



Centre for Economic and Regional Studies of the Hungarian
Academy of Sciences – Institute of World Economics
MTA Közgazdaság- és Regionális Tudományi Kutatóközpont
Világgazdasági Intézet

Working paper

248.

November 2018

Tamás Gerőcs

**INDIAN COMPANIES' TECHNOLOGICAL INVESTMENTS
IN THE EU WITH A SPECIAL FOCUS ON
CENTRAL AND EASTERN EUROPE**

W P

Centre for Economic and Regional Studies HAS Institute of World Economics

Working Paper Nr. 248 (2018) 1–57. November 2018

Indian companies' technological investments
in the EU with a special focus on
Central and Eastern Europe

Author:

Tamás Gerőcs

junior research fellow

Institute of World Economics

Centre for Economic and Regional Studies Hungarian Academy of Sciences

email: gerocs.tamas@krtk.mta.hu

The contents of this paper are the sole responsibility of the author and do not necessarily reflect the views of other members of the research staff of the Institute of World Economics, Centre for Economic and Regional Studies HAS

ISSN 1215-5241

ISBN 978-963-301-677-0



Indian companies' technological investments in the EU with a special focus on Central and Eastern Europe¹

Tamás Gerócs²

Abstract

India is one of the fastest growing economies in the world whose global share in “outward foreign direct investment” (OFDI) among the developing countries increased from a low level to second only to China. It has not only been a spectacular rise in Indian overseas investment activity, but the nature and the structure of Indian OFDI have also changed in the last decades. In the following paper we will examine the reasons and driving forces behind this spectacular rise, concentrating mostly on those host country characteristics that are the pull factors in attracting Indian investments. We follow the most recent literature on global value-chain specialization as much of Indian outward foreign investment is following a technology-seeking strategy currently. We choose Central and Eastern Europe as our case study because the region combines attributions of both advanced and developing countries in attracting Indian investment.

JEL: F14, F23, F63, H63, L22

Keywords: India, OFDI, internationalization, Central and Eastern Europe, technology-seeking investment, global value chains, production system, global contender, absorptive capacity, medium-tech manufacturing, level of productivity, R&D

Introduction

Because of the emerging mega-regional trade and investment blocks in the world economy, developing countries' share in global investment and trade has been steadily rising since the 2000s. Multinational companies from the BRICS countries are the key drivers of this increase, accounting for 62% of total developing country outward foreign direct investment (OFDI) stock in 2016—with China alone accounting for 36% (Perea

¹ This paper was written in the framework of the research project "Non-European emerging-market multinational enterprises in East Central Europe" (K-120053), supported by the National Research, Development and Innovation Office (NKFIH).

² junior researcher, Centre for Economic and Regional Studies of the Hungarian Academy of Sciences Institute of World Economics, Tóth Kálmán u. 4, H-1097 Budapest, Hungary Email: gerocs.tamas@krtk.mta.hu

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

and Stephenson, 2018:114). Between 2000 and 2015, developing countries quadrupled their share in total global FDI stocks, increasing from 4% to over 15%, equal to ca. USD 3000 billion by 2015 (Figure 1). One reason for the spectacular rise is that OFDI can boost their companies' innovation capacities.

Indian companies used to be laggards among large BRICS investors. In the 1980s the dominant proportion of Indian investment (OFDI) still concentrated in other developing countries, but since the 2000s we see a spectacular catch-up in the number of transactions in advanced western as well as Central and Eastern European (CEE) countries (Pradhan, 2017). This phenomenon mirrors the gradual evolution of Indian "global contender" multinationals, whose history have been characterized by the elimination of economic restrictions and concomitant reforms in the Indian economy (Athukorala and Chandra 2009). Given the fact that Indian firms contributed to overseas investments since the late 1960s and have witnessed a number of key structural amendments³ in the country's industrial policy agenda that have considerably influenced their investment behaviour, Indian companies' experience offers one of the most insightful case studies to assess the push and pull factors in the global OFDI environment.

³ The three pillars of economic reforms in 1991 have been the cornerstone of economic policy and foreign exchange regulations, e.g. the central bank's liberalization in relation to balance of payment activities. As a result of the liberalization, Indian firms have been seeking joint venture partnership with foreign companies. The transformation for overseas investment was further supported by administrative relaxation of the foreign exchange control, particularly as the FERA was replaced by the FEMA in 2000.

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

Figure 1: Share of Indian OFDI among BRICS countries 1985-2015

	1985	1990	1995	2000	2005	2010	2015
	<i>OFDI in mn USD</i>						
World	62103	243878	356889	1164956	841092	1386061	1594317
Developing	3725	13111	52307	90003	118351	373906	389267
Developed	58378	230767	303966	1071786	704694	961715	1172867
Brazil	81	625	1096	2282	2517	22060	3092
China	629	830	2000	916	12261	68811	127560
South Africa	51	27	2498	271	930	76	5744
India	3	6	119	514	2985	15947	7572
	<i>Share in global OFDI (%)</i>						
Brazil	0,13	0,26	0,31	0,2	0,3	1,59	0,19
China	1,01	0,34	0,56	0,08	1,46	4,96	8
South Africa	0,08	0,01	0,7	0,02	0,11	0,01	0,36
India	0	0	0,03	0,04	0,35	1,15	0,47
	<i>Share in developing OFDI (%)</i>						
Brazil	2,18	4,76	2,09	2,54	2,13	5,9	0,79
China	16,88	6,33	3,82	1,02	10,36	18,4	32,77
South Africa	1,37	0,21	4,77	0,3	0,79	0,02	1,48
India							
	<i>Share in GDP (%)</i>						
Brazil	0,4	0,15	0,14	0,35	0,28	1	0,17
China	0,2	0,21	0,27	0,08	0,53	1,13	1,14
South Africa	0,09	0,02	1,59	0,2	0,36	0,02	1,83
India	0	0	0,03	0,11	0,37	0,97	0,36

Source: Chaudhry et al. (2018:6)

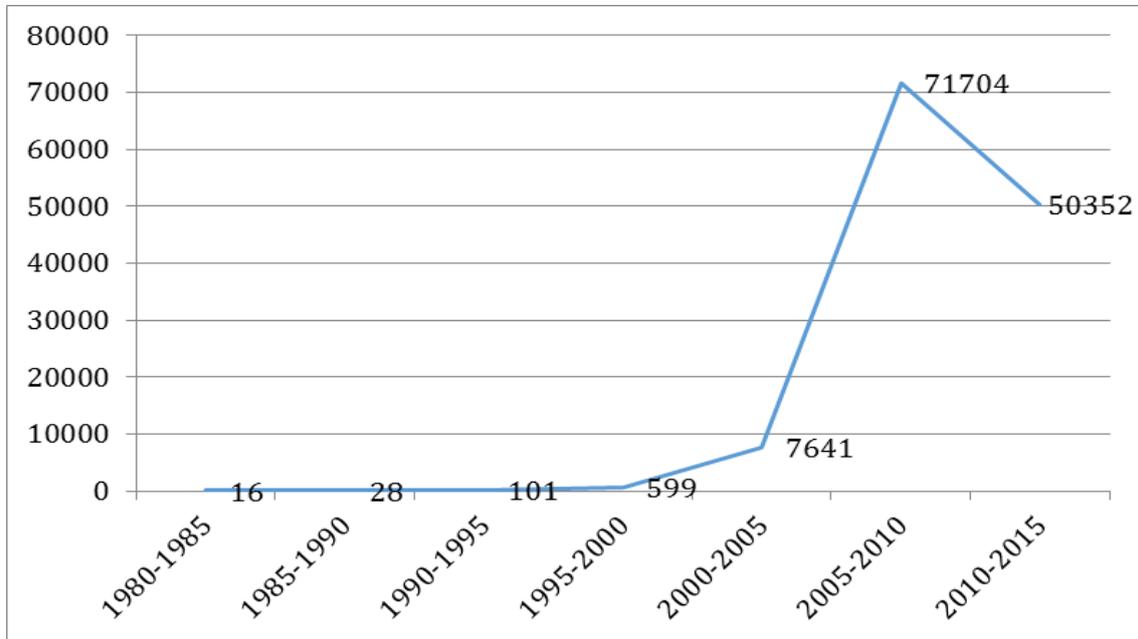
*Tamás Gerócs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

Although the share of Indian OFDI used to be relatively small in comparison to other developing countries (0,4% in 1981), its share surpassed South African and Brazilian OFDI by 2005 and it is now only second to China with a share of 4,6% in 2015 (ibid). However, India's OFDI activity temporarily declined in 2011 because of the effects of the global economic crises. The global financial crises eroded the risk appetite of Indian companies and reduced their overseas activities in many regions (Chaudhry et al., 2018:17-23). As it is tracked by Figure 2, the flow of Indian investments decreased from USD 16,8 billion in 2011 to just USD 10,9 billion in the following year and further dropped to USD 7,1 billion in 2012. Between 2013 and 2014, the actual level of OFDI from India showed some signs of recovery and was recorded at USD 13,4 billion. India's OFDI begun to show recovery once again and by 2017 it was estimated to increase above USD 15 billion by the end of the year⁴. From the beginning of 2000s until the end of 2016, the total amount of India's foreign direct investment was roughly estimated at USD 255,4 billion (Gerócs, 2017b). While the magnitude of OFDI has risen remarkably over the last decade, a thorough analysis in the change of the character of investments, including the transformation of the sectoral composition and the geographical characteristics, including host country attributions – which we call the pull factors - is still needed for understanding the full picture behind Indian multinationals' global strategy.

⁴ Official RBI statistics on 2017 full year OFDI was not yet available by the finalization of this paper.

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

Figure 2: Indian OFDI flows, cumulative 5-year periods 1980-2015 (mn USD)



Source: Pradhan (2017:44)

As many of the scholars on the subject of Indian multinationals agree, the comparative advantage of the largest Indian companies has dramatically shifted from low-level of technological capabilities and labour-intensive production to middle-ranked knowledge-based, technologically-driven investments targeting advanced economies (Nölke et al., 2018). The shift has been largely driven by sectors, such as IT, pharmaceuticals, steel production and automotive industries. 'Global contenders'⁵ require sophisticated management practices and high level of technical expertise which they can acquire through foreign direct investments in host countries which exhibit high quality technological assets or whose economies are embedded and connected to large production systems where state of the art technology is accessible and transferable to other locations.

The general trend since the 2000s indicates that Indian multinationals expanded their global presence in advanced economies through mergers and acquisitions (M&A). While greenfield investments have been the preferred mode of entry into other developing and transition economies, including Central and Eastern Europe (Nayyar, 2008). Indian

⁵ Global contender: see description in Boston Consulting Group's (2018) „Global Challengers Report”

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

companies started investing in CEE after the liberalization process in the 2000s⁶. The case study of CEE discussed in this paper hinges upon the investment experience of Indian companies in transition economies which occupy a bridge position – both in terms of their geographical proximity to western markets but also of the nature of investments in concern - between developed and developing countries. The bulk of these investments have largely been concentrated in automotive and IT but very recent economic trends suggest that CEE holds tremendous potential in tourism, pharmaceuticals, water management, alternative energy and telecom markets as well (Milelli, 2007). It is interesting to note that such investments have a peculiar profile when we compare them with Indian OFDI in western economies in the UK, US or Germany, or when we compare them to other developing markets e.g. in Africa or in Asia. Such comparative analysis is still largely missing, and this paper's focus is neither on that, but we will give a short overview about the specific characteristics of Indian overseas investments in Central and Eastern Europe, with a particular focus on Hungary.

Theoretical discussion

Business scholars use classical modernization theories when they deal with overseas investments (cf. Vernon, 1966). Modernization theories, such as the concept of upgrading embrace companies' foreign investment as a successful attribution of getting access to new markets and to improve technical knowledge and capacity (Gereffi et al., 2005; Gereffi, 2014).

Not much attention has been paid to those global pull factors which are restructuring the world economy. If we look at internationalization from this global perspective not all the stories of emerging companies become immediate success stories of upgrading. These are often part of a more global restructuring in which competitive and complementary market forces simultaneously play their roles. When we take these economic forces into account, the picture becomes more complex. It is not only the decision of the particular company or the industrial policy initiated by the state that

⁶ The enactment of Foreign Exchange Management Act (FEMA) in 2000 liberalized the political framework by systematically raising per annum upper limits for overseas investments.

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

matters the most for internationalization, but many other aspects of the world economy can influence the decision of the investor company in concern (Venkata, 2006). In order to study the complex structural effects of the internationalization of Indian companies we have to gain a more thorough insight into the structure of the world economy from this global perspective.

In the following paper I overview the investment strategy of Indian companies in this complex environment in order to analyse the long-term effects of internationalization on both the host and home economies. I will pay attention not only to domestic economic factors (the so called: “push factors” behind internationalization) as I have already analysed them elsewhere (Gerőcs, 2017b). In this paper the focus is more on the host country's characteristics which are integral parts of the world economy alike and which trigger key ‘pull factors’ in attracting investments. In order to gain insight into the host country's characteristics (pull factors), I will show examples of Central and Eastern Europe which serves as a gateway for Indian multinationals seeking entrance to much larger and more developed global production systems in the European Union. This paper also provides an overview about where Indian multinationals tend to specialize in the newly emerging production systems and value chains and we will assess what role CEE economies might play in their global strategy in the future.

This paper is structured as follows: first, we give a global overview of Indian investment in the 2000s. Then we analyse the most important firm-specific characteristics of Indian multinationals, including imported-technology, export intensity, average size and age of the companies and the relationship between parent and subsidiary in relation to R&D activity. In the third chapter we give a summary of the most important Indian global contenders before turning to the most important host country characteristics that attract Indian investments into a particular location. The final chapter is an overview of host country characteristics in Central and Eastern Europe. We empirically show the most important selected host country specific characteristics that are attributed to the transition economies in attracting Indian investors. This empirical chapter is followed by a short conclusion.

Indian investment in global outlook

India's share of global OFDI jumped from 0,01% in 1990 – before liberalization started – to 0,41% by 2010. And by 2015 India's OFDI stock was equivalent to 51% of the inward FDI stock and 6,5% of the Indian GDP, 17% of gross capital formation (GFCF) (Pradhan, 2017:44). Some of these indicators showed that India's openness exceeded the level of China (Gerócs, 2017a).

Intensified competition in their home market – due to this liberalization process – meant that Indian firms needed to adjust to global forces in the short run and to integrate into international production systems in the long run, resulting in growing outflow of capital. Narayanan and Bhat (2017) has provided empirical evidence that there is a strong correlation between the level of productivity and degree of internationalization among Indian companies. Their model comprises of a three-scale productivity scheme in which high productivity companies – having both foreign and home-based R&D activities – have the most incentives to invest abroad. Companies in the middle-ranked productivity range tend to prefer exporting over investment into foreign locations, whereas low productivity firms still depend on domestic sales and in many cases, rely on state subsidies or protectionist market policies (cf. Topalova and Khandelwal, 2011; Thomas and Narayanan, 2017).

Thomas and Narayanan (2017:18) demonstrated that the more productive a given firm appears to be, the higher its probability to take international investment activity especially in advanced economies. Only the most productive firms have the capacity to foster foreign investment, because the financial barriers in overseas activities are usually too high for less lucrative or smaller companies. Enterprises choose OFDI over trade due to high transportation costs, or other administrative trade barriers (e.g. discriminative tariffs or non-tariff administrative obstacles) which they have been facing lately in the two most important advanced markets: the United States (USA) and the European Union (EU). Both entities have raised barriers or deployed protective means to withhold and select out investors from outside areas, most notably from BRICS countries.

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

Therefore, the majority of Indian companies investing in these affluent but protected markets are usually clustered “highly productive” and strong enough to circumvent the administrative obstacles. Plus, these companies usually depend less on their home markets. The main difference between pre- and post-liberalization investment strategies in India is that motivation in the former era was still dominated by the need of the home economy, such as access to foreign currency. In the case of post-liberalization, focus is on strategic assets, for example technology-seeking and trade-supporting FDI in advanced markets which are driven more by firm-specific strategies.

The main advantage of OFDI is to reap the benefits from the proximity to large and developed, but relatively closed markets, e.g. in the EU or in the North American Free Trade Agreement (NAFTA). As Thomas and Narayanan (2017) underlines, export experience is still important before any investment decision is made. Indian companies usually start with developing trade relations; not only because of their actual level of productivity, but because they lack adequate information about the market where they want to locate their operation.

Feenstra (1998) has underlined in his seminal work that more foreign output implies more trade and not necessarily the other way around. As a consequence, it is not always previous trade activity that is followed by an incentive to invest, but the result of foreign investment is more trade. This is the reason why Indian contenders differ from those old state-owned companies that sought internationalization prior to the liberalization process. However, the model applies differently in final goods and intermediary products. In terms of the latter, empirical evidence shows a stronger substitutive effect (De Beule and Somers, 2017). In the case of final goods, we find stronger complementary effects between trade and investment, since their production is vertically linked, integrating Indian companies into global production systems. Brainard (1997) arrived at a similar conclusion, according to which there is mixed evidence regarding complementary or substitutive effects between investment and exports. The above-mentioned model showed a clear complementary relationship in India, but the picture is more nuanced if we take different firm-characteristics into account. More recent studies show that the primary drivers of internationalization are not industry-related

characteristics, such as transportation costs, trade barriers, or intangible asset-seeking, but firm specific variables. The most important characteristic in this regard is Indian companies' access and usage of modern technology (Ramamurti, 2012). The main driver for Indian multinationals to specialize in global value chains is to get access to state of the art technology which can help them develop capacity in their home base. Therefore, we need to analyse the form such specialization take and the way companies access and transfer acquired technologies along the value chain.

Major pull factors in value-chain specialization

Researches focusing on Indian companies' specialization in different global value chains (GVCs) show that these investments tend to follow technology-seeking strategies in advanced economies (Ramamurti, 2012). Three industries in particular dominate global contenders' specialization: IT, automotive manufacturing and pharmaceuticals (Pradhan, 2004; Thomas and Narayanan, 2017). The vertical specialization of Indian companies in the above-mentioned industries generally occur in competitive market environment and at the middle or lower-end of the value chain hierarchy where other emerging companies also seek to take position. At the top of the chain where hierarchy plays out, the accompanying market structure is becoming oligopolistic; therefore, the balance in the specialization makes more complementary links between new entrants and incumbent firms.

The value chain hierarchy has another global dimension. The whole process of geographical relocation, the fragmentation of production and the subsequent technological transformation have been induced by immanent profitability crises peculiar to industrial production in advanced economies. The most exposed sectors are the automotive, electronics and chemical industries (Feenstra, 1998, Pradhan and Singh, 2011). The crises gave space for new entrants with new corporate techniques. For these new-entrants, however, their technology-seeking investment strategy does not translate into competition with western companies or the desire to overtaking those (Mathews, 2002). The specialization in the value chains does not automatically lead to technological upgrading. Functional upgrading depends on many home and host country

factors simultaneously. For instance, technology-seeking FDI can play two types of roles: first, adaptation into well established and highly sophisticated western production-systems for which complex absorptive capacity is needed. Secondly, it can boost a globally competitive technology for the entire company for which transferring knowledge from the host economy back to the home country is a necessary and crucial factor (Narula, 2004). Complementary vertical specialization happens when new entrants take the position in the production system from which incumbent companies withdraw or re-specialize usually at higher ranks inside the value chain hierarchy. As researches highlight this is often the case with companies from developing economies, including India that target those positions in the value chains where incumbent western firms are squeezed by some forms of profitability crises (Gereffi, 2014). In certain industries, especially in manufacturing, standardized production has already been relocated to other developing economies, like China or India. Indian contender firms tend to specialize in manufacturing in which they become supplier to western firms (Gerócs, Pinkasz 2019 forthcoming). Simultaneously, western partners can re-specialize in non-tangible service activities, such as design, branding, R&D and marketing activities (Gereffi, 2014; Pradhan and Das, 2013; Fleury and Fleury, 2011). In the complementary specialization western companies tend to remain the brand owners with much higher brand recognition both in their home markets as well as in emerging markets, occupying top positions in the world economy. These brand owners take buyer-driven positions in global value chains and as a result of that they successfully liberate themselves from most parts of the manufacturing process. Instead they focus on branding, R&D and marketing, as Apple's iPhone is an indicative example in the electronic industry (Humphrey and Memedovic, 2003).

As a consequence of world economic restructuring, there is a newly emerging functional division of labour between western and developing economies as companies from the former region are leaving their traditional value chain position, especially in manufacturing. Whereas the newly rising companies from developing economies are entering into manufacturing value chains where they occupy positions that had been left vacant by their western counterparts due to the profitability crises and the subsequent

technological transformation. Any structural rigidity in the newly forming international division of labour, however, might have serious consequences for countries that specialize themselves as manufacturing suppliers at the middle and lower-end of the value chain hierarchy. Upgrading in the technological ladder is a static process in which improvements are measured by changes in the technological endowments of a given production process. The theory of upgrading does not necessarily apply to all the aspects of the international division of labour that have been mentioned before. The concept of functional upgrading presupposes improvement in the relative position of a given company in the division of labour when there is a technological modification in the production system, e.g. during the introduction of a new model. Or when new functions are added to the production process which changes the vertical specialization of the company in concern within the value chain. In other words, functional upgrading can bring benefit for companies to improve their relative position in the internal structure of the value chain (Gereffi et al., 2005; Gereffi, 2014). When we analyse Indian companies' technology-seeking investment strategies we have to take these global forces - emanating from value chain restructuring - into account. Therefore, various aspects of the value chain governance need to be analysed in order to understand what factors create space for Indian companies' specialization. In the following section we analyse those factors which Pradhan (2017) emphasized as the crucial firm-specific determinants for Indian companies when they enter foreign, mostly advanced markets to specialize in the local production system. These are imported technology, export-intensity, size and age of the value-chain participants, and the sectoral composition of global contenders. And finally, the thorough analysis of the value chain governance of intra-firm relationship between the foreign subsidiary and the home-based parent company in relation to their ownership structure and the division in the company's R&D-intensive activities.

1. Technology-import

We can get a better insight into the structural transformation that has been characterizing global contenders from India, when focusing on their productivity

improvements, the evolution of which is one of the strongest determinants for global FDI activity. In terms of OFDI's firm-specific objectives, Indian enterprises do not only intend to increase market share by acquiring intangible assets, but specific asset- or efficiency seeking FDI target technologically intensive production systems with new technologies, skills and marketing networks. These acquisitions concentrate in Europe from where technology-import usually comes. Technology import is an important determinant, it is also related to the capacity of the foreign subsidiary to transfer acquired or embedded technology back to the parent company. We distinguish between two technology import types in relation to Indian companies' experiences. One is 'embedded technology' in the form of capital goods, where we find a very strong correlation and complementary effect between Indian companies' trade and investment activities (Katrak, 1990). Capital goods can be both the product of foreign investments – especially if the production is part of an integrated value chain system – or it can be subject to trade. The other form of technology import is when the company purchases know-how-related services. This usually requires that the firm pays fees and royalties. However, to avoid these costs Indian enterprises prefer access to new technologies through trade and investment.

II. Export intensity

Export intensity is another important determinant for Indian companies' overseas investment. Trade experience for example does matter for companies' foreign investment decisions because this experience provides information about the location where trade relations had been previously developed. Export experience from the past typically helps to learn about local distributional networks, consumer preferences or any institutional mechanism important for trade, production and distribution. The common denominators for Indian companies investing in a foreign location are the following: an advantageous and stable (at least predictable) fiscal regime, favourable treaties with India covering bilateral trade and investment agreements as well as a

*Tamás Gerócs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

comprehensive economic partnership with the Indian government⁷. In addition to these, low tax rates, including the avoidance of double-taxation constitutes a major factor. As a more recent prerequisite global contenders prefer to have access to international financial markets (Pradhan, 2017:54). We will more thoroughly analyse these factors in our case study on CEE countries, particularly investment relationship between India and Hungary.

III. Firms' size and age

The average size and age of firms concerned with internationalization is another widely studied phenomenon (Chaudhry, 2018; Pradhan, 2017:62). It seems obvious that the bigger the given company is, the higher its probability for international engagement (Figure 3). Similarly, the older and more experienced the firm is, the more likely that it can take the risk for overseas operations, because of the previously gained experience in trade, amongst others.

⁷ India has bilateral investment treaties with Mauritius, Singapore, Netherlands, Switzerland, Cyprus that care for double-taxation avoidance and offer low tax rates and access to international financial markets to overseas investors.

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

Figure 3: Enterprise size of Indian OFDI 1980-2015

Enterprise size		1980-1990	1990-2000	2000-2010	2010-2015	1980-2015
Small	<i>mn USD</i>	1	64	1371	2868	4304
	%	0,7	1,9	2,1	1,7	1,8
Medium	<i>mn USD</i>	0,1	15	882	647	1544
	%	0,1	0,5	1,3	0,4	0,7
Large	<i>mn USD</i>	98	2301	51236	140269	193904
	%	64,6	68,7	78,4	83,6	81,9
Unclassified	<i>mn USD</i>	53	971	11880	24101	37005
	%	34,7	29	18,2	14,4	15,6
All enterprises	<i>mn USD</i>	152	3351	65368	167886	236757
	%	100	100	100	100	100
Number of OFDI firms						
Small		10	68	169	121	287
Medium		1	35	72	57	115
Large		76	421	885	869	1460
Unclassified		59	726	2477	3532	5934
All enterprises		146	1250	3603	4576	7793

Source: Pradhan (2017:64)

The latter presumption might apply in India to the period before the 2000s, but more recent studies show a rather mixed picture, which does not contradict to the hypothesis above, but provides a more nuanced understanding of the working of these

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

determinants (Ramamurti, 2012). As for the size of Indian companies in concern, it is valid to say that large Indian firms are the biggest foreign investors. In fact, their share among investor groups rose from 64,4% in 1989 to 83,6% by 2015 (Pradhan, 2017). Simultaneously, the role of small and medium sized enterprises (SMEs) in this realm is climbing. Their number has increased recently especially in areas, such as IT and BPO service providers (ibid). The net worth of their projects are, however, much smaller on average, therefore their share among the investor groups is still at around 2%. They are usually small suppliers of large Indian companies, following their larger partners in internationalization. When their larger partner decides to bring operation abroad they also have to follow suit otherwise they risk losing out from the partnership. On the other hand, following their partner is regarded as a potential path to upgrade technological capacity (Narayan and Bhat, 2011).

The age of the company is another variable indicating Indian companies' internationalization strategy. Figure 4 shows a detailed statistical break-down according to which approximately 50% of new foreign investments have been made by Indian companies operating for 20 years or less (Chaudhry, 2018; Pradhan, 2017). Furthermore, 15,4% of the investment has been made by companies in the range of 20 to 30-years, while 10,8% of investments have been made by 30 to 40-year-old investor firms. Pradhan (2017) shows that past experience in investment or in trade is a strong factor for further internationalization, because international experience is cumulative and transferable. However, recent statistics show that the average age for companies before foreign market entry has also dramatically decreased in the last few years (ibid). An increasing number of Indian enterprises internationalize quicker than their ancestors would have in the past. The decrease of the average age for internationalization is mostly attributable to the increasing number of IT companies and other service sector participants. Many of these companies have the first experience with foreign investment while they are still in their start-up phase. This is especially typical of Indian IT start-ups active in Silicon Valley, or in other western logistic centres (e.g. in the UK or in the Netherlands).

Figure 4: Enterprise age of Indian OFDI 1980-2017

Enterprise age		1980-1990	1990-2000	2000-2010	2010-2015	1980-2015
1-10 yr	<i>mn USD</i>	24	725	16302	23126	40177
	%	16,1	21,6	24,9	13,8	17
10-20 yr	<i>mn USD</i>	60	1634	14399	60879	76971
	%	39,7	48,8	22	36,3	32,5
20-30 yr	<i>mn USD</i>	36	388	11713	24392	36530
	%	24	11,6	17,9	14,5	15,4
30-40 yr	<i>mn USD</i>	5	210	2775	22586	25576
	%	3,1	6,3	4,2	13,5	10,8
41- yr	<i>mn USD</i>	26	394	17424	36890	54734
	%	17	11,8	26,7	22	23,1
Unclassified	<i>mn USD</i>	n.a.	0,2	2755	13	2768
	%	n.a.	0	4,2	0	1,2
All enterprises	<i>mn USD</i>	152	3351	65368	167886	236757
	%	100	100	100	100	100
Number of OFDI firms						
1-10 yr		58	737	1950	2324	4603
10-20 yr		21	308	1085	1267	2287
20-30 yr		14	110	487	725	1126

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

30-40 yr		18	61	159	266	437
41- yr		41	97	211	291	444
All enterprises		146	1250	3603	4576	7793

Source: Pradhan (2017:67)

In a summary, Pradhan's (2017:69) empirical findings show that exporting Indian firms have higher productivity than Indian companies specialized only in domestic market supply, but global contenders can achieve even higher productivity. Firms with foreign investments lead higher output, more capital-intensive production than simple export activity. Findings show that investment boosts trade and not the other way around. Investing firms are usually larger and offer better salaries to employees compared to counterparts which only interested in export. Despite the majority of Indian multinationals being older than domestic companies in average, their average age has been steadily decreasing as start-ups – especially in the IT sector – rapidly expand to overseas locations, given the nature of their activities.

IV. Ownership structure of subsidiaries

The ownership structure of Indian companies' foreign affiliates has been shifting since the 1980s – a process reflecting broader changes in the economy. As Figure 5 demonstrates approximately 65% of the foreign subsidiaries of Indian companies comprised of joint ventures (JV) with minority stakes of the parent company in the 1980s (cf. Kumar, 2008). In 2010-2015, wholly-owned subsidiaries (WOS) of Indian companies accounted for 69% of the total OFDI approvals (Pradhan, 2017:58).

Figure 5: The ownership structure of Indian OFDI 1980-2015

Ownership type		1980-1990	1990-2000	2000-2010	2010-2015	1980-2015
JV	<i>mn USD</i>	95	1285	15243	52270	68894
	<i>%</i>	62,7	38,4	23,3	31,1	29,1

Tamás Gerőcs / Indian companies' technological investments in the EU

with a special focus on Central and Eastern Europe

WOS	<i>mn USD</i>	49	2065	50118	115616	167849
	%	32,6	61,6	76,7	68,9	70,9
Unclassified	<i>mn USD</i>	7	0,2	7	n.a.	14
	%	4,7	0	0	n.a.	0
Total	<i>mn USD</i>	152	3351	65368	167886	236757
	%	100	100	100	100	100
OFDI firms by number						
JV		88	647	1285	1622	3123
WOS		34	714	2735	3395	5592
Unclassified		49	1	3	n.a.	53
Total		146	1250	3603	4576	7793
Amount of OFDI per firm (mn USD)						
JV		1	2	12	32	22
WOS		1	3	18	34	30
Unclassified		0,1	0,2	2	n.a.	0,3
Total		1	3	18	37	30

Source: Pradhan (2017:58)

For the same period, 3,395 investing companies sought 100% ownership in foreign affiliates and only 1,622 sought to enter foreign markets through joint ventures (JVs) (Pradhan, 2017). The preference of Indian firms to acquire WOS in foreign affiliates could be attributed to the economic liberalization in India and to the protection of R&D centres. It is also worthwhile to mention that while Indian enterprises have increasingly

tried to enter to developed markets through mergers and acquisitions (M&As), greenfield investments are still the most popular mode of entry in key developing countries, mostly in South East Asia (Khan, 2012). This is probably due to the fact that markets in developed countries are well-established and usually do not encourage greenfield investments from outside investors. This massive shift in property relations reflects Indian multinationals' broader structural changes. Parent companies' decisions of ownership structures are influenced by the host country's regulatory environment. As Figure 6 highlights, before the 1990s, the majority of Indian OFDI went into Eastern Africa and South-East Asia, where foreign investment was only permitted in the form of joint ventures – to the benefit of the host economy (Perea and Stephenson, 2018). Indian enterprises possessed modest technological advantage compared to western competitors and did not have enough experience in cross-border business operations; therefore, JVs reduced risk in developing countries with unstable business environments⁸.

Figure 6: Geographical distribution of Indian OFDI 1980-2015

Period		Developing	Transition	Developed	All regions
1980-1990	<i>mn USD</i>	86	29	36	152
	%	56,9	19,4	23,7	100
1990-2000	<i>mn USD</i>	1793	81	1476	3351
	%	53,5	2,4	44,1	100
2000-2010	<i>mn USD</i>	30721	2316	32331	65368
	%	47	3,5	49,5	100
2010-2015	<i>mn USD</i>	100494	1304	66088	167886

⁸ Governments in developing countries can still maintain capital account restrictions, requiring e.g. technology transfer from foreign investors through joint ventures in order to help these investments get embedded in the local economy. Liu and Dicken (2006) call this type of embeddedness 'obligated'.

*Tamás Gerócs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

	%	59,9	0,8	39,4	100
1980-2015	<i>mn USD</i>	133095	3730	99931	236757
	%	56,2	1,6	42,2	100
Memorandum 1980-2015					
<i>Number of investing firms</i>		4752	144	3992	7793
<i>OFDI/firm (mn USD)</i>		28	26	25	30

Source: Pradhan (2017:53)

In recent years, however, investment policies in some developing countries have shifted gradually from restrictive to be little more open, although restrictions still persist overall in the country-group. In 2015, almost half of developing countries (77 out of 156) maintained OFDI restrictions (Perea and Stephenson, 2018:119). Restrictive investment regulation stem from the concern that capital outflows can cause balance of payment problems and capital is usually scarce in the home economy (Khan, 2012), as many of these countries, including India faced financial stresses and capital flight several times in the past⁹. Perea and Stephenson (2018) show that low-income developing countries are more likely to restrict OFDI than other middle-income countries. According to their estimate, in 2015 60% of low-income developing countries had OFDI restrictions (36 of 60 countries); in contrast, only 43% of middle-income developing countries had any control (41 of 96). Among the large developing countries, such as the BRICS we find differences in terms of capital account openness. The most liberal country is Brazil, and China has also been rapidly opening up its capital account (Gao and Yu, 2011; Gerócs, 2017a). India belongs to the more restrictive group together with South Africa¹⁰.

⁹ Measures to regulate OFDI can take the form of approval requirements, reporting requirements, foreign exchange controls, ceilings on investment amounts, or limits on destination sectors in the targeted economy (Kuzminska-Haberla, 2012).

¹⁰ India maintains a relatively restrictive framework, despite the economic liberalization of the 1990s. OFDI in real estate is for example forbidden, it is also quite restricted in financial investments. In energy or other natural resources, manufacturing, education, and hospitals there is still an approval needed

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

Although restrictions on ownership have been gradually relaxed in many developing countries, a reverse process can be observed in the developed countries. Ownership requirements have been restricted in some developed countries, especially since the global economic crises in 2009. The latter is lamented by some commentators (see e.g. Emmott and Gros and Jin and Roach, 2018¹¹) as the first steps in a potential trade war, between the likes of the US, EU and China. Despite restrictive tendencies, advanced countries still convey a liberal approach to foreign trade and investment. This has benefitted Indian companies since the 1990s, because they have been able to shift from JV in developing markets to a strongly-preferred WOS ownership structure in developed markets, such as the EU's or the US' due to improved competitiveness. WOS allows affected Indian companies to protect the modes of their productivity increases, underpinned by developed countries' patent systems. Furthermore, parent firms can use the existing patent system to legally purchase and upgrade their existing technological capacity. Despite the opportunity, Indian firms still prefer to avoid this mode of acquiring technology, due to the high transaction costs involved (Charlie, 2012; Ramamurti, 2012). Irrespective of their strategies, a secure and reliable patent system remains attractive for Indian companies when choosing a country to invest.

WOSs currently account for the dominant share of Indian foreign investments, highlighting differences between developing and developed economies in terms of transactions. In developed economies, over 80% of Indian investments were through WOSs before 2015, but slightly declining since then. The latest data from 2017 shows that the share dropped to 61%, which is largely due to some politically sensitive technological acquisitions in which the host country's government insisted on technology-sharing in the form of joint venture to avoid technological espionage (Ramamurti, 2012). As we can see, property relations are double-edged swords, they can serve the interests of the investing company, but the host government can also enforce special regulation if it intends to protect domestic technological advancements.

from the Reserve Bank of India. RBI also monitors and regulates investments flowing into neighboring countries (for example, Bhutan, Nepal, and Pakistan). Quantitative restrictions are also set by the net worth of the Indian firm. After approval, the company must perform annual reports on each transaction.

¹¹ Debate and forum on Project Syndicate about Trump's trade war

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

The German and the US governments have been particularly active in this respect¹². Germany's reaction will be crucial in this respect because it can influence the trade regulation throughout the European Union. Political distresses in Europe, particularly in the southern member states and in the UK due to Brexit meant, however, that negotiation of a key bilateral agreement between India and the EU remained unsettled (Charlie, 2012; Perea and Stephenson, 2018).

Despite the slowing down of the bilateral trade negotiation, or even because of that, Indian companies' risk appetite to invest in European assets actually grew substantially, thanks to which the annual bilateral trade in goods and services amounted to over EUR 100 billion since 2012, and the EU became India's second largest trading partner after the Gulf states. We see a distinct shift of Indian investments in favour of Europe at the expense of the US within developed countries (Figure 7). Europe had a share of 52% in 1989 but by 2015 over 76% of Indian foreign investments in developed countries targeted Europe.

Figure 7: Top destination for Indian OFDI 2014-2017

	2014	2015	2016	2017	USD million	Share in total OFDI (%)
Mauritius	652	1747	4872	765	8036	20
Singapore	1592	1315	2833	2144	7884	19
USA	1239	1649	1785	982	5655	14
UAE	458	1750	867	266	3341	8
Netherlands	732	1146	731	625	3235	8
UK	334	641	1330	619	2923	7

¹² Chinese firms are usually more exposed to governmental interventions, especially after China's Geely managed to acquire 10% share in Daimler which the German government and Daimler's management understood as a hostile takeover attempt. Following the acquisition, the German government initiated restrictions for investors from outside the EU (Werres, 2018).

Switzerland	361	678	492	193	1723	4
Russia	2	223	312	378	914	2
Jersey	211	99	95	80	485	1
British Virgin	107	127	102	123	459	1
Total OFDI in top 10 (mn USD)	5688	9376	13419	6175	34657	
Total OFDI in top 10 (% of total)	84	88	91	84	88	
Total OFDI	6803	10620	14795	7331	39549	

Source: Chaudhry et al. (2018:23)

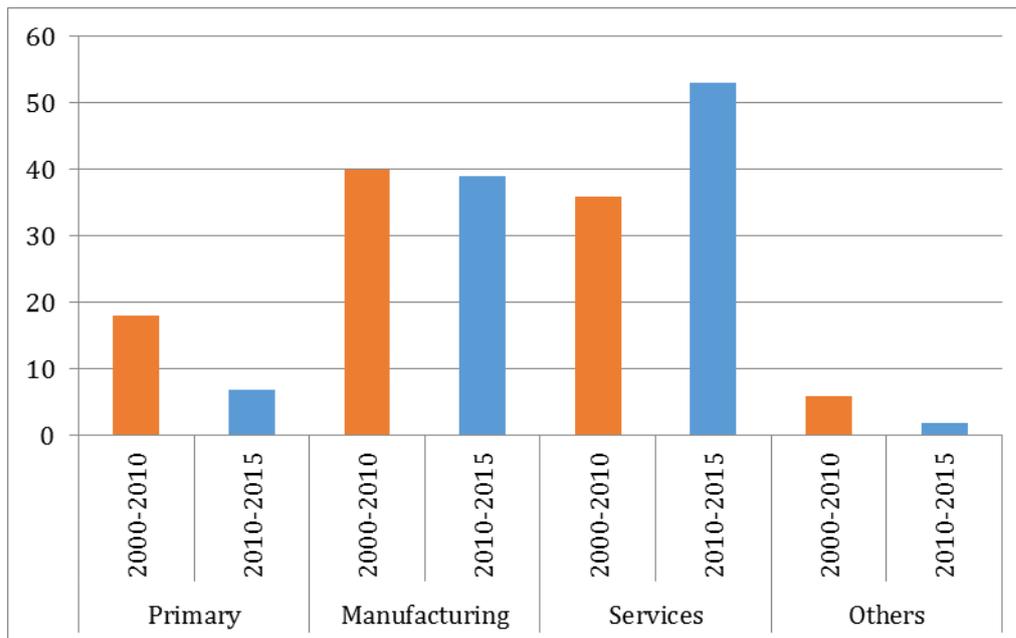
This spectacular geographical shift has been driven by Indian IT and ICT companies' global spread. But pharmaceutical, automotive and steel companies also contributed to the dynamism. In a global comparison Europe accounted for 32% of India's total investments between 2000 and 2015, while South-East Asia and Eastern-Africa appeared second and third with 21% and 19% respectively. In Europe, Netherlands accounted for 54% of India's OFDI, becoming the most preferred destination in the EU due to its tax-heaven and logistical position (Pradhan 2017). In the following we take a more detailed look at the sectoral composition of this investment drive.

V. Sectoral advantages in advanced markets

After the economic liberalization of the 1990s the sectoral composition of Indian OFDI has dramatically changed (see Figure 8-9). As mentioned earlier, foreign investments were traditionally dominated by large manufacturing companies in energy and textile industries (Kumar, 2008). This was in line with the objectives of import substitutive industrial (ISI) back at the time. Large business conglomerates in

manufacturing and in extractive industries used low-level of technology and labour-intensive production when they followed their market-seeking FDI strategy. These investments were compelled to take minority stakes in joint-ventures by both of the recipient and sending regulatory authorities.

Figure 8: Sectoral composition of Indian OFDI 1980-2015 and 2000-2017



Source: Chaudhry et al. (2018:19)

Since the 2000s, OFDI has become much more diversified as investments spread widely across economic sectors. The share of primary sector OFDI was estimated at 19% and 6% of approved foreign investments in 2010 and 2015, respectively (Pradhan, 2017). Manufacturing captured 40% and 39% of India's overall approved OFDI in between 2010 and 2015 respectively while the service sector accounted for 35% and 53% in the same period. In 2010 service sector became leading force in OFDI, overtaking the position of manufacturing for the first time. Manufacturing still accounted for 40% of total Indian OFDI in 2009 because companies from the industry have also risen to take advantage of their global presence. Complex, technologically-advanced companies dealing with pharmaceuticals, medicinal chemicals and forestry products, metal and ore products, coke and refined petroleum products, etc. have emerged as important global

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

contenders between 2010 and 2015. Figure 9 demonstrates how sectoral composition of Indian OFDI changed between 2000 and 2015.

Figure 9: Composition (%) of India's OFDI in manufacturing sector, 2000-2015

Period		Primary	Manufacturing	Services	Other	All
1980-1990	<i>mn USD</i>	n.a.	56	82	13	152
	%	n.a.	36,9	54,4	8,7	100
1990-2000	<i>mn USD</i>	13	1713	1404	221	3351
	%	0,4	51,1	41,9	6,6	100
2000-2010	<i>mn USD</i>	12181	25895	23133	4158	65368
	%	18,6	39,6	35,4	6,4	100
2010-2015	<i>mn USD</i>	10122	65845	89355	2564	167886
	%	6	39,2	53,2	1,5	100
1980-2015	<i>mn USD</i>	22316	93509	113975	6957	236757
	%	9,4	39,5	48,1	2,9	100
Memorandum item 1980-2015						
<i>Number of investing firms</i>		270	2356	4407	774	7793
<i>OFDI/firm (mn USD)</i>		83	40	26	9	30

Source: Pradhan (2017:47)

This new trend might also be attributed to improving economic conditions in India which helped the technologically intensive industries to strengthen competitiveness and also supported cross-border activities to boost their overseas export. Meanwhile manufacturing had overtaken services in terms of approved investments in 2000 and

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

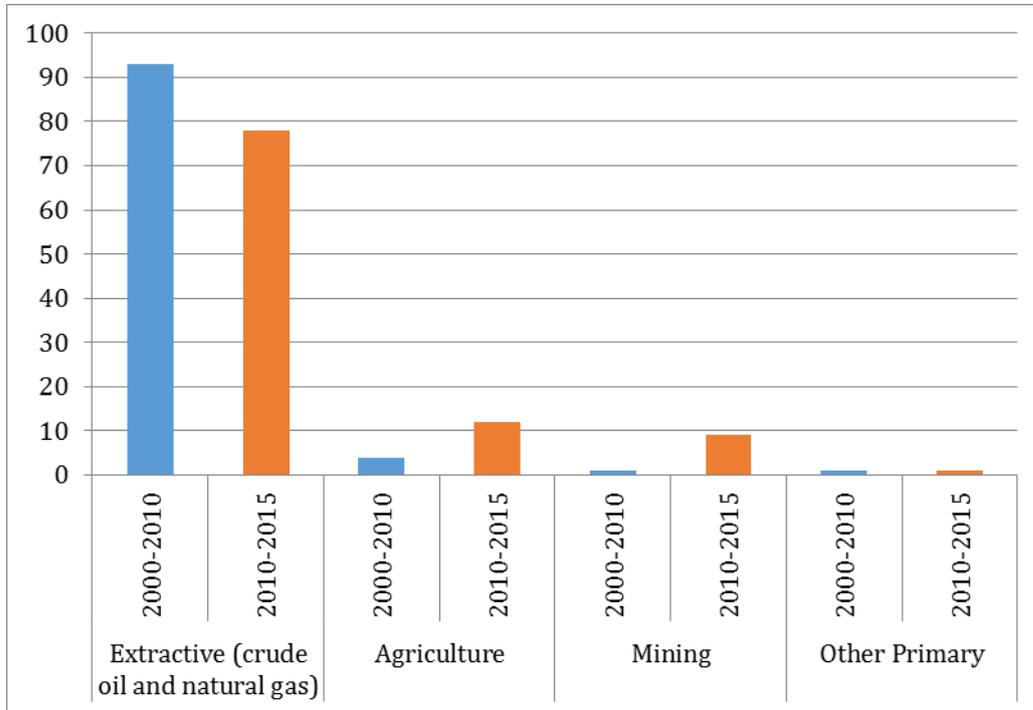
2010, service sector rebounded to become the leading OFDI sector in 2010 and 2015. In contrast to manufacturing, service sector enjoys majority ownership and companies follow asset-seeking investment strategy and rely more on mergers and acquisitions (brownfield investments) in advanced economies. In the following we give a short description how foreign investment activities have changed in India in a detailed sectoral breakdown.

a. Primary sector

As the result of India's latest industrialization drive the share of the primary sector has been on the rise due to growing demand for crude oil and natural gas (Figure 10). State-owned enterprises are dominating the sector's share in OFDI. The driving force behind the rise of the sector's share in total OFDI has been the surge in oil prices, rapid industrialization and the subsequently growing fossil fuel demand in India (Exim Bank, 2014). In 2010 approximately 19% of total Indian OFDI comprised of primary sector investments conducted mostly by large state-owned enterprises (Pradhan, 2017). 87% of these investments went to the energy sector (crude oil and natural gas), the rest included extractive industries in mining and a very minor share in agriculture. During the economic boom period growing demand for energy, and rising dependence on energy imports was characteristic and when domestic oil and gas market saturated, Indian firms reoriented themselves to overseas extractive industries through state-owned petroleum and natural gas enterprises. In addition, competition among emerging economies for oil products pushed Indian companies to the international stage¹³.

¹³ One of the largest state-owned company with global aspirations was ONGC Videsh Ltd. It has invested mostly in oil field exploration in Russia and in Mozambique (Pradhan, 2017).

Figure 10: Indian OFDI breakdown within primary sector



Source: Chaudhry et al. (2018:20)

b. Manufacturing

The composition of the manufacturing sector has also changed over time. It became less concentrated than it used to be before the 2000s. Chemical and textile industries accounted for over 50% of all manufacturing OFDI in the 1980s, in fact 80% of these investments were made by the top 4 companies of the time (Rajan and Yanamandra, 2015). By 2015 it has become much more diversified and the top companies accounted for less than 64% of manufacturing investments due to the broader range of industrial activities (ibid). The diversification has also affected other manufacturers with specialization in low-tech investments in basic chemical products, textiles and food processing (such as beverages and tobacco). The specialization shifted into technology-intensive investments in pharmaceuticals, motor vehicles, electronic and optical products. Although pharmaceutical, automotive companies and machinery and equipment producers seem to be the least beneficiaries of this drive in the last investment period between 2010-2015 (Figure 11).

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

Figure 11: Indian OFDI breakdown within manufacturing 2000-2015

	2000-2010	2010-2015
Basic metals and fabricated metal	8,4	20,9
Chemicals and chemical	9,7	8,7
Coke and refined petroleum	5,1	20,7
Computer, electronic and optical products	5,1	3
Electrical equipment	1,8	3,9
Food products, beverages and tobacco	5,4	4,2
Gems and jewellery	1,4	1,7
Leather products	0,1	0,5
Machinery and equipment	14,4	7,3
Motor vehicles, and other transport equipment	21,5	3,7
Non-metallic minerals	0,9	2,4
Paper products	0,6	2,2
Pharmaceuticals, medicinal chemical	17	13,9
Printing and media	0,2	0
Rubber and plastics	3,6	2,2
Textiles and apparel	3,7	4,2
Wood products	0	0,1
Other Manufacturing	1,2	0,5
Total Manufacturing	100	100

Source: Chaudhry et al. (2018:21)

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

The common feature among large manufacturers was that they all grew out of a secured domestic market with generous state subsidies and a strong reliance on their home-developed innovations. These manufacturing investments still rely on home-based R&D to a large extent. As part of their technology-exploring strategy manufacturers' subsidiaries seek technology-exploring investments. Indian manufacturing investments in middle or high-end technologies can be embedded in the production system of the targeted host economy. Therefore, the technological gap between the home and host economies matter a lot to them. These investments flow into those developing countries where advanced technologies are often exhibited and where geographical, functional or infrastructural proximity to the most advanced western markets are also available. In these locations, Indian companies can still gain adoptive capacities in research. As we will see in the last chapter of this paper, one of the most distinguished examples is automotive investments in Central and Eastern Europe.

Service sector

As mentioned earlier, the service sector has produced the largest number of Indian OFDI since 2010 partly as a result of India becoming a service dominated economy. Improvements in the telecommunication infrastructure have been the most important driving force. The composition of the service sector indicates that ICT (Information and Communication Technology) and software developers have become major global contenders between 2000 and 2010 and between 2010 and 2015, accounting for 44% of the combined OFDI in service sector in the first period and 49% in the second period (Thomas and Narayanan 2017). High quality IT-related education combined with low-cost but highly skilled workers helps Indian IT companies' global competitiveness. The most active companies are specializing in R&D related services. Banking and insurance occupy a significant share of OFDI in services too. Companies in this industry often follow market-seeking investment strategy as Indian service providers cannot provide effective and secure after-sale services without a close local presence. This has been a disadvantage of Indian service companies for a long time and it is anticipated that they

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

might need further upgrading in order to remain global contenders¹⁴. Contrary to their western competitors, Indian firms still serve a narrowly targeted group of clients in different locales (Nölke et al., 2018). Post-sale assistance is not always easy for them to manage from their home centres, therefore companies prefer to build up a network of service centres regionally. As we will see in the last chapter, a good example of such regional ICT hub is Tata Consultancy Group's regional headquarter based in Budapest, Hungary from where most of the European clients can be reached and served.

Figure 12: Indian OFDI breakdown within 2000-2015

	2000-2010	2010-2015
Accommodation and catering	0,7	0,9
Administrative and support services	4	5,1
Communication	14,5	41,5
Construction	9,3	11,1
Education	0,2	0,1
Public utilities (electricity, gas, water)	5,6	4,3
Finance and insurance	10,9	7,7
Health-care	0,3	1,4
IT and ITC	29,3	7,3
Legal and accounting services	0,3	0,5
Professional, academic and technical services	1,8	2,1
Real estate	2,9	0,9

¹⁴ Amongst western ICT and IT companies, even in finances after-sale services can usually be managed from distant locations, there is no need for a physical presence near to the client. Most of the clients of western companies are all around the world, so the technological innovation usually targets the deterritorialization of post-sale assistance.

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

Transportation and storage	8,1	7,5
Wholesale and retail trade	8,3	7
Other services	3,8	2,6
Total Services	100	100

Source: Chaudhry et al. (2018:22)

We can also observe a changing pattern in service companies' activities. Back in the 1980s, two-thirds of the service-related investments were made by banks and insurance companies, followed by tourist agencies, usually associated with accommodation services with a surprisingly large share of 12% in service OFDI (Figure 12). IT companies occupied a mere rate of 9% of Indian service-related OFDI which in total OFDI was less than 2%. This composition has dramatically changed since then, as ICT and IT related investments took 41,5% of OFDI share in services by 2015 becoming far the largest group in Indian international investments (ibid). Interesting to note that services related to construction industry – which is closely associated with tourism and logistics – have come up to be the second place with a share of 11%. Finance and insurance lost dominance in the period but still accounted for ca. 7,7% of service-related OFDI whereas transportation and storage stood at 7,5% in 2015 (ibid).

VI. Fragmented company productivity and R&D-intensity

Indian companies' technology-seeking strategy is strongly related to the last important determinant of internationalization: research and development (R&D) intensity. As it has been demonstrated by Topolova and Khandelwal (2011) R&D intensity has a positive relationship with foreign investment activity at the overall level of the firm, but the effect is not evenly distributed between the parent company and its affiliates. It is important to note that R&D opportunities have probably been one of the most important factors for Indian companies to seek investment in advanced economies and to diversify away from their home market. Their global aspiration is to access knowledge and competences which could compensate for competitive weaknesses and

help reduce their latecomer disadvantage (Taylor, 2017). Foreign subsidiaries have to accomplish knowledge transfer to enhance product development in home-based R&D centres. There is a strong positive correlation between subsidiaries' activity in foreign R&D clusters and the company's overall productivity gains (De Beule and Somers, 2017). Thus, global contenders can achieve productivity improvement by entering into foreign research clusters and linking up with other companies or institutional settings. This reflects on how Indian companies attempt to get embedded in global value chains and production networks where knowledge is constantly transferred. Technology transfer requires different sorts of investment strategies, each of which convey host country attributions. With other words these are the pull factors for technology-seeking investors.

As De Beule and Somers (2017) explain: *„Reverse flow from overseas subsidiary to the Indian parent is more positively associated with the competitiveness of the host country than that of the home country. The complex nature of technological strategies is intrinsically linked to the locational choice. If the technological gap between home and host countries is too high, firms may not have sufficient absorptive capacity to exploit the knowledge available in the host country.”* (De Beule and Somers, 2017:36)

Host country factors

De Beule and Somers (2017) highlight a very important attribution for Indian investments in relation to the level of the host country's technological development. There is often a technological gap between the host and the home economy, which needs to be bridged when technology-seeking investment is located. Otherwise, the local affiliate in the host country may face knowledge-transfer disruptions and limitations in embeddedness-related operation. Such a technological gap decisively influences the choice for an investment's location. Host countries' technological development can influence investment decisions in numerous ways. For instance, what type of investment is the most appropriate: greenfield or brownfield; should investments target high-end industrial clusters or find intermediate technological transmitters. Indian companies may prefer R&D activity in other developing or transition economies, because they can

actually reduce their gap by this way. Those countries which host large amount of FDI from advanced multinationals may be the best choices because Indian firms can still get access to the specific knowledge and competence they search for. As selection criteria, the host economy has to exhibit the type of technology in the particular industry which is the concern for Indian investors. Indian companies are usually competitive in low and medium-tech segments, which make them more inclined to locate their technology-seeking investments to economies that are specialized in middle-end technologies and medium-tech manufacturing. These should be close to India's level of technological development (Amighini et al., 2013).

Now we turn to the specificities of these host country determinants. The most important host country factors are measured by Pradhan (2017) and summarized in the following table:

- large and sophisticated local market
- local labour costs
- intellectual-property rights and patent law
- technological and scientific strength
- availability of skilled workforce
- institutional settings, technological clusters including university and corporate R&D hubs

What matters the most for technology-seeking investment is to integrate into the host economy's production system where it can get access to local knowledge and competence which it can transfer to the parent company. Given that India has had no such similar "embedded" home-based R&D infrastructure as advanced countries usually have, internationalization of Indian R&D might result in the substitution of home-based R&D activity. This is important to note because classical modernization theory, such as Vernon's (1969) product life-cycle concept applies only to western companies' experience in which innovation can usually take place in the home economy. This concept does not always apply to developing economies because of the different structure of their innovation capacity.

Bridging the technological gap: host economy's R&D activity

The main difference which Vernon's (1966) theory does not address is that developing countries can either be recipients of large amount of foreign R&D investment from advanced economies, or developing country's R&D might take place outside of the home economy. The question that arises is whether R&D conducted by Indian companies outside of the home country automatically reinforces innovation at home or due to the substitutive effect of foreign innovation, it does not immediately translate into productivity gains at the level of the parent company. If the latter is the case, then internationalization of R&D can lead to growing heterogeneity in firm-level productivity which might make contradictory outcome for internationalization.

Therefore, Indian companies follow a complex strategy of technology-seeking investment in which they combine technology-exploitation with technology-exploration (De Beule and Somers, 2017:30-33). Technology-seeking investments have different applications in relation to the connection between parent and subsidiary when we take host country characteristics into account, e.g. differences in the level of development. What makes the difference in the application is whether technology-seeking investment is exploring or adoptive (exploiting). The latter refers to technology-adaptation into the local cluster, whereas the former is designed to transfer competence and help improve the overall productivity of the investor company, first and foremost at the level of the parent where the acquired knowledge is meant to be transferred. What we find in empirical researches is that technological-exploring Indian investments in advanced countries have a positive effect on home-based R&D, whereas adoptive – so called technology-exploiting – activities have a negative impact on R&D in India (Topolova and Khandelwal, 2011; Amighini et al., 2013; De Beule and Somas, 2017). Interestingly, as De Beule and Somas (2017) show these effects work in the opposite direction when Indian R&D is located in another developing country: technology-exploring investments in developing countries have a moderate impact on productivity at home but technology-exploiting activity does have a strong positive impact on home R&D because of the more similar level of development in the host country that makes adaptation and reverse transfer closely linked.

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

This observation applies to investments in the European Union which block contains many of the important host country attributions that attract Indian FDI – and which involves the classical features elaborated by Dunning et al. (2008). The EU also consists of very heterogeneous economic structures of both advanced (western and southern) and transitional (eastern) member states. This makes Indian companies' choices of the investment location very complex and dynamic in time. We need to ask the question, why certain Indian firms prefer CEE destination over western or southern countries in their strategic locational choice. According to Amighini et al. (2015) if technological gaps between the home country (in this case India) and the host country (somewhere in Europe) are too high, firms may not possess adequate absorptive capacity to exploit knowledge and competence that might be in abundance in the host country. In order to bridge the technological gap, firms from developing countries may prefer R&D investments in other developing or transitional countries where they can better exploit even the most advanced technologies if those are available amid local presence of mature western multinationals. Any limitations on firm-level and economy-wide absorptive capacity¹⁵ in host countries may disrupt OFDI's home effects. When undertaking OFDI decisions, the firm's absorptive capacity is a key to determining the appropriate match with targeted knowledge and technology. Absorptive capacity can influence the home effects of OFDI in two different ways. First, firms distant from cutting-edge technology may benefit most from spillover effects as they are starting from a low technological base. Counter arguments suggest that these firms may not have the capacity to make the best application of acquired technologies (Narula, 2004). Rather, as Narula (2004) argues that firms closest to the technology frontier are best placed to adopt cutting-edge technologies available through OFDI. Empirical evidence supports both views, indicating a U-shape function in the relationship between absorptive capacity and OFDI home-effects, with simple knowledge at the low range and complex knowledge at the high range being more likely to facilitate these effects (Girma et al., 2008). This match will change over time, however, as competence is gained and absorptive capacity improve.

¹⁵ Absorptive capacity may be measured at both the level of the firm and of the economy.

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

At some point, the investor firm should have sufficient absorptive capacity to invest in acquiring knowledge at the frontier. Companies therefore begin their investment in targeted countries where the technological gap is smaller and from where they can gradually move their operation closer to more advanced locations, with higher technological capacity. Evidence from India shows that, when the knowledge gap between firms is too great, interactions between firms are less likely to lead to knowledge transfer or spillovers because firms are unable to absorb the capacity (Amighini, 2015). Using OFDI to target highly sophisticated knowledge so as to leapfrog to the knowledge frontier may therefore not be an effective strategy until Indian firms first increase absorptive capacity. Different levels of development may thus call for different OFDI strategy in acquisition and innovation.

As Amighini et al (2015) has also proved, Indian multinationals are more competitive in low to medium-technological segments which makes them less attracted to countries with very high level of technological endowments. In these economies Indian companies have better chance to exploit inward FDI from western multinational and to link it to their home country R&D base (home effect) as an alternative way to access and transfer specific knowledge to their own technological system. Indian manufacturing companies therefore prefer to locate into countries that have specialized themselves in middle-end technologies, e.g. medium-tech manufacturing which is not too far from their own technological capabilities. As I will show in the next chapter CEE is one of the most ideal locational choice for fostering such investment strategy because the region exhibits both geographical proximity to western markets (most advanced technology), i.e. allows investing companies to follow their market-seeking and technological-seeking strategies. On the other hand, the vertical specialization of these countries in lower and middle-tech segment of manufacturing value chains make them functionally closer to the technological adaptability for Indian companies. The latter fact helps to make technological adaptation and embeddedness in the home institutional environment easier for Indian companies, thus the reverse flow from overseas subsidiaries to the Indian parent is more encouraged. Host market R&D intensity therefore seems to be one

of the key elements in determining overseas investment¹⁶. This makes the CEE region very appealing as it occupies a unique position between advanced European and developing non-European markets.

Indian companies in CEE

Taking the position of technological transition between east and west, the CEE economies combine a mixture of developed (acquisitions in IT Services, Pharmaceutical) and developing (greenfield in manufacturing, extractive industry) host economy characteristics which Indian multinationals can use for optimizing their investment strategy. Indian companies use these locations not only for conquering domestic market niches, although in specific cases like in retail segments in Poland that can happen too (market-seeking strategy), neither for any strategic asset purchases but the main investment target is to capture the proximity to advanced western markets with their high standard of technological availabilities (technology-seeking strategy). This is no coincidence as evidence suggests that Indian investors are relatively more willing to target smaller and peripheral economies in a gradual strategy before they enter to large and mature markets (Ramamurti, 2012). The reason is that some of the Indian firms find it difficult to compete in larger, more competitive markets far away, lacking the networks and experience of developed country firms. In our study we found that Indian investors usually expand into larger and more complex European markets after first successfully expanding in smaller, lower- or middle income nearby economies in Central, Eastern and South-Eastern Europe.

In the following chapter we will make a more detailed analysis of the major host country factors attracting Indian FDI in the context of Central and Eastern European accession to the European Union. We follow the categorization of Pradhan (2017) as elaborated above.

¹⁶ In the auto and chemical and pharmaceuticals industries, evidence reveals that OFDI firms generate reverse technology spillovers to domestic firms that did not invest abroad (Nair et al., 2015).

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

1. Large and sophisticated local market

One of the most important comparative advantages of the Central and Eastern European region in attracting foreign investment is its geographical proximity to the world's largest and most sophisticated market inside the European Union. CEE countries serve as a good entrance to the more advanced European market. Countries in the region are not only geographically close to western markets but CEE economies are part of the European production systems, therefore they are capable to provide the necessary infrastructure and skilled workforce for servicing important clients in western markets. Secondly, these economies are part of the European Union's single market scheme therefore setting up facilities in their home-base provides with the possibility of legally accessing goods, services, patent rights and most favourable treatments in the European Single Market. Since 2004 when these countries joined the EU they did become not only able to capitalize on their geographical closeness but they themselves have become parts of the vast and affluent but highly protected market-system. They adopted legal schemes including regulation on taxation, labour relations, intellectual property rights and patent law when they incorporated *acqui communautaire* into their national legislature as part of the accession process. Since then the countries promote themselves as the gateway to the European Single Market. The gateway function means that investment in their local economies could help to overcome administrative and tariff barriers in the European market.

Some of the forms in which CEE countries promote investment opportunities as a gateway to the protected European market - e.g through low and flat corporate and income taxes - also resembles to Ireland's similar experience with US capital in the early 1990s. As Ireland was able to serve US capital with investment friendly regulation when US capital sought to enter the newly forming European Single Market, in a similar vein Eastern European country follow the pattern of peripheral FDI attraction targeting capital from BRICS countries.

In short, we find that the domestic market size of many of these countries would probably not be attractive enough for Indian investors, given the fact that the region is

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

politically highly fragmented, and the average purchasing power is hardly exceeding 60% of their western counterparts, but as a legal, and geographical gateway they seem to be able to provide the most attractive legal and economic environment for Indian seeking entrance to Europe. The gateway function has been appreciated by Indians for another reason as well (Gerőcs, 2017b). After the global economic crisis, both the southern periphery of Europe and even western economies were challenged by fiscal deterioration and skyrocketing debt. In comparison to the old EU member states CEE countries provided much sounder fiscal position, lower debt levels and predictable and stable monetary environment which – according to Pradhan (2017) – Indian companies highly appreciate as they are more exposed to and sensitive to the financial environment than western companies usually are. We shall thus add the stable fiscal condition to the gateway function which CEE countries have exhibited and sustained in recent years.

II. Intellectual-property rights and patent law

To secure a stable patent system and protect intellectual property rights it is usually guaranteed by multi- and bilateral agreements. It is regulated under the supervision of the WTO in which India has become a member in 1995. As Pradhan (2017) has mentioned, Indian investors seeking market and efficiency improvements tend to prefer locations with highly sophisticated and developed secure patent system. The regulation of intellectual property rights and patent laws are not limited to state legislation in Europe but European authorities, e.g. European Commission's competition agency oversees the national legislation of the member states. Therefore, negotiations and agreement of IPR and patent law is between European Commission on the one hand and the Indian government on the other. National authorities have a highly limited scope in this regard, especially in the CEE which countries have only limited influence over the European Commission decision making procedure. The advantage of the EU membership is that the strict regulation and the sophisticated laws apply in the CEE region as well; hence Indian companies can enjoy protection similar to advanced western economies. Disadvantage is that there has been a stalemate in the forming of a bilateral trade and investment agreement between the EU and India since 2007 which

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

can have a negative effect on CEE's investment strategy too. However, we must highlight, that there is no competition of such between western and eastern European member states as the negotiations are European in their scope and there is no other gateway to the European Single market which could undermine a more competitive environment. Despite all of this, national governments tend to fabricate their own bilateral agreements with the Indian government in which certain regulations are shared and mutually discussed. Good example is Hungary which represented itself in a ministerial visit in October 2013 in Mumbai and Delhi. Hungarian prime minister was joined by approximately 100 businessmen and several business forums were held between Hungarian and Indian corporate representatives. Government representatives held meetings in the meantime, and Hungary was able to strengthen its comprehensive relationship with the Indian government by the visit which also resulted in a bilateral agreement. As further result, the two countries' investment agencies, Invest India and the Hungarian Investment Promotion Agency (HIPA) concluded a three-year cooperation agreement to help Indian investors' orientation in the country. As we can conclude from Pradhan's (2017) description, Indian companies backed by the investment agencies in the host and home countries prefer locations for their investment where India can develop favourable business, financial and political treaties.

III. Institutional settings, technological clusters including university and corporate R&D hubs

In addition to the level of mutual economic development and the size of the host country's market, Indian investors may also be relatively more willing to target host economies with "weaker" institutional quality (Perea and Stephenson, 2018). Indian OFDI is less discouraged by weak institutional and economic environments in host countries, in fact smaller technological or institutional gap between the home and the host economy helps develop absorptive capacity which is an important transmission mechanism for transferring knowledge and capacity to the parent company. However technological capacities, highly advanced network of universities and innovation clusters are important in this respect as they provide infrastructural links to larger

western technological hubs. Good example is Infopark Budapest which hosts university facilities from the Budapest University of Technology and Economics and from the Corvinus University of Budapest. Plus, it is an incubator for many start-up companies as well. It is no coincidence that one of the largest Indian investments in CEE, namely Tata Consultancy Services' (TCS) regional headquarter has been placed and extended in Infopark Budapest, Hungary. As the example of TCG demonstrates, the European market is important not only for widening the economies of scale of the company's business model, but it can serve to diversify the product variety for their western clients. In short, the regional centre can help to enhance TCS's technological economies of scope as well.

IV. Local labour costs and skilled workforce

Another important factor for foreign capital – regardless whether from the east or from west – to come to Central and Eastern Europe is the region's highly advanced and integrated infrastructure. In some instances, it is even more developed than in parts of western Europe thanks to the developmental heritage of the state socialist era. The highly skilled manufacturing workforce is also part of this historical legacy of state socialist industrialization. The geographical and legal proximity to western markets as elaborated above in combination with highly developed infrastructure and the availability of sophisticated and skilled workforce makes the region especially appealing for manufacturing companies seeking efficiency in large advanced markets. Moreover, it is not only the geography and advancement in labour market endowments but the low relative prices also make Central Eastern Europe an attractive gateway for Indian companies in Europe. This compares again to the Irish example, although in the experience of the Celtic Tiger other cultural and linguistic factors did count as well. The relative prices in CEE are much below the average of the western markets not just because of the cheap labour force but also the very competitive tax rates push down labour and transport costs. The reason for the low taxes and low prices are twofold. Firstly, the political fragmentation of the region fuels a fiercely competitive situation in the corporate and personal income tax system. This compares to the Irish experience, however, the competitive nature of the market is even much fiercer than it was in the

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

case of the Celtic Tiger. Take the example of Hungary, where the centrally regulated flat corporate tax rate is only 9% compared to the 12,5% in Ireland. Due to the fact that the state subsidizes investing companies with various non-fiscal means – as direct tax subsidies are prohibited in the EU – the estimated effective corporate tax rate in Hungary is at around 7,2%. As media investigation showed the 30 largest multinationals in Hungary among which there is no Indian company so far pays an average estimated 3,6% effective corporate tax rate due to very favourable one-off subsidies (Bucsky, 2018).

Moreover, Hungary introduced business friendly educational and labour reforms in recent years. The latest amendment in the labour code dates back to 2013. These legislations have been drafted by the Hungarian Chamber of Industry and Commerce. Hungary introduced one of the most flexible labour regimes in the whole region pushing down average wages below the rates in the neighbourhood countries. The education system prioritizes vocational schools from which trainees can be employed by companies up to 2 years below the minimal wage and contracted by the partnering school. This model provides a large amount of relatively skilled and semi-skilled, young and trainable workforce for industrial companies in areas such as automotive manufacturing, or electronic and pharmaceutical companies.

Favourable legislation of labour and education, plus extremely low and competitive taxes combined with the availability of large, cheap and skilled young workforce with advanced infrastructure and geographical, plus legal proximity to the world's largest protected market with the strongest purchasing power make many of the CEE countries appealing gateway choices for Indian companies that seek to enter into Europe and in particular seek to integrate into manufacturing production systems in Europe.

As a matter of a fact, CEE economies' large qualified workforce is already employed and trained by western companies in their own established production systems. Indian "global contender" companies might also want to link their own capacities to the European production system. Good example is the automotive industry which had been one of the strongest economic drivers in CEE countries to be integrated into western, mostly German value chains. Indian automotive suppliers are increasingly become

Tamás Gerőcs / Indian companies' technological investments in the EU

with a special focus on Central and Eastern Europe

global partners in the German automotive production networks. As a consequence, they are motivated to increase their presence in CEE where German auto-manufacturers are the most active. In Hungary for instance 8 companies out of the 17 registered companies with Indian (full or majority) ownership active in the country brought greenfield investments in manufacturing. The largest example so far has been Apollo Tyres' investment in 2014. Six of these companies are active in the automotive industry. Five companies are in IT or BPO services, two in chemical or pharmaceutical industries and two companies in food processing industry (see Figure 13).

Figure 13: Indian owned companies registered in Hungary

Source: Own collections

Company name	Date of entry	Parent company	Industry	Employees	Head office in HU
SMR Automotive Mirror Technology Hungary Bt.	1993	Motherson Sumi System Ltd	Automotive	1631	Mosónmagyaróvár
Tata Consultancy Services Limited Magyarország	2004	Tata Consultancy Services Ltd	IT Services	839	Budapest
CG Electric Systems Hungary	2001	Avantha Group	Machinery	789	Budapest
ALKALOIDA Vegészeti Gyár Zrt.	1991	Sun Pharmaceutical Industries	Pharmaceutical	361	Tiszavasvári
Cognizant Technology Solutions Hungary Kft.	2007	Cognizant Technology Solutions Corp (US-Indian)	IT Services	299	Budapest
Genpact Hungary	2004	Genpact	IT, BPO	214	Budapest
Dunakiliti Konzervüzem Kft.	1991	Global Green Ltd	Food	144	Dunakiliti
Columbian Tiszai Kft.	1992	Aditya Birla Management Corp.	Chemicals	95	Tiszajúváros
ORION Elektronikai Kft.	1992	Thakral Group (Singapore-based)	Electronics Manufacturing Services	87	Budapest
Pusztai Konzerv Kft.	2001	Global Green Ltd	Food	75	Balmazújváros
Wipro Holdings Hungary Kft.	2007	Wipro Ltd	BPO (finance)	8	Budapest
Satyam Computer Services Limited	2004	Stayam Ltd	IT Services	n.a.	Budapest
Apollo Tyres (Hungary) Kft.	2014	Apollo Tyres Ltd	Automotive	450	Gyöngyöshalász
Holimex Termelő és Kereskedelmi Kft.	1993	Pentair Water India Private Ltd	Alternative Energy	n.a.	Tiszkécske
MBE EWB Technológiai Kft.	2002	McNally Bharat Engineering Company Ltd	Architecture design	14	Budapest
Küpper Hungária Fémfeldolgozó és Öntödei Kft.	2002	Amtek India Ltd.	Automotive	36	Tiszajúváros
NP Hungária Kft.	2000	SINTEX Industries Ltd	Automotive	360	Gödöllő

Text box:

Indian-Hungarian economic relations

There has been a robust uptick in the trade between India and Hungary since Hungary became a member of the European Union in 2004. The volume of trade grew six-folds between 2003 and 2015. The trade volume was approximately 522,67 million EUR in 2015 – according to the Hungarian Chamber of Commerce and Industry (see Figure 14). Hungary has been producing moderate deficit with India, and there was a drop in the volume of ca. USD 200 million in 2012 because of the smaller shipments in info-communication equipment and electronic devices (mobile phones) as a consequence of Nokia's exit from Hungary. India's share in the Hungarian trade grew substantially although still very small compared to the potential, ca. 0,4% in the Hungarian import and 0,27% in the export as of 2014. Hungary is the 33th most important import partner of India and the 37th most important export destination from India.

As for the structure of the shipments: machineries, transport equipment (automotive spare parts) and telecommunication devices take about a third of Hungarian exports to India, whereas electronic-devices represented 13%. Similar size was produced by chemicals and food stuff export (13%). On the import side: chemical and pharmaceutical products predominate with a share of 44% (2014). Equipment, office machineries and transport devices accounted approximately for 10% of imports from India. According to the Hungarian Chamber of Commerce and Industry (2016) The stock of Indian FDI in Hungary was estimated at ca. USD 1,5 billion (HCCI, 2016:9).

Figure 14: Commodity breakdown in Hungary's trade with India (million euro)

Source: Hungarian Chamber of Commerce and Industry (2016)

	Export				Import				Sum			
	2012	2013	2014	2015	2012	2013	2014	2015	2012	2013	2014	2015
Total	216,2	162,8	157,3	193,7	282,5	275	286,7	329	-66,4	-112,3	-129	-135,5
Food, beverage tobacco	0,372	0,233	0,632	1,345	5,89	6,237	4,63	5,95	-5,51	-6	-4	-4,6
Raw materials	12,91	2,1	1,91	2,143	1,95	2,4	2,46	2,64	11	-0,34	-0,6	-0,5
Fuels	3,34	0,143	0,082	0,3	0,002	n.a.	n.a.	n.a.	3,34	n.a.	0,08	0,3
Manufactured products	70,3	61,4	57,3	63,4	155,68	144,3	167,7	181	-85,4	-82,94	-110	-118,1
Machineries, equipments	129,2	98,9	97,4	126,5	119	122,1	111,9	139	10,2	-23,13	-14	-12,62

Other positive examples from the automotive industry can be found in Tata Motor's recent relocation in Nitra, Slovakia where the new Jaguar Land Rover production plant has been opened and in Hungary where a new engineering office¹⁷ will be put in operation to serve Jaguar's suppliers located in Central and Eastern Europe. Indian automotive suppliers are expected to relocate more facilities from the UK to Eastern Europe after the Brexit deal. Another important example from manufacturing has been India's Flex Film's decision to open its next European factory in Hungary after Poland. Flex Film is one of the largest packaging suppliers in the beverage industry¹⁸. The decision was backed by the Indian and the Hungarian investment agencies' agreement.

Indian technology-seeking investments in CEE

With respect to asset-seeking partnerships in both green- and brownfield investments, there has been a steady rise in the CEE countries in industries like IT, BPO or financial services. As noted earlier, TCS placed its regional headquarter in Budapest, Infosys serves clients from Brno, Czech Republic and Wipro has an office in Budapest, Hungary and Bucharest, Romania. These investments are the exemplar version of those knowledge- and technology-intensive acquisitions that target host economies with

¹⁷ According to Tata Group's statement the new Jaguar Land Rover engineering office in Budapest will be a small R&D center for developing Jaguar Land Rover's electronic vehicles. The office will employ „Assisted and Automated Driving Vehicle Based Validation Engineer" and "Assisted and Automated Driving Data Analysis Engineer". Similar so called „Supplier Technical Engineering" offices are already operating in the UK, Ireland, North America and China. Source:

<https://media.jaguarlandrover.com/news/2018/11/jaguar-land-rover-confirms-technical-engineering-office-hungary>

¹⁸ It serves western European clients, such as Coca-Cola, Ferrero Rocher, Nestlé or L'Oreal.

strong ties to western clients but which countries simultaneously exhibit similar technological standards. Therefore, local absorptive capacity helps to locate technological intensive operation but it allows technology transfer back and forth. IT companies' choice of CEE for their regional hubs are probably the most spectacular examples of the type of technology-seeking investment and the specificities this region can offer for Indian companies. These services are also positioned in the middle- and lower-ranks in value chain hierarchies, specializing in IT supply to larger western clients. The region has become so attractive and popular for this type of IT and BPO companies, that since the economic crises in 2009 some of the older operations that used to take place in Western Europe before the crises have been relocated to CEE mostly for financial reasons but also because of the need to reduce technological gap.

Text box:

Apollo Tyres Hungary

Apollo Tyres was founded in 1972. Today it is the 17th largest tyre producer in the entire world specialized in trucks and passenger cars. Apollo Tyres invested USD 500 million in its second European factory in Gyöngyöshalász, Hungary in 2014. The first factory was a brownfields investment in the Netherlands when the automotive industry purchased Vredestein from its previous Russian owner in 2009 for an undisclosed sum. The Hungarian plant is the first greenfield investment of Apollo Tyres outside of India. The Hungarian plant was opened in 2017 but the factory is anticipated to reach full capacity by the end of 2018 when approximately 5,5 million tyres will be produced for passenger cars and 675 000 for trucks annually. It recently employs 450 people but by the time it reaches full capacity Apollo is expected to employ 1000 people. The company has established training programs at the University of Miskolc and in two vocational schools in Gyöngyös and Heves.

Source: Company Report

Wipro Technologies

Wipro Technologies opened its first development centre in Budapest in 2010 when it agreed with Deutsche Telecom to provide customer-service related services from its new Budapest branch. Wipro Technologies has 20 of similar delivery centres active in telecom services around Europe. In Central Easter Europe Wipro Technologies have offices in Poland and Romania. Wipro explained the greenfield investment for being able to deliver a complete range of business and technology services closer to the large customers.

Source: Company report

Tata Consultancy Services (TCS)

In April 2016 TCS extended its Budapest-based capacities by a newly installed head office and 500 freshly admitted employees with whom the workforce of the company increased to 1800 in Hungary. TCS opened its office in Budapest in 2003. In 2013 TCS signed strategic partnership contract with the Hungarian government. TCS's revenue in Hungary reached HUF 10,8 billion in 2015 from which HUF 6,54 billion was produced by export to EU markets, almost double as much as in the previous year. (Tata, 2016:17).

Similarly to other developing countries, there appears to be some resource-seeking investments in CEE targeting the primary sector. Although some of these projects are regarded as failures due to what Lall (1983) defined as wrong choice of the partner by the investor firm. One notable example is Gujarat Heavy Chemicals (GHCL) which purchased 65% of Romanian soda ash firm SC Upsom in 2005 at the net value of USD 19,5 million. Soon after the acquisition the natural gas price which is crucial for the production at GHCL was substantially increased by the state monopoly Romgas which made the project unprofitable. This has been treated as a discriminatory attitude on behalf of one of the CEE states in the extractive industry. Two other controversial investments did take place in Romania. Asmita Estates planned to build a 780-apartment tower block in Bucharest for EUR 150 million. It is very rare that large investors in real estate do overseas investments since it is still subject to RBI approval in India. The other

large acquisition was made by ArcelorMittal which purchased Sidex Galati, a steel company in Galati Romania in 2001 (Roman et al., 2014). Resource-seeking investments in the primary sector are, however, very rare in the region and usually happens only in Romania, or in Russia with small volume. The majority of Indian investment coming to the region follows technology-seeking strategy and targets middle-ranked manufacturing in automotive- and chemical (pharma) industries, plus IT service companies are active. The strategic target, as mentioned above, is to link up with western production systems, gain technological advancement that can be reverse-transferred to the parent company, thus helping its global aspiration. IT and BPO service companies tend to serve western clients from CEE regional hubs.

Conclusion

Developing countries' share in global investment has been steadily rising since the 2000s. Multinational companies from the BRICS countries are the key drivers of this increase, amongst which Indian companies have spectacularly caught up in the last decade. Their share in developing OFDI has come second to China. The driving force for Indian companies to internationalize is to improve their competitiveness by accessing advanced technologies which they can build into their own production system. As empirical evidence in this paper has showed foreign investment can increase the country's export potential which has been one of the main reasons for Indian companies' internationalization effort since the 2000s. Internationalization may also bring knowledge and technology back to the parent company that further improves its global export competitiveness. OFDI may also be used to plug into global value chains through backward and forward chain integration, stimulating exports of intermediate inputs. However, limited absorptive capacity in the home economy, vis-à-vis trading partner in the region, can be an obstacle for enhanced home effects of R&D-related investments, therefore there is no guarantee that technology investment improves the overall productivity of the company. It can lead to firm-level heterogeneity. Still, about two-thirds of Indian OFDI went to developed western countries, mostly notably to the EU, including Central and Eastern Europe, while the remaining third was placed in fellow

developing countries. As for Indian OFDI entering into CEE these are becoming increasingly efficiency- and technology-seeking investments, as the region is well embedded in global value chains by hosting key manufacturing activities as lower-cost locations. The most important transmission mechanisms are scale- and knowledge-effects: OFDI may open new markets to western customers, creating opportunities for increased export-oriented production of either intermediate or finished goods when they integrate into regional production systems. The most significant regional value chain in CEE which Indian companies have tended to target are automotive, pharmaceutical, electronic and IT, ICT-related (BPO) services. These companies all have regional headquarters in CEE cities. ICT companies serve western customers from CEE-located centres, such as in Budapest (TCS), Brno (Infosys), Warsaw (Wipro) and Bucharest (Wipro). From these locations Indian multinationals are better able to access state of the art technologies which they can transfer back to their parent company. CEE also serves as a bridge to the European Single Market. Many Indian companies relocate operations first here to gain experience in the European market, but at a later stage when they obtained adequate knowledge and experience they might move forward to the core of the European market, using CEE as a gateway.

Indian companies seeking foreign investment usually attract to standard host economy locational determinants (for example, market size, level of development, geographical proximity to advanced markets) in similar way as developed companies do. These are attracted to lower wage, but highly qualified workforce with advanced level of infrastructure and good geographical proximity to large western markets. As a conclusion, companies from developing countries can use OFDI in other developing regions located near advanced economies as a catch-up strategy to source technology, increase domestic capacity, upgrade production processes, boost competitiveness, and augment managerial experience and access distribution networks from the most developed markets.

Bibliography

- Agarwala, R. - Kumar, N. - Riboud, M. eds. (2004): *Reforms, Labour Markets and Social Security in India*. Oxford: Oxford University Press.
- Amighini, A. A. - Rabellotti, R. - Sanfilippo, M. (2013): "Do Chinese State-Owned and Private Enterprises Differ in Their Internationalization Strategies?" *China Economic Review* 27:312–25.
- Amighini, A. - Cozza, C. - Giuliani, E. - Rabellotti, R. - Scalera, V. G. (2015): *Multinational enterprises from emerging economies: What theories suggest, what evidence shows. A literature review*. *Economia e Politica Industriale*, 42(3), pp. 343-370.
- Athukorala, Prema-Chandra (2009): *Outward foreign direct investment from India*. In *Asian Development Review* 26 (2), pp. 125–153.
- Boston Consulting Group (2018) "Global Challengers," Chapter Two: Meet the Challengers
Downloaded: <https://www.bcg.com/de-de/publications/2018/global-challengers-2018.aspx>
- Bucsky, P. (2018) "Hungary is one of the biggest losers of Multinationals' transferpricing. In: *g7.hu* magazine. 2018. 11. 9. Downloaded:
<https://g7.hu/allam/20181109/magyarorszag-az-egyik-legnagyobb-vesztese-a-multik-transzferar-trukkjeinek/>
- Brainard, S. L. (1997): "An empirical assessment of the proximity-concentration trade-off between multinational sales and trade", *American Economic Review*, Vol. 87, No. 4, pp. 520-544.
- Charlie, A. (2012) 'Indian Companies in the European Union, Reigniting Economic Growth', Europe India Chamber of Commerce (EICC). Brussels.
- Chase-Dunn, C. - Yukio Kawano, Y. - Brewer, D. B. (2000): "Trade Globalization since 1795: Waves of Integration in the World-System". *American Sociological Review*, Vol. 65, No. 1, *Looking Forward, Looking Back: Continuity and Change at the Turn of the Millennium* (Feb., 2000), pp. 77-95.

Chaudhry et al. (2018): Deconstructing Indian Overseas Foreign Direct Investments, Historical & Contemporary Trends. Oxfam Discussion Papers

De Beule, F. - Somers, D. (2017): 'The impact of international R&D on home-country R&D for Indian multinationals', *Transnational Corporations*, 24(1), pp. 27-55.

Dunning, J. H. (1988): "The eclectic paradigm of international production: A restatement and some possible extensions". *Journal of International Business Studies*, 19(1), pp. 1-25.

Dunning, J. H. - Kim, C. S. - Park, D. H. (2008): "Old Wine in New bottles: A Comparison of Emerging-Market TNCs Today and Developed-Country TNCs Thirty Years Ago." In *The Rise of Transnational Corporations from Emerging Markets: Threat or Opportunity?*, edited by K. P. Sauvant, 158–78. Cheltenham, UK: Edward Elgar Publishing.

Edelman (2018) "Brands Take a Stand" *Earned Brand Global Report* October 2018

Downloaded: [https://www.edelman.com/sites/g/files/aatuss191/files/2018-10/2018 Edelman Earned Brand Global Report.pdf](https://www.edelman.com/sites/g/files/aatuss191/files/2018-10/2018_Edelman_Earned_Brand_Global_Report.pdf)

EXIM Bank (2014): *Outward Direct Investment from India: Trends, Objectives, and Policy Perspectives*

Emmott, B. - Gros, D. - Jin, K. - Roach, S. S. (2018) „Trumps Trade War” In: *Project Syndicate*

Downloaded: <https://www.project-syndicate.org/bigpicture/trump-s-trade-war>

Feenstra, R. C. (1998): 'Integration of Trade and Disintegration of Production in the Global Economy', *Journal of Economic Perspectives*, 12 (4), pp. 31-50.

Fleury, A. - Fleury M., T., A. (2011) 'The Internationalization of Indian firms' In: *Brazilian Multinationals Competences for Internationalization* (ed. Fleury and Fleury). Cambridge University Press pp. 366-380.

Gao H. – Yu, Y. (2011): "The Internalisation of the Renminbi". *Bank for International Settlements Papers*, No. 61.

Gereffi, G. (2014): 'Global Value Chains in a Post-Washington Consensus World', *Review of International Political Economy*, 21 (1), pp. 9-37.

*Tamás Gerőcs / Indian companies' technological investments in the EU
with a special focus on Central and Eastern Europe*

- Gereffi, G. - Humphrey, J. - Sturgeon, T. (2005): 'The Governance of Global Value Chains', *Review of International Political Economy*, 12 (1), pp. 78-104.
- Humphrey, J. - Memedovic, O. (2003): *The Global Automotive Industry Value Chain: What Prospects for Upgrading by Developing Countries*, Vienna: United Nations Industrial Development Organization.
- Gerőcs, T. (2017a): *Challenges of Internationalisation from the Perspective of the Chinese Currency*
- Gerőcs, T. (2017b): *Internationalization of Indian Multinational Enterprises Motivations, strategies and regulation from the experience of Indian investments: a focus on Europe*. Centre for Economic and Regional Studies HAS Institute of World Economics, Working Paper Nr. 234 (2017) 1–40. October 2017
- Gerőcs and Pinkasz (2019): „Relocation, Standardization and Vertical Specialization: Core-Periphery Relations in the European Automotive Industry”. In: *Society and Economy*, 2019 *Forthcoming*.
- Girma, S. - Gorg, H. - Pisu, M. (2008): “Exporting, linkages and productivity spillovers from foreign direct investment”, *Canadian Journal of Economics*, Vol. 41, No. 1, pp. 320–340.
- Gopinath, S. (2007): *Overseas investments by Indian companies – evolution of policy and trends*. RBI, Mumbai
- Hattari, Rabin - Rajan, Ramkishen S. (2010): India as a source of outward foreign direct investment. In *Oxford Development Studies* 38 (4), pp. 497–518.
- Hungarian Chamber of Commerce and Industry (2016) ‘Republic of India, guidelines for Hungarian investors’ (“Indiai Köztársaság, “tudnivalók magyar vállalkozók számára”). MKIK Gazdaság és Vállalkozáskutató Intézet, 2016 Budapest.
http://www.mkik.hu/upload/mkik/nemzetkozi/orszagtanulmanyok/orszagprofil_india_frissitett_2016.pdf
- Katrak, H. (1990): Imports of technology and the technological effort of Indian enterprises. *World Development*, 18(3): 371-381.

- Khan, Harun (2012): *Outward Indian FDI: Recent trends and emerging issues*. RBI. Bombay Chamber of Commerce and Industry, 2/3/2012.
- Kohli, R. (2005): *Liberalizing Capital Flows: India's Experiences and Policy Issues*. Oxford: Oxford University Press.
- Kumar, N. (2008): "Internationalization of Indian enterprises: Patterns, strategies, ownership advantages, and implications", *Asian Economic Policy Review*, Japan Center for Economic Research, Vol. 3, No. 2, pp. 242-261.
- Kumar, N., - Aggarwal, A. (2005): *Liberalization, outward orientation and in-house R&D activity of multinational and local firms: A quantitative exploration for Indian manufacturing*. *Research Policy*, 34, pp. 441-460.
- Kuzminska-Haberla, A. (2012): "The Promotion of Outward Foreign Direct Investment—Solutions from Emerging Economies." Working Paper, Institute of International Business, University of Gdansk no. 31, Poland.
- Lall, S. (1983): "Multinationals from India", in Lall, S. (ed.), *The new multinationals: the spread of third world enterprises*, New York: John Wiley and Sons, pp. 21-87.
- Lall, S. (1982): *The emergence of third world multinationals: Indian joint ventures overseas*. *World Development*, 10(2): 127-146.
- Liu, W. - Dicken, P. (2006): 'Transnational Corporation's and "Obligated Emneddedness": Foreign Direct Investment in China's Automobile Industry', *Environment and Planning A*, 38 (7), pp. 1229-47.
- Werres, T. (2018) „Wie Daimler mit Geely kooperieren will” In: *Manager Magazin* 2018. 04. 19
Downloaded:<http://www.manager-magazin.de/unternehmen/autoindustrie/daimler-will-geely-entgegenkommen-a-1203738.html>
- Mathews, J. A. (2002): "Competitive advantages of the latecomer firm: A resource-based account of industrial catch-up strategies". *Asia Pacific Journal of Management*, 19(4), pp. 467–488.

McKinsey Global Institute (2016) "India's Ascent: Five Opportunities for Growth and Transformation" Executive Briefing, August, 2016.

Downloaded:

<https://www.mckinsey.com/~media/mckinsey/featured%20insights/employment%20and%20growth/indias%20ascent%20five%20opportunities%20for%20growth%20and%20transformation/indias-ascent-executive-briefing.ashx>

Milelli, C. (2007): "Outward expansion by Indian firms: the European route". Working Paper 2007-25, Paris EconomiX.

Nair, S. R. - Demirbag, M. - Mellahi, K. (2015): Reverse knowledge transfer from overseas acquisitions: A survey of Indian MNEs. *Management International Review*, 55(2), pp. 277-301.

Narayanan, K. - Bhat, S. (2011): "Technology sourcing and outward FDI: A study of IT industry in India", *Technovation*, Vol. 31, No. 4, pp. 177-184.

Narula, R. (2004): "Understanding Absorptive Capacity in an 'Innovation System' Context: Consequences for Economic and Employment Growth." MERIT-Infonomics Research Memorandum Series 3, Maastricht.

Nayyar, D. (2008): "The internationalization of firms from India: Investment, mergers and acquisitions", *Oxford Development Studies*, Vol. 36, No. 1, pp. 111-131.

Nölke, A. - May, C. - Mertend, D. - Schedelik, M. (2018): „Challenges for the Stability of State-Permeated Capitalism in Large Emerging Countries: The Cases of Brazil and India" In: Paper prepared for the 25th IPSA World Congress of Political Science July 21-25, 2018, Brisbane, Australia.

Downloaded:

https://www.researchgate.net/publication/260416776_The_Rise_of_Large_Emerging_Economies_Is_a_State_Capitalist_Consensus_Replacing_the_Washington_Consensus

Panagariya, A. (2004): "India in the 1980s and 1990s: A triumph of reforms". IMF Working Paper WP/04/43, International Monetary Fund.

- Perea and Stephenson (2018): Outward FDI from Developing Countries, chapter 4, Global Investment Competitiveness Report 2017/2018. pp. 101-134
- Pradhan, J. P. (2004): The Determinants of Outward Foreign Direct Investment: A Firm-Level Analysis of Indian Manufacturing, *Oxford Development Studies*, 32 (4), pp. 619–639.
- Pradhan, J. P. - Das, K. (2013): Exporting by Indian small and medium enterprises: Role of regional technological knowledge, agglomeration and foreign direct investment. *Innovation and Development*, 3, pp. 239-257.
- Pradhan, J. P. - Singh, N. (2011): Business group affiliation and location of Indian firms' foreign acquisitions, *Journal of International Commerce, Economics and Policy*, 2(1), pp. 19–41.
- Pradhan, J. P. - Aggarwal, R. (2011): On the globalness of emerging multinationals: A study of Indian MNEs, *Economia e politica industriale – Journal of Industrial and Business Economics*, 38(1), pp. 163–180.
- Pradhan, J. P. - Singh, N. (2009): “Outward FDI and knowledge flows: A study of the Indian automotive sector”, *International Journal of Institutions and Economies*, Vol. 1, No. 1, pp. 155-186.
- Pradhan, J. P. (2017): Indian outward FDI: A review of recent developments. In *Transnational Corporations (UNCTAD)* 24 (2), pp. 43–70.
- Rajan, Ramkishen S.; Yanamandra, Venkataramana (2015): *Managing the macroeconomy. Monetary and exchange rate issues in India*. Basingstoke: Palgrave Macmillan.
- Ramamurti, R. (2012): “What is Really Different About Emerging Market Multinationals?” *Global Strategy Journal* 2 (1), pp. 41 –47.
- Ramamurti, R. - Singh, J. V. (2009): “Indian multinationals: Generic internationalization strategies”. In Ramamurti, R. - Singh, J. V. eds., *Emerging Multinationals in Emerging Markets*, Cambridge: Cambridge University Press, pp. 110-166.
- RBI, (2016): *Master Direction – Direct Investment by Residents in Joint Venture (JV) / Wholly Owned Subsidiary (WOS) Abroad*, RBI/FED/2015-16/10

- Roman, T. - Manolica, A. - Maha, L-G. (2014) 'The dynamics of Indian FDI in Europe and its impact on Romanian-Indian relations' *Current Science*, Vol. 107. No. 10, 25th November 2014. P. 1666-1672.
- Sauvant, K. P. - Pradhan, J. P. (2010): "Introduction: the rise of Indian multinational enterprises: revisiting key issues". In: Sauvant, K. P. - Pradhan, J. P. (eds.): *The rise of Indian multinationals: Perspectives on Indian outward foreign direct investment*, New York: Palgrave MacMillan, pp. 1-24.
- Taylor, H. (2017): "Uncovering the institutional foundations of specialization patterns in the Indian pharmaceutical industry", *Transnational Corporations*, 24(1), pp. 57-79.
- Tata Company Report (2016)
- Thomas, R. - Narayanan, K. (2017): "Determinants outward foreign direct investment: a study of Indian manufacturing firms", *Transnational Corporations*, 24(1), pp. 9-26.
- Topalova, P. - Khandelwal, A. (2011): "Trade liberalization and firm productivity: The case of India", *Review of Economics and Statistics*, Vol. 93, No. 3, pp. 995-1009.
- Venkata Ratnam, C. S. (1998): "Economic Liberalization and the Transformation of Industrial Relations Policies in India". In Venkata Ratnam, A. J. and A. Verma, eds., *Challenge of Change: Industrial Relations in Indian Industry*. Mumbai: Allied Publishers Limited.
- Venkata Ratnam, C. S. (2006): *Industrial Relations*. Delhi: Oxford University Press.
- Vernon, R. (1966): "International investment and international trade in the product cycle", *Quarterly Journal of Economics*, Vol. 80, No. 2, pp. 190-207.