

# The auto industry in the U.S. and Japan: What makes the difference?

by Anthony K. Wikrent

Japan is labeled “unfair,” because it has not accepted the arrogance of the Harvard Business School approach. Because the human individual is more highly valued than a usurious financial system, Japan’s auto industry has been able to introduce new technologies faster than has the U.S. auto industry. The result is that the Japanese are now about five years ahead of the United States in both car design and manufacturing technology. Naturally, the Japanese can build a better car faster and cheaper than the U.S. Big Three—General Motors, Ford, and Chrysler.

The first striking difference between the auto industries in the two countries, is that pay and social scales have not crystalized into such a huge class barrier in Japan. Chief executives at Japanese auto companies receive only \$350,000-450,000 a year, including bonuses, about 10 times more than the \$49,000 average pay of their factory workers. The chief executives at the U.S. Big Three make as much as \$2 million a year, including bonuses and stock options, 50 times as much as the average U.S. auto worker. Even at the Japanese transplants, such as the Toyota assembly plant in Georgetown, Kentucky, there is no executive parking area or executive dining room. None of the executives, including the president, has his or her own office (James Risen, “Japanese Workers Go Extra Mile to Ensure Cars’ Quality,” *Los Angeles Times*, Jan. 19, 1990).

Since they prize dedication, loyalty, and training, the Japanese are loathe to lay off workers, unlike American companies, which generally implement worker layoffs at the first sign of a downturn. Sam Heltman, who left his position as vice president for human resources with a Ford/New Holland farm equipment plant to assume the same job at the Georgetown, Kentucky Toyota plant, told *Washington Times* reporter Marsha Mercer on Feb. 10, “Ford talked a lot about people being their most important resource, but when hard times came along, the first thing I was required to do was write a plan to lay off people. Here, layoffs would be the last step, not the first as at Ford.”

It is this value placed on the individual worker, which has allowed the Japanese auto makers to emerge as world leaders. While the U.S. work ethic has been smothered under the tidal wave of the rock-sex-drugs counterculture, the Japanese companies have inculcated in their workers what American managers and academics have chosen to call “an obsessive attention to detail.” As a result, the “fit and finish” of

Japanese cars is simply better than that of American cars. Japanese cars built in the United States are reported to be of the same quality as those made in Japan.

If the Japanese auto makers have an “unfair” advantage, it must be that their work ethic allows them to include assembly line workers in the design teams at the very beginning of the design and development of a new product. The insight and expertise of the assembly line workers has resulted in designs with remarkable ease of production and assembly. “If our designers worked alone, they wouldn’t have that input and know about the needs of manufacturing,” Katsuyoshi Yamada, Toyota’s general manager for quality control, told the Jan. 22 *Los Angeles Times*.

## The case of GM

The experience of General Motors, when it attempted to emulate the quality of the Japanese auto makers, is instructive. Around 1985, GM selected the Buick LeSabre as the car it would build with quality comparable to the standard being set by Japanese-built cars. The experiment succeeded: The 1989 LeSabre was rated the second best-built car, after the Nissan Maxima, by J. D. Powers and Associates. But the problems it ran into are indicative of what afflicts all of U.S. industry.

After completely redesigning the LeSabre, GM gutted a 75-year-old assembly plant in Flint, Michigan, and crammed it full of the most advanced robotic assembly machinery available. The first LeSabres turned out in 1985 were some of the worst cars GM produced that year. GM brought in J. T. Battenberg—then with GM/Europe and hence intimately familiar with the pressing demand for quality output—to turn the Flint operation around. Among other changes, Battenberg reversed GM’s practice of repairing defective materials shipped to the plant, and returned them to their suppliers instead. To stress his commitment to quality, Battenberg had production suspended and the workers sent home when quality lagged. GM’s machinery suppliers were ordered into the plant to correct dysfunctional equipment they had sold GM.

When many of the robots could not be made to operate properly, Battenberg ordered them ripped out. Manual labor was reinstated. “That plant had been over-engineered,” Battenberg told the Jan. 23 *Los Angeles Times*. “There were too many robots and too much automation. There were just too many variables in a brand-new plant, so we tried to minimize the variables by taking out automation.”

Contrast this to the view of Toshiharu Nishizawa, the deputy general manager of Toyota's Tahara plant, which builds Toyota's new luxury car, the Lexus: "Traditionally, the basic purpose of automation was to reduce the number of workers involved. In this case, we wanted to replace the skills and hunches of workers with the precision of machines that will not vary the quality of the work. It is a balance. You want to replace rote skills with machinery, and train your people to do the more specialized work that a robot can't do" (David E. Sanger, "Japan's Luxury-Car Gains Pose New Threats to Rivals," *New York Times*, Jan. 3, 1990). In Japan, assembly line workers who lose their jobs to automation are trained as engineers or technicians.

GM says that the LeSabre now has 77% fewer defects than in 1986, and warranty costs have dropped 59%. But analysts question whether GM can continue to produce the LeSabre with such high quality. Two other GM cars based on the same design, the Pontiac Bonneville and the Oldsmobile Delta 88, continue to be of much lower quality, suggesting that the quality is not inherent in the design. As an analyst at J.D. Powers pointed out, if the quality of the LeSabre is the result of sheer determination on the assembly line, it will be difficult to sustain.

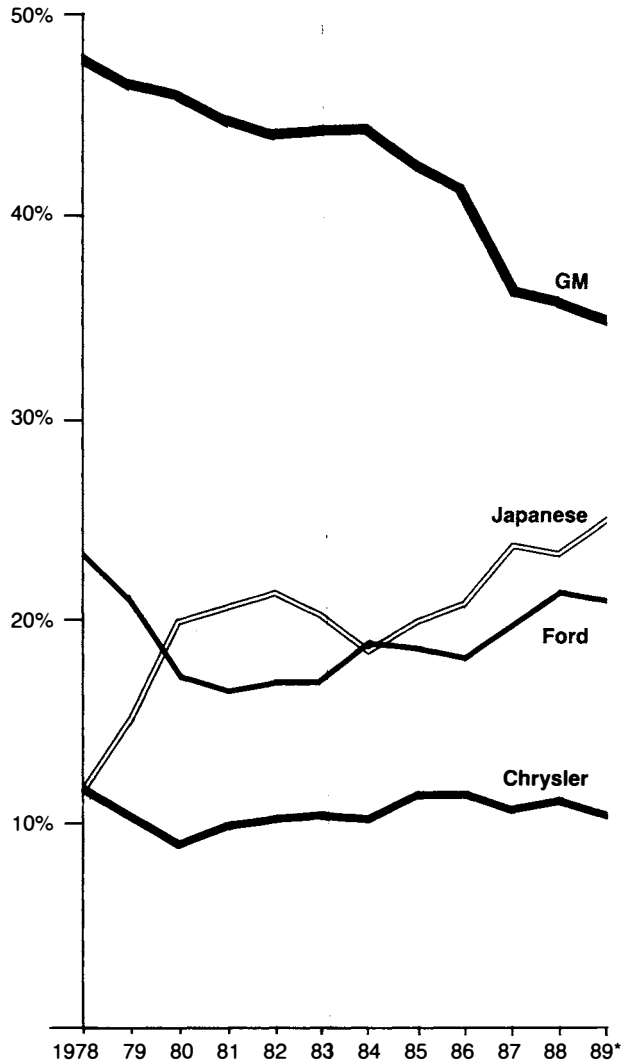
### Not just better, but newer, too

The Big Three have almost caught up with the Japanese in quality, but not quite. Last year, each GM-produced vehicle had 1.7 defects, Ford had 1.5, and Chrysler had 1.8, compared to 7.4, 6.7, and 8.1 defects, respectively, in 1980. But the average number of defects in a Japanese-made car meanwhile dropped from 2.0 to 1.2.

The Japanese auto makers completely redesign 80% of their models every five years, according to Takeshi Tanuma, the president of Nissan Research and Development. By contrast, said Tanuma, the Big Three redesign only about 40% of their models in the same period. Statistics on patents awarded in the United States in 1988 bear out this assertion. U.S. inventors received only 52% of all patents granted that year, down from 62% in 1978. In the same period, the Japanese share of U.S. patents rose from 10.5% to 20.7%. The second worst field was motor vehicles, where Americans received only 43% of new patents in 1988, compared to 26% for Japan, 13% for West Germany, and the remainder for France, Canada, Britain, and a few other countries. The sixth worst area was internal combustion engines.

In contrast to the ability of the Japanese to rapidly deploy new technologies, the Big Three appear like stodgy bureaucracies. The Japanese can design, engineer, and launch a new model almost three times faster than can the U.S. auto makers. GM Vice President Lloyd Reuss told *Fortune*, "A few months ago we couldn't make up our minds about how much chrome to put on the front end of a car, and one of our guys wanted to run a marketing clinic that would take eight weeks." Reuss shot that idea down, but internal bickering

FIGURE 1  
The shift in the share of car sales in the United States



\* Fortune estimate  
Source: Ward's Automotive Reports, *Fortune Magazine*.

over the basic conception for a redesign of the aged Chevrolet Camaro/Pontiac Firebird has consumed six years. By the time GM's replacement for the Camaro/Firebird comes out, over 10 years will have passed. In that time, Toyota will have put out three new versions of the Celica.

At the Tokyo Auto Show in November 1989, Japanese auto makers displayed "concept cars" that incorporated advanced technologies American auto makers conceded will take Detroit years to develop. Though the Japanese had been very careful to give equal billing to the displays of the Big Three, the *New York Times* reported that "the absence of high technology from the United States reinforced the widespread stereotype . . . of an American auto industry in decline,

ceding its technological edge, and perhaps even its genius for design, to Japanese companies.”

The star of the Tokyo show was the Mitsubishi HSR-11, which carries seven computers connected to sensors specially developed for it by the Nikon Corporation, a Mitsubishi subsidiary. The Nikon sensors measure clearances all around the HSR-11 and feed the data to the computers, which automatically maintain a safe distance between the HSR-11 and other traffic and from guard rails—at speeds up to 225 miles per hour. The HSR-11 can also parallel park itself by following guide tapes placed on the ground, and can determine its exact location by communicating with a satellite. The only problem, according to a Mitsubishi engineer, “is that the computers are too big,” wrote David E. Sanger, in the *New York Times*, on Nov. 6, 1989.

The Japanese auto makers have already perfected the mass production of very complex multi-valve engines. Every Honda now sold in the United States is powered by a four-cylinder engine that is 15% more powerful than U.S. six-cylinder engines. The key to this is multiple intake and exhaust valves for each cylinder, allowing fuel to be burned much more efficiently in the combustion chamber than is possible with older engines, aspirated by only one intake and one exhaust valve per cylinder.

Nissan’s new luxury car, the Infiniti, has a new eight-cylinder engine with four valves for each cylinder. Each of the 32 valves on the Infiniti Q-45 engine is regulated by a complex electromechanical timer that adjusts the opening and closing times of the valves in accordance with the speed of the engine.

The Big Three have reportedly decided not to build these more efficient and more complex multi-valve engines, because they contend that American drivers would be unaccustomed to the higher-pitched whine of such engines! Moreover, such engines require a very high degree of manufacturing precision, and could cost a U.S. automaker as much as \$500 million to retool to build.

In a recent study, TRW, Inc., the aerospace firm with a division that makes automotive and truck engine valves, found that 100% of Hondas sold in the United States have multi-valve engines, 70% of Toyotas, 54% of Nissans, 37% of Mazdas, and 24% of Mitsubishis. By contrast, only GM has fielded a multi-valve engine, the Quad Four, which it sells as a high-performance option. In 1988, of the 9 million engines GM built, only 190,000, or 2.1%, were Quad Fours (Doron P. Levin, “New Japan Car War Weapon: A ‘Little Engine That Could,’ ” *New York Times*, Nov. 26, 1989). Ford and Chrysler are in the process of developing multi-valve engines. GM is now designing a Cadillac V-8 32-valve engine, the North Star.

### **Japanese lead in manufacturing technology**

The Japanese have only a \$300 per car cost advantage over the United States on cars built in Japan, and a \$700

per car cost advantage on cars built in the United States, according to Morgan Stanley analyst Scott Merlis. If true, these figures definitively repudiate the old story that Japan’s advantage is its cheaper labor. Building a car at a GM plant requires 5.0 work days, Chrysler takes 4.4 work days, and Ford requires only 3.4 work days; Japanese assembly plants in the United States require just under 3 work days, according to the *Wall Street Journal*’s Paul Ingrassia (“Auto Industry in U.S. Is Sliding Relentlessly Into Japanese Hands,” Feb. 16, 1990). MIT analyst John Krafcik, who has studied 40 auto assembly plants in 13 countries, estimates that the average plant in Japan needs 20.3 hours of labor to assemble a car, 20% less than the 24.4 hours in the average North American plant. West European plants need 32.9 hours (Alex Taylor III, “Why U.S. Carmakers Are Losing Ground,” *Fortune*, Oct. 23, 1989).

If labor costs were the main advantage of the Japanese, it is clear that the Japanese auto makers would have a much greater than \$700 cost advantage, given that they take 13-66% less time to assemble a car. If they pay less, and take less time as well, the Japanese cost advantage would have to be, minimally, over \$1,950.

If the Japanese auto makers have any advantage at all, it is that they operate in a financial system that is properly subordinated to the requirements of industrial production. In a book published only in Japan that has touched a raw nerve of the Anglo-Americans, judging by the howls of rage in the U.S. press following circulation of a bootleg translation, Akio Morita, the highly respected founder of Japan’s premier consumer electronics firm, Sony, argues that Americans make money by “simply moving money back and forth through mergers and acquisitions.” He warns that the function of money “should not be to enrich banks and securities companies, but to smooth the path of production. . . . [In Japan, we] plan and develop our business strategies 10 years ahead, while Americans seem to be concerned only with profits 10 minutes from now. . . . For [Americans] the name of the game is nothing but quick profits. Entrepreneurs and investors alike do not leave their money in long-term projects. . . . The American economy is without substance” (Akio Morita and Shintaro Ishihara, *The Japan That Can Say No—The New U.S./Japan Relations Card*). Automotive industry analyst Maryann Keller has estimated that since 1986, Toyota has raised \$6.2 at interest rates of only 1.2% to 4.0%. American auto makers can’t hope to come close to that, while the U.S. financial system is dominated by usury.

It was revealed on March 20, for example, that one-third of Ford’s 1989 financial services profit consisted of \$221 million Ford had received from the Federal Savings and Loan Insurance Corp. after Ford’s purchase of four troubled S&Ls. In February, General Motors announced that its pension fund was going to purchase billions of dollars of junk bonds—an especially dubious investment since Drexel Burnham Lambert went bankrupt.