

Technology transfer, joint ventures and the emergence of Indian multinationals: the case of the automotive industry^{♦♥}

Giovanni Balcet and Silvia Bruschi

1. Introduction: from inward to outward international operations

The expansion of multinational companies from emerging markets represents a new and very dynamic dimension of the world economy. Since the early 2000s, the annual growth rate of outward foreign direct investment (FDI) from emerging countries often exceeded that of industrialised countries (Unctad, 2007). South-South FDI has been a focus of interest since the 1970s (Lall, 1983a), but only in more recent years have outward FDI from emerging economies targeted also OECD countries, through huge cross-border mergers and acquisitions (Goldstein, 2006).

Indian corporations actively contributed to this trend. Since the liberalisation process started in the 1990s, a growing number of firms have been able to acquire frontier technologies from Western MNCs, often through innovation-oriented joint ventures (JV) and alliances, and in a subsequent stage to grow internationally, building multinational networks.

This chapter sheds light on the emergence of Indian multinationals in the automotive sector – including the manufacturing of cars, commercial vehicles (CV) and trucks, as well as their components – in relation to inward and outward FDI and the acquisition of technology. The chapter is based on a case study methodology (Yin, 2003). It takes into consideration two multinational companies (MNCs), one vehicle manufacturer – Tata Motors – and one auto component supplier – Bharat Forge, which are highly representative of these new actors. To carry out our empirical work we relied on several sources such as pieces drawn from the economic literature, companies' annual reports and web sites, news published in the Indian and international press, as well as direct interviews with the companies' management.

The first part of the chapter (sections 2 and 3) shows the evolution of the Indian automotive industry, from a highly protected sector in the 1980s, to the liberalisation process of the 1990s - that see the entry of several global as well as local vehicle manufacturers - and the new competitive scenario of the 2000s, characterised by a strong competition and a growing market. Sections 4 and 5 focus on the two above mentioned companies, which were able to go multinational after a process of acquisition of both technology and organisational competencies. The question is raised on the main sources of international competitiveness of these industrial groups. Two tables (table 4 and 5) present synthetically their main structural features as well as those of their multinationalisation process. Section 4, devoted to Tata Motors, also sheds light on the dynamics of industrial and technological alliances through the case of the Fiat – Tata agreement, involving not only operations in India, but also joint projects abroad. Complementarities and targets of the partners are assessed, in order to understand the role of international agreements and alliances in the early international expansion of Indian firms. Section 6 presents our conclusions.

2. From the import substitution era (1950s – 1970s) to the deregulation process (1980s-1990s)

The import substitution industrialisation policy, that dominated Indian planning since the 1950s, deeply affected the automotive industry. Its main goal with respect to the latter was to develop the production of tractors and commercial vehicles, while passenger cars, considered luxury goods, were not among the priority sectors. Imports of vehicles were restricted by protectionism through tariffs, quotas and administrative measures, while production and technology transfers were highly regulated.

[♦] This paper is part of the project “The two Asian emerging economic powers, China and India, and their relationship with the Italian economy”. The financial support of the CRT Foundation is acknowledged.

[♥] The authors are grateful to the top managers of Tata Motors, Fiat Auto and Bharat Forge, as well as to the Italian Trade Commission – Office of New Delhi, who kindly cooperated in this work.

University of Torino, Department of Economics. E-mail of corresponding author: giovanni.balcet@unito.it

Prices too were controlled, and export performance imposed on the enterprises. Local content regulations were intended to support local small and medium-sized component suppliers. This policy generated high rents from protection, and constrained productivity (Ahluwalia, 2007). Moreover, control policies and strict regulations negatively affected the import and diffusion of new technology in the country (Desai, 1988). As in the case of other industries, the automotive industry suffered from low volumes, obsolete technology, fragmented supply. The macroeconomic context was dominated by the slow 'Hindu growth rate'.

The first automotive production in India was developed by Ford and General Motors, that opened assembly units since the 1920s. In the 1940s few local enterprises made local assembly under license (Kim, 2004). In 1954, Hindustan Motors was the first local manufacturer, with the model Ambassador, produced in India under license of the British carmaker Morris, and adapted to the local market. Other producers were Premier Automobiles Limited, Standard Motors Products of India Limited and Sipani Automobiles. Mahindra & Mahindra dominated the segment of multi-utility vehicles (Government of India, 2002; Kim, 2003). New protectionist laws were introduced in 1957, in order to give incentives to the local production of components and parts. During the 1970s, the first technical and industrial agreements were signed between Indian firms and several Japanese producers, including Toyota, Mitsubishi, Nissan and some component suppliers (Kim, 2003).

It is however worthwhile to note that the policy carried out by the Indian government in the years of the self-reliant development did not have only negative consequences on the Indian economy and on the automotive sector in particular. So the large investments in the education system, especially as regards the science and technology field, produced a pool of skilled labour force that turned out to be a competitive advantage for different sectors of the Indian economy (Guha, 2007)¹. Moreover, the strategy of technological self-reliance itself proved to have positive fallouts, as recognised as back as in the early 1980s by Lall (1982: 144) who singles out this as one explanatory factor for the 'revealed comparative advantage' of Indian multinationals. The restrictions on technology imports indeed forced the Indian industry to develop technical capabilities, which generated the ability to manufacture 'a range of intermediate components of some sophistication' (Forbes, 1999: 408)².

Since the early 1980s, India started a gradual process of modernisation, opening markets to competition and promoting exports. A first wave of deregulation involved also the automotive industry. In 1985 the need of a license for new investments in the commercial vehicle sector was abolished, and the existing producers were allowed to enlarge their production capacity. Therefore the main manufacturers started to diversify their production (Singh, 2004, Becker-Ritterspach, 2006). Other deregulation measures followed.

In 1982, a turning point was represented by the creation of the JV between Maruti Udyog Ltd, a State-owned company that had not been able to make its production take off, and the Japanese multinational Suzuki Motor Company. This JV deeply affected the production system and technology standards in the Indian automotive industry. In a few years, since the second half of the 1980s, it represented a market share superior to 50 per cent. A very important flow of technology characterised this alliance. Several Japanese suppliers of Suzuki invested in India and started their production operations. New technology was introduced, as well as new design and management systems.

In 1991, the Indian macroeconomic situation deteriorated due to internal and international factors, which 'drove India into the arms of the International Monetary Fund and down the road of reform' (Guha, 2007: 314). Again, the automotive industry was involved in the deregulation process, and foreign investments were allowed up to 51 per cent for commercial vehicles and for component production (Chaturvedi, 2002). Also, the acquisition of foreign technology was liberalised. In the case of foreign capital participations higher than 51 per cent, the approval was given case by case (Singh, 2004). Local content regulations were gradually phased out.

In the mid 1980s the passenger car segment overcame the commercial vehicle one (Kim, 2003). In the 1983-1993 period, the production of passenger vehicles grew from 67,000 to 244,000 units (Humphrey

¹ This circumstance was confirmed also by our interviewees, who were in general satisfied with the level of education of the workforce they could draw from the Indian labour market.

² This skill brought for instance the Indian casting and forging companies, that are connected also to the automotive sector, to be quite competitive when liberalisation started (Forbes, 1999)

and Salerno, 2000). In the early 1990s, three Indian carmakers operated in the domestic market: Maruti³, the leader with more than 60 per cent of the market share, Premier Automotive Ltd, with 23 per cent and Hindustan Motors with 13 per cent. The market size was still limited in that period, corresponding to about 350,000 vehicles (against 500,000 in China and 900,000 in Brazil (Mukherjee and Sastry, 1996b).

FDIs developed rapidly after the liberalisation and many multinationals entered the market, including Ford, Honda, Fiat, Daewoo and Hyundai (see table 1). Almost all these newcomers operated through JVs, in which the foreign partner had usually the managerial power and control over technology (Mukherjee and Sastry 1996a). In the following years most foreign multinationals would acquire the control through majority ownership (Kim, 2004).

In the 1990s as well, some Indian corporations that had operated in other segments of the automotive industry or in other industries, entered this market and quickly acquired technology and signed international agreements. It is the case of Tata Group, while Mahindra & Mahindra started the production of passenger cars thanks to a collaboration with Ford. These corporations were part of big and diversified industrial groups, usually family-controlled, which represents a very common form of corporate governance in India (Ward, 2000). The number of models offered in the market highly grew, design improved and competition became much stronger. The Indian automotive industry showed a significant annual growth rate during the 1990s of about 14 per cent in real terms from 1992 to 1997, exceeding by about 30 per cent the growth rate of industrial production in general in the same period⁴. However, the growth of car demand was lower than foreseen by the optimistic view of the mid-1990s. Therefore, economies of scale and the volume of newcomers were much lower than expected. In 2000 the overall size of the market was still limited to about 574,000 vehicles, and crowded by a high number of competing producers, each with a small market share, with the exception of the dominant producer, Maruti, with a share exceeding 50 per cent (Richet and Ruet, 2006).

Table 1. After the deregulation: foreign direct investment and partnerships in the Indian automotive industry (1994 – 1998)

| Foreign company | Local partner | New company established and Year of Establishment | Capital shares | Models | Investment (million \$) and initial capacity |
|-----------------|----------------------|---|----------------------------------|-------------------------------------|---|
| Daewoo | DCM-Toyota | DCM Daewoo Motors Ltd, 1994 | 51% Daewoo; 34% DCM; Toyota 2,6% | Cielo | 1000 / 72,000 |
| Mercedes Benz* | TELCO** | Mercedes Benz India Limited, 1994 | 51% Benz; 49% Telco | Mercedes E220; D250; E230 | 116.67 / 9.000 |
| General Motors | Hindustan Motors | General Motors India Limited, 1994 | 50% GM; 50% HM | Opel Astra | 117/ 25,000 |
| Peugeot | Premier Automobile | PAL Peugeot, 1994 | 32% Peugeot; 32% PAL | Peugeot 309 | 207/ 60,000 |
| Rover | Sipani Automobiles | Sipani Automobiles Ltd, 1994 | 15% Rover; 65% Sipani | Montego Clubman; Montego D | 44 / Not available |
| Fiat | Premier Automobile | India Auto Limited (IAL), 1998 | 51% Fiat; 49% Pal | Fiat Uno; Palio and Siena world car | 50 / 60,000 |
| Ford | Mahindra & Mahindra | Mahindra Ford India Limited, 1995 | 50% Ford; 50% M&M | Escort ; Fiesta | 800 / 50,000 |
| Honda | SIEL | Honda Siel Cars India Pvt. Ltd., 1995 | 60% Honda; 40% SIEL | Civic | 283.33 / 30,000 |
| Mitsubishi | Hindustan Motors | Hindustan Motors Ltd, 1995 | 10% Mitsubishi; 90% HM | Lancer | 83,33 / 30,000 |
| Audi | Ashiya Motors Bombay | 1996 | 100% Audi | Audi A4 | Not available / Audi's cars were imported and distributed through a franchising network |
| Hyundai | - | Hyundai Motors, 1996 | 100% Hyundai | Accent | 500 / 120,000 |
| Toyota | Kirloskar | Toyota Kirloskar, 1997 | 74% Toyota | | 50,000 |
| BMW | Hero Motors | BMW India Limited, 1998 | 51% BMW; 49% Hero | BMW 7 Series | Not available / Not available |
| Volkswagen (VW) | Eicher | Volkswagen Eicher Ltd, 1998 | 50% VW; 50% Eicher | City Golf | 600 / Not available |

³ Suzuki, the Japanese partner of this JV, acquired the control of the company only in 2004; the Indian government was the majority owner from its establishment until 1992, when Suzuki reached 50 per cent of equity.

⁴ Consequently the share of the automotive industry in industrial production went from 4.3 per cent in 1992-3 to 5.4 per cent in 1996-7 (Chaturvedi, 2002).

Source: Kim, 2004; Mukherjee, Sastry, 1996a.

* Mercedes Benz and Telco established the JV Mercedes Benz India Limited, subsequently renamed as DaimlerChrysler India Private Ltd, today a wholly owned subsidiary of DaimlerChrysler group.

** Tata Engineering & Locomotive Limited, Tata's name until 2003.

3. Market fast growth and new actors in the 2000s

In the new century, the growth of the Indian automotive industry – though curbed by poor infrastructure, in particular as regards the road and highway system – has been pushed by several factors. Among them the growth rate of the Indian economy⁵, the presence of a growing middle class, a dynamic national innovation system (Nassif, 2007), the availability of skilled labour and low cost engineers⁶, an intellectual property protection system, the respect of the rule of law, and a developed financial system.

A role in such growth was undoubtedly played by the continuation of the liberalisation process in the early 2000s. A new policy was released 'to promote an automotive industry globally competitive' (Government of India, 2002: 2), and in particular to reach the following two targets:

- a. to develop 'an international hub for the production of small and economically accessible cars'
- b. to create a 'global source for automotive components'.

In 2001 India was obliged by WTO rules to abolish the last performance requirements still imposed to foreign carmakers (Kim, 2003). Since 2002, foreign investments in this industry have been automatically approved. Since 2004, the import of completely built-up vehicles (CBU) was made possible up to a value of 40,000 USD. Outward FDI was permitted without limitations as regards the share of equity (Singh, 2004). However, following a classic trade policy scheme oriented to stimulate delocalisation of foreign assemblers, since 2001 a tariff policy was implemented providing for a high custom duty of 105 per cent on the import of passenger vehicles (reduced to 100 per cent since 2005), and a lower duty of 35 per cent (progressively reduced in the following years and amounting to 10 per cent in 2007) on automotive components (SIAM, 2008a).

In the mid of the 2000s, 5 per cent of the Indian GNP could be ascribed to the automotive sector (Government of India, 2006) which employed, directly and indirectly, about ten million people in 2006-2007 (Siam, 2007). In the period 1991-2007, the whole transport industry accounted for 7.6 per cent of total FDI inflows (Government of India, 2007). Between 2002 and 2007 the automotive market grew fast: the passenger vehicle and the CV production respectively increased by 19 per cent and 22 per cent annually⁷, while the annual increase of auto component turnover was 27 per cent from 2001 to 2006 (ACMA, 2007). The Indian automotive industry nevertheless represents only 2.37 per cent of the world automotive production, and 0.3 per cent of world export (Government of India, 2006)⁸. In 2006 India was the eighth world producer of automobiles and light commercial vehicles (OICA, 2006). Figure 1 shows the localisation of the main clusters of automotive production in the country: Mumbai and Pune (where Tata, Mahindra & Mahindra and Fiat operate), Chennai (where Ford India, Hyundai and several component suppliers are concentrated) and Bangalore (where Toyota, Bosch and Iveco are located), Delhi (where Maruti-Suzuki is located) and finally the cluster in West Bengal where Tata Motors has located its new plants.

⁵ Indian GDP increased by 8.5 per cent in 2004, 9.2 per cent in 2005, 9.4 per cent in 2006, 8.8 per cent in 2007 (OECD, 2007a and 2007b).

⁶ The annual salary of an electronic circuit designer with a master's degree and five years of working experience is about 18,000 \$ compared to 84,000 \$ in the US; senior engineers' salaries vary from 30,000 to 40,000 \$ in India against 150,000-200,000 in the US (Mitra, 2007).

⁷ In the period 2002-2007 the production of passenger vehicles increased from 733,330 to 1,762,131 units and that of CV from 203,697 to 545,176 units (Siam, 2008b).

⁸ Indian exports of CV increased from 12,255 units in 2002 to 58,999 units in 2007, while passengers vehicles export expanded in the same period from 72,005 to 218,418 units (SIAM, 2008b); the share of exports over productions is therefore of 11 and 12 per cent for the two segments respectively. The most active carmakers in export activities have been Ford India, Hyundai and Maruti.

Figure 1 Localisation of automotive assemblers and component manufacturers in India



Source: ACMA 2007 with our elaboration

The segment of small cars is dominant in today’s landscape of the Indian automotive market, but growing income and the availability of cheap credit allowed for the growth of the upper segment of demand (Richet and Ruet, 2006). Table 2 shows the total sales of the automotive producers and their respective shares. The position of Maruti, even if decreasing, is still dominant, with more than 46 per cent of the market, while new investments have been made by other domestic and foreign companies, such as Tata and Honda.

Table 2. Main actors: passenger vehicle producers and market share (fiscal year 2006-2007)

| | Sales | Market share |
|--------------------------------|------------------|--------------|
| Maruti Suzuki | 635,629 | 46.1 |
| Tata | 226,893 | 16.4 |
| Hyundai | 195,261 | 14.2 |
| Mahindra & Mahindra | 89,734 | 6.5 |
| Honda Siel | 61,325 | 4.4 |
| Toyota Kirloskar | 51,343 | 3.7 |
| Ford | 41,798 | 3.0 |
| General Motors | 38,857 | 2.8 |
| Hindustan Motors | 13,663 | 1.0 |
| Skoda | 12,444 | 0.9 |
| Force | 8,499 | 0.6 |
| Fiat | 2,198 | 0.2 |
| Daimler Chrysler | 2,054 | 0.1 |
| Total | 1,379,698 | 100 |

Source: SIAM, 2008a.

The segment of automotive component suppliers is represented by a large number of players: more than 500 are the ‘organised’ ones, and more than 5,000 are part of the ‘unorganised sector’

(Government of India, 2006). The relationships between assemblers and component suppliers have been deeply affected by the entry into the Indian market of the big multinational carmakers that imposed new quality standards and induced a concentration process in this segment (Humphrey and Salerno, 2000; Kim, 2003). Many component suppliers diversified their clients, becoming suppliers of two or more assemblers. This process led gradually to situations of monopoly in the production of specific parts, allowing some medium-sized firms to dominate some niches of production and technology⁹ (Kim, 2003). Among component suppliers, several multinational producers are active, promoting partnerships and JVs with domestic suppliers. Table 3 shows the partnerships operational in the early 2000s.

Table 3. Main actors: component suppliers and their partners (2001-2002)

| Rank | Company | Parent or partner company | Location | Turnover (million \$) | Export share (%) |
|------|----------------------------------|--------------------------------------|------------|-----------------------|------------------|
| 1 | Motor Industries (MICO) | Robert Bosh | Bangalore | 341.8 | 12.0 |
| 2 | The Supreme Industries | Wavin Overseas b.v. | Mumbai | 143.5 | 5.7 |
| 3 | Brakes India | TRW | Chennai | 120.8 | 14.9 |
| 4 | Subros | Denso, Suzuki Motor | Delhi | 101.6 | 0.2 |
| 5 | Lucas-TVS | Lucas | Chennai | 101.1 | 3.9 |
| 6 | Bharat Forge | Metalart | Mumbai | 100.4 | 23.4 |
| 7 | Delphi Automotive Systems India | Delphi | Delhi | 100.0 | 16.8 |
| 8 | Visteon Automotive Systems India | Visteon | Chennai | 100.0 | 56.1 |
| 9 | Rico Auto Industries | FCC | Delhi | 95.8 | 1.9 |
| 10 | Sundram Fasteners | Dura Automotive | Chennai | 92.2 | 18.9 |
| 11 | Omax Autos | Honda Motors | Delhi | 79.0 | not available |
| 12 | Munjal Showa | Showa | Delhi | 78.2 | not available |
| 13 | Wheels India | Titan Europe | Chennai | 66.5 | 13.2 |
| 14 | Jay Bharat Maruti | Hamamatsu | Delhi | 58.4 | not available |
| 15 | Motherson Sumi Systems | Sumitomo Wiring | Delhi | 57.7 | 16.1 |
| 16 | Gabriel India | Arvin Industries | Delhi | 56.3 | 5.3 |
| 17 | Fenner India | Fenner | Chennai | 54.9 | 14.6 |
| 18 | Premier Instruments & Controls | Denso, Nippon Seiki WABCO, Air Brake | Coimbatore | 53.7 | 7.4 |
| 19 | Sundaram_Clayton | System | Chennai | 52.5 | 3.0 |
| 20 | Denso India | Denso | Delhi | 50.5 | not available |

Source: Kim, 2003.

These partnerships have been a major channel for technology transfer and acquisition by Indian enterprises. Japanese enterprises have been the most active partners, taking part in the early 2000s in 145 partnerships out of a total of 482 (Kim, 2003)¹⁰. Partnerships and acquired technologies have been the condition for a subsequent expansion abroad, in a first stage through export and in a second stage through FDI and international production (Banik and Bhaumik, 2007)¹¹.

⁹ For example, Ashai India Glass controls 95 per cent of the market of glass (Kim, 2003).

¹⁰ In this context the success stories of Sundram Fasteners Limited (SFL), and that of Sona Koyo Steering Systems Limited, both located in Tamil Nadu State, provide good examples of industrial and technological alliances with European and Japanese multinationals, as efficient instruments of technological acquisition

¹¹ SFL, which exported fasteners to the Opel plant of GM in Germany, became the main supplier of radiator caps to the GM productive network worldwide, after the re-location of machinery from Britain. In 2004, it opened a plant in China, and diversified into new markets, including Japan.

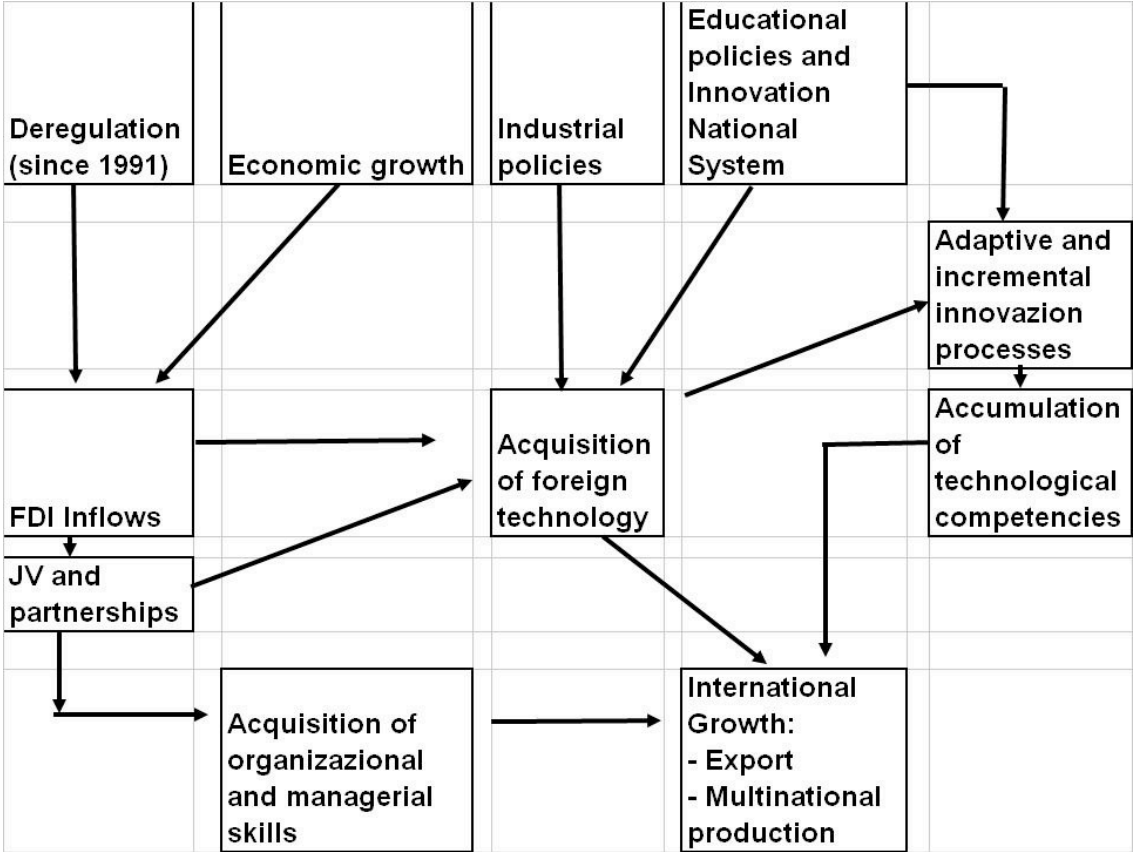
It is meaningful that the exports of car components have been more dynamic than those of assembled vehicles, increasing from 625 million of USD in 2000-1 to 2,930 millions in 2006-7 (ACMA, 2006). This evolution is indeed due to FDI by global component manufacturers, following the international carmakers, and rationalising productions on a regional or global scale.

These export flows have also been stimulated by export requirements imposed on auto companies by the Indian regulations (and removed only in 2001). It is worthwhile to note that several domestic component suppliers became the source of big multinational carmakers also in other countries¹².

The main destinations of component exports are North and South America (31 per cent) and Europe (30 per cent) followed by Asia (18 per cent) and other areas, with the USA, Germany and UK being the main importers. This structure shows that the global configuration prevails over the macro-regional configuration of supplier networks. India seems to be directly inserted in the global economy, while Asian networks have a secondary role.

The multinational growth, therefore, as well as the interconnection between inflows and outflows of FDIs, characterises both the automotive assemblers and the main component suppliers. Figure 2 shows the main relations and interactions we tried to explore in this chapter.

Figure 2 - Emergence of Indian multinational firms



We shall now examine the trajectories of two emerging Indian multinationals which are representative of the new trends in this industry.

Sonia Koyo Steering Systems Limited, the largest manufacturer of steering gears in India, is a JV between Sona Steering, that benefited from the indigenisation process of Maruti, and the Japanese Koyo Seko. The JV was not only able to absorb Japanese technology, but it introduced continuous improvements.

¹² It is the case, for example, of Rico Auto Industries and Wheels India, suppliers of Ford also in Mexico, South Africa and China (Kim, 2003).

4. The emergence of Tata Motors as a multinational investor

Evolution and structural characteristics

Tata Motors Limited is part of the highly diversified Tata group, one of the oldest Indian family-owned enterprises, established in 1868 by Jamsetji Tata,¹³ and operating in the textile industry. Before the independence, the Tata group diversified into the steel industry, electricity and chemicals; it also opened a luxury hotel chain and an international airline. In all these industries, it played the role of a pioneer in the Indian market (Goldstein, 2008). It also created new social standards, introducing eight-hour work day and paid leave, so opening a long tradition of corporate social responsibility, that is still alive.

Today it is the most important Indian industrial conglomerate: in 2007, the group's turnover amounted to 29 billion US \$, equivalent to 2.9 per cent of India's GDP, with a staff of 289,500 people. The group encompasses 98 companies, 28 of which are listed, whose activities range from ITC to engineering, from energy to consumer goods, from services to chemicals. Tata Motors was established in 1945 with the name 'Tata Engineering and Locomotive Company' (TELCO), as a manufacturer of locomotives and other engineering products. It was renamed Tata Motors in 2003. TELCO started manufacturing commercial vehicles in the 1950s, while it entered the passenger vehicle market only in 1991 with the launch of Tata Sierra. In 2006-2007 it achieved a turnover of 8 billion US \$, selling 334,238 commercial vehicles and 246,042 cars, both in India and abroad. In 2007, the company employed 22,000 people (Tata Motors, 2007).

The company ranks second in the list of Indian producers of passenger and light commercial vehicles after Maruti (397,055 vs. 666,935 units manufactured in 2007) and first in that of medium and heavy commercial vehicle producers before Ashok Leyland (185,152 vs. 83,104 units manufactured in the same year) (SIAM, 2008a). Over time, it accumulated competencies and increased its competitiveness in a product area ranging from heavy commercial vehicles to light trucks, including buses. In this area, economies of scale were crucial and the feature of the domestic market acted as a driving force. A good example of this product area is given by the successful mini-truck Tata Ace, introduced in 2005, a very versatile product designed for commercial as well as for agricultural and handicraft activities.

The production of passenger vehicles covers sport utility vehicles, multi utility vehicles, sedan cars and space wagons. Around the main production area in Pune, 65 per cent of suppliers are located in a large Industrial Development Area nearby. This location is consistent with an externalisation process and the progressive introduction of toyotist just-in-time systems.

Tata Motors has four main production centres in India, Jamshedpur, Pune, Lucknow and Pantnagar. A fifth greenfield plant was built in the State of West Bengal (raising many protests from the farmers expropriated to make room for it) to produce the Nano model, a low cost car priced 100,000 rupees, about 2,500 US \$. It was unveiled in January 2008, when it was announced that sales should start later the same year. The production capacity installed is 250,000 units per year. The new model is intended to allow Tata to approach the target it is pursuing, of reaching the market leader Maruti in the passenger car market, the gap being about 30 per cent of total sales in 2007 (see table 2). About 2 per cent of its annual turnover is devoted to R&D activities, carried out by a huge R&D unit, located in Pune, with 1,400 engineers and researchers. Other two research facilities are located in Jamshedpur e Lucknow.

External sources of technology played a crucial role in the development of Tata Motors capabilities over the last decades: among them, the importance of the licensing agreement with Daimler Benz signed in 1954 should be stressed as the source of a strategic change. It opened to TELCO the opportunity to operate in the automotive business, through the entry into the industrial vehicle and the medium commercial vehicle sectors (see table 4). Daimler Benz then entered the capital of the Indian company. Another JV was established in 1994 with the same partner, to manufacture Mercedes Benz cars¹⁴. This confirms the important role of this German-Indian relationship.

¹³ The Tatas are a Parsi family from the Zoroastrian community in Mumbai.

¹⁴ The model Mercedes E220 was launched in 1995. In 2001 Tata left the JV that was then taken over by the German partner.

In the course of time, Tata entered several agreements and collaborations with car and commercial vehicle producers, as well as with components suppliers (Kathuria, 1996). These agreements allowed a long term process of acquisition of industrial know-how and core competencies in automotive manufacturing. In more recent years, important technology-oriented agreements have been signed with Cummins Engine Co (USA), Daimler Benz, MG Rover, Marcopolo and IVECO, as well as with research institutions for pre-competitive R&D (see table 4)¹⁵. In 2000, a JV was established in India with the Japanese Hitachi Construction Machinery: Telcon, a former wholly owned subsidiary of Tata Motors, whose activities concern the designing, manufacturing, assembling, selling, distributing of earth moving machinery and construction equipment. In this way Tata got access to newer technologies and processes¹⁶.

International growth

The company's exports started in 1961 with commercial vehicles, with the shipment of trucks to Sri Lanka, and in 2000 as regards cars.¹⁷ Today, Tata's commercial and passenger vehicles exports reach Europe, Africa, the Middle East, South and South East Asia and Australia, amounting in 2006-7 to 53,000 units sold for 70 million US \$ (8.55 per cent of total revenues) (Tata Motors, 2007). Early foreign production by TELCO took place in the early 1970s in Singapore and Malaysia, through JVs.

In 2002 Tata entered the British market. The Indian company and MG Rover agreed that Tata would modify its model Indica according to Rover's suggestions, and that the car would be distributed in the UK with the name CityRover under Rover's trademark and through the retail network of Rover itself. An important acquisition was made in 2004 in South Korea, targeting the Daewoo Commercial Vehicle Division, that became a wholly owned subsidiary, including a relevant R&D unit. Two important acquisitions took place in 2005, both concerning design and engineering centres: for cars in the UK, for buses in Spain. These acquisitions represent a new step in the multinational growth process, both for their geographical destination, Europe, and for their main motivation, the acquisition of strategic assets and human resources.

In 2006 an agreement was signed with the Brazilian company Marcopolo to set up a JV in India to manufacture buses and coaches both for the Indian and the foreign markets. In the same year, an agreement was reached with a Thai company to manufacture and distribute Tata's pick-ups in Thailand. In 2008, Tata Motors has assembly units in Malaysia, Bangladesh, Ukraine, Kenya, Russia and Senegal. In 2004, the company was listed at the New York stock exchange and the following year it produced and sold its millionth passenger vehicle.

Finally in 2008 Tata Motors acquired from Ford its British affiliates Jaguar and Land Rover for 2.3 billion USD, strengthening its presence in Europe through the control of well-known brands, and diversifying in two upper-segment niches.

These multinational operations correspond to both market-oriented and asset-seeking strategies, as in the case of acquisitions in Europe.

Competitive advantages

Tata Motors is a major example of a trajectory that we can observe also for other emerging Indian carmakers: it started as an automotive company, operating within a larger industrial group, producing other vehicles than cars. In the case of Tata Motors, these sectors are represented by commercial and industrial vehicles, and by buses. Only in a second stage, after a long process of accumulation of skills, technologies and managerial competencies, and when the national policies and the market conditions evolved, Tata Motors decided to enter the passenger car business.

¹⁵ Another common venture was set up in India with Holset Engineering Company (UK) to manufacture turbochargers to be used on Cummins engines (Cummins itself acquired the total control of this company in March 2007).

¹⁶ Five years later Hitachi's stake in the JV was raised to 40 per cent and with the same agreement greater collaboration is envisaged between the JV and its parent companies, including the sourcing, by Hitachi, of components and machines from Telcon, introducing newer products of construction equipment in India, setting up a product development facility in India and making Telcon a part of HCM's global network.

¹⁷ In that year, a limited number of Tata Indica were exported to Malta.

The fact of belonging to a large conglomerate group, which played a prominent role in the economic and social history of India, and characterised by a well-known brand, represents a crucial asset for Tata Motors, whose value can be assessed in terms of 'ownership advantage' *à la* Dunning. Tata brand was defined as 'very powerful' in India by the interviewed managers of Tata Motors. Synergies exist at the financial and marketing level, while the mobility of top managers (for instance, between Tata IT and Tata Motors) contributes to spread technological knowledge and organisational skills. Intense exchange of information and knowledge transfer, even if difficult to quantify as often informal, are reported to take place between the different companies of the group.

The large dimension of the domestic market acted as a driving force, *via* the economies of scale it generated, in a first instance for domestic growth, and in a second instance for multinational expansion. The opening of the Indian economy then stimulated the group to react through an accelerated internationalisation.

The financial dimension of the group represented another ownership advantage, connected to the ability to have access to the increasingly developed Indian financial markets, and to global liquidity.

Deep engineering expertise, depending on the past experience accumulated by the group in its long history, may be considered a key factor of competitiveness for Tata Motors, as stated by the interviewed managers. Also in this case, low cost engineers and innovation-oriented international JV, mainly with major component and module suppliers, have been an essential instrument of learning, as can be expected on the base of relevant theories (Balcer, 1990).

5.1. A global alliance of the 2000s: Fiat-Tata

In 2005 Fiat opened negotiations with Tata Motors in order to develop a cooperation agreement in the industrial and technological field. In January 2006 the first agreement concerned the distribution and sale in India of the Fiat models Palio and Siena, as part of a global strategy for a world car, developed by Fiat since the mid-1990s (Balcer and Enrietti, 2002)¹⁸.

A second agreement, signed in December 2006, expanded the alliance from the commercial to the industrial dimension¹⁹. A JV was created, in order to produce a common vehicle in the Fiat plant of Ranjangaon, in the area of Pune, never operational before. In the same area, Tata has a research and development centre, as well as its main factory: both have been involved in the cooperation process. The new Fiat-Tata productive pole created a favourable condition for the location of component suppliers, including the multinational ones (Altavilla, 2006)²⁰.

The alliance with Tata represents a great opportunity for Fiat to penetrate the Indian market, where up to now its performances have been disappointing. The target stated is 70,000 vehicles sold in India in 2010²¹.

If the strategic asset provided by the Indian partner is the access to the domestic market, the knowledge of the institutions, rules and actors in the Indian automotive industry, the strategic asset provided by Fiat is mainly of a technological nature, *i.e.* the diesel multi-jet engine that represents a firm-specific advantage of this company. Small diesel engines are especially demanded in the Indian market. It is interesting to note that the same diesel engines are also produced by Maruti under a Fiat license. As a consequence the 1.3 multi-jet engine is becoming the most common diesel engine in the Indian market, and it is also expected to be exported by Suzuki Motors to Europe.

¹⁸ Tata engaged to commercialise other Fiat models (Bravo and Cinquecento), imported respectively from Italy and from Poland.

¹⁹ The Fiat-Tata agreement of December 2006 also strengthened the role of Tata as a distributor of Fiat models, with the involvement of 100 dealers of Tata network. Total investment by the two partners in the JV is estimated to exceed 660 millions euros.

²⁰ The output of the JV is the production of both Fiat (Linea and Grande Punto) and Tata models, mainly for the domestic Indian market and to a lesser extent to be exported. Moreover, the production of engines, powertrains and gear boxes is planned in Ranjangaon. The production capacity target is 130,000 vehicles and 300,000 engines in 2010. The agreement also foresees the exports of the cars manufactured by Tata in the JV.

²¹ In April 2007 the first cars Palio and Stile have been produced by the JV in Ranjangaon, while the launch of Grande Punto and Linea, a new world-car, should follow within 2008.

Table 4 - Indian automotive multinationals: Structure, strategies, performances

(Fiscal year 2006-2007)

| Company structure and company information | Tata Motors | Bharat Forge |
|---|---|--|
| ownership structure | family conglomerate group | family conglomerate group |
| listing | Bombay Stock Exchange; National Stock Exchange; New York Stock Exchange | Bombay Stock Exchange, Pune Stock Exchange, National Stock Exchange; FCCBs listed on Luxembourg Stock Exchange and on Singapore Exchange Limited |
| sales | 8 billion \$ | 488 million \$ |
| employees | 22000 | 4500 |
| R&D | | |
| R&D expenses | 2.9% of turnover | 0.24% of total income |
| staff employed in R&D activities/total staff | 2500 | 120 |
| patents granted to the company; licensed out technology | yes: 9 granted in 2006-07 | not available |
| external sources of technology | <p>1948 collaboration with Marshall Sons (UK) for steam road rollers</p> <p>1954 license from DailmerBenz to manufacture CV</p> <p>1993 JV with Cummins Engine Co (US) to manufacture high horsepower emission friendly diesel engines</p> <p>1994 JV with Daimler Benz/Mercedes (Germany) to manufacture Mercedes Benz cars</p> <p>2000 JV with Hitachi Construction Machinery (J), Telcon; design, manufacturing, assembling earth moving machinery and construction equipment</p> <p>2002 Agreement with MG Rover (UK) for adapting Tata Indica for the European market</p> <p>2006 JV with Marcopolo (Brazil) to manufacture buses</p> <p>2006 JV with Fiat to manufacture cars, engines, gear boxes and powertrains</p> <p>2007 Memorandum of understanding for an agreement with Iveco (Italy) to explore strategic alliances opportunities</p> <p>cooperation with research institutions/universities in the pre-competitive phase</p> | <p>1962 technical agreement with SIFCO (USA) for hammer forging technology</p> <p>1984 technical agreement with Tokyo Drop Forge (Japan). Technology up-gradation and quality improvement for hammer forging</p> <p>1986 technical agreement with Jidosha Buhin Kogyo (Japan) for machining of front axle beams</p> <p>2004 Technical Know-how and assistance from MetalArt Corporation (Japan) for the manufacture of forged products for Toyota's JV in India</p> <p>Import of capital equipment (German press lines in 1991 and in 2000; Japanese press lines in 1996)</p> <p>collaboration with Indian, British, German and Swedish universities for internship and use of test facilities</p> |

| | Tata Motors | Bharat Forge |
|--|--|---|
| external sources of technology (continued) | Import of disembodied technology: 1 transactions/year in 2001 and 2003; 2 transactions in 2004 and 2005; 1 in 2007 outsourcing of R&D to external firms | |
| production strategies, company organisation | | |
| platforms | 2 for cars; 3 for CV | does not apply |
| co-design with clients / vendors | yes | yes |
| participation in clients' first tier system / organisation of vendors in tiers | vendors organised in tiers; 300-400 vendors in the first tier | |
| local content | not available | does not apply |
| certification | all CV plants certified TS16946 for quality; car business certified ISO 9001 for quality and ISO 14001 for environmental management. | Certified ISO/TS 16949:2002, ISO 9002; ISO 9001:2000; ISO 1400; QS 9000; in India: ISO 27001 |
| just in time | applied with about 60 vendors | not available |
| adaptation of the product to the local needs in the foreign countries | yes (e.g. pick ups for Thailand) | does not apply |
| internal organisation (functional, divisional,...) | not available | not available |
| human resources' training programmes | yes | yes |
| corporate values' integration across countries | not available | integration and strategy meetings programme; intense exchange programmes involving the personnel of different units |
| ICT solutions (videoconferences, internet....) | yes | yes |
| advertising expenses (in % over sales) | not available | n.a. |

A different agreement signed in February 2007 concerned light commercial vehicles, and it is of particular interest because of its geographical dimension. Under this agreement, a pick-up will be produced by Fiat under Tata license in Argentina, in the Fiat plant of Cordoba that has been under-utilised since the financial crisis of 2001 and the collapse of the regional integration of production of the Fiat group in Mercosur. In this case, the rules of the partners are inverted, as the industrial know-how is mainly provided by Tata Motors, and the access to the Mercosur and more generally to the Latin American market is provided by Fiat²².

²² New developments in the Latin American area are possible, both in the car industry and in the industrial vehicles industry, and are the object of a memorandum of understanding agreed upon in 2007 between Iveco, a company of the Fiat group, and Tata Motors.

Table 5 - Indian automotive multinationals - International strategies

| | Tata Motors | Bharat Forge |
|--|--|---|
| internationalisation activities and strategies | | |
| exports/sales | 8,5% of revenues | 38,6% |
| main exports destination | | US, European countries, Japan, Russia, China |
| first productive operation abroad | 1974 - jv in Singapore - manufacturing of precision tools | 2004 |
| foreign production/total production | not available | 54% (overseas subsidiaries turnover/consolidated gross sales) |
| existing operations abroad (engaged in production or R&D activities) | <p>2004 Acquisition of Daewoo Commercial Vehicles (Korea) - manufacturing of LCV and R&D for the same segment</p> <p>2005 - UK - acquisition of 92.5% of Incat - design center for cars</p> <p>2005 Spain - acquisition of 21% of Hispano Carrocera, design and manufacturing of bus</p> <p>2007 - Thailand - jv will manufacture pick ups</p> | <p>2004 Acquisition of Carl Dan Peddinghaus (Germany) - Activities: manufacturing of engine, chassis and railroad components; R&D.</p> <p>2004 - Acquisition of Aluminiumtechnik GmbH & Co KG (Germany). Manufacturing of forged chassis parts. R&D</p> <p>2005 - Acquisition of Federal Forge (USA). Forgings for cars and trucks</p> <p>2005 - Acquisition of Kilsta AB (Sweden) and of its seven subsidiaries in Scotland - Production of crankshafts, front axle beams, steering arms, transmission parts for automotive Industry; R&D</p> <p>2006 - Jv in China with FAW Group. Manufacturing of Parts for Engine, Chassis, Front Axle Beam, Transmission, Gear box, Driveline Catering for commercial Vehicle & Passenger Car; components for the railway sector and the construction industry machines</p> |
| relationships with foreign units | strict control | strict coordination |
| motivations | access to new customers; access to complementary resources; market access; risk reduction; improve legitimacy | being near to ready-made customers, gaining new customers, getting access to new technology and certified facilities; improving turnover; access good practices; de-risking the business; increasing economies of scope and therefore scale up the value chain |
| ex ante competitive advantages | low cost advantage; the strong historical competences in the engineering field; being part of a group; multiple listing (also abroad) | Availability of trained manpower at low cost; being part of a group; leadership on the internal market; customer base abroad, served through export; scale and scope economies; good technology level in designing and manufacturing served through exports. |

5. Bharat Forge: getting an integrated production structure on an international scale

Evolution and structural characteristics

Bharat Forge was established in 1961 to manufacture forgings for the automotive sector. It is the flagship company of the family group Kalyani, whose activities range today from forging to auto components, from renewable energy and infrastructure to speciality chemicals. The group employs 10,000 people worldwide and its turnover amounts to 2.1 billion \$ (www.kalyani.com). Bharat Forge's main business is in the manufacturing of components, both in steel and aluminium, for passenger cars, commercial vehicles and tractors. It counts 35 global OEMs and tier one suppliers among its customers²³. Nevertheless a diversification process has begun in the non-automotive sector – in particular in aerospace, oil and gas, energy, rail, marine, mining and infrastructure – which in 2008 represents about 17 per cent of turnover. In 2006-2007 Bharat Forge had a standalone income of 488 million \$ (Bharat Forge, 2007), and was the largest forging company in Asia and a leading chassis component manufacturer in the world (www.kalyanigroup.com; www.bharatforge.com). Some 76 per cent of its revenues came from outside India, with Europe representing 48 per cent of the total revenues (Bharat Forge, 2007).

In 2008 Bharat Forge is employing 4,500 people. The structure of its manpower has changed considerably in the last fifteen years²⁴: white collar workers have increased from about 15 per cent to 85 per cent. In connection with the importance attributed to the human resource, the company has undertaken specific programmes of training/talent scouting²⁵. In general, employees' training is devoted a special attention and life-long training programmes are developed, also in collaboration with university institutions. Efficiency is also pursued by spurring the workforce engagement through a compensation system that includes incentives²⁶.

Investment in R&D amounted to 0.24 per cent of total income in 2006-2007 and this activity employed about 120 people. As regards external sources of technology, as far back as 1962 the company signed its first technical agreement with a US company. Other similar agreements with Japanese companies followed in the 1980s and 1990s, while in the 1990s and early 2000s equipment was imported from abroad in several occasions (in particular from Germany and Japan; see table 4 for details). That process gave the company the possibility of upgrading its technological level, growing 'from a primarily automotive ancillary to an engineering enterprise' (www.bharatforge.com) as well as to expand its production capacity.

International growth

Exports started towards Greece in 1972, followed by supplies to former Soviet Union in the 1980s. The export business grew considerably in the early 1990s with the breakthrough in developed countries markets such as Japan, the USA and the UK as regards engine and suspension components. The company is in 2008 the largest exporter of auto components from India (www.bharatforge.com). Important destination countries, besides those mentioned above, are also Russia, China and Europe.

Since the early 2000s the company has developed a productive presence, besides India, in the USA, Germany, Sweden, the UK and China. This result was achieved through successive acquisitions of developed country based companies often near bankruptcy (Bouissou, 2007) and the establishment of a JV in China (for details see table 5).

²³ Among them Toyota, BMW, General Motors, Volkswagen, Renault, Volvo, Cummings and Dana Corporation can be mentioned.

²⁴ The reduction of about 1,000 units of the workforce carried out at the end of the 1990s also contributed to this change and as a consequence in 2002 Bharat Forge employed 2,521 people (Bharat Forge, 2002).

²⁵ Such programmes are developed in collaboration with both foreign universities (in the UK, Germany and Sweden) and technical colleges in Indian rural towns ('talent pipeline project') (Elliott, 2007)

²⁶ The incentive system (about 6 per cent) is based on performance and adds to a wage level that (according to the company) is higher than the sector's average one.

Competitive advantages

The low cost of well trained human resources can be mentioned among the company's advantages²⁷. Nevertheless, other factors played a role along with it. The good technology level in designing and manufacturing is among them²⁸. Moreover, the same is true as regards the scale²⁹ and scope economies³⁰ that the company already enjoyed, and the organisation of the productive process, that gave Bharat Forge a very fast 'speed to market' product development time (Bharat Forge, 2003). Besides, being part of an industrial group that has a presence in the steel production, the company got access to this resource at favourable conditions. Lastly, Bharat Forge's interviewees mentioned to us their good management capability as a valuable resource in this context.

Through its multinationalisation process Bharat Forge wanted to keep growing beyond the Indian market. This was done in the previous years through exports but this could not be done that way further. Many customers indeed requested the presence of their component suppliers near their plants: the choice was that of pursuing a 'follow-the-client strategy'. The acquisitions offered the opportunity of working near the ready-made customers, as well as to access the customer base of the target companies. Besides, by going multinational, Bharat aimed at accessing resources that could improve several aspects of its business: R&D in first place but also other aspects such as quality and delivery. Another aim of the process was to de-risk the business, entering different geographical markets that have separate business cycles. Lastly, the international expansion would allow the company to increase its economies of scope, putting the company in many cases in the position of supplying not only the single component but more complex subsystems (Kalyani, 2004)

Technology transfer among the different units is an important result of the company's expansion overseas and is mainly carried out through personnel exchange programmes³¹. In addition, thanks to its multinationalisation, Bharat Forge could adopt a dual shore designing and manufacturing system³². The 'learning to learn' aspect is moreover dealt with carefully thanks to the implementation of a benchmarking process to single out the best practices in the different sectors, followed by exchange programmes for the personnel to spread such practices within the company and therefore cross fertilise its different units.

Summing up, Bharat Forges's multinationalisation process is an accelerated one, counting four acquisitions and one JV since 2004, that brought the company to have a productive presence in five

²⁷ Bharat Forge's interviewees pointed out that today (2008) such advantage remains valid only for the lower level of the workforce, while the management's remuneration level is not so distant from the European one.

²⁸ In the early 2000s, the company had fully automated press lines, CAD/CAM systems (Bharat Forge, 2003) and made also a wide use of IT technologies. So at the beginning of the 2000s it introduced a virtual manufacturing system and an integrated supply chain management system. The technological level reached by Bharat Forge is also among the factors that allowed it to scale up the value chain and increase the importance of machined components in its business (accounting for 44 per cent of Bharat Forge's sales in 2001-2002 from 26 per cent in 1996-1997; Bharat Forge, 2002), reducing that of raw forging. Besides, the company was certified ISO 9002 and QS 9000 as back as during the 1990s (www.bharatforge.com).

²⁹ In 2002 Bharat Forge was one of the few companies having two 16,000 metric tons (MT) forging press lines; besides, with a capacity of 120,000 MT per annum, it was the largest single location commercial forging facility in the world and among the top 3 players worldwide (Bharat Forge, 2002; Bharat Forge, 2003). Moreover, in 2001-2002 it was already supplier of global vehicle manufacturers as well as tier one component suppliers such as Daimler Chrysler, Caterpillar-Perkins, Renault Vehicle Industries, Toyota, Dana Corporation's Spicer Europe, Cooper Cameron Corporation. In the same year the company had a market share of more than 50 per cent in US heavy truck axle component segment (Bharat Forge, 2002). In 2002-2003 exports represented 39 per cent of sales, the company had 24 global customers and it was the leading axle component manufacturer in the world, with 25 per cent market share (Bharat Forge, 2003).

³⁰ Production and export were already fairly diversified, if we consider that in 2001-2002 about 20 per cent of the export were outside the automotive business (Bharat Forge, 2002).

³¹ In the case of R&D activities the monitoring of the best practices and the actions aimed at their transfer across the different units are coordinated by Bharat Forge's Centre for excellence in R&D, located in Germany.

³² The company can design and manufacture each of its products in at least two locations, and therefore it is able to fill each order either from a low cost location such as India or China, at a lower cost but with a longer delivery time, or from an overseas unit operating near to the final customer, which involves a higher cost but, among other advantages, a very short delivery time (www.bharatforge.com). This system implies a coordinated management of the different company units across countries, which contrasts the 1980s third world multinational companies' feature of a loose or inexistent coordination of the parent company over its overseas subsidiaries (Wells, 1983; Lall, 1983b).

countries over three continents. Behind such process one can discern market access as well as resource augmenting motivations (Dunning, 2006). Nevertheless the features of Bharat Forge's multinationalisation process do not completely reflect those highlighted as typical for the emerging countries companies by some scholars' recent contributions. In our opinion this is true as regards the lack of OLI advantages and the circumstance that such companies "*internationalize in order to grow large*" (Bonaglia et al., 2007: 370).

6. Conclusions: from the acquisition of technology to multinational growth

This chapter presents the first results of a research work on Indian multinationals. Assuming an evolutionary approach, it sheds light on the emergence of Indian multinationals in the automotive sector and on the role of technology transfer and acquisition, as well as of productive and technological alliances, in creating the conditions for the multinational growth of Indian firms.

We can point out our main findings as follows.

A large empirical evidence suggests that low cost and skilled labour, including engineers, managers and technologists, represent a main competitive advantage (or 'ownership advantage', in terms of John Dunning's paradigm) for the Indian emerging multinationals.

The huge dimension and fast growth rate of the domestic market represent a major source of competitive advantage for the new multinationals from India. It is the case for automakers in the commercial vehicle, pick-up and low-cost vehicle segments. It is also the case for the auto component sector, whose growth was driven by the booming domestic car and commercial vehicle sectors, and by the entry of multinational assemblers. Becoming suppliers or partners with global car manufacturers or with their tier one suppliers offered the Indian companies the possibility to leverage these linkages and to make their way to global markets easier.

The conglomerate nature of the Indian groups, generally family-controlled, generated economies of scale and economies of scope. It deeply affected the emerging multinationals. Intra-group technology transfer, along with information flows, represent a strategic advantage and support international growth. The financial strength of these groups represents a crucial condition for multinational growth.

Some of the Indian emerging multinationals are market leaders worldwide in specific product segments and niches. It is the case of Bharat Forge in the manufacturing of some chassis components. The internationalisation process is then based on such leadership, allowing a two-fold diversification process, both in new markets and in new industries.

The innovation processes are in most cases market-driven, as in the case of the low-cost car project launched by Tata. This new dimension of technological innovation processes may recall in some way the 'appropriate technology' debate in the 1970s.

Foreign operations are mainly market-oriented, aiming at penetrating new markets or enlarging market shares. However, asset-seeking and technology-seeking motivations also play a significant role in production and R&D operations abroad. The non negligible *ex ante* advantages possessed by the multinationals we took into consideration let us favour the definition of asset-augmenting FDI's.

Asia is not a dominant destination for export flows and multinational operations, that are also largely oriented to both Europe and the US. This seems to suggest that Indian corporations tend to grow from the continental size of their domestic market directly to a global dimension.

The importance of JVs and international alliances is well showed by the story of Maruti-Suzuki, that shaped the Indian automotive market, and then evolved from a JV to majority-controlled subsidiary. Also the recent alliance Fiat-Tata illustrates the role of the international alliance for the Indian emerging multinational as well as for the foreign investor. In the case of Bharat Forge, on the contrary, the function of international alliances in the acquisition of foreign technology seems to be replaced by the import of equipment, and by technological agreements on specific products.

The different trajectories we have observed in our case studies confirm how important the issue of hybridisation is, in order to explain the growth patterns of the new multinationals from India, and from emerging countries in general. While some common features are emerging, there is not one best way to go multinational, and international strategies reflect different paths and competitive assets.

Policies played a major role: it is widely acknowledged that trade policies moving from the rigid protectionism of the 1980s to the opening and liberalisation of the market played a major role, pushing Indian groups to expand abroad. However, the impact of the import-substitution decades should not be

underestimated as a key element in building some of the pre-conditions for industrial growth, including the supply of skilled labour. Industrial policies continue to deeply influence growth processes. The macroeconomic policies in the 1990s and in the 2000s created favourable conditions for outward FDI flows, via the current account surpluses that they generated.

The Indian national system of innovation and the educational system represented essential conditions for the acquisition of industrial technology and of the organisational capabilities that allowed the industrial groups to go abroad. They explain why the Indian ability to absorb foreign-generated technology evolved into the capacity to introduce original improvements, incremental innovations and finally new products and processes.

References

- ACMA, Automotive Component Manufacturers Association of India, 2006, *Industry Statistics*, www.acmainfo.com/industry_stat.htm.
- ACMA, Automotive Component Manufacturers Association of India, 2007, *Indian Automotive Component Industry "Engine of Growth Driving the Indian Manufacturing Sector"*, http://acmainfo.com/docmgr/Status_of_Auto_Industry/Status_Indian_Auto_Industry.pdf
- Ahluwalia, I.J., 2007, *Industry*, in Basu, K. (ed.), «The Oxford companion to economics in India», Oxford University Press, New Delhi.
- Altavilla, A., 2006, Presentazione all'Università degli Studi di Torino, Facoltà di Scienze Politiche, 2 dicembre.
- Balcet, G., 1990, *Conclusioni: per una teoria della joint venture*, in Balcet, G., (ed.), «Joint venture multinazionali: alleanze tra imprese, competizione e potere di mercato nell'economia mondiale», ETAS libri, Milano.
- Balcet, G., and Enrietti, A., *The Impact of Focused Globalisation in the Italian Automotive Industry*, in «Journal of Interdisciplinary economics», vol. 13, n. 1 – 3, 2002.
- Banik, A., Bhaumik, P.K., 2007, *Technology Transfer*, in Basu, K. (ed.), «The Oxford companion to economics in India», Oxford University Press, New Delhi.
- Bharat Forge, 2002, *Annual Report 2001-2002*.
- Bharat Forge, 2003, *Annual Report 2002-2003*.
- Bharat Forge, 2007, *Annual Report 2006-2007*.
- Becker-Ritterspach, F.A.A., 2006, *The Hybridization of Local MNE Production Systems: The Case of Subsidiaries in India*, Dissertation at the University of Groningen, Labyrinth Publications, Ridderkerk.
- Bonaglia, F., Goldstein, A., Mathews, J., 2007, *Accelerated internationalization by emerging markets' multinationals: The case of the white goods sector*, in «Journal of World Business», vol. 42, p. 369-383.
- Bouissou, J., 2007, *L'indien Bharat Forge s'est hissé au deuxième rang mondial des pièces forgées pur l'automobile* in «Le Monde», 4 December.
- Chaturvedi, S. K., 2002, *India, An Emerging Automobile Giant*, in: «UN Economic and Social Commission for Asia and the Pacific (ESCAP), Development of the Automotive Sector in Selected Countries of the ESCAP Region», United Nations, New York.
- Desai, A., 1988, *Technology Absorption in Indian Industry*, Wiley Eastern Limited, New Delhi.
- Dunning, J., 2006, *Comment on Dragon multinationals: New players in 21st century globalization*, in «Asia Pacific Journal of Management», Vol. 23, n. 2, June.
- Elliott, J., 2007, *Manufacturing Takes Off*, in «Fortune», vol. 156, n. 8, p. 76-83, 29 October.
- Forbes, N., 1999, *Technology and Indian industry: what is liberalization changing?*, in «Technovation», vol. 19, p. 403-412.

- Goldstein, A., 2006, *Who's Afraid of Emerging Multinationals?*, paper presented to the International Conference "The Rise of Transnational Corporations from Emerging Markets: Threat or Opportunity?", Columbia University, New York, October 24-25, 2006
- Goldstein, A., 2008, *The internationalization of Indian Companies: The Case of Tata*, CASI Working Paper Series, Center for the Advanced Study of India, January.
- Government of India, Ministry of Heavy Industries and Public Enterprises, Department of Heavy Industry, 2002, *Auto Policy*, <http://dhi.nic.in>.
- Government of India, Ministry of Heavy Industries and Public Enterprises, Department of Heavy Industry, 2006, *Automotive Mission Plan 2006-2016*, <http://dhi.nic.in/>
- Government of India, Ministry of Commerce and Industry, Secretariat for Industrial Assistance, 2007, *SIA Newsletter*, August.
- Guha, A., 2007, *International trade*, in Basu, K., (ed.), «The Oxford companion to economics in India», Oxford University Press, New Delhi.
- Humphrey, J., and Salerno, M.S., 2000, *Globalisation and Assembler-Supplier Relations: Brazil and India*, in Humphrey, J. et al. (Eds.), «Global Strategies and Local Realities. The Auto Industry in Emerging Markets», Macmillan Press, Houndmills.
- Kathuria, S., 1996, *Competing through technology and manufacturing*, Oxford University Press, Delhi.
- Kim, Y., 2003, *Global auto companies and their supplier relations in India*, paper presented at the "Eleventh Gerpisa International Colloquium", 11-13 June, Paris.
- Kim, Y., 2004, *The Indian Passenger Car Industry and the South Asian Market: Global Auto Companies' Struggles in India*, in: Carrillo, J., Lung, Y., van Tulder R., (Eds), 2004, «Cars, Carriers of Regionalism?», Palgrave Macmillan, New York.
- Lall, S., 1982, *The Emergence of Third World Multinationals: Indian Joint Ventures Overseas*, in: «World Development», vol. 10, n. 2, p. 127-146.
- Lall, 1983a, *The new multinationals. The spread of third world enterprises*, John Wiley & Sons, Chichester.
- Lall, 1983b, *Multinationals from India*, in Lall, S., (ed.), «The new multinationals. The spread of third world enterprises», John Wiley & Sons, Chichester.
- Mitra, R. M., 2007, *India's Emergence as a Global R&D Center*, Working Paper R2007:012, Swedish Institute for Growth Policy Studies, Östersund.
- Mukherjee, A., and Sastry, T., 1996a, *Entry Strategy in Emerging Economies: The Case of the Indian Automotive Industry*, International Motor Vehicle Program at MIT, imvp.mit.edu.
- Mukherjee, A., and Sastry, T., 1996b, *The Automotive Industry in Emerging Economies: A Comparison of Korea, Brazil, China and India*, International Motor Vehicle Program at MIT, imvp.mit.edu.
- Nassif, A., 2007, *National Innovation System and Macroeconomic Policies: Brazil and India in Comparative Perspective*, UNCTAD/OSG/DP/2007/3, Unctad, United Nations, Geneva.
- OECD, 2007a, OECD Economic Outlook, n. 81, May, Paris.
- OECD, 2007b, OECD Economic Outlook, n. 82, December, Paris.
- OICA, 2006, *2006 Production Statistics*, <http://oica.net/category/production-statistics/2006-statistics/>
- Richet X., and Ruet, J., 2006, *The Chinese and Indian Automobile Industry in Perspective : Technology Appropriation, Catching-up and Development*, in Huchet, J., Ruet, J., «Globalisation and Opening Markets in Developing Countries and Impact on National Firms and Public Governance, The Case of India», Centre de Sciences Humaines, New Delhi, www.csh-delhi.com/programs/programs.php?idprog=143#
- SIAM, Society of Indian Automobile Manufacturers, 2007, *Profile of the Indian Automobile Industry*, (CD-Rom), SIAM, New Delhi.

- SIAM, Society of Indian Automobile Manufacturers, 2008a, *Statistical Profile 2007-08*, (CD-Rom), SIAM, New Delhi.
- SIAM, Society of Indian Automobile Manufacturers, 2008b, *Industry Statistics*, www.siamindia.com/
- Singh, N., 2004, *Strategic Approach to Strengthening the International Competitiveness in Knowledge Based Industries: The Case of Indian Automotive Industry*, RIS Discussion Papers 82/94, RIS, New Delhi.
- Tata Motors, 2007, *Annual Report 2006-2007*.
- Unctad, 2007, *World Investment Report. Transnational Corporations, Extractive Industries and Development*, United Nations, New York and Geneva.
- Ward, J.L., 2000, *Reflections on Indian Family Groups*, in «Family Business Review», vol. 13, n. 4, December.
- Wells, L. T. Jr., 1983, *Third world multinationals: the rise of foreign investment from developing countries*, The MIT Press, Cambridge, Massachusetts.
- Yin, R.K., 2003, *Case study research: design and methods*, Sage, Thousand Oaks.