

Rationalization & Tierization of Indian Automotive Industry: Challenges for Indian Tier2/3 Suppliers



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Background

Indian Auto Market has been growing continuously for over two decades. Almost all major automobile companies have set up their plants here in order to take benefits of growth & low manufacturing cost. Auto Component Manufacturing firms, who are first level suppliers to OEMs, are flourishing at rapid pace mainly due to localization by Transnational Companies (TNC)&increase in export of auto components. Indian Tier-1 companies are joining hands with global suppliers, to meet stringent requirements of OEMs. This has led Tier-1 companies to learn & adapt many of the global best practices. However, the same cannot be said about level 2& 3 suppliers, who are supplying components & sub-assemblies to Tier-1 companies as per print. Tier 2 & 3 suppliers; as referred to in Automotive Supply Chain are local SMEs. They are large in numbers & mainly employ labour intensive processes. Auto SMEs considered major contributor to any national economy in terms of generating employment, contribution to GDP & export. However global practices, in particular, rationalization of suppliers & tierization of auto chain, pursued by Indian Auto OEMs, are putting Indian breed of small suppliers on fence.

Purpose

Developing a perspective of upstream part of Indian auto supply chain requires a clear understanding of the operational strategy followed by firms. Growth of upstream firms dependent on buyer firms' **outsourcing strategies & policies**. **The aim of this study was to understand operating mode I& evaluate the effect of rationalization & tierization process on Indian auto SMEs.**

Methodology/ Approach adapted

The paper explains the basic operational strategy followed by firms at lower end of Indian auto supply chain. Further to this, key characteristics of Tier-2/3 suppliers and key aspects for competitive advantages are analyzed. The necessary data collected by way of observations & non-structured interview at small & medium sized suppliers related to Indian automotive supply chain.

Findings

Tierization process does not bring uniform benefits for all the firms of auto chain. Based on chosen key aspects, findings reveal that Indian Tier-2/3 suppliers are at various level of development. Buyers choose appropriate supplier with the purpose of keeping cost down. Higher level Tier-2 suppliers have better chance of coping with future challenges. It is observed from sample companies; Indian auto SMEs, prefer to diversify to non-auto industry or adjacent industry rather than climbing the ladder in auto value chain. Author presents the logical path for the development of Indian Tier 2/3 suppliers in auto chain. Practical implications it is important for researchers and managers to understand the complexities of auto supply chain in countries like India and how it shapes the cost structure of buyer companies.

Limitations

Study is based on key aspects of limited number of Indian automotive suppliers.

Originality/value

The main value of this paper is recognizing and assessing the effects of Tierization model in emerging market conditions.

1. Introduction

Fast emerging economy on world map, Indian Auto Market has been growing continuously for over two decades. Almost all major automobile companies have set up their plants here in order to take benefits of growth & low manufacturing cost. Indian automotive sector has become one of the largest in the world. It produces, on an average 24 million vehicles annually and provide employment to over 29 million people (direct and indirect employment), Indian automotive industry has been on a growth pat has internal consumption as well export is increasing for over the last two decades. Indian Auto Industry has become 93 billion dollar & has a share of 7.1% of India's GDP (FY2015-16).It plays big role in country's economy and regarded as a 'Sunrise sector' under Make in India. [14]

As a result, Auto Component Manufacturing sector is also flourishing at rapid pace mainly due to localization by Transnational Companies (TNC) & growth in export. Auto SMEs support automobile majors by manufacturing components

which go into making final vehicles. Auto component revenue has increased from US\$ 26.5 billion in FY08 to US\$ 43.5 billion in FY17 at a CAGR of 5.66 per cent during FY08-17(**Figure-1**)

There are over 400 firms in the organized sector & more than 10,000 firms in small unorganized sector, producing all most all the parts of vehicles. India is fast emerging as major auto center hub in Asia and expected to play major role in global supply chain in coming years. Auto SMEs have bright future & growth prospects. [17]

Recently Indian Government has redefined classification of SMEs in terms of turnover, in line with other developed countries. [19]

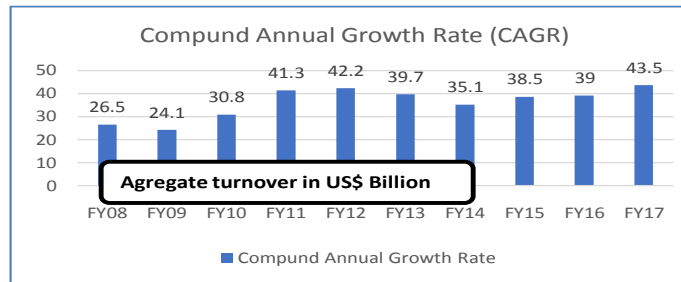


Figure 1 Growth in Auto Component Sector

Government classify firms so that benefits of supportive policies reaches to smaller size firms, who are at disadvantageous condition due to various constraint & challenges of global competition.

Table 1 Definition of MSMEs in India & Tier Relationship

New classification criteria of MSMEs (India)		
Type	Revenue (Annual turnover)	Tier category (Indicative)
Micro Enterprises	Up to Rs. 5 Crore	Tier-2 & Tier-3 firms
Small Enterprises	Above Rs. 5 Crore to 75 Cr.	Majority of Tier-2 & some Tier-1s firms
Medium Enterprises	Above Rs 75 Cr. to 250 Cr.	Mostly Tier-1s firms

Source: ACMA

Automotive vehicle consists of approximately 20,000 parts. No company makes all the parts. It is far more cost effective for several companies to specialize in making certain components than for one company to generate and market products end-to-end. Tier 1 or Tier 2 companies develop expertise in one or other aspect and employ best people and equipment for that job. Manufacturing outsourcing is big thing in auto industry. Company may outsource all or part of a process or process result. For example, the outsourcing of manufacturing processes may take the form of part, component, or a finished product. Some global large car manufacturers only perform the final assembly of major parts whose production is outsourced to external suppliers. For example, Ford Motor Company started operation in India with only assembly plant. All parts were received from different suppliers situated in different part of world & few were locally purchased. From Supply Chain Management perspective, supplying firms are categorized under Tiers i.e. Tier-1, Tier-2, Tier-3 & so on depending upon their business relationship. Its aim is to link important business functions and processes in the supply chain into an integrated business model.

2. Automotive Tier Structure

As automotive supply chain consists of number of entities, starting from supplying raw material to delivery of final product to customers. These entities are inter linked & categorized based on their position in supply chain. OEMs only deal with their direct suppliers i.e. linked closer to them. These direct suppliers are termed as Tier-1 companies in automotive supply chain. Tier-1 companies followed the same strategy of OEMs & outsource many components to other firms, termed as Tier-2 suppliers. Tier-2 suppliers outsource some of the processes to Tier-3 suppliers & so on. That’s how we have supply chain model with tiers i.e. OEM at one end & followed by other members, who are grouped in Tiers. Such multilevel outsourcing approach creates pyramid type structure of firms along the supply chain. (**Figure 2**)

“Tierization” is widely used in Aircraft & Automobile industry to streamlining & smoothening the flow pattern, so as to optimize quality, flexibility, inventory, cost & responsiveness. Indian Auto industry following footsteps of global companies & undergoing transformation with tierization of suppliers.

- **First Tier Suppliers (Tier 1):** Tier-1 companies are generally the largest or the most technically-capable companies in the supply chain. They have the skills and resources to supply the critical components that OEMs need and they have established processes for managing suppliers in the tiers below them. They are capable of designing, manufacturing & supplying integrated systems to the vehicle manufacturer rather than individual components, e.g. Dashboard assembly,

Suspension, Brake system etc. These suppliers are required to offer not only a broad range of technologies and materials but have strong research capabilities in order to work closely with the vehicle manufacturers to develop better systems. They also need to be financially strong in order to invest continuously into new technologies and manufacturing capacities. They operate on a global basis. For examples M/S Visteon supplies Cockpit assembly, Interior trim components etc., M/S Brakes India Ltd. designs, manufactures & supplies brake system, M/S Lear Corporation Design & manufacture Seating system etc.

To improve collaboration, tier one companies use data networks to exchange supply and demand information with OEMs and other members of the supply chain so that all parties can synchronize production and logistics. These suppliers usually work with a different car companies, but often tightly coupled with one or two OEMs and have more of an arms-length relationship with other OEMs.

- **Second Tier Suppliers (Tier 2):** The second-tier suppliers include those companies, which supply the first-tier manufacturer with Principle components based on their print. They are generally small sized local companies, who do not have either the financial or technical resources to supply integrated systems to vehicle manufacturers. These firms themselves do not sell directly to OEMs. Tier 2 suppliers are often experts in their specific domain, but they also support a lot of non-automotive customers. These companies have less technical advantages than Tier 1 companies.
- **Third Tier Suppliers (Tier 3):** These are again local firms, supply simple components such as plastic parts, aluminum parts and other basic parts and components to the Tier 2 suppliers as per print.[15]

There are few cases, where Tier-2 supplier provide product or service directly to OEMs & Tier-1 both. And there are cases where, Tier-3 supplier provide components to companies which include Tier 1, Tier 2 & OEMs. But that is not dominant pattern.

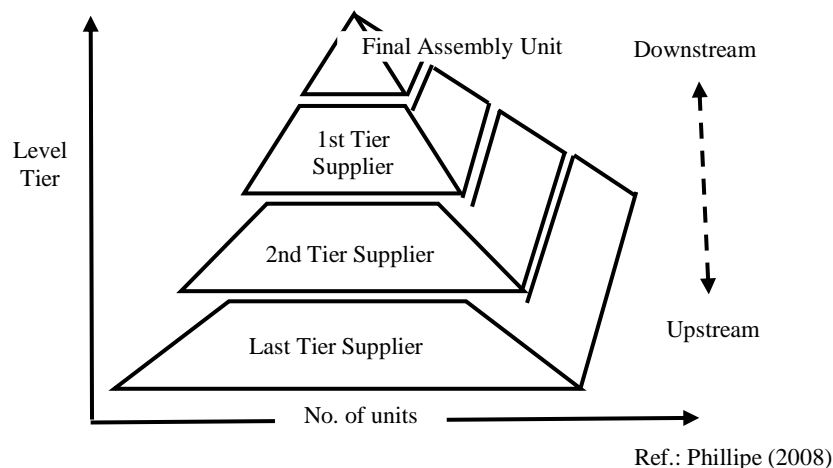


Figure 2 The Supplier Pyramid

Key Characteristics of Tierization Structure

- Number of firms increase as we go down the Tier level. For example, basic component manufacturing units are more in number as compared to Tier-1 firms.
- Buying power & influence decrease as we go upstream i.e. from Tier-1 to Tier-3.
- Technology & Manufacturing capability of Tier firms decrease as we go upstream i.e. from Tier-1 to Tier-3.
- Tier-1s are direct suppliers to OEMs, similarly, Tier-2 is Direct supplier to Tier-1.

Emerging Trend in Auto Supply Chain: System Integrators (0.5 Tier)

Under rationalizing process, reduction in number of Tier one suppliers doesn't mean less systems or parts are needed to build a vehicle. This means Tier 1 suppliers are being requested to develop more capabilities to produce more complex and complete modules and systems. Tier 1 suppliers have no other choice but to expand outside of their current core competencies, and become quickly recognized as a cost efficient, reliable supplier in multiple domains untouched until now. Tier-1 companies are slowly becoming system suppliers & Integrators. The value chain which was earlier done by assemblers are being taken up by Tier-1 suppliers now. Complete chain of activities Upstream designing, manufacturing, integration, testing of complete systems is being done by major Tier-1 companies. These assemblies are supplied on line on Just in Time (JIT) basis. This has brought Tier-1 suppliers to step closer to Assembler, hence term 0.5 Tier supplier coined in industrial world.[2],[20]. For example, Seat supplier for four wheelers design & manufacture seating system for particular vehicle & supply complete set of seats on assembly line. Supplier gets the schedule for day & he sequentially supply on JIT basis for different variant on line, such as 6 seaters, 7 seaters, high end model, low end model etc. This is true for other major assemblies. (Figure: 3)

Tier 2 and Tier 3 suppliers are then impacted from the snow ball effect, as Tier 1 suppliers want to optimize their new supply chain model as well. Majority of Indian Tier-2 firms are small in size. Sustenance and survival still remain an issue for these companies. Capitalizing on this growth prospect will mean keeping pace with global developments and imbibing capabilities to improve cost competitiveness, customer orientation & lead time that will give an edge to Indian SMEs in surviving this rapidly changing competitive environment. [18]. Major companies follow The Kraljic’s model & classify their suppliers based on the segregation of products as **Strategic, Leverage, Routine & Bottleneck**. Management spend resources and develop performance-based relationships such as partnership on those suppliers whose products matter most.

Traditionally in Indian Auto Industry, outsourcing activities were mainly focused only on cost reduction. Later on, under “Strategic Sourcing” initiative, major autos had the same objective; i.e. how can we reduce price of purchased goods. This was achieved by either negotiation based on bulk purchases from single source or long-term agreement with suppliers or exploring various markets globally to source materials and components.



Figure 3 Progresses toward System Integrator

3. Indian Automotive Tier Structure

(Figure 4) Though Indian Automotive Tier structure matches with global practice, however entities

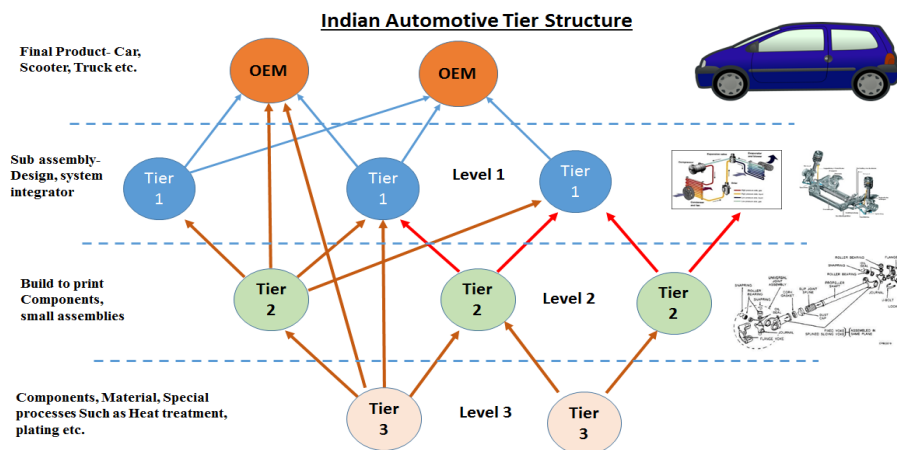


Figure 4: Indian Automotive Tier Structure
Source: Author's adaptation

At each level exceeds by numbers as compared to any global auto company chain. The India's automobile major, M/S Tata Motors Ltd. currently has about 1300 suppliers, which include small child parts makers as well. In phased manner they want to reduce it to 300-400, which is still more than any global auto company will have [Box 1]. Even Mahindra & Mahindra Ltd. (Utility Vehicle Manufacturer) was holding 650 suppliers few years back, which they are bringing down by 10% every year. Indian OEMs are going for system suppliers & getting finished components from suppliers. [Box 2 & 3]. European & Japanese auto companies typically deals with 150-200 suppliers.

Box 1: Rationalization by Indian OEM

India’s largest automobile company, M/S Tata Motors Ltd. has started focusing on vendor rationalization process for last few years. They have currently about 1300 suppliers, which include small child parts makers as well. To streamline its supply chain, they plan to reduce the number of parts suppliers by one-third in three to four years. As that will hurt a lot of tier-II and tier-III vendors, they would be doing it in phased manner. In future, they will have only the complete system suppliers rather than every individual part. The overall number of Tata vendors is likely to come down to 300-400,”

Source: Economics Times, Aug 30, 2016)

Box 2: System Supplier

M/S TACO- Pune, supplies complete assembled cockpit for Tata Cars on assembly line. All components which goes in making cockpit assembly, are assembled at M/S TACO company. And as per production plan of assembler, Cockpits assemblies are supplied on line. Assembler has to simply pick the assembly & fit inside the car body. Involving supplier right from design stage made it possible.

Source: Author’s observation at site. [21]

Box 3: Company acquiring new process & skill:

One of the Aluminum Foundry company (Tier-1) was supplying cast components such as Exhaust Header, Cylinder head etc. to major Indian OEM for more than 10 years. Further processing (machining) was done by OEM in house. Under OEM's new Suppliers Management Strategy, supplier was asked to supply fully finished parts in place of castings. Supplier had to invest in putting up machining line and acquire new competency in that area. Now casting supplier, supply fully finished components on assembly line.

Source: Author's observation at site[21]

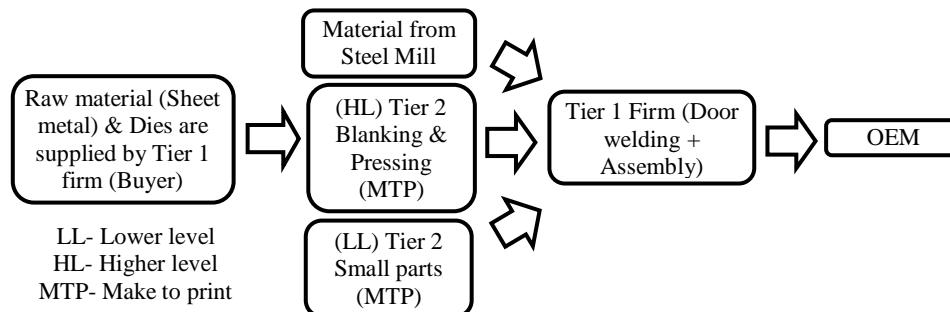
Example of Supply of Vehicle Door Assembly by Tier-1 firm

Figure 5 Vehicle Door Assembly Supply (Example from Indian Auto Supply Chain)

Source: Author's observation at Tier-1 firm

(Raw **Figure 5**) Here Tier-1 firm supplies "Vehicle Door Assembly" to major OEM. Design of components & assembly of door done in collaboration with OEM. Dies for press tools are designed & manufactured by firm in house. Tier-1 firm outsourced Blanking & Pressing operations to Tier-2 firms. Raw material (Sheet metal) procured by Tier-1 firm and supplied to Tier-2 supplier. There are two Tier-2 suppliers; one does critical operation (Higher level) as it has high tonnage presses (facility) required for door panels. Other Tier-2 supplier (Lower level) supplies small parts such as brackets, rail etc. needed for door assembly. Both suppliers dispatch components to Tier-1 firm, who keeps stock of parts & assemble, dispatch as per schedule.

Tier-1 firm is able to control inventory of finished components by controlling the raw material. This is a case where, Tier-1 firm able to keep cost down by outsourcing to different Tier-2 suppliers & controlling inventory by supplying raw material.

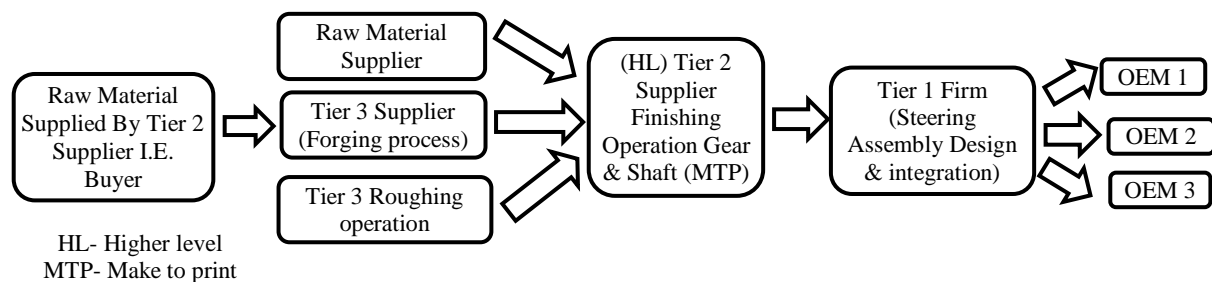
Example of Supply of Steering Assembly by Tier-1 firm

Figure 6 Steering Assembly Supply (Example from Indian Auto Supply Chain)

Source: Author's observation at Tier-2 firm

(**Figure 6**); Here Tier-1 firm designs, manufacture & assemble steering system for commercial vehicle manufacturers i.e. OEMs. All the operations except assembly are outsourced. Tier-2 firm is sole supplier and supplies Precision Machining Components to Tier-1 companies as per their design. Upstream chain consists of Forge shop, who converts raw material to forge blanks. Raw material is supplied by Tier-2 firm. Roughing operations (non-critical) again, are outsourced to Tier-3 firm on piece rate basis. In this case, Tier-2 supplier outsource non-critical operation to small supplier on piece rate basis and keep his cost down.

4. Analysis & Discussion

In the past, Indian vehicle manufacturers did most of the design, manufacturing, assembly work in-house and the component industry was supplying mainly small & individual components. Vehicle manufacturers supported component manufacturers in a parent-ancillary relationship. Hence, the component industry never got the opportunity of developing true system capabilities. Furthermore, due to the large number of auto SMEs, viable scales were never developed. This led to a

fragmentation of capacities and, eventually lack of domestic and international competitiveness. Although these conditions have been changing in the last few years. The time available to the automotive component industry to transform into a globally competitive industry seems very short. Unless they improve fast, many small auto SMEs would face the prospect of losing business and, eventually, having to close down.

Table-2 below describes firms of the Indian Automotive Tier Structure, their Business model & key characteristics of firms. (Based on the study of 25 Indian Auto Component Manufacturing Firms)

Table 2 Tierization level & key characteristics of firms (Source: Built by Author)

Category	Business Models in Indian Auto Industry	Key Characteristics of firms
Tier-1 firm	<ul style="list-style-type: none"> • Full Indian ownership • Indian owner and Multi National Company (MNC) in technical alliance Indian owner and MNC Joint Venture • Complete MNC subsidiary 	<ul style="list-style-type: none"> • Professional, experienced organization • Own design, Blue print • Multiple customers & plants • Part of local & global supply chains • Generous compensation & benefits. • Employees involvement in improvement. • Follow Make to Stock model • Facility, Equipment up gradation with time
Higher Level Auto Tier 2 Supplier	<ul style="list-style-type: none"> • Individual or partnership Indian ownership • Part of Business Group 	<ul style="list-style-type: none"> • Expert in specific manufacturing domain • Limited design capability- modification to blue prints • Limited compensation & benefits for employees • Multiple customers & plants • Part of local supply chain. • Mix of Make to Stock (MTS) & Make to Order model (MTO). • Moving towards system orientation. • Initiation of lean mfg., use of quality tools • Long term relationship with key customers
Lower level Auto Tier 2 Supplier	<ul style="list-style-type: none"> • Individual or partnership Indian ownership 	<ul style="list-style-type: none"> • Make to Print. • Driven by customer schedule. • Mostly MTO. • Shared capacity for many customers. • Single plant. • Management by Cost • ISO certification, mostly Quality by inspection • Medium term relationship with customer.
Auto Tier 3 Supplier (Process only)	<ul style="list-style-type: none"> • Individual or partnership Indian ownership 	<ul style="list-style-type: none"> • Owner/ Entrepreneur driven, Small firm. • Blueprint provided by the customer. • Make to Order model • Single plant. • Piece rate working • Mix of old & new equipment • Medium term relationship with customer. • Employ more migrant or temporary workers • 100% Quality inspection before dispatch + Rework capability

Large Tier-1 companies took full advantage of continuous growth, have not only acquired new customers but also joined hands with global component manufacturers to improve their capability in terms of design & technology and started exporting the components. Vendor rationalization by OEMs too, has given opportunity to scale the operation and enabled suppliers to invest in technology to upgrade operation in order to satisfy stringent requirement of buyers.

Indian Tier 2, Tier 3 suppliers are small in size & largely home-grown companies, mostly owned by individuals or entrepreneurs. Rationalization & Tierization process has resulted in increasing distance from focal firms & shutting off knowledge transfer because of interactive learning. There is hardly any joint venture with multi-national company in this

category of suppliers. High competition, squeezed margin, lack of resources to upgrade & other factors are putting the individual Tier 2 supplier in a position of great risk.

Based on size & capability further categorization of Tier-2/3 suppliers are done as Higher & Lower suppliers as customers choose suppliers based on value addition and competitive price. Capability of Higher level in Tier-2 category is closer to tier 1 and ready to migrate to next level. Another important finding is that Tier-2 suppliers belong to major business group has advantage over others because of strong relationship with higher tiers.

From Tier-2/3 suppliers' perspective, result shown for four key aspects, competition factors, value addition, Growth opportunity & replacement cost. It is based on literature review & ratified by 5 experts attached to Indian Automotive Industry.

Table 3 Weight age of Key Aspects at Different Tier Level (Source: Derived by Author)

Entity	Key factors for competition	Value addition by firm	Growth opportunity for firm	Cost of replacement for buyer
Tier-1 (Module Suppliers) System integrator: Example: Power Steering Assembly, Cockpit Assembly etc.	Innovation & operational excellence	☐☐	☐☐	☐☐
(H)Tier-2 Sub assembly supplier / Principle components manufacturers.	Operational excellence	☐☐	☐☐	☐☐
(L) Tier-2 Sub assembly supplier / Components manufacturers	Operational excellence	☐☐	☐☐	☐☐
Tier-3 Supplier: Sub component manufacturers (Make to Print)	Operational excellence	☐☐	☐☐	☐☐

With reference to Table-3, from buyer's perspective, risk associated with lower tier supplier is low & also replacement of supplier is possible with modest cost. Better growth opportunity lies for suppliers, who are at higher level.

Positioning of Firms in Emerging Market model by **Dawar & Frost (1999)** is relevant here to develop perspective. It presents four different strategies for emerging market companies based on asset transferability & pressure for globalization for emerging market companies. It is seen Tier-1 companies are able to move by forming joint ventures with multinational companies and improving capabilities. They have started exporting to many countries too. These companies have become **Dodgers & Contenders**. However, Tier-2/3 suppliers are falling in "**Defenders**" category. Moving up the value chain means competing in a far more complex battlefield.

Some of the future changes can be perceived in Indian auto component market. Consolidation process started at Tier-1 level very likely will move to upstream level. Companies from countries like Taiwan, China, South Korea may start targeting this segment of chain as volume grows further. World over in automotive industry, trend is to move towards single source for each component but Indian Tier-1 companies in India prefer to have multiple suppliers for the same component. This is to ensure that they get competitive price & at the same time covers the risk of non-supply. In future, Indian companies too would have to move towards single supplier sourcing so as to have control on traceability, variability & cost.

5. Conclusion

In order to grow Indian Tier-2 suppliers will have to take initiative for building up the beneficial relationship with buyer & develop capability gradually. For that supplier has to pass through logical steps (**Figure 7**). Adaptation of best practices in piece meal approach has not given expected improvement in Indian Tier-2 suppliers. It is observed from sample companies; Indian auto SMEs, operating solo prefer to diversify to non-auto industry or adjacent industry rather than climbing the ladder in auto value chain.

Firms, though small but part of group companies are having better chance of survival because of access to capital, Knowledge & assured business. Tier-2 lower level & Tier-3 firms are operated and owned independently & managed by owner-manager. Vision, cultural value & attitude of owners can have significant impact on adapting to changing environment. Present environment calls for cooperative relationship with customers & suppliers, learning continuously by benchmarking or any other means & improving faster. It may not be possible to "defend" turf for long unless they differentiate themselves and show entrepreneur spirit. With new safety & emission regulation on the door, Indian component industry is likely to see further turmoil. **Refer Box 4.**

Box 4: Maruti Suzuki cracks down on suppliers over quality

Maruti Suzuki will stop offering contracts to auto component makers that fail to meet its zero-defect policy, as part of its efforts to avoid car recalls. Since the auto component industry functions at multiple levels—where a tier-III vendor supplies tier-II, who in turn supplies the tier-I vendor, and then the component reaches an OEM—chances of defects passing undetected are high. In India, the situation is worse as tier-II and tier-III vendors are often financially weak and are unable to invest sufficiently in people, technology and machinery.

Source: Aug 01 2016. www.livemint.com Paper

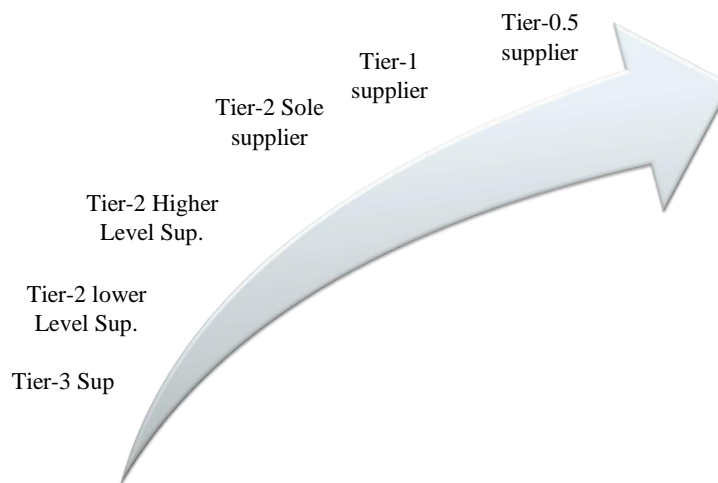


Figure 7 Logical Progression of Indian Small Firm

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7. Annexure

Sr No.	Companies	Tier	Turnover	Customer	Key Characteristics	Investment	Turnover	Special skill, D: design	Level- H: High L: Low
1	Shore rubber	1, 2	28	OEM + T1	Customer Design, Own design too, molding, Mainly export	M	M	D	HL T2
2	Pooja Casting	1, 2	60	OEM + T1	Joint development with customers, mold design, cast, machining	H	H	D	T1
3	Admach Auto India Ltd	2	48	T1.	Joint development, die design, stamping, multiplants	H	M	D	HL T2
4	Kumar Industries	2	10	T1.	High volume, high investment in equipment, single source	H	M	SPM	HL T2
5	Premier Press Parts P. Ltd.	2	12	T1.	Joint development, die design, stamping, plating, Zero defect & DOL	M	M	D + Zero defect + JIT	HL T2
6	Sri Sivasakthi Engineers	2	4	T1.	Only machining, Material supplied by customer on weekly basis.	L	L	x	LL T2
7	Venkateswara Steel & Spring P Ltd.	1, 2	43	OEM + T1	Design, manufacturing, surface treatment, high volume, high investment, multiple customer.	H	H	Multiple processes	HL T2
8	M/S Artfab	2	13	T1.	Only machining, major part outsourced to T3, Raw Material from open market.	M	M	x	HL T2
9	M/S Mangala Industries	2	12	T1.	Only machining, 50% Material supplied by customer, Rough machining to T3	M	M	x	LL T2
10	Ganesh Engineering bhosari	2	9	T1.	Machining, Welding, multiple customers, zig-zag flow	M	M	x	LL T2
11	Sealant	2	4	T1.	Raw material, MTP, only machining, assembly	L	L	D	LL T2
12	Primoris	2	3	T1.	Machining	L	L	x	LL T2
13	Tej Ind	2	25	T1.	Complex & heavy parts, joint development, Machining	H	H	D	HL T2
14	Plastamps	2	1	T1.	Shearing, rolling, tig welding. All old equipment.	L	L	x	LL T2
15	Maruthi	2	2	T1.	Manual Electroplating, Powder coating, multiple customers	L	L	x	LL T2
16	Polywin	2	28	T1.	Die design & manufacturing, high investment, multiple customers.	H	M	Multiple processes	HL T2
17	Kashi Precision	2	12	T1.	Old automates, able to maintain quality. Plating outsourced	L	L	x	LL T2
18	GI Auto	2	30	T1.	Multiple plants, Multiple customers, Press, weld, New investment lined up.	H	M	Multiple processes	HL T2
19	Microtech Industries	2	10	T1.	Only Machining for Sintered job, small size jobs.	L	L	x	LL T2
20	Abilities India Piston	1, 2	Large	OEM, T1	Major firm	H	H	D + multiplant	T1
21	Neolite ZKW Lighting	1, 2	Large	OEM, T1	Major firm	H	H	D + multiplant	T1
22	Ganesh Industries	2	40	T1.	Casting, Machining, auto plating plant, supplying to MNC.	H	H	Multiple processes	HL T2
23	SEP India P Ltd	2	35	T1.	High value addition by way of processes, multiple plants	H	H	Multiple processes	HL T2
24	STV Industries	2	30	T1.		H	H	Multiple processes	HL T2
25	Chandan Poly Products	2	1.7	T1.	Injection molding, Single source to Tier-1 company, Die design & mfg outsourced	L	L	x	LL T2