

In-house Integration Model in the Indian Automobile Industry

A Research Note

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I. ECONOMIC BACKWARDNESS ?

Since the mid-1980s, Indian automobile suppliers have been upgrading their technological knowhow to competitively respond to an increasing demand for higher value-added components from domestic and global assemblers. From an infant industry in the 1940s, many of India's auto component suppliers have attained "preferred vendor" status with the global auto manufacturers (SIAM 2012). According to the Automotive Component Manufacturers Association of India (ACMA), the auto component market in India should grow at a CARG (compounded annual growth rate) of 11.7 percent between 2011 and 2015, and the export market at a robust CARG of 18 percent between 2011 and 2021 (ACMA 2012). In stark contrast to the immutable import substitution origins of the Indian automobile industry, this emerging scenario would make it one of the dynamic automobile component hubs in the world.

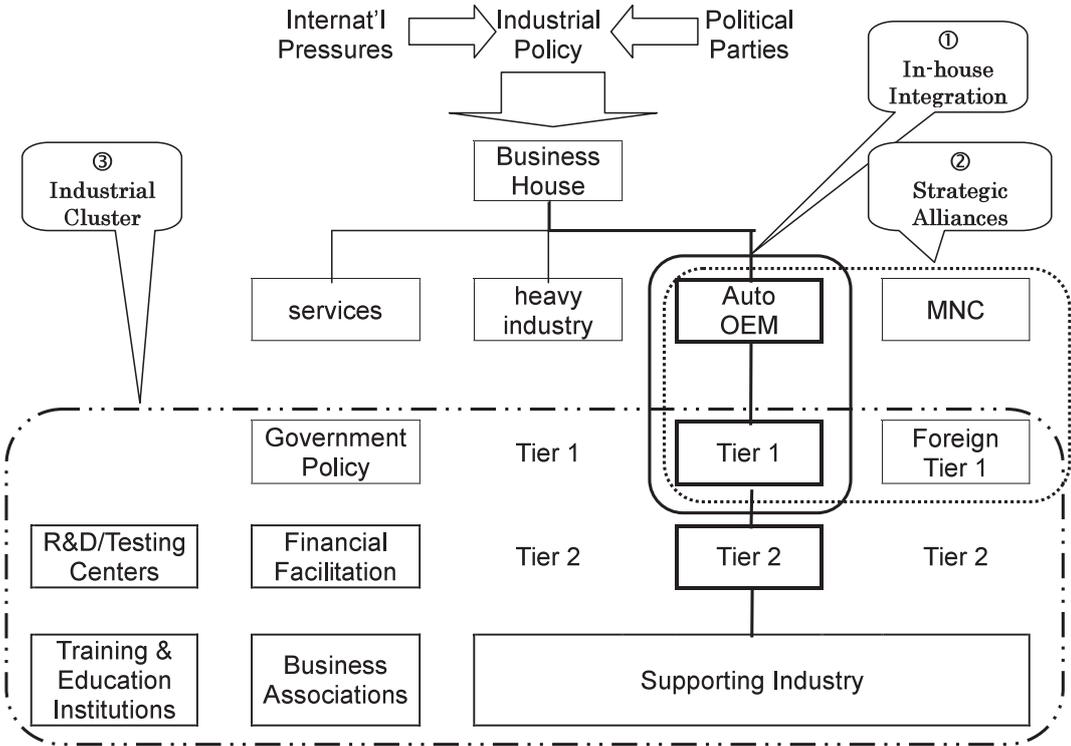
The conventional wisdom is that the global rise of the Indian automobile companies has been driven by the deregulation of the economy from the 1980s and the subsequent entry of multinational corporations (MNCs) since the 1990s. Contrarily, in carefully tracing the development of the automobile industry *before* deregulation, Ranawat and Tiwari (2009) bring back into focus the role of government import substitution policies—that is, the substitution of foreign goods with ones produced by domestic companies for local consumption—in creating a proto-automobile industry in India. These policies provided the incentive for local companies such as Hindustan Motors (Birla Group), Premier (Walchand Hirachaud Group), Mahindra & Mahindra (Mahindra Group), Tata Motors (Tata Group), Bajaj Auto (Bajaj Group) and Ashok Leyland (Hinduja Group) to enter the automobile industry. Figure 1 illustrates that the channels for acquiring technology flows from a business house (corporate group) to its affiliated automobile original equipment manufacturers (OEMs—assemblers) and their Tier 1 suppliers—that is, an inter-firm but intra-group relationships (often referred to as an in-house integration model). In contrast to the experiences of countries such as Spain, Mexico and Brazil, this pre-deregulation in-house

integration business model legacy is one important reason Indian automobile companies have not been swept aside by MNCs in the wake of the liberalization of the economy in the 1990s (Humphrey 1999).

As government licensing and quota policies gradually gave way to market forces *after* the liberalization of the economy in 1991, then, Indian OEMs were not in a position of total weakness, but as Figure 1 indicates, they could leverage strategic alliances with MNCs to create new channels for acquiring technologies (technology licensing, technical collaborations, and joint ventures). Narayanan (1998) finds that where local automobile companies acquire technology in partnership with MNCs, they achieve a higher level of organizational performance (profits). Saranga (2009) examines the reverse side of this coin and finds inefficient local automobile companies perform less well because they lack the capacity to acquire and absorb technologies. Empirically exploring this interaction between the transfer of technology by MNCs and the technological absorption capacity of Indian automotive companies, Kumaraswamy et al. (2010) assert the strategic alliance channels for technology acquisition are actually a series of learning curves for Indian companies. At the early stages of the learning curve, they incur an investment cost (e.g., improving product and process quality capabilities to meet stringent OEM standards) and so organizational performance initially suffers. Indian companies that successfully manage this organizational change process, however, move up the learning curve and then gradually achieve higher levels of organizational performance that off-set the initial costs.

D’Costa (1995) underscores the benefits Indian companies derive from partnerships with MNCs; however, he is apprehensive about the linked assertion that the deregulation of the economy initiated from the 1980s resulted

FIGURE 1: Political Economy of Automobile Industry



in less government intervention in the industry. A vivid example is the state enterprise Maruti Udyog Limited's joint venture with Suzuki Motor Corporation established in 1982 (Ishigami 2005). Despite deregulation, the government has played an important complementary role in facilitating the success of this joint venture. Figure 1 shows a stylized fact representation of the supportive government policies and institutions surrounding the Maruti-Suzuki joint venture. Arguing for this endogenous path to industrial development, Singh (2004) supports freer markets, however in combination with more strategic government rules and regulations (taxes and tariffs, research and development incentives, export promotion) and government supported institutions (research and testing centers, training and education institutions, etc.) to strengthen the competitive capacity of Indian companies. In this connection, Kuchiki (2004) proposes a flow chart model to shed light on how government interventions (trade and investment policies, industrial zones initiatives), local capacity building (infrastructure, support institutions, and human resource development) and lead firms can agglomerate into industrial clusters to create the critical mass for acquiring technology. Along with his colleagues at the Institute for Developing Economies (IDE), they argue the agglomeration of institutional resources mitigate market failures in India, facilitating better organizational performance among companies operating within an industrial cluster than those outside it (Okada and Siddharthan 2007; Uchikawa 2011).

This research note examines the Indian automobile industry based on government, company and organization interviews in three major automobile regions in India: Maharashtra (Mumbai-Pune), Tamil Nadu (Chennai), and the National Capital Region (Delhi, Manesar, Gurgaon) conducted in 2010 and 2011.¹ In particular we sought information that would be useful in understanding how government policies affect the organization of the in-house integration business model commonly found among Indian automobile companies.

II. DOES POLICY MATTER?

International and domestic issues draw different stakeholders into the political arena, influencing the debate on industrial policies. This in turn affects the degree the in-house integration of Indian OEMs and suppliers is based on market or non-market relationships. Table 1 shows the import substitution regime that emerged between 1947 and 1965, and elaborated through the administration of licensing and quota policies in the 1970s, shaped an in-house integration of OEMs and suppliers based on non-market relationships. The gradual deregulation of the economy from 1981 and the increasing pace of liberalization since 1991 facilitated a mixed market and non-market in-house integration of domestic and foreign OEMs and suppliers through strategic alliances. This section

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TABLE 1 Political Economy of Indian Automotive Industry

	1947–1965 Import Substitution	1966–1980 Licensing-Permit Raj	1981–1990 Deregulation	>1991
Political Economy	INC Socialist Reforms (1950–1975) Balance of payment crisis (1956–57) China (1962) & Pakistan (1965) Wars	Establishment of SIAM and ACMA Currency devaluation (1966) Oil Crisis (1973–1974)	BJP center-right challenge Indian Economic Crisis (1990–91)	Entry to WTO (1995) Asian Financial Crisis (1997) Lehman Shock (2008)
Industrial Policy	<ul style="list-style-type: none"> • Industrial Policy Resolution (1948) • IDRA (1951) • Tariff Commission Report (1953) • Industrial Policy Resolution (1956) • L. K. Jha Committee (1960) 	<ul style="list-style-type: none"> • Tariff Commission Report (1966) • MRTP Act (1969) • Foreign Exchange Regulation Act (1973) • IDRA licensing rules relaxed (1975) • Industrial Policy Statement (1980) 	<ul style="list-style-type: none"> • Letter of Intent (1981) • Appendix I List revision (1982) • Phased Manufacturing Programme (198?) • Schedule IV (1984) • MRTP Revision (1985) 	<ul style="list-style-type: none"> • Industrial Policy Statement (1991) • Auto Policy (2002) • Automotive Mission Plan (2006)
Automobile Industry	<ul style="list-style-type: none"> • Business houses dominate industry 4-wheel category • In-house (non-market) integration business model • Beginning of ancillaries sector • Regional center automobile hubs in west and south 	<ul style="list-style-type: none"> • Increase in commercial vehicle and 2-wheel OEMs (product diversification) • Arms-length suppliers emerge, especially in south • Northern automobile hub (geographical diversification) 	<ul style="list-style-type: none"> • Re-entry of foreign OEMs • Reorganization of in-house integration model into a supply chain model in northern region. • Design as well as manufacture role for Tier 1 suppliers • Maruti revolution, expansion of consumer market 	<ul style="list-style-type: none"> • Strategic alliances with foreign automobile companies • Production for export market • Domestic market competition in small cars

NOTES: FYP = five year plan; IDRA = Industrial Development and Regulation Act; MRTP = Monopolies and Restrictive Trade Practices Act; WTO = World Trade Organization

SOURCE: Compiled from Ranawat and Tiwari 2009

brings policy back into focus to illuminate the ways Indian automobile companies change and do not change their organizational form (in-house integration) in order to acquire technologies.

1947–1965 Import Substitution Regime

The Indian National Congress (INC) Party, headed by Jawaharlal Nehru, dominated the political arena following India's independence from Great Britain on August 15, 1947. The party platform—based on the principles of secularism, socialist pattern of society and a non-aligned foreign policy—called for government control over strategic industries and regulation of the private sector in a concerted drive toward rapid economic development. The fiscal budget demands of guns (wars with China and Pakistan) and butter (agrarian reform) issues required the government to keep a tight rein on the Indian economy (Bhagwati 1993). Consequently, an import substitution policy regime evolved, focusing on (1) protection against foreign competition, (2) local production primarily for the domestic market, and (3) licensing and quota requirements.

The protectionism dimension of India's import substitution regime originated from the 1948 Industrial Policy

Resolution (IPR), empowering the Ministry of Industry to implement a prohibited tariff on the import of fully-built vehicles. This was followed by a Tariff Commission report submitted in 1953, recommending licensing and quota schemes favoring domestic production over foreign imports. Unable to profitably substitute imported fully-built vehicle with local parts, General Motors and Ford subsequently closed their assembly plants in Mumbai, Kolkata, and Chennai. Behind this protect tariff wall, Hindustan Motors, Premier, Mahindra & Mahindra, Tata Motors, Bajaj Auto and Ashok Leyland took unchallenged positions in the automobile industry.

A key element supporting their dominant market presence is affiliation with a business house. Take the case of the Hindustan Motors, famous for the iconic Ambassador car. It is affiliated with the CK Birla Group, a diversified conglomerate with interests in resources (cement), heavy manufacturing (precision bearings, paper, building products) and services (engineering services, education, and healthcare). Hindustan Motors could count on access to these intra-group resources (i.e., goods, people, money and information) to implement its business plans. We note a similar organization pattern across the other business houses, where their competitive strength is derived from the ability to diversify their business activities *within* their industry (i.e., moving up the technology ladder to higher value-added products) and/or *across* industries (i.e., leveraging core technologies to manufacture new products in another industry). In the absence of access to such organizational resources through a business house or state owned enterprise, single standing companies are at a distinct competitive disadvantage.

The IPR was revised in 1956, declaring a “socialist pattern of society” and defining where and to what extent government would guide (command) the economy. This translated administratively into the establishment of Schedule A, exclusively state owned enterprise (SOEs) industrial sectors, and Schedule B, mix of SOEs and private enterprises industrial sectors. All other sectors, including the automobile industry, would be open to private enterprises with limited government interventions. Table 2 shows this further protected and legitimized the business houses that had already entered the automobile industry before 1956 as well as highlighting their continuing dominance of the market, as no new company, domestic (Table 2) or foreign (Tables 3), would enter the 4-wheel vehicle category (passenger cars and commercial vehicles) and only a few in the other vehicle categories (2-wheel and 3-wheel vehicles) of the industry until the 1980s.

Although the IPR of 1948 and 1953 effectively closed the Indian automobile industry to MNCs producing fully-built vehicles, it allowed Indian automobile companies to continue technical agreements with them to import crucial parts and components unavailable in the domestic market. What evolved is a lead company (i.e., OEM) importing components as well as procuring parts from local in-house suppliers. To reduce dependence on foreign parts, a second dimension of the import substitution regime became localization of parts manufacturing. In 1957 the Tariff Commission initiated measures to encourage the local assembly of automobiles and manufacturing of vehicle parts. Particularly prominent among these measures is the progressive manufacturing programme (PMP), requiring OEMs to initially attain 50 percent local content in their vehicles followed by incremental increases in the years thereafter. Although the percentage of local content in vehicles increased, the 1960 L. K. Jha Committee

TABLE 2: Major Domestic OEMs

Estab Year	Company	4-Wheel				3-W	2-Wheel			
		PC	UV	M&H CV	LCV		S	MC	MP	2-W
<i>Import Substitution</i>										
1942	Hindustan Motors	●								
1944	Premier		●		●					
1945	Mahindra & Mahindra	●	●		●	●				
1945	Tata Motors	●	●	●	●					
1945	Bajaj Auto					●	●	●		
1948	Ashok Leyland			●	●					
1949	Standard Motor ¹	●								
1955	Royal Enfield MC ²							●		
<i>Licensing & Quotas</i>										
1970	Kinetic Engineering							●	●	
1972	LML ³						●	●		
1972	Scooters India					●				
1973	Majestic Auto								●	
1974	Sunrise Automotives ⁴	●								
<i>Deregulation</i>										
1981	Maruti Suzuki India ⁵	●	●							
1982	Eicher Motors			●	●					
1982	TVS Motors						●	●	●	
1982	Eicher-Mitsubishi ⁶				●					
1983	Allwyn-Nissan ⁷				●					
1983	DMC-Toyota ⁸				●					
1984	Swaraj Mazda ⁹			●	●					
1984	Hero Honda ¹⁰						●	●		
1985	Force Motors		●		●	●				
1986	Atul Auto					●				
1989	JCBL			●						
<i>Liberalization</i>										
2002	Asia Motor Works			●						
2003	Internat'l Cars & Motors		●							
2005	Mahindra Navistar A						●			
2008	Mahindra Two Wheeler									●
2008	VE Commercial Vehicles			●	●					
2010	Mahindra Reva EV	●								

NOTES: Estab = establishment (year); PC = passenger car; UV = utility vehicles H & HCV = medium and heavy commercial vehicles; LCV = light commercial vehicles; S = scooters; MC = motorcycles; MP = mopeds; 2-W = electric 2-wheelers; 3-W = 3-wheelers. Domestic OEM = 50% ownership or more controlled by Indian. Internat'l = International. A = Automotives. EV = Electric Vehicles

¹Standard Motor went out of business in 1988 and recently re-entered the industry. ²The Royal Enfield Motor Company merged with the Eicher Group in 1994. ³LML = Lakshmi Motor Limited. ⁴Sunrise Automotive Industries was renamed Sipani Automobiles in 1978 before going out of business in 1983. ⁵In 2007, Suzuki became the majority owner in this joint venture. ⁶Eicher-Mitsubishi sold to Eicher Motor in 2009. ⁷Allwyn-Nissan sold to Mahindra and Mahindra in 1994. ⁸DCM-Toyota becomes DCM Daewoo in 1995 (100% ownership in 1998). ⁹Swaraj Mazda changes name to SML Isuzu in 2011. ¹⁰Hero Honda was renamed Hero MotoCorp in 2011 when Honda withdrew from its joint venture with Hero.

SOURCE: Ranawat and Tiwari 2009, IRC 2009; SIAM 2012

found the Indian automobile OEMs' in-house manufacture of parts hindered the robust development of local parts manufacturers. It recommended the promotion of an indigenous ancillaries (supplier) sector. After the government's adoption of the committee report, small scale industry suppliers were granted exclusive rights to manufacture a list of 60–80 components, marking the beginning of a market based ancillaries sector in India.

A licensing and quota scheme became the third dimension of the import substitution regime. The 1951 Industrial Development and Regulation Act (IDRA) harnessed economic development to government licensing of industrial products, output, expansion, and location of companies with more than 50 workers—that is, mainly the large companies of the major business houses. The licensing restrictions on broad banding (manufacturing in different vehicle categories and segments) and quotas (restrictions) on production volumes meant consumers had limited model choices. Table 2 shows there is a relatively neat division of labor *across* the three major vehicle categories (4–wheels, 3–wheels, and 2–wheels); and *within* categories, vehicle segment diversification is mainly found mainly among Mahindra & Mahindra and Tata Motors, the two largest business houses. Furthermore, we found the licensing and quota schemes limited the market reach of the Indian OEMs, skewing business activities to their region of origin more than nationwide. Standard Motor and Ashok Leyland in the southern region of India (Tamil Nadu), and Premier, Mahindra & Mahindra, Tata Motors and Bajaj Auto in Maharashtra and Hindustan Motor in Gujarat, both in the western region of India, became the country's two major regional automobile industry hubs.

In short, the opportunities and limitations of the protectionism and localization dimensions of the import substitute regime influenced Indian OEMs to create a closed (non-market) in-house integration between OEMs and key suppliers business model embedded within a business house, and loosely linked under a policy mandate to a large fragmented ancillary supplier base. Moreover, the licensing and quota dimension of the import substitution regime molded the regional business contours of the OEMs and automobile suppliers that still remain perceptible today in the organization of the automobile industry.

1966–1979 Licensing and Quota Regime

The INC Party continued to dominate the national political arena in the 1970s, however, under the Indira Gandhi administration, it would extend its reach down to the federal state level, tightening the national government's grip on the Indian economy (Bhagwati 1993). The necessity for devaluing the currency in 1966 and the contraction of the economy after the oil shock in 1973 drove the INC Party to redouble its populist command economy approach. Industry would shoulder most of the austerity measures to lighten the social impact. Passenger car OEMs got particularly squeezed between the revenue and expenditure countermeasures as the government institutionalized the licensing and quota schemes in competition policy and foreign exchange controls.

Yielding to populist political pressures in 1969, the Tariff Commission reversed its import substitution regime stance and imposed statutory price controls on the passenger cars segment to allay consumer pressures. This was

quickly followed by the 1969 Monopolies and Restrictive Trade Practice Act (MRTP), a competition policy to curb the excess practices of big business. Under this Act, companies with more than INR 200 million in fixed assets and/or a one-fourth market share would be classified MRTP companies, subjecting them to license and quota regulations administered by the MRTP Commission in addition to those already specified by the 1951 IDRA. In competition policy, the reverse side of curbing monopolies is promoting more competition in the market. In this connection, given the division of labors among Indian OEMs across the vehicle categories, the MRTP did significantly curb the business activities of the dominant business houses in the 4-wheel vehicle category (Okada and Siddharthan 2007). On the other hand, the MRTP protection against big business opened competitive entry to the automobile industry; but, Table 2 shows almost no new OEMs entered the 4-wheel vehicle category during the 1970s. Likewise, the 1973 Foreign Exchange Regulation Act (FERA) added another licensing and quota burden on automobile companies. Ostensibly meant to preserve the country's dwindling foreign reserves, the policy subjected companies with more than 40 percent foreign equity to surveillance by the Foreign Investment Board on the import of technology, raw materials and components. In short, government guidance replaced the market discipline of supply (competition) and demand (price), especially in the passenger car (luxury) segment, resulting in small volumes, stunted growth, and sluggish technological change.

Under the Appendix I classification of automobile vehicles, however, the government granted the commercial vehicles and tractors segments favorable treatment under the MRTP and FERA. As a result, the Indian OEMs dug deep into their business house intra-group resources to sustain their passenger car production while turning their attention to growing the commercial vehicle and tractor businesses. Table 2 shows Hindustan Motors, Premier, Mahindra & Mahindra and Tata Motors, mainly in the western region, made this transition across the vehicle segments. Standard Motor, located in the southern region of India, was the hardest affected as it did not produce commercial vehicles nor did it have the intra-group resources to move into this vehicle segment. In contrast, Ashok-Leyland, also located in the southern region, was already exclusively a manufacturer of commercial vehicles and tractors and used this opportunity to move up the technological ladder to consolidate its market position. Moreover, the government encouraged the manufacture of personal and affordable 2-wheel vehicles and 3-wheel vehicles through preferential measures. Table 2 shows four OEMs—Kinetic Engineering, LML, Scooters India, and Majestic Auto—entering the industry during this period of time. Interestingly, all but Kinetic Engineering, are located in the northern region of India; nurturing what would become a third regional hub in the automobile industry. The intentional and unintentional outcomes of government policies, then, was product and geographical diversification thereby broadening the foundations of the automobile industry.

During the licensing and quota regime, we find the OEM in-house integration model persisting in the western region of India; however, the declining production volume of Standard Motor forced automobile suppliers in the southern region of India to become more market-oriented to secure OEM customers nationwide as well as develop their commercial vehicle and tractor parts businesses. Except the Anand Group, the major automobile

supplier groups who trace their product diversification to this period are from the southern region—Rane Group, Amalgamations Group and TVS Group—and today have an exceptionally strong national presence in the parts and component market as well as export markets. The growing stratification of the automobile industry meant the OEMs had a growing market option beyond their in-house suppliers for procuring parts and components. On the eve of the deregulation of the Indian economy, then, the OEMs and automobile supplier had created a basic framework for a viable automobile industry.

1980–1997 Deregulation and Liberalization

The political arena became more pluralistic after dissatisfaction with the INC Party's undemocratic state of emergency decrees brought the Janata Party to power in 1977, and then the rise of the Bharatiya Janata Party (BJP) from the federal state level to become a vocal opposition party in national politics in the 1980s. Although the INC Party regained power in 1980, the BJP—advocating self-reliance, free market capitalistic policy, and foreign policy driven by a nationalist agenda—moderated the INC Party's socialist agenda and opened the door for more debate on liberal policies (Bhagwati 1993). A similar debate was taking place right in India's regional backyard as the plausibility of an export-oriented approach to economic development was gaining momentum among the newly industrializing economies in East Asia (World Bank 1993). Taking advantage of the open trade and investment regimes dawning in East Asia, the major automobile OEMs from the United States, Europe, and East Asia began extending their supply chains across national borders, reappearing on India's door steps after a three decade long hiatus.

The 1991 New Economic Policy is often portrayed as the beginning of the liberalization of the Indian economy; however, a decade earlier the Industrial Policy Statement (1980) set the tone for a series of changes to gradually dismantle the import substitution regime. Many of the steps were experimental, and so the government's trial-and-error approach meant some vacillation between deregulation and re-regulation. On the licensing and quotas dimension of the import substitution regime, for example, between 1982 and 1984, the government relaxed regulations on industrial products, output and expansion. The Appendix I list was revised in 1982 to include "luxury" passenger cars as well as 2-wheel vehicles and 3-wheel vehicles, allowing MRTP and FERA companies to expand product models and provide consumers a wider choice of vehicles. In addition, in 1980 and renewed in 1982, the government allowed automatic growth (i.e., expanding output without prior permission of the government) so that automobile companies could achieve economies of scale. And non-MRTP companies and non-FERA companies could expand production up to the built (planned) capacity of their facilities. But from 1984, pressures from within the INC Party constituencies led to the enforcement of Schedule IV measures—that is, industries requiring special regulation on the grounds of raw material shortage, likelihood of high pollution or infrastructure constraints—reviving some aspects of the licensing and quota framework.

Nevertheless, the initial quick success of the Maruti-Suzuki joint venture quieted critics of deregulation enough

for the government, on the protectionism dimension of the import substitution regime, to lower tariff barriers on the import of technology and foreign equity collaboration. In 1983, the government gave four Indian OEMs—Swaraj-Mazda, DCM-Toyota, Allwyn-Nissan, and Eicher-Mitsubishi—a Letter of Intent, permitting them to manufacture light commercial vehicles. Although the outcomes of each joint venture has been different,² it is clear all Japanese automobile companies have been very generous in transferring product and production practices—total quality management (TQM) and total productive maintenance (TPM) and their associated techniques—to their Indian partners. We found the 10 largest Tier 1 suppliers—Amalgamations Group, Antek Group, Anand Group, Endurance Group, Kalyani Group, Rane Group, Sona Group, TACO Group, TVS Group, and Varroc Group—have leveraged their strategic alliances with foreign partners to improve the “quality, cost and delivery” of products and production to become not only a local supplier, but also a “preferred vendor” in the global supply chains of the MNCs. Vendor awards, ISO (International Standards Organization) certification in quality and environmental management systems, TS 16949 (quality management system for supply chain), Deming Prize and other industry certifications were commonly displayed at all the companies we visited; some setting aside a quality control room named after or displaying the Japanese “gurus” that have assisted them. Moreover, we found the “spill-over” of Japanese management and production practices throughout the Tier 2 supplier network, leading us to call the impact of this early period of foreign investments the Suzuki-nization of the Indian automobile industry.

The INC Party returned to power in the 1990s, but the growing strength of the opposition parties and the worsening fiscal crisis moved its policies toward the center of the political spectrum. The political consensus was that Indian should cautiously open the economy, leading to the government announcement of a New Economic Policy in 1991 and accession to the World Trade Organization (WTO) in 1995. In 1991 the Industrial Policy Statement (IPS) signaled to foreign investors the government was willing to remove the barriers to market entry. Table 3 suggests there was a wait-and-see period until around 1997. During the interim, the government followed through on the IPS by dismantling all three dimension of the import substitution regime—protectionism, localization, licensing.

III. ORGANIZATIONAL CHANGES IN INDIAN AUTOMOBILE COMPANIES

After 1997 and in the space of three years, nine MNCs entered the Indian automobile industry. When MNCs, like General Motors, Mercedes-Benz and Honda, entered the Indian automobile market, they found a well established in-house integration of Indian OEMs with local Tier 1 suppliers in the western region of India and a more familiar SMC inspired supply chain model; but, some residual import substitution policies and an inadequate infrastructure (JBIC 2011). The Indian government’s response to these issues was the Auto Policy of 2002. It

2 We discuss the variations in outcomes in a forthcoming paper on “Channels for Acquiring Technologies.”

TABLE 3: Major Foreign OEMs

Estab Year	Company	4-Wheel				3-W	2-Wheel			
		PC	UV	M & H CV	LCV		S	MC	MP	2-W
<i>Import Substitution</i>										
	<i>None</i>									
<i>Licensing & Quotas</i>										
	<i>None</i>									
<i>Deregulation</i>										
1981	Maruti Suzuki India	●	●							
1985	India Yamaha Motor							●		
<i>Liberalization</i>										
1994	Mercedes-Benz India	●		●						
1994	General Motors India	●	●							
1995	Honda Siel Cars India	●	●							
1996	Hyundai India	●								
1997	Fiat India Automobiles	●								
1997	Suzuki Motorcycle India						●	●		
1997	Toyota Kirloskar Motor	●	●							
1998	Piaggio Vehicles				●					
1998	Volvo India			●						
1998	Tata Vectra Motors			●						
1999	Ford India	●	●							
1999	Honda MC & Scooter						●	●		
2001	SkodaAuto India	●								
2005	Nissan Motor India	●								
2006	BMW India	●	●							
2007	Volkswagen India	●								
2007	Mahindra Renault	●								
2007	Greaves Cotton			●						
2008	Daimler India CV			●						
2008	Volvo Buses India			●						
2009	Kamaz Vectra Motors			●						
2011	SML Isuzu ¹			●	●					

NOTES: Estab = establishment (year); PC = passenger car; UV = utility vehicles H & HCV = medium and heavy commercial vehicles; LCV = light commercial vehicles; S = scooters; MC = motorcycles; MP = mopeds; 2-W = electric 2-wheelers; 3 = w = 3-wheelers. Domestic OEM = 50% ownership or more controlled by Indian. CV = commercial vehicles. ¹Sumitomo become majority owner of Swaraj Mazda in 2009, and in 2011 changes name to SML Isuzu

SOURCE: Ranawat and Tiwari 2009, IRC 2009, SIAM 2012

presented the government's vision of India as an international hub for small, affordable passenger cars and a key center for manufacturing tractors and 2-wheel vehicles. On the policy side, it highlighted low entry barriers (foreign equity investment up to 100 percent), emphasis on R & D (tax deduction up to 150 percent for in-house research & development), and concern for emissions (harmonization of regulatory standards with the rest of the world). Although SkodaAuto India entered in 2001, there was another wait-and-see period until 2005.

In 2006 the government issued the Automotive Mission Plan 2006–2016. Besides promising a favorable and predictable business environment, it also addressed the issue of infrastructure development, especially roads, sea ports, airports, railways, utilities and communications. From 2005 and the following five years, another

nine MNCs entered the Indian automobile industry. The sheer number of foreign OEMs now in India and their concentration in the 4-wheel category seems unsustainable without greater growth in the passenger car market. However, when we consider the historical development of regional hubs in the west, south and north of India, perhaps the carrying capacity of the domestic economy and its growing links to the global market may prove critics wrong.

Unlike the Maruti-Suzuki case (and Hyundai Motors), foreign OEMs have experienced mixed results. Take the case of the earliest joint ventures permitted under the 1983 Letter of Intent. Sumitomo became the majority owner of Swaraj Mazda in 2009, and in 2011 changed the company name to SML Isuzu. Daewoo Motors gradually increased its equity stake in DCM-Toyota to 100 percent by 1998; but, went out of business soon after when the parent company in South Korea was reorganized. In 1994 the Allwyn-Nissan joint venture was eventually incorporated into the Mahindra Group. And Mitsubishi Motors sold its stake to Eicher Motors, ending a 27 year partnership in 2009. The similarities and differences between the Maruti-Suzuki case and the other four cases are instructive.

What has become problematic is collaboration in the design of vehicles (OEMs) and components (suppliers). Suzuki Motor Corporation (SMC) made a cautious commitment to deepen its partnership with Maruti Udyog Limited (MUL) along these lines. It helped develop the layering of the supply chain into tiers, where Tier 1 suppliers provide component systems to OEMs, Tier 2 suppliers of auto components or sub-assemblies to one or more Tier 1 suppliers, and supporting industries (Tier 3) providing basic support services such as parts testing, specialized machinery, moulds and dies, and processed or forged materials. This systematized the ad hoc supply chain that had been developing in the Indian automobile industry, deepening the market reach of the Indian OEM in-house integration model. The Sona Group, Amtek Auto Group and other suppliers located in industrial parks set aside for MUL, for example, trace their rise to Tier 1 status in MUL's supply chain.

Besides all the difficulties of managing a business partnership, where SMC differs from the other four Japanese joint ventures is a greater willingness to take the next step of single sourcing (exclusively using one supplier for procuring a component) under a long term supplier relationship. This meant Tier 1 companies would supply not only components, but also design (component) solutions for OEMs and control the supply chain to the lower tiers. Tier 1 suppliers expressed to us the learning curve for acquiring a design capacity is very steep, testing the limits of an in-house integration model. The deregulation of the Indian automobile industry in the 1990s, then, became a preview of the problematic steps necessary for transforming the in-house integration model into a supply chain model over the next two decades.

This research note, tracing the policy path from national Independence in 1947 to the present and its impact on the in-house integration business model in the automobile industry, provides the backdrop for our next research on the channels for acquiring technology through strategic alliances and the role of industrial cluster in developing Indian automobile companies.

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