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BHARAT FORGE LIMITED
Forging Leadership

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Mr. Baba Kalyani, Chairman and Managing Director of Bharat Forge Limited received an email from two of his people who had gone to visit the company's recently acquired subsidiary, CDP Bharat Forge GmbH, in Germany. The email read:

Dear Sir

We had been to CDP two weeks back as part of Technical Exchange Programme. When we entered the facility in Daun we found something missing at the entrance. It was the signboard that did not have Bharat Forge name included. We made a request to our colleagues in Daun to change the name to CDP Bharat Forge. Our colleagues in CDP responded immediately and we could see the signboard at the entrance in four days.

Well the incident does not end here!

Few days later, we met one Indian gentleman, Mr. Hans Raj Bally in front of factory gate. Mr. Hans Raj Bally has been living in Daun for 23 years and works in Daun. He told us how proud he felt seeing an Indian flag in Germany and that too in a small town like Daun. He got down from his car to salute the Indian flag and the person who made the Indian flag flying high in Germany. He added that in his entire career of 23 years in Daun he never saw this happening and never could imagine that something like this would ever happen.

Thankfully and proudly we would like to convey the salute of Mr. Bally to our Chairman and Managing Director, whose entrepreneurship and great vision has made it happen.

Regards,
Niyaj/Raskar (CDFD-ENGG).

Baba Kalyani smiled as he read the email. He and his management team (Exhibit 1) had done what many believed to be rather difficult for manufacturing companies from an emerging economy like India to do: achieve global scale. In mid-2004, BFL was the second largest forging company in the world, behind ThyssenKrupp Automotive Group of Germany and ahead of Sumitomo Metal Industries of Japan. More importantly, the planned expansion of its capacity and its willingness to pursue other acquisition opportunities could very well see the company emerge as the global leader in the near future. In his annual report to the shareholders, Baba Kalyani wrote:

> In an atmosphere where Chairmen and CEOs are advised not to say anything about the future, I have no hesitation in saying that my management team and I are optimistic about our future performance. Looking at the order books, and the de-risking of the business model that we have carried out, I see Bharat Forge continuing on its growth path.

Baba Kalyani's optimism stemmed from the stellar performance of the company over the last decade. During this period, even as it coped with severe downturns in its major markets, the company had more than doubled its turnover and nearly quintupled its profits (Exhibit 2); improved productivity (Exhibit 3), moved up the value chain (Exhibit 4), diversified its customer portfolio (Exhibit 5), improved its speed to market, upgraded its technology, became India's largest exporter of auto components and emerged as the world's largest axle component manufacturer with a market share of over 25%.

To sustain its growth momentum, BFL is investing Rs. 3.5 billion to double its forging capacity, expand its machining capacity and set up a new product testing and validation facility. The new capacity was expected to be fully operational by the last quarter of the financial year 2004-05. BFL's decision to invest in fresh capacity was influenced in part by the buoyant market conditions in both domestic and overseas markets, and in larger part by the changing dynamics in the global automotive industry.

Faced with renewed competitive pressures, the global auto majors are triggering a fresh wave of rationalization in the industry supply chain (see Annexure). The traditional suppliers to the auto majors out of Europe and America were finding it difficult to meet the further reduction in prices that was being demanded of them. The earlier waves of restructuring had resulted in erosion in the profits and capital efficiency of the auto parts suppliers, as the OEMs had typically been unwilling to compensate them for the additional capital they had invested. The search for lower cost was leading the OEMs (and their suppliers) to low cost destinations like India, China and Thailand. Among the low-cost destinations, India was fast emerging as a destination of choice because of the superior design and engineering capability of the Indian auto component industry (Exhibit 6). Several global auto majors including Daimler Chrysler, Toyota, Cummins, Ford, Volvo etc. set up offices in India to source auto components from here. The global OEMs were, in addition to low costs, placing significant emphasis on the suppliers' ability to undertake value added services such as design, engineering, product testing and validation. Typically, it took a few years before a company became a "regular" supplier to the auto majors (Exhibit 7). BFL, with its state of the art technology, global scale & presence was best positioned to exploit this growing trend of sourcing from India. BFL estimated its addressable market opportunity to be of the order of US$5 billion. Baba Kalyani said:

> Fundamentally our competition today is vulnerable on cost. My cost even 25 years ago was lower than theirs, but I was not able to match their quality. Today our manufacturing side is on par with best anywhere in the world and at a cost that is lower by almost 20-25%! The challenge for us now is to move from just being a manufacturing enterprise into a full service enterprise. We need to be able get into in an automotive platform right at the beginning - right from the concept design stage. And that is the front end that we are now putting together. It will take us about 4-5 years to build up the capability. And once you build that capability, then the world is at your feet – you can do anything

The Foundation

Dr. Neelkanth Kalyani, Baba Kalyani's father, established BFL in 1961 at Pune[1] in India. The Kalyani family was based in Karad, a small town near Pune, where they were involved in farming and agriculture. Over several generations they had become close friends of the Kirloskars – an industrial house with a strong presence in engineering industries. The Kirloskars, who resided in neighboring Kirloskar Wadi, would pay a visit to the Kalyani household every time they went to Mumbai as Karad was en route to Mumbai. In the early sixties, the Kirloskars needed a supplier of forged components for their engine manufacturing unit and they encouraged Dr.Kalyani to enter the forging industry. While the idea was mooted in 1961, it took Dr.Kalyani four years to get the license from the Government of India, and finally the plant was setup in 1966 in a technical collaboration with a Cleveland, US, based company. Baba Kalyani joined the organization in April 1972, after completing his masters in engineering from MIT in Boston. He recollected:

> I did a three-month stint at our collaborator's plant before coming back. I became the plant manager in December 1972 and remained one for the next 21 years! I could run every machine on the shop floor and knew the business like the back of my hand.

By the middle of eighties, BFL had established itself as the market leader. The company had also made a foray into export markets with mixed results. While its exports to Russia were steady, its participation in the more developed markets of the world was sporadic. Baba Kalyani said:

> Right from the beginning my dream was to export. Having studied in the US, I felt a strong desire to export our products to the developed markets of the world. But it took us almost ten years to get our first export order. I worked very, very hard, my people worked very, very hard – I had a willing workforce; a willing management team, and of course I was willing to do whatever it took. But it took a long time and those were very frustrating ten years. This was because we were just not capable of producing consistent quality across several lots of production. We could not produce 5000 pieces of crankshaft of consistent parameters. Nobody in India could do it at that time. In fact, very few in India can do it even today!
>
> It then became clear to us that we got to change the way we produce. It is simply not possible to *consistently* produce high quality products with a manual process, however good and well trained our people are. And our people were very good. I realized that to compete in advanced markets I would need to modernize our facilities and deskill the process. We needed to replace muscle power with brainpower and design our processes in such a way that we use brainpower as inputs rather than muscle power as an input.

Until the late 1980s, BFL, like all other forging companies in India, had a conventional hammer shop for making forgings. The capacity of the plant was enough to meet the

[1] Pune is ~ 200Kms South-East of Bombay

monthly demand of 3000MT. Since most of the hammer shop operations are manual, it took anywhere between three and five minutes to make one forging. Also, there is little consistency in the jobs that are done. In sharp contrast, the alternate method of producing forgings in a press shop was substantially superior both in terms of consistency in quality and productivity (it took about 40 seconds to make the same forging in a press shop).

Mr. Gopal Agarwal, Executive Director, said:

> One of the key factors for succeeding in the developed market is to make the customer comfortable with your facility. They expect to see facilities that are comparable to facilities abroad. But when they saw our old forge shop it was difficult to get business from them because of the impression our plant and technology gave them. They would not buy even though our price was much lower because they did want to risk disruption in their supply. So, the first step was to upgrade everything and talk the language that our customers wanted to hear.

BFL upgraded its technology by installing fully automated press lines for manufacturing forgings. Baba Kalyani recalled:

> There were two directions to follow at this stage. We could have gone with smaller capacity presses and be one of the few hundred forging plants that exist across the world. Or we could go with the biggest and break into the top five of the world. We chose the second option. I was confident that we could do it. The experience of being here, running the plant successfully all these years – all contributed to the confidence. I knew that if we leveraged our intellectual capabilities, we would be a winner in the global market.

Between 1987 and 89, BFL invested about Rs. 1500 million and installed two state-of-the-art forging Press lines from Muller Weingarten, Germany with a combined capacity of 22000 MTs. Such an investment was way ahead of its time and was written off as a 'white elephant' by popular press; especially since even the old hammer shops were not operating at full capacity at that time. Internally too, there was plenty of skepticism, not all of which was without a reason. The technology was new and except for a select few, nobody knew how to operate a fully automated press line. Baba Kalyani said:

> Forging as a technology is not very complex. But there are lots of 'touch-points' that are technology intensive. This adds to the complexity. There is a little bit of 'black-box' that needs to be dealt with. But this is also what makes India competitive; we are extremely good at dealing with technology intensive touch points. Indians do not have superior manual skills or the strength and energy of a European or an American. Our capability is more intellectual. But, to leverage that, we need to do things differently. We needed to run the operations with knowledge workers. That is what we did.

<u>Reengineering Work</u>

BFL decided against upgrading the existing workforce, as it would have called for changing the then prevailing work culture. It opted instead to staff the new press shop

with freshly recruited white-collar employees, each of them, at the very minimum, a science graduate. The company made conscious efforts to ensure that the work practices and attitude existing in the old shop did not influence the freshly recruited workforce. For example, while the hammer shop work force was characterized by narrow specializations like a 'fitter', a 'grinder' and a 'machinist', the employees in the press shop were trained to be multi skilled. The new recruits were paid higher salaries and provided with facilities and infrastructure that would help them to deliver high productivity. Teams on the shop floor were also given considerable autonomy to decide the best way to run the operation and continuously improve it. As a consequence, shop floor issues got resolved in half-as-much time as before, since engineers on the shop floors used their discretion rather than refer them to higher levels of managers. Baba Kalyani noted:

> In a global organization, you don't break a problem into tasks. Rather, you take a problem, put cross functional teams in place, put a time frame and business processes and fundamentally bring together people from different fields of expertise like engineering, manufacturing, quality and so on and allow them to solve the problem. The challenge was to institute a system driven management rather than one that is driven by the hierarchy. This transformation was imperative because this is where we, as Indians, are very weak. We are great individually, but we do not know how to conform to systems and work as a team.

Predictably, the new recruits in the press shop were seen as a 'privileged' lot and that caused dissatisfaction among the older employees. However, it did not snowball into a crisis, largely because of the trust that employees had in Baba Kalyani. Dr. Chandak, Vice President (Human Resources), remarked:

> All our employees have seen him slogging on the shop floor every day and have developed tremendous respect for him. He used to come to office at 7:30 in the morning and work till 7:30 in the evening, and of those 12 hours, he would spend more than 6 hours on the shop floor. He would tell them what he was doing and more importantly why.

Implementation of the new press lines took two and a half years, which was more than what was initially planned for. However, once the line was stabilized, it resulted in dramatic cost reduction on the shop floor. It enabled the company to save about Rs. 6000/ MT in variable costs alone. Other savings included extension of the life of the die – impression of a piece that is used to make a forging – by nearly two and a half times. If BFL could make 1000 pieces with a single die in a hammer shop, it could make 2500 pieces with the same die preparation on a press line.

Acquiring Customers

The first big break came when Rockwell International, a joint venture partner in one of the companies in the Kalyani Group invited BFL to send in its proposal for supply of forgings. Rockwell planned to shut down its forging plant in Newcastle, Pennsylvania and source its requirements from the market. BFL's proposal was cost competitive and it was short listed along with suppliers from Brazil, Hungary and Japan. Rockwell employees visited the facilities of all the short-listed candidates and gave a very positive

report about the technological capabilities of BFL. And, BFL was awarded the contract to supply 30% of Rockwell's requirements. Agarwal remembered:

> Initially there was a lot of resistance, at least psychologically. Can they match the levels of services that are being currently provided? For example, in our business, the customer needs supply of parts two to three times a day. We therefore stocked 30 days inventory in warehouses located close to the customer and posted a resident engineer there. Our key people who interact with them were ready with multiple entry visas so that they could be with the customer at short notice.

Within two years, following the failure of the principal supplier to cope with the volatility in customer's demands efficiently, BFL was supplying 70% of Rockwell's requirement. Agarwal explained:

> Suppliers from the developed nations work on a business model of predefined capacity allocated to a steady set of customers. But we have flexible capacity to accommodate any incremental demand. Our old shop acts as a reservoir of capacity, and we can also start a third shift, if required. More importantly we never charge them a premium for it. Obviously, this is risky, but one can live with it provided one has a good sense of the market and the potential customers.
>
> I remember the Vice-President of Purchasing of one of the customers asked me 'Gopal, what is your capacity?' And I told him, 'my capacity is what you want it to be.' He asked, 'what do you mean?' He thought that I did not understand his question. So he said, 'no, no, I want you to tell me about your production – how much you are selling to somebody else, and how much more you can do for us?' So I said, 'Craig, I will do what you want me to do'. Then he said, 'can you do 9000 front axle beams?' I said yes. So it became 9000 beams!

Widening the Footprint

Notwithstanding the successes it met with in the export market, BFL continued to depend heavily on the domestic market. The growth in domestic demand fueled by the economic reform program undertaken by the Government of India in the early 1990s to accelerate growth of the Indian economy, resulted in BFL further consolidating its leadership of the domestic forging industry. BFL had a well-diversified customer base that included virtually every OEM in the country. Even though many of these OEMs had historically built up captive forging capacity, they increasingly preferred to source forgings from BFL to meet their growing demand, as the company was cost and quality competitive. By mid 1990s, BFL had 55% share of the market for heavy forgings and 85% market share in machined crankshafts.

The burgeoning growth in the domestic market prompted BFL to further expand capacity. But even as the company was implementing the capacity expansion projects the domestic market went into a steep downturn and the company found itself in a crisis. Baba Kalyani said:

> Until the previous year 1995, every one of our customers was projecting huge growth. They were constantly urging us to expand our capacity. And when we did, the demand collapsed! It took us all by surprise. Nobody anticipated it, including our major customers like Tata Motors etc. We had spent so much capital in creating capacities that we were in a bad shape. We started by doing the standard things like delaying the commissioning of the new facilities, working three days a week, and when that was not enough, started laying off people etc. But then realized that the only way to survive was by getting a larger portion of the global market; so, we shifted gears.

Restructuring Finance and Operations

The downturn in 1996 led BFL to actively focus on its cost structure. One of the cornerstones of its cost reduction strategy was to focus on its financing costs. As a first step, the company "dollarized" its balance sheet. It started mobilizing debt from the international capital markets as the interest rates where much lower and by 2004, 88% of its debt was in the form of foreign currency loans. While overseas capital subjected the company to currency risks, its exports acted as a natural hedge against this risk. To improve its ROCE, the company divested its portfolio investments as well as holdings in group companies, and spun off the assets that were not core to its manufacturing operations – that included the investment in windmills it had undertaken to take advantage of tax and power tariffs credits that reduced its cost of power – into a separate entity called BF Utilities Limited through a process of de-merger. By the financial year 2000-01, BFL emerged as a fully focused manufacturing company with only those assets that were relevant to the core business in its balance sheet.

Efforts were made in parallel to reduce operating and material costs. The company streamlined its vendor management processes – reduced its vendor base and only engaged with what it called the "chosen and trusted" few –and deployed an integrated supply chain system. Simultaneously the company also launched several initiatives to constantly upgrade the competencies of its workforce. An agreement with Birla Institute of Technology and Science, Pilani, a leading engineering school, allowed employees of the company to pursue a part-time engineering course for a B.S. (Manufacturing Engineering) degree."

BFL replaced its many layered organization, where shop floor feedback of manufacturing changes took ages to implement, with a three-layered structure. To bring about greater transparency and objectivity in its performance management practices, particularly to identify and reward performers, the company rolled out a new performance management system. In a letter to the shareholders, Baba Kalyani wrote:

> Any management team can deliver results during booms. The test of a disciplined, proactive management is not only how it can weather slumps, but also use the period of adversity to reengineer the company to widen its footprint, cut costs and implement strategies that overcome adversity.

Growing Exports

Simultaneously the company actively searched for opportunities to grow its exports. Its existing relationships with overseas customers enabled it to achieve fresh breakthroughs. Its relations with Meritor proved to be particularly helpful. One of the plant managers of Meritor had joined Metaldyne, a company that was a supplier to Caterpillar. Metaldyne was facing quality issues with its existing US based supplier and the plant manager recommended BFL as a potential supplier to his new firm, since he had, while at Meritor, good experience in dealing with it. BFL was asked to send a response to their query. Agarwal recollected:

> Our response went within five days and it ran into sixteen pages. Over and above the price, we explained our manufacturing process in detail with diagrams and flow charts. They were quite impressed, both with the response time as well as by the comprehensiveness of it and asked for a teleconference. This ran into couple of hours, where they clarified a lot of their doubts. At the end of it, they told us that they would like to visit our facilities for evaluation. Three weeks later they flew down. We took them around to show our facilities. When they came to the press shop, they asked, "Whose part is being forged? It looks very similar to ours." We told them it was their part that was being forged. This took them completely by surprise and they asked "How can you be making our part, when we never gave you the order". We said, 'if four of you are coming all the way from the US, it means that you are seriously interested. Now what you want to find out is whether we can make the part or not. Two of you would say, 'yes, you can', and two of you might say, 'I am not sure', so how do we prove it? The best way we thought was to show the actual product to you! We thought if you are spending 5000 dollars to come here, we should be willing to spend 20,000 dollars and develop this part'. When they were going back, we gave them the sample so that they could test it in their lab. After the testing, they called back and told us, 'the program is on!'

It was during this time it became apparent to BFL that to break into the fiercely competitive global market it would need to stretch itself and respond faster than the existing suppliers of their potential customers. While its willingness to create capacity ahead of demand provided it with opportunities to gain a toehold with customers, it realized that to gain a pole position in the customer's account it would need to redefine its value proposition in a fundamental way. It sought to do this by radically improving its designing skills and adding value to its product offerings.

Building Design Competence

Designing is an important part of the process of manufacturing forgings. An optimal die design improves the life of the die and an optimized forging sequence reduces the number of forging stages. Additionally, a faster design process reduces time to respond, a parameter that is important in export markets. Hence, BFL decided to revamp its designing process from a manual one in which draftsmen developed the design with pen and paper, to a computerized one using CAD/CAM/CAE[2] systems in which the design is

[2] Computer Aided Design / Computer Aided Manufacturing / Computer Aided Engineering

first done on the computer and then directly downloaded on to the forging shop to be converted into a forging. Baba Kalyani said:

> Our entire tool making skills and knowledge is sitting in our CAD / CAM software and processes. Till mid 1990s, we used to have a skilled operator called the toolmaker. However, thanks to our design facilities, we have deskilled the job. Today we recruit fresh engineering graduates and give them rigorous training. In two months they can make tools with these machines. The engineer's intellectual abilities do come to bear during the design, when the CAM and machining programmes are generated.
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> By suitably investing in technology and instituting the right processes, we have dramatically increased the bandwidth of our design engineers. It is possible to do the same in the US, but such employees will be four times more expensive. Thus, it is not factory labour cost arbitrage that we are leveraging. We are gaining from intellectual capability arbitrage. Today we are a low cost operation and not a low price operation. We don't need to be low priced; we are not a commodity player. If you become a commodity, you lose. If you lose your pricing power to your customers, you are finished – they will make sure that you operate at a 2% margin! That is where intellectual competition comes in. We have strategically positioned ourselves by offering them seamless capacity, faster speed to market in terms of development time. We simply deliver far better value than our competitors.

Diversifying Product and Customer Portfolio

As its engagement with automotive majors in the world markets increased, BFL witnessed a growing preference among them to have components in a ready to assemble form. It then embarked on a strategy of further maximizing supply of components in the machined form instead of raw forgings. The company soon emerged as a reliable vendor of machined components to the automotive sector as well as the oil and gas sector.

Historically BFL had concentrated on manufacturing large forgings. The explosive growth of passenger car industry in India prompted the company to increase its presence in the small forgings segment. The passenger car segment was estimated to be 4 times the size of commercial vehicles segment, the traditional area of focus for BFL. The small forgings segment of the industry was highly fragmented with a host of small and medium sized units supplying parts using old technology. BFL believed the then prevailing wave of vendor consolidation in the auto sector afforded it a window of opportunity to emerge as a major player by offering products using state of the art technology. It went ahead and installed three new forging press lines aggregating to a total capacity of 9000 MT to manufacture small forgings. The company achieved a major breakthrough when it entered into a contract with Toyota to supply small forgings for the latter's Indian and global operations. In his letter to the shareholders, Baba Kalyani wrote:

> I am sure we are well on our path of achieving our long term goal of making BFL one of the top forging companies in the world in the next three to five years. Together, we shall make it happen.

It did happen. In January 2002, BFL concluded an agreement for supply of forgings to Dana Corporation's Spicer Europe Limited operation in Kirkstall, Leeds, UK. Under the agreement, BFL assumed Kirkstall's responsibilities as a supplier to the Cameron Division of Cooper Cameron. The supplies were to be made by BFL over a seven-year period from India. Mr. Prakash Bhalerao, Executive Director, explained:

> The deal came to us since the word was out that we were looking for acquisitions. We looked at it. We found the order book interesting and not their assets - we already had excess capacity here! We offered to pay 3 million pounds for the order book. But Dana wanted to divest the whole block, including the physical assets. We helped them find others who were interested in the individual parts of the physical assets - plant, land and buildings etc. That way Dana ended up getting what it wanted! And we got what we wanted. We paid 3 million pounds for the order book and got 10 million pounds worth of orders per year, for the next 7-years! And we also got the dies and tools.

Immediately after the Kirkstall acquisition, BFL's concerted efforts to penetrate the burgeoning Chinese market met with success. The decision of the Chinese government to adopt Euro II emission norms provided BFL with a competitive edge over local Chinese companies as they did not have the requisite technology. BFL then entered into a long term agreements for supply of steel forged crankshafts and other engine components to two of the largest engine manufacturers in China. And within two years, China emerged as the second largest export destination for BFL after the United States. In his annual report to the shareholders for the financial year in 2002-03, Baba Kalyani wrote:

> I can see the DNA of each of us in the company changing. Several years of ordeal by fire tempered our steel; increased speed to market; and made us more hungry and competitive.

Global Leadership

In January 2004, BFL acquired the assets, intellectual property and labour force of Carl Dan Peddinghaus GmbH & Co. KG (CDP), a €120 million German forging company in an asset purchase deal worth €29 million (Exhibit 8). CDP, which was founded in 1839, was well known for its product design and development capabilities. Baba Kalyani said:

> CDP has phenomenal capabilities. For example, when BMW starts designing a new car, it would invite CDP to develop the suspension components from scratch. CDP engineers would work along with engineering department of BMW for the next two or three years to develop a prototype. And CDP would get the rights to be the sole supplier for seven years, the lifetime of that vehicle. We were looking to acquire a technology and engineering beachhead in Europe and CDP provides us that. After this acquisition OEMs will start looking at us differently. They will look at us from a long term perspective and partner with us for future products and models.

BFL had been preparing for an overseas acquisition since 1999, when it first took the decision to acquire companies in Europe and/or USA. It took this decision as it found

manufacturers, especially in Europe, displaying a strong preference for component manufacturers located close to their factories. Bhalerao said:

> The Kirkstall acquisition gave us a lot of confidence that we can do it; that we can make it happen. The downside of that was that we still didn't have a base in Europe; we didn't have our footprint in Europe. CDP gave us that. It also gave us a lot of synergies on the customer, product and market side (Exhibit 9).

Negotiation for CDP took about eight months. Baba Kalyani explained:

> Unlike the US, where it is a very time sensitive process, in Germany the acquisition process is a very informal affair, and it can go on for a year or two as there are four constituents who are involved in the process of sale. First are the banks, which put the company into administration, because they are the ones who have to get the money; Second are the employees, who are generally represented by the unions; third is the existing management; and the fourth are the customers. In our presentation, we informed them that we will not shut CDP down or move it to India; and we gave a road map of how we would grow the business there. Finally, two of us – ThyssenKrupp was the other – were left in the fray. ThyssenKrupp was willing to pay more money than us, but the unions opposed it, and the management opposed it, and even some customers opposed it. And we ended up acquiring it.

BFL retained the entire CDP top management team. In his first address to all 790 CDP employees, Baba Kalyani assured them that he intended to nurture and grow the operations of the newly formed 100% subsidiary CDP Bharat Forge GmbH (CDP-BF). And soon thereafter, he announced a € 4 million investment in building a new production line at the German plant. Baba Kalyani said:

> The success of any acquisition boils down to people and mindsets. When a firm is bought, people are uneasy, pain level is very high. The pain comes out in all kinds of concerns. (Thus) you need to send out the right signals and instill confidence in the management team. Never say one thing before the acquisition and do the opposite after. If you lose people's trust, you will never win it again.

<u>Integrating the Acquisition</u>

BFL believed that if the acquired firm were not integrated with the parent within the first hundred days, it would never be! It therefore launched a '100-day integration plan'. that had the twin objectives of integrating people and capturing synergies. The idea was to seek opportunities for both organizations to benefit from each other's best practices. While BFL started learning about CDP-BF's process for manufacturing key components, BFL's equipment maintenance practices were adopted in Germany. And to facilitate and speed up the process of integration and transfer of best practices, BFL introduced a part-time German language course for its managerial personnel.

Efforts at integration were complemented with detailed review of manufacturing costs, product mix and value addition for each activity. The German management, with their focus on technical excellence, was not focused on some of these aspects. At first, such

discussions were sacrilegious, but soon they started appreciating the business logic because it was objective and undisputable.

In the first quarter after the acquisition CDP-BF earned a net profit of nearly Rs 100 million. In his first public statement, four months after the takeover, Mr. Michael Kasperski, Director of CDP paid a glowing tribute to the new organization, stating

> It was a great surprise for the employees that the acquisition worked so well in both directions. The employees are enjoying their work once again and we look forward to an optimistic future[3].

In BFL too there was excitement, especially about CDP-BF's product design and development skills. These skills would provide the leverage BFL was seeking to make a push for global leadership. There was also an additional unexpected spin off. Baba Kalyani said:

> It's not easy to describe, but the acquisition is doing wonders for us in India. Our employees suddenly have a new sense of pride!

Post Script

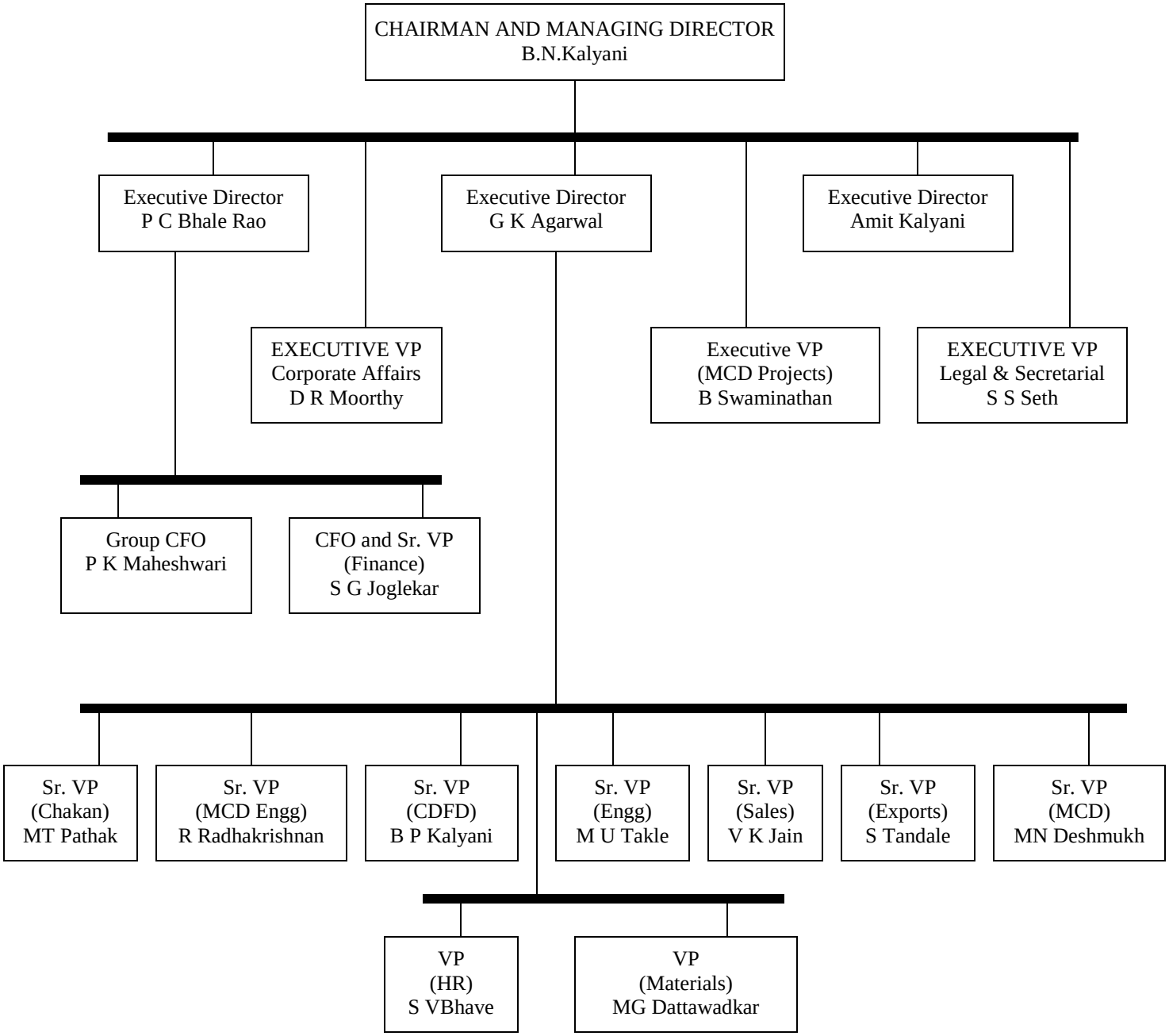
In December 2004, BFL acquired CDP Aluminiumtechnik (CDP-AT), a significant player in the area of aluminium forged components used in passenger cars and other automotive applications. BFL was funding the €6.30m all cash deal through a mix of equity (€3.80m to be infused over the next six months) and non-recourse debt (€2.50m).

Aluminium is progressively becoming the preferred material for specialized high end automotive applications due to significantly lighter weight and consequent advantages of fuel efficiency. CDP AT, which has a turnover €35m and employs 130 people, is located at Brand-Erbisdorf, near Dresden, Germany, an area fast emerging as major automotive hub with new plants being set up by Porsche and BMW. CDP AT has developed and patented its technology of aluminium forgings in Germany and its customers include BMW, Audi, Volkswagen, and Ford.

[3] Westfalenpost, 3rd May, 2004

Bharat Forge Limited
Exhibit 1

ORGANISATION STRUCTURE



(Source: Company)

Bharat Forge Limited
Exhibit 2

FINANCIAL PERFORMANCE

A. PROFIT AND LOSS ACCOUNT (Rupees million)

	94-95	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04
INCOME										
Gross sales	3236	4536	5572	5737	4595	5677	5233	4718	6863	9020
Less: Excise duty	424	534	661	543	438	594	558	470	505	700
Net Sales	**2812**	**4002**	**4911**	**5194**	**4157**	**5083**	**4675**	**4248**	**6358**	**8320**
of which Export Sales	276	490	482	892	746	1149	894	1108	2717	3330
of which Domestic Sales	2536	3512	4429	4302	3411	3934	3781	3140	3641	4990
Operating &Other Income	347	429	394	315	273	176	215	113	92	191
Total Income	**3159**	**4431**	**5305**	**5509**	**4430**	**5259**	**4890**	**4361**	**6450**	**8511**
EXPENSES										
Raw material, Components, Die block	1286	1832	2262	2571	1659	1824	1879	1576	2223	3181
Staff Cost	253	347	401	412	440	465	464	427	462	537
Other manufacturing expenses	591	781	960	867	855	1114	858	789	1244	1518
Other expenses	221	326	711	556	343	388	361	372	562	682
Total expenditure before IDTA	2351	3286	4334	4406	3297	3791	3562	3164	4491	5918
EBIDTA	**808**	**1145**	**971**	**1103**	**1133**	**1468**	**1328**	**1197**	**1959**	**2593**
Interest	383	459	518	446	424	442	573	454	408	323
Depreciation	166	176	209	236	291	299	397	390	418	458
Total Expenditure	**2900**	**3921**	**5061**	**5088**	**4012**	**4532**	**4532**	**4008**	**5317**	**6699**
PBT	**259**	**510**	**244**	**421**	**418**	**727**	**358**	**353**	**1133**	**1812**
Provision for tax	1	1	58	59	45	101	32	133	322	563
PAT	**258**	**509**	**186**	**362**	**373**	**626**	**326**	**220**	**811**	**1249**
EPS	6.97	12.32	4.17	9.56	9.90	12.88	8.28	5.50	20.71	32.28
RONW	10.36%	12.31%	4.77%	9.30%	9.14%	15.60%	21.89%	21.53%	47.26%	49.70%
NAV / Equity share	58.05	103.14	100.14	102.58	107.84	103.57	33.85	18.96	34.54	56.57

(Source: Company Annual Reports)

Bharat Forge Limited
Exhibit 2 (continued)

FINANCIAL PERFORMANCE

B. BALANCE SHEET (Rupees million)

	94-95	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04
SOURCES OF FUNDS										
Shareholders' funds	**2490**	**4135**	**3900**	**3893**	**4082**	**4013**	**1489**	**1022**	**1716**	**2513**
Capital	481	768	497	377	377	477	477	577	677	677
Reserves & Surplus	2009	3367	3403	3516	3705	3536	1012	445	1039	1836
Loan Funds	**3569**	**3578**	**4273**	**4621**	**3957**	**4092**	**4129**	**3823**	**3236**	**2856**
Secured Loans	2053	2520	2940	2938	2220	2598	2623	2203	2530	2191
Unsecured loans	1516	1058	1333	1683	1737	1494	1506	1620	706	665
of which Foreign Currency Loans	1224	1228	1692	2708	2419	1979	1549	1664	2067	2402
Share Appln. Money	-	-	75	-	-	-	-	-	-	-
Deferred Tax Liability	-	-	-	-	-	-	-	740	819	850
TOTAL	**6059**	**7713**	**8248**	**8514**	**8039**	**8105**	**5618**	**5585**	**5771**	**6219**
APPLICATION OF FUNDS										
Fixed Assets	**1864**	**2290**	**2433**	**3249**	**3698**	**5045**	**4405**	**4475**	**4566**	**5389**
Gross Block	2523	3130	3124	3510	4699	6769	6359	7071	7697	8220
Less:Depreciation	935	1108	1330	1571	1825	2121	2463	2859	3270	3708
Net Block	**1588**	**2022**	**1794**	**1939**	**2874**	**4648**	**3896**	**4212**	**4427**	**4512**
Capital WIP	276	268	639	1310	824	397	509	263	139	877
Investments	**1080**	**1752**	**1725**	**1707**	**1663**	**928**	**12**	**-**	**-**	**344**
Def. Tax (assets)	-	-	-	-	-	-	-	-	39	45
Current Assets,	**3973**	**4798**	**5439**	**4966**	**4308**	**4206**	**2814**	**2939**	**4014**	**5228**
Inventories	812	891	950	796	759	932	879	860	1264	1332
Sundry Debtors	749	1039	1334	1142	823	663	837	716	813	1001
Cash & Bank Balances	110	132	408	204	51	156	29	93	233	86
Other Cur. Assets	35	46	45	33	134	144	113	150	384	443
Loans & Adv.	2267	2690	2702	2791	2541	2311	956	1120	1320	2366
Less: Current Liabilities	**866**	**1177**	**1377**	**1437**	**1650**	**2086**	**1727**	**1937**	**2963**	**4869**
Liabilities	769	1027	1154	1143	1229	1635	1364	1511	2192	3381
Provisions	97	150	223	294	421	451	363	426	771	1488
Net Current Assets	**3107**	**3621**	**4062**	**3529**	**2658**	**2120**	**1087**	**1002**	**1051**	**359**
Miscellaneous Expenditure	**8**	**50**	**28**	**29**	**20**	**12**	**114**	**108**	**115**	**82**
Total	**6059**	**7713**	**8248**	**8514**	**8039**	**8105**	**5618**	**5585**	**5771**	**6219**

(Source: Company Annual Reports)

Bharat Forge Limited:
Exhibit 3

PRODUCTIVITY PERFORMANCE

	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04
Forging production per employee (Tons)	20.64	24.30	25.37	21.75	16.78	22.23	18.32	19.53	27.11	30.95
Revenue per employee (Rs. in mn)	1.326	1.773	2.094	2.120	1.669	1.938	1.707	1.730	2.499	3.131
Employee Cost (% of Total Income)	8.01	7.83	7.56	7.48	9.93	8.84	9.49	9.79	7.16	6.31
No. of Employees	2383	2499	2533	2598	2655	2714	2865	2521	2581	2718
Capital Output ratio	1.27	1.57	1.70	1.66	1.08	0.92	0.74	0.65	0.87	1.07
Capacity Utilization	69	86	91	80	63	60	51	48	68	82
Interest Cost (% of Total Income)	12.12	10.36	9.76	8.10	9.57	8.40	11.72	10.41	6.33	3.80

(Source: Company)

Bharat Forge Limited:
Exhibit 4

SHARE OF MACHINED COMPONENTS IN TOTAL TURNOVER

(%)

	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04
Machined Components	N.A	N.A	25	26	43	42	42	44	49	49

(Source: Company)

Bharat Forge Limited
Exhibit 5

CUSTOMER PORTFOLIO

(A) KEY CUSTOMERS

1994	2004	
India: Tata Engineering, Ashok Leyland, BEML, Eicher Motors, Mahindra and Mahindra Escorts, Kirloskar Group, Bajaj Tempo **North America:** Arvin Meritor	**India:** Tata Motors , Ashok Leyland, Maruti Udyog, Mahindra and Mahindra, Cummins, Toyota Kirloskar **Asia:** Toyota, Honda, Ford, GM, Renault Vehicle Industries First Auto Works, China Second Auto Works, China Isuzu.	**North America:** ArvinMeritor, Dana Corporation, Ford, GM, Caterpillar, Cummins **Europe:** Daimler Chrysler, Volvo Trucks, Renault Trucks, IVECO, Ford, Caterpillar Perkins, Volkswagen, Cummins

(Source: Company)

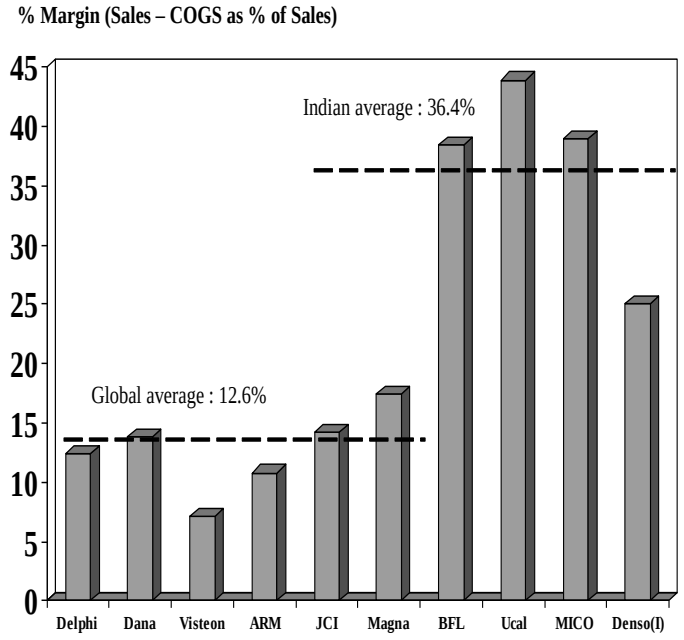
Bharat Forge Limited
Exhibit 6

A. Benchmarking Indian Auto Component Industry with Other Low Cost Destinations

Parameter	India	China	Thailand	Taiwan
Quality of supply	1	4	2	3
Ability to supply consistent quality	3	4	2	1
Price competitiveness	4	1	3	2
Design and engineering capabilities	1	4	3	2
Customer / after sales support	3	4	1	2
Maturity of auto component industry	1	4	3	2
Government regulations	4	3	1	2
Attractiveness of domestic market	2	1	3	4
Compliance and transparency	2	4	3	1

(Source: Frost and Sullivan/Company)

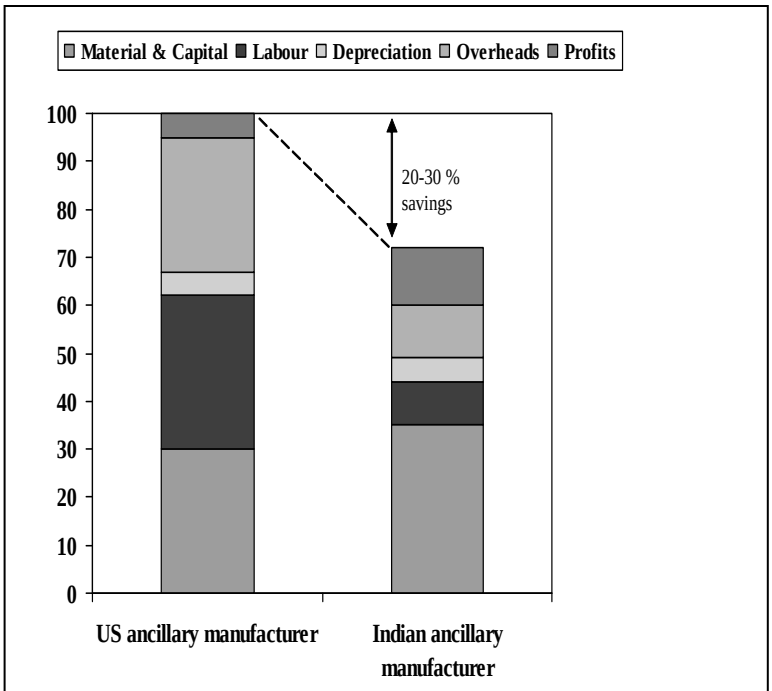
B. Benchmarking Indian Auto Component Industry With Component Majors



Comparing global and Indian auto component manufacturers' margins

Source : J P Morgan

Comparison based on FY2002 results for international companies & 9 months FY03 results for Indian companies

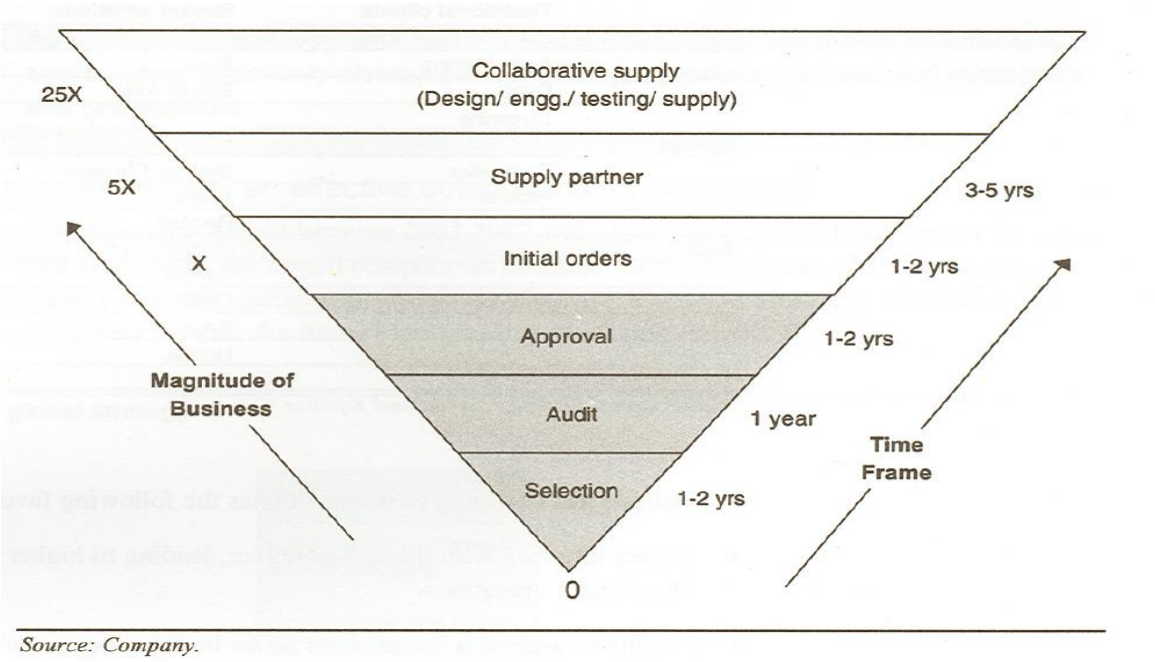


Comparative cost structure of US and Indian auto component manufacturers

Source : MOST- Inquire , September 2004

Bharat Forge Limited
Exhibit 7

TYPICAL CUSTOMER ACQUISITION PROCESS



Source: Company.

Bharat Forge Limited
Exhibit 8

CDP ACQUISITION: FINANCING DETAILS

	Euro (m)
Cost of Acquisition	
Purchase price	28.00
Expenses incurred for purchase	1.00
Total	**29.00**
Means of Finance	
Shareholders' contribution (BFL)	6.00
Internal accruals of CDP-Bharat Forge	5.00
Non-recourse long term debt	18.00
Deutsche bank AG, IKB Deutsche Industriebank AG & Commerzbank AG	
Total	**29.00**
Liabilities taken up by Bharat Forge	
Pension	1.70
Early Retirement	0.30
Jubilee (30 yrs in service) payment	0.30
Total	2.30

Source: Company

Bharat Forge Limited
Exhibit 9

SYNERGIES BETWEEN BFL AND CDP

Feature	CDP	BFL	Combined entity
Size and scope	Germany's second largest company with strong design and engineering capabilities	Largest single location facility, 3rd largest in the world	Emerges as world's second largest
Geographical spread	Europe centric operations (~80%)	Asia and US dominant	Acquires a near global footprint
Product breadth	Strong in passenger cars (50%+) components, CVs(20%+) and others	A major in CVs (60%+) and diesel engines (15%)	Covers requirement of most product markets
Facilities	Adequate capacities in small forgings	One of the world's only two companies in heavy forging	Complete range of forging facilities
Value proposition	A shop renowned for high end technology operations based close to the customer	Destination for low cost operations, most suited for certain components	End-to-end solutions

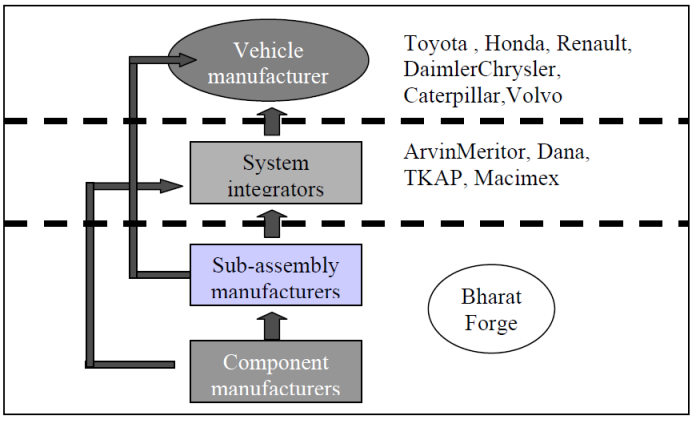
(Source: BFL, Kotak Institutional Equities estimates)

Bharat Forge Limited
ANNEXURE

Outsourcing in Global Automobile Industry

Increased competition, rising costs and pressures to provide additional comfort and safety features resulted in the global automobile industry supply chain undergoing a phase of restructuring in the late 1980s through the 1990s. Global automobile manufacturers dramatically reduced the number of suppliers they dealt with and focused on procuring from a select few 'systems integrators' (Fig 1).

Figure 1



Source: Asian Development Bank , J P Morgan

The sustained pressure imposed by ruthless extractions of price concessions by the OEMs impacted the profitability and return on capital employed of the systems integrators and component manufacturers in the West. Unable to grant any more price cuts, these players too were aggressively looking out for opportunities to cut costs by sourcing globally.

Global Forging Industry

ThyssenKrupp Automotive Group of Germany and Sumitomo Metal Industries, Japan are among the largest suppliers of forged parts to the global auto industry include. However, forging constituted a relatively smaller minor share of their turnover. System integrators like Dana Corporation and ArvinMeritor also have large captive forging units but they are increasingly outsourcing their forging requirement so that they can focus on higher value-added activities like system design and assembly. According to analysts, forging has become a 'sunset' industry for the developed world and they believe orders from global auto OEMs would increasingly go to companies from the emerging economies of the world.

Estimates of the global export opportunity for automobile forgings vary between US$ 5 –15 billion. Manufacturers of custom impression forging (BFL's area of specialization) from the US, Canada and Mexico reported aggregated sales of US$ 4 billion in 2002.This was the total output from 300 plants of 250 forging companies in these nations. Automotive applications at US$ 1.5 bn accounted for 37.5% of total sales, followed by aerospace applications at 24%. Since US automobile accounts for only 30% of the total global production, the global market for automotive forgings alone is estimated at US$ 5 billion. However, other estimates suggest that there are close to 10 international auto giants whose individual annual requirements of high-grade auto forgings are approximately US$ 1 billion. Another 50 auto and related companies buy forgings to the tune of US$ 100 million a year. These would add up to US$ 15 billion for global requirement of high-grade auto forgings.

Indian Forging Industry

The Indian forging industry comprises suppliers of forging components ranging from crankshafts, camshafts, connecting rods, axle beams and steering knuckles for the 4-wheeler industry to kick starters for the motorcycle industry. There are three broad segments in the industry. The top tier comprises about 9-10 large players*;* the middle consists of 31 players while the small sector is made up of close to 250 units. The small sector caters primarily to the replacement market. While 75% of these organizations employ less than 250 workers, about 40% have between 20 and 99 employees. BFL is the largest player in the organized sector, followed by Amtek Auto, Amforge, M M Forgings and Super Auto Forge Ltd. Apart from these, some auto majors like Tata Motors have their own captive forging plants. Following the footsteps of global OEMs, domestic auto majors are also reducing vertical integration and increasing outsourcing. Thus, their captive forging plants are being shut down, increasing opportunities for merchant forging organizations.