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From Joint Ventures to National Champions or Global Players? Alliances and Technological Catching-up in Chinese and Indian Automotive Industries¹

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The internationalisation of the automotive industry in China and India sheds light on the economic processes of emergence at large.

The modes of endogenisation of technology have shifted from an all-over joint venture route towards the direct emergence of provincial players into the global scene and new forms of alliances. This evolution in the car industry serves as an analyser of the relationships between industrial policies, industrial partnerships and paths of technological catching-up that are at the core of the phenomenon of emergence.

Chinese and Indian car companies are not only internationalising by selling abroad; they are internationalising by producing abroad and even, for some of them, globalising their production process through rethinking their whole supply chain, entering new value chains, or grasping global opportunities. This paper, based on interviews, examines different stylised business models for Chinese and Indian car companies, to ultimately question the theory of emerging market multinationals and of joint ventures. It does so by examining the following points:

- the trajectories of Chinese and Indian carmakers, viz. their property status and relationship to the State (private vs. State owned; province of localisation) in a context of consolidating national champions;
- modes of technological catching-up and innovation processes;

- market mix strategies between a geographically fragmented (in China) or concentrated (in India) domestic market and a growing export performance combined with an early multinational production.

The paper concludes on the different trajectories and on perspectives for joint ventures. We notably raise the hypothesis that joint ventures classically based on an exchange of technology for market access have exhausted

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their scope, and might now have to be based on an exchange of domestic market for international market, or are evolving towards different forms of governance.

Automotive Industry, Emergence, China, India, Globalisation, Multinational Corporations

1. History matters

The respective positioning of the Chinese and Indian economies in the world economy is directly linked with the early modes of opening these countries chose for their national economies. But there is a history before the so-called 'liberalisation'. Opening modes were in turn strongly determined by the industrial structure they had earlier gained from their socialist experience (China) or by the path they chose for exiting what might be called a "mixed socialism" as in reference to a mixed economy (India).

China and India had inherited an industrial structure, and especially automotive industries, that were maybe not efficient but that had led to the creation of:

- (a) regional districts of technological knowledge and know-how of industry experience, and
- (b) some companies which, by engaging into JVs, performing substantial restructuring, developing further investment, boosting intake of new talents and human resources, would along a course of 10 to 20 years become the base of fast internationalising national champions.

The current weaknesses but also strengths of these companies are still largely to be found from that period. We wish to emphasize here that some of the strategic advantages as well come from a path that finds its roots in that earlier period, whereas they are usually considered to have come from 'market forces' only. That materialises in the way these firms catch-up in technology and processes, internationalise and develop innovation.

Let us describe the history earlier to liberalisation to show the industrial structure in the two countries and more precisely how they built what we believe to be the main advantages of Chinese and Indian firms:

- an ability to compete for new markets and segments for across their *regional and product organisation* for Chinese car-makers,
- an ability to transfer technology and organisational innovation within their *conglomerate structure* for Indian car makers.
- In both cases, the organisation of these firms cannot be explained out from a historical path,
- for both, an ability to leverage knowledge from partnerships, to assimilate, diffuse and upgrade technology, developing original innovation.

1.1. Import substitution and planning: not lost but learning-intensive years

There was a socialist and developmentalist path of development in the 1949-1978 period in China and in 1947-1984 in India.

In China the automotive industrial history has been quite a bumpy road. Initial capacities have been developed on the basis of earlier industrialisation during the Japanese occupation of Manchuria, that was redeveloped with the Soviet help after 1949 and accelerated after 1953. This led to the creation of First Automobile Works (FAW) in the city of ChangChun, till today the second largest carmaker in China (including its own models and JV production). When sino-soviet relations

went conflictual, Second Automotive Works –later renamed DongFeng– and ChangAn were developed in the cities Wuhan (central China) and Chongqing (western China) respectively. Soon enough major automotive poles appeared: in ShenYang (in another province of Mandchouria region), which is today the seat of the company Brilliance, and also in Tianjin, in Hangzhou, in Beijing, Nanjing. The Great Leap Forward and Cultural Revolution further led to de-multiply the number of companies. Car plants were under the direct control of a State Ministry through a vertical system of command implying different layers of transmission bodies: State ministry, Department of automobile construction, provincial ministries, municipalities, factories. The localisation of firms over the country followed political decisions in the first stage of the industrialisation. Both the degree of autonomy of provincial powers and the pressure for job creation have pushed local governments to duplicate, fragment and miniature the number of under-sized factories (Huang, 2003), notably in the car industry, producing low volumes: in 2003, 88 companies produced volumes under 50 000 units each, 170 between 100 and 10 000. By 1978, on 31 provinces, only five didn't have facilities producing cars (Richet and Ruet, 2008).

The Chinese State today wishes to develop 'national models' that would be able to compete in the world market, integrating different makers. Such integration, by 1978 would have been deemed near to impossible. In fact, the control and mode of management of many of those companies through (a) erstwhile central ministries and (b) dual careers between the companies and the provincial –or national– government have ensured a certain gathering of the organisation. There is a common culture shared by the 10 to 15 largest State Owned Enterprises. In fact, as we shall see below, this has even been extended to the few later created private companies, especially as far as their relationships to provincial and national governments is concerned. It is a fact that car companies gained technology –from an obsolete level– through joint ventures with foreign companies after the reforms. Nonetheless, several among the large ones have also been able to build competitiveness when the cross-provincial markets have opened and have become increasingly competitive throughout the 1990s and 2000s. Chinese companies have managed to keep their indigenous models, while competing with foreign models made by their own JVs (FAW, BAIC –Beijing Automobile Industry Company–, ChangAn, DongFeng have been good at this). A certain knowledge of the competitors through the ministry links, as well as a phased evolution of policies and incentives to give a 'reasonable' stick by the authorities to the carmakers have been two ingredients of this success.

India after 1947 developed a mixed regulated economy that was later largely socialised after 1969 by Indira Gandhi. Administrative licenses were required not only to start a company but also to start a plant, augment its capacity, introduce a new model and virtually any decision. This had a first impact on the automotive sector, which was to create a quasi-monopoly of Hindustan Motors (the sector was based on mature Morris-UK and Fiat-Italy technologies and never really modernised until 1984) and oligopoly in trucks and utility vehicles (with Mahindra & Mahindra, Ashok Leyland and Tata's Telco).

The import substitution industrialization policy, that dominated the 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. Prices too were controlled, and export performances 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). 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”.

New protectionist laws were introduced in 1957, in order to give incentive 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.

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). Moreover, the strategy of technological self-reliance itself proved to have positive fallouts, as recognized as back as in the early 1980s by Sanjaya Lall (Lall, 1982). The restrictions on technology imports 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). It was the case of Indian casting and forging companies (Balcet and Bruschi, 2008).

But this had an even more profound and lasting impact which we believe is central in understanding catching up, innovation and internationalisation of Indian firms till today (Richet and Ruet 2008, Balcet and Bruschi 2008). Limited in their expansion in one sector, each company wished to develop into other industrial sectors and diversify. They soon became conglomerates. Domestic automotive production realised by private industrial groups, in fact by big diversified companies, is a distinctive feature of the industry in this country. Along the three truck or Jeep makers –Tata, Mahindra & Mahindra, Ashok Leyland– the first two were able to engage into a strategy of technology acquisition to partly design their own car models over the 1990s, and later engage into international commercial agreements in the 2000s. These conglomeral groups, which have really restructured along the 1990s and somehow refocused their core business, nonetheless present interesting scope dynamics: a technological upgrading or a process upgrading can often and easily be internally transferred to other branches. The large cash flow of these groups can easily be concentrated towards the development of strategic sectors –car development for M&M; car and steel for the Tata group which was also benefiting from the huge cash flows generated by its IT branch, TCS. Inter-branch transfers, concentration on specific business, allowed a rapid move on the value chain ladder: in the most competitive sectors, intense capital investments have been made (Tata).

The Indian socialist regulation had produced situations of private oligopoly that were to have a lasting effect. Indeed, ‘Indian socialism’ has never been very far from

'Indian capitalism', so much has the link between the State and the big private companies always been at the heart of the system. This situation dictated the pace of the adoption of liberal reforms. The role of the State is now limited to a more decentralised form of support in terms of access to land: for example, the State of Karnataka in attracting Toyota, but via its partner in the JV, Kirloskar (Richet and Ruet 2008).

1.2. Transition and post-socialist liberalisation processes: the impact of foreign direct investments and joint ventures on market structures and national linkages

As the car industry requires to master a whole complex technological system, processes around production, but also supply and marketing, as well as calls for constant innovation, both countries in the 1980s chose to enable a Joint Venture (JV) route. We see notable differences however which find their origin within the industrial history of the two countries.

China wanted to keep the control in terms of investment location as far as jobs and industrial levers are concerned. In line with its region-driven sense of industrialisation the Chinese government chose that when foreign companies entered the domestic market, they were channelled to different locations in order to venture with specific State Owned Enterprises (SOEs). The local state would ensure a market –if at all at the cost of public orders– but would not initially leave the choice of the partner. It would ensure that at least 50% of the JV is owned by the Chinese counterpart, with a long-term aim to ensure technological catching-up.

India, so as to test the possibility of reforms in this sector, opened up to a joint venture between the State-owned industrial group Maruti Udyog and the Japanese car-maker Suzuki, in 1982 (the JV became effective in 1984). It took a near decade to really open further, and despite 1991 have marked the opening to foreign investment in many sectors, it wasn't the case in the car industry until the mid 1990s. Less proactive in the beginning, the Indian scenario ultimately let more freedom. Indian majority control is not required, JVs are not even necessary, and some Indian companies themselves chose to acquire and develop technology out from the purview of JVs. However, let us notice here that this doesn't imply that liberalisation was a 'text book' one: before opening, the government waited until several players –notably Telco later renamed Tata Motors and Mahindra & Mahindra– had first started to achieve some modernisation of their plants and were ready to face the international competition.

The difference is explained by the lesser regional focus in the Indian political economy, and the fact that, conversely to the case of China, a large part of the automotive industry had always been private, especially in the trucks (along with the two and three wheelers) but, least the regulation, actors had long been willing and ready to move into passenger cars.

Another impact that would last till today is the fragmentation vs. concentration of the sector in the two countries.

JVs added to the initial regional fragmentation in China. In the mid 80s, new companies have been set up: Shanghai VW in Shanghai (1984) in which the German makers, right from the beginning had 50% control in the JV – SAIC (Shanghai

Automotive Industry Company) was created at this occasion; it is now the largest carmaker in China; Beijing Jeep in Beijing with Chrysler (33%), Guangzhou Peugeot (1985) in Guangzhou, with PSA (25%), FAW VW (1991) in Jilin Province ChangChun) with VW (40%), Dongfeng Citroën (1992) Hubei Province with PSA (25%). Exploiting foreign licences has also taken place between local and foreign makers: Tianjing Xiali and Daihatsu (1987) in Tianjing, Chang'an Automobile and Suzuki (1983) in Sichuan, Guizhou Aviation and Fuji Heavy (Subaru) (1989) in Guizhou. Honda & Toyota soon followed (data from Richet & Ruet).

In India, the initial oligopoly, followed by nearly a decade when the main move was the Maruti-Suzuki JV formation, have led to a dominant position of Maruti-Suzuki in the passenger vehicles with half of the market, followed by other main actors, as Tata Motors, the local affiliate of Hyundai and Mahindra & Mahindra.

The competitive structure is thus completely different in the two countries; we shall see below it has a lasting impact on the contrasted need for various companies to fast internationalise.

2. Some theoretical instruments

In this section we introduce few selected theoretical hypothesis, in two crucial fields, as instruments to analyse and assess empirical evidence on Indian and Chinese automotive industry.

2.1. How can emerging country multinationals be interpreted?

Third World, or developing country multinationals stimulated since the 1970s theoretical explanations, including those based on the well-known product life cycle model (Vernon, 1979; Wells, 1983); the theory of technological accumulation (Lall, 1983); and the investment development cycle, derived from the eclectic paradigm of international production (Dunning, 1986). All these theoretical approaches share the same fundamental assumption, elaborated with reference to the behaviour of the Western MNEs: that in order to expand abroad, firms must possess ex-ante competitive advantages, strong enough to overcome the initial disadvantages they face in the host country (Hymer, 1960). This assumption has been questioned by some scholars with reference to the experience of emerging market MNEs in the new century: for these theories, asset-seeking motivations become a key explanation of the international operations by these new actors.

The “imbalance theory” (Moon and Roehl, 2001) draw on the resource-based view of the firm, recognizing that the decision to undertake OFDI can be motivated by the intention to exploit firm advantages abroad. However, there are cases in which firms may be motivated by their disadvantages, such as a lack of resources, technology or management knowledge, or limited market share. Nevertheless, some ownership advantages are still needed to engage in factor-seeking OFDI.

John Mathews (2002) points out consequently that the internationalization process of emerging MNEs is not based on the possession of domestic assets to be exploited abroad: this is true for both newcomer MNEs and for emerging country MNEs. In the absence of vast resources, the internationalization process represents the best way for them to acquire capabilities and improve their competitiveness. The

Linkage, Leverage, Learning (LLL) framework is proposed. Thanks to their ability to weave such linkages, latecomers can leverage resources from their partners (Mathews 2006). Developing the same view, Luo and Tung (2007) argue that emerging market MNEs use OFDI “as a springboard”, to acquire strategic assets needed to compete more effectively, and in particular to access advanced technology, while competitive advantages are mainly generated through participation in international alliances and JVs.

Emerging market companies can be expected to lack monopolistic or oligopolistic advantages in the strict sense, including patents or strong global brands. However they can possess other competitive advantages, ranging from their ability to obtain inputs on favourable terms to the access to cheap unskilled and skilled labour and raw materials, the ability for fast assimilation and creative recombination of transferred technologies, abundant financial resources, marketing skills and managerial abilities. Last but not least, the active support by the governments of many emerging markets, including forms of strategic trade policies and state or public ownership, give rise to firm-specific advantages for these companies.

It is important to point out that multinationals from China and India, even when their strategy is mainly asset-seeking, do have some kind of ownership advantages, in Dunning’s terminology, the advantages deriving from the multinationality “per se”, as stressed by Ietto-Gillies (2005;chapter 15).

2.2. Partnerships and joint ventures as learning instruments

The broad notion of linkages can be better qualified and decomposed in the more precise notion of alliances, referring to the external network and its international expansion. Inter-firm alliances, and in particular JVs have been a peculiar and crucial instrument both for Indian and for Chinese companies. The category of alliances includes different forms of equity (joint ventures) and non-equity long-term cooperative relations. To this respect, the JV may be considered as representative of a wider range of organizations aimed at strengthening cooperative ties between companies from different countries. Different approaches have been proposed in the economic and managerial literature in order to explain drivers, motivations and characteristics of JVs.

A first traditional approach proposed the view that JVs may represent second-best options (Dunning, 1995), in presence of restrictive legislations on ownership, performance requirements and control policies. It was the case of many developing countries during the import substitution stage of their industrialisation process. A good question to raise is what happens when deregulation processes take place, as in the 1990s in many Latin American, Asian and African countries (WIR, 2005); JVs may well evolve to wholly-owned foreign affiliates, or they can maintain their status of collaborative institution, if some other advantage and interest is operating.

This traditional explanation is still very relevant in the case of China (as it was in the past in the case of India) in some key sectors considered of strategic interest, including automotive vehicle assembly.

A second traditional approach viewed JVs as related with mature technologies, to be transferred to developing countries (Ozawa, 1985). In this case, the multinational

partner, Western or Japanese, aims at market access of emerging and fast growing countries, while offering to local partners its proprietary technology, organisation and management skills. JVs are considered as a key instrument for transferring complex and often non-codified technology.

Drawing on new empirical evidence of much more complex and diversified JVs and on new theoretical interpretations (Contractor and Lorange, 2002; Castellani and Zanfei, 2006), we can point out the following three main dimensions of JVs (Balcer, 2009).

From a static point of view, a JV can be interpreted as a “hostage”, i.e. an institutional device created in order to guarantee each of the partners from the possible opportunistic behavior of the others, as suggested by the transaction costs theory (Williamson, Teece). It allows to make operational transactions too complex for a purely contractual arrangement. It is noteworthy the case for the market of knowledge, imperfectly regulated by the intellectual property rights, rules and international standards. JVs may eventually be intended to re-equilibrate the relational power between partners.

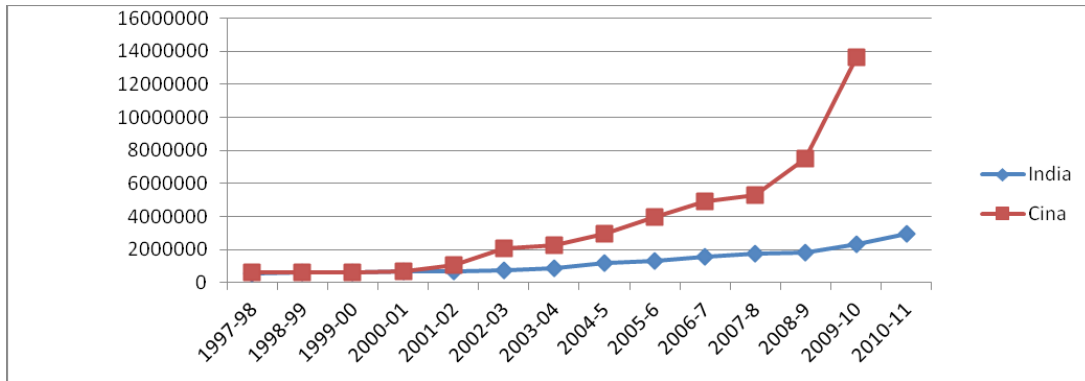
From a dynamic point of view, the JV can be viewed as a “learning instrument” in a broad sense, with different and complementary motivations for each of the partners. Such motivations include the access to new technology and knowledge, learning of organizational and managerial skills, access to new markets, especially those characterized by a strong distance factor. In the case of developing and emerging countries, a dynamic equilibrium can typically be reached between a Western or Japanese multinational, providing advanced technology and management skills, and a local partner, providing the access to the domestic market. This approach helps to understand the evolutionary nature of JVs and alliances, always related to their specific historical and geographical context. Moreover, they can be used as instruments of oligopolistic behaviour and collusion, as well as means for the exchange of threats between competitors, in highly concentrated markets. In the case of emerging countries, JVs play a specific and crucial role as learning instruments, and they are frequently based on a partnership between public actors and private multinational actors.

From the point of view of the MNC as a network, JVs and alliances may be seen as the basic elements shaping the external multinational network of a corporation, opposed to the internal network i.e. the complex intra-group flows of goods, people, information, and resources, connecting subsidiaries, regional headquarters, and global headquarters. External networks include cooperative relations, alliances and joint ventures with competitors as well as with specialized suppliers, clients, research institutions and universities.

3. Policies matter: national regulations, industrial policies and trajectories of growth

Everything taken together –and not losing sight that China’s GDP has more than doubled India’s during the years 2000s– the Chinese automotive market is now largely ahead of India’s (see Figure 1).

Figure 1. Passenger vehicles production in China and India



Sources: For India SIAM, Society of Indian Automobile Manufacturers; For China <http://data.chyxx.com/jtwl/201008/994128GEMZ.html> and www.thetruthaboutcars.com.

Indeed, as regulations go, the two countries have a definitely different model. China, while it has opened many sectors to majority ownership by foreigners, has not only restricted the participation of car assembling to JVs, but the government has also meticulously directed which company should partner with which one and in which region; conversely, the Indian automotive sector itself has after a point praised real competition as it saw it as an accelerating factor for real technology transfer. Today the government even gears up in helping Chinese firms to internationalise while Indian companies use and build their own global networks.

This stark difference in regulation did lead to a very contrasted level of technological catching-up. Higher level of foreign control in India as compared to China made foreign companies keener to transfer technology to their Indian ventures than in the case of China. This additionally concurred to faster knowledge dissemination in the supply segments. In return this helped Indian companies to earlier develop their own proprietary models of cars and to first reach successful international takeovers (see Section 6)².

The Indian way has ultimately favoured the rise of an autonomous industry, where foreign affiliates play a crucial role, beside some major national actors. Conversely, the large number of channelled JVs in China, combined with the sheer macroeconomic dynamism, has ensured that the Chinese automotive market has grown up manifold above the Indian one. The two models have really contrasted until now, and we describe them in the coming sections. The key question for future will be how, the two industries being increasingly connected to the global industry, the Chinese companies will learn to get their autonomy from the State, the way their Indian counterparts did; and conversely to understand where Indian companies will find growth reserves so that they don't get outweighed by their Chinese neighbours.

² Here we consider in particular that the early takeover of Ssangyong by Shanghai Automotive was a failure and that the takeover of Rover by Nanjing Automotive –then Shanghai Automotive– proved successful only by 2008 when the Roewe car model took off in China, that is later than the spectacular takeover of Jaguar by Tata Motors in 2007 and the launch of the Tata Nano, revolutionary in concept, in 2008. In 2010 Geely in China finalised the takeover of Volvo, but observers note that challenges are ahead.

3.1. Industrial policies and regulations in China and India

Industrial policies cover a large set of questions, that ultimately favour the macro-economics of the sector (level of demand), the effect of national costs on micro-economic profit (cost and benefit structure), but here we deal more particularly with issues that pertain to the definition of priority sectors, financing from State, public support to R&D and general ways to favour technology learning and dissemination, as well as sectoral policies such as concentration targets when available, which, through the threat of favouring M&As, do set a strong incentive to companies to remain within the group of the most competitive ones.

While India has set a few such policies, China has developed the whole gamut of them up to a very large extent.

China has mostly been proactive speeding-up the technology transfers (going up to changing the market structure through mergers), while India has mostly played on the timing and level of opening-up of its market and let the latter play.

China³

The Chinese industrial model may be described as a model of competition across provinces. That leads to over-capacities which are the price to be paid for an advantage: learning is decentralised. The regulation has been keener to focus on rationalising a bit more the “vertical” cooperation with foreign firms (supply); especially in the automotive industry learning has occurred more through the suppliers than through the customers (as in the case in the textile industry for instance). Favouring through many ways (land and capital access, easing of administrative processes) the installation of suppliers can be considered to be an industrial policy. Furthermore, specific localisation rules have been implemented, which has effects beyond the official regulations. For instance, officially 40% of the production of parts of JVs has to be localised. However, as not everything can be de-entangled, interviews in the industry have revealed that often the rate is of 70% of localisation of production. This figure is easily attained as a fast evolution of skills of suppliers derives from a clear support of authorities to suppliers through universities with which many suppliers have shown strong links: students doing some tasks, access to equipment for developing/testing, and no geographical dispersion between industry and university in the ‘economic zones’. This anyway matches targets of international players, which have in few years gone from a range of 40 to 60% to targets of 70% pre-crisis, near to 85% since then.

At the national level, there is a full-fledged industrial policy. The National Development and Reform Commission (NDRC) and the Development Research Centre within the State Council are the heart of this system. The SASAC (State Asset Supervision and Administration Commission) holds the national state assets and is in charge of controlling the national interest in the OFDI. At the highest level innovations are replicated; the 11th five year plan took the example of the Geely and Cherry successes –domestic Chinese cars developed by these two autonomous companies–, to request each company to give birth to similar models.

The macroeconomic schemes (especially the post-crisis package in 2009) have contributed to this.

³ Research on the issues discussed in this section have been developed since 2005 with our colleagues Jean-François Huchet and Xavier Richet, at CEFC Hong Kong.

India

In India, the industrial policy may be equated to a more limited extent. It pertains to the rhythm at which the economy and the sector in particular got opened to foreign investment and competition. However, this fine equation between the government and the industry turned out to be the key point of optimising the time of entry into the world industry; and this in itself is already far from textbooks.

Since the early 1980s a first wave of deregulation involved 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. Other deregulation measures followed.

Rajiv Gandhi (1984-1989) attempted experimental reforms, essentially on sequential relaxation of restrictions to imports for equipment goods and machine-tools. These have been named the 'pro-business' reforms as opposed to later 'pro-market' reforms of the 1990s. They met with a slowdown between 1987 and 1989 so that the industry could integrate the technology transfers; this slowdown matched with a pre-electoral cycle. Meanwhile there was a major shift in the leading role of key industry associations, from the age-old pre-eminence of the Federation of Indian Chambers of Commerce and Industry (FICCI) that was looking for a pause in reforms, to the progressive rise of the Confederation of Indian Industry (CII). In 1991 the country started reforms but in the mid 1990s the true start of opening for the automotive industry took place with the support of the CII. The industry had benefited of a decade to modernise its obsolete production system.

Since then the industrial policy has been of less relevance, except with targeted measures to favour the exports of parts and components.

3.2. Post-liberalisation policies. India as a case in point⁴

Despite the withdrawal of the 'Monopolies and Restrictive Trade Practices Act' in 1991, 16 sectors, such as 'new' household goods, chemicals or the automobile industry, remained for some time under strict regulations and were only gradually 'de-licensed' (during this decade eight critical sectors remained under the exclusive control of the State; today two remain: the atomic sector and the railways).

As we have pointed out in Section 1, the joint venture between Maruti Udyog Ltd, a State-owned company, and the Japanese multinational Suzuki Motor Company, created in 1982, deeply affected the production system and technology standards in the Indian automotive industry. In few years, since the second half of 1980s, it got 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, and there was a remarkable improvement of the supply chain.⁵

Following the 1991 liberalisation, also due to the IMF strong pressure, foreign investments were allowed up to 51 per cent for commercial vehicles and for

⁴ This Section develops from Balcet and Bruschi (2008).

⁵ As a consequence of this process, in 2008 14 joint ventures with main first tier component suppliers were operating. In most cases, a minority share, ranging from 10 to 30%, is held by MSIL; in some other cases, a minority participation is held directly by Suzuki Motors.

component productions, while 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, while local content regulations were gradually faded out.

In the 1983-1993 period, the production of passenger vehicles grew from 67,000 to 244,000 units. In the early 1990s three Indian carmakers operated in the domestic market: the JV Maruti, 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 to about 350,000 vehicles against 500,000 in China.

Inward FDI developed rapidly after the liberalization and many multinationals entered the market, including Ford, Honda, Fiat, Daewoo and Hyundai, usually operating through JVs. However, in the following years most foreign multinationals will acquire the control through majority ownership (Kim, 2004).

In the 1990s 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 Motors, part of the conglomerate Tata Group, and Mahindra & Mahindra.

These corporations were part of big and diversified industrial groups, usually family-controlled, which represents a very common form of corporate governance in India (see Section 4). 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 of about 30 per cent the growth rate of the industrial production in general in the same period. However, the growth of car demand was lower than foreseen in the optimistic view of the mid-1990, and the economies of scale 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, Ruet, 2008). Japanese product and process technologies, combined with Indian low cost skilled and unskilled labour, represent key factors of competitiveness for Maruti Suzuki India. This Indian-Japanese JV evolved over time into a majority-owned subsidiary of Suzuki Motors: the Japanese company has been constantly increasing its stake since 1989, holding a majority control since 2004, while the Indian government participation has gradually decreased below 12%. The progressive withdrawal of the State from this JV was consistent with the overall policy of liberalisation and privatisation of the 1990s.

In the early 2000s, while its strongly dominant position in the domestic market is challenged by new Indian carmakers, Maruti moves to a more export-oriented strategy, within the Suzuki Motors network, while upgrading its capabilities in the field of innovation and technology.

In 2003, a new policy was released “to promote an automotive industry globally competitive” (Government of India, 2002), 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.

The growth of the Indian automotive industry –though curbed by poor infrastructure, in particular as regards to the road and highway system– has been

pushed by the growth rate of the Indian economy, the presence of a growing middle class, a dynamic national innovation system, and a developed financial system.

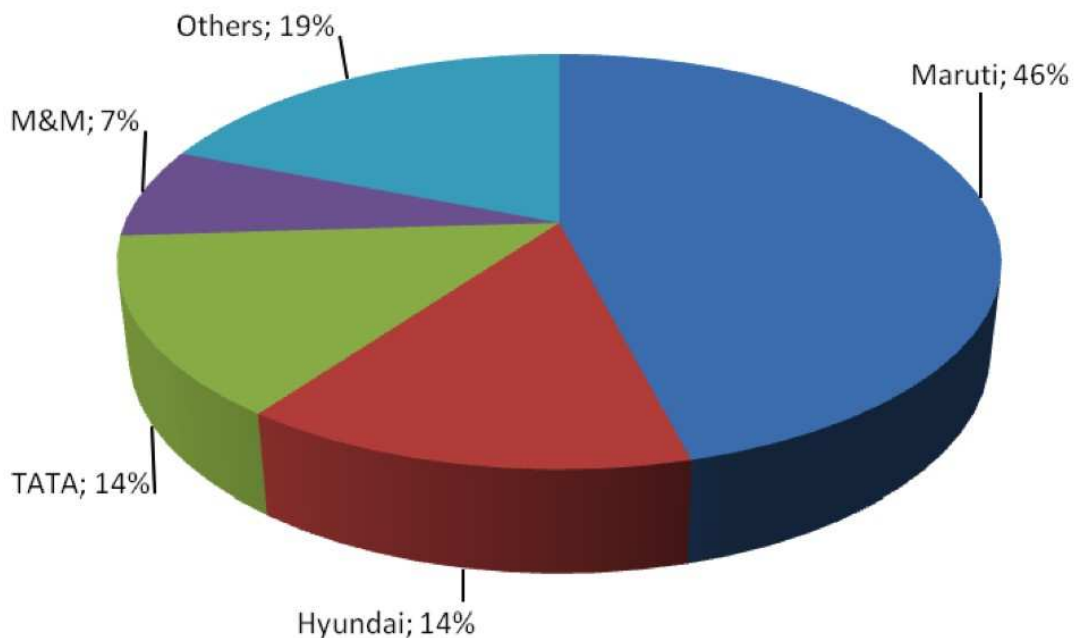
In 2001 WTO rules obliged India to abolish the performance requirements still imposed to foreign carmakers (Kim, 2003). Since 2004, the import of completely built-up vehicles (CBU) was made possible up to a value of 40,000 USD. Outward FDI was permitted without limitations as regards the share of equity.

Figures 2 and 3 show the market share of the automotive producers in 2007 and in 2009.

The position of Maruti is still dominant and keeps stable, though slightly decreasing (from 46 to 45 per cent of the market), followed by the wholly-owned Indian affiliate of Hyundai of Korea, that grew from 14 to 16 per cent in the years under exam, and by Tata Motors, part of the conglomerate Indian Tata Group, accounting for 15 per cent in both years

Figure 2. India: Share of the passenger vehicle market (2008-2009)

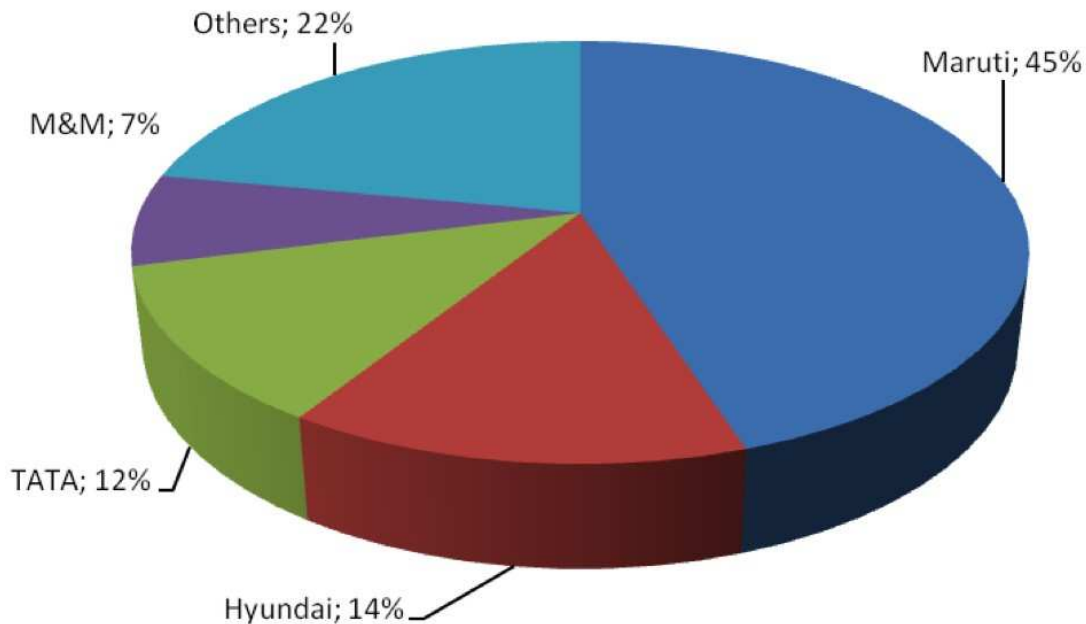
Total market volume: 1,6 million units



Source: Siam, Society of Indian Automobile Manufacturers

Figure 3. India: Passenger Vehicle Market Share (2010-2011)

Total market volume: 2,5 million units



Source: Siam, Society of Indian Automobile Manufacturers

4. Institutions and governance matter

In both China and India, as a result of the history of industrialisation and reform, the State and business vest a close relationship. Today, the development of business feeds back to issues of re-balancing the central and local projections of the State.

4.1. Conglomerate family-owned groups in India

In India, as we have seen in previous Sections, reforms took place initially gradually in the 1980s, then becoming more widespread during the 1990s. From this economy managed by and within closely knit personal networks, the opening was virtually orchestrated, so as to leave time for the conglomerates to reorient themselves towards their main activities. Since 1984, the joint venture between Maruti and Suzuki has been symbolic of this new logic of import and transfer of selected technologies. For the State it meant identifying along with the business world, the sectors in which fast modernization of an obsolete production apparatus would lead to the greatest results.

It was within this relatively protected context, that the Indian conglomerates, from the mid-1990s, accelerated the reorganization of their activities, in particular, by multiplying their strategic alliances with foreign companies. Their conglomerate form allowed them to extend to their other branches a technology or a know-how initially transferred to only one of them (as a form of spill-over effect), and this explains the very rapid restructuring of the Indian groups. It is the case of Tata Motors, Mahindra & Mahindra and Bharat Forge. Finally, the governance of the Indian companies makes them completely independent of the State in their decisions regarding investments abroad, which is far from being the case of even the 'most private' Chinese companies.

4.2. State and Province ownership in China

Whereas in China, car companies multiplied the JVs for public agenda reasons (mostly, employment) at least as much as for the objective to acquire technological know-how, our field interviews show that, in this context of multi-partners and mandatory JVs, foreign partners trusted less their local partner. They equally show that many state car makers ultimately have come close to become ‘holdings’ more than holders of technological skills. This is a risk that some of them want to tackle, but which is ultimately borne into the kind of relationship they have with the state.

Within the large, national government-supported companies one finds FAW, BAIC, Dongfeng. Each of them has of course strong relationships with the provincial government of the Province that hosts them but, either through their ownership structure or through their history, there are considered to be of direct relevance by the central government. In the case of FAW⁶ and BAIC⁷ we found that the balance between the provincial and national levels of governments has allowed the companies to manage a strategy of technological integration –developing their own models or being aggressive in seeking international partners– and commercial expansion in provinces out of their ‘strongholds’, including abroad (for details on how organisationally and technologically they made use of this strategy of balancing powers, refer to section 5; for steps of internationalisation refer to section 6). It is a general feature for Beijing companies to be quite independent (in Iron and Steel, Beijing Steel Company –of which Chinese name is Shougang is a case in point). Foton has some private capital additional to the ownership of BAIC, which helped this strategy. Similarly, FAW has been able to play a good equilibrium between the national government and the Jilin Province government to early impose the idea of having assembly operations in Malaysia first and in Mexico next. This is to be contrasted, within the same ‘national’ category, with Dongfeng, where the industrially strong Province of Hubei has always underlined first the pursuit of employment targets and less of technological integration (see Richet and Ruet 2008).

The second category of companies, which have a provincial ownership, are interesting to consider too. They have till the mid 2000s been relatively sleepy, content with their JVs. When announcements multiplied that a national industrial concentration –keeping not more than 10 ‘champions’– would arise, that gave them an impetus to react. Interestingly, long established local companies found a way to differentiate themselves through a sudden overseas activity that contrasted in dynamism with the established champions, as they had to come back to what they suddenly perceived to be a new race. As companies from this category got recently quite dynamic we discuss them at length on the section 6. However, let us here detail an example seldom studied by China observers, as it illustrates well the range of strategies these companies apply. Brilliance⁸, created only in 1984 and with its base in Shenyang (Liaoning Province) and with recent acquisition in Sichuan province, already employs 30,000 people globally, with a capacity of 550,000 vehicle including mini-bus, sedan, light truck; 500,000 engine production capacity

⁶ Interview in 2009, May Gicquel and Joël Ruet.

⁷ Interview in 2010, Giovanni Balcet and Joël Ruet, introduced through Prof Kang Rongping.

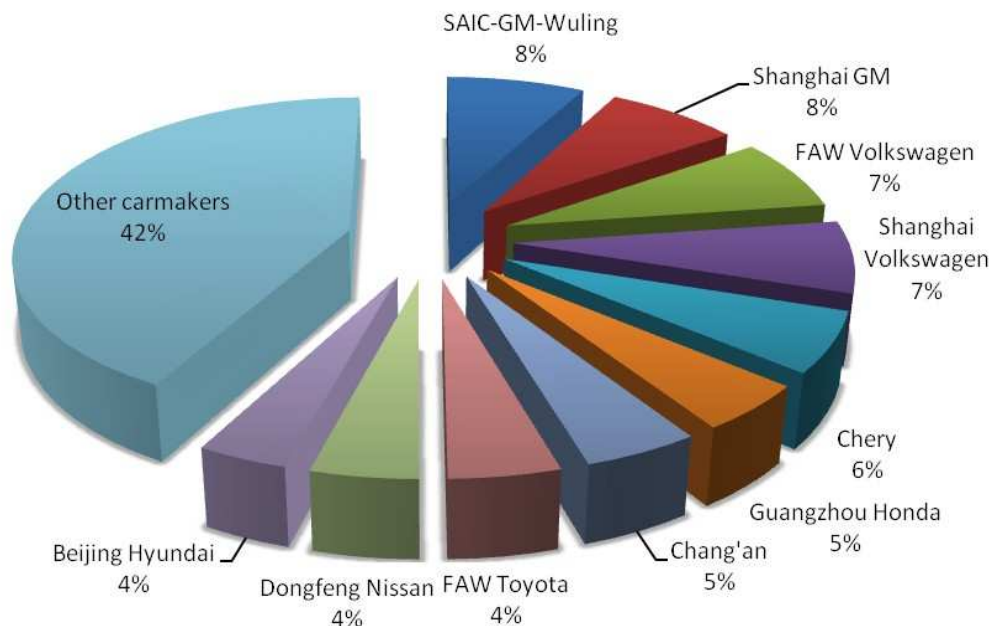
⁸ Interview 2010, G. Balcet and J. Ruet.

(combining a sedan and a utility vehicle, and including its production through a JV with BMW of 55,000). Now they move into the markets of the western provinces with a “strong support from the local governments”, similarly want to move towards the higher segment for which they try to find a foreign partner. Their commercial-cum-technology expansion strategy thus relies both on government support and private partnerships. In Europe they look for “buying a R&D centre”, and have internationalised in 2011 with a SKD project, this time using full national government support, through the “China-Africa fund”.

There are markedly two periods that can be identified. Until the mid 2000s, the ability to build independence from the government and its wish to create employment was a key driver for success; few companies managed this, which were usually able to play an ‘in-between lines’ across the two levels of government. As it is now becoming clear that there is an orchestrated competition across state players, all companies want to acquire technology and markets. Interestingly, those which felt most threatened –those locally controlled– have managed to express their own dynamism through active search for partnerships and equally managed to acquire the support of local government support –and sometimes of national support as a recognition of these efforts.

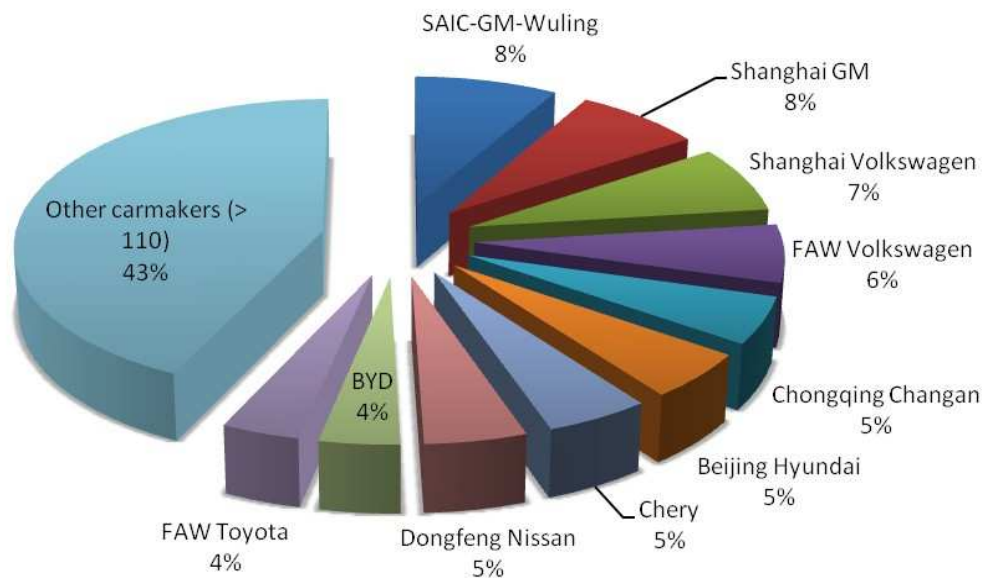
Figures 4 and 5 show the still highly fragmented structure of supply, as well as the crucial role of JVs, in 2007 and 2010 respectively.

Figure 4. China: Passenger vehicle market share of the 10 biggest domestic producers (2007)
Total market volume: 6,3 million units



Source: data CAAM, published on
www.chinaknowledge.com/Business/CBGdetails.aspx?subchap=3&content=9

Figure 5. China: Passenger vehicle market share of the 10 biggest domestic producers (2010)
Total market volume: 13,7 million units



Source: data CAAM, published on www.thetruthaboutcars.com

4.3. Complex and evolving State-Corporations relations: the perceived State's role to minimise transaction costs, and improve market rules

Institutions in emerging countries are often analysed as mostly serving the purpose to favour or subsidise their industries, whether nascent or internationalising. As this is well known, here we focus on another side of the institutional relationship with the administration. Public and state institutions (central government in both countries, provinces in China, some autonomous municipalities in China like Shanghai or Chongqing) have contributed –sometimes in an ambiguous and contradictory manner– to create the competitive framework that was necessary for firms to develop, become more efficient, and engage into technology development.

We should also note the role of local States in India in regional development policies, through localisation incentives. It was the case of West Bengal first and then Gujarat in the case of Tata Nano project (see Section 5.3 below).

The question one has to look at pertains to how the state-business relationship shapes industrial organisation and promotes industrial dynamics in the context of post-socialist industrial transformation and production globalisation, and how the various levels of the State can make use of the current economic dynamics. We address this through classical questions of political economy to illustrate that today's India and China provide an original and innovative outlook to key questions.

Competition in China is manifold even though JVs are necessary for foreign companies. Within a state Chinese group, the organisation of JVs makes it that different JVs formed with different foreign partners do compete with each other. Seen from the perspective of a foreign company present in China, conversely, the

same model of car can be sold (thus produced) through several Chinese partners. There is a sense of internal competition within the consolidated sales of a single foreign company, and of course competition across Chinese companies. The role of provincial or private companies in China is interesting. While in the 1990s the focus of JVs was largely with the largest –mostly centrally owned– car companies, the 2000s have seen a generalisation of JVs. Thus the smaller or regionally controlled Chinese companies have entered into the national competition for markets. Further, a few companies –like Chery, BYD and Geely– which have entered the market without JVs have had some State support, that soon got conditioned to productive efficiency. This is a feature of Chinese industry seen in other sectors (electronics, steel, coal, metal mining etc.) that on the longer run the sustained support of the State is conditioned to the ability of companies to seize opportunities (in mergers, internationalisation: see below) as well as market expansion and technological development. The ‘industrial policy’, that way, ‘picks the winner’. Till today the Chinese state plays a major role in building competition advantages by authorising or not the JVs, the takeovers (abroad and domestic) and granting access to technology resources; however this is not devoid of consideration as to where this support can be best utilised so as to develop autonomous technology platforms, accumulate capital and know-how, support a business model.

In India the structure of sales is largely dominated by Maruti-Suzuki. However the rest of the market is quite segmented and competitive and one can say that competition rules are actually cross-checked by the SIAM (Society of Indian Automotive Makers) which accepts foreign companies as members. The competition is in fact organised by segment of cars and foremost by geographic regions. The state has mostly played a role in the 1990s in phasing the opening up of the market. Since the 2000s, its role has been mostly limited to regulations such as introducing norms, e.g. the rhythm of introduction of Bharat I, Bharat II and Bharat III safety and emissions norms (which are modelled on the Euro I, II and III respectively). Nonetheless, the industry has been able to use the good sectoral understanding the government has so as to favour measures that led India to become an important exporter for parts and components, for the financial benefit of supplier companies, as well as a positive neighbourhood effect for Indian car makers and their technological and process catching-up.

4.4. Development programs, innovation and local use of business dynamics to renew development models

The two countries contrast on whether it is the market or the State that shapes the sector. However, while it is obviously the private sector that plays the leading role in India, influencing regulations, rhythm of adoption of norms etc., the power and influence dynamics at play in China are rather subtle, and not just oriented towards the tilt of the sole State. We could even advocate the thesis of the ‘follower State’, or at least on the ‘near-to-follower’ state in terms of innovation policies and drivers for innovation. Despite its formidable apparatus to support innovation the Chinese state is (a) entrenched into the know-how of the companies’ managers (in large majority communist party leaders who have a dual career in the automotive industry and the administration (with the exception of private companies like Geely, BYD...)) and

(b) the consensus in terms of policies (that results out of competition between different organisations, for instance between MMIT and MOST, or ministries and NDRC, or again through different industrial organisation visions within the SASAC –vertical integration versus diversification models– often adapts to the edge or the frontier of what the industry has actually absorbed; ideology and plans are fit to reality).⁹

Generally speaking, one should disentangle between R&D, innovation and technology. In both China and India, national policies have been relatively late in pointing to innovation as a driving force, preferring on one hand to promote S&T policies and “capacity building” for science and technology at the national level, and on the other hand to let innovation as part of a firm-specific activity that is located and managed at a local level.

Since recent years, in a context where innovation-led sectors have proved their exports capacities as well as their spill-over capacities, both the Chinese and Indian governments have aimed at promoting ‘qualitative growth’ and ‘knowledge-based’ economies.

The determinants for market vs State-driven and for international vs national-driven innovation are gradually evolving. In India and China, main innovation in systems come from learning from the suppliers and integration of western companies. This is a general feature of the global car industry and there is here nothing intrinsically specific to emerging economies, India and China; just to notice that their companies have been able to ‘catch-up’ on this point. Innovation in technologies (electric or hybrid vehicles) or business models (the good-enough, quality low cost and new concepts like Nano by Tata) pertain to another line of explanation which, this time, is specific to the integration of these companies into the local *tissu* of suppliers and labs and the global industry, and their ability to leverage on both. This is detailed in the next section, but let us see here how the specificities of the local network of industries and suppliers articulate from an institutional point of view.

Even though helpful for the industry, policies that ultimately amount either to ‘taking-up performing clusters’ or to organising the environment of usually autonomous inventive assemblers, ultimately amounts to a ‘follower role’ for the State. That role is at the same time not to be neglected, as it can accompany some groups in their path of exiting a certain dependency on the cluster, but it should not be overstated. That understanding sheds some new light, for China, on the public centres of innovation, for India, on the public-private partnerships such as Ministry-to-industry or UNIDO/Confederation of Indian Industry.

To conclude, one contemporary aspect of pro-innovation policies is centered around the idea to ‘lift up’ clusters. Processes occurring within a cluster are more complex than mere question of size, ownership (public/private), or central/local scales of regulation, but have to be technologically understood from within the firms (Arvanitis et al., 2007). Innovation policies do not necessarily trickle-down to the firms of a cluster, they need first and foremost the right alignment between suppliers and firms: where, again, history matters.

⁹ See examples from section on technology.

5. Technology: Acquisition, assimilation, gaps and leapfrogging

Where the industry has been left with the larger latitude and the less capital restrictions (India) technological transfers and brand building have developed in a greater fashion than where protection was provided (China); in turn this (paradoxically) gives larger scope for an aggressive industrial policy.

Recently, paths for complete leapfrogging in technological conception have appeared. Not surprisingly they are the brainchild of private companies in India (the Tata Nano car for instance), while in China, even if one private company (BYD) had initially taken the lead in electric vehicles, the government has made it a point that it become a national policy goal; if justified as far as a large infrastructure and industrial and urban ecosystem is required, this has nonetheless been implemented ‘the Chinese way’, including most of the car makers into the ‘competitive subsidies’ given by the government.

5.1. India

Alliances, joint ventures and partnerships have been a major channel for technology transfer and acquisition by Indian enterprises. In this process, Japanese multinationals have been the most active partners, taking part in the early 2000s in 145 partnerships on a total of 482.

Table 1 shows the main sources of technology and knowledge in four case study Indian multinational companies, which represent a sample of the new emerging actors in this crucial industry: the carmakers Tata Motors and Mahindra & Mahindra, and the component suppliers Bharat Forge and Amtek (Balcer and Bruschi, 2008; 2010).

Table 1. Technology acquisition process by Indian multinationals:
Tata Motors, M&M, Bharat Forge and Amtek Auto

	Tata Motors	Mahindra & Mahindra	Bharat Forge	Amtek Auto
Part of a group	Diversified family group (67 bln \$ in 2010)	Diversified family group (7,1 bln \$)	Diversified family group (2,5 bln \$)	Family group (n.a.)
Established in	1945	1945	1961	1985
Sells (consolidated 2010)	19.842 mln \$	5.300 mln \$	695 mln \$	766 mln \$

Rank	First Indian commercial vehicle manufacturer and third Indian passenger vehicle manufacturer	First Indian utility vehicle manufacturer; first Indian tractor manufacturer	First Indian exporter of auto components	First Indian machining company and second Indian forging company
R&D intensity (% on sales - 2010)	3,3	3,2	0,15	n.d.
Agreements	9 (4 JV)	34 (13 JV)	10 (JV)	13 (8 JV)

Source: elaborated by Silvia Bruschieri from Balcet and Bruschieri (2008)

We recorded in Section 3 the role of Maruti-Suzuki in shaping the automotive industry in India. This same JV opened the way to the technology catching up in the Indian car industry. Since the early 1980s, several Japanese suppliers of Suzuki invested in India in order to “follow the client”, improving the supply chain and transferring production technology. Few main first tier component suppliers have been associated in the platforms in order to co-design new models (as in the case of Swift model, to be exported to Europe).

For Suzuki Motors the R&D centre located in Gurgaon near Delhi is the most important in Asia outside Japan. It employs about 1000 engineers and technologists. Applied research and product development are mainly oriented to the areas of emission, suspensions and seats. This means that Indian high skilled and low cost engineers work both on the assimilation and adaptation of Japanese-origin technologies for the domestic market, and on specific changes needed for export models (e.g., emission requirements in Europe).

External sources of technology played a crucial role in the development of Tata Motors capabilities over the last decades: the licensing agreement with Daimler Benz signed in 1954 represented a strategic change. Daimler Benz then entered the capital of the Indian company. Another JV was established in 1994 with the same partner, to manufacture Mercedes Benz cars, confirming the role of this German-Indian relationship.

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. 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 organizational skills. Intense exchange of information and knowledge transfers take place between the different companies of the group (Balcet and Bruschieri, 2008). 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. Innovation-oriented international JVs, mainly with major component and module suppliers, have been an essential instrument of learning, as it can be expected on the base of relevant theories (Balcet, 2009; see Section 2).

Tata entered several agreements and collaborations with car and commercial vehicle producers, as well as with components suppliers. These agreements allowed a long term process of acquisition of industrial know-how and core competencies in automotive manufacturing. Among others, 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. In 2000 a JV was established in India with the Japanese Hitachi Construction Machinery.

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. 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 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 incorporated in models exported by Suzuki Motors to Europe.

During the 2000s, Mahindra & Mahindra showed an increasing focus on technological upgrading, devoting increasing resources to its still modest internal R&D activities, while the import of disembodied technology strongly increased. Technology transfer from foreign companies also occurred through domestic acquisitions, such as that of an automotive pressing unit from the U.K. company GKN in 1989. The presence of foreign partners among the shareholders of the company (including Ford Motors until 2005) represented an additional channel for the acquisition of foreign technology. Several collaborations with foreign partners have contributed to the improvement of Mahindra & Mahindra's technology level in the course of time.

Bharat Forge, established in 1961 to manufacture forgings for the automotive sector, is the flagship company of the family group Kalyani, whose activities are highly diversified. In the case of this company internal R&D is modest, while external sources of technology are crucial: in 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 key equipment was imported from abroad, in particular from Germany and Japan. This process gave the company the possibility of upgrading its technological level, while expanding its production capacity. For Bharat Forge, agreements with foreign companies represented a way to access technology. To make the most of new technologies, the company improved the education level of its high quality workforce.

Amtek Auto is a manufacturer of components for the automotive sector and other applications. The company was established in 1985 and the agreements it signed with foreign partners starting from the 1990s played an important role for the

technological upgrading of the firm. Several of such agreements provided for the establishment of JVs which allowed Amtek Auto to access external sources of technology as well as to enlarge its product basket and its client base. So for instance, in the case of the JV established in 2007 with VCST, Amtek and the foreign partner respectively contributed expertise as gear blanks and forging manufacturer, and the experience of a world leader in the production of gears and driving shafts.

Looking to the Indian experience, both alliances and acquisitions have been key instruments of the process of technological upgrading and catching up. Learning and leveraging processes can be originated from both international alliances and acquisitions.

Therefore, among the competitive advantages of Indian companies we can include the capacity of fast assimilation and creative recombination of transferred technologies and know-how, and managerial abilities in finding and leveraging resources and capabilities from foreign partners, and to coordinate them with the existing resources and capabilities.

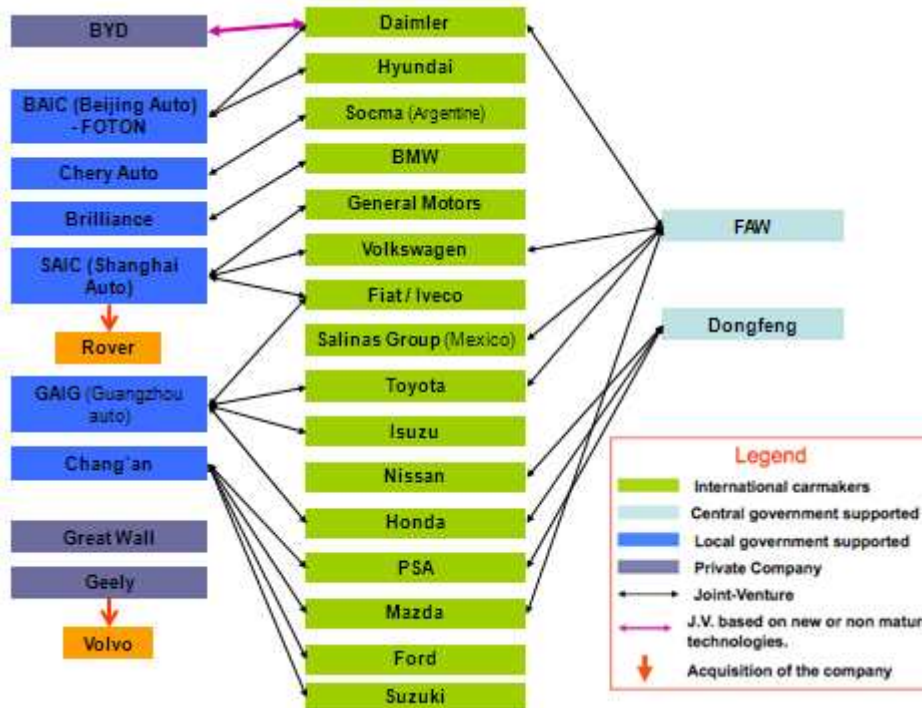
5.2. China

Catching-up is often an ability to adapt processes rather than copying them or transplanting them. It occurs over a historical base either in the car industry or more general. In 2006, our interviews in Hubei Province happened at a time when relative 'newcomers' like Geely and Chery had already opened other paths of autonomous development in other provinces. The question was for Companies like Dongfeng to know whether they'd manage to do the same. International observers there declared to us that in production lines "a new practice is being developed since the province of Hubei is specific: everything is new here, it does not have the historical background of Shanghai for instance; technicians and engineers are the first generation to gain this kind of environment; this is already the second generation in Shanghai. A very big surprise is that skilled workers are really trained, far above than what is found in Europe (memory ability for long succession of operations), many of them have the College entry level." (our interview, 2006). The result of this is a learning path. Since the mid 2000s some exit of suppliers was noticeable for those who were not able to implement cost reduction strategies: at least a 10% decrease per year in car prices.

In China, catching-up through JVs met a plateau in the mid 2000s (see Richet and Ruet, 2007, 2008). The integration of technology by Chinese companies across multiple partners was difficult and was bearing the risk that they become holding companies and no longer technical companies.

Figure 6 shows that all national companies and several with a more provincial background have reached a number of JVs, that actually compete across the same markets.

Figure 6. Car Industry in China: Major Actors, Joint Ventures and Acquisitions



A lot happened in fact through suppliers and part makers. Valeo for instance, in Wuhan, in the mid-2000s, used to find the situation quite different compared to Shanghai. In Shanghai the Chinese partner had a strong position and was not that willing to cooperate with foreign partners¹⁰. They thought that they could go along by themselves. In the Hubei province, things have been different as the Chinese partner was controlled by State bodies, was not competitive and couldn't match its commitments inside the JV¹¹. A minority position was not the best way to increase competition and match the standards. One big issue for Valeo was to find good sub-contractors in the region. The company focuses on non-strategic sub-contractors, that is contractor able to make non-essential product. But with the rise in volume and sales, more local companies are lured and invest around Valeo, easing the building up of the value chain. The company would have hoped to develop more quickly, but it followed the pace of PSA development in Wuhan, which has followed a bumpy road in the last decade. One third of the sales are made with the Franco-Chinese JV in Wuhan, DPCA. Valeo Wuhan tried to emancipate from its Wuhan market, supplying other car assemblers, in spite of distances and transport, in Shanghai (VW) and in other parts of China: Nissan and Toyota (which could make one other third of the sales). Ford and GM are also other targeted assemblers. These ultimately benefited the Chinese carmakers too. SAIC for instance, –which was simultaneously trying to acquire technology through M&As that revealed at that time costly and time consuming–, equally multiplied its subsidiaries, trying to learn about all the sector. They notably developed a JV with Visteon (an American first-tier supplier), concentrated a lot on human resources and learnt a lot from their suppliers

¹⁰ On regional and local differences between Chinese automobile sites, see Thun (2006).

¹¹ See Richet and Wang (2005).

The acquisition of some technical platforms –and not the whole company as they had learnt from their initial difficulties in absorbing companies– as in the case of SAAB by SAIC, can be interpreted in a dual pragmatic manner. This was first to gain specific segments of technology at the time they were performed. But it was also clear that this could later have been the first step to pave the way to globalisation of these groups. The crisis has accelerated the opportunities and the Chinese companies may now gear up from technology acquisition towards overt globalisation.

But it is important to note that international acquisition is best prepared through early in-house R&D. As companies of national importance go, BAIC for instance has been able to concentrate on its JVs with Hyundai and Daimler to first develop a coherent range of car models, that do not overlap with its two fully owned local brands. On the commercial front, while successfully fulfilling national interests in having foreign JVs in the national capital with Hyundai and Daimler, it has been able to concentrate on business vehicles, with its subsidiary Foton being the first ranking in the world for business vehicles sales. On technology, it took the time to assess previous failures in the country (Nanjing Auto having acquired Rover, failed in a JV with Fiat) so as to use a “better cashflow” and better connection with their “existing research centre, first built for two years before buying abroad” while they underline NAIC did the reverse. Brilliance, equally, had initially got its technology for their utility vehicle through an agreement with Toyota –technical cooperation agreement– but now the know-how has been integrated, and the facelift design redone several times with their own R&D of 1,000 people in Shenyang and Shanghai.

5.3. Leapfrogging opportunities

India: Low-cost cars, cost-effective design and good-enough quality
In 2003 Tata Motors began the development of its “one-lakh car”, a very low cost car to be priced one lakh, or 100,000, rupees (about 2000 USD). This rear-engined, four-passenger city car first produced at the end of 2009, and launched in 2010 with the name “Tata Nano”, was an ambitious project of a car that would change the mobility habits of millions of Indian families, and would impose at the same time Tata’s brand on the international car market. Tata Nano is aimed primarily at three targets in the Indian market:

- large motorcycles owners;
- lower income consumers, that previously could not afford a car;
- higher income urban consumers, as a second family car.

Delays in bringing this car to market were caused by a strong opposition over the acquisition of farmland that the Tata Motors should use to set up its new plant in West Bengal. Due to this initial troubles, Tata Nano’s main plant had to be transferred and it was set up in Sanand, Gujarat, starting small-scale operations at the end of 2009, and full-scale operations in April, 2010, its production capacity being of 350,000 cars a year.

Rapidly rising material prices (up 13% to 23% over the car’s development time) and technology upgrading needed to make the car compliant with new Indian emission norms BS III and BS IV caused the car to be priced about 30 per cent

higher than one lakh as originally announced, at 134.000 rupees for the basic model (yearend, 2010). Nevertheless, Nano is the cheapest car in the world today, with its standard version priced little more than US \$2,000. The purchase price of this no frills auto was brought down by dispensing with most nonessential features, reducing the amount of steel used in its construction, and relying on low-cost Indian labor. In addition, Tata developed a low-investment production strategy and reduced dealer margins wherever possible.

The Nano's design implements many cost-reducing innovations:

- The trunk is only accessible from inside the car, as the rear hatch does not open.
- One windscreen wiper instead of the usual pair
- No power steering, unnecessary due to its light weight
- No airbags
- 623cc petrol engine with only 2 cylinders and top speed of 105 km per hour.

Innovation also allowed Nano to stand out on the Indian car market for some of its characteristics¹². More than 70% of this car's parts have been designed and produced in India, but the car's exterior was designed at Idea Institute in Torino, Italy. Furthermore and very interestingly, in March 2010 Tata Motors unveiled Nano EV, the electric version of Nano, built in cooperation with Miljøbil Grenland (Norway), 80 per cent of which was acquired by Tata in 2008.

Nevertheless, this process is not without its difficulties. During the second part of 2010, the production slowed down to one third of the installed capacity in the Sanand plant, due to shortages in the supply chain, and to a slowing demand: after a brilliant performance in the first months, in the first rush of publicity, and following some technical problems, reaching the main target customers –first-time car buyers with limited buying power– appeared difficult. In particular, a major challenge was arranging for affordable financing to this segment of clients. One must note that the viability of these projects presupposes to obtain large volumes in the medium term, which in turn implies a hard challenge such as granting access to low cost finance and quality service to the largely dispersed Indian consumers.

According to some analysts the Indian trend to develop small low cost cars could make Indians to take the lead of a kind of “Gandhian engineering”, “combining irreverence for conventional ways of thinking with a frugality born of scarcity”, just as “the Japanese popularized kanban (...) and kaizen (...)” (The New York Times, 8 January 2008). Indeed, other car makers in addition to Tata Motors are developing the small- and ultra-low-cost car concept in India. So Bajaj Auto in partnership with the French-Japanese Renault Nissan is expected to launch its low cost model in 2012. From 2004 to 2011 Indian exports of passenger vehicles increased from 129.000 to 453.000 units (SIAM), while from 2001 to 2010 the value of automotive components exported passed from 0.63 to 3.8 million dollars (ACMA). This trend seems to confirm that objective set by the 2002 Automotive policy of the local government to establish the country as a small car manufacturing hub is doomed to be successful. Tata Nano's launch potentially expands the Indian car market, thereby making the country the first test grounding for low cost cars to be sold all over the world, and therefore reinforcing Indian stand as small car manufacturing hub. In

¹² Tata Nano couples the smallest exterior footprint (length: 3.1 metres; width: 1.5 metres; height 1.6 metres) and the highest spaciousness, and its fuel efficiency (23.6 km/litre) is the highest for a petrol car in the country.

fact, Nano itself was developed for the Indian market, but at Geneva Motor Show in March 2011 Tata presented the concept of a “spruced-up” versions of Nano, called Nano Pixel, developed for the sub-compact segment of the European market. Three meter long and endowed with much technology the car was presented as the most “package efficient” four-seater in the world (Tata Motors transforms Nano into Pixel for Europe, domain-b.com, 7 March 2011).

China: Building a new business model or a new value chain? The electric vehicle China is positioning itself as a leader in the hybrid and electric vehicle. In this matter, it has leveraged at the national level the vision of a private company which has met rocket success.

It started with the efforts of a private company, BYD (Build Your Dream). BYD was founded in 1995 as a battery company, to produce cell-phones batteries, with no history whatsoever with the car industry and it is now the second largest cell phones battery maker in the world and it wants to use its edge in batteries for becoming a leader in the electric vehicle new market. It had an early international outlook as in 1999 BYD Europe BV was established, and 2000 for BYD America Inc. to start battery supply to Motorola. The development model was quite capitalistic, as 2002 saw an IPO of BYD Co., Ltd. at the Hong Kong Stock Exchange. The car adventure followed in a bold manner immediately with BYD Auto Co., Ltd. founded in 2003, and the BYD first auto model F3 launched in 2005 through the takeover of a car license in Shaanxi province (but that company had no performing technology at all, it was rather to go through the licensing policy in China and get the Province’s subsidies) and the first models are said to have happened through reverse engineering. 2007 saw the establishment of BYD Electronic Ltd. IPO at HKSE and BYD Electronics India. In 2008, three models, the F6, F0, F3DM were launched, the latter one being an hybrid. Sales met the level of 200,000. In 2009 Warren Buffett became BYD strategic investor; and in 2010 BYD and Daimler signed an MOU for EV cooperation. Whereas car technological design is largely borrowed from existing ‘on the shelf’ technology, BYD focuses on aesthetic design and really focuses its future development onto the technology of batteries where it has a real competitive edge. As per 2009, the cell design and development involved 200 engineers working on improving the battery, and a R&D center with 140 employees working on the whole chain.

The advantages are in the battery production, but a value chain will only develop when the infrastructure is ready to take an electric vehicle; there is a great advantage for countries which can fast develop a cooperation between the industry and the state.

The absolute advantage in the rare earth metals; the NiMH batteries enter in Hybrid cars (including Prius and Lexus of Toyota, Civic and Insight of Honda, Fusion of Ford). As an industrial base of battery production, China is among the top three countries for the production of batteries, with Japan and Korea. China is further a very important producer of lithium carbonate that will most likely be the core technology of the electric vehicle (lithium-ion battery). Leapfrogging is happening through the learning curve of an intermediary step: the huge market of electric cycles and bikes (100million units in use in China).

But the role the government has fixed itself is to set the infrastructure and the financial incentives that are required to develop: smart grids, fast charge and economic subsidies to allow the vehicle to 'ramp up' before industrialisation at large scale gets a price decrease.

The key program is the Program of 13 cities with 1,000 electric vehicles each. The MOST (Ministry of Sciences and Technologies) is in charge of R&D dynamics through its network of research centres ("National R&D Program" ('863 Program') with an envelop of 880 million RMB for 2001-2005 and another of 1 billion RMB for 2006-2010). The MIIT (Ministry of Industry and Information Technologies) takes over to monitor the implementation, experiments at large scale and the preparatory steps for commercialisation. The NDRC (National Development and Reform Commission) supervises the coordination at macro-economic level. Indeed, according to plans, there will be 19% of electric vehicles in China by 2030, and 55% by 2050. Local governments are in charge of coordinating the infrastructure as well as the subsidies for their locally based "national champions" car makers.

The "Fuel Efficiency and New Energy Vehicle Mega-program" got an initial 1.1 billion RMB dotation. The key project is the "13 cities-1,000 clean vehicles" (2009) for buses, taxis, and later on some private vehicles. Different technologies will be tested and consolidated nationally: 12 cities with hybrid buses, 8 with electric buses, 3 with fuel-cell. As for taxis 9 cities will test EVs, 6 hybrids and 1 for fuel-cell. In 2010, an extension was announced to reach 20 cities. The State Council further announced in may 2010 that "5 agglomerations pour the EV" would come up, that cover the base regions of key constructors (SAIC, FAW, Chery, BYD, Geely). The aim is clearly to support the Chinese leapfrogging. BYD is already present –with Toyota and Honda– in the Hybrid vehicle; the battery for electric vehicle technology is developed by the Chinese companies BYD, Chery, Zotye Auto. As for Fuel-cell vehicles FOTON in Beijing (a subsidiary of BAIC) tests 3 prototypes of fuel-cell buses. The fast-change battery vehicle technology is being developed by Dongfeng, SAIC, Chery.

The competition for being the first and for subsidies is overt, as the launch of a 16-car makers alliance by the government shows, with and 100 billion RMB program through state grant; in preparation of the next environment-focused 5-year plan. This program is clearly an attempt to control the negative aspects of competition. But the tendency is towards the creation of JVs with foreign companies.

SAIC (Shanghai Automotive Industry Corporation) partners VW, to develop the FCV technology under the Roewe brand (Roewe is the Chinese name of the Rover technology SAIC has acquired).

These are still JVs, but their face has really changed; they no longer exchange old/mature technologies for starting markets, they are JVs between equal partners on advanced technology.

6. International growth

While for long India was not used as an assembling for re-exports platform by international companies, the exports of cars from India took up. This has notably been the achievement of companies like Tata, including in markets like the UK.

These specific capacities of a few private companies to internationally export have been visible since the mid 2000s in India in contrast with their Chinese counterparts (see table 2, *infra*). Beyond respective capacities in technological and branding issues, the difference can also be explained by the fact that, except for very young and substantially smaller private companies, Chinese companies have become somewhat dependent on their partners in JVs, and dependent on their strategic choice to focus on the Chinese market. The relatively great capitalistic and technological independence of private Indian companies, along with a capacity to internationally market their products that they had earlier gained from their other branches in their conglomeral structure, explain Indian companies' advantage. Last but not least, the smaller domestic market in India was a greater compulsion for these companies to go abroad.

The next step is aimed at entering the US and other developed markets at the low end but many problems are still ahead in terms of marketing, after-sales, dealership, not to speak of the quality of these cars competing on markets where low prices is not the only factor for increasing market shares.

Takeovers of foreign companies can have different aims: to add a commercial segment into the portfolio of models, or into the national domestic available know-how, to shorten the process of catching-up with the standards of international competition –provided this is integrated by the acquiring company, which is always a long and arduous task.

Very often, the ultimate post-acquisition success stories are met with companies which had a rapid growth on their domestic market and have managed to create cost-efficient platforms for exports. Internationalisation of Chinese firms is also the result of internal factors (decentralisation, deconcentration, competition across companies) as much as external (the wish to emulate the exports-driven model of other industrial sectors). They ultimately are in a better position to achieve external growth and proper integration of their targets into their global strategy (as well as using them to precisely define such a strategy in a step-by-step manner). This is in this sense as well that several Chinese companies have first engaged into rapid national and foreign expansion through sales prior to getting labelled as potential champions by the Chinese authorities, thus availing the financial support. This is in a sense a repeated game.

This equilibrium has been reached after initial failures in post-acquisition stage had been observed.

6.1. India's multinational move

The export orientation and the multinational growth of both Indian carmakers and main component suppliers is higher than those of Chinese producers, more oriented to their much bigger and booming domestic market.

In India, 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.

Car exports from India accounted 530,000 vehicles (including passenger and commercial vehicles) in 2011. It is meaningful that the exports of car components have been more dynamic than those of assembled vehicles, increasing from

630 million of dollars in 2000-1 to 3.8 billion dollars in 2011. This trend is consistent with the policy priority given in 2002 to the development of a global source for automotive parts and components (see Section 3). This evolution is indeed due to FDI by global component manufacturers, following the international carmakers, and rationalizing 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 countries. In 2010 the main destinations of component exports were Europe (37 per cent) and North and South America (27 per cent) followed by Asia (28 per cent) and other areas (ACMA data). As 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, characterizes both the automotive assemblers and the main component suppliers.

The following sequences tend to characterize the trajectories of the multinational growth of Indian industrial enterprises and groups, following two main stages.

In a first stage, alliances and JVs are located in India, creating a web of connections –whose width varies for the different companies– with Western and Japanese MNCs. Being part of this network supports the companies in their growth on the domestic market, giving them access to different kinds of resources: manufacturing expertise, basic scientific knowledge, high skilled human resources and advanced equipment, quality management techniques, managerial competencies, knowledge of the foreign market, partners' distribution networks in the foreign countries. In the same stage, foreign affiliates and multinational subsidiaries in the country are the target of acquisitions by Indian firms. As partnerships, also acquisitions allow a rapid process of catching up, transfer and assimilation of foreign knowledge and technology.

In a second stage, the international expansion takes place, via greenfield FDI in developing countries, or acquisitions in most developed countries, thanks to the capabilities, resources and abilities accumulated during the domestic market-driven phase. It implies the establishment of an internal multinational network under the corporate control. Acquisitions, allowing leveraging external resources, represent the most common entry mode, in particular as regards those FDI operations carried out in the developed countries, which represent the dominant destination. Another, alternative or complementary, way of multinational growth is still represented by alliances and JVs, usually established in order to overcome institutional barriers. Efficiency seeking, market seeking and asset seeking FDIs contribute to enhance the competitive advantage of the Indian MNCs.

Table 2 shows the most significant steps in the international growth by the four main Indian actors in the automotive industry, the same that we have considered in Section 5 under the point of view of technology acquisition and assimilation.

Table 2. Indian multinational groups
Multinational growth: Tata Motors, M&M, Bharat Forge and Amtek
Auto

	Tata Motors	M&M	Bharat Forge	Amtek Auto
First export operations	1961 (trucks exported to Sri Lanka)	1968 (utility vehicles and their components exported to Yugoslavia)	1972 (auto components exported to Greece)	1999 (ring gears exported to Japan)
First foreign direct investment carried out	2004	1969*	2003	2002
Foreign direct investments carried out since 2002 (manufacturing operation)	6 (5 acquisitions; 1 jv)	13 (9 acquisitions; 4 JV)	5 (4 acquisitions; 1 JV)	8 (7 acquisitions; 1 greenfield)

* After 1969 M&M proceeded a second operation in 1984. All following operations are lead starting from 2004.

Source: elaborated by Silvia Bruschieri from Balcet and Bruschieri (2008)

For the market leader, Maruti-Suzuki, the Indian domestic market represents the overwhelming destination of the production. Exports amounts to about 50,000 units over a total production of 720,000.

Exports are oriented not only to countries surrounding India (such as Sri Lanka and Nepal), but also to the European market (mainly to the Netherlands, Italy and Germany). Exported models Alto, WagonR and Swift, require specially adapted technologies, developed in two specific export-oriented platforms. In particular, engine performance and environmental standards are adapted to the European requirements.

Tata's exports started in 1961 with commercial vehicles, with the shipment of trucks to Sri Lanka, while early foreign production took place in the 1970s in Singapore and Malaysia, through JVs.

In the 2000s, Tata's commercial and passenger vehicles exports reach Europe, Africa, Middle East, South and South East Asia and Australia. 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 suggestion, and that the car would be distributed in 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. Other two important acquisitions took place in 2005, concerning design and engineering centers: 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 2004 the company was listed at the New-York stock exchange and the following year it produced and sold its millionth passenger vehicle.

In 2008, Tata Motors has assembly units in Malaysia, Bangladesh, Ukraine, Kenya, Russia and Senegal.

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

The first export operation of Bharat Forge dates back to 1972. After some activity developed towards the Soviet Union during the 1980s, the export business grew considerably in the early 1990s with the breakthrough in developed countries markets such as Japan, USA and UK as regards engine and suspension components. In 2008 the company was the largest exporter of auto components from India. 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 USA, Germany, Sweden, UK and China. This result was achieved through successive acquisitions of developed country based companies often near to bankruptcy, and the establishment of a JV in China.

Technology transfer among the different units is an important result of the company's expansion overseas and is mainly carried out through the personnel exchange programs. In addition, thanks to its multinationalization Bharat Forge could adopt a dual shore designing and manufacturing system. Bharat Forge's multinationalization process is an accelerated one, counting four acquisitions and one JV since 2004, that brought the company to have a productive presence in five countries over three continents. Behind such process one can discern market access as well as resource augmenting motivations.

Mahindra & Mahindra started exporting in 1968. Nevertheless this activity still absorbs a limited share of the vehicle production of this company, mainly consisting in shipments of commercial vehicles to other emerging or developing countries. Exports of auto components generated by the companies of the Mahindra group are more relevant. In the vehicle sector, the internationalization carried out by Mahindra & Mahindra via FDI was often driven by market seeking motivations, as happened with the JV established in South Africa, Italy and Australia in the distribution segment at the mid 2000s, as well as for the acquisition of the Korean automobile

manufacturer Ssangyong Motor (2010). Other motivations were the asset seeking one, aimed at accessing complementary technologies and new clients, and the aim of generating economies of scope. This is the case for instance of the acquisitions carried out in Italy in 2008 of the engineering and design companies Grafica Ricerca Design and Engines Engineering. In the auto component sector Mahindra & Mahindra carried out 6 acquisitions in Europe between 2006 and 2008, that made this company an integrated supplier of a complete service: from design to manufacturing of a wide gamut of products.

Amtek Auto is an example of a very dynamic Indian component supplier, which acquired 7 companies in the US and Europe and set up a greenfield operation in the US since 2002. This process allowed the company to strongly increase its manufacturing capacity, to access new technologies and to acquire certified plants as well as to enlarge its customer base, becoming able to serve the latter either from India or from one of its foreign locations.

Another Indian success story in internationalization is given by Sana Koyo Steering Systems of Chennai, exporting high quality precision products to USA, Europe and Japan and with a JV in France.

6.2. Late internationalisation of Chinese carmakers

For the reasons we underlined –State governance and slower (compared to India, but fast in historical terms) technological catching-up– Chinese companies internationalised later than Indian companies.

Here we distinguish exports from the internationalisation of production: at least a partial assembly abroad. In the first category we can find mostly utility vehicles, which have been a great Chinese export. The case of Brilliance has been discussed. Their main model for long (a new JV was launched with SAIC and Iveco) was derived from a Berliet model (1967, from France) when Hongyang acquired the knowledge and engineering. These trucks are now popular in the French-speaking part of Africa and the company sells in Senegal, Gabon, Ghana, Angola, Kenya, Tanzania, with plans to expand into Peru, Iran, Philippines, Cambodia, India, Malaysia, Morocco, Egypt, Thailand¹³. It arrived in some African countries through Chinese projects there (governmental or private projects), and brought Chinese equipment as well, initially following its customers (construction projects, mines).

But passenger car companies too can target a pure export strategy. BYD places many hopes in exports for funding its technological expansion. In 2006 BYD, started to export its vehicles to foreign countries and as of 2009 BYD exported its cars to Africa, South America and the Middle East. The company has plans to enter the European and Israeli markets, and to sell vehicles in the United States, and has already some sales in Pakistan. The trucks case is interesting too as it exemplifies how China expands internationally.

As far as internationalisation is concerned, we distinguish three models.

- The first one is merely a shift from an initial exports strategy. Brilliance for instance long exported and now became an assembler from Egypt as was mentioned above.
- The second strategy, developed by companies like FAW and Changan, is based on early assembling abroad. The international growth of companies with a strong provincial support, for instance, Changan, based in Chongqing municipality, has been quite impressive. They entered

¹³ As when interviewed in 2009 by Giovanni Balcet, May Gicquel and Joël Ruet.

the Italian market with mini trucks in 2006 and commercialized one of their brands in Greece. Their largest foreign markets soon became South Africa, Algeria and Latin America, after massive exports of commercial vehicles really started in 2002, to the Middle East, Eastern Europe, Latin America and South-East Asian countries. They perceived the crisis as “a chance for Chinese cars to enter the European market, because people want cheap and good quality cars”. Success followed success and in the domestic market, sales increased dramatically. They started factories abroad in Malaysia, Ukraine, Vietnam, USA, Iran and Egypt, for the final assembly (painting, welding). For these plants, they have cooperation agreements with local companies (car makers and sale networks). In the US they cooperate with Tiger company (not with their JV partner Ford for competition fears), in Iran with PIDF and in Ukraine with Geely and AIS. They pursue two big CKD projects in Iran and Mexico. Production of electric vehicles by Changan takes place in the US and Canada. They bought the battery technology, but will develop their own vehicle. It is noteworthy that Changan has a global strategy ranging from production to R&D; among its 5 R&D centers, 3 are in China (one in Shanghai, and 2 in Chongqing for engineering) but two are abroad: one in Italy (Torino) and one in Japan, for design and accessories.

- The third strategy, of acquiring foreign assets and brands, is ultimately coming to be a minority of cases. Geely in 2010 took over Volvo and it will be really telling to see how the integration is done, while Geely is clear about preserving Volvo’s autonomy and quality strive. Within this category, the most advanced and stabilised case is definitely SAIC, which has met a bumpy road of trials and errors but now emerges as a group with international ambition and technological credibility.

6.3. State support to internationalisation: amore advanced tool in China

Compared to other Asian countries, the share of exports and production abroad is still low, although both countries are entering the world market following different strategies. Indian companies, concentrating on some product segments with higher added value, export relatively more than Chinese companies. In this country, at least for JV, the domestic market matters first. Initially, only new comers like Chery, a company supported by the province of Anhui, or some private Chinese companies like Geely, started to export on the world market, with low end products to Asian and Middle East countries. Other companies (FAW, Brilliance) are developing facilities in foreign countries either to produce, assemble (in Malaysia for the former, Egypt for the latter), or to have access to sub-contractors with more developed technology to increase the quality of their product (FAW in Mexico). The diplomatic support of the Chinese State is a key factor; for instance the intervention in Egypt was decided after the 2009 Sino-African summit in Beijing. The support by the government may be important in takeovers as well, at the financial level (credit, access to foreign currency), or later access to national technology centres and their human resources to fast integrate the knowhow of the acquired company. If one considers the acquisition of the south-Korean firm Sangyong by Shanghai auto, 66% of the acquisition got financed by preferential loans by three State-owned banks (again there is no specificity of the automobile industry in this very recurring Chinese feature, as Huawei for instance, in telecoms, benefited from a credit line of 10 billion USD for its foreign expansion). Also the acquisition of Volvo by Geely benefitted of financial support by the governments of three Provinces, where the new Volvo plants and R&D centres will be located.

However, some companies which had not been labelled as “national champions” went international without the support of the State and have met with failure. Direct support remains, but the state had recentered onto strategic acquisitions.

7. Concluding remarks: New scenarios

7.1. China and India: Converging and diverging trajectories

Comparing market structures, actors and growth trajectories of the automotive industry in the two countries sheds light on common features and different paths.

In both countries strong political emphasis has been put on this industry, considered as a “pillar” or crucial sector for national development. In different ways, national regulations (including ownership rules) and industrial policies strongly supported its growth and shaped market structure. As a result, fragmentation characterizes the structure of the Chinese market on the supply as well as on the demand side, while Indian manufacturers are quite concentrated and few main actors, beside several smaller producers, dominate the sector.

- At the beginning of the new century, the size of the two markets was comparable. But since 2002 growth trajectories diverged dramatically, as the Chinese market’s fast growth evolved in an impressive boom at the end of the decade.
- State ownership, at central and local (province and municipality) level represents the dominant pattern of governance in China, along with JVs with foreign multinational investors; while private companies are a second but dynamic component. All of them are quite focused on the automotive business (ranging from cars to commercial vehicles to buses). In India, history and policies gave rise to different institutions, i.e. family-owned conglomerate groups, highly diversified and creating synergies between their different branches.
- Each country shows specific weaknesses. In India, poor infrastructure, namely insufficient highways, handicaps seriously the development of this sector. In China, consumer finance is under-developed. In both countries, environmental concern and traffic congestion problems limit further growth along present trajectories, calling for technological change (low-emission vehicles, including electric vehicles) and new urban and infrastructural planning.
- Both countries face opportunities for technological leapfrogging, with potential implications for their future role in the global scenario of this industry: the electric vehicle in the case of China, and the low-cost car in the case of India. Technological capabilities, production resources and policy options contributed to make these innovative opportunities emerge.

7.2. Evolving patterns of joint ventures

Alliances, JVs and vertical relationships (suppliers) are at the core of any explanation of technological catching-up in India and in China. They have represented crucial instruments to acquire assets from multinational partners, enhancing the capabilities and therefore the competitive advantages of Indian and Chinese firms. Their role has evolved in the last decades, the two countries following specific trajectories.

Bridging the empirical evidence and the existing literature, as recalled in Section 2, we can point out that joint ventures, as an institutionalized partnership, can be interpreted as a “hostage”, aiming at stabilizing complex cooperative relationships, that would be difficult and risky to deal with purely contractual non-equity instruments. This has been the case in India, especially during the

deregulation and the early liberalization decades of the 1980s and the 1990s. From this point of view, their role has been declining with the implementation of the legal framework and the IP rules. In China, their role is still crucial as a guarantee for long-term partnership. In some key industries, including automotive assembly operations, it is still imposed by the law: in this case, the JV may be considered a “second best” option for the MNC.

If we look to JVs from a dynamic point of view, they can be viewed as a “learning instrument”.

Traditionally, and it is the case for both India and China, such motivations include the access to technology, organizational and managerial skills for the local partner, public or private company. For the multinational, Western or Japanese corporation, the main motivation is the access to huge emerging markets, overcoming institutional barriers and a strong distance factor. In the traditional pattern, transferred product and process technologies could be mature or even obsolete, especially in the case of protected domestic markets, and MNCs could limit the technology transfer, or delay it, in order to preserve a lasting gap.

A dynamic approach underlines the evolutionary nature of JVs and alliances, as we have pointed out in the case of the twenty years lasting Maruti Suzuki JV, which evolved into a majority-owned foreign affiliate after having shaped the Indian market. Both in India (Tata, Mahindra & Mahindra) and in China (SAIC, FAW) domestic companies have been able to develop their own capabilities leveraging from short-term or long-term lasting JVs. At the same time, these companies and emerging national champions followed other ways to upgrade their technological capabilities, including internal R&D, licensing, acquisitions, reverse engineering and consultancy firms.

If the golden years of JVs were over in India after the privatization process deepened, a strategic evolution is under way in China too. As exports expand, the traditional domestic market /technology deal may evolve and JVs can export to other emerging market, to developing or semi-peripheral areas, as the Middle East, Russia, Indonesia and some African countries. In the same time, the Indian and Chinese partner, after an intense growth and catching up process, may become less dependent on foreign and multinational technologies. An exchange technology / technology, beside that market /market may become a significant content of such new generation JVs.

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