

# **EMERGING DYNAMICS OF GLOBAL PRODUCTION NETWORKS AND LABOUR PROCESS: A STUDY FROM INDIA<sup>#</sup>**

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## **ABSTRACT**

There has been a significant global restructuring of organization of production under capitalism over the last three decades. The global reorganization of production with rapid pace of technical progress, global competition and interpenetration of productive activity have pushed emerging economies to shift from simple export-oriented industrialization to gaining access to higher value activities in global production networks (GPN). In this respect, India's automobile sector has emerged successful in integrating itself into the global production networks, with cheap labour and a strong supply base, as a preferred site of production for leading global firms and indigenous component industry. For the required governance to remain globally competitive, Indian automobile industry has progressively been adopting AMT (Advanced Manufacturing Technology) and lean or JIT (Just-In-Time) production process. These changes are, of course, not neutral in terms of implications for labour. This paper seeks to study the nature of changes in organization of production and work, both intra-firm and inter-firm, and particularly their impact on the changing labour process and issues of managerial control, skill or working conditions under GPN in automobile industry using case studies (including particularly that of India's leading car-maker Maruti Suzuki) from the National Capital Region, India. The automobile cluster in the Gurgaon-Manesar-Dharuhera region, with its important global lead firms, sophisticated technology, deep backward integration with a strong supply base of different tiers extending up to slum production, and a huge and segmented labour force, has been studied as a representative case of this development. The anatomy of the recent waves of labour unrest there has been studied to investigate its relation with changing labour process, and to understand the new regime of accumulation from a political economy perspective in terms of the dynamic interaction of capital's strategy, technology and the agency of labour – which shapes the labour process in GPN.

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# **EMERGING DYNAMICS OF GLOBAL PRODUCTION NETWORKS AND LABOUR PROCESS: A STUDY FROM INDIA**

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## **Introduction**

In the last few decades there has been significant restructuring in the modus operandi of global capitalism. One major aspect of it is the trans-nationalization of production, i.e., a splitting up of segments of production among different regions or factories across the globe. It has led to the ascendancy of global production networks (henceforth GPN). A glaring example of this process has been the globalization of production of automobile industry and the shifting of production base to large emerging economies. India has successfully emerged as a major destination of global auto production for leading multinational companies, with a strong supply base and sophisticated technology.

A major framework to understand GPN<sup>1</sup> has been in terms of increasing global competition between MNCs to tap new markets and cheap labour to exploit economies of scale and to cut down cost of production. Economic, social or technical ‘upgrading’ in the firms that join GPN are then seen as the outcome of this process. Introduction of advanced manufacturing technology or lean production techniques in the organization of production and work have been considered as the driving force for increasing workers’ skill and autonomy in the production process<sup>2</sup>. Though a substantial section of literature has expressed serious concern over the condition of workers under GPN, many of them take capital’s strategy as autonomous in shaping GPN and consider labour to be at the receiving end of this process. In this paper, on the contrary, we try to understand GPN from a political economy perspective in terms of dynamic interaction of capital’s strategy and agency of labour – which in turn articulates the labour process in GPN.

To explore the dynamics of GPN and labour process we have examined the sphere of automobile production of Gurgaon-Manesar industrial cluster under NCR in Haryana, with a special emphasis on the labour process in India’s leading car manufacturer Maruti Suzuki’s factory there, and its supply chain. The paper seeks to explore the specificities of the operation of assembly points of car production in a developing country like India, with huge informal sector and reserve army of labour. It also tries to compare the labour process(es) in firms inside and outside GPNs in the context of India, taking the case studies of Maruti Suzuki and Hindustan Motors.

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<sup>1</sup> See Gereffi et al (2001), Humphrey and Schmitz (2000)

<sup>2</sup> See Womack et al (1990,2007)

In the context of evolution of GPN at the current juncture, this paper seeks to explore several issues which include, *inter alia*: internal segmentation of the working class; formal and real subsumption of labour under capital; or the transfer of crisis in a context of combined and uneven development. It also studies the genesis and anatomy of recent strike wave in Gurgaon-Manesar cluster and elsewhere in the automobile industry, with special emphasis on the strike in Maruti Suzuki Manesar unit in 2011, to understand their local and global significance and the strategic response of capital. The study has been based on interviews of workers of different factories in Gurgaon-Manesar cluster and of Hindustan Motors, and on primary and secondary literature.

The next section provides a brief overview of some of the critical arguments from the relevant literature and sketches the theoretical outline for the present paper. Section three describes production process in Maruti Suzuki and its supply chain situated in the Gurgaon automobile cluster, and makes a comparison with the labour process in Hindustan motors to identify the differences in the new labour regime. The fourth section seeks to understand the implications of the ongoing changes in the production networks in the Gurgaon industrial cluster in Indian automobile industry focusing on the questions of the autonomy of the workers, formation and skill, social or technical ‘upgrading’, managerial control etc. The next section documents the workers’ response and the recent strike waves in this cluster and explores its significance in terms of workers’ organisation and restructuring of production organisation. The last section concludes the paper with a few brief remarks.

## **Outline of a Theoretical Framework:**

As is well known, the concept of ‘labour process’ as an analytical category received significant attention in Karl Marx’s writings, and subsequent literature in Marxist tradition. Marx explained a pure capitalist mode of production as a system of generalized commodity production and exchange in which everything is a commodity including the worker’s labour power (her capacity to labour). The system is inherently anarchic driven by its own spontaneity, and the key element which drives such spontaneous system is the endless and insatiable quest for surplus value or profit.

Marx described the capitalist labour process<sup>3</sup> that is necessarily a valorization process—a surplus value generating process in which the commodity labour power is applied to other commodities (raw materials or instruments of production) to produce further commodities, the value of which is greater. Workers are organised at work by the capitalists or their representatives to ensure that maximum surplus is produced. Only living labour (variable capital) can create value in the labour process, and the rate of surplus generation, and thus the rate of profit depends on the organic composition of capital (ratio of constant capital to variable capital). Viewed historically, Marx described ‘formal subsumption’ of labour under capital as the process where capitalist production emerged from the earlier modes of production with a straightforward distinction between capital and wage labour. Then from simple co-operation of workers grew complex co-operation of the manufacturing division of labour. However, it was the advent of ‘large-scale industry’ where the labour process was revolutionized, and the ‘real subsumption’ of labour under capital started taking place, where instead of prolongation of the working day (to increase the

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<sup>3</sup> For an elaborate discussion of Marx’s ideas on labour process, see Nichols (1980)

appropriation of absolute surplus value), increased productivity through intensification of work, revolutionizing the production techniques (to increase the appropriation of relative surplus value) becomes the centerpiece of labour process<sup>4</sup>. We understand formal and real subsumption of labour under capital here not simply as a matter of chronology but a powerful analytical category which helps us comprehend the dynamics of present capitalist production process.

There is a substantial literature on labour process that has evolved after Marx, particularly in the last quarter of the 20<sup>th</sup> century. It is not our purpose here to review the entire body of the literature; we rather pick up a couple of critical arguments that help us frame a perspective to understand the labour process as the dialectic between immanent tendencies of capitalism and agency of workers. Capitalist class, seen as 'capital personified' and being driven by the motive of profit and accumulation, has to extract maximum possible surplus value from production. This leads to two major contentious issues between capital and labour in the sphere of production – the first one is, "How the organization of labour serves the interest of dominant class, i.e. the capitalists?" And, the second one is, "How does it facilitate the overall control of the dominant class?" is well known, a major classic in the Marxist tradition, namely, 'Labour and Monopoly Capital' by Harry Braverman published in 1974, sought to understand labour process by addressing these issues, and became the cornerstone of the subsequent debates around labour process. Braverman argued that a progressive degradation of work took place in the 20<sup>th</sup> century in the production process under monopoly capital, marked by the emergence of Fordist mass production or Taylorist scientific-technical revolution, in which management expropriated control from workers through deepening the division of labour, particularly the division between the conceptualization and execution of work or division between mental and manual labour. It gave a historical and structural interpretation of work organisation centered on labour process. Similarly the justly famous essay by Stephen Marglin (1974) also elaborated<sup>5</sup> on this and tried to show how social and economic organizations shape technology and control over production, as the capitalist class aspire for 'technological efficiency' as well as 'economic efficiency'<sup>6</sup>. Yet the labour process theory triggered by these debates at that time gave much room to the agents of capital like managers to affect change and less to value theory and the laws of motion of capitalist society. Furthermore, gradual trans-nationalization of production and subsequent international division of labour gave this debate a new dimension—transnational labour processes were divided between the processes of conception concentrated in advanced capitalism and processes of execution, concentrated in the labour reservoir of the developing world. Some, particularly a section of radical political economists influenced by Marxist ideas, tried to reorganize labour process theory going beyond the shop floor and in the last two decades important attempts were made to make a better connection between political economy and labour process. Labour process was attempted to be understood in terms of circuits of capital referring to the need to consider competition between capitalists as well as between capital and labour in production; or in terms of regulation theory with its concepts of

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<sup>4</sup>"In handicrafts and manufacturing, the worker makes use of a tool, in the factory, the machine makes use of you... in manufacture, the workers are the parts of a living mechanism, in the factory we have a lifeless mechanism which is independent of the workers, who are incorporated into it as living appendages." – Karl Marx, Capital Vol. I, p 548

<sup>5</sup>Marglin (1974), "What do bosses do?" in The Review of Radical Political Economics, vol.6, no.2, Summer 1974

<sup>6</sup>Obviously both of these two categories should be understood in an interrelated dynamic, where the later can better be viewed as 'class efficiency'

regime of accumulation encompassing various institutional structures; or varieties of capitalism under comparative political economy<sup>7</sup>.

The point worth highlighting is that in Marxian discourse 'pure capitalism' is necessarily a *spontaneous* system subject to a range of immanent tendencies, which Marx visualized as the 'laws of motion of capitalism'. However, as he also emphasized, the functioning of capitalism is embedded necessarily, *inter alia*, in the dialectics of struggle between capital and labour, different kinds of capital and the nature and role of the states. As it happens, for much of its existence, the evolution of capital on a global scale has been to a large extent driven by powerful impulses associated with these so-called 'laws of motion of capitalism'. Yet there are phases when these laws came under substantial regulation through a range of interventions. One such period was the accumulation regime on a global scale in the post WW II era. The emergence of Keynesian demand management and welfare State at that time kept the spontaneity and excesses of capitalism in check, and the so-called 'golden age of capitalism' saw a rise of both profit and real wage in the economy. But from mid-sixties when there was an increasing pressure on profit margin, capitalist class had to push the wage share down, and for that had to break the workers' increased power of collective bargaining and reorganize the production. It led to globalization of production undermining the strength of workers of erstwhile major production bases and utilizing the non-unionized low-wage labour regime in developing countries due to the existence of huge reserve army of labour to ensure much greater degree of freedom for capital (Harvey,2010;Foster,2011), and labour process was(re)structured in the production process as a dialectical interaction between capital's strategy, technology and workers' response under the new regime of accumulation in last few decades.

## **Indian Automobile Industry in the Era of GPN: A study of Gurgaon-Manesar Cluster**

The automobile manufacturing industry in India has a history of seven decades. Before 1948, cars were only assembled here. Hindustan Motors took off its journey in 1948. In 1953, the government of India, for industrial self-reliance through import substitution, accepted the recommendations of a Tariff Commission report on the development and protection of the automobile industry and pushed for the localization program according to an approved time schedule. It led to the exit of foreign car assemblers from the Indian market. The domestic manufacturers, namely Hindustan Motors (manufacturer of Ambassador cars), Premier Automobile and Standard Motor, got government approval for production with phased manufacturing program to localize the manufacture of components. While all of them could use technology import to manufacture a car, no further import of technology was allowed to upgrade the cars or change models. Protection was given to the industry and competition was prevented. It created a base for domestic production but the industry remained technologically backward, compared to the global situation. From the beginning of the 1980s, significant restructuring in the Indian automobile industry in collaboration with Japanese MNCs took place. In 1983, Maruti Udyog Limited (MUL), a joint venture of the Government of India and Suzuki Motor Corporation, launched the model Maruti 800 which soon captured a large share of the 4-wheeler segment of the market. To promote indigenization, it had to adopt Phased Manufacturing Program (PMP), following government policy, which required 92% localization of

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<sup>7</sup>See Thompson(2010) for an elaborate discussion

components within 5 years from the start of production. MUL, to reduce its vulnerability of production, tried to develop a strong base of vendor companies and encouraged its local suppliers to adopt flexible practices and advanced technology (Bhargava, 2010). Hero Honda, established in 1984 as a joint venture between Hero group and the Japanese Honda company, introduced the four-stroke engine motorcycle in 1985, and it gradually became the market leader. In 1994, the government de-licensed car production. Following on the heels of Maruti, other global players entered the scene, raising not only India's vehicle output substantially, but also diversifying the industry with qualitatively new products. In 1997, new government policy allowed companies to localize 50% of production within 3 years and 70% of production within 7 years, further liberalizing the market. Apart from cars, they were allowed to export components and ancillaries, and it further promoted the integration of Indian automobile sector to global production networks of the industry. Import duties on components have fallen from 60 per cent in the 1980s to 10 per cent today. Since 2008 the export of parts growth faster than the export of assembled cars, at the same time since 2009 we can see that the share of car part imports for local assembly – mainly from Thailand and South Korea – increases quicker than the general local parts manufacturing. This shows that assembly plants in India use more parts from abroad, while the part manufacturers in India send increasingly more parts abroad than to the local assembly plants. In last several years we can see an actual extension and re-linking of the supply-chain between North and South and within Asia, integrating Indian automobile industry more to the complex global production networks.

The establishment of assembly plants like Maruti Suzuki in Gurgaon (and later another plant in Manesar), Hero Honda in Gurgaon and Dharuhera or Honda in Manesar, and numerous first-tier, second-tier or third-tier component suppliers along with these lead firms has shaped the Gurgaon-Manesar-Dharuhera industrial region as a most significant cluster of automobile industry in India and an important location for global auto production. The changes that took place in the last few decades in the global auto industry with the ascendancy of GPN have significantly influenced and restructured this cluster too. Some changes that can be identified in assembler-supplier relations in global auto industry (Humphrey, 2003) are –

- Now first tier suppliers assemble parts and supply them as a complete unit (dashboard, seat, rear axle assembly etc.)
- Component manufacturers have taken an increasing role in designing of components and systems. Assemblers provide overall performance specification and information about interface, and suppliers design (modular suppliers)
- Increasing numbers of joint ventures, mergers, takeovers in emerging markets.
- Just-in-time delivery, inventory reduction under lean production, and so proximity is increasingly important that leads to 'follow sourcing' and sophistication and integration of component industries of emerging economies.

We can see in the case of Gurgaon clusters the first-tier suppliers like Rico, Denso, Omax etc. having emerged as global suppliers of auto components besides supplying the lead firms in the region. Again, global players like Delphi or Bosch establishing their production units here, symbolizes this cluster as a destination for the global auto component industry. Numerous joint ventures of local firms with global players, joint ventures of lead firms with its vendor companies, mergers or takeovers have resulted in deeper inter-firm dynamics, flexible production practices, standardization of process and products,

integration and technological sophistication for the upper layer of supply chain in the cluster. For our purpose of understanding, we will study the production process of an a lead firm, namely Maruti Suzuki (we have studied the labour process of Maruti Suzuki's Manesar plant, as later it will help us to connect to the labour unrest that took place there in 2011) and its supply chain in the industrial cluster.

### **Key Elements in Production Process in Maruti Suzuki Manesar Plant and the Supply Chain**

Maruti Suzuki is a major assembly point in GPN, and it is the market leader in car manufacturing in India. The production process in this assembly plant starts from press shop, where the sheet-metal is cut and pressed only one day in advance, meaning what is pressed today will be assembled tomorrow. Then there are six lines of power presses. The press-tools of these machines change automatically, according to different form of parts to be pressed. There are almost 40 permanent workers working on one shift in the press-shop which includes apprentices and trainees, and in addition to that 30 workers hired through contractor. The press-shop runs on three shifts. The harder work, such as taking pressed parts out of the machines, is done by workers hired through contractor and apprentices. In general the work in the press-shop is less hard, because most work-stations are machine-stations, meaning that it gives a little breathing space while the machine works. In the weld-shop and assembly workers have a harder time. In weld shop, there are 250 to 300 hand-welders in Manesar A-plant, and full automation in B-plant. Almost 200 out of 300 workers are through contractor. Since 2006, the numbers of work-stations came down from 16 to 8 and then to 4 since June 2011, through increased automation and usage of robots. But so far work had been re-distributed in a way that workers' numbers did not come down as much as work was replaced (one robot replaces ten workers). In the paintshop at the Manesar plant in one side there are 12 painting robots rubbing shoulder with the workers. Each worker has to carry 70-80 screens up and down the stairs, working an extra hour without pay if the job is not done by the end of the shift. At the sealer-line, the cars arrive there from the weld-shop. There are about 38 work-stations at the sealer line; two workers are at each station. Most of the workers at the line are temporary or casual workers, trainees. The plastic moulding of bumpers takes place in the department itself, lights and other devices are attached to the bumpers, then 'bumper-shop' workers attach the bumper to the car at the assembly line. Out of almost 250 workers in the department only 20-25 are permanent, most are trainees and workers hired through contractor.

Then the car is assembled in the assembly line. The assembling process/ assembly line was captured quite well in an article in The Hindu and it may be worth quoting in some details: "In Manesar, Maruti produces about 180 variants of three basic models. When a car rolls in, the worker looks at a large matrix pasted on the vehicle that indicates if the car is a left or right hand drive, powered by petrol, diesel or compressed natural gas engines intended for the domestic, European or general export market. Depending on his work station the worker chooses from 32 different upholstered seats, 90 tire and wheel assemblies, and innumerable kinds of wire-harnesses, air conditioning tubes, steering wheels, dashboard trims, gearboxes, switches, locks, and door trims, in an average time of 50 seconds per car. For parts like air conditioning tubes, the worker stands between a set of parts racks. As a particular car variant rolls in, a light above the corresponding parts rack blinks with increasing urgency as the worker runs to it, grabs a part and pulls a cord to acknowledge he has chosen the right part. He then steps onto the conveyor belt, fits the part and rushes back to match the next car to the next blinking parts rack before an alarm rings. If

the line halts, signboards across the shop floor light up – flashing the number of the workstation where the line has stopped and the duration of the stoppage.”<sup>8</sup>

In general there are not too many stoppages of the line, may be once or twice per day, if at all, and usually not longer than for a minute or two. On the long-block assembly-line there are about 200 work-stations, manned by one worker each. After the engine block arrived it is washed. A worker makes use of a crane, clamps the engine block, operates the washing machine, and takes the engine out. That's the job of one worker. Then different data entry has to happen, according to eight different engine models. That's another work-station. Then the worker has to attach a bar-code and do the engine number punching. After that he fits the crank-shafts - they are also first checked, then washed, then fitted. The crank-shafts arrive from Oriental Engine Pvt. Ltd. The crank-shaft is fitted manually, this is physically the most demanding work, they weigh 15 to 20 kg. The pistons come from Sensera, Amtek, Subros. At the dressing-line there are around 12 stations, one worker per station. Here 'attachments' are fitted, such as compressors or starter motors. These parts come from companies like Bosch, Bolio. The heavy work, such as taking crank-shafts out of the trolley and testing it mechanically is mainly done by contract workers. The relatively lighter work, such as data entry or final check, is mainly done by permanent workers.

Workers of other companies like Belsonica, FMI, Krishna Maruti, SKH Metal etc. work in the company premises. For Belsonica 600 workers hired through contractor and 40 to 45 trainees work on two 12-hours shifts, manufacturing smaller sheet metal parts. They also work on Sundays. They are forced to work longer, so their overtime amounts to 150 to 200 hours per month, they are paid only 24 Rs per hour.

The ‘electronic flow’-management<sup>9</sup> in central assembly plant symbolizes the attempt of capital to get to grips with the flow of value. This electronic flow is actually the sequence of production plans from the vendor [supplier] to Maruti’s shopfloor, which now sits at a two hour cycle from 30 days in the past, to pass on ‘information’ between assembly department and the scattered landscape of supplying industry. The ‘information-flow regime’ is supposed to ensure that a perfectly synchronized supply-chain will reconcile ‘technical productivity’ and ‘profitability’, by tuning the rhythms of welding-robots to those of the precarious hands of slum labourers.

Across Maruti’s twin sprawling plants in Gurgaon and Manesar, multi-coloured bumpers arrive in mobile trolleys and components line up outside factory sheds directly feeding the multitasked assembly lines. For the company’s 250-odd first tier vendors including 20 global suppliers, and hundreds of lower tier suppliers, supply is a seamless activity. Maruti Suzuki keeps a strict 'no single source'-policy. Maruti receives multiple supplies in a day within a slot of two hours based on the information given out to its vendors the previous night. That’s a far cry from the initial 30-day or subsequent 15-day cycles Maruti drove in years ago. And that’s what it takes to crank out 4,600 cars a day<sup>10</sup>.

Along with processes like electronic flow, new technologies and materials such as plastic instead of a metal fuel tank or light tinting of glass to keep the car cool, are now in the offing. Increased competition in the late 90’s gave rise to global suppliers coming to India, like Delphi or GM. Global suppliers like Delphi came with a range of technologies, like wiring harnesses, chassis and Powertrain components and

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<sup>8</sup> Taken from “Gone in 50 seconds” by Aman Sethi, The Hindu, 6 November, 2011

<sup>9</sup> See [www.gurgaonworkersnews.wordpress.com](http://www.gurgaonworkersnews.wordpress.com)

<sup>10</sup> [www.gurgaonworkersnews.wordpress.com](http://www.gurgaonworkersnews.wordpress.com)

AC components and they became Maruti's suppliers<sup>11</sup> as well. At that time, it was the 'Materials' division of Maruti that dealt with the supply side. Instead of price increase, which was the order of the day, Maruti called on its existing vendors to focus on cost reduction. Initially, the company could bring down the cost of production by 2-3 per cent and in 2006-07 it even lowered that by 5%. Maruti inducted many global suppliers in their vendor network<sup>12</sup>, like Faurecia for seat mechanism, Bosch and some Japanese suppliers like Dentsu, Sumitomo Metals and Continental, all with a global footprint.

The main automobile companies try to outsource not only stock and certain production steps, but also the financial risks. Component producing suppliers down the supply chain complain about financial squeeze: there is increasing price pressure from both sides (steel and rubber prices are increasing and final assembling companies asking for lower prices) and the current hike in interest rates as part of 'anti-inflationary measures' make investments in capacity expansion more costly. Final assembling companies 'take informal credit' from suppliers by paying for parts, not in advance, but with increasing delay of up to 180 days. The final assembling plants are compelled to increase capacities and to run the capital-intensive plants 24 hours, while the rest of the supply-chain is dragged deeper into the squeeze. In the 'Appendix 5' we have the glimpses of some vendor companies down the supply chain of Maruti Suzuki. These experiences show the dismal working condition, exploitation and oppression on the 'precariat'<sup>13</sup>.

### **Maruti Suzuki and Hindustan Motors: Juxtaposing two production regimes**

In this section we compare labour process in Maruti Suzuki, which is a major player in global auto production under GPN, with that of Hindustan Motors Uttarpara plant, where the ambassador car is produced. Hindustan Motors before the arrival of MUL was the market leader in Indian passenger car market, but lost its market to Maruti, not being able to transform its production organization and technology to match the demand for quality and standardization. Uttarpara plant is not an assembly plant, rather a production plant, having foundry, forging and infrastructure for manufacturing of most of the components within the factory premise. So it offers a labour process in car manufacturing outside GPN representing a frozen time, as if, of production of Fordist nature when India was under ISI policy, making a sharp contrast with labour process in advanced centers under GPN now.

In Maruti Suzuki, the value added by the workers depends on increasing intensity of work, i.e. in terms of relative surplus value. In Hindustan Motors, the scope to increase relative surplus value has been very limited because of the very nature of the labor process, technology and the organisation of work. Even when the production was relatively high in 1980s and the first half of the 90s, it majorly tried to increase the value added in terms of absolute surplus value in the form of higher overtime or running three shifts a day.

The centralized production system, flexibility and AMT in Maruti Suzuki give a scope for management to directly control and intervene in shop floor labour process in terms of increasing the speed of assembly line, exact control of timing in lunch or tea break, or swift redesigning nature of work etc. It has

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<sup>11</sup> [www.scribd.com/doc/50282674/Maruti-Suzuki](http://www.scribd.com/doc/50282674/Maruti-Suzuki)

<sup>12</sup> *ibid*

<sup>13</sup> A term to describe the pauperized section of working class. See Guy Standing, *"The Precariat: The New Dangerous Class"* (New York: Bloomsbury Academic, 2011).

substantially reduced the autonomy of floor managers or supervisors on the shop floor, who have been majorly the direct executors of managerial controls and decisions. In contrast, in Hindustan Motors, foremen or supervisors on the shop floor wield a significant autonomy in terms of controlling the shop floor labour process, and historically were in charge of assigning overtime.

In most of the cases in Hindustan Motors, the workers do not require any formal degree, rather their experience over time on the shop floor makes them well-equipped to perform their tasks. In Maruti Suzuki, this experience has been replaced by training. Workers here require formal ITI degrees, where a part of this training is already outsourced. The continuous technological upgrading and sophistication has made the skill of the workers more and more replaceable by a suitable duration of training.

In case of Maruti Suzuki, the continuous flow of assembly line doesn't allow workers even a small break to drink water. If there is any mistake, at any station in the assembly line, the signboard shows the number of the workstation and the time lost due to the mistake, thus leading to a heavy intensity of workload. But in Hindustan Motors, the checking of the cars is done at the end of the car assembly line, so any increase in speed of the assembly line may lead to a fall of quality, of the cars produced as it is not possible to trace any mistake at any particular step in assembling the car in the assembly line itself.

To manufacture workers consent in terms of technological sophistication and control to increase work intensity and production, Maruti Suzuki links a significant part of the wage to the production. Parallely, quality circles and visit to Japanese plants for training has been other mechanisms to develop workers consent and participation. Whereas in Hindustan Motors, there has never been a significant direct participation of the mass of the workers in terms of increasing the volume of production and productivity; rather the understanding of the management with the workers union has mediated the participation of workers<sup>14</sup>.

In Maruti Suzuki, the assembly plant produces very few essential parts, has negligible inventory and is embedded in the just-in-time production network consisting of hundreds of suppliers. The hazardous works like forging or foundry has been outsourced to the periphery of the supply chain, majorly to be found in the slums of Faridabad or Ghaziabad. In Hindustan Motors, The production plant produces most of the auto parts itself. There the labour process includes this forging or foundry works inside the factory premises itself.

In Maruti Suzuki, the internal labour market or the internal segmentation of workforce is much more elaborate than Hindustan Motors. There are permanent, contract, trainee workers, and also workers of other factories working in the same premises of Maruti Suzuki. In the upward segments, there are 'quality circles' or supervisors selected from the workers. In Hindustan Motors, it is experienced permanent workers who constitute the majority of the workforce. In Maruti Suzuki, the main burden of production is on the contract workers in comparison to the permanent workers, whereas in Hindustan Motors, it is the migrant permanent workforce that carries the main burden of production.

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<sup>14</sup> Manthan Samoyiki, July-August, 2007

## **Gurgaon Automobile Cluster: the Structural Unevenness and Some Key Issues Relating to labour and Capital**

### **Coexistence of ‘primitive’ and ‘modern’: “unity of opposites” embedded in “combined and uneven development”**

Even in the most sophisticated segment of production networks, there are ample evidences of dismal work conditions, exploiting the cheap labour and job insecurity due to the existence of huge reserve army of labour. For example, the paintshop at the Maruti Suzuki Manesar plant is a curious combination of cutting-edge robotic technology and brute physical labour. On one side there are 12 painting robots. On the other, are workers carrying 25 kilo head loads of used screens up two flights of stairs and returning with a 30 kilo load of clean screens. Each worker has to carry 70-80 screens up and down the stairs, working an extra hour without pay if the job is not done by the end of the shift. This unevenness in the heart of the “modern” exists as apart from the mechanisation of a segment of production that is required to maintain the quality or standardization of products, firms operating in low-wage regime find it cost-effective to maximize the use of cheap labour in other segments of production.

Due to the same cheap labour and huge reserve army, the lower segment of the supply chain, apart from the lead firms and the global auto component manufacturers in the first-tier, becomes the main source to produce more and more absolute surplus value with prolonged working hours, burden of overtime at a dismal wage rate and often precarious working condition to contribute to the value added in the production network. They absorb the main burden of cost cutting and pressure due to profit squeeze, from the upper segment constituting the lead firms and the component assemblers in the first-tier. This results in structural unevenness along the supply chain.

As the Gurgaon-Manesar automobile cluster developed over time, it developed strong backward linkages extending to informal slum production which has led to regional unevenness. The earlier industrial areas or workers’ *jhuggis* which emerged as the centre of industrial activities in the 1970s or 80s in Faridabad or Ghaziabad but later got overshadowed and eroded with the shifting of centre of industrial activity to Gurgaon or NOIDA, got gradually co-opted in the extended labour process of automobile production centered in Gurgaon cluster<sup>15</sup>. This provides a low wage labour-intensive regime with minimal bargaining power of workers for the outsourcing of hazardous or labour-intensive work from the Gurgaon cluster. Thus, the global destination of automobile production under Global Production Network (GPN) feeds on the backwardness of its periphery. Labour process of old and eroded industrial base is formally subsumed under the new capital.

### **Siphoning of Profit and Transfer of Crisis**

With the extension of production networks with deep backward linkages, it has been smoother for lead firms and global component manufacturers to siphon the profit and transfer its crisis into other segments of the production network with less bargaining power. Crisis can be internal or external to the production process for a firm. Internal crisis may arise due to strikes or increasing bargaining power of shop-floor workers leading to a profit squeeze or an erosion of hegemony or control of management over workers. External crisis may generate due to sudden change in demand in domestic or global market leading to

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<sup>15</sup> Faridabad Mazdoor Samachar, various issues

shortage of capacity or overcapacity, or due to a rise in oil prices or adverse change in interest rate, leading to a fall of profit margin.

For example, the Indian car industry experienced the global slump from October 2008 to March 2009. Companies sacked temporary workers and reduced capacities accordingly. But soon the industry faced an upswing of demand. Most automobile manufacturers found their capacities and supply-chains overstretched. The mechanism of ensuring profit margin and transfer of these crises exploits the combined and uneven development embedded in the production network. It may take various forms. Within the plants larger intensification of work takes place. In early-2010, coming out of the slowdown in car sales in 2008 and 2009, Maruti experienced a sudden jump in demand, a 30% rise year-on-year in bookings. What made the situation worse was that the company had not invested in manufacturing capacity during the slowdown. The longer wait period for Maruti's models meant rivals started cannibalising market share. That led to more frequent maintenance of machines, reprogramming robots that control the assembly line to squeeze out efficiency, and implementation of a flexible line besides the main assembly line that could produce multiple models. Production rose and it saved Maruti the cost of a new assembly line -- Rs 1,700 crore.<sup>16</sup> Its Manesar plant, with an installed capacity of 250,000 cars a year then, started making 350,000 cars. To ensure workers' participation, their incentives were aligned to production. But life on the shop floor took a turn for the worse. While production at its Gurgaon facility rose by 17%, Manesar was pushed harder, with a 40% jump.<sup>17</sup> This jump in production had its effect along the supply chain where the workers faced the ultimate burden of it. We will argue that this transfer of crisis on the workers and subsequent intensification and coercion in labour process made the ground for Maruti strike in Manesar plant from June, 2011, and labour unrest elsewhere.

Also, the increasing contractualisation of workforce and shifting the main burden of production on the contract workers or trainees, who have very low bargaining power due to job insecurity and lack of organisation or right to unionize, helps firms to weaken the bargaining power of the permanent workers and to co-opt them with more and more supervisory nature of works, resulting in deeper segmentation within the workforce. Contract workers have to face larger work intensity with increase in demand in the market or have to face layoffs when there is an under utilization of capacity, which is not so smooth to do for a permanent worker.

In time of crisis, to maintain a markup of profit, the lead firms often pressurize the vendor companies down the value chain to go for a cost-cutting and thus attempts to shift the burden of crisis. After the strike in Manesar plant and a subsequent fall of profit, also hit by adverse foreign exchange fluctuations and higher input costs, Maruti Suzuki India is looking at reducing its buying costs by three per cent every year to improve profit margins. They expect cost benefits from cuts in buying costs to be at least Rs 800 crore in 2012, more than the Rs 653 crore decline in net profit the company saw in strike-ridden year 2011-12.<sup>18</sup> It is additionally consolidating its supplier base to increase sourcing from a smaller and more stable base of tier-I vendors to bring down logistics costs. This puts pressure on the supplier companies and forces them to be 'disciplined' by reducing their cost of production. Also, to open a new plant and shift the major volume of production to a location where they can exploit lower bargaining power of workers, and can weaken the resistance of labour confined to the earlier location of unrest. During the Maruti Suzuki

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<sup>16</sup> Economic Times, 7 October, 2011

<sup>17</sup> Economic Times, 7 October, 2011

<sup>18</sup> Business Standard, 30 April, 2012

strike in 2011, the company management put pressure on the workers that the company would shift its production to Gujarat.

### **Issues of technology, skill, managerial control etc.**

A study of technological shifts going on in the automobile industry suggests that there are two important dimensions of the genesis of technological changes from the viewpoint of capital: firstly, a capital-capital (competition among capitalists) one, to improve quality or standardization of products to ensure larger market share; secondly, a capital-labour (class domination and control) one, to shift maximum workload to a category of workers that is as cheap and unorganized as possible. These changes redesign the organization of work and alter the labour process. Work redesigning contributes to technological changes too, and the workers' response generating from an altered labour process influences the trajectory of technological transformation. From this view technological change is not something entirely 'exogenous' to labour process. To take technology as 'given', where redesigning of work will take place only *after* the technological change has taken place, gives us a contingent and partial view of this change. One important dimension of technological change may be incremental and endogenous to the experience of concrete work, which comes from the tacit knowledge of labour process in the form of suggestions of quality circles of workers or otherwise. In 'Appendix 2' we have shown the amount of suggestions and the huge cost reduction due to these incremental changes in Maruti Suzuki plant in last few years. Another important dimension of the change is the larger application of advanced manufacturing technologies (AMT) that covers a broad spectrum of computer-controlled automated process technologies. AMT is an umbrella term used to describe a wide range of automation and related technologies, which have emerged during the past two decades as a consequence of developments in information technology. More specifically, AMT can be described as a group of computer-based technologies, including computer-aided design (CAD), computer numerical control (CNC) machines, direct numerical control (DNC) machines, robotics (RO), flexible manufacturing systems (FMS), automated storage and retrieval system (AS/RS), automated material handling systems (AMHS), office automation (OA) etc. to get the benefit of inventory savings, less floor space, reduced unit cost of production, an enhanced competitive advantage due to increased flexibility, improved product quality or quick response to customer demand (Dangayach et al, 2004).

But this 'automation' or mechanization is not a given 'black-box'; there are different components of this mechanization that have different consequences for labour. As Blackburn et al (1985) drawing from Bell (1972) show, the degree of mechanization can vary for three different processes of production, namely, *transformation* of materials into new products, *transfer* of materials from one part of production system to another and *control* of these two activities. Even in the Fordist era the mechanization of transformation process and transfer took place on a significant scale, but the use of microelectronics in the era of GNP has revolutionized the process of control, both on individual machines and in the co-ordination of other two processes. In fact it is worth emphasizing that the labour process at the current juncture is dramatically different from the Fordist mass production regime and is quite amenable to flexibilities<sup>19</sup> of

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<sup>19</sup>See Gartler (1988) for a study of flexibility in work, production, accumulation -- flexible machines (CNC machine tools that are capable of producing a variety of new products and that can be reprogrammed); flexible manufacturing system--computer integrated manufacturing (CIM) integrating design (CAD), manufacturing (CAM) or distribution; flexible specialization in terms of firms ability to respond to fluctuations in the market demand and adopt new product quickly; flexible accumulation (Harvey, 1987) where from an older Fordism based upon mass

various kinds. There is a major opinion that the lean production<sup>20</sup> as a generalized concept developing from Toyota Production System has brought together the best elements of craft production and mass production and has ushered in a new era of workers' autonomy and democracy on the shop floor in the modern automobile industry, which has been a cornerstone of work organization under GPN. However, such view needs to be modified. It is true that workers' larger participation in production process in the forms of quality circles or 'cells' are in the upper strata of production network, but it is only to that extent which helps company to appropriate the 'local' knowledge of production, which they do not otherwise have access to, for developing a better control over production process. And, to this extent only, they promote a partial integration of conceptual and executive labour process, for example, the linking of computer-aided design (CAD) with computer-aided manufacturing (CAM).

But as now managerial control becomes more sophisticated with significant changes in productive forces, lean production actually becomes a more intensified form of Taylorism. In lead firms or first tier MNCs, along with increased automation, teams of workers use their tacit knowledge of the labor process to streamline and intensify their work. Teams face peer pressure which result in self-policing, enforcing of production speed-up. These forms of 'workers' participation', in general, does not improve the quality of work life and does not create a worker friendly environment, rather it becomes a tool for increasing corporate control and work standardization. But even that kind of participation is also very rare, applicable for very few companies, and for a very small stratum of workers. For majority of workers, a lion's share of which is contract workers, coercion and subjugation rather than hegemonic control is the main expression of just-in-time production. There seems to be growing clash between the technocratic logic and the democratic logic. In Maruti Suzuki, "...if the assembly line halts, signboards across the shop floor light up – flashing the number of the workstation where the line has stopped and the duration of the stoppage. Another board displays the total time 'lost' during the shift; a scrolling ticker lists the production targets at a given time of the day, the actual cars produced and the variance. For every fault, the feedback is recorded and the worker has to sign against it, it goes into his record. Every Maruti worker must sign 'Standing Orders' that, among 100 other conditions, bar them from slowing down work, singing, gossiping, spreading rumors and making derogatory statements against the company and management"<sup>21</sup>. The work record is examined during yearly appraisals. Many times the social hierarchy is reproduced in the shop floor. 19th of November 2009 a labour unrest developed at Napino Auto and Electronics Ltd near Gurgaon<sup>22</sup>. It seemed like a trivial incident at the time as it was not something unusual-- a shop-floor manager punished a worker for a fault on the assembly line. The worker was asked to get on a table, hold his ears, squat, and then stand up again-a form of discipline across northern India and known as the "murga" (rooster). Again various religious-cultural forms are used to assure control. After the strike in Denso in 2010 or after the first phase of Maruti strike, management arranged an

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production of standardized goods made by highly unionized better-paid labour and rigid machinery to a new era of specialized production, flexible machines and flexibly deployed (increasingly non-unionized) labour.

<sup>20</sup>See Womack et al(1990)who introduced and elaboratedthe term in the book "The Machine That Changed The World"

<sup>21</sup> "Gone in 50 seconds", The Hindu, 6 November, 2011

<sup>22</sup> [www.gurgaonworkersnews.wordpress.com](http://www.gurgaonworkersnews.wordpress.com)

interactive session between spiritual management consultant 'Brahma Kumaris' to win back the heart of the workers<sup>23</sup>.

There are different views regarding the impact of new technology upon the skill of workers. Braverman's deskilling hypothesis assumes that the technical change exhibits a long-term trend in the direction of making skills unnecessary and crafts redundant. On the contrary, the other view is that the new technology is a means to liberate workers from drudgery by eliminating the repetitive and physically demanding elements of the job; the individual is free to pursue its more creative and fulfilling aspects. Skill enhances as the worker interacts with more sophisticated machinery.

We found in our survey the question of skill to be quite complex where it has to be understood with many-fold dimensions like craft-input, knowhow, experience, market value of skill, etc. There seems to be a general decline in terms of craft input in the labour process. The knowhow increases or decreases depending on the specific changes in the labour process in terms of technological shift or reorganization of production. Experience seems to be less and less important as it is now easily replaceable by suitable training. CNC machines are controlled by micro-processors and are programmed to carry out a detailed sequence of machinery operations and thus offering relatively narrow range of tasks for workers. The use of the CNC equipments moves the responsibility from the operator to the computer. The skills required to operate the new machines are minimal and could be learned by anyone in a matter of few days. With the evaporation of conventional skill, the possession of a devalued skill and the fear of inability to cope with the new technology create insecurity of job loss among the workers. Only a few workers are required as supervisors with the experience to identify a fault when it occurs in the process of production.

In this overall context the idea of social or technological 'upgrading' is itself problematic, as both these categories need to be grounded in a combined and uneven development of a process unfolding in a single factory production or in the entire industrial belt, or in a global dimension as well. Need for standardization of product and flexible practices force original equipment manufacturers (OEMs) to sophisticate their technology or to give a miniscule of workers better wage. But even that sophisticated technology can lead to a regressive labour regime and the wage increase can lead to wage deflation of a larger section of workers. So any change in that direction cannot be easily described as 'upgrading'. And more importantly, as this 'modern regime' feeds on a labour-intensive low-wage counterpart in the cluster, it imposes a constraint for better working condition or wage for labour, or a technological sophistication in this huge counterpart of production network.

## **Workers' Response: The Genealogy and Anatomy of Strike Waves**

This section examines the nature of workers' assertion vis-à-vis the changes taking place in the production process, which has time and again expressed itself in factory occupations, strikes, or other forms of labour unrest, locally or globally. Marxist understanding enables us to appreciate the active role of workers in the emerging dynamics of labour process and GPN. Complete subsumption of labour is never possible in the labour process. That is why Marx discusses labour power, not labour, as that which workers sell to capital. That explains capital as a "material condition of labour confronting the labourer as

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<sup>23</sup> Economic Times, 17 October, 2011

power that has acquired an independent existence... as a definite social relationship'<sup>24</sup>. An important category is 'variable capital' to understand this dynamic (Nichols, 1980). It is 'variable' as the surplus value and thus the profit is not determined in some mechanical a-social way. Rather, it is affected by the duration of work where the worker's fight against the extension of work to resist squeeze of more absolute surplus value out of the labour process becomes important. Again, for most cases in the modern industry, it is affected by the intensity of labour in labour process, where the workers fight against, say, 'speed-up' can restrict extraction of relative surplus value.

In India, the major automobile clusters under GPN has been shaken with major incidents of labour unrest in last few years, be it the strike of Hyundai workers in Tamilnadu, of General Motors workers in Gujarat or of Maruti Suzuki workers in Haryana, reflecting the morbid symptoms of a crisis accumulating under the 'boom'. Particularly in Gurgaon-Manesar cluster, the automobile industry has seen waves of strikes in recent times. After the 89 day-long strike by the Maruti workers in Gurgaon in 2000 got crushed by the management, it was the spirited struggle of Honda workers in Manesar in 2005 and their success in forming workers' union that triggered a series of moments when labour went in offense against capital. Contract workers sporadically revolted against their dismal working condition and low wage in the entire belt, including Hero Honda factory occupation in April 2006, Honda HMSI wildcat strike in September 2006, and strike at Delphi in January 2007, unrest in Hero Honda Dharuhera plant in May 2008, another wildcat strike at Honda HMSI in December 2010 etc. Workers in Napino Auto (November 2009), Omax Auto (December 2009), Denso (February 2010), Sunbeam and Rico Auto (September 2009) or Maruti Suzuki, Manesar plant (in three phases from June 2011 to October 2011) went for sustained unrest or strikes demanding their right to unionize, better working condition or higher wages. The workers' upheaval in the entire belt shows some emerging new tendencies, which demand closer attention. We will try to explore these tendencies, putting a focus on the recent experience of Maruti Suzuki workers' strike in Manesar plant.

In our judgment, one important dimension of the new waves of workers' struggle in automobile industry under GPN is that these are deeply grounded in labour process, in the shop-floor work experience. Most of the cases the strikes or labour unrests do not put forward documented concrete 'economic' demands to negotiate with the management and then, if required, go for a strike with prior notice as the last resort of collective bargaining in the traditional trade union framework. Sometimes the demands are initially disarticulated as they are linked to different dimensions of working condition and aspiration for dignity and workplace democracy, and gradually take shape in course of struggle. Sometimes those are semi-articulated, and a plethora of demands get together representing a demand to form a union of workers, where the union symbolizes a united assertion of workers. In case of Maruti Suzuki, the workers went for a sudden occupation of factory on 4<sup>th</sup> June, 2011 demanding recognition of their own union. But the actual genesis of this strike can be traced back to the worsening of working condition, increased managerial and supervisory control and intensification of work to meet the post-2008 increased demand which we discussed earlier. Almost half of the wage of permanent workers was kept variable, explained as production incentive and attendance award, where one-day absence cost 25% of attendance award resulting a deduction of Rs 1200-1500, and three-day absence in a month cost entire of it. Some important points of contention were 7.5 minute tea-break, 30 minute lunch break and the speed of assembly line, all linked to the organization of work. After the partial success of first phase of strike, their sudden feeling of

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<sup>24</sup>Marx, Theories of Surplus Value, Part II

collective strength helped enlarge the workplace democracy, supervisors were friendlier, no one was harassed like before for a fault in assembly line, work intensity reduced. But as this situation cannot go on for long from management's perspective, the truce was soon broken, leaders were suspended and workers were asked to sign a 'good conduct bond' to enter the factory, and it led to the second phase of labour unrest. The basis of unity among the contract and permanent workers was also the shared experience of shop-floor labour process.

Another important dimension of these struggles is the use of strategies that goes beyond the traditional legal trade unionist framework of workers' struggle, and makes capital vulnerable in a new way. In Maruti Suzuki in first and third phase of struggle workers took the form of factory occupation so that it would not be possible for management to continue production by training new workforce. Workers went for go-slow in production. Workers of other factories like Suzuki Powertrain, Suzuki Casting, Suzuki Motorcycle went for sustained solidarity strike, 7 other companies like Satyam Auto, Bajaj Motor, Endurance, Hi-lex, Lumax etc went for one-day solidarity strike on 8 October 2011. All these are 'illegal' – occupation, go-slow, solidarity strike. But in a production network with strong interdependence of firms, these forms show disruptive capacity of workers against the strategy of capital.

But labour in the neo-liberal era in a GPN faces some serious constraints with the form of collective bargaining. The shift in work organization, new technology, increasing contractualisation and increased bargaining power of capital vis-à-vis labour due to mobility and shifting of production activity in GPN have undermined the effectiveness of trade unions which comprise of only permanent workers and act on factory level. When contract workers are majority and run the production, and there is a growing interdependence of firms on a regional and global basis, this becomes a serious constraint. Another problem is that technological shift in terms of adopting advanced manufacturing technology (AMT) has rarely been considered an area of workers' struggle in the traditional trade union framework. In many cases where permanent workers get production incentive any technological shift that enhances production is considered beneficial, and its impact on labour process is overlooked. But flexibility and redeployment is crucial to the successful implementation of AMT. So redeploying workers from one job to another, one line to another or one department to another is not considered as a part of collective bargaining and thus localized resistance of workers against redeployment or intensification of work due to new technology does not get properly articulated vis-à-vis the 'lack of discipline' accusation of management. Another problem is that the staffs, supervisors, lower and middle rank of management were historically outside of labour union, even antagonistic to it, and vice versa. But the reorganization of production on one side under this old job classification divide a section whose work is very close or same as the 'workmen', and on the other side creation of internal labour market and internal segmentation of workers by management sometimes separate skilled and experienced workers with the designation 'supervisor'.

To undermine the collective assertion of labour, capital has shown different strategies. One way is to crush the workers' movement and damage the confidence of workers and then go for the necessary restructuring of work, technology and production process without any significant resistance so that the previous objectivity of workers struggle gets changed and undermined. After the 3-month long workers' strike of 2000, Maruti Suzuki management could crush the resistance and terminate the main leadership. They then introduced a VRS scheme to reduce the workforce, increased the number of contract workers to undermine the strength of permanent workers, restructured production where contract workers would run the main work, and co-opted a section of workers and formed a separate union. But often capital is

forced to make a compromise with labour to avoid larger damage. Thus the struggles of Hero Honda workers in late 1980, Honda workers in 2005 or Maruti Suzuki workers in Manesar in 2011-12 could achieve their right to form union. Then capital has to accept some concession for labour. But, in gradual course, in Hero Honda, and partially in Honda, management was successful to contain the union representing the interest of only permanent workers who gain from increased productivity, whereas the main burden of production is on contract workers. If we study closely the post-strike events unfolding after the struggle in Maruti Suzuki in 2011, we see, management was forced to increase the tea-break from 7.5 minute to 15 minute, to decrease the speed of assembly line, to increase transport facility for workers, employ more workers so that now a worker gets a 'reliever' when s/he goes to the toilet. An average wage increase took place for ITI holder contract workers from 6,500 Rs to about 8,500 Rs per month. Now contract workers can take two holidays within three months - before the dispute it was only one holiday which also had to be approved by the supervisor - which hardly happened. The permanent workers can take 4 holidays within three months. But all these means capital to maintain its profit margin has to transfer the crisis elsewhere, and one option is across value chain. As part of this cost-cutting exercise, the company has initiated measures to step up localization levels and to pare the number of tier-I suppliers over the next two-three years. The measures taken together are expected to show cost benefits over the next two-three years. The company expects likely to save up to Rs 2,000 crore a year. It also decided to 'discipline' vendors by consolidating its supplier base to increase sourcing from a smaller and more stable base of tier-I vendors to bring down logistics costs. Apart from that, it restructured the plant-B that got operational during the strike in Manesar and by shifting those workers hired during the time of the lock-out to the B-plant and by introducing a different ratio between workers and machinery in the B-plant management created a new division. B-plant is more mechanized; unlike A-plant its weldshop is fully automated. To secure the supply side, Maruti Suzuki has made a deal with FIAT to obtain 100,000 engines per year and also decided a merger with Powertrain to ensure the supply of diesel engines<sup>25</sup>. Maruti adopted 40 ITI colleges in Gujrat<sup>26</sup>, to ease the supply of labour, when in need for it. By outsourcing work to companies such as Belsonica, FMI, Krishna Maruti, SKH Metal which operate on the Maruti premises, a formal division is created between workers in the same factory. More importantly, to strengthen the internal segmentation, management is trying to contain the union by assigning the permanent workers more of supervisory kind of work. But still it can be said that the union there has still now maintained strong bargaining power for the interest of the workers, including contract workers. The full significance of this interaction of capital's strategy, assertion of labour and technology is yet to be revealed.

In spite of all these constraints, labour unrest in firms under GPN is exposing an increasing vulnerability of this new regime of production. A strike at any point can result in ripple effects across the supply chain, upward or downward, with regional or even global disruptive effects. The 44 day-long Rico Auto workers' strike which saw the killing of a worker in a clash resulting in a one-day general strike in Gurgaon automobile cluster with the participation of almost one lakh workers in the belt, caused a halt in production in General Motors Plants for three days in US and Canada due to shortage of parts. Strike in Satyam Auto in 2012 in Haridwar disrupted production in Hero Honda plant in Gurgaon. Strike in Maruti Suzuki Manesar plant in 2011 stopped production of quite a few vendor companies and damaged production significantly along its supply chain. Strike in Suzuki Powertrain, which supplies engine to the

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<sup>25</sup>Economic Times, 19 January, 2012

<sup>26</sup> Mint, 1 July, 2012

assembly lines of Maruti Suzuki, brought Maruti Suzuki Gurgaon plant to halt last year. This shows that a labour unrest at any point in the GPN has potential consequence up or down the supply chain. During Maruti Suzuki workers' struggle, an embryonic form of plant-level workers' self-organization was unfolding that included workers of other plants of Suzuki and of few more companies, still, the question regarding the nature of organization and conscious strategy labour movement required in this new objectivity remains valid and open.

If we look at the important automobile clusters under GPN located in other developing countries, we will find similar kind of strike waves with many similar trends. In China, workers went for strike on May 17, 2010 at Nanhai Honda Lock's transmission factory in Foshan (south-eastern China) near Guangzhou and caused shut down all four of the Japanese car maker's factories on the mainland. This factory produces automatic and manual transmissions and parts of engines used by the four Honda assembly plants. This strike was followed by a wave of strikes in other car plants, Honda, and then Toyota. These struggles are one important dimension for the relocation of some auto production units from South-East to West China, another being the reserve army of labour with cheaper wage cost. Temporary workers at Hyundai plant in Ulsan, South Korea went for wildcat strike and occupation in November 2010. In Mexico, unrest developed at Honda plant in El Salto, Jalisco in December 2010. A transition from formal to real subsumption of labour under Capital, from appropriation of absolute surplus value to relative surplus value in labour process in the new assembly points and automobile clusters under GPN is giving birth to a young, militant, skilled workforce globally. As Beverly Silver (1993) argues for workers' agency to be a key element in the global restructuring of automobile industry, "... the world automobile industry has been characterized by a half-century-long trajectory of labor militancy and capital relocation during which automobile production (in its "Fordist" incarnation) together with a characteristic corresponding form of labor militancy, have spread across the globe. This trajectory has been propelled by three major waves of militancy among the world's autoworkers: (1) the CIO struggles of the 1930s, (2) the "resurgence of class conflict" in Western Europe in the late 1960s, and (3) the emergence of "new union movements" in Brazil, South Korea and South Africa in the 1980s. Each of these rounds of labor struggles have prompted managerial responses, including the restructuring of production and the relocation of capital. And each round of restructuring and relocation has undermined workers' bargaining power in the sites of disinvestment/restructuring at the same time that it has created and strengthened new working classes in the sites of new investment"<sup>27</sup>, it is an important question that how the workers' response will influence the contemporary operation of GPN and new regime of accumulation.

## **Concluding Remarks**

In the last few decades with the new regime of accumulation under neo-liberalism and with the ascendancy of GPN, the vulnerability of workers, as a global tendency, is clearly on the rise. With the trans-nationalization of production, along the same production chain workers of the global South are struggling against low-wage regime, against harsh working condition or for the right to unionize, whereas workers of the North are facing wage-cuts, job-cuts, and increasing casualisation of workforce. Marx's general law of accumulation: the tendency of the capitalist system to concentrate wealth while expanding

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<sup>27</sup> "1930-present: Labour unrest and the successive geographical restructuring of the world automobile industry", [www.libcom.org](http://www.libcom.org)

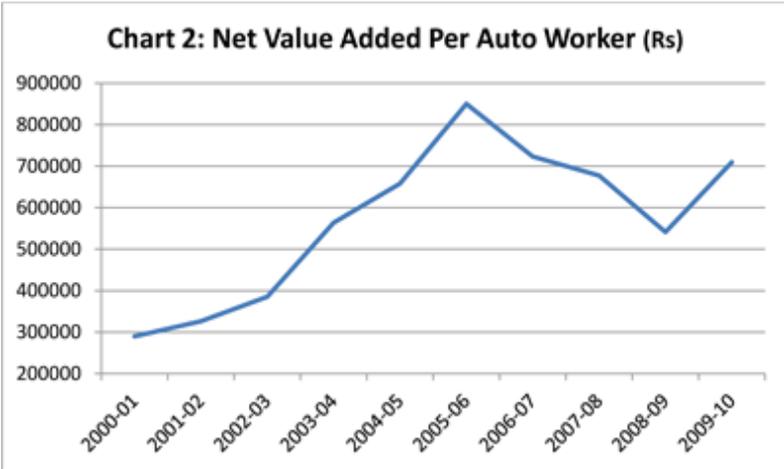
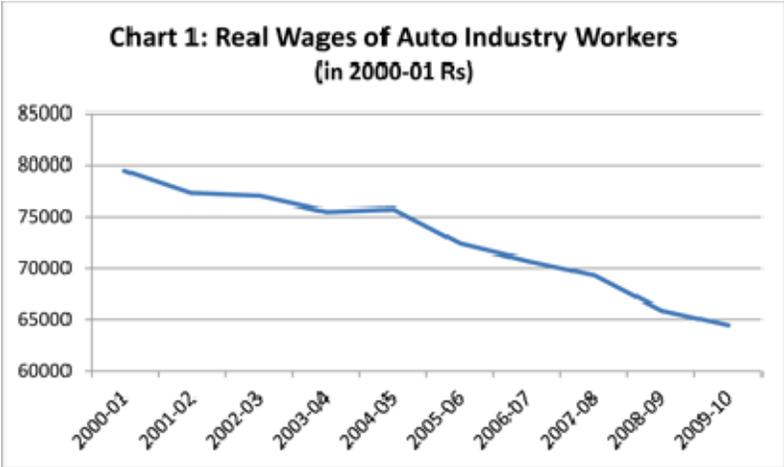
relative (or even absolute) poverty, seem to be more relevant in present times. The global worsening condition of labour under GPN has been captured quite well in the words of Prabhat Patnaik : “even as wages in the advanced countries fall, at the prevailing levels of labor productivity, labor productivity in third world countries moves up, at the prevailing level of wages, towards the level reached in the advanced countries. This is because the wage differences that still continue to exist induce a diffusion of activities from the former to the latter. *This double movement means that the share of wages in total world output decreases.*”<sup>28</sup> In the context of a prevailing economic crisis when capital faces difficulty to maintain its profit margin, it tries more and more to transfer the crisis on the working masses by undermining their collective bargaining strength and restructuring the labour process in its favour, with the assistance of neoliberal state and legislative reforms. It is this context when the dynamic between labour process and GPN becomes more important. In this paper, we tried to understand this dynamics in the context of a developing country like India. While analyzing the Gurgaon cluster, a representative location of the new spatiality of GPN operating in a capital-intensive, technology-intensive industry in a developing country, we see that the internal segmentation of labour force and the combined and uneven development of production process and technology in the cluster become instrumental for capital to expropriate larger profit and to transfer its crisis. This observation stands against the argument of a unilinear understanding of social or technical upgrading, and poses a need to understand these categories as embedded in the ‘unevenness’. We further observe that the promises that the new labour regime under lean production made, like the autonomy of workers and workplace democracy, enhancement of skill etc., does not deliver much, and managerial control operates as mainly a medium both to subjugate and hegemonize the working force, operating under the specific socio-cultural, institutional context of a developing country. The strike waves as active intervention on behalf of the workers in response to capital, consolidating a new tendency in working class movement emanating from the specific condition of labour process under the new regime of capital, seems to pose a potential threat to convert many parts of the supply chain into radical chains in GPN. But the question regarding the form and strategy of labour vis-à-vis multinational capital in GPN still remains an open question, which needs further attention.

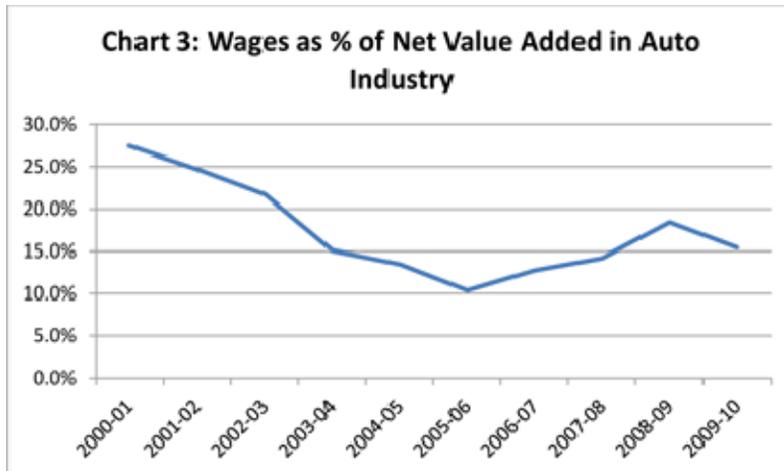
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<sup>28</sup>“Contemporary Imperialism and the World’s Labour Reserves,” *Social Scientist* 35, no. 5/6 (May-June 2007): 13.

**Appendix I**

*(This empirical evidence of worsening situation of workers in automobile industry has been taken from [www.rupe-india.org](http://www.rupe-india.org), no.52, June 2012)*





Source for Charts 1-3: Annual Survey of Industries.

The real wages in the auto sector fell continuously in the period 2000-01 to 2009-10. (The latest data available from the Annual Survey of Industries [ASI] are for 2009-10.) True, annual wages in the motor vehicles industry rose in nominal terms from Rs 79,446 in 2000-01 to Rs 88,671 in 2004-05 to Rs 109,575 in 2009-10. However, the Consumer Price Index for Industrial Workers (CPI-IW) consistently rose more steeply than wages. So real wages in the auto industry fell 18.9 per cent between 2000-01 and 2009-10. (See Chart 1) On the other hand, net value added per auto worker has been rising, barring a dip in the years of the slowdown in the economy. Each worker added value of Rs 2.9 lakh in 2000-01; this figure rose by 2009-10 to Rs 7.9 lakh (see Chart 2). Naturally, wages as a share of value added have been falling, as can be seen in Chart 3. In 2000-01 workers' wages were 27.4 per cent of value added. By 2009-10, the ratio had fallen to 15.4 per cent.

## Appendix 2

### Different indicators related to Sales, Profits and Employee Cost in Maruti Suzuki

year	Net Income (in million Rs)	Profit After Tax (PAT) (in million Rs)	Employee Cost (in million Rs)	% ratio of Employee Cost to PAT	% ratio of Employee Cost to Net Sale
2010-2011	375,224	22,886	7,036	30.74%	1.9%
2009-2010	301,198	24,976	5,456	21.84%	1.9%
2008-2009	214,538	12,187	4,711	38.66%	2.3%
2007-2008	188,238	17,308	3,562	20.58%	1.99%
2006-2007	152,523	15,620	2,884	18.46%	1.98%

Source: Annual Reports of Maruti Suzuki, 2006-07, 2007-08, 2008-09, 2009-10, 2010-11

### Trend of Workers' Suggestions and Cost Savings of Maruti Suzuki

Year	Suggestions	Cost Savings(in million Rs)
2010-2011	228,872	1572
2009-2010	128,893	2028
2008-2009	132,804	707
2007-2008	108,885	666
2006-2007	85,428	509

Source Annual Reports of Maruti Suzuki, 2006-07, 2007-08, 2008-09, 2009-10, 2010-11

Appendix 3

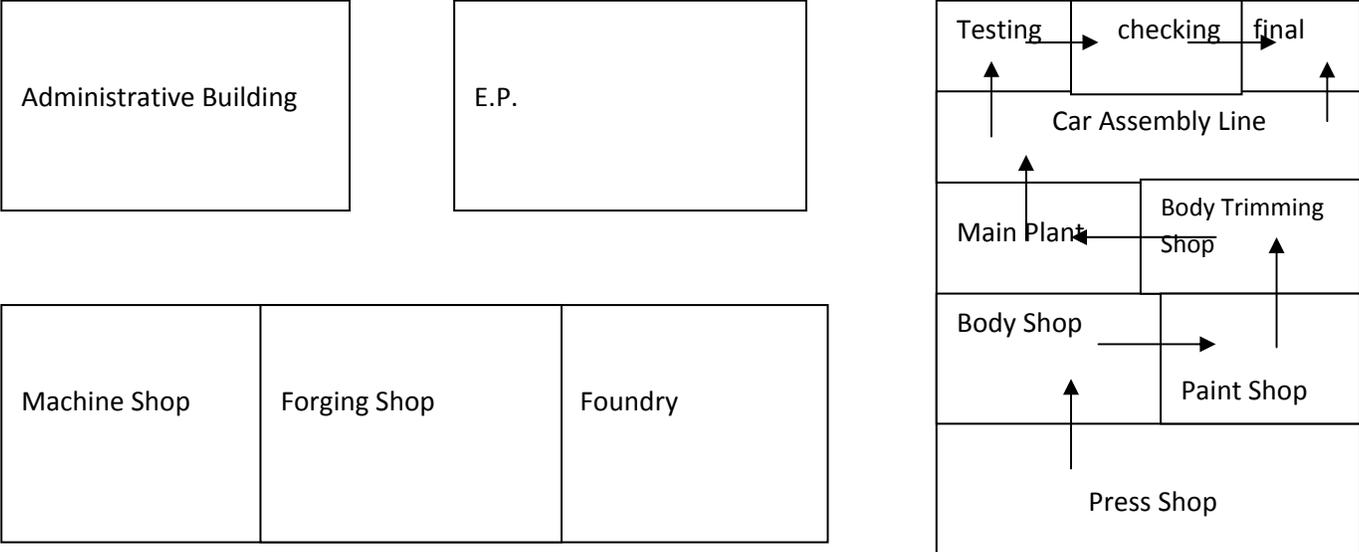


Diagram of production structure: Hindustan Motors, Uttara Para Plant, West Bengal (not according to the scale)

## Appendix 4

*This is a list of major automobile companies in Gurgaon region. In the bracket respective foreign investment and nature of products are mentioned. Deep penetration of multinational capital and joint ventures in different tiers of industry are evident.*

ASK Automotive (Italy) Gurgaon (brake shoes)  
Abishek Autos (Japan) Delhi (components)  
Air Liquid India (France) Delhi (exhaust systems)  
Aksh Optifibre Limited, Manesar  
Allied Nippon (Japan) Delhi (brakes)  
Alpha Toyo (Japan) Faridabad (handle bars, switches)  
Amtek (UK, Japan) Delhi , Manesar (connecting rods)  
Ample Auto, Gurgaon  
Ampress Sheet Metal (South Korea) Delhi (components)  
Anand Motors Products (USA) Delhi and Gurgaon (components)  
Anika Norma Automobiles (Estonia) Delhi (seat belt)  
Anand Nishikawa (Japan) Delhi, Gurgaon Udyog Vihar Phase 1 (rubber parts)  
Anand Gates India (USA) Delhi (coolant)  
Anu Autos Industries (France, South Korea) Gurgaon (locking systems)  
Asahi India (Japan) Delhi (safety glass)  
Aisin Seiki (Japan) Delhi (hinges, locks)  
Apollo Tyres Gurgaon  
Arvin Industries) Gurgaon (filter)  
Automotive Wiring Systems (Germany, Leonische Drahtwirke AG) Delhi (components)  
Automotive Acoustic Insulat (Germany, HP Chemie Peizer) Delhi (trim parts)  
Auto Tension (Germany, Stumpp und Schuele) Delhi (springs)  
Axo-Scintex Delhi (horns)  
Bajaj Peizer (Germany, Chemie Peizer) Noida (insulation)  
Benad Amtex (Japan) Delhi (fly wheel)  
Bharat Seats (Japan) Haryana (seats)  
BMW (Gurgaon, only HQ)  
Boramtek Delhi (components)  
Bosch Chassis Manesar  
Bosch (Germany) Gurgaon (pumps)  
BTR Wadco Automotives (Japan) Delhi (sealing systems)  
Bharat Steel Tubes (USA) Delhi (wheel rims)  
Brakwel Automotive Components (Japan) Noida (clutches)  
Britax Motherson (UK) Noida (rear mirrors)  
BRT Motherson (UK) Noida (moulded components)  
Brytax Auto Industries (Taiwan) Delhi (lights)  
Caparo Maruti (UK) Gurgaon (sheet metal)  
Claas Tracktors Faridabad  
Climax Overseas Manesar  
Clutch Auto (Italy, Automotive Products Italia spa) Delhi (clutches)  
Consolidate Radiators (Canada/USA) Delhi (radiators)  
Continental, Gurgaon  
D.I. Filter Systems (USA, Donaldson Company) Gurgaon (air filters)

Deadong Gurgaon (cables)  
Delphi Automotives (USA) Gurgaon (steering systems, wiring harness)  
Denso Haryana (Italy, Japan) Delhi (injections)  
Denso India (Japan) Delhi (starter motors)  
Deepak Industries (UK) Faridabad (steering gears)  
Donaldson Company Gurgaon (air filters)  
Eagle Picture) Faridabad (rubber hose)  
Echlin India (USA) Haryana (brakes)  
Eicher Faridabad  
Escorts Mahle (Germany) Delhi (pistons)  
Escorts Herion (Germany) Delhi (hydraulic cylinders)  
Execy Cheekay (Japan) Noida (clutch disk)  
FCC Rico (Japan) Gurgaon (clutch assembly)  
Ferodo (UK) Gurgaon (brakes)  
Fiem Sung San (South Korea) Delhi (lights)  
Fine Mobile Parts (Japan, Mitsubishi) Delhi (disk brake pads)  
Flash Transval (France) Delhi (spark plugs)  
Gateway Rail Freight Pvt. Ltd.  
Gabriel India Ltd. Gurgaon  
GKN Invel Transmissions (Germany) Delhi (front axle assembly)  
GT Exhaust India (UK) Delhi (exhaust systems)  
Gegarg Gears Delhi (gears)  
Gitanjali Enterprises (USA, Khanna Cars) Delhi (washing system)  
Goetz (Germany) Delhi (piston rings)  
Goodyear (Faridabad)  
Graziano Transmissions (Italy) Delhi (transmissions)  
Grobain Delhi (automotive glass)  
Gupta Machine Tools (South Korea, Li-Tech corp.) Faridabad (halogene lamps)  
Henkel Teroson (Germany) Gurgaon (anti-freezing coolant)  
Harig Crankshafts (Germany, Wilhelmus) Delhi (crankshafts)  
Highway Cycles Industries (Japan, Honda) Gurgaon (piston for engines)  
Hilton Roulunds (Denmark) Haryana (automotive belts)  
Haryana Sheet Glass LTD (UK, Pilikington) Haryana (automotive glass)  
Haryana DD Autos (Germany) Haryana (shafts)  
Haryana Deepey Autos (UK, Woodhead) Gurgaon (shock absorbers)  
Hongo Phawa (Japan) Noida (components)  
Hi-Tech Gears (Japan, USA, Gegarg Gears) Delhi (gears)  
Hella (Germany) Faridabad (lamps)  
Horizon Industrial Products (Germany, E.A. Storz) Delhi (sheet metal parts)  
Imperial Auto Industries (USA, Gates Rubber, UK, Eagle Picture) Faridabad (rubber hose)  
IST (Switzerland, Ronda) Delhi (precision parts)  
Ikeil Metals (South Korea) Delhi (aluminium diecastings)  
Jagan Litech Lamps (South Korea) Delhi (halogene lamps)  
Jaina Casts (Germany, Motometers) Faridabad (dash board instruments)  
Jay Bharat Maruti (Japan) Gurgaon (pipes)  
JBM Sung Hoo (South Korea) Delhi (components)  
JBM Group Gurgaon  
JMA Industries (Germany, Hella) Faridabad (lamps)  
Jay-Yusin (Japan) Gurgaon (door latch)  
Jay Industries (South Korea, Boramtek) Delhi (components)  
Johnson Matthey (UK) Gurgaon (catalysts)

Johnson Matthey Manesar

JNS Instruments (Japan) Gurgaon (instruments)

Kiekert Germany Faridabad (locking system)

Korin India (South Korea) Delhi (rear axle assembly)

Krishna Maruti (Japan) Gurgaon (seats)

Krishna Toyo (Japan) Gurgaon (rear mirrors)

Lakhani Rubber Works (Germany, Phoenix, Munderner Gummiwerke) Faridabad (fuel hoses)

Leonische Drahtwirke AG Delhi (components)

*Source: [www.gurgaonworkersnews.wordpress.com](http://www.gurgaonworkersnews.wordpress.com)*

## Appendix 5

### Working condition and labour process in some vendor companies of Maruti Suzuki

(adapted from [www.gurgaonworkersnews.wordpress.com](http://www.gurgaonworkersnews.wordpress.com) and different issues of Faridabad Mazdoor Samachar )

#### **Krishna Maruti** (Maruti Suzuki)

The factory is on the premises of the Maruti Suzuki factory in IMT Manesar – at gate number 4. In the moulding division 250 workers manufacture plastic fiber parts for the inner lining of Maruti Suzuki cars. They work on two 12 hours shifts. The overtime is paid at single rate, around 20 Rs per hour. All workers are hired through two different contractors, only the 25 – 30 people of the middle-management are permanent. Whether helper or operator, all are given the ‘unskilled’ grade. Those operators who work there since two or three years get 200 to 300 Rs more per month. If someone has full attendance s/he gets 350 Rs extra, if s/he takes a single day off they cut 350 Rs from his/her wages.

#### **Sanden Vikas** (Maruti Suzuki, Tata, Mahindra, Hindustan Motors, Honda)

(Plot 65, Sector 27 a, Faridabad)

Around 60 permanent and 400 workers hired through contractors are employed. They manufacture air conditioning systems for various automobile companies. Officially there are two shifts: from 6:30 am till 3 pm and from 3 pm till 11:30 pm. The workers hired through contractor work from 6:30 am till 7 pm and from 3 pm till 6:30 am. These workers are forced to work 8 to 12 hours on Sundays, as well. They work 200 hours overtime per month, paid single rate. Leaving 12 of their work-mates alone and suspended, the rest of the permanent workers entered the factory in February 2010, after a strike. They entered with the promise of labour officers and representatives of the management, that everyone will get their job back and that there won't be any sentiments of revenge. The management has actually taken eight workers back on, but an internal investigation has been started to decide about their future. Four workers have been sacked and remain outside.

#### **JV Auto**

(Plot 113, Sector 3, IMT Manesar)

On a single 12-hours shift 150 workers manufacture parts for Maruti Suzuki. The wages of the helpers and machine operators is 4,214 Rs. The overtime payment for the helpers is less than single rate, 17.50 Rs per hour. There are only 14-15 permanent workers, the rest are all casuals. There are 20 power presses. Accidents keep on happening; people cut their hands and are sent to the ESI. If their injuries are minor, e.g. if only one finger is injured, they are taken back on. If the injuries are more severe, they are kicked out.

#### **Track Components**

(Plot 21, Sector 7, IMT Manesar)

Only the staff (middle-management) is hired by the company directly, 700 workers are hired through three different contractors. There are two shifts, the day-shift is 10.5 hours the night-shift is between 11.5 and 13.5 hours. The overtime is paid less than single rate. From wages money for ESI and PF is deducted. Even after years of employment an ESI card is not given – they issued a blank card once, but they ceased to do even that. The statutory bonus for 2008 was paid in March 2010, and for people who have worked the whole year the bonus was only between 1,000 Rs and 3,500 Rs. After they increased the work load of the newly hired workers in the welding department they now ask the old workers to also increase their load. If someone asks for more money in return they say that s/he need not have to come back the next day. In the factory there are 42 power-presses. In order to increase production, the safety devices have been removed. With the safety guard in place you were able to churn out 2,000 pieces, after having removed it even 4,000 pieces. In order to keep production running the machines are not even switched off for the allotted time for maintenance. Due to the lack of safety, the lack of maintenance and the work

pressure a lot of cases happen where hands get cut.

**Kalpana Forging** (JCB, Maruti Suzuki, Mahindra, Hero Honda)

(Plot 35, Sector 6, Faridabad)

The factory runs every day, 24 hours. 400 workers manufacture parts on two 12-hours shifts. The operators work 150 to 225 hours overtime, paid at single rate. There are 200 helpers, for 30 days of 12-hours shifts they get 5,500 Rs. Only 100 to 125 workers get ESI or PF. One hand gets cut at the power presses every month. They don't fill in the accident report. They send the injured workers to private treatment and then sack them. There is no ambulance. There is no canteen. They give the workers one tea and one biscuit for a 12-hour shift, if they make them work longer than 12 hours they give you 25 Rs for food. The drinking water is bad. Managers swear a lot at the workers.

**Rajhans Industries** (Honda, Maruti Suzuki, Orient Pankha)

(NH-2, opposite Grain Warehouse)

In the two plants opposite the Grain Warehouse more than 400 workers are employed. In the machine shop two 12-hours shifts rotate, in the other departments there is only one 12-hours shift. There are more than 300 workers hired through contractors. The male and female helpers get 3,200 Rs, the press operators get 3,500 Rs. Overtime is paid at single rate. About 400 to 500 Rs is cut from wages for ESI and PF. If you leave before six months of employment they won't fill your PF document. There are a lot of accidents at the power presses.

**Gautam Packaging**

(354 Udyog Vihar Phase 4)

The factory runs on two shifts, they produce seat belts and power window parts for Maruti Suzuki. They pay skilled workers the minimum wage for unskilled workers.

**Haryana Enterprises**

(318 Udyog Vihar Phase 3)

The helpers get 3,000 Rs, neither ESI nor PF. The shifts are 12 hours each. Over-time rate is 10 Rs per hour. They produce parts for Maruti Suzuki here. People cut their hands on the power presses on a regular basis – they tell to get private treatment and then sack the worker.

**Logwell Forge**

(116 Udyog Vihar Phase 1)

48 workers work in this factory since fourteen years. In August 2009 all of a sudden the company changed permanent contracts into temp work contracts – through a contractor. On top of that 26 were sacked. They did not even give the gratuity payment. Now the remaining 22 workers have to do the work of 48 workers. They manufacture parts for Maruti Suzuki. In total there are 400 workers hired through contractor in this factory. The 74 Rs of Dearness Allowance were not paid since July 2009. They work on two 12 hours shifts. Over-time is paid at single rate instead of double rate.

**Neolite**

(396 Udyog Vihar Phase 3)

They work from 9am till 9pm, manufacturing light-systems for Maruti Suzuki, Eicher and Tata vehicles. They used to be paid 16 Rs per hour, since July 2009 this has been reduced to 15.40 Rs. Over-time is also paid at this rate. They have to work on Sundays, too. If a worker takes a day off, management kicks him out. When company hires, they have to work a day without being paid. On one line 40 workers are employed, but there is only one fan. The heat causes a lot of distress. There is a cooler, but it does not work. If you tell them they say that the cooler stirs up dust.

## Reference

- Bagchi, A. K. (ed.) 1995. *New technology and the workers' response: Microelectronics, labour and society*. Sage Publication
- Bhargava, R. C. with Seetha. 2010. *The Maruti story: how a public sector company put India on wheel*. Collins Business
- Blackburn, P., Coombs, R., Green, K. 1985. Technology, economic growth and the labour process. *St. Martin's Press*
- Braverman, Harry. 1974. *Labour and monopoly capital*. Monthly Review Press
- Burawoy, Michael. 1979. *Manufacturing Consent: Changes in the labour process under monopoly capitalism*. Chicago Press.
- Dangayach, S. G., Deshmukh, G. S. 2004. *Advanced manufacturing technologies: Evidences from Indian automobile companies*. Inderscience Publishers, p.426-433
- D'Costa, A. P. 1995. *The restructuring of Indian automobile industry: Indian state and Japanese capital*. World Development, Vol. 23, No. 3, p. 485-502
- Foster, J. B., McChesney, R. W., Jonna, R. J. 2011. The global reserve army of labour and the new imperialism. *Monthly Review, Vol. 63, Issue 06*
- Gartler, M. S. 1988. The limits to flexibility: comments on the post-Fordist vision of production and its geography. *Transactions of the Institute of British Geographers, New Series, Vol. 13, No. 4, p. 419-432*
- Gereffi, G., Humphrey, J., Kapilinsky, R., Sturgeon, T. 2001. Globalization, value chains and development. *IDS Bulletin 32.3*
- Harvey, David. 2010. *A brief history of neoliberalism*. Cornerstone Publication
- Humphrey, J. 2003. Globalization and the supply chain: The auto industry in Brazil and India. *Global Networks, 3,2(2003), p.121-141*
- Marglin, Stephen. What do bosses do? *The Review of Radical Political Economics, Vol. 6, No. 2, Summer 1974*
- Marx, Karl. 1967. *Capital, Vol 1*. International Publishers
- Nichols, Theo. 1980. *Capital and labour: Studies in the capitalist labour process*. Atholone Press.
- Thompson, P. 2010. The capitalist labour process: Concepts and connections. *Capital & Class, 2010, 34: 7.*

- Womack, J. P., Jones, D. T., Roos, D. 2007. *The Machine that changed the world*. Simon and Schuster