

Paper title: The intra- and inter-firm geography of emerging multinationals: India's pharmaceuticals

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Abstract

This paper offers an overview of the current state of Indian pharmaceutical multinationals, with a particular emphasis on their organisational and geographical dynamics. The analysis looks at both the intra- and inter-firm dimensions of these emerging multinational corporations (EMNCs). It shows that, despite drawing a large portion of their sales from foreign markets and having a significant number of foreign subsidiaries, the intra-firm spatial division of labour of India's pharmaceutical multinationals is largely oriented towards their home country. Inter-firm alliances are a significant strategy for these EMNCs, yet should not be interpreted as implying the absence of aspects of an intra-firm competitive advantage.

Keywords: emerging multinationals, pharmaceuticals, India, geography.

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1. Introduction

The wave of interest in “third world multinationals” a quarter of a century ago found developing-country foreign direct investment (FDI) to be largely intra-regional, with a tendency to go to other countries with similar levels of development (Kumar, 1982; Wells, 1983). Set in the days of a more protectionist-oriented trade environment, key motivating factors for FDI were centred around navigating trade barriers such as tariffs and quotas. The study of business strategy now increasingly recognises the importance of multinational corporations (MNCs) serving the base of the economic pyramid (Prahalad and Hammond, 2002), yet emerging MNCs (EMNCs) today actually target higher income markets more than in the past (Ramamurti, 2004: 280), with developing country FDI now largely developed-country oriented (UNCTAD 2006). This shift has attracted considerably scholarly interest in EMNCs, including on firms from China and India (e.g. Chitoor and Ray, 2007; Garg and Delios, 2007; Gaur and Kumar, forthcoming; Kumar, 2007; Pradhan, 2007), yet so far there is only limited analysis of the geographical organisation of these firms.

The goal of this paper is to provide empirical evidence of both intra-firm and inter-firm locational and organisational dynamics in order to gain a better understanding of the functioning of EMNCs. Much of the MNC literature (e.g. Dunning, 1988; Vernon, 1966) traditionally focuses on the intra-firm organisational and locational aspects of these firms as a reflection of their knowledge-sourcing and production organization. With respect to EMNCs, however, it suggests the importance of inter-firm linkages external to the firm, such as research alliances and collaborative arrangements (e.g. Mathews, 2006). For EMNCs, it is critical that they not only exploit their available resources through an expansion of intra-firm

networks abroad, but also engage in asset exploration through developing inter-firm networks.

As a case example of EMNCs, pharmaceutical firms from India are chosen for the following reasons. First, pharmaceuticals and particularly biotechnology, is one of the most knowledge-intensive sectors of the modern economy (Gertler and Levitte, 2005). With many MNCs locating their routine activities in lower-cost countries under the new international division of labour (Frobel et al., 1978), many governments in high-income countries target knowledge-intensive activities as key sectors for competitiveness (Birch, 2008). Yet emerging markets now form a growing share of the global pharmaceutical industry¹ and the sector is prominent in the internationalisation of emerging economy firms (Gaur and Kumar forthcoming, 11), defying the traditional spatial division of labour. Second, pharmaceuticals is also a major sector among Indian EMNCs (Basu and Maertens, 2007; Chitoor and Ray, 2007), with large firms such as Ranbaxy Laboratories and Dr Reddy's Laboratories establishing growing webs abroad.

2. The dynamics of (E)MNCs: from intra-firm organisations to inter-firm alliances

Traditional MNC theory largely mirrors the realities of the post WWII world economy, in which MNCs emerged exclusively from the developed economies, and focuses largely on the internal coordination challenges and on developing rationales for their existence (e.g. Dunning, 1988; Vernon, 1966). To counteract the foreigner disadvantage when entering a market abroad, Dunning's (1988) ownership, location, internalization (OLI) framework suggests MNCs derive three sources of advantage, which they exploit. The MNC 'owns' a competitive advantage, such as a broadly defined technology, knowledge and skills regarding products and production processes, or a brand. Location-specific advantages of the

¹ The share of emerging markets in the global pharmaceutical industry is expected to grow further in the coming years, fuelled by their economic growth and large populations with significant healthcare needs (Sun Pharma, 2007: 9).

MNC are its flexibility in location selection in relation to factors such as availability of raw materials, trade barriers, costs, government policies and market size. Internalization refers to the benefits from economies of scale and scope that arise from conducting activities in-house. This conventional approach is based on the perspective that, intra-firm, the MNC possesses superior resources which it exploits abroad (Mathews, 2006: 18).

The role of external, inter-firm alliances for MNCs has been a relatively neglected aspect of MNC research until recently, as acknowledged by Dunning (1995) himself. Recognising inter-firm cooperation as an increasingly significant model of organizational form with the emergence of alliance capitalism, as opposed to hierarchical capitalism, Dunning calls for its inclusion: “the OLI configuration determining trans-border activities is being increasingly affected by the collaborative production and transactional arrangements between firms; and these need to be incorporated more systematically into the eclectic paradigm” (1995: 462).

The limited attention given to external linkages is a notable weakness in understanding MNCs, particularly so when trying to account for the rise of EMNCs. Paralleling Dunning’s tripartite structure, Mathews (2006) has recently proposed a linkage, leverage, learning (LLL) framework based on the experience of the so-called “Dragon multinationals” from the Asia-Pacific region. Linkage involves firms exploring resources and advantages which can be acquired externally, and is often characterised by partnerships and joint ventures. Leverage involves the development of links so that resources can be leveraged or exploited. Learning is the repeated application of linkage and leverage processes. This linkage and leverage strategy is supposedly suited to the interlinked nature of the global economy today.

The prominent role of these inter-firm linkages for EMNCs leads to much debate around the question of the competitive advantage of these firms (e.g. Ping Li, 2003).

Relatively little is conclusively known about the sources of strength that allow these firms to invest abroad (Kumar, 2007). Possibilities for sources of competitive advantage include benefiting from unique home market conditions (Aulakh, 2007), familiarity with developing world conditions and/or membership of a family business group (Yeung, 1994). In general, the relative lack of understanding of the nature of these firms' internal strengths and the recognition of the proliferation of inter-firm alliances leads to suggestions that the internationalisation of EMNCs may be associated more closely with exploring or voicing an ownership advantage than exploiting one (Ping Li, 2003), with ownership advantage maybe a goal for a developing country firm to achieve over time after TNC formation (Ping Li, 2007: 299).

To extend the debate on the competitiveness of the EMNCs, in this paper I frame my analysis in terms of the geographical and organisational spread of EMNCs in an attempt to integrate the intra- and inter-firm dynamics of EMNCs. Although the organisational forms and geographical spread of MNCs and EMNCs were recognised as an area of neglect over a decade ago (Dunning, 1998; Yeung, 1994), criticism of the neglect of geography has persisted. As noted by Buckley and Ghauri, "aspects of the strategy of MNEs can also be enhanced by a deeper understanding of spatial issues" (2004: 91). This paper therefore aims to present empirical analysis that integrates the intra- and inter-firm dimensions of the geographical and organisational spread of Indian pharmaceutical EMNCs.

The intra- and inter-firm dynamics of the pharmaceutical industry make it a particularly relevant case for investigation. With the advent of biotechnology, the model of the large, vertically integrated, pharmaceutical firm is supposedly in decline (Gilbert et al., 2003) with many MNCs in this sector now functioning more as hubs, buying not making services (Cooke, 2004a: 627) and integrating lower order functions (Cooke, 2004b) by coordinating innovative relations in transnational scales (Zeller, 2004). Firms in this

knowledge-intensive industry increasingly engage in collaborative agreements, both inter-firm and firm-university-government (Etkowitz and Leydesdorff, 1997), as highlighted in the recent conceptualisation of an alliance-driven global commodity chain (ADGCC) (Birch, 2008). This ADGCC adds the vital role of linkages and their multi-scalar nature in certain industries to the original global commodity chains framework (Gereffi, 1999). These linkages are an important element of business strategy for Indian pharmaceutical firms, too, with “a change in the way the Indian companies are operating. Companies are forming alliances with partners to leverage on their core strengths and consolidate operations” (Dr. Reddy’s, 2005: 152).

3. India’s pharmaceutical industry

India’s big pharma² is emerging from a rapidly changing home-country context. For a long time after independence, the Indian economy followed a protectionist policy of import substitution, promoting the growth of a diverse industrial sector. Growth fluctuated around the “Hindu rate of growth” of 3.5% in the 1950s, 1960s and 1970s (Basu and Maertens, 2007), yet since liberalisation in 1991, the Indian economy has grown rapidly³ and become increasingly outward oriented. Inward FDI has surged and is heavily concentrated in the services sector, with business services and software particularly prominent (Yusuf et al., 2007) in India’s emergence as a world class services hub (Kochar et al., 2006). Although India’s stock of outward FDI is smaller, it is growing rapidly with large Indian multinationals, such as Tata Consultancy Services, Wipro and Infosys, emerging in these sectors. Amid the hype of India’s attraction of inward FDI⁴ and its famed tertiary sector, this

² The term ‘big pharma’ is generally used to refer to the world’s largest pharmaceutical companies, which tend to be based in the United States or Europe. Here, I use the term India’s big pharma to refer to the largest Indian pharmaceutical companies.

³ The Indian economy has grown at an average rate of 6.5% from 1993 to 2004 (Bhaskar and Gupta 2007).

⁴ India is ranked by A.T. Kearney (2007) as the world’s second most attractive location for FDI in its 2007 FDI Confidence Index. China is first.

paper looks at the growing outward activities of a prominent sector in Indian manufacturing – the pharmaceuticals industry.

Despite India's pharmaceuticals only recently emerging on the world stage, it is a long established industry with a distinctive history (Pradhan, 2006), shaped by the changing intellectual property rights (IPR) environment. The Indian Patent Act of 1970 only provided for patents, which lasted seven years, being granted on processes, with no patents on products (Feinberg and Majumdar, 2001; Sampath, 2006). The combination of this weak IPR regime and a protectionist economic environment brought a simultaneous decline in foreign MNCs' share in the Indian market⁵ and take-off in India's indigenous pharmaceuticals industry based on reverse engineering products developed abroad (Lalitha, 2002). In recent years, however, trade liberalisation has altered the IPR environment with the implementation of the World Trade Organisation's (WTO) 1995 Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). Developing countries were allowed a 10-year transition period so that by 2005 they had to comply with strict WTO provisions on pharmaceuticals product patents (Sampath, 2006). India's pharmaceuticals industry today is very dynamic and is still undergoing substantial transition.

The growing internationalisation of India's largest pharmaceutical firms is a key feature of recent transformation in this industry (Pradhan, 2006). Although growing rapidly, within India the pharmaceutical industry is still small with a very low annual per capita expenditure on pharmaceuticals (Dr. Reddy's, 2004). Indian big pharma can thus benefit from geographic diversification and are now coordinating their activities globally and exercising geographical advantages in the worldwide business environment (Pradhan, 2006). These firms have been noted for their particular focus on increasing their presence in

⁵ MNCs' market share in India has fallen from around 70 per cent in 1971 to around 17 per cent today (Hamied, 2007).

developed markets (Chitoor and Ray, 2007), largely entering through acquisition of existing entities (Pradhan and Alakshendra, 2006).

This paper examines the top ten Indian pharmaceutical firms as ranked in Business World India's (2007) list of the top 500 firms in India (see Table 1). Although the Indian pharmaceutical industry is very fragmented, the number of firms pursuing significant internationalisation is relatively small, thus these firms serve as the leading cohort. Research in a sensitive sector such as pharmaceuticals can be a difficult process (Gray and Parker, 1998), yet much information is publicly available and this paper is based on data largely drawn from company websites, annual reports⁶ and media reports. I focus on changes from 2002 onwards, which allows the paper to concentrate on the period when the internationalisation of most of these firms has really taken-off.

Table 1 - India's big pharma - India's largest pharmaceutical companies⁷

Firm	Total assets (Rupees million.)	Net sales (Rupees million.)	Headquarters location	Year established
Ranbaxy Laboratories	34 068.2	35 754.4	New Delhi	1961
Cipla	24 521.8	28 974.1	Mumbai	1935
Dr. Reddy's Laboratories	31 860.1	20 058.5	Hyderabad	1984
Sun Pharmaceuticals Industries	32 107.6	16 815.5	Mumbai	1983
Aurobindo Pharma	21 106.3	13 698.7	Hyderabad	1986
Lupin	15 565.5	15 965.4	Mumbai	1968
Jubilant Organosys	14 484.4	13 849.1	Noida	1978

⁶ A number of times in this paper I cite the annual reports of these firms. In the interests of clarity and brevity of presentation, these are not included in the references section.

⁷ Firms are ranked by a combination of total assets and net sales, with total assets and net sales data taken from Business World India (2007).

Orchid Chemicals and Pharmaceuticals	18 132.8	8734.6	Chennai	1992
Wockhardt	16 149.0	9600.3	Mumbai	1959
Nicholas Piramal India	11 627.1	14 062.8	Mumbai	1988

Source: Business World India's "BW Real 500: India's top companies" (2007). HQ location and year established are sourced from company websites and annual reports.

The remainder of the paper is laid out as follows. To introduce India's big pharma further, I briefly discuss how these firms' developed their competitive strength and, as an indicator of their internationalisation, I examine the geography of these firms' revenues. I also analyse the foreign subsidiary locations of these companies in 2002 and 2007 and examine to what extent these subsidiaries are solely financial or marketing entities. I then explore the intra-firm spatial division of labour for Indian big pharma, with a focus on the manufacturing and R&D operations at home and abroad. Finally, I analyse the collaborations and alliances these firms have entered into, a key aspect of their internationalisation strategy.

3.1. The development of Indian big pharma and their growing internationalisation

The in-house development of competitive strength of Indian big pharma

Many of India's largest pharmaceutical companies emphasise how far they have progressed in a relatively short period, moving from imitators towards being innovators (Kale and Little, 2007). Lupin, Orchid and Aurobindo, for example, all note how they started out as manufacturers and suppliers of active pharmaceutical ingredients (API). India's pharmaceutical firms developed considerable advanced skills in process chemistry through this period, however. As an example, when viagra was patented by Pfizer in 1993, Indian firms were able to produce the indigenous version within weeks for a fraction of the costs

what took Pfizer 13 years and millions of dollars to perfect (Lalitha, 2002). The skills and learning developed from reverse engineering are cited as crucial in establishing the position these firms occupy today. Dr. Reddy's, for example, says that:

“We began in 1984 and, like some other players of that era in India, concentrated on strengthening reverse engineering capabilities to produce high quality bulk drugs and formulations at low costs, and sell them in the domestic market. The importance of these skills cannot be exaggerated, for they created the technological foundations for your Company's successful foray into the international generics market” (2002: 6).

The large Indian pharmaceutical firm is now in a position to “leverage our chemistry knowledge, strong R&D and manufacturing skills, accumulated over the last 25 years” (Jubilant Organosys, 2005: 15). Dr. Reddy's, for example, now claims to have “global leadership in organic synthetic chemistry” (2004: 2). The increased internationalisation of these firms' activities, demonstrated through this paper, is a manifestation of these firms leveraging their strengths. As Aurobindo describes:

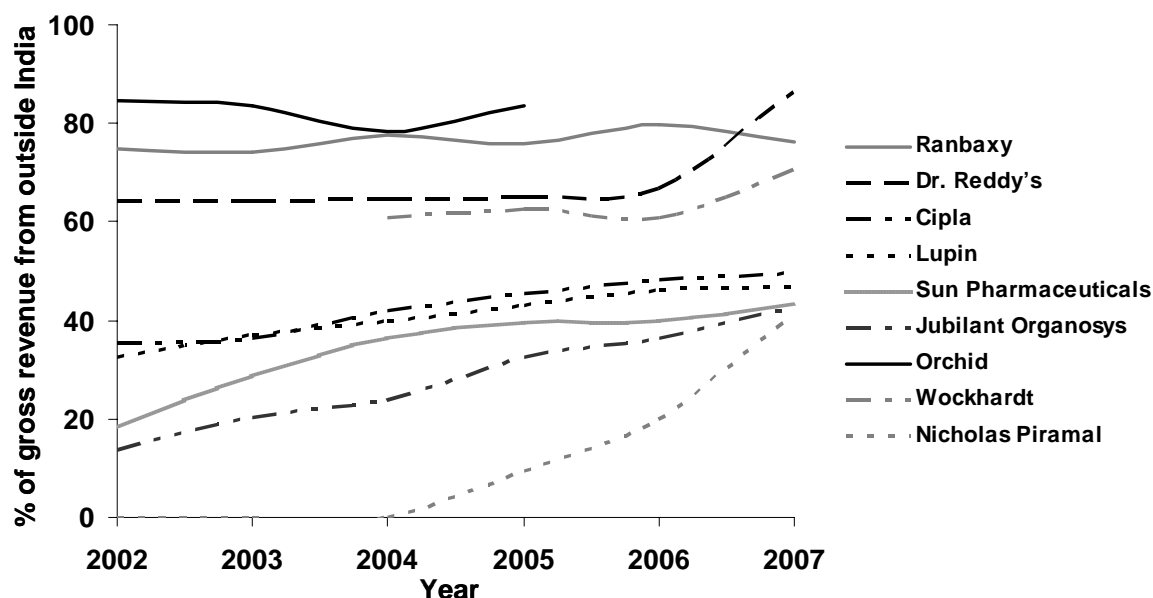
“The company's strength has always been manufacturing cost effective active pharmaceutical ingredients (APIs). We leverage this capability to produce generic formulations for the regulatory markets” (2006: 6).

The revenue generated through these forays into international markets is also providing an important source of finance for drug discovery. Thus, Indian pharmaceuticals are now integrating the “business of today with the drug discovery of tomorrow” (Orchid 2007: 8), a significant progression from a business model which was arguably based on the integration of ‘the business of today with the drug discovery of yesterday’.

Changing geography of Indian big pharma's revenues

The growing internationalisation of Indian big pharma is a reflection of this internal strength. As an indicator of internationalisation, I examined the percentage of the top ten firms' gross revenue coming from outside India over the period 2002 to 2007 (see Figure 1). This shows that, over the last six years, India's big pharma are increasingly drawing their revenues from outside the home market. Most of these firms' gross revenues are growing faster than the Indian pharmaceutical industry as a whole and, although their revenues from domestic markets are also increasing, the majority of this revenue growth has been driven by foreign market expansion.

Figure 1: Share of gross revenue from abroad for India's largest pharmaceutical firms 2002-2007



Source: Author's compilation based on company annual reports. All of the above data are from the consolidated (Indian GAAP) financial accounts. Data for all, with the exception of Ranbaxy and Wockhardt, refer to the financial year i.e. 2007 is April 01st 2006 to March 31st 2007. The Ranbaxy and Wockhardt data refers to the calendar year. Orchid stops providing segment data from 2004-05 onwards. Nicholas Piramal does not provide geographical segment information prior to 2004-05 as "it is not relevant and operations of foreign subsidiaries are not significant" (2005: 98). Geographical segment data was

also not encountered for Lupin (2004 and 2005), Wockhardt (2002 and 2003), Orchid (2006 and 2007) and Aurobindo Pharma (all years).

The internationalisation of Indian big pharma is relatively recent and rapid as measured by their sales data. In 2002, Ranbaxy, Dr. Reddy's, Orchid and Wockhardt were the only four of these firms to draw more than 50% of their revenues from foreign markets. By 2007, however, all of these firms were above or close to this landmark. Over the period 2002 to 2007, seven of the nine firms saw substantial increases in their revenue share coming from overseas markets, the two exceptions being Ranbaxy and Orchid. In 2002, Ranbaxy had already reached a stage where it drew a high proportion (around 75%) of its revenues from foreign markets so there was not as much opportunity for this to increase substantially, while Orchid, founded in 1992 as an export-oriented company, has always drawn the substantial part of its revenues from foreign markets.

Within the foreign sales of India's big pharma, there is an increasing concentration on the lucrative markets of North America and Europe. Of the firms that provide a more detailed geographic breakdown in their consolidated accounts, in each case the proportion of foreign revenue coming from North America and Europe has increased since 2002 and, in five of the six cases, comprises the majority of foreign revenue⁸. For the big two global players, Ranbaxy and Dr. Reddy's, regulated market growth in the last six years has largely been driven by European expansion. Both these firms sought to break into the North American market first, and then proceeded to foray into Europe. Ranbaxy, for example, explains that "after reaching critical mass in USA, the Company focused its efforts in Europe" (2003: 10). This pattern is followed by other firms too as, for example, Lupin now says "replicating our

⁸ In 2007, for example, Wockhardt (89.8%), Ranbaxy (64.6%), Dr. Reddy's (69.6%), Jubilant (68%), Lupin (47%), all drew large parts of their foreign revenues from the regulated markets of North America and Europe. Of those firms in the sample providing this level of geographic breakdown, Orchid (22.2%) is the only one with a minor share of its foreign revenue coming from North America and Europe, although it has relatively small foreign revenue compared to the other firms.

success in the US, our eyes are now set on Europe” (2007: 13). In a counter example, however, Wockhardt has substantial European sales but has yet to make a significant mark in the North American market. The overall picture of the international orientation of these firms’ sales is “we are targeting the regulated markets ... huge potential for our products” (Aurobindo Pharma 2005: 3).

3.2. Patterns of globalisation: intra-firm

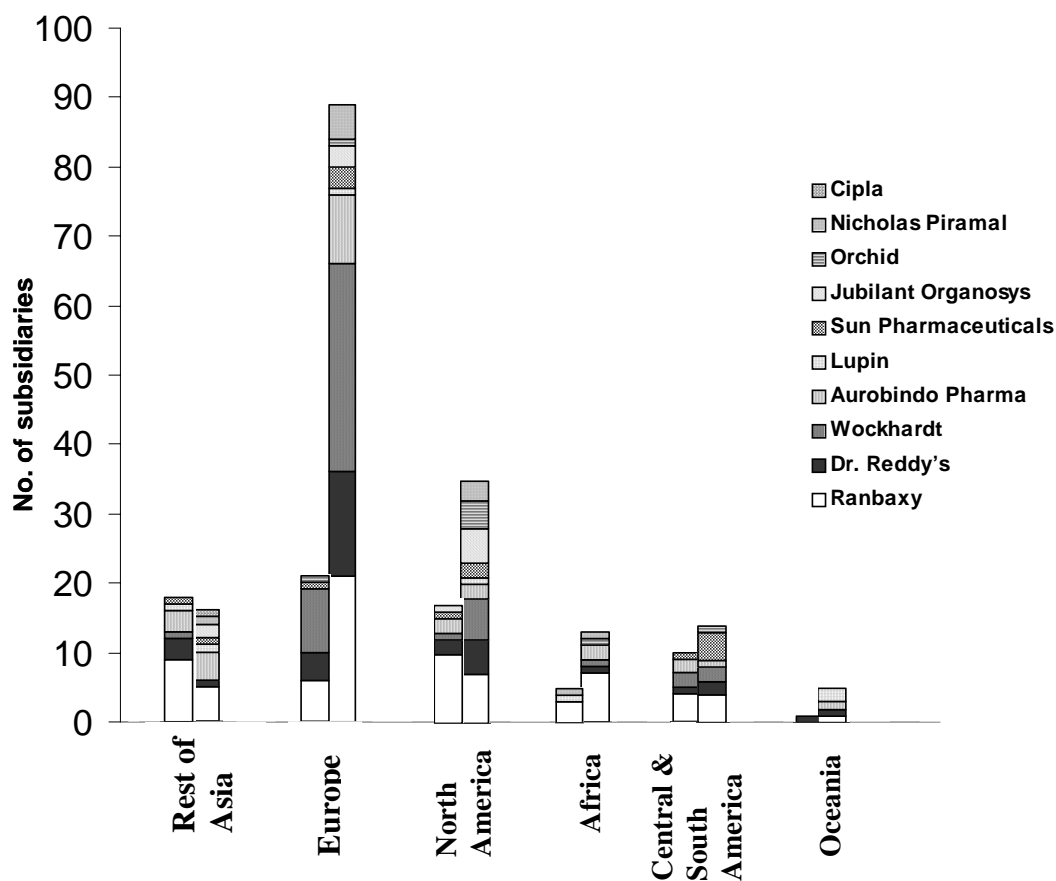
Location of foreign subsidiaries

While these sales could be generated by exporting from India, another option is the establishment of a foreign network of joint ventures or subsidiaries, which includes manufacturing, R&D, marketing or financial functions. It turns out, however, that these firms have very few joint ventures⁹ and largely operate wholly or majority-owned subsidiaries.¹⁰ Figure 2 shows the location of these firms’ foreign subsidiaries in 2002 (left column) and 2007 (right column) for various regions outside India.

Figure 2: Location of foreign subsidiaries of Indian big pharma in 2002 and 2007

⁹ India’s big pharma have very few joint ventures abroad. None of the firms in this sample had more than two foreign joint ventures in 2007, and many do not have any joint ventures abroad at all. This contrasts with an older observation that “joint ventures are the most common form of transnational operations among developing country TNCs” (Yeung 1994, 300).

¹⁰ For subsidiaries, I include those entities listed as subsidiaries in the consolidated financial accounts of the group.



Source: Author's compilation based on company annual reports. The column on the left for each region is 2002 data and for the right is 2007. Subsidiaries divested during the year in question are not included. Lupin and Jubilant Organosys data are 2003, not 2002, and 2007, while Wockhardt data is for 2005, not 2002, and 2007.

The number of foreign subsidiaries of Indian big pharma has substantially increased over the period 2002 to 2007. As shown in Figure 2, this expansion has been geographically uneven. In terms of number of subsidiaries, the rest of Asia was as significant as Europe and North America in 2002. Over the period to 2007, however, the rest of Asia area stagnated, while there was rapid growth in Europe and North America. This growth was driven by firms across the sample, each of them, with the exception of Cipla, increasing their number of subsidiaries in either Europe or North America, and six firms increasing their presence in both. Despite not featuring as prominently as Europe or North America, these Indian pharmaceutical firms also have some presence in both Africa and Latin America. Overall,

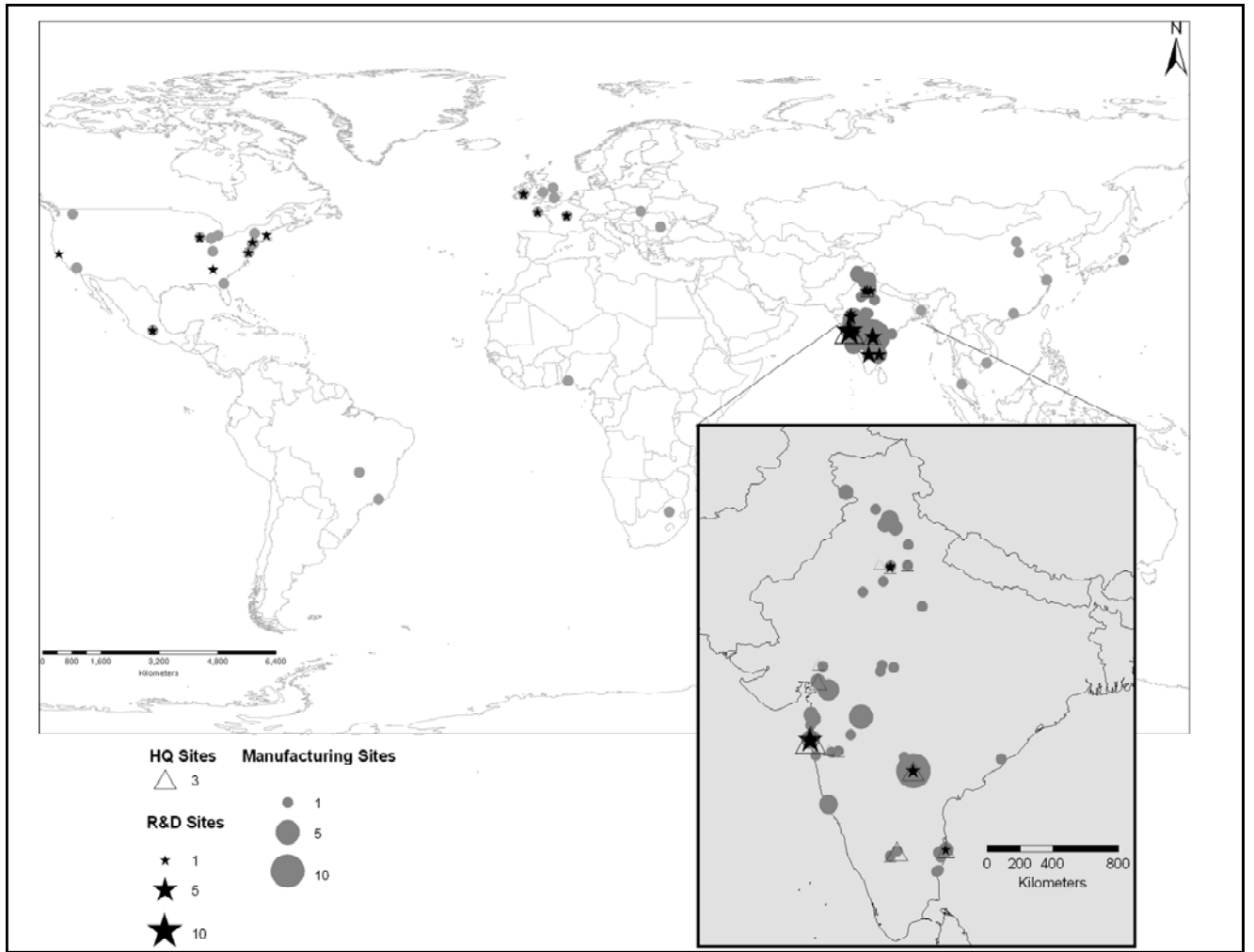
this data confirms recent findings that show Indian outward FDI is increasingly developed-country oriented (Kumar, 2007).

Another notable aspect of the nature of subsidiaries is that a number of the entities included in this list of subsidiaries are solely financial or front-end sales/marketing offices, which perform little manufacturing or research activities. To better understand the actual spatial division of labour within these firms, in the next section I examine the internationalisation of their manufacturing and R&D.

Spatial division of labour: manufacturing and R&D

To what extent are these firms internationalising their manufacturing and R&D functions? Figure 3 shows the locations of main manufacturing plants and R&D. Despite drawing a large proportion of their revenues from foreign markets and having an increasing number of foreign subsidiaries, Figure 3 shows that India's pharmaceutical EMNCs largely keep their core functions of R&D and, to a lesser extent, manufacturing, at home, much like developed country MNCs. For example, Cipla and Lupin conduct all of their manufacturing and R&D within India, despite drawing 49.7% and 47%, respectively, of their gross revenues from foreign markets. Overall, this geographical specialisation of sales and the spatial division of labour suggests the exploitation of home-country competitive advantages is an important feature of the internationalisation of these firms.

Figure 3: Principal manufacturing and R&D locations for India's big pharma at end of 2007



Of those functions Indian firms have located abroad, manufacturing is considerably more globalised than R&D. Across all firms in the sample, Ranbaxy has the most foreign manufacturing plants, in ten countries in all, and these are mainly located in the major market in each continent. The highly regulated markets of the United States and United Kingdom are prominent for all firms, with Brazil and China also emerging as manufacturing locations. Many of these plants are outcomes of acquisitions (Pradhan and Alakshendra, 2006), which provide instant access to overseas markets, as facilities are already approved by the local regulatory body. In contrast, overseas or domestic greenfield investment requires a significant waiting time, as does bringing existing Indian plants up to the standards of foreign regulatory bodies. Market access would thus seem to be the dominant motivation for the location of much of these foreign manufacturing plants, with cost a secondary consideration. For example, Ranbaxy, through acquisition, recently set up a large plant in Romania and "with good local manufacturing potential, the entity offers a strategic advantage for us to service the EU market efficiently and cost-effectively" (2006: 8). While navigating trade barriers was a key factor influencing foreign investment for the "third-world" multinationals of the 1980s (Kumar, 1982; Lall, 1983; Wells, 1983; Lall, 1986), for Indian pharmaceuticals today, navigating the strict regulatory standards of the developed markets would appear to be playing a key factor influencing investment.

R&D activities have an even greater domestic focus, with the firms' principal research centres all based in India. Only four firms in the sample have some R&D facilities outside India. Of those R&D functions located abroad, the United States is the main destination. These facilities are located in places such as Boston, New Jersey and Silicon Valley, which are global megacentres for R&D in pharmaceuticals, particularly in biotechnology. Clearly, Indian big pharma is attempting to enhance the research strengths it possesses at home through plugging into the localized externalities in these high-tech

megacentres. This mirrors a general phenomenon whereby pharmaceutical TNCs embed themselves in knowledge-rich regions in order to generate and absorb knowledge (Zeller, 2004). Dr. Reddy's, for example, explains its strategy - "we will leverage the chemistry and pharmacological capabilities of our labs in India and early stage research capabilities of our labs in Atlanta to create further synergies" (Dr. Reddy's, 2003: 47). Nevertheless, despite the general recognition that innovative activity in pharmaceuticals is multi-scalar, with international linkages playing a key role (Birch, 2008; McKelvey, 2004; Zeller, 2004), the picture from this spatial division of labour suggests the majority of Indian firms' R&D is still based in the home market.

3.3. Patterns of globalisation: External alliances and inter-firm linkages

Industry-government-university linkages

Along with the intra-firm operations discussed earlier, the formation of non-equity inter-firm and, to a lesser extent, industry-government-university linkages are key strategic features of the operations of Indian big pharma. The vast majority of industry-government-university linkages recorded are domestic partnerships¹¹. Although industry-university collaboration is in a nascent stage in India (Lalitha, 2002: 3551), Indian big pharma are increasingly engaging with Indian universities and government for collaboration, although less so with respective foreign parties. For example, Ranbaxy and Nicholas Piramal have both recently signed up to the Indian government's initiative to create an industry-university/national institute partnership programme in drug discovery. Lupin has an agreement with the Indian Government's Department of Science and Technology to collaborate for clinical development of Lupin's migraine and psoriasis projects, while Orchid has a collaborative agreement in nanotechnology with the Indian Institute of Technology

¹¹ 19 such agreements were noted in total for the firms, and only 2 of these were with parties from outside India. This excludes industry-industry linkages.

Madras. Other institutes including the National Institute of Pharmaceutical Education and Research, Institute of Nuclear Medical and Allied Sciences, Indian Institute of Chemical Technology Hyderabad, Indian Institute of Science Bangalore and the Central Drug Research Institute Lucknow are all engaged in collaborations with firms in this sample.

International inter-firm alliances of Indian big pharma

In recent years, the vast majority of Indian big pharma's strategic alliances have been with firms from North America and Europe. Of the 124 individual agreements recorded¹², 107 of them were with firms from North America and Europe. Very few strategic agreements between Indian firms were recorded, with only nine cases. Along with a couple of R&D collaborations, these largely involve Ranbaxy undertaking international marketing for another Indian firm. In contrast, inter-firm alliances are very much a part of these firms' international activities, although the parties involved are concentrated geographically. Only eight of the international agreements that Indian firms entered into were with firms from outside North America or Europe, and three of those were with firms from the highly regulated market of Japan.

Table 2 classifies recent international inter-firm¹³ collaborations and alliances of Indian big pharma. On the horizontal axis is the main function the agreement refers to: manufacturing, marketing or R&D. The vertical axis represents the direction of the agreement: inward, joint or outward. For example, marketing inward means that the Indian firm will perform the marketing for the other firm, while research outward implies the agreement is for the US/European firm to do the research on behalf of the Indian firm, with co/joint referring to the activity being performed together.

¹² Data was recorded from company annual reports, websites and press releases for individual cases announced during the period from the start of 2002 until the end of June 2008.

¹³ This does not claim to be an exhaustive collection of all the alliances/collaborations these firms have announced over the last 6 years, yet it hopes to be as comprehensive as possible and indicative of the dynamics of this key aspect of these firms' activities.

Table 2: Classification of Indian big pharma’s international non-equity inter-firm collaborations 2002-mid 2008

	Manufacturing	Marketing and distribution	R&D
Inward	24	35	6
Co/joint	0	5	22
Outward	0	19	4

Source: Author’s compilation based on company annual reports, websites and press releases.

Manufacturing is the only function where the agreements only run in one direction – Indian firms perform manufacturing on behalf of a North American or European firm, but do not appear to outsource their own production to these firms. Wockhardt, Cipla and Nicholas Piramal, in particular, have established niches for themselves in contract manufacturing. The data vastly underestimate the number of manufacturing contracts these firms are engaged in, however, with many of these firms reporting having a large number of manufacturing contracts, although not disclosing the individual details.

Marketing and distribution is the most common function involved in Indian big pharma’s international inter-firm alliances. These are fairly evenly split in number between Indian firms doing the marketing on behalf of US or European firms (inward), and vice versa (outward). Inward marketing arrangements largely involve Indian firms marketing and distributing products of US or European firms in India and, possibly, neighbouring markets. Indian big pharma, therefore, play a useful role for global big pharma by acting as marketing powerhouses within India.

Outward agreements, in contrast, largely involve Indian firms partnering with a US or European pharmaceutical company who will market and distribute products on their behalf. Take Orchid for example:

Orchid has consciously followed a strategy of focusing on product development and manufacture, leaving front-end marketing to be fulfilled through distribution alliances. Orchid has secured tie-ups with global distribution majors such as Apotex Inc., Apotex Corp, Par Pharmaceuticals Inc, Actavis, Stada, IVX and Mayne for distributing 41 products in U.S., Europe and other regulated/contiguous markets (Orchid, 2007: 8).

Cipla, without foreign subsidiaries¹⁴, adopts a similar strategy:

“Cipla's continued success in its overseas business has been largely due to its strategy in forming strategic alliances with partners all over the globe who assist with the registration process and help market Cipla products internationally. In the U.S., Cipla has alliances with nine generic majors including Teva Pharmaceuticals USA, Inc., Watson Pharmaceuticals, Inc., Eon Labs, Inc. and Akorn, Inc. for over 125 projects” (Cipla, 2007: 6).

Indian pharmaceutical firms are not all solely relying on this partnership model for their international marketing, however. In particular, Ranbaxy and Dr. Reddy's, which have large webs of foreign subsidiaries, are beginning to generate their own worldwide marketing capabilities and, in some cases, even starting to market products in the regulated markets on behalf of US or European firms. Although Dr. Reddy's initially started with product partnerships, it has since “graduated to marketing products under its own label” (Dr. Reddy's, 2005: 5).

R&D is an area where Indian firms are increasingly engaging in inter-firm alliances with firms from North America and Europe, with the majority of these joint collaborations. Significantly, these partnerships were nearly all formed after the strengthening of India's IPR

¹⁴ It technically has one, located in the Dubai, United Arab Emirates, but this had not commenced commercial operations by the end of financial year 2007.

regime at the start of 2005. These R&D collaborations between Indian and global pharma players involve attempts at leveraging the strengths of both parties. They also suggest that Indian pharma, and indeed Indian and Chinese MNCs more generally, are developing their own research capabilities that global big pharma is trying to gain access to, looking to India as a source of innovation (Wadhwa et al., 2008). Sun Pharmaceuticals, for example, notes how these licensing deals are “indicative of the advantage that India offers, high quality science at a reasonable cost and a flexibility to work on projects across continents” (2005, 29). Jubilant Organosys is establishing itself as an outsourcing recipient, focusing on CRAMS (custom research and manufacturing services) and DDDS (drug discovery and development services), aiming to partner firms who want “not only accelerating drug development schedules but also to achieve this at a considerably lower cost to the stakeholders involved (2007: 5).

With pharmaceutical companies globally “entering into strategic alliances and collaborations to effectively capture the growth opportunities and address the key gaps in their value chain” (Ranbaxy, 2007: 5), this analysis suggests where these areas of strength and weakness lie for India’s major pharmaceutical firms. The relative lack of a (internal to the firm) foreign marketing and distribution network may be seen as a gap in the value chain for most Indian big pharma, yet at the same time niche roles in the global pharmaceutical industry are established in other areas. These include functioning as contract manufacturer, domestic marketing powerhouse, and as a player in R&D.

4. Conclusions and future research agenda: The sources of Indian advantage

Taking into account both the inter-firm and intra-firm organisation, the analysis shows that inter-firm alliances are a key dimension of the strategy of EMNCs, confirming a general finding in this literature. Indian pharmaceutical MNCs are engaging in these alliances for

manufacturing, marketing and distribution and, increasingly, research and development, but with a distinct geography. The multiple inter-firm alliances should not be interpreted, however, as implying that the EMNC does not internally possess a significant competitive advantage. While there is a tendency to associate MNCs with intra-firm asset exploitation and EMNCs with inter-firm asset exploration, the analysis here suggests that EMNCs engage in inter-firm alliances not only to explore or augment their assets but also to exploit existing intra-firm competitive strengths.

The analysis of the intra-firm locational and organisational dynamics of India's big pharma shows these firms possess significant intra-firm competitive strength and that the internationalisation of these EMNCs is associated with exploiting a distinct India advantage in the global pharmaceutical industry, with "India: emerging as a hub for global pharma" (Ranbaxy, 2007: 5). There are a number of competitive advantages that these firms exploit from their home economy, India. For one, "India has emerged as an important cost-effective destination for pharmaceutical manufacturing" (Cipla, 2007: 7) and has the largest number of FDA-approved plants outside the USA. India also possesses a distinct cost advantage in drug development/research, an important dimension considering the notoriously high-costs of drug development for developed-country big pharma. For example, the Indian clinical research industry today claims to offer cost reduction benefits of up to 50-60% to a pharmaceuticals company in the United States (Jubilant, 2007: 12).

Yet, the Indian advantage is based on more than just cost. More importantly for the longer term prospects of the industry and its firms, India has a pool of highly educated scientists who, in the pharmaceutical industry, have developed strong skills in drug manufacture and technology, chiefly in the area of process chemistry. This is seen by global pharma as an advantage for high-end research, as is the availability of a large, genetically diverse patient pool for clinical trials, meaning India is emerging as a prominent destination

in the globalization of clinical trials (Thiers et al., 2008). Taken together, these advantages are prompting a number of developed country pharmaceutical companies, including Merck, Eli Lilly and Johnson & Johnson to locate R&D activities in India to access some of this India advantage (Wadhwa et al., 2008).

Given that EMNCs are undergoing rapid change and constantly evolving, it is essential for future research to seek to understand how maturity of EMNCs would alter intra- and inter-firm dynamics. Will the spatial division of labour of these pharmaceutical firms continue to favour India? Will inter-firm alliances continue to be an important strategy for these MNCs and will the nature of these collaborations change? Finally, perhaps the most significant question on EMNCs is whether they will effectively serve the needs of the base of the economic pyramid. This is a particularly important question for pharmaceuticals where “third world diseases such as malaria, chagas disease, tetanus, and lymphatic filariasis have not attracted developed countries’ attention” (Lalitha, 2002: 3545). Although Cipla is one of the leaders in anti-AIDS and anti-malarial drugs in the world, and Lupin is prominent in the provision of Anti-TB APIs, the analysis here leaves no doubt that the reengineering of these firms’ business models from being imitators in the domestic market towards emerging as multinationals is part of an increased focus on developed markets. This could be seen as pointing to a gap between the successful innovation and global competitiveness of the Indian pharmaceutical industry and access to its benefits at home (Chaudhuri, 2007). Whether this gap can be bridged will undoubtedly be the most important clinical trial for India.

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