Geographical agglomeration of Indian and Chinese multinationals in Europe: A comparative analysis (Preliminary version)

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Abstract

The outward FDI from emerging economies to developed countries is of great interest to international business researchers and policy makers, also with regard to their location and sectoral patterns. On the basis of a large pan-European firm level dataset, this study maps Indian and Chinese direct investment in Europe. The geographical agglomeration of multinational companies from these two large emerging countries is analysed and compared across Europe. The study focuses on the impact of firm specific advantages on the co-location of Indian and Chinese multinationals in Europe. A non-parametric statistic test is carried out to complete the analysis.

Introduction

During the last decade, both India and China have emerged as two leading sources of outward foreign direct investment (OFDI). Especially the tendency for Indian and Chinese multinational enterprises (MNEs) to expand via acquisitions of Western companies and European companies is impressive. The Chinese outward direct investment (ODI) even increased during the global financial and economic crisis of 2008-2009, while Indian ODI seems to have resumed after the worst of the crisis had passed. According to the latest World Investment Report (UNCTAD, 2011), the outward foreign direct investment (OFDI) stock of India increased from US$1.73 billion in 2000 to US$92.41 billion in 2010, while that of China went up from US$27.77 billion to US$297.6 billion during the same decade.

As M&A have become a major mode of entry for foreign firms, it is not surprising that also the companies from the two most populated countries in the world - sometimes combined under the term 'Chindia'- are following this track for investing abroad, especially to enter developed countries. In 2010, the total value of overseas M&As by Indian and Chinese firms reached respectively US$26.42 billion and 29.20 billion, representing together more than three times the total outward M&As realised by firms from the European Union (EU).

India and China are sharing some common characteristics or similarities in their OFDI, such as the government policy and incentives in supporting the international expansion of their companies, the motivation of resource seeking investment initiatives and the take-over of Western high-tech manufacturing and knowledge intensive service companies. Yet, when looking at India and China's OFDI in Europe, a number of substantial differences are revealed as will be illustrated further.

First, compared to China India recorded a higher rate of growth (CAGR) of OFDI in Europe since the mid-2000s, even though both countries' OFDI flows to Europe registered a rapid rise. In 2003, India's OFDI flows to Europe reached US$84 million as compared to US$145 million for China. India

surpassed China in 2004 and experienced an annual growth rate during the period 2003-2010 of 111 per cent as compared to 69 per cent for China. In 2010, India's ODFI to Europe reached US$7.5 billion which was more than twice the amount for the OFDI flows from China.

Figure 1. Growth of Indian and Chinese FDI flows in Europe, 2003-2010 (US$ million)
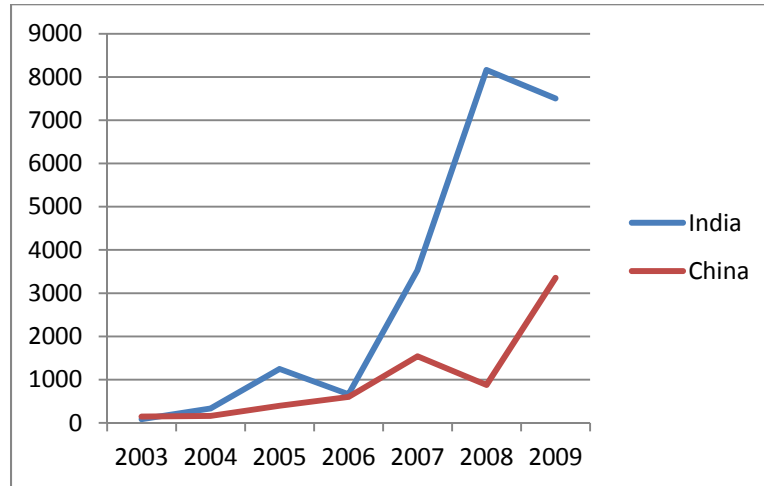
Source: IRB (2011) and MOFCOM (2010)

Second, next to Asia, Europe is the most important destination of Indian OFDI. Europe accounted for nearly one third (31 per cent) of Indian OFDI stock in the world at the end of 2010, compared to only 3.3 per cent of Chinese total OFDI. Indian OFDI in Europe is highly concentrated in three countries, namely, The Netherlands (50 per cent), the UK (26 per cent) and Russia (14 per cent), while Chinese European OFDI is mainly located in Luxembourg (33 per cent), Russia (28 per cent), the UK and Germany (respectively 12 per cent).

Figure 2. Geographical orientation of Indian and Chinese FDI stock (per cent)
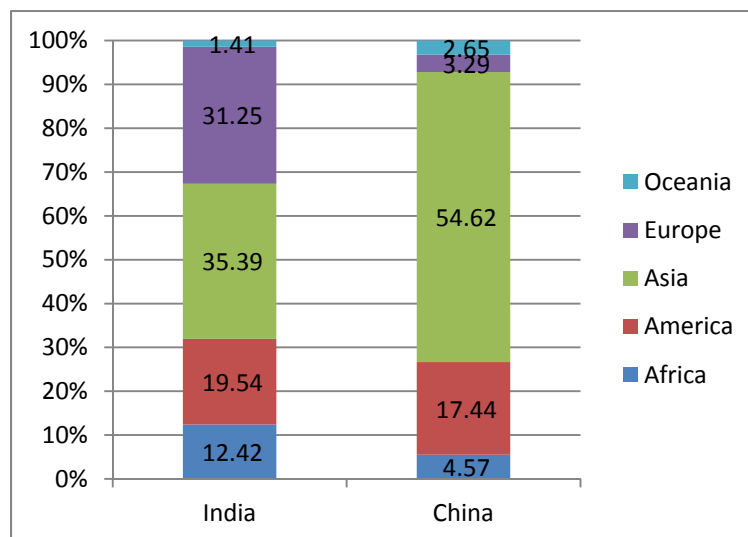
Source: IRB (2011) and MOFCOM (2010)

The rapid rise of Indian and Chinese OFDI on the one hand, and their special need to acquire natural resources via M&As on the other hand have drawn the interest of scholars and made them study these two most populated countries from a new perspective. Yet, most of these studies are based on either macro level data or a sample of large M&As, or even case studies with the focus on the traditional aspects of the internationalisation of firms, such as motivation, entry mode, location factors, etc. (Zhao, 2010, Athukorala, 2009, Hattari & Rajan, 2010, Pradhan, 2011). This study uses a vast firm level database to analyse the geographical agglomeration or the so-called co-location of Indian and Chinese invested companies in Europe. The key research questions are *how* and *why* Indian and Chinese firms are agglomerated in a small number of European cities and *which are* the differences in their approaches.

After this introduction, the following section presents the data sources and the analytical framework. Next, some key features of the Indian and Chinese owned companies in Europe, especially their geographical concentration and sectoral distribution, are analysed. In the third section , a nonparametric statistic test is carried out to compare Indian and Chinese MNEs with regard to their geographical agglomeration in Europe and to identify the main factors which determine their location choice. To conclude, the theoretical and managerial implications of the main findings will be advanced as a contribution to the literature about this new international business phenomenon of OFDI by firms from emerging economies in developed countries.

Data sources and methodology

The firm-level data which are used in this study were compiled from the Amadeus European company database in November 2010. This database contains comprehensive financial and business data on over 14 million companies registered in 43 European countries, including standardised annual accounts (consolidated and unconsolidated), financial ratios, business activities, location and ownership information. On the basis of ownership information, 6,496 subsidiaries in 31 European countries were identified as partly or completely owned by Indian or Chinese investors, i.e. 1,820 from India and 4,676 from China.

The spatial concentration of Indian and Chinese firms in a particular European city as compared to other foreign subsidiaries is checked via two steps. First, the cities which host more than one per cent of Indian or Chinese companies are selected as locations with a spatial concentration of Indian and Chinese firms in Europe. Secondly, the concentration of Indian or Chinese companies in these cities are compared with other foreign subsidiaries in order to detect whether the spatial concentration in these cities is a particular phenomenon of Indian or Chinese firms or whether it also applies to other foreign subsidiaries. A proxy of the so-called "location quotient" (LQ) on the basis of the number of companies is used to carry out this comparison. If the LQ=1 or <1, it means that there is no spatial concentration of Indian or Chinese firms in these cities compared to other foreign subsidiaries. By contrast, if the LQ is higher than 1, this finding can be interpreted as meaning that Indian and Chinese firms tend to agglomerate in such locations.

$$L.Q.= \frac{\text{Number of Indian or Chinese firms in a particular city/Number of all Indian or Chinese firms in Europe}}{\text{Number of foreign firms in a particular city/Number of all foreign firms in Europe}}$$

On the basis of the above mentioned two steps methodology, 14 European cities were identified as agglomerations where Indian and/or Chinese firms in Europe, tend to be co-located (Table 1). As compared to other foreign owned firms, Indian firms are strongly present in cities, such as Bucharest, Madrid, Amsterdam, Moscow and Frankfurt, while the cities with a relatively high concentration of Chinese companies are Bucharest, Budapest, Leningrad, Köln, Düsseldorf, Hamburg, etc.

The presence or absence of Indian and Chinese firms in these cities is modelled using a logistic regression. The dependent variable is a dichotomous/discrete value between the presence (1) or absence (0) in the cities with a concentration of Indian or Chinese owned companies. The firms included in the database were coded into two categories according to their location in Europe. The first group consists of companies which are located in the cities with a high concentration of Indian or Chinese companies, while the latter group includes firms which are dispersed over locations with no real concentration of Indian or Chinese firms . Each of the 6,406 Indian and Chinese owned firms thus corresponds to one observation. The information of the individual firm is used, rather than aggregate FDI data, , because location choices in Europe are supposed to be strategic decisions made by individual firms on the basis of their firm specific advantages (FSA). It therefore makes sense to focus on the determinants of these individual decisions rather than the resultant flows of FDI which are frequently used in the location literature about foreign owned firms (e.g. Buckley, Clegg, Cross, Liu, Voss and Zheng, 2007).

The regression reads as follows.

$$Logit(P(y=1)) = \ln(\frac{P(y=1)}{1-P(y=1)}) = \sum_{ij} \beta_i X_{ij}$$

Where y indicates whether the company is in the respective regions of agglomeration. When the company is located within the agglomeration, the y equals one, otherwise, the y equals zero. X_{ij} are the company-specific factors. Among others, *age* is the company age from its establishment, *Equit* is the equity share that Indian or Chinese parent company hold in the subsidiary, *CorpInvestor* is a dummy variable indicating whether the parent company is a corporate investor or individual(family) investor, *Greenfield* is a dummy which equals to 1 when the company is a result of M&As and 0 when the company is a greenfield investment. In the regression, we also examine the size effects and industry effects through a bundle of dummies. The *Size_Dummy$_i$* indicates whether the company is a small, medium, or large sized company. The *Industry_Dummy$_j$* classifies the industry that the company operates as less knowledge intensive service, low-tech manufacturing, knowledge-intensive service, or high-tech manufacturing. Then the full regression model is in the following form:

$$Logit(P_{y=1}) = \beta_0 + \beta_1 age + \beta_2 Equit + \beta_3 CorpInvestor + \beta_4 Greenfield + \sum_i \delta_i Size\_Dummy_i + \sum_j \varphi_j Industry\_Dummy_j + \varepsilon_{ij}$$

The dependant dichotomous variable divides Indian and Chinese owned firms into two groups, i.e. those which are present in the cities where there is an agglomeration or concentration of Indian or Chinese firms, and those in other cities. The firm specific factors that are used as independent or explanatory variables allow us answering the question of why firms move to cities with a concentration of Indian and/or Chinese businesses. Therefore, the presence or absence of firms in

the cities with concentration of Indian or Chinese owned firms are explained and predicted according to their ownership structure, size, year of establishment, mode of entry, type of investors, business activities, etc. Table 2 presents the descriptions and expected impacts of the explanatory variables.

Table 2 Variables and expected results

Name	Type of variable	Description	Expected result
Agglomeration	Dependent (dichotomous variable)	Presence (1) or absence (0) in the cities with concentration of Indian or Chinese firms	
age	Continuous independent variable	Age of Indian or Chinese owned company in 2010 (number of years)	Not significant
Size	Category independent variable	Size of Indian or Chinese owned company in terms of revenue, number of employees or assets (1=small, 2=medium, 3=large)	Small firms tend to agglomerate (-)
Equit	Continuous independent variable	Percentage the equity capital by the parent company in the European subsidiary (per cent)	Positive (+)
Greenfield	Category independent variable	Entry mode of the Indian or Chinese company in Europe (1= M&As; 0=Greenfield)	Greenfield investment tend to agglomerate (-)
CorpInvestor	Category independent variable	Type of shareholders of Indian and Chinese subsidiary in Europe (1= individual/family investor; 0=Corporate investors)	Individual/family investor tend to agglomerate (+)
Industry	Category independent variable	Technology/knowledge level of Indian or Chinese subsidiaries in Europe (1=Less knowledge intensive services; 2=Low tech manufacturing; 3=Knowledge intensive services; 4=High tech manufacturing; 5=Others activities)	LKIS tend to agglomerate

The co-location (or agglomeration) of firms from the same country in a foreign market may present a number of advantages. For companies with a so-called strong 'diaspora' abroad, such as the availability of ethnic businesses and entrepreneurial networks and strong cultural and historic links with the home country are likely to present advantages. It is expected that it allows to lower information and transaction costs and to reduce risks that may complicate venturing into foreign markets. A number of studies grounded in institutional theory (e.g., Child 1997, Hall and Soskice 2001 and Johansen and Mattson 1987) suggest that firms' networks may have an important impact on FDI decisions by providing the focal firm with important information and resources. Such network-related factors not only provide the resources for firms in the early stages of their internationalisation, but also may come with useful advice as to how they should proceed to avoid unnecessary complications Furthermore, this knowledge and resources are particularly useful for firms entering new markets, even more so for emerging multinational companies which are not all that familiar with Western developed economies. It may therefore be reasonable to suggest that the potential of locating in an established agglomeration of Indian or Chinese firms may be an important determinant of the location decision. Also the potential and importance of such a location is likely to vary from one company to another because of their firm specific characteristics, such as for instance the type of shareholders, company size, ownership structure, entry mode and business activities.

Firm size

On the basis of the Amadeus classification, Indian and Chinese firms are divided into three categories, i.e. small, medium and large sized companies[i]. Alsleben (2005) found that small firms

agglomerate more than the large ones since they employ more creative workers that are difficult to replace, while Holmes and Stevens (2002) concluded that there is a positive correlation between the agglomeration and the dimension of firms. Bronzini (2004) stated that size is not relevant for explaining the locational choices of firms.

Technological level

The business activities of Indian and Chinese owned firms are divided into less knowledge intensive services, low-tech manufacturing, knowledge intensive services and hi-tech manufacturing according to the much used OECD definition. Elia and Mariotti (2007) claimed that traditional sectors appear to be the most agglomerated ones in the countries they investigated and consequently expected a positive effect on the agglomeration of firms. However, the most recent location literature suggested that high technology facilities tend to agglomerate, because high levels of spatial concentration increase the likelihood of knowledge spillovers also to the indigenous sector, which should improve the overall level of innovation.

Type of shareholders

The Amadeus ownership database divides the shareholders of foreign companies into individual/family shareholder and corporate shareholders. This latter category consists of industrial companies, financial institutions, government agencies and research institutes. Different types of shareholders are likely to have quite different preferences with regard to the location choice of their overseas subsidiaries, because of their perception of the risks involved in FDI locational decisions. The risks involved with the establishment or acquisition of a company in overseas markets can be interpreted quite differently by potential foreign investors. Strange, Igor, Lien and Jenifer (2009) suggest that "the choice of location for a foreign affiliate within a host economy will depend not only upon the various location-specific attributes, but also upon the risk preferences of the shareholders in the parent company; the extent of the resource commitment in the affiliate, and hence the degree of exposure; and *the extent that the risk may be mitigated by existing network linkages*" (our italics).

Contrary to corporate shareholders, individual or family investors may have to cope with a relative lack of tangible and intangible sources, a less diversified portfolio, and limited liquidity because of concentrated equity holdings (Anderson and Reeb, 2004). Therefore such shareholders are more exposed to the parents' *idiosyncratic* risks, which leads them "to prefer FDI locations that are associated with lower risk". The affiliates owned by families tend locate in the regions and cities where there are strong cultural and historic links with the home country. Ramasamy, Yeung and Laforet (2010) also noticed that Chinese state owned enterprises (SOEs) are different from private firms in their location choice, because of their different investment motivations. The large Chinese SOEs are resource/asset seeking investors which tend to go more to countries with natural resources or a high level of technology, while private firms behave more as more as market seekers, looking for locations with intensive trade activities and possibilities.

Ownership control

Previous research has suggested that firms' entry mode and location choices are interrelated (Filatotchev et al. 2007, Meyer/Nguyen 2005), and has established that after taking into account

traditional determinants such as firm size, R&D intensity, etc., the equity stakes taken by parent companies in their overseas affiliates depend upon where those affiliates are located. This latter study also reported a statistical relationship between the location choices and the resource commitments, as measured by the equity stake in an affiliate, but without providing an explanation. We would argue that the larger is the equity stake taken by the parent firm in its overseas affiliate, the greater will be the risk exposure. Risks are greater for firms entering more distant geographical and cultural markets,. These risks may be mitigated by network-related factors, such as access to network resources, knowledge and information linked to a particular FDI destination. These network effects are particularly strong when network members share the same cultural values and have a common heritage (Gao 2003, Rauch 1999, Rauch/Trinidade 2002). Hence, it is reasonable to suggest that investments involving a large equity participation are likely to be located in more familiar and culturally closer areas to minimize risk exposure.

<u>Company age</u>

The newly established companies are more inclined to be located in an agglomeration as a way to follow other home country's companies. Locating together with other home country companies allows to benefit from the existing business network.

<u>Entry mode</u>

The Amadeus data does not allow making a distinction between greenfield investments and M&As. In order to track potential differences between greenfields and acquisitions of Indian and Chinese firms when entering the European market, this study arbitrarily divided Indian and Chinese firms into two groups according to the year of their incorporation[ii]. The greenfield projects may be more inclined to locate in the established agglomeration, while evidently the M&As depend on the location of the targeted companies.

Key features of India and China invested companies in Europe

Although the 1,820 companies established by Indian companies in Europe are spread out over 30 countries, there is a high concentration in only three countries, namely the United Kingdom, Russia and Germany which account for three quarters of the total number of Indian companies in Europe. The Netherlands and Switzerland rank as fourth and fifth host country in this list of Indian subsidiaries in Europe. Compared to India, the location of China invested companies in Europe is somewhat different. While the 4,676 Chinese invested enterprises in Europe are also widely dispersed, i.e. in 29 countries, and strongly concentrated . The top five countries host 4,298 Chinese firms, or 92 per cent of the total number of Chinese invested firms in Europe. These countries are the Russian Federation (29 per cent), Germany (22 per cent), Hungary (18 per cent), Romania (17 per cent), and the UK (6 per cent).

The location of Indian and Chinese firms varies a lot. About 42 per cent of Indian firms are located in Northern Europe, especially the UK, while the relative share for China is only 8 per cent. Two thirds of Chinese invested firms are located in Eastern Europe as compared to only one quarter for Indian firms. In Western Europe, Indian and Chinese subsidiaries present a comparable share, i.e. 27 per cent as compared to 25 per cent. Significant differences are observed between the Indian and

Chinese firms with regard to their location in Eastern, Northern and Southern Europe, as the *standardised residual* is larger than two (Table 3).

Table 3. Main characteristics of Indian and China invested companies in Europe (No. of firms)

		China	India	Total
Year of incorporation				
Before 1990	Count	86	235	321
	%	2.00%	13.50%	5.30%
	Std. Residual	-9.4	14.9	
1990-1994	Count	203	125	328
	%	4.70%	7.20%	5.40%
	Std. Residual	-2	3.2	
1995-1999	Count	829	243	1072
	%	19.20%	14.00%	17.70%
	Std. Residual	2.3	-3.7	
2000-2004	Count	1,865	547	2412
	%	43.20%	31.50%	39.90%
	Std. Residual	3.5	-5.5	
2005-2010	Count	1,333	586	1919
	%	30.90%	33.80%	31.70%
	Std. Residual	-1	1.5	
Entry mode				
Greenfield	Count	2167	680	2847
	% within home	46.30%	37.40%	43.80%
	Std. Residual	2.6	-4.2	
M&As	Count	2509	1140	3649
	% within home	53.70%	62.60%	56.20%
	Std. Residual	-2.3	3.7	
Size category				
Large	Count	150	373	523
	%	3.20%	20.60%	8.10%
	Std. Residual	-11.7	18.8	
Medium	Count	384	407	791
	%	8.20%	22.50%	12.20%
	Std. Residual	-7.8	12.6	
Small	Count	4,142	1,027	5169
	%	88.60%	56.80%	79.70%
	Std. Residual	6.8	-10.9	
Location				
Eastern Europe	Count	3,091	461	3552
	%	66.10%	25.30%	54.70%
	Std. Residual	10.6	-16.9	
Northern Europe	Count	376	765	1141
	%	8.00%	42.00%	17.60%
	Std. Residual	-15.5	24.9	
Southern Europe	Count	24	97	121
	%	0.50%	5.30%	1.90%

	Std. Residual	-6.8	10.8	
Western Europe	Count	1,185	497	1682
	%	25.30%	27.30%	25.90%
	Std. Residual	-0.7	1.2	

Ownership structure

<10%	Count	118	41	159
	%	3.10%	2.30%	2.90%
	Std. Residual	0.9	-1.3	
10-24%	Count	133	38	171
	%	3.50%	2.20%	3.10%
	Std. Residual	1.5	-2.2	
25-49%	Count	340	104	444
	%	9.00%	6.00%	8.00%
	Std. Residual	2.1	-3	
50%	Count	598	91	689
	%	15.70%	5.20%	12.40%
	Std. Residual	5.8	-8.6	
51-94%	Count	355	221	576
	%	9.30%	12.70%	10.40%
	Std. Residual	-2	2.9	
95-100%	Count	2,253	1,252	3505
	%	59.30%	71.70%	63.20%
	Std. Residual	-3	4.4	

Type of investors

Individual or family	Count	3,897	686	4583
	%	83.30%	37.70%	70.60%
	Std. Residual	10.4	-16.7	
Industrial company	Count	758	1,090	1848
	%	16.20%	59.90%	28.40%
	Std. Residual	-15.7	25.1	
Financial and government institution	Count	21	44	65
	%	0.40%	2.40%	1.00%
	Std. Residual	-3.8	6	

Technology level

<u>Knowledge intensive services</u>	Count	359	534	893
	%	8.10%	31.90%	14.60%
	Std. Residual	-11.4	18.6	
Knowledge intensive market services	Count	178	138	316
	%	4.00%	8.30%	5.20%
	Std. Residual	-3.4	5.6	
High-tech knowledge intensive services	Count	71	258	329
	%	1.60%	15.40%	5.40%
	Std. Residual	-10.9	17.8	
Knowledge intensive financial services	Count	59	90	149
	%	1.30%	5.40%	2.40%
	Std. Residual	-4.7	7.7	
Other knowledge intensive services	Count	51	48	99
	%	1.10%	2.90%	1.60%

	Std. Residual	-2.5	4	
Less knowledge intensive services	Count	3852	890	4742
	%	86.50%	53.20%	77.40%
	Std. Residual	6.9	-11.2	
Less knowledge intensive market services	Count	3,808	858	4,666
	%	85.50%	51.30%	76.20%
	Std. Residual	7.1	-11.6	
Other less knowledge intensive services	Count	44	32	76
	%	1.00%	1.90%	1.20%
	Std. Residual	-1.5	2.5	
High-tech manufacturing	Count	112	122	234
	%	2.50%	7.30%	3.80%
	Std. Residual	-4.5	7.3	
High-tech manufacturing	Count	37	40	77
	%	0.80%	2.40%	1.30%
	Std. Residual	-2.5	4.1	
Medium-high-tech manufacturing	Count	75	82	157
	%	1.70%	4.90%	2.60%
	Std. Residual	-3.7	6	
Low-tech manufacturing	Count	132	126	258
	%	3.00%	7.50%	4.20%
	Std. Residual	-4.1	6.6	
Medium-low-tech manufacturing	Count	39	66	105
	%	0.90%	3.90%	1.70%
	Std. Residual	-4.3	7	
Low-tech manufacturing	Count	93	60	153
	%	2.10%	3.60%	2.50%
	Std. Residual	-1.7	2.8	

Note: Std. Res. >= 2.0: significant; 1.0> Std. Res. >2.0: tendency; -1<= Std. Res. <=1.0: not significant; -2.0< Std. Res. <-1.0: tendency; Std. Res. <=-2.0: significant

Source: On the basis of Amadeus database

The geographical concentration of Indian and Chinese invested companies is not only reflected at the country level, but also at the city level. About 44 per cent of Indian invested firms are located in 10 cities/urban areas of 6 European countries. The Moscow and London areas host 30 per cent of Indian invested firms in Europe, while for Chinese firms the top 10 host cities/regions received 71 per cent and the top three cities, i.e. Moscow, Budapest and Bucharest accounted for 51 per cent (Table 5).

**Table 5. Regional concentration of China and India invested companies in Europe (No. of firms)**

Chinese owned companies			Indian owned companies		
City/country	No. of firms	%*	City/country	No. of firms	%*
Moscow region	1,151	24.62	Moscow region	285	15.66
Budapest	812	17.37	London Inner	255	14.01
Bucharest	715	15.29	London Outer	78	4.29
Hamburg	188	4.02	Harrow - Watford	56	3.08

London Inner	114	2.44	Glasgow	39	2.14
Düsseldorf	108	2.31	Amsterdam	34	1.87
Grad Sofiya	88	1.88	Bucharest	26	1.43
Berlin	75	1.60	Hamburg	25	1.37
Köln	68	1.45	Madrid	25	1.37
Leningrad region	62	1.33	Frankfurt	24	1.32
Frankfurt	52	1.11	Budapest	18	0.99
Nordrhein-Westfalen	47	1.01	Reading - Slough	18	0.99

*Note: * Percentage of total China and India invested companies in Europe*

Figure 3 and 4 map the location of Indian and Chinese invested firms in Europe and shows clearly that although Indian and Chinese invested firms are widely dispersed over Europe, they tend to agglomerate in a small numbers of cities.

Figure 3. Mapping of India invested companies in Europe (No. of companies), 2010
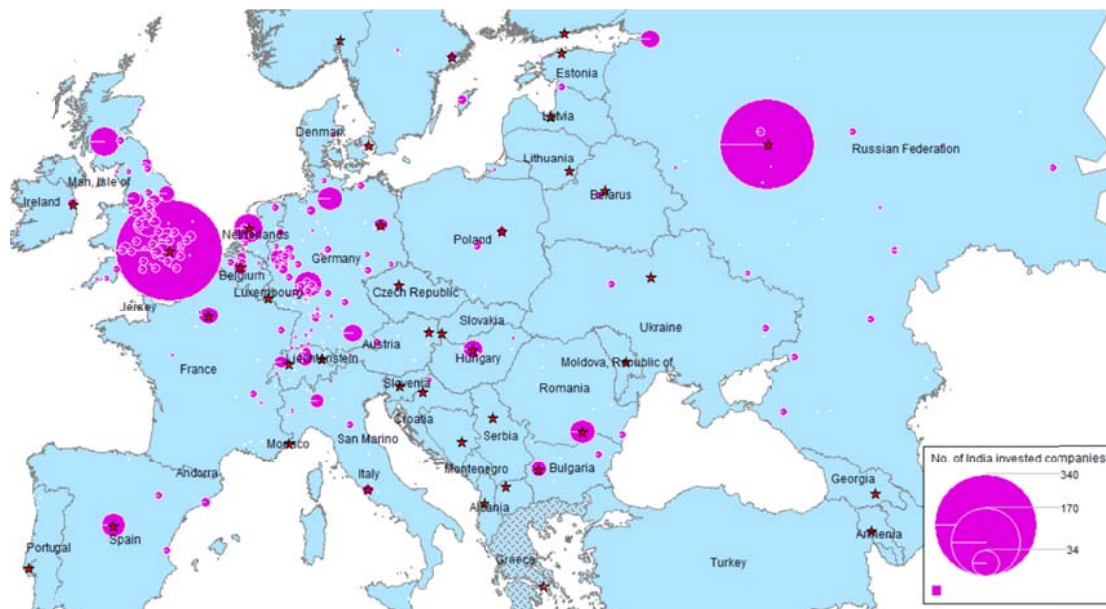
Source: Amadeus database

Figure 4. Mapping of Chinese invested companies in Europe (No. of companies), 2010
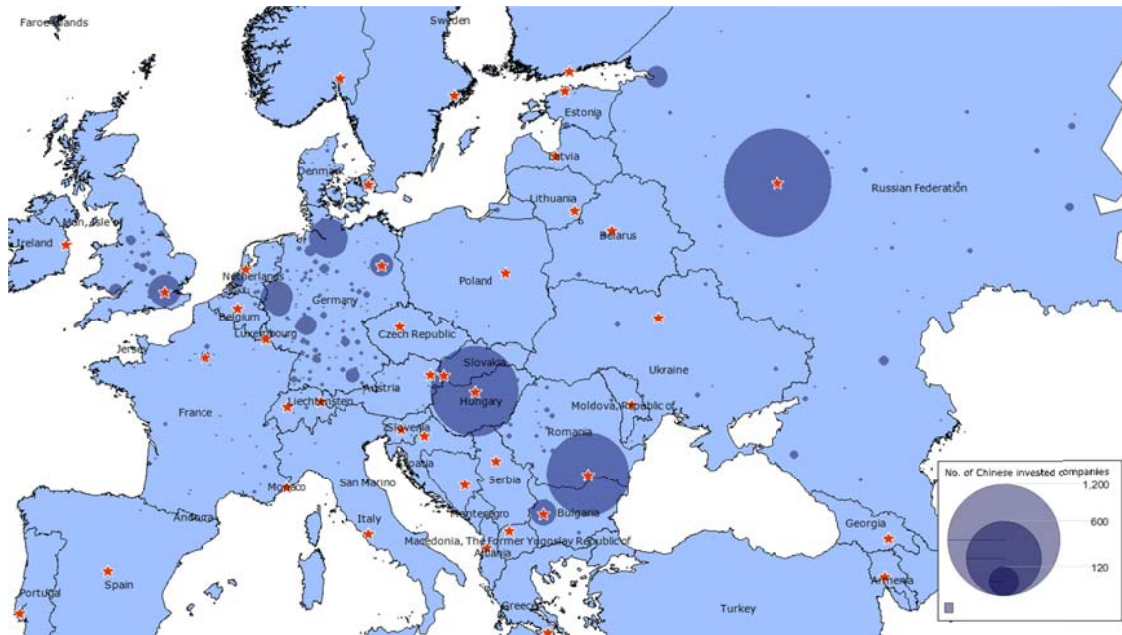
Source: Amadeus database

Compared to China, the Indian firms have a longer European 'history', as, i.e. on average they have been established 13 years ago, while Chinese invested firms date back only 8 years. About 14 per cent of the Indian firms were established before 1990 as compared to only 2 per cent for the Chinese subsidiaries. Given the fact that significant Indian and Chinese investments in Europe only date back to the mid 1990s, it can be assumed that European firms which were established before the 1990s were acquired by Indian and Chinese owned though M&As at a later stage. It is not really possible to check this as the Amadeus database does not provide information about the date of the acquisition. Yet, the higher proportion of Indian invested firms with a longer presence in Europe indirectly indicates that India's OFDI in Europe is more often the result of more take-overs of existing firms, at least compared to their Chinese counterparts. Most of the Indian and Chinese companies in Europe were set-up or acquired during the periods 2000-2004 and 2005-2010. In fact, about two thirds of the Indian subsidiaries and three quarters of the Chinese firms were set up between 2000-2010.

Based on the above assumption 44 per cent of the 'Chindian' owned firms in Europe are likely to have been established as greenfield projects, while 56 per cent were likely the result of. M&As. Indian firms made more use of acquisitions to enter the European market as almost two thirds (63 per cent) used this mode of entry, while this proportion was somewhat more than half (54 per cent) for Chinese investors.

The data about the company size show that on the base of assets one fifth of the Indian firms are strongly presented in the league with the largest size category, , while this amounts only to 3 per cent for Chinese invested firms. Almost all Chinese firms are medium and small sized, i.e. respectively 8 and 89 per cent as compared to 12 and 57 per cent for the Indian counterparts. The difference in firm size between Indian and Chinese companies in Europe is remarkably high. This size difference between of the Indian and Chinese companies are confirmed on the basis of the comparison of their sales or number of employees. On average Indian firms provide employment to 468 people, while the average jobs in Chinese firms is only 17 persons. The average sales of the

Indian firms in Europe amount to 91 million Euro and are about 15 times higher than the 5.8 million sold by Chinese firms (Table 3).

There is also a significant difference with regard to the ownership structure in the European subsidiaries. Almost three out of four (72 per cent) Indian firms opted for wholly owned subsidiaries, For Chinese firms this type of sole ownership is preferred by three out of five companies.. Chinese firms are relatively more inclined to use the 50:50 joint venture form, i.e. 16 per cent as compared to 5 per cent for Indian firms. Yet, the average equity share of Indian invested companies in Europe is 87 per cent as compared to 80 per cent for European based Chinese firms (Table 3). Indian firms have more registered shareholders, i.e. on average 3.76 investors per firm This might be related to their larger size, especially for listed companies. The typically smaller sized firms Chinese companies have on average 1.65 participants in their equity capital.

Another striking difference between these two largest BRIC countries is that three fifths of the Indian firms in Europe were established or acquired by industrial companies, while more than four fifths of Chinese firms (83 per cent) were set up by individuals or families. This specific feature is related to the expansion of Chinese migrant entrepreneurs into Eastern Europe at the beginning of the 1990s. The fact That most Chinese firms are small sized companies is of course the result of the limited investment funds available by most of these individual or family investors.

The sector distribution between Chinese and Indian owned companies is not very similar either.. First, 14 per cent of the number of Indian firms is concentrated in manufacturing, , compared to 5 per cent for the Chinese establishments. Besides Indian firms are more active in information and communication services, as 14 per cent of their companies in Europe engage in such activities, while . only 1.3 per cent of Chinese are operating in this sector. Yet, this comparison is based on the number of firms. When sales and employment figures are used both countries are equally strong in the information and communication services. This is due to because of the presence of some leading Chinese telecom companies in Europe, such as Huawei, ZTE, etc. Compared to Indian companies, two thirds of the Chinese companies are active in wholesale and retail trade, while only one third of the Indian counterparts are active in this sector (Table 6).

Table 6 Sector distribution of China and India invested enterprises in Europe (Number of firms)

	China		India	
	No.	%	No.	%
Agriculture, forestry and fishing	26	0.57	2	0.11
Mining and quarrying	8	0.18	4	0.22
Manufacturing	244	5.35	248	13.63
Electricity, gas, steam and air conditioning	8	0.18	10	0.55
Water supplying, sewage and waste management	6	0.13	5	0.27
Construction	62	1.36	34	1.87
Wholesale and retail trade	2,932	64.23	629	34.56
Transportation and storage	71	1.56	31	1.70
Hotels and restaurants	611	13.38	26	1.43
Information and communication	59	1.29	253	13.90
Finance and insurance	59	1.29	90	4.95
Real estate	75	1.64	38	2.09

Professional, scientific and technical services	190	4.16	149	8.19
Administrative and support service activities	132	2.89	143	7.86
Public administration and defence	6	0.13	1	0.05
Education	10	0.22	7	0.38
Human health	15	0.33	16	0.88
Arts, entertainment and recreation	9	0.20	7	0.38
Other service activities	41	0.90	34	1.87
Activities of extraterritorial organisations and bodies	1	0.02	0	-
Others	-	-	93	5.11
Total	4,565	100.00	1,820	100.00

On the basis of EUROSTAT's classification, the business activities of Indian and Chinese invested companies can be split up according to their technological level and degree of knowledge intensity. Indian firms are highly concentrated in knowledge intensive services, i.e. where one third of their companies are to be found compared to 8 per cent for Chinese invested firms. These are quite distinctive characteristics in high-tech knowledge intensive services and knowledge intensive market services and illustrate the well-known and generally recognized Indian dominance in these sectors. By contrast, Chinese firms are mostly in the less knowledge intensive services, i.e. 87 per cent of all their companies in Europe, where many operate in e.g. the import and the distribution of consumer goods. Indian firms are relatively more involved in hi-tech manufacturing, especially in chemicals, pharmaceuticals, machinery, electrical equipment and also basic metals. Chinese firms are more active in the manufacturing of machinery and equipment, computers, electronics and optical products, fabricated metals, etc.

Regression results and discussion

Three logistic regression models were constructed to identify the impact of firm specific factors on the agglomeration or co-location of respectively Indian, Chinese groups of companies in Europe (Table 7). Although the results of these tests are quite similar, some differences were revealed among Indian and Chinese owned firms.

Model 1 for Indian owned firms includes 1,603 firms. The model's chi-square is 183.928, which is statistically significant at p<0.001. The overall accuracy rate is 65.7 per cent, showing that the model is relevant. Model 2 for Chinese owned firms counts 3,615 companies and its overall accuracy rate is 77.4 per cent. Model 3grouips both the Indian and Chinese owned 5,218 firms in the test and shows an overall accuracy rate of 71.1 per cent.

These three models provided a number of interesting findings, which result in the following interpretations. First, the age of Chinese owned companies in Europe is positively related with a Chinese presence in cities with an agglomeration of Chinese firms. This finding indicates with a level of significance of p>0.01 shows that the Chinese recent investments tend to co-located in cities where there is already a strong concentration of such businesses. For Indian owned firms the same test did not give any evidence of this tendency, meaning that the age of firms did not have an influence on their location decisions.

Secondly, the equity share that Indian parent companies hold in their subsidiaries is positively related to their preference to be co-located with other Indian firms. The model about Chinese

owned firms provide the same results. As mentioned before , the existence of an agglomeration of Indian and Chinese business communities provides a familiar business environment, firm networks and easier access to entrepreneurial social networks. Such a business environment tends to be perceived by these firms as a shortcut to lower investment risks and costs, especially for wholly owned or majority owned subsidiaries with high resource involvement compared to minority owned ventures or portfolio investment.

Thirdly, the corporate shareholders have a negative impact at a level of significance of $p<0.01$ on the agglomeration of their subsidiaries in Europe as compared to individuals or family investors. This confirms that compared to corporate investors, individual or family investors lack resources and take fewer risks taking in their internationalisation process. Therefore, locating in a city or region with high a concentration of firms from their home countries may allow them to lower their transaction costs and perceived risks.

Fourth, as compared to acquisitions , the greenfield investments are positively linked with the presence in the agglomeration for both Indian and Chinese firms. As expected, the location choice in the take-over of existing companies is practically predetermined, especially for the firms embedded in their own industrial clusters, such as regional innovation clusters or high-tech manufacturing hubs. Of course , the objectives of Indian and Chinese firms that take over European high-tech manufacturing companies or R and D centres want to be close to an innovative environment in order to have access to local and specialised knowledge.

Fifth, the negative relationship between the firm size and the presence in the agglomeration was confirmed for Indian owned firms, but at a low level of significance ($P<0.1$). Small sized Indian firms tend to co-locate with firms from their home countries, while large sized Indian firms do not undergo such an influence by these locations. Due to the lack of resources, small firms may consider the established business communities as additional assets to allow them to successfully support their expansion into a foreign market. Yet, model 2 about the Chinese owned firms did not provide similar results.

Sixth, it is interesting to notice that both Indian and Chinese owned firms are more inclined to co-locate with firms from their home countries, when they are active in less knowledge intensive sectors, mostly in distribution services, more in particular in wholesale and retail trade, accommodation and food and beverage services. This result confirms certain previous studies (Elia and Mariotti, 2007) in suggesting that traditional sectors tend to are to be agglomerate. Model 2 also confirmed that Chinese owned firms tend to agglomerate in low-tech manufacturing activities in Europe, such as textiles, cloths, leather and related products, wood, basic metals, etc. The results are rather strong ($P<0.01$) and indicate that Indian firms operating in high-tech manufacturing and knowledge intensive services are not often found in locations with a high concentration of Indian firms.

Conclusion

Table 2. European cities with agglomerations of Indian and Chinese firms

City/region	No. of Foreign owned firms	% (1)	No. of Indian owned firms	% (2)	LQ (2)/(1)	City/region	No. of Chinese owned firms	% (3)	LQ (3)/(1)
Moscow region	42,957.00	1.22	285.00	15.66	12.82	Moscow region	1,151.00	24.62	20.15
London Inner	248,400.00	7.06	255.00	14.01	1.98	Budapest	812.00	17.37	535.65
Harrow - Watford	33,267.00	0.95	56.00	3.08	3.25	Bucharest	715.00	15.29	796.59
Glasgow	19,058.00	0.54	39.00	2.14	3.95	Hamburg	188.00	4.02	24.29
Amsterdam	5,049.00	0.14	34.00	1.87	13.01	Düsseldorf	108.00	2.31	24.27
Bucharest	675.00	0.02	26.00	1.43	74.42	Berlin	75.00	1.60	8.15
Hamburg	5,820.00	0.17	25.00	1.37	8.30	Köln	68.00	1.45	24.40
Madrid	2,355.00	0.07	25.00	1.37	20.51	Leningrad region	62.00	1.33	66.42
Frankfurt	4,131.00	0.12	24.00	1.32	11.23	Frankfurt	52.00	1.11	9.47
		-		-				-	
Total	3,516,454	100.00	1,820	100.00	1.00	Total	4,676	100.00	1.00

Table 4. Some business indicators of China and India invested companies in Europe, 2009

	Total			India*			China*		
	Mean	N**	S.D.	Mean	N**	S.D.	Mean	N**	S.D.
Age	9.71	6,052	10.44	12.96	1,736	16.99	8.39	4,316	5.55
Sales (million Euro)	36.84	2,235	274.32	5.8	1,426	42.41	91.57	809	447.42
No. of employees	175.59	2,308	1,835.39	17.37	1,497	109.32	467.63	811	3,072.57
Share of main shareholder (%)	82.21	5,385	26.48	87.25	1,706	23.6	79.87	3,679	27.41
No of recorded subsidiaries	0.88	5,372	12.55	2.37	1,693	21.1	0.19	3,679	4.88
No of recorded shareholders	2.32	5,385	7.16	3.76	1,706	12.4	1.65	3,679	1.53

Note: *Only companies with an equity share equal or above 10% are included*

*** Number of available cases*

Table 7. Logistic Regression on the number of Indian and Chinese owned firms with geographical concentration

	Model 1. Indian owned firms				Model 2. Chinese owned firms				Model 3. Total (Indian and China)			
	B	S.E.	Sig.	Exp(B)	B	S.E.	Sig.	Exp(B)	B	S.E.	Sig.	Exp(B)
Age	0.000	0.004	0.950	1.000	0.048	0.008	0.000***	1.049	0.013	0.003	0.000***	1.013
Equity share	0.013	0.002	0.000***	1.013	0.014	0.002	0.000***	1.014	0.013	0.001	0.000***	1.013
Corporate investor	-0.879	0.130	0.000***	0.415	-1.928	0.111	0.000***	0.145	-1.544	0.081	0.000***	0.214
Entry mode-Greenfield	0.494	0.128	0.000***	1.639	0.723	0.137	0.000***	2.060	0.626	0.089	0.000***	1.870
Size-small			0.040**				0.328				0.200	
Size-medium	-0.191	0.171	0.265	0.826	-0.020	0.258	0.937	0.980	-0.246	0.140	0.079*	0.782
Size-large	-0.386	0.158	0.015**	0.680	0.179	0.238	0.452	1.196	-0.136	0.128	0.285	0.873
Less KIS			0.000***				0.000***				0.000***	
Low tech manufacturing	0.003	0.128	0.981	1.003	0.884	0.141	0.000***	2.420	0.474	0.090	0.000***	1.606
KIS	-1.178	0.268	0.000***	0.308	-0.115	0.275	0.675	0.891	-0.774	0.187	0.000***	0.461
High-tech manufacturing	-1.278	0.268	0.000***	0.279	-0.203	0.250	0.417	0.816	-0.792	0.175	0.000***	0.453
Others	0.235	0.243	0.335	1.265	-1.278	0.221	0.000***	0.279	-0.959	0.160	0.000***	0.383
Constant	-0.685	0.251	0.006***	0.504	-1.490	0.282	0.000***	0.225	-0.647	0.166	0.000***	0.524
No. of case	1,603				3,615				5,218			
2 Log likelihood	2003.133				3584.637				5797.748			
Chi-square	183.928				1065.661				1281.316			
Overall predicted %	65.70				77.40				71.10			

*** p<0.01, ** p<0.05, * p<0.1, Robust standard errors in parentheses

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Notes

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[i] Firms are considered to be large sized when they meet at least one of the conditions: (1) operating revenue is equal to or more than €10 million, or (2) total asset is equal to or more than €20 million, or; (3) employees are equal to or more than 150. Similarly, Medium sized companies satisfy the conditions (1) operating revenue is equal to or more than €1 million but less than €10 million, or (2) total assets is equal to or more than €2 million EUR less than €20 million, or (3) employees are equal to or more than 15 but less than 150 persons. Companies are considered to be small companies when they are not included in another category.

[ii] The first group consists of firms that had been founded since 2003 and that were owned by Indian and Chinese investors for more than 50% at the end of 2010 (Weterings, Raspe and van den Berge, 2011). These firms are quite young (maximum of five years old) and, therefore, are more likely to have been greenfield investments, because young firms generally are less attractive acquisition targets for foreign firms (with the possible exception of high-tech companies developing very specific products). The second group consists of firms that were established before 2003 and were assumed to become Indian and Chinese owned as a result of M&As. Yet, given the fact that Chinese investment in Eastern Europe already started in the mid 1990 by immigrants (Nyíri, 2003), the Chinese firms established in Eastern Europe, i.e. mostly Hungary, Romania and Russia, with above 50 per cent equity share are considered as greenfield investments. Following this definition,