

## Chapter 6

### THE UNIQUE TRAJECTORY OF MITSUBISHI MOTORS

In Freyssenet M., Mair A., Shimizu K., Volpato G. (eds), *One Best Way? Trajectories and Industrial Models of the World's Automobile Producers*, New York, Oxford, Oxford University Press, 1998, 476 p.

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The Mitsubishi Motors Corporation (MMC) is a member of the Mitsubishi group (formerly zaibatsu), so most of the company's investments have been financially supported by members of the group. However, this means that interest payments have sometimes weighed heavily on MMC's profitability. MMC produces all types of vehicles: passenger cars, commercial vehicles and industrial vehicles as well as minicars. The company's diversity saved MMC when it ran into difficulties during the transition to mass production of passenger cars. From the latter half of the 1980s, MMC pursued a balanced course of development having at last discovered how to combine technological and commercial innovation in the design of its products so as to meet market demands.

#### 6.1. MMC PRIOR TO THE FIRST OIL CRISIS

Mitsubishi Heavy Industries (MHI) had begun building automobiles in 1918, when it made 21 units adapted from Fiat's Tipo model. The zaibatsu's companies produced tanks, battleships, bombers and fighters during World War II. These facts accounted for the dismantling of the Mitsubishi zaibatsu following Japan's defeat, with MHI being divided into three companies, each sited in a different region. Two of the companies focused on the automotive industry. Mitsubishi Nippon Heavy Industries, sited in the East, produced trucks and buses under the marque Fuso, while New Mitsubishi Heavy Industries (NMHI), sited in the central region, produced scooters, three-wheelers, automobiles, Willis Jeeps, and commercial vehicles in its two factories at Nagoya and Mizushima, and Mitsubishi engines at its Kyoto factory. In 1964 these three companies

merged to form the new Mitsubishi Heavy Industries, which adopted an organizational form of divisions based on product lines: naval, engineering, automotive, aeronautics and special vehicles.

In the late 1960s, MHI launched a minicar, Minica, the sales of which rose rapidly between 1964 and 1970. However, the first passenger car, the Colt, was not a success. Having learned from this failure, MHI designed a new model, the Colt Galant, with a new engine (Saturn) which met Japan's 1966 anti-pollution regulations. Launched in 1969, this model went into mass production, at 10,000 units per month. Yet at this point MHI remained principally a producer of mini cars and commercial vehicles.

During the late 1960s some producers sought to forge links or even to merge, as a means to resist equity participation by foreign companies now that the country's economy would be open to foreign capital. In 1968 MHI decided to merge with Isuzu, in the context of a merger of their respective banks, Mitsubishi Bank and Daiichi Bank. The failure of the bank merger in 1969 led MHI and Isuzu to abandon their own plans. Meanwhile, Chrysler was also proposing future cooperation with MHI. Besides seeking to make headway in the Japanese market, the American company also wanted to produce small automobiles with the aid of MHI. In 1969 the two companies decided to form a joint subsidiary, Mitsubishi Motors Corporation (MMC), and signed a distribution contract for MMC's products in the United States and other markets through Chrysler's sales networks. In the end Chrysler's participation was limited to 15 per cent of MMC's capital, a result of its own deteriorating finances caused by its European investments. Hence, MMC was founded as an American-Japanese joint venture with the capacity to produce 500,000 vehicles per year and 20,095 employees at three factories: the Kawasaki factory which specialized in the production of Fuso commercial vehicles, and the factories at Nagoya and Mizushima which produced passenger cars (Debonair and Colt Galant), commercial vehicles and minicars.

MMC's production areas had been converted from aeronautical to automotive use. In terms of production equipment, Mitsubishi turned to the most recent methods such as automated guided vehicles to transport vehicle bodies and a computerized system to

manage the assembly lines (ALC: assembly line control), installed in 1966. However, lack of space at the Nagoya plant, for example, made linkages between the different parts of the assembly line difficult and caused efficiency losses. Work was organized into two shifts: the day shift worked six days per week and the night shift five days. Workers were trained to be polyvalent, though rotation of work posts was not the rule. By the late 1960s, for example, employees worked on several machine-tools simultaneously in the mechanical components production area at Mizushima. There had been a kaizen system since 1954, though quality circles were not introduced until 1965. As was the case in other Japanese companies using the same methods, improvements only involved equipment that had already been installed, whereas responsibility for the design of larger scale technical innovations was assumed by engineers.

When the company was formed, MMC's union had been separated from that of MHI. Yet until 1979 the two unions cooperated in negotiations with MMC and MHI in order to obtain the same conditions of work. The crisis in the shipyards then made it difficult to pursue identical wage policies. While MMC's union sought to cooperate with management it retained a strong position in negotiations. As a consequence, the reduction of working hours was obtained more quickly here than at other automobile producers. Hence five day working week with an official 1,960 hours worked per year was adopted in 1973.

MHI had continued to make strong distinctions between blue-collar workers (paid by the day) and white-collar workers (monthly salary), even though this differentiation had been abolished in most companies as part of the democratization of industrial relations in the period immediately following World War II. Creation of the new MMC brought with it the elimination of this distinction; henceforth all employees had the same status. Instead they were organized into hierarchical functional groups: management, administration, engineering, staff, production, specialized tasks and medical staff. Within each function, employees were classified hierarchically, by levels which reflected their competencies and seniority; there were five levels for production workers, for instance, and two for supervisors.

The wage system was also revised. From 1971 monthly salaries (not including overtime pay) were comprised of a part that was the individual basic salary (Honkyu, HK), a part based on attendance (Kinmukyu, RA), a part based on skill or ability (Shokunokyu, RCQ) and various allowances. The annual salary increase took place in April at the time of the Shunto (Spring wage negotiations). Individual salary increases were based on two evaluations (the two satei): the satei for the employee's activities determined individual basic salary increases, attendance related pay and the annual bonus; the satei for ability determined ability-based pay and prospects for promotion. The satei therefore played a vital role in getting employees involved in their tasks: a common thread running through Japanese companies.

MMC differed from other companies in its training policies. From 1970, MMC has employed holders of secondary education diplomas as factory workers. They were trained internally for one year before assignment to a work post. MMC workers therefore possessed advanced technical skills, which was one source of the company's high productivity.

In 1970 MMC suppliers formed an association, 'Kashiwa Kai' composed of 227 companies supplying the passenger car division and 124 supplying the commercial vehicle division. Some of them had strong links to the Mizushima factory. In 1962 they had formed a producer cooperative in order to modernize their equipment, raise their level of technology, improve working conditions and recruit their work force collectively. In 1966, the cooperative was installed in an industrial park 'Sojya Danchi' built close to the Mizushima factory. The factory and the producer cooperative collaborated so closely at the technical level that former looked upon the latter as one of its own factory areas. By 1968, MHI was already requiring suppliers to control and guarantee the quality of the parts they supplied, so that the company itself would no longer have to control the quality of components received from its suppliers. To do this MHI periodically issued suppliers with certifications, following inspection of their work processes and after assisting them when necessary.

Mitsubishi Motors Sales (MMS) had 114 dealerships, organized into two networks: a network for passenger cars and minicars, and a network, Fuso, for trucks and buses. In 1966, these two networks were merged, but they were separated again two years later, an instability which reflected the commercial difficulties Mitsubishi was encountering. At its inception, MMC sought to establish close collaboration with MMS, by jointly deciding an annual programme and long-term strategy. Despite these efforts, sales of passenger cars remained lack-lustre. The Colt Galant, launched in 1969, was not really able to break into a market dominated by Nissan's Bluebird and Toyota's Corona. Even though new variants were introduced, sales of the Colt Galant/New Galant still did not improve. Nor was the Lancer, introduced in 1973, capable of competing with Nissan's Sunny and Toyota's Corolla. Moreover, the sales of the Minica declined steadily as demand for minicars was displaced into the cheaper passenger cars. While in 1972 MMC had a model for each major market segment - Debonaire (upmarket model), Colt Galant (mid-range), Lancer (mass market), and Minica (mini) - sales of its passenger cars (including minicars) remained stagnant until the first oil crisis (see Figure 6.1. and Statistical Appendix 6.).

Put here Fig. 6.1.

MMC's production system seemed to be a combination of Fordism, Japanese techniques for managing work, and more specific company traits (a higher technological level inherited from aeronautical production as well as a highly skilled workforce). Yet these co-existing elements did not result in a coherent and viable model. Inconsistencies between the elements of the MMC socio-productive configuration were reflected in a high degree of instability of top management. The growth of the company slowed in line with the progressive decline of the market for minicars. MMC was temporarily overtaken even by Honda, a late entrant into the automobile industry, in the market for passenger cars, as its market share remained below 6 per cent. The company's indebtedness, due to its poor capacity for self-financing (around 10 per cent), weighed heavily on its finances. Consequently, the rate of profit after taxes fluctuated around 0 per cent (see Figure 6.2.). The company's viability over the medium term depended in part on its ability to design a passenger car that could be sold in large numbers.

## 6.2. THE END OF A LONG TUNNEL, 1975-1994

It was after the first oil crisis that production of passenger cars took off at MMC, rising from 287,000 units in 1975 to 519,000 in 1978. MMC recorded the highest profits in its history and improved its financial position. Yet production dipped again between 1980 and 1986 because of a reduction in passenger car sales in the Japanese market, although (weak) profitability was maintained by increased sales of commercial vehicles and exports. After 1989, there was more balanced growth of sales of passenger cars, commercial vehicles and minicars, even though the Japanese economy was in deep recession after the bursting of the bubble economy. MMC became the number three producer in Japan.

Passenger car sales in Japan picked up again in 1975, after the first oil crisis, and then increased rapidly until 1979 due to the success of two new models. Other producers had difficulties in rapidly designing engines which accorded with anti-pollution norms and were energy efficient. From 1972, MMC had possessed an engine, the improved Saturn, which met the anti-pollution regulations established in 1973. Strengthened by this progress, by 1976 MMC had developed two new engines (G11B Orion and G32B Saturn) which met the 1978 norms. And yet sales of the New Galant and Lancer models continued to be poor because they did not really correspond with customer tastes despite being technically advanced and of high quality. The new Galant  $\Sigma/\Lambda$ , launched in 1976, and its new version, Eterna, marketed in 1978, did meet with success. Sales of the Galant actually outstripped those of Nissan's Bluebird. During the 1976-79 period 750,000 units were produced, making the Galant the first MMC car to be mass produced. The Galant and the Mirage (the company's first front-wheel drive model, launched in 1978) enabled MMC to increase its share of the passenger car market in Japan from 5.7 per cent to 8.6 per cent between 1975 and 1979. By the latter half of the 1970s, MMC had truly established itself in the passenger car market.

This improvement was also due to a strengthening of the sales network, increased production capacity, and modernization of the factories. By 1978 MMC had three networks: the Galant chain, the Car Plaza chain for the Mirage and the SPD (Single Point

Dealer) group in places where there had not been Galant chain sales points. A new factory with production capacity of 15,000 passenger cars per month was built at Okazaki. At this time it had the highest level of automation in Japan, with ten robots in the paint shop, 71 robots in the body shop (88 per cent automated), and automatic marriage of engine to body. The old factory at Oye was rebuilt in 1979 to install a new type of assembly line; sub-assembly lines were directly connected to the main assembly line, and operators followed the main line along by standing on a parallel conveyor belt (obviating the need to work while walking along). This all occurred more than ten years before Toyota adopted similar ideas. By 1978 MMC was using kanbans to order components, as an economical means to manage mixed production on the assembly lines. That same year the Mizushima factory began assembling the Lancer and Mirage models on the same assembly line (though welding lines continued to specialize in one model). With the construction of the engine factory in 1979 at Shiga, MMC became a flexible mass producer.

The size of the workforce remained remarkably stable despite the rapid growth of production. This was a response to the uncertainties which followed the first oil crisis, and was achieved through longer overtime, automation and rationalization of the production system.

And yet the early 1980s were very difficult years for MMC. Customers showed less and less interest in the Galant/Eterna and Mirage models. Their sales in the domestic market dwindled from 210,000 units in 1980 to 112,000 in 1986, thus cutting MMC's share of the passenger car market from 7.9 per cent down to 3.7 per cent. As far as the domestic automobile market was concerned, MMC was in crisis.

This reduction was largely compensated by export of passenger cars and the sales of mini commercial vehicles in the domestic market. Indeed exports grew to 77 per cent of passenger car production in 1986 (following a dip in sales in 1982 and 1983, a consequence of the crisis at Chrysler and the self-imposed limitation of exports to the United States). As a result, MMC's annual production averaged 1,000,000 vehicles during the early 1980s.

Yet MMC continued to face problems in designing passenger cars. Accordingly, the company reorganized its design activities in 1985. Teams were formed around each planned new model. Each was headed by a product manager and collaborated with both the design department and the experts in production cost management. To consolidate its financial structure, MMC merged with MMS and terminated its contract with Chrysler, giving 20 per cent of its capital to Chrysler in 1985, and placing its own shares on the Japanese stockmarket in 1988. The company could now attract funds from capital markets to improve its financial position.

MMC's sales in the Japanese market grew in parallel with the economic boom of the bubble economy period during the late 1980s, and continued to grow throughout the long recession which began in 1991. In 1994, MMC recorded the highest operating profits in its history, thanks to the success of its passenger car and commercial vehicle models.

At the lower end of the range, a new Mirage (1300-1800 cc) was introduced in 1987, and the Lancer, which used the same platform as the Mirage, was given its own platform in 1990. In the middle of the range, the new Galant introduced in 1988 was equipped with a double overhead camshaft (DOHC) engine, an active suspension, and four wheel drive. According to the MMC president, its radical shape truly distinguished the car from its competitors (the Bluebird and Corona). As with the lower end automobiles, the Eterna and Galant models no longer shared the same platform. With this differentiation strategy, the Galant/Eterna series proved very successful: a 'miracle which gave MMC the opportunity to take off again' (Mitsubishi Motors Corporation 1993, 303). At the top of the range, in 1990 MMC launched the Diamante/Sigma models, which also shared their platform. The luxury market was being stimulated at this point by a change in the system of taxation (replacing the tax on vehicles, 23 per cent of sales price, by a 6 per cent consumption tax), and by a reduction of 27.7 per cent in voluntary automobile insurance payments. The 2,500 cc version of the Diamante/Sigma series sold particularly well. Of models categorized as commercial vehicles, the Pajero, launched in 1982, replaced in 1991 and which permitted the driver to select either two wheel drive or four wheel drive, and the Delica, a 'box car' equipped with a four wheel drive system in 1981,

were introduced into the niche 'recreational vehicle' (RV) market which was to develop rapidly during the 1990s.

MMC's excellent performance was the result of a successful marriage between advanced technology and innovative model designs. MMC was responsible for creating the market for RVs and automobiles with 2,500 cc engines. MMC also pursued the flexibilisation and automation of its production system. The new body plants installed between 1990 and 1992 were able to weld several different bodies: at the Oye factory the Diamant/Sigma models, at Mizushima the Mirage/Lancer, and at Okazaki the Galant/Eterna. The Mirage/Lancer line, entirely automated with 321 robots, was capable of welding ten different bodies. The automation of assembly has started in 1982 for the installation of seats, windows and tyres. In 1988, MMC began the automation of the trim line, where by 1995 32 of 107 tasks had been automated: installation of tyres, headlights, windscreen wipers, gear lever, and so on. To facilitate assembly work, components containers which move along parallel to the assembly line were used from 1980. Doors-off assembly began in 1988. The automation of an operation generally took place after possibilities for improving existing arrangements had been exhausted. MMC itself manufactured most of the robots and equipment used in its factories. The priority given to automation was justified by a desire to eliminate tedious and dirty tasks while at the same time increasing productivity.

In the factories, workers were organized into groups of 20-40 employees with a group leader (ko-shi). The group was divided into two teams, each of which was led by an under-group leader (fuku-ko-shi), and it worked in two shifts. The teams worked alternate days (08:10-17:00) and nights (21:15-06:30) with an hour and a half of overtime per team. Task rotation within teams was introduced in 1986 to make employees polyvalent and reduce fatigue. At the Mizushima factory workers rotated posts every two or four hours. There were also kaizen groups composed of ten members which made minor improvements but which could work on the assembly line if production had to be increased.

Seventy per cent of parts were delivered by suppliers. The kanban system was no

longer used except in the body parts stamping department, although the company abided by some of the principles of just-in-time: reducing production costs by reducing stocks, smoothing of production, supply of small and frequent batches. The weekly production plan was established by the head office in Tokyo. Upon receipt of the production plan, the factory ordered parts from suppliers and started the production process, making minor adjustments in the last two days. The parts were then delivered directly and regularly to work posts, or to a warehouse where workers converted them into small batches to be taken to the work posts. Quality was not controlled at this point, having previously been checked by the suppliers.

By the end of the 1980s, social tensions had begun to appear. Strict control over growth of the workforce reduced opportunities for promotion. The average age of employees rose from 30.8 to 38.0 years between 1970 and 1989, yet the number of supervisory and management positions had not increased. Many candidates for these posts were unable to attain them, often remaining at 'level five' for workers (just under fuku-ko-shi) and 'level one' (huku-ko-shi) for supervisors. The lack of opportunities for promotion reduced the motivation of employees. To deal with this problem, in 1991 MMC established a new hierarchical organization which separated 'rank' from hierarchical position (see Figure 6.3.). 'Rank' depended upon an employee's competency and experience, whereas hierarchical position remained related to posts available. These two classification systems operated separately, in parallel.

Put here Fig. 6.3.

The new organizational form was accompanied by a change in the wage system. The new system included the basic salary (BS), 'rank' related pay (RRP), pay related to hierarchical position and individual activities (FAP) and allowances (A). The standard salary was made up of BS (45 per cent) + RRP (20 per cent) + FAP (30 per cent) + A (5 per cent). The BS, considered to be a salary based on seniority, increased in line with increases in the cost of living (calculated by age), as well as by 'rank'. The rise in SB was therefore cumulative. The RRP was fixed according to 'rank'. The FAP added together a payment by hierarchical position and a non-cumulative increase determined by the

evaluation (satei) of the employee's activities, undertaken annually. In this system employees of the same 'rank' and age received the same BS and RRP, and the element influenced by the satei was only one part of the FAP. If they worked better and received an improved evaluation, it was therefore possible for employees to make up for any handicap the following year. The new wage system was deemed more transparent and equitable while at the same time preserving individual incentives. Above all, it permitted wage increases through increased rank even if hierarchical posts were all filled.

It could be said that by the end of the 1980s MMC had adopted a coherent and viable production system. However, its financial structure remained fragile, and its rate of self-financing remained low, still under 30 per cent, even after its shares were placed on the stockmarket. Even though operating profits for 1994 were the highest in the company's history, the net rate of profit was only 0.7 per cent; financial structure continued to be the company's Achilles' heel.

### **6.3. TOWARDS GLOBALIZATION**

Despite this weakness, financially aided by the trading firm Mitsubishi Shoji, and with the support of Chrysler in distribution, MMC developed a strategy of internationalization, followed by globalization. Chrysler's sales networks permitted MMC to increase its exports, especially to the United States, during the 1970s. The crisis at Chrysler at the end of the 1970s had held exports back, but also gave MMC the opportunity to create its own distribution networks in markets heretofore dominated by Chrysler. In the United States MMC founded a sales company, Mitsubishi Motor Sales of America, in 1981, and went on to do the same in Europe following Chrysler's withdrawal from that market. Europe became MMC's best market overseas, with 224,600 vehicles sold in 1991.

In terms of the globalization of manufacturing there were three types of production unit. The first was joint venture subsidiaries already formed by MHI and local capital, in South East Asia and Portugal. The second was companies whose control had passed from Chrysler or joint ventures to MMC: MMAL in Australia, CARCO in the Philippines and

DSM (Diamond Star Motors) in the United States. The third type consisted of companies in which MMC participated at the request of a national government or local company, such as Proton in Malaysia and Nedcar in the Netherlands. Of these various ventures, the manufacturing plants that could be viewed as true MMC transplants were Proton, DSM and Nedcar.

MHI had exported automobiles and assembled them in Malaysia since 1958. In 1981, the Malay government launched a national project for automobile production. Proton was formed by Heavy Industries Corporation of Malaysia (70 per cent), Mitsubishi Shoji (15 per cent) and MMC (15 per cent). MMC was responsible for building the factory. Before installation, the functioning of all equipment was first verified by MMC at its Mizushima factory, and 322 Proton employees were trained there between 1983 and 1986. Proton proceeded to launch its first national car, the SAGA, with 70 per cent local content. In 1988 the Malaysian government decided to hand over the company's management to MMC because of its deteriorating financial situation. With reductions in production costs, easing of financial costs and modification of product prices, Proton was revived. In 1989 Proton began exporting Sagas to the United Kingdom, and its output now increased steadily.

In 1985, Chrysler and MMC founded DSM in the United States, to supply automobiles to both Chrysler and MMSA. MMC planned the production equipment for the DSM factory at its Okazaki factory. The factory was highly automated with 477 robots; the body shop was more than 90 per cent automated, while assembly was about 20 per cent automated, with 116 robots. The factory was managed by an ALC system with 100 terminals. All section head posts, except for that of accountant, were occupied by MMC employees sent from Japan. One hundred and seventy American employees, the majority of whom had no experience working in the automobile industry, had been sent to the Oye factory for training, particularly in equipment maintenance. In 1988 the DSM factory began production of two models on the same platform, MMC's Eclipse and Chrysler's Plymouth Laser/Eagle Talon. In 1990 the plant began production of the MMC Mirage model. While DSM was itself successful, Chrysler's own crisis led it to sell all its

shares to MMC, so that DSM became a full subsidiary of MMC in 1991.

As far as Europe was concerned, MMC signed an agreement in 1990 with Volvo and the Dutch government to manage the existing Nedcar company; MMC contributed to the capital and assumed management of the company. The new equipment for the factory had been developed at the Mizushima (assembly) factory and the Kyoto (engine) factory to be installed in 1994. Dutch employees were sent to both these factories to learn about the equipment, while a further 600 employees received on the spot training in Japan. Nedcar produced cars for both Volvo and MMC, becoming the first Japanese automobile transplant on the continent of Western Europe (Dankbaar 1995).

Among the problems faced at the MMC transplants were the training of maintenance staff and the implementation of team work. In fact, MMC particularly needed workers trained to maintain automated equipment, with the high priority it gave to automation, whereas other Japanese producers prioritized the training of team leaders and supervisors so that they could develop teamwork and kaizen activities. DSM adopted the same form of organization as used by MMC, although the former had a formal distinction between direct workers who were unionized and paid by the hour, and salaried, non-unionized workers who were paid by the month (Suzuki 1991). Teamwork at Nedcar was a hybridization of the Scandinavian tradition (socio-technical design) and MMC organization (Dankbaar 1995). Whatever form was taken, MMC sought to use team work to improve quality, productivity, safety and motivation. Moreover, it sought cooperative relations, without conflict, with trade unions. At DSM, the United Auto Workers union accepted, as it had at the General Motors-Toyota joint venture NUMMI in 1984, a reduction in the number of blue-collar categories to three, rotation of work posts, kaizen, teamwork, not to mention increased productivity and improved quality, in exchange for job security. The UAW also accepted to resolve problems through discussions between management and union without the need to resort to strikes (Suzuki 1991; Abo et al 1991).

As well as exports and overseas production, MMC's international activities included collaboration with Korean automobile maker Hyundai and German automobile maker

Mercedes-Benz. Collaboration with Hyundai began with technical assistance for the design of the Pony in 1973. MMC and Mitsubishi Shoji took 5 per cent of the Korean company's capital in 1982, rising to 6.3 per cent in 1991. In contrast, collaboration with Mercedes-Benz did not proceed far, although MMC sold the German manufacturer's products in Japan.

By 1991, annual production at MMC's overseas manufacturing units exceeded 500,000 vehicles, equivalent to one third of MMC's production in Japan (or one quarter of worldwide production). Furthermore, these units too began to export their products: MMAL in Australia to New Zealand and Japan, MSC in Thailand to Canada, Proton to New Zealand and the United Kingdom, DSM to Japan. The mutual supply of components, known as BBC (brand to brand complementation) was being developed among facilities in the ASEAN countries. Starting with three countries, this international division of labour progressed to involve nine countries, including Japan and Korea (Hyundai) during the first half of the 1990s. MMC thus seemed to be moving towards developing a network of manufacturing units world-wide in order to realise economies of scale at the global level.

#### **6.4. CONCLUSION: THE INSTABILITY OF THE MITSUBISHI PRODUCTION SYSTEM**

Mitsubishi's production system was purported to be 'lean' like that of other Japanese producers. Yet it differed from Toyota's system on a number of vital points. Firstly, there was the company's strategy, which after numerous trials and errors succeeded in making MMC a successful automotive producer in a country where there were already several producers, focusing on niches such as minicars, minivans, four wheel drive and recreational vehicles, and by designing technically advanced products. A further differentiating feature was the significance of automation in increasing productivity. Kaizen activities were not organized as systematically as Toyota and there was no link between salary and increased productivity at the team or factory level. Other than through job security, the involvement of workers was achieved through emphasis on technical

skills in training and promotion, and on individual evaluation. The flexibility of production, particularly necessary with a range of highly differentiated vehicles and with variable sales, was obtained by turning to flexible automation and through the polyvalency of a workforce which changed posts systematically every two or four hours, through a system of two shifts per day, which permitted each shift to work one and a half hours of overtime per day when necessary. The kanban method was not used. Production was planned on a weekly basis for both MMC factories and suppliers. Lastly, MMC adopted a strategy of internationalization through collaboration and transplantation to support the position it gradually and with some difficulty secured in the Japanese market.

Neither Fordist, nor Toyotaist, MMC's production system resembles instead the 'innovation-flexibility' model (Boyer and Freyssenet 1995), which reduces the risks of a strategy focusing on technical and commercial innovation by means of greater flexibility in production and a low breakeven point. Yet even though the growth of MMC accelerated during the 1990s, the company continued to suffer from poor profitability. Automation involved burdens on its capital, and the company's low rate of self-financing left it with high debt repayments. Hence by the mid 1990s MMC was seeking to reduce the length of time required to design new models to twenty months, to import components from countries where production costs were lower, and to have complete sub-assemblies manufactured by suppliers. These measures were all the more necessary as Mitsubishi faced increased competition from other producers in the recreational vehicle segment. The company had also announced, in 1996, that it would be cutting its workforce by 2,000 employees over the next few years. Nevertheless, the company has not abandoned its goal of a 5 per cent share of the global market by 'globalizing' its production.

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