due to the lower input costs, the development of common suppliers, specialist labour pools, spillover of technical know-how, and the development of a greater comprehension of the workings of the particular industry by individuals and firms "(Becattini, 1990; Marshall, 1920)".

Studies on industrial economics have highlighted the reduction of the transactional costs due to geographical proximity of firms and informal and face-to-face contacts among them as one of the most important benefits of IDs "(Mariotti, 1989)".

Studies on innovation management have pointed out that IDs found the competitive success on their innovative capacity, which is due to the presence of high specialized technical competencies, the existence of networks of formal and informal relationships, and the geographical proximity that creates an environment wherein information, codes, languages, routines, strategies, and knowledge are easy to be transferred and shared "(Cainelli *et al.*, 2005; Cooke and Morgan, 1998; Henry and Pinch, 2002; Lundvall and Johnson, 1994; Storper, 1997)".

Synthesizing the results of these studies, the competitive success of IDs is mainly based on: the specialization of firms, the presence of a specialized workforce, the division of labour among firms, the accumulation of specific knowledge in the local area, the networking processes among both the economic and social system, the development of a widespread innovative capacity, the presence into the local area of a common system of social-cultural values.

Recently, some scholars have rethought the ID production model shifting their attention from the cost-based benefits to the knowledge-based benefits. These works have proposed a knowledge-based theory of IDs "(Maskell, 2001; Maskell and Malmberg, 2004)", by investigating the nature of knowledge circulating in IDs "(Tallman *et al.*, 2004)", the frequency and the effectiveness of the knowledge transfer processes among ID firms "(Gordon and McCann, 2000; Mesquita, 2007)", and the learning processes activated by firms in IDs "(Albino *et al.*, 2005; Maskell, 2001)".

According to these studies, the key source of the ID competitive advantage is their superior capacity to support processes of knowledge transfer and creation, and to facilitate innovation.

2.2 Location choices of MNCs

MNCs location decisions have been extensively studied in the international business context.

Dunning (1993) identified four categories of motives for foreign direct investments (FDIs) by MNCs: resource seeking, market seeking, efficiency seeking, and strategically motivated seeking. FDI motivated by resource seeking tends to acquire natural resources, raw materials, and technologies available in host country less costly. The market seeking FDI has as a main aim to enter into a new market by avoiding trade barriers and high transportation costs. The FDI that seeks to increase the efficiency of the company are mainly motivated by the reduction of production costs achievable by localizing the production activities into countries with lower labour costs. Strategic-seeking FDI is engaged by company to promote their strategic objectives, usually that of sustaining or enhancing their international competitiveness.

Firms expand abroad also to exploit local financial incentives, environmental constraints, to overcome export-import constraints, to differentiate the product "(Dunning, 1973; Porter, 1986; Bartlett, 1986; Lessard, 1986; Bartlett and Ghoshal, 1989; Bellini *et al*., 1998; Dunning, 1998; Fujita *et al*., 1999)".

Recently, the analysis of MNCs location choice has been extended by recognizing a further motive to FDI: knowledge seeking, i.e. the exploitation of new technologies, skills, knowledge, and competencies that are not available in their home countries "(Cantwell, 1989; Chung and Alcacer, 2002)". Even though it is possible to catch new knowledge by imitating products and marketing strategies of the leading firms, the most effective way to transmit and absorb knowledge is to locate close to knowledge sources "(Boschma, 2005)". A lot of studies have in fact put in evidence that the intensity of knowledge spillovers increases with geographical proximity "(Antonelli, 2000; Audretsch and Feldman, 1996; Jaffe *et al.*, 1993)".

In line with this view, the literature on the internationalization of R&D contains an increasing amount of evidence that knowledge sourcing may be a motive for FDI "(Cantwell, 1995; Cantwell and Janne 1999; Pearce, 1999; Florida 1997)".

Literature has also investigated the link between MNCs location choice and agglomeration. Krugman (1991) highlights that the existence and the development of a local industry makes the location in that area more and more attractive due to the presence of agglomeration externalities. Cantwell (1989; 1991) shows that there are significant benefits to both domestic and foreign firms from agglomeration because of the exploitation of localized knowledge that is increasingly important for the advancement of their technological competence.

Le Bas and Sierra (2002) and De Propris and Driffield (2003) develop such arguments further and focus on a local unit of analysis consisting in the ID. They demonstrate that IDs are important for technology sourcing FDI by MNCs because of knowledge spillovers that are significantly greater for IDs, and argue that they are important attractors for FDI.

3. Location of MNCs in Industrial districts

In line with the knowledge seeking FDI motivation, it is possible to argue that the attractiveness of some IDs lies on the valuable opportunities they offer for increasing MNC knowledge due to the knowledge inflows resulting from both the available stock of knowledge and the degree of knowledge transfer characterizing the ID.
In the next, we sustain these arguments by borrowing both the literature on MNCs agglomeration and on ID, and four hypotheses to be empirically tested are developed.

3.1 The ID Knowledge stock

The knowledge stock is the amount of assets a firm. The ID knowledge stock derives from the knowledge embedded into three kinds of actors: the individuals, the firms, and the institutions located in the ID.
As to the individuals, the knowledge stock is associated with their professional skills and knowledge on manufacturing processes and products and on the markets. The individual knowledge stock is continuously increased by the processes of learning by using, by doing and by interacting with other individuals.
As to firm, the knowledge stock concerns the accumulated knowledge assets which are internal to the firm, such as the intangible research capabilities, the technological capabilities, and relational capabilities. The firm knowledge stock is updated by the R&D activities internal to the firms, by interactive learning processes activated with suppliers and customers, and by hiring high specialized workforce.
As to institution, the knowledge stock is mainly the scientific and codified knowledge developed in universities and research centres. This is accumulated by internal R&D activities and by exploiting external knowledge sources.
Literature on agglomeration of MNCs has shown the importance of knowledge and knowledge activities as a motive to agglomerate. A few studies consider the knowledge stock associated with workforce and stress the importance of the educational level as a possible determinant of FDI attraction "(Couglin and Segev, 2000)". Other studies focus on the knowledge stocks as the result of R&D activities developed by firms and institutions "(Cantwell, 1995; Cantwell and Janne 1999; Pearce, 1999)". For example, Basile (2004) studies the importance of public research institutions in attracting the FDI in Italy.
In line with these arguments, the following hypotheses are formulated:

Hp1: The higher the intensity of R&D activities, the higher will be the ID attractiveness towards MNCs that are making location choices.

Hp2: *The higher the level of ID professional workforce, the higher will be the ID attractiveness towards MNCs that are making location choices.*

3.2 The ID knowledge transfer

The degree of knowledge transfer describes the transferability of knowledge. The transferability depends on the nature of knowledge (the more codified, the easier the transfer) and on the existence of factors that enable the knowledge sharing and spread.
Literature on MNCs analyzing the critical role of knowledge as a source of competitive advantage, has also stressed that a further critical factor in the process knowledge seeking it is linked not only to the amount of available knowledge but also to the capacity to spill that knowledge. Because knowledge is partially tacit and localized, it is widely recognized that knowledge transfer requires frequent interaction that proximity facilitates. In the IDs the geographical proximity among firms facilitates face-to-face contacts and the inter-firm informal relationships, so as to create an environment conducive of knowledge "(Maskell, 2001)".
Thus, we posit that:

Hp3. The higher the geographical proximity among firms, the higher will be the ID attractiveness towards firms that are making location choices.

According to the theory of knowledge spillover entrepreneurship "(Acs and Armington, 2006; Acs *et al.*, 2006; Audretsch *et al.*, 2006)", the start-up of a new venture provides the conduit for the spillover of knowledge from the source firm creating that knowledge to the new venture, actually exploiting and commercializing that knowledge. Thus, the entrepreneurial activity provides the conduit facilitating the knowledge transfer.
To this regard, Garnsey and Heffernan (2005) studying the Cambridge cluster find that the formation of new firms and spin-out from the university and local businesses being channels of knowledge diffusion exerts attraction effects through international subsidiaries and inward FDIs.
The creation of new firms by both academic and not-academic spin-offs is a phenomenon well investigated in the ID literature "(Saxenian, 1994)" as one of the main condition for the development. The generation of a new firm by employees of an existing local organisation as a research centre, a university, and a firm involves the transfer to the newly established firm of know-how and problem solving skills previously learned within the local organization and this in turn activated learning processes and new knowledge.
Therefore, the following hypothesis is formulated:

Hp4. The higher the rate of formation of new firms, the higher will be the ID attractiveness towards firms that are making location choices.

4. Empirical analysis

4.1. Data

The data set is formed by all the Italian Industrial Districts identified by the Italian National Statistical Institute (ISTAT) on the basis of the information provided by the 2001 Industry Census "(ISTAT, 2001)". In particular, the ID identification comes from the following procedure. First the national territory has been divided into local labour systems (LLS), defined as small areas characterized by internal commuting patters that produce a self-contained labour market. Using information on daily commuting to work contained on the 2001 Population Census and starting from the aggregation of the smallest geographical unit defined for administrative purposes in Italy (municipalities) ISTAT divided the Italian territory into 686 LLSs. Second, for each SSL three distinct indexes are calculated. The first measures the share of manufacturing employment in the local system, the second the share of manufacturing employment in small and medium (less than 250 employees) firms, the third is a sector specialisation index. All the indexes are calculated with respect to national averages. A local system for which the three indexes result simultaneously greater than one is defined as an industrial district.
In this way the data set covers a number of 156 IDs. In Table 1 the main demographic data on IDs and LLSs are reported. Table 2 synthesizes the key characteristics of the Italian IDs.

Table 1. Demographic data of Industrial Districts and Local Labour Systems, 2001.

Indicators	**IDs**	**LLSs**	**%**
Number	156	686	22,7
Number of municipalities	2.215	8.101	27,3
Area (square Km)	62.114	301.328	20,6
Population	12.591.475	56.995.774	22,1
Local units	1.180.042	4.755.636	24,8
Local units' employees	4.929.721	19.410.556	25,4
Manufacturing local units	212.410	590.733	36,0
Manufacturing local units' employees	1.928.602	4.906.315	39,3
Employment density (%)	*39,1*	*34,1*	-

Entrepreneurial density (%)	*9,4*	*8,3*	*-*

Table 2. Main characteristics of Italian Industrial Districts, 2001.

Manufacturing specialization	Industrial Districts		Number of manufacturing local units		Number of manufacturing employees	
	N.	%	N.	%	N.	%
Textile and clothing	45	28,8	63.954	30,1	537.435	27,9
Mechanics	38	24,4	56.816	26,7	587.320	30,5
Household goods and furniture	32	20,5	42.287	19,9	382.332	19,8
Leather and footwear	20	12,8	23.441	11,0	186.680	9,7
Food	7	4,5	3.781	1,8	33.304	1,7
Jewellery/musical instruments	6	3,8	13.010	6,1	116.950	6,1
Paper and printing	4	2,6	4.342	2	35.996	1,9
Plastics, Rubbers	4	2,6	4.779	2,2	48.585	2,5
Total	**156**	**100,0**	**212.410**	**100,0**	**1.928.602**	**100,0**

4.2 The econometric model

I test the four hypothesis using the OLS regression. In particular, we use a step-by-step Least Squares procedures, in which variables are progressively introduced.

4.2.1. The dependent variables

As the phenomenon under study is the attractiveness of Italian IDs towards firms that make location choices, we use the amount of Foreign Direct Investments (FDI) within IDs measured in the 2003 as dependent variable (expressed in logarithmic form) in the OLS regression models. Specifically the dependent variable is as follows:

$$FDI_i(2003) = FDI_{pi} * \frac{E_i^j}{E_{pi}^j}$$

Where:

i = 1, ……, 156 IDs.

FDI_{pi} = amount of FDI in the province *p* in which ID *i* is located.
E_i^j = number of employees in ID *i* in the manufacturing specialization *j* of ID.
E_{pi}^j = number of employees in the province *p* in the manufacturing specialization *j* of ID *i*.

Note that in order to exclude endogeneity problems, the independent variables have been measured for the 2001, lagged of 2 years respect to the dependent variable. Data on the FDI in each Italian province come from UNIONCAMERE.

4.2.2. The independent variables

Intensity of R&D activities

The measure adopted as a proxy for the intensity of R&D activity ($R\&D_i$) relates to the number of patents developed in each ID. It has been measured by:

$$R\&D_i = P_{pi} * \frac{E_i^j}{E_{pi}^j}$$

where P_{pi} is the number of patents developed by firms located in province *p* of the ID *i*. Data on patents are collected from the European Patent Office.

Availability of high professional workforce

The measure adopted as a proxy for the availability within the ID of high professional workforce ($PROF\_WORK_i$) is the following:

$$PROF\_WORK_i = DEGREE_{pi}$$

where $DEGREE_{pi}$ is the number of graduates in technical-scientific fields in province *p* of the ID *i*. Data on graduates are collected from the database of the University and Research Ministry.

Geographical proximity among firms

The measure adopted as a proxy for the geographical proximity among ID firms ($PROX_i$) is:

$$PROX_i = \frac{F_i^j}{A_i}$$

where:
F_i^j = number of firms in ID *i* in the manufacturing specialization *j* of ID.
A_i = area covered by ID *i*.
All data are sourced by ISTAT (2001).

Rate of formation of new firms

The measure adopted as a proxy for the intensity of new firm creation is the following:

$$RATE\_NEWF_i = \frac{NEW\_F_{pi}^j}{ACTIVE\_F_{pi}^j}$$

where:

$NEW\_F_{pi}^j$ = number of new registered firms in the province *p* in the manufacturing specialization *j* of ID *i*.

$ACTIVE\_F_{pi}^j$ = number of active firms in the province *p* in the manufacturing specialization *j* of ID *i*.

Data are sourced by the UNIONCAMERE database.

4.2.3. The control variables

Works on the determinants of MNCs location choice demonstrate that much FDI is attracted by areas with extensive infrastructure provision "(e.g. Coughlin *et al.*, 1991)". The presence of a well-structured system of firms and/or large players in the ID are further factors of attraction "(Mariotti *et al.*, 2008)". Therefore, the following variables are included in the regressions as control variables:

- $INFRASTR_{pi}$ = measure of the local infrastructure provision of the province *p* in which ID *i* is located.
- $AVER\_SIZE_i$ = average firm size of ID *i*.

$INFRASTR_{pi}$ is an index provided by the *Istituto Tagliacarne* that takes into account the presence of/ease-of-access to transportation infrastructures in each province, namely roads and motorways, railways and airports as well as IT infrastructure and financial systems such as banks .

The AVER_SIZE is calculated referring to the number of employees.

Table 3 summarizes all the independent and control variables showing the used measure and the data source.

Table 3. Measures of the independent and control variables.

Variables	Measures		Data source
Independent variables			
Intensity of R&D activities	$R\ \&\ D_i = P_{pi} * \frac{E_i^j}{E_{pi}^j}$	P_{pi} = number of patents developed by firms located in province *p* of the ID *i*	the European Patent Office
Availability of high professional workforce	$PROF\_WORK_i = DEGREE_{pi}$	$DEGREE_{pi}$ = number of graduates in technical-scientific fields in province *p* of the ID *i*	University and Research Ministry
Geographical proximity among firms	$PROX_i = \frac{F_i^j}{A_i}$	F_i^j = number of firms in ID *i* in the manufacturing specialization *j* of ID *i* A_i = area of the ID *i*	ISTAT
Rate of formation of new firms	$RATE\_NEWF_i = \frac{NEW\_F_{pi}^j}{ACTIVE\_F_{pi}^j}$	$NEW\_F_{pi}^j$ = number of new registered firms in the province *p* in the manufacturing specialization *j* of ID *i*. $ACTIVE\_F_{pi}^j$ = number of active firms in the province *p* in the manufacturing specialization *j* of ID *i*.	UNIONCAMERE
Control variables			
Local infrastructure provision	$INFRASTR_{pi}$ = measure of the local infrastructure provision of the province *p* in which ID *i* is located.		Istituto TAGLIACARNE
Presence of large firms	$SIZE_i$ = average firm size of ID *i*		ISTAT

4.3. OLS results

Table 4 contains the summary characteristics of the variables and the correlation matrix.
The correlation matrix shows that the variables are not significantly correlated, therefore multicollinearity problems are not present in the model.
The empirical findings obtained from the estimation are given in Table 5. In particular, the results of multiple OLS regression models are reported.

Table 4. Descriptive statistics and correlation matrix of the variables.

	1	**2**	**3**	**4**	**5**	**6**	**7**
Minimum	3,867	3,880	35,1	0,0	3,880	0,029	0,0175
Maximum	16,639	8,586	298,1	449,6	8,586	18,072	0,1231
Mean	8,580	6,252	90,6	12,7	6,251	1,511	0,0526
Standard deviation	2,377	0,686	38,6	38,8	0,686	2,586	0,0210
(1) Ln (FDIi)							
(2) Ln ($SIZE_i$)	0,521						
(3) $INFRASTR_{pi}$	0,410	0,178					
(4) $R\&D_i$	0,456	0,390	0,096				
(5) $PROF\_WORK_i$	0,597	0,298	0,236	0,378			
(6) $PROX_i$	0,272	0,577	0,100	0,534	0,215		
(7) $RATE\_NEWF_i$	-0,164	-0,151	-0,012	-0131	-0,051	-0,022	

Table 5. OLS estimation results (dependent variable Ln (FDI_i_2003).

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Constant	-	-	-	-	-
R&Di		0,288 (4,384)***	0,171 (2,794)**	0,239 (3,613)***	0,299 (3,444)***
$PROF\_WORK_i$			0,385 (6,402)***	0,374 (6,305)***	0,376 (6,337)***
$PROX_i$				-0,176 (-2,480)**	-0,166 (-2,319)*
$RATE\_NEWF_i$					-0,061 (-1,132)
Ln($SIZE_i$)	0,463 (7,129)***	0,352 (5,302)***	0,295 (4,940)***	0,374 (5,599)***	0,362 (5,354)***
$INFRASTR_{pi}$	0,328 (5,046)***	0,320 (5,207)***	0,250 (4,490)***	0,250 (4,560)***	0,251 (4,581)***
R^2	0,376	0,446	0,564	0,581	0,585
R^2adj	0,367	0,435	0,552	0,567	0,568
F	46,024	40,742	48,842	41,636	34,975
Observations	156	156	156	156	156

*Numbers in parentheses are t-student. Significant at: *p<0.10 **p<0.01 ***p<0.001*

In regression 1 only the control variables are introduced. In regressions 2-3 the variables for the level of ID knowledge stock, namely the intensity of R&D activities and Availability of high professional workforce are sequentially introduced. Finally, models 4-5 introduce the variables

for the degree of knowledge transfer in the ID, namely the geographical proximity among firms and the rate of new firm creation .

The values of R^2 and the adjusted R^2 confirm the overall goodness-of-fit of all the regressions presented.

Model 1 confirms the that the presence of large leader firms in the ID and the infrastructural provision increases significantly the likelihood that the ID attracts FDI (the variables Ln(SIZE) and INFRASTR shows, indeed, a positive coefficient that is significantly different from zero, at $p < 0.001$).

The results of model 2 show a positive and significant ($p < 0.001$) relation between the intensity of R&D activities and the amount of FDI, thus confirming Hypothesis 1. The higher the amount of the ID knowledge stock due to the R&D activities, the higher the attractiveness of the ID towards MNCs.

As far as the second hypothesis, i.e. the role of high professional workforce, results confirm it (Model 3). Namely, the availability of high professional workforce do impact positively on the location of MNCs in the ID (PROF_WORK is positive and significant at $p<0.001$).

On the contrary, the hypothesized positive relationship between the degree of knowledge transfer in an ID and the attractiveness of the ID towards firms that are making location choices is not supported. In fact, in Model 4 the geographical proximity among ID firms is negatively related to the amount of FDI. Likewise, Model 5 shows a negative even though not significant relation between the rate of new firm creation and the amount of FDI.

The lack of support of these hypotheses can be explained by considering that firms that makes location choices aim at not only acquiring new knowledge thanks to knowledge transfer but also at not loosing their knowledge. In fact, according to some scholars "(Alcacer, 2006; Alcacer and Chung, 2007; Breschi and Lissoni, 2001; Kalnins and Chung, 2004; Shaver and Flyer, 2000)" firms not only benefit from co-location in terms of inward knowledge flow, but they also contribute to knowledge spillovers being a knowledge source. Therefore, when a firm co-locates, it is involved in two kinds of knowledge flows, i.e. the inward and the outward. The outward knowledge flow is detrimental for the firm because its knowledge is gained by the competitors so reducing the firm knowledge-based competitive advantage. For that reason, firms that make location choices could prefer ID with a lower degree of knowledge transfer so reducing the outward knowledge flow and the risk of losing their competitive advantage based on their knowledge.

5. Conclusions

This paper has contributed to the debate on the competitiveness of IDs. The latter has been under questioning in the literature because of internationalization and delocation processes that are profoundly modifying the ID structures and thus the traditional sources of the ID competitive advantage.

According to the most recent literature that recognizes the IDs as a locus on knowledge creation and transfer, the paper investigates the attractiveness of IDs for MNCs making location choice. In fact, in a knowledge-based economy, one of the main goals driving the firm location choice is the knowledge seeking.

In particular, it is argued that the attractiveness of some IDs lies on the valuable opportunities they offer for increasing MNC knowledge due to knowledge inflows resulting from both the available knowledge stock in the ID and the degree of knowledge transfer.

As far as the knowledge stock, results show that the higher the level of R&D activities and the higher the level of ID professional workforce, the higher the ID attractiveness towards firms that are making location choices. As far as the degree of knowledge transfer, results show that neither the geographical proximity among firms nor the rate of new firm creation are positively related to the amount of FDI.

The present study offers contributions both to the literature on MNC location choice and to the studies on ID competitiveness. Specifically, while most of previous studies on MNC location choice focuses on a country level of investigation, this paper analyzes the MNCs location choice at a sub-regional level and explain why MNCs locate into specific local areas, namely the IDs. Furthermore, the literature on IDs has mainly stressed the role of MNCs as crucial driver for their growth, while this study shifts the perspective of analysis by considering the IDs as source of knowledge that can be exploited by MNCs to increase their technological capabilities, thus offering them a valuable opportunity for increasing their competitiveness.

Finally, this study provide some insights on the formulation of managerial and policy implications. MNCs can exploit location in IDs with high level of knowledge stock to enhance their competitive position. However, results on the role of knowledge transfer suggest that MNCs should take into account that when they locate in ID not only gain new knowledge from ID firms but also spill out their knowledge to them. Thus, if they want to preserve their knowledge-based competitive advantage, they should adopt mechanisms to protect their knowledge.

In policy terms, the study highlights that the attractiveness of IDs can be increased by strengthening their knowledge stock. In particular, it becomes important to promote R&D activities by founding public and private research initiatives as well as to invest in professional training and high education.

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