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CHAPTER 5

Collective Bargaining in the U.S. Auto Assembly Sector

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Editor's Abstract

In the recent past, the assembly sector of the automobile industry has witnessed widespread experimentation with new work designs and human resource practices. Collective bargaining outcomes across companies and plants have become more varied. Katz and MacDuffie link these developments to increased competitive pressures and to the challenge posed by lean production.

The Big Three (GM, Ford, and Chrysler) increased their market share in the early 1990s. This, however, followed a period of intense competitive pressure in which the Big Three lost ground. Japanese market share rose from 22% in 1979 to 33% in 1991. These figures include both direct imports and the output of "transplants," the largely nonunion assembly plants established by Japanese producers in the 1980s in the U.S. and Canada. Despite the upturn in sales in the early 1990s, the Big Three hourly work force continued to fall, from 740,000 in 1978, to 455,000 in 1990, to approximately 400,000 in 1993.

One source of Japanese advantage appears to be the lean production system. This involves both a set of production practices (designed for manufacturing, just-in-time inventory, closer links to supplier firms, more product variety, and more rapid model development) and a set of human resource practices (work teams, fewer job classifications/multi-skilling, increased worker training, employee involvement, and pressures for "continuous improvement"). Aspects of this new HRM and production system have been adopted by the Big Three in various auto plants, but these practices are by no means universal. This is one source of increased diversity.

In the early 1980s, there was a sharp shift in automotive collective bargaining with the demise of the traditional bargaining formula of a 3% annual improvement factor plus COLA. Profit sharing was instituted. Although profit sharing has never been substantial relative to base pay,

it has produced different results for GM, Ford, and Chrysler employees. Concession bargaining emerged repeatedly in plant-level negotiations in the 1980s—largely in the form of company demands for changed work rules. Management has utilized investment decisions to gain leverage in these negotiations. However, Katz and MacDuffie point out that new HRM systems like teams typically have been more successful when they are not forced upon the hourly work force.

In an era of reduced employment and continued plant closing, management has held a strong position. However, the UAW has been able to maintain itself as a formidable force in the industry. The real base wage rate for auto assemblers actually rose slightly between 1980 and 1993, despite the economywide decline in real hourly earnings. The UAW has also focused on increased job security through SUB plans, job banks, and through cooperation aimed at enhancing productivity. A primary remaining challenge is organization of the largely nonunion transplants.

Katz and MacDuffie point out that there is a range of opinions within both management and labor about these collective bargaining and human resource developments. Controversy remains regarding the success of the Saturn agreement, the experience at NUMMI, and, indeed, the whole gamut of work design and human resource experiments at other facilities. The future is uncertain, but those who support a cautious, incremental approach to change, employee involvement, and lean production are likely to be reinforced by the recent success of the Big Three.

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The auto industry has historically played a prominent role in American collective bargaining, introducing many now common features—multiyear contracts with cost-of-living-adjustment escalators and built-in annual real wage increases, supplementary unemployment benefits, "30-and-out" pensions, and quality of working life (QWL) programs—and upholding a strong structure of pattern bargaining for many years.[1] In the 1980s automotive labor relations was again in the forefront in taking actions to modify this long-established model, under pressure from both foreign and domestic competitors and from new production models linked to new human resource practices.

The cumulative outcome of these pressures has been increased diversity and decentralization of collective bargaining outcomes, at both company and plant levels; widespread experimentation with new work designs and human resource practices at individual plants, both new and old; and continued debate within both union and management ranks about the best way to deal with these changes. Modifications of the industry's collective bargaining model have included so-called "concessionary"

contracts that replace traditional bargaining formulas with company-specific profit-sharing plans and work rule changes; extensive new income and job security programs to cope with industry restructuring; joint labor-management efforts around training and quality; and the use of new work structures at the shop floor level, such as teams combined with very few job classifications, that challenge the principles of "job control" unionism.

The auto industry also remained newsworthy during the 1980s and 1990s as a result of the expansion of Japanese ownership and influence and the prominence of new models of worker and union participation. As Japanese companies became owners or co-owners (along with American company partners) of new assembly plants, the fact that virtually all of the solely owned Japanese plants operated without a union introduced the threat of nonunion operations to what had been one of the few remaining fully unionized sectors in the American economy. The presence of Japanese plants in the U.S. also gave impetus to the diffusion of "lean production," a Toyota-derived model combining new manufacturing methods such as just-in-time inventory systems and statistical process control with new human resource practices focused on worker motivation and multiskilling.

The perception of lean production as economically superior to traditional mass production increased the pressure on the U.S. industry to move toward more flexible ways of automating plants and organizing work, and launched a debate within the unions about the advantages and disadvantages of lean production from the workers' viewpoint. Meanwhile, the extensive form of worker and union involvement (even in business decisions) that emerged in the expanding Saturn facility, a subsidiary of General Motors, was viewed by many as an American alternative to (or extension of) lean production and quickly attracted both proponents and opponents among management and union ranks.

Before we describe these recent developments in automotive industrial relations more fully, we will first review the industry and its innovative history of labor-management relations. We focus in this chapter on the automotive assembly sector—those auto companies that assemble cars and trucks (and also produce many vehicle parts that are supplied to these assembly operations). In the next section, we describe the primary parties involved in U.S. automotive labor relations: the unions and the companies. Subsequent sections focus on the competitive and technological

environment affecting the bargaining context for the U.S. automotive industry, the structure of collective bargaining in this industry historically, new developments in collective bargaining from 1979 to the present, and a look to the future that sketches out three possible scenarios for automotive industrial relations.

The Parties

The Unions

The United Automotive Workers (UAW) is the primary union representing workers in the auto industry.[2] The International Union of Electricians (IUE) also represents some hourly workers in the assembly firms (primarily in the electrical products plants of these firms). By the late 1940s the UAW had organized all hourly workers in the companies that assembled cars and trucks.[3] Until 1985, the UAW was an international union as it included Canadian auto workers. In 1985 the Canadian auto workers voted to secede and a separation agreement was negotiated between the U.S. and Canadian parts of the UAW to form the Canadian Auto Workers (CAW).

The UAW is a large and fairly centralized union. The internal structure of the union includes departments organized along company lines in the auto industry and an agricultural implements department. National union staff coordinate bargaining within each department and also assist in the implementation of benefits, employee assistance, health and safety, and quality of working life programs.

The central figure in the union over the postwar period was Walter Reuther who, along with his brothers, was active in the union's sit down strikes and organizing efforts in the 1930s. Reuther served as president of the UAW from 1947 until his death in 1970. During his tenure, Reuther led a coalition (the "administrative caucus") that dominated the national affairs of the union, and while he was alive, Reuther's influence and imagination encouraged an innovative spirit within auto bargaining (Steiber 1962). Under Reuther's guidance the UAW also was very active in national and local politics and a strong supporter of the Democratic Party. Yet, even with the dominance of the Reuther coalition, the UAW historically has had strong democratic traditions which appeared recently in the debates occurring within the UAW between the "New Directions Movement" and the "Administrative Caucus." These debates are reviewed later in this chapter.

The Companies

The American assembly companies are commonly referred to as the "Big Three"—General Motors (GM), Ford, and Chrysler. They produce a number of car and truck parts and they assemble these parts into final vehicles, although the extent to which these assemblers are "vertically integrated" (use parts produced in their own plants) varies. Estimates of the degree of integration as of 1990 are GM—70%, Ford—40%, and Chrysler—30%.[4] The Big Three's production and skilled trades workers are completely unionized, and their national (companywide) collective bargaining agreements cover the companies' final assembly and parts plants. In addition, the Saturn Corporation, a subsidiary of GM, operates a sizeable unionized auto assembly complex in Tennessee, covered under a separate contract that differs substantially from the national GM agreement. Table 1 contains basic information about these companies.

There are also a number of assembly plants with Japanese ownership involvement, referred to in the industry and in this chapter as the "transplants." Table 2 contains summary information on these plants. The three unionized transplants acquired this status by virtue of their joint venture arrangements with U.S. companies. These arrangements have been somewhat fluid; they have been altered at two of these plants since they opened.[5] The contracts at these plants, like at Saturn, represent a substantial departure from the national UAW-Big Three agreements. Five of the transplants are nonunion plants, and they appear to represent the dominant trend for new investment, with both BMW and Mercedes-Benz now building new nonunion plants.[6]

Japanese companies have historically been much less vertically integrated than the Big Three, and this pattern is also true for the transplants. Estimates indicate that Toyota, Nissan, and Mazda are the most vertically integrated of the Japanese companies at 30%, and that Suzuki is the least vertically integrated at 16%; the industry average is just under 25%.[7] The transplants initially sourced many of their parts from Japan but have made a strong effort in recent years, accelerated by political pressures related to the U.S.-Japan trade deficit and the rise in the value of the yen, to increase the "local content" of their U.S.-built vehicles.[8]

The Bargaining Context

The Competitive Environment

From 1946 until 1979, the auto industry in the U.S. was on a prosperous growth path, even in the face of the industry's periodic sharp

TABLE 1

U.S. Automotive Companies:
North American Assembly Operations, 1990-1993

Company	Number of Assembly Plants			1990 NA Production	1991 NA Productiion	1990 U.S. Employment	1993 est. Employment
	US	Canada	Mexico				
GM	26	4	2	2,654,302	2,401,077	287,000	233,000
Ford	15	2	2	1,378,146	1,172,384	100,000	87,000
Chrysler	7	4	2	726,753	510,147	68,000	55,000

Source: Automotive News; Annual Reports; unpublished reports, UAW.

TABLE 2

Japanese Automobile Assembly Plants Based in the United States, 1982-90

Company	Location	Production Began	1989 Production	1990 Production	Current Capacity	Unionized
Total			1,262,876	1,493,884	1,815,000	
Honda	Marysville, OH	1982	1,363,274[1]	1,435,437[1]	360,000[1]	No
Nissan	Smyrna, TN	1983	238,641	235,248	265,000	No
New United Motor Manufacturing (Toyota and General Motors)	Fremont, CA	1984	192,471	205,287	240,000	Yes
Mazda (with Ford)	Flat Rock, MI	1987	216,501	184,428	240,000	Yes
Diamond-Star (Mitsubishi and Chrysler)	Normal, IL	1988	90,741	148,379	240,000	Yes
Toyota	Georgetown, KY	1988	151,099	218,155	200,000	No
Subaru-Isuzu	Lafayette, IN	1989	11,160	66,950	120,000	No
Honda	East Liberty, OH	1989	0[1]	0[1]	150,000	No

[1]Honda Marysville production level includes Honda East Liberty production as well.

Sources: Motor Vehicle Manufacturers Association and *Automotive News*, Detroit, MI: Crain Communications, Inc., various issues.

Christopher J. Singleton. 1992. "Auto Industry Jobs in the 1980s: A Decade of Transition," *Monthly Labor Review*, Vol. 115, no. 2, pp. 18-27.

cyclical swings. Over these years domestic production of cars and trucks increased from 5 million to 13 million vehicles. From 1946 to 1979 the number of production workers grew 20% and periodically fluctuated substantially along with vehicle production. The combination of large vehicle output growth and modest employment growth was due to the significant productivity gains accomplished by the industry. This productivity and output growth helped produce strong profit figures for the industry and provided support for substantial growth in auto workers' real earnings.

From the end of World War II until the late 1970s, the economic environment of the auto industry was conducive to steady improvements and general stability in labor relations. Three environmental factors were critical—growth in domestic auto sales, a low level of imported vehicle sales, and a high degree of unionization. Yet, in the early 1980s, a labor and management that had grown accustomed to long-run growth in total vehicle sales and profits were confronted by a number of fundamental changes in the auto market.

One important aspect of the change was an increase in international competition in the form of increased vehicle imports. While the level of imports increased steadily during the 1960s and 1970s from a postwar low of 5% in 1955, it surged during the 1980s. As reported in Table 3, the total import share of American new car sales rose from 22.2% in 1979 to a peak of 30.8% in 1987, although a variety of developments in the early 1990s, as noted below, caused an equally sharp decline in import share to 21.7% in 1993.

In the early 1980s American auto makers also confronted sizeable declines in sales induced by a sluggish American economy. As shown in Table 4, from 1979 to 1982 employment in the auto industry (SIC 371) declined by 29.4% (from 990,400 to 699,300). Ford and Chrysler were hardest hit during this downturn. Then, in mid-1983, auto sales began to rebound strongly and employment in the industry and the financial status of the auto assemblers markedly improved. By 1985 employment had recovered to 883,500; these numbers reflect not only the recovery of the Big Three but also the strong growth in transplant employment during the early 1980s. Profits also rebounded; the combined profits of the Big Three (GM, Ford and Chrysler) were $6.3 million in 1983 and $9.8 million in 1984, and the Big Three continued to be profitable into the late 1980s.

Despite the return to profitability in the mid-1980s, the Big Three faced increasing competition not only from imports but also from the

TABLE 3

U.S. New Car Sales of American Automakers, Japanese Transplants and Imports, and Total Imports, 1979-90
(Numbers in thousands of Units)

Year	American Automakers		Japanese Transplants		Japanese Imports		Total Imports		American Automakers—All Motor Vehicles
	Sales	Percent of Total	Sales	Percent of Total	Sales	Percent of Total	Imports	Percent of Total	Production
1979	8,163	76.7	0	0	1,848	17.4	2,328	21.9	11,098
1980	6,401	71.3	0	0	1,977	22.0	2,397	26.7	7,667
1981	6,044	70.8	0	0	1,892	22.2	2,326	27.3	7,614
1982	5,665	71.0	0	0	1,801	22.6	2,222	27.9	6,785
1983	6,660	72.5	50	0.5	1,916	20.9	2,386	26.0	8,900
1984	7,744	74.5	134	1.3	1,906	18.3	2,442	23.5	10,462
1985	7,906	71.6	221	2.0	2,218	20.1	2,841	25.7	11,095
1986	7,675	67.0	446	4.1	2,386	20.8	3,249	28.3	10,688
1987	6,402	62.6	618	6.0	2,173	21.3	3,144	30.7	10,097
1988	6,735	63.6	766	7.2	2,103	19.8	3,067	28.9	10,122
1989	6,064	62.4	1,009	10.4	1,911	19.7	2,698	27.8	9,615
1990	5,500	59.2	1,343	14.4	1,721	18.5	2,453	26.4	8,152

Note: For the purposes of this table, the term, "American Automakers," denotes General Motors, Ford, Chrysler, and American Motors.

Source: Motor Vehicle Manufacturers Association and *Automotive News* (Detroit, MI., Crain Communications, Inc.), various issues.

Christopher J. Singleton. 1992. "Auto Industry Jobs in the 1980s: A Decade of Transition," *Monthly Labor Review*, February 1992, Vol. 115, No. 2, pp. 18-27.

TABLE 4
U.S. Automobile Industry Employment in Motor Vehicles and Equipment (SIC 371)

Year	Employment (thousands)
1979	990.4
1980	788.8
1981	788.7
1982	699.3
1983	753.7
1984	861.7
1985	883.5
1986	872.4
1987	866.6
1988	857.4
1989	857.0
1990	800.9
1991	789.0
1992	812.2
1993	820.4
February 1994	851.4

Sources: Figures (except for February 1994) are annual averages from various issues of *Employment and Earnings*, Bureau of Labor Statistics, Washington, DC: GPO.

sizeable growth in Japanese transplant auto production. Table 3 shows that Japanese transplant car sales grew from zero in 1982 to 14.8% of the U.S. market by 1993, with transplant sales projected to approach a 20% share of the American market by the turn of the century. With a relatively constant level of Japanese imports through most of the 1980s, this represented a growth in the market share of nearly 15 percentage points for Japanese companies, from 17.6% in 1979 to 32.1% in 1991—representing most of the lost market share for the Big Three, since European and Korean imports gained less than 4% of the U.S. market during this period.[9]

When a sluggish economy returned in the early 1990s, it had dramatic effects on both employment and profits among the Big Three. By 1991, auto industry employment was down to 789,000; most of this drop reflected job losses for the Big Three, since the transplants continued to bring new capacity on-line during this period. In 1991 financial losses in the core automotive businesses at GM, Ford and Chrysler were $5.2 billion, $1.9 billion, and $0.8 billion, respectively.[10] GM's losses led to the

company's decision to close 22 plants by 1995 and cut white- and blue-collar employment by 80,000.

Some good news for American companies came in the early 1990s with a small but significant increase in Big Three market share, up from 60.5% in 1991 to 63.6% in 1993, brought on by sluggish sales of vehicles imported from Japan, partly due to an unfavorable exchange rate and the Big Three's successful unveiling of some popular new products and willingness to show price restraint to gain sales. Profits also rebounded at the Big Three in 1993, with GM, Ford, and Chrysler all reporting profits of around $2.5 billion.[11] Along with this sales and profit rebound, employment also rebounded but not as strongly as the auto companies made extensive use of overtime (particularly at Ford and Chrysler) and benefited from productivity improvements.

Even in the face of periodic profit rebounds, the increase in international and domestic competition led to sizeable declines in employment at the Big Three and UAW membership. From 1978 to 1990, the number of hourly jobs at Big Three assembly operations declined by 39% (from 740,000 to 455,000). This trend continued despite the most recent upturn, with 1993 estimates of 400,000 hourly jobs. Meanwhile, overall UAW membership declined 37% from 1979 to 1990 (from 1,510,000 to 950,000).[12]

In addition to intensified competitive pressures, the economic environment of the U.S. auto assemblers was altered from the 1980s on through the Big Three's decision to forge coproduction agreements with their Japanese counterparts, as noted above.[13] The primary motivation for the U.S. companies was to fill gaps in their product lines, particularly for small cars. Yet, the Big Three have also been influenced, to varying degrees, by the desire to use these co-owned but Japanese-managed plants to experiment with new production systems and to develop demonstration models for their wholly owned plants.[14]

The importance of the transplants for industrial relations arises from the fact that they utilize innovative practices in both work organization, employee involvement, and manufacturing practice (discussed below) and that the plants solely built by the Japanese are unorganized. The emergence of sizeable domestic nonunion competition in the auto assembly sector represents a significant new pressure on the UAW. Although the UAW had seen its representation decline in the independent auto parts sector (plants that make auto parts but are owned by companies other than the Big Three) over the post-World War II period,

the assembly sector had remained completely unionized. Indeed, the Big Three essentially abandoned its efforts to create a nonunion sector when the UAW successfully resisted GM's "Southern Strategy" of opening nonunion assembly plants in the 1970s. Through the new nonunion transplants the UAW came to face the same threat that plagued so many other American unions over the last 30 years. Although the UAW has launched various organizing drives in unorganized transplants in recent years, none of these drives have come close to being successful.

Also significant for collective bargaining has been the formation of more extensive linkages between the assembler companies and their parts suppliers. Most assemblers dramatically reduced the number of their parts suppliers and initiated longer term contracts with the select group of suppliers that remained. At the same time, they increased the percentage of the parts purchased from non-captive suppliers through increased outsourcing from their wholly owned "inside" suppliers. The immediate effect of this trend was to increase the pressure for cost reduction on the parts plants owned by the assemblers and to reduce union density in the auto parts sector, since the vertically integrated suppliers are 100% unionized, while the U.S.-owned independent sector is about 50% unionized, and the Japanese supplier transplants are nearly 100% nonunion. The formation of stronger links across the assembly companies and between assemblers and parts suppliers eventually also may produce complicated problems regarding bargaining structure and union jurisdiction.[15]

The increased use of just-in-time (JIT) inventory systems, in which assemblers receive multiple parts deliveries from suppliers close to the time of production and substantially shrink their buffers of incoming parts and work-in-process inventories, placed new demands for quality and on-time delivery on suppliers. Those suppliers able to meet these demands, often larger U.S. independent parts companies or Japanese supplier transplants already familiar with just-in-time, benefited greatly, thus accelerating the trend away from vertical integration.

As the level of inventory held by the Big Three dropped during the 1980s (Haimsen 1992), the interdependence of assembler and supplier plants increased dramatically, affecting labor relations in unpredictable ways. For instance, while the lean buffers of JIT provide an incentive for suppliers to avoid labor conflict that might interrupt parts deliveries (and for assemblers to do business with suppliers who can manage labor relations effectively), the greater interdependence between assembly and parts plants also gives a new potential source of strike leverage.[16]

Plant-Level Performance Differentials

In the face of heightened competition, the Big Three and the UAW made substantial changes in their industrial relations practices over the 1980s and early 1990s, as discussed below. An important force for change was the perception that Japanese-owned plants, both in Japan and in the U.S., had substantial productivity and quality advantages over the typical Big Three plant because of their use of lean production, a system developed by Toyota and used to varying degrees by all Japanese companies.

Lean production is described (Womack, Jones, and Roos 1990) as combining a different way of thinking about production goals (quality and productivity as mutually attainable, not a tradeoff) with new production methods aimed at boosting efficiency through the elimination of waste (reducing buffers through just-in-time inventory systems; "building in" rather than "inspecting in" quality) and human resource practices aimed at motivating workers and developing their skills (work teams, job rotation, problem-solving groups, increased worker training, performance-based bonus pay, reduction of status barriers). Underpinning the entire system is the idea of *kaizen* or continuous improvement in production processes and in productivity and quality outcomes. According to this model, buffer reduction reveals production problems and creates the pressure to solve them. Then, if workers are sufficiently skilled and motivated, they will respond by extensive participation in the improvement process.

The perception of lean production as the source of Japanese competitive advantage represented an important shift away from Japan-specific factors such as lower wage rates, longer working hours, cooperative enterprise unions, lifetime employment, and cultural traits (e.g., a strong work ethic and a group orientation conducive to teamwork). These culturally based explanations were undermined by the performance of the Japanese transplants in the 1980s. Data from MIT's International Assembly Plant Study indicated that the transplants, using American workers, engineers, managers and (at some plants) union officials, achieved performance results, in terms of both productivity and quality, that matched or surpassed most American plants (Krafcik 1986; Krafcik and MacDuffie 1989).[17]

Furthermore, the source of the transplants' performance advantage appeared to be their implementation of lean production methods very similar to those used in plants in Japan (Shimada and MacDuffie 1987;

Gelsanliter 1989; Florida and Kenney 1993). The transplant wages and benefits are similar to U.S. plants (although, with a new young work force and less generous programs, their pension and health care costs are much lower). Their level of technology ranged from moderate to high, but was often less in amount and sophistication than the most advanced U.S. plants.

The NUMMI case was particularly influential, because unlike the "greenfield" nonunion plants of Honda and Nissan, it occupied a former GM plant in California and hired its employees from the ranks of the former GM work force. Union officials from what had been one of the most militant local unions at GM were brought back as well. Yet within a year of opening, NUMMI had the best quality and productivity of any GM-affiliated plant and the lowest absenteeism and grievance rates as well (Krafcik 1986; Brown and Reich 1989; Adler 1992).

Observations about the transplants were supported by broader statistical analyses from the MIT Assembly Plant Study (MacDuffie 1991, 1994a; MacDuffie and Krafcik 1992). In an international sample of 62 assembly plants, there was a strong relationship between the use of buffers and the use of human resource practices (i.e., the "leaner" the buffers, the more extensive the reliance on work teams, job rotation, high levels of worker training, contingent pay, and so forth). The study also found that the use of buffers and human resource practices were strong predictors of productivity and quality, both as separate indices and when combined into a single "production organization" measure.

This view of lean production has been challenged on two points. Some researchers question whether lean production is indeed a distinctive paradigm with performance advantages, pointing to industry and company-level statistics on inventory levels and financial performance that show only modest variation across U.S. and Japanese companies (Williams and Haslam 1992). Whatever cost advantages Japanese companies may have are attributed to lower wages in the various tiers of the supply system.[18]

More widespread are critiques that acknowledge the performance advantages of lean production, but argue that these are attained not through greater dependence on worker skill and motivation but through exploitation of workers. For example, the Mazda plant in Flat Rock, Michigan has achieved some notoriety for the harsh treatment of workers during its launch period, as reported in Fucini and Fucini (1990). It is interesting to note that this account suggests that many of the problems at

the Flat Rock plant were due to management's inability to implement lean production effectively under the financial and time pressures of the product launch.

Other accounts of the transplants develop a broader critique of "lean production" as relying on "sweating" workers through a faster work pace, rigid job standardization, intensive peer pressure for higher work effort within teams, and continual stress from the lack of buffers and from *kaizen* efforts to remove work content from jobs (Parker and Slaughter 1988; Babson 1993; Graham 1993). From this perspective, the challenge to unions is to develop a strategy for eliminating or at least containing the exploitative aspects of lean production.[19] For researchers, these critiques highlight the importance of gathering more information on the consequences of lean production for workers and workers' perceptions of lean work practices.

These critiques have influenced debates within auto workers' unions in North America, as discussed below. The Canadian Auto Workers (CAW) have prepared the most fully developed position on lean production, based on their research at the GM-Suzuki joint venture transplant in Canada known as CAMI (CAW 1993; Robertson et al. 1993).

Meanwhile, the idea of lean production as a new production paradigm capable of superior performance has taken hold strongly among corporate management at the U.S. companies. However, the implementation of lean production at U.S. plants has been relatively slow, and varies for different aspects of this system. Most quickly adopted have been lean production policies on the reduction of buffers. The pace of implementation of new human resource practices has been slower, particularly in the cases where new work structures such as teams are being implemented at existing plants. The area in which U.S. companies have followed the lean production model least is product variety and manufacturing flexibility, as noted below.

Forces for Flexibility

In the post-World War II period, the auto industry was noteworthy as a model of the success of mass production techniques with steady, but incremental, technological change. In the early 1970s it appeared that these mass production techniques would be extended through the development of "world cars" assembled with interchangeable parts manufactured all over the world. A number of aspects of the new competition in the world auto market, however, raised doubts about the

world car strategy and the future efficacy of mass production techniques. The new economic environment placed a premium on flexibility in the production process, and placed demands on labor and management to reorient labor relations accordingly (Katz and Sabel 1985). However, the response of the Big Three companies to these demands has varied considerably.

Factors contributing to the need for greater flexibility in the production process include: developments in the product market, new technologies, and macro-economic events. On the product market side, U.S. consumers have responded enthusiastically to the growing variety of vehicle types offered for sale by both domestic and foreign auto producers, a reflection of the world-wide erosion of distinct national auto markets (Altshuler et al. 1984). Much of this variety has resulted from an increase in "niche" products produced in relatively low volumes. Japanese companies have been able to exploit their more rapid product development cycle to meet these new market niches more quickly than the Big Three.

There has been a proliferation of models offered in the U.S. market, as shown in Table 5. From the 1940s through the 1960s, the American auto companies designed family size cars, produced each model in large volumes and made much of their profits from these cars. In 1955, for example, three models (two Chevrolets and one Ford) made up 50% of all cars sold in the U.S. By 1991, it took 24 models to cover half of U.S. sales, and these models were produced by seven companies (three American, three Japanese, and one joint venture).

This shift in product market strategy has important implications for the production process because production schedules for niche vehicles are more subject to changes in consumer preferences or competitive offerings. Consequently, on the shop floor there is greater need for the capacity to rapidly adjust production volumes and type, particularly the mix of different products within a certain level of production. One way to acquire this sort of flexibility is to replace the traditional assembly-line production techniques and highly formalized industrial relations practices with team forms of work organization and more informal work rules.

A second factor is the move toward new microprocessor-based technologies that has made it easier to build multiple models in the same assembly plant. The increased use of robotics and other "flexible" automation provides additional pressure for more flexible work rules

TABLE 5
Fragmentation of the American Auto, Van, and Light Truck Market 1955-1989

	1955	1973	1986	1989
Total				
Products on Sale	30	84	117	142
Annual Sales per product ('000s)	259	169	136	112
American Products				
Products on Sale	25	38	47	50
Annual Sales per product ('000s)	309	322	238	219
European Products				
Products on Sale	5	27	27	30
Annual Sales per product ('000s)	11	35	26	18
Japanese Products				
Products on Sale	0	19	41	58
Annual Sales per product ('000s)	0	55	94	73

Source: James P. Womack *et al.* 1990. *The Machine that Changed the World*. New York: Rawson Associates.

since the ability to rapidly switch product types appears to be the critical advantage robots have over earlier forms of automation.[20]

A third factor is the volatility in product demand generated by macro-economic flux and structural economic developments: oil price shocks, government policy responses to the inflation-unemployment tradeoff, and the increased exposure of the U.S. economy to world economic events.[21] This trend, which seems likely to continue, exacerbates the fluctuations in consumer demand that result from increased product variety, and further increases the need for companies to be able to rapidly adjust production volumes and model mix in any given plant.

Given these trends, the American auto companies faced a double problem in the early 1980s. While they were racing to adjust to the new volatility and variety in product demand and technology, they were simultaneously struggling to reduce the cost and quality advantages of Japanese producers. A complicating factor during this period was that it was not clear exactly what was the source of the Japanese performance advantage. Initially, U.S. companies suspected that the Japanese auto companies had lower costs and higher quality because they had a better way of performing mass production.[22] In addition, since Japanese products sold in the U.S. at that time were small cars with few option combinations, some U.S. observers concluded that Japanese factories faced

substantially less manufacturing complexity than American factories, another cost advantage.[23]

At the same time, Japanese production systems seemed to be better suited than American practices to providing the flexibility demanded in a world of volatile markets and technologies.[24] Thus, the American companies were confused as to whether to focus their strategy around performing mass production in a less costly manner, or whether the world industry required a radically redesigned production system oriented toward flexibility and adaptability.[25] This confusion had important consequences for the conduct of industrial relations, as discussed below.

By the early 1990s, all of the Big Three spoke quite openly about their intention to speed the transition to lean production approaches in their assembly operations. For the most part, however, this has not included the lean production emphasis on high levels of product variety. Indeed, most Big Three plants are probably more narrowly focused on a single platform than they were in the early 1980s, and the number of options offered has been reduced dramatically as well, both in the interest of cost reduction.[26] Current strategic choices of the Big Three suggest that this "variety gap" with Japan will continue.[27] The fact that the Big Three will not be asking their plants to handle high levels of product variety implies that there will be less pressure to introduce flexible forms of production at these plants.

Locational Effects

The locational consequence of the changes underway in the world auto market has been a movement toward the recentralization of production. Although the concurrent trend toward the outsourcing of certain parts to low-wage locations such as Mexico receives much attention, the more significant trend has been toward a greater geographical concentration of auto-related manufacturing. The rationale is in part to capture the benefits of just-in-time inventory procedures and in part to allow more intensive communication between product design and manufacturing functions. This has occurred through the tendency for plant closings to occur in plants located far from Detroit; the creation of clusters of plants, such as Buick City and Saturn at GM, that bring together engine plants, transmission plants, assembly plants, and other parts plants to one central location; and the consolidation of stamping operations and other operations into assembly plants.

It is also noteworthy that a number of the new "greenfield" assembly plants are clustering in an area close to Interstate I-75, in a north-south

corridor of Midwestern states that extends well south of the traditional Detroit-area home of the industry. These include Honda's two Ohio plants, the Saturn complex, and the Nissan plant in Tennessee, the Toyota assembly plant in Georgetown, Kentucky, the Mitsubishi plant in Illinois, and the Subaru-Isuzu plant in Indiana. No doubt the construction of these plants in the South was partially induced by management's belief that workers there would be more willing to avoid unionization and/or accept nontraditional industrial relations practices.[28] This I-75 corridor has also become the home for new independent parts suppliers, many of them Japanese-owned or Japan-U.S. joint ventures, that supply the transplants. These new suppliers are also overwhelmingly nonunion.

The Structure of Collective Bargaining

Pattern Bargaining

Prior to 1979, the bargaining structure among the auto assembly firms involved very strong pattern following within and across the auto companies. The degree of pattern following has declined across the Big Three and cross-company variation has increased with the entry of Japanese transplants as described more fully below.

In the traditional bargaining structure that prevailed at the Big Three compensation is set by national company-specific, and multi-year (since 1955 they have been three-year) agreements. Some work rules such as overtime administration, employee transfer rights, and seniority guidelines are also set in the national contracts. Local unions, in turn, negotiate plant-level agreements which supplement the national agreements. These local agreements define work rules such as the form of the seniority ladder, job characteristics, job bidding and transfer rights, health and safety standards, production standards, and an array of other rules which guide shop floor production. The local agreements do not regulate either wages or fringe benefits which are set in the national contract. Some indirect influences on wage determination do occur at the plant level in the definition and modification of job classifications provided through the local agreements.

Local bargaining over work rules allows for the expression of local preferences and some adjustment to local conditions. This facilitates the sort of shop floor "fractional bargaining" described by Kuhn (1961). In this system the grievance procedure with binding third-party arbitration serves as the end point of contract administration although disputes concerning production standards, new job rates, and health and safety issues are not resolved through recourse to arbitration.

The influence of the agreements reached in the auto assembly firms has traditionally extended out to the auto supplier industry and beyond. The UAW, for example, has used the auto assembly agreements as a pattern setter in their negotiations in the agricultural implements industry.[29] Other unions, especially those linked to auto production such as the rubber industry, also looked to the contracts in the auto assembly firms as pattern setters. From the early 1950s until the late 1970s the extent of interindustry pattern following varied somewhat over time, but generally there was a high degree of pattern following. In the 1980s, the pattern leading role of the Big Three settlements declined (Budd 1992).

Wage Rules and Fringe Benefit Determination

From 1948 until 1980, formulaic mechanisms have been utilized to set wage levels in collective bargaining agreements in the Big Three.[30] The formulaic wage-setting mechanisms traditionally included in the contracts were an annual improvement factor (AIF) that after the mid-1960s amounted to 3% per year, and a cost-of-living adjustment (COLA) escalator that often provided full or close to full cost-of-living protection.

The importance of these formulaic mechanisms is that they provided continuity in wage determination across time and across the assembly companies at any given point in time. The continuity across time was provided by the fact that, except for minor adjustments, the formula mechanisms rigidly set wages from 1948 until 1979 among the Big Three companies.[31] Continuity across the industry was provided by intercompany pattern following and by the fact that in the plants covered by the company agreements, the national contract wage was not modified in local bargaining.

Along with increases in real hourly earnings, auto workers received steady improvements in their fringe benefit package. A number of these fringe benefit advances such as supplementary unemployment benefits, "30-and-out" pensions, and paid personnel holidays were innovations that eventually spread to the auto supplier firms and to a number of other industries. Over the postwar period fringe benefits became a larger share of total worker compensation.

Job Control Unionism

At both national and shop floor levels, the labor relations system in the Big Three traditionally relied on contractually defined procedures to regulate disagreements between labor and management. The contractual

regulation of these procedures was heavily focused on "job control."[32] Wages were explicitly tied to jobs and not to worker characteristics. In addition, much of the detail within the contract concerns the specification of an elaborate job classification system with much attention paid to the exact requirements of each job and to seniority rights that were tied to a job ladder guiding promotions, transfers and layoffs (Piore 1982).

The dominance of a job control focus did not lead to a complete stabilization of shop floor labor-management relations. Labor and management often engaged in struggles over the exact terms of working conditions and the bounds of union or worker involvement in decision making. Frequently these issues were addressed through informal day-to-day relations between workers and their supervisors, but occasionally disputes produced either authorized or unauthorized local strike actions.

Furthermore, there was not perfect standardization in the tenor or outputs of shop floor labor relations because the focus of collective bargaining was on standardizing *contractual terms*. Significant variation emerged in the tenor and practical conduct of shop floor labor-management relations across plants and across work groups within given plants. In some plants there was a constant acrimonious relationship, while in others the parties developed a more cooperative interaction.[33]

From the late 1940s until the late 1970s, the application of wage rules and job control unionism produced steadily rising real compensation to auto workers and long-term growth in auto employment and production. With limited import penetration in auto sales, this was a bargaining process where the geographic bounds of union organization closely matched the relevant product market. The consistency the bargaining process had with the economic environment was one of the primary factors contributing to the system's attractiveness to both labor and management. Important political functions for labor and management also were served by the stability and continuity in the auto negotiation processes.

New Developments in Collective Bargaining, 1979-94

Concession Bargaining

By the late 1970s the economic environment in the world auto industry had changed substantially from its former pattern, and labor and management struggled to respond to many economic pressures. The wage rules traditionally used to set wage levels were modified significantly, first as part of efforts to avoid bankruptcy at Chrysler in 1979

and 1980. In agreements reached at the Big Three after 1979, the traditional formulaic wage rules were replaced by lump sum increases, periodic base pay increases, and profit sharing.[34] The 1993-96 contracts provide a 3% base pay increase in the first year and 3% lump sum pay increases in the second and third year of the contracts and continue the company-based profit-sharing programs.

Table 6 reports the hourly wages (including COLA payments) received by auto assemblers at GM from 1980 to 1993.[35] The figures in Table 6 show the limited growth in real earnings received by auto assemblers over the 1980s and early 1990s as a result of the abandonment of the regular 3% per year AIF wage increases. Yet, given the declines in real earnings suffered by many other American workers, auto workers' hourly wages rose sizably relative to other production workers over this period as shown in column C of Table 6.

Table 6
Auto Assembler Hourly Wages, 1980-1993

	(A) Auto Hourly Wage	(B) Auto Real Hourly Wage	(C) Ratio of Auto to Average Production Worker Hourly Wage
1980	9.77	11.86	1.47
1985	13.15	12.22	1.53
1990	15.69	12.00	1.57
1993	17.42	12.06	1.61

(A) This figure is the hourly base wage (including COLA payments) received by assemblers at General Motors. It is from an unpublished series of the UAW.

(B) This figure is the hourly wage reported in Column A divided by the consumer price index, as reported by the Bureau of Labor Statistics, *Monthly Labor Review*, various issues (1982-84 = 100).

(C) This figure is the hourly auto assembler wage reported in Column A divided by the average hourly earnings of production or non-supervisory workers on private non-form payrolls, as reported in the Bureau of Labor Statistics, *Monthly Labor Review*, various issues.

The introduction of profit sharing received much attention in the press, particularly in light of the traditional pattern setting role the auto assemblers have played in American collective bargaining. The payouts of the profit-sharing plans adopted in the Big Three from 1982 on have varied substantially, in large part due to differences in the financial

performance of the companies. The profit-sharing payouts between 1982 and 1989 at GM, Ford, and Chrysler totaled $1,754, $13,365, and $3,752, respectively.[36] In 1993 Chrysler workers on average received a profit-sharing payout of $4,300, while Ford workers received $1,350, and GM's profit sharing plan provided no payout to hourly workers.[37] The variation in profit-sharing payouts received by workers across companies was the source of some controversy within the work force and the UAW.

The contracts at the Big Three after 1979 also included a number of new income and job security programs; programs that were induced by the layoffs and plant closings that were occurring at the Big Three. These programs include "guaranteed income stream benefits," joint national employee development and training programs at each company funded by company contributions, and "jobs bank" programs protecting workers displaced by non-market (i.e., non-sales) related causes.[38] A worker's seniority heavily influenced the level and duration of benefits they received in these programs, although the specific benefit criteria varied across the programs.

The 1990-93 and 1993-96 Big Three contracts provided extensive additions to the income security package. A significant new element in these contracts was the provision that workers could not be laid off for more than 36 weeks *whatever the cause*. These income and employment security programs became a costly and controversial issue at GM as a result of the extensive layoffs and plant closings that were occurring there. GM exhausted the $4.2 billion that had been allocated for income and employment security protections in the 1990-93 contract and in the winter of 1993 had to provide supplemental funding into the SUB funds (and divert $400 million from the joint GM-UAW training fund) to continue benefits until the contract was renewed. The 1993-96 contract at GM replenished the SUB funds and provided a total of $4 billion to cover the income and employment package. The income and employment security protections at GM included an early retirement program in an effort to more quickly reduce the work force.

These job security measures served a number of purposes. The job security measures appear to serve a symbolic function by providing some direct assurance to the workers that pay and work rule concessions would in fact lead to an improvement in their job security. It appears that this sort of explicit linking of concessions and employment enhancement is often necessary to convince workers of the value of such concessions.

The UAW also favored income security programs as a device to raise the cost of layoffs to the companies. The union hoped that as the relative cost of employment declined (given the rise in benefits paid to laid off workers) the companies would have a greater incentive to maintain employment. Unfortunately, increased income security programs also exerted a downward "income effect" on employment (by reducing the companies' total assets). It is unclear whether the relative cost or income effects dominated. In any case, large scale layoffs and plant closings continued at GM in the 1990s even in the face of the high income security penalties paid by the company.

Another explanation for the UAW's support of the income and job security programs was that these programs represent, in part, the union's effort to negotiate acceptable severance payments for workers. Under a severance approach, the UAW is essentially accepting the inevitability of plant closings and layoffs and uses the income security programs to ease workers' acceptance of this outcome.

The severance payment programs may even encourage further employment declines by stimulating complacency within workers and the UAW by reducing the costs to workers of further employment declines. On the other hand, the employment security programs, particularly those oriented toward training, may be facilitating changes in work practices that contribute to cost and quality improvements and thereby help encourage employment expansion. A potential positive benefit of the programs is to allay workers' fears that the participation in productivity improvement will jeopardize their own or other workers' employment prospects. Our field work suggests that the effects of income and job security programs vary substantially across plants and are closely linked to the dynamics of labor-management relations at the plant level.

It is interesting to note that the existence of very costly income and employment security programs at GM did not completely settle employment security issues. In the winter and spring of 1994, as sales began to recover at GM, in the local bargaining over the local contracts that supplemented the company contract the UAW pressured the company to extend even further employment protections. In many cases the union was successful at using whipsaw tactics and the threat of strikes at critical part plants whose shutdown would harm production throughout the GM system. For example, at a major parts making complex in Flint the company agreed to add a third shift and drop plans to cut employment while at its Shreveport plant the company agreed to specific employment

increases to relieve work pace pressures (Templin and White 1994; *Daily Labor Reports* 1994b).

With respect to fringe benefits, the agreements reached at the Big Three after 1979 included a number of concessions. For example, all paid personal holidays (nine per year in the 1979-1982 agreement) and one regular holiday were eliminated. Although the companies have sought medical care copayments, to date the Big Three agreements have not included copays, but rather have been modified after 1979 to require steps such as second opinions and encouraged the use of preferred providers. In addition, the 1993-96 Big Three contracts diverted 22 cents in COLA adjustments to pay for fully paid medical benefit coverage.

The Increase in Diversity and Decentralization

The pay concessions and the move to contingent compensation schemes that tied wages to company performance increased the variation in employment conditions across the auto assembly companies. In addition, sizeable variation was created through the addition of the unionized Japanese transplants and the Saturn subsidiary, each of which had a separate agreement with the UAW, and through wage and benefit policies at the nonunion transplants.[39]

Further variation resulted from the fact that work rules and work organization were being modified in different ways and at a varied pace across auto assembly plants. The threat of increased employment loss due to either the further outsourcing of parts production, plant closings due to excess capacity, or production volume reductions due to demand fluctuations all created pressures to lower costs and improve product quality. Ultimately, the pressure for increased interplant work rule divergence came from the same source as the pressure for intercompany pay variation: the fear that even greater losses in employment would result if previous policies were maintained. Companies often used investment decisions as explicit leverage for these changes, in a strategy unions saw as "whipsawing," that is, forcing plants to compete against each other through concessions.

Some of these work rule changes involved increases in the "effort bargain" through a tightening of production standards. Other work rule changes include efforts to lower production costs by increasing the flexibility with which labor is deployed. Common examples of the latter include classification consolidation, limits imposed on job bidding rights, the use of work teams to promote multiskilling through job rotation, and

a pushing down of certain responsibilities, such as quality inspection, from specialized staff to the shop floor. Finally, in many plants the modification of work rules interacted closely with ongoing worker involvement programs. In this way, the emergence of more decentralized collective bargaining was linked to a shift away from the job control focus that characterized postwar auto bargaining.

The extent of changes in work organization and employee involvement at different plants can be arrayed along a continuum, with the most change occurring at "greenfield" sites such as the Japanese transplants and Saturn. Anchoring the other end of the continuum are "brownfield" plants with ongoing operations that have changed very little, typically because of opposition to change in management and/or union ranks and because the demand for the plant's product has remained strong.[40]

There are two intermediate points along this continuum. Most similar to the new "greenfield" sites are those plants that are closed for several months for a major retrofit. The lengthy shutdown creates the opportunity for substantial change, both by signalling a new approach to labor-management relations or manufacturing methods and by allowing the time for extensive training. Changes in these cases are typically less extensive than in the pure "greenfield" cases and vary depending on the company's overall strategy and on the credibility of company threats to withhold investment unless changes are made.[41]

Another intermediate category would be "brownfield" plants in continuous operation that attempt a major "on-line" retrofit. These plants typically agree to make changes in their traditional procedures out of concern for their long-term competitiveness, prompted either by their management or union leadership, or by some kind of investment "carrot" or "stick."

There can be high variation within this group, in terms of motivation to change and the mechanisms of change. For example, the Oklahoma City and Shreveport plants of GM are both relatively new, built in the late 1970s and early 1980s, and both began as nonunion plants with a "team concept" during GM's "Southern Strategy" years. Although both were quickly unionized, the team concept was retained at Shreveport and was reaffirmed in three referenda at the plant during the 1980s. Shreveport became an important model for plants considering teams within and outside of GM. At Oklahoma City, however, the team concept was thrown out as soon as the plant was unionized. Only in the late

1980s was a revised and renamed version of teams implemented at the plant, along with a variety of initiatives that helped the plant make the J.D. Power "Top 10" list for quality in 1991.

Chrysler's Newark and Sterling Heights plants also reflect two different approaches to bringing about new work practices. The Newark plant is one of six Chrysler plants (two are assembly plants) covered under an innovative collective bargaining contract known as the Modern Operating Agreement (MOA). Modeled on the team system at GM's Shreveport plant, the MOA consists of a consolidation of job classes, a pay-for-knowledge system, work teams, extensive training, and the removal of status barriers between managers and workers. It is overseen by elaborate joint governance arrangements, involving union and management representatives at both plant and corporate levels, and a crew of union and management MOA facilitators to support the program. For the Newark plant, voting in favor of the MOA was the quid pro quo required by Chrysler before it would commit to investing in retrofitting the plant for a new product line.[42]

The Sterling Heights plant, on the other hand, is not an MOA plant and is covered by a mostly traditional collective bargaining contract. However, management initiated what is known as a Progressive Operating Agreement (POA), involving greater flexibility in labor deployment (i.e., fewer classifications) but not team structures or new compensation schemes. Chrysler installed the POA after ascertaining that there was little chance of convincing the local union to adopt the MOA and no opportunity to apply the leverage of an investment decision.

Often the more a plant is forced to make changes toward a flexible, team-based model by the threat of plant closure or disinvestment, the greater the difficulty with implementation, because workers perceive the changes as concessions. Chrysler's Newark plant first voted down the MOA and only voted in favor when it became clear that the alternative was a plant shutdown. After the second favorable vote, implementation was very slow. GM's Van Nuys plant in California was intended to become the next "NUMMI" and GM arranged for many members of NUMMI to go there as advisors and trainers. But the vote on moving to the team concept was bitterly divided, and at the same time that employees approved it, they also elected a new president opposed to the team concept. The changes never took hold, and the Van Nuys plant was closed in the fall of 1992.

The diversity and decentralization of collective bargaining arrangements has posed challenges for both management and the union (Katz

1993). While management has spurred much of the diversity by taking advantage of opportunities to apply the leverage of investment decisions to different plants, the resulting mix of contract arrangements creates considerable administrative complexity. This is particularly true when national-level wage, benefit, seniority, and job security policies must be synchronized with local-level variation in such areas as pay-for-knowledge and classification consolidation.

For the UAW, the decentralization of collective bargaining makes it difficult to develop a unified national strategy with respect to management-initiated reforms. The potential for "whipsawing" is particularly distressing for the union during a period of plant closings. For example, when GM's December, 1992 announcement of several plant closings left unclear which of two plants making large rear-wheel-drive vehicles would be closed, each plant undertook a campaign to convince the company to keep them open. This implicit pressure for local concessions infuriated the UAW and seriously strained relations with GM, while also creating conflict between plants. Finally, the close interaction between decentralization in bargaining and movements away from traditional "job control" unionism creates special problems for union strategy.

From Job Control to Increased Worker Involvement in Business Decision-Making

The expansion of worker and union involvement and the introduction of team forms of work organization in some plants has led to significant movements away from the traditional job control orientation of shop floor labor relations. The earliest worker participation programs were the QWL programs at GM. QWL programs were initially conceived of as experimental efforts designed to address worker concerns with the work environment and the climate of the relationship between workers and supervisors. Yet, in response to the industry's decline, at corporate and local levels, the distinction between QWL activities and "normal collective bargaining" often disappeared. Rather, worker involvement became inextricably linked with other aspects of labor relations. In the process, labor and management took significant steps away from the traditional job control orientation, and thereby contributed further to the erosion of the old labor relations system.

Early corporate-level steps toward greater union involvement in decisions included the placement of Douglas Fraser, then President of the UAW, on the Chrysler Board of Directors; "mutual growth forums"

initiated at the Big Three where business decisions such as investment and outsourcing are discussed; and an informal exchange of information between national company and union officials. Joint (and often informal) activities underway at the local level include worker involvement in shop floor quality circles; local mutual growth forums analogous to national forums; and wide-ranging discussions between plant management and union officials concerning outsourcing, new technologies, quality, and production problems.

The range of worker participation now varies widely across plants.[43] In some plants a sizeable number of hourly workers participate regularly in quality circles or problem solving groups. A more extensive form of worker involvement occurs in the plants utilizing "team," "natural work group," or "modern operating" concepts. In these plants there are few and in some cases only a single, classification for production workers and often a "pay-for-knowledge" system which rewards workers for learning a wider variety of jobs. The teams or work groups receive advance warning regarding new technology and production plans, can voluntarily create job rotation schemes, and have input into the work area layout and production decisions. Informal dispute resolution mechanisms drive down the level of formal grievances. Often the introduction of teams has led to substantial reductions in the number of supervisors and a shift in the remaining supervisors' role toward that of a facilitator and coordinator.[44] At the same time, in some other plants labor-management relations are much as they were years ago.

The most extensive participatory labor-management relationship in the auto industry (and perhaps the most extensive anywhere) occurs at the Saturn Corporation. In July 1985, GM and the UAW reached agreement on the design of labor relations at Saturn. Saturn, a subsidiary of GM, is a complex of plants in Spring Hill, Tennessee, can now produce approximately 325,000 small cars a year. As this volume went to press, GM announced plans to place the Saturn unit in an expanded small-car group.[45]

The organizational structure of Saturn includes a number of committees, each of which includes worker or union representation (Rubenstein, Bennett, and Kochan 1993; Saturn Corporation 1985). At the shop floor level there are work units made up of 6 to 15 workers and a single production worker classification. Work units participate as a problem-solving group and make decisions concerning job assignments, job rotation, overtime, and recruitment.

Workers perform a variety of job tasks in their work area and also perform some of the planning and control tasks traditionally carried out by supervisors. At the top level of Saturn is a "strategic advisory committee" which engages in long-run business planning and includes the president of the UAW local union.

All employees of Saturn are paid on a salary basis. Currently production workers receive base wages that are 95% of the wage received by other GM auto workers and are eligible for a bonus based on how well training targets are met. This bonus has lifted Saturn worker earnings modestly above the earnings received by auto workers in other parts of GM. The intent is to expand the bonus to roughly 20% of the workers' earnings and shift the performance target to cost and quality objectives when Saturn is producing at full capacity.

Saturn sets out to provide a more permanent form of employment security for its work force than the traditional layoff system. Over the long run, 80% of the Saturn work force will be protected by a pledge that layoffs will not occur "except in situations arising from unforeseen or catastrophic events or severe economic conditions." The remaining 20% of the work force will be "associate members" and will not receive this protection. Issues such as the practical meaning of the employment security pledge and the mechanisms to be used to decide when a catastrophic event or severe economic conditions have occurred, have not yet been resolved.

There are two extremely novel aspects of shop floor industrial relations at Saturn. For one thing, the Saturn complex has no local seniority agreement. Thus, there is no formal role for seniority in matters such as job assignments, job bidding, overtime, and shift assignments. Most of these decisions are made informally by the work units (i.e., by workers themselves). Perhaps most revolutionary is the presence of union and management "partners" who co-manage decisions within the Saturn complex. Although the union does not have a formal place on the GM Board of Directors which makes the ultimate decisions concerning Saturn's investments, products, and pricing, the strong role played by union partners at Saturn gives the union a level of involvement in decision making that is unparalleled in contemporary American industrial relations.

Internal Union Debates

There have been heated debates inside the UAW and the auto work force concerning the virtues and effectiveness of worker and union

involvement processes. Often these debates occur informally, in some cases they are triggered by specific events occurring at a plant such as a local contractual dispute or contract renegotiation. In the 1980s, the New Directions Movement emerged as an important organization that opposed the joint programs underway in the Big Three. Some candidates in the various elections occurring at the plant level identify themselves as part of this "movement." In addition, the leader of the movement, Jerry Tucker, has run for executive offices in the UAW under the heated opposition of the administrative caucus (the "party" that has dominated the internal affairs of the UAW since the rise of Walter Reuther). Tucker was soundly defeated in his 1992 bid to unseat Owen Bieber as President of the UAW, yet New Directions candidates have been more successful in a number of local UAW elections.[16]

Although the New Directions Movement represents the most formal and effective opposition to the administrative caucus that has surfaced in the UAW over the last twenty years, it is important to keep in mind that the UAW has a long tradition of democratic politics in its many local unions. The intensity of debates at the plant level may well have increased in recent years in the face of economic pressures and alternative restructuring methods, but this debate builds on longstanding traditions.

Debates inside the UAW about new work practices are exacerbated by the wide variation occurring in the form and consequences of new practices. The content and meaning of teams, for example, varies significantly across plants and at some plants, even across work groups. Teams at NUMMI, for instance, exhibit a "Japanese" orientation with their emphasis on standardized job assignments, continuous improvement, and a relatively strong role for supervisors. At some other plants, including Saturn, work teams are linked to the broadening of worker roles and worker autonomy. As a result, the UAW is under pressure to formulate positions toward teams and joint processes in the midst of wide experimentation and ambiguities in the new work practices.

While developments in Canada are largely beyond the scope of this chapter (see Kumar and Meltz [1992] for an overview), it is worth noting that the Canadian Auto Workers (CAW) has taken positions similar to New Directions on work restructuring and developed them into an "active opposition" strategy for dealing with the Big Three and the one Canadian unionized transplant (CAMI) (Kumar and Holmes 1994).

In the case of CAMI, the CAW carried out a longitudinal research study of worker attitudes after the plant opened and detected a steady

decline in worker support for key provisions of lean production (Robertson, Rinehart, and Huxley 1992). This culminated in a strike of CAMI by the CAW in the fall of 1992, partly over an economic issue involving wage parity with other Canadian plants, but also over various concerns about lean production as implemented at the plant, most prominently a demand that team leaders be elected rather than appointed. The contract settling the strike includes provisions establishing crews of relief workers, constraints on the use of *kaizen* to change production processes without a review of staffing requirements with the union, election and recall procedures for team leaders, and other language restricting management flexibility in allocating labor. It is not yet clear how the CAW position on lean production—limiting certain practices while attempting to seize control of new work structures such as teams that can increase worker power in the production process—will influence the UAW position at the unionized transplants and at Saturn.

A Look to the Future

Currently labor and management in the auto assembly sector (and more generally in U.S. industrial relations) confront a choice regarding how to adjust industrial relations in the face of many environmental pressures. The interconnected nature of the auto (and any) labor relations system constrains the range of alternatives facing the parties. The auto assembly sector remains so interesting because it so starkly illustrates those choices.

On the one side stands the participatory approach represented by Saturn and the many other auto plants that have expanded worker and union involvement. A key step in this participatory direction are the elaborate joint programs coordinated at the corporate and national union levels in the Big Three, with the joint programs between Ford and the UAW standing out as an exemplar case (Ferman et al 1991). In the participatory approach, training programs are used to redeploy the work force which along with the reorganization of work and participatory processes help bring work back into Big Three plants.

The decentralization underway within the structure of collective bargaining and the expansion of Japanese transplants give local labor and management more flexibility than ever to promote a participatory approach if they so choose. In this sense, Saturn and the transplants have had a powerful "demonstration effect" in raising awareness of the viability of this participatory route.

At the same time, there are some within the ranks of both labor and management who would prefer to continue traditional approaches. These individuals either prefer the old system or doubt the efficacy of participation. The option here is to make small incremental changes in collective bargaining practices rather than bold reforms. Recent events involving GM and the UAW illustrate this approach. In the face of the cutbacks in GM plant capacity and employment, GM management and the GM department of the UAW agreed to provide more extensive early retirement benefits hoping that this would ease the tensions associated with the downsizing of the corporation. Fitting with an incremental approach, contracts in 1987, 1990, and 1993 substituted lump sum payments for previous annual improvement pay increases, but kept the profit-sharing segment only as a small component of the total pay package. Contracts negotiated at the Big Three in 1993 extended this approach by providing further income and job security programs functioning as severance payments to permanently laid off workers.

Another manifestation of this conservative path is found in resistance to the diffusion of "special case" collective bargaining agreements to a broader number of plants. The UAW leadership, while still accepting the Saturn and NUMMI pacts, has made it clear that they do not regard these pacts as a precedent to be followed by other plants and at times, has even expressed doubts regarding the value of those agreements. Many managers at Big Three plants also have been cautious and/or skeptical about the value of changing toward these new models, given the threat they pose to traditional roles.

Militants within either the work force or the UAW prefer to aggressively resist the downsizing of the Big Three by trying to limit the companies' ability to close plants and lay off workers. The New Directions movement supports this approach. Although it is not exactly clear how the militants could gain the job security they seek, at least a militant program in the years ahead could extend New Directions' opposition to joint programs.

The management counterpart to this militant strategy would promote the further outsourcing of production and seek further contractual pay and work rule concessions. In this strategy, at some point, management at the Big Three might seek to emulate their Japanese counterparts and operate on a nonunion basis by trying to win a strike with the UAW through the hiring of permanent striker replacements.

As one speculates about the form and likelihood of success for any of these strategies, it is clear that the choices made by labor and management

influence one another. In the Big Three, a participatory approach by the union, for example, is unlikely to succeed in the face of managerial efforts to go nonunion. Likewise, managerial efforts to promote participatory restructuring are unlikely to progress where the union (or the work force) pursue a militant agenda.

The parties face choices in how they respond to the options before them and consequentially our predictive powers are limited. At the same time, it does appear that militancy (and possibly complacent acceptance of the status quo) by either side could override any interest in the other side to participatory restructuring. It seems clear that if participation is to become the centerpiece of auto assembly industrial relations in any of the Big Three, then both labor and management will have to promote this strategy more forcefully than they have in the recent past. At the time of the writing of this chapter, the rebound of sales and profits at the Big Three makes a conservative approach—including incremental changes in collective bargaining practices—a more likely outcome in the near term.

The Japanese transplants, while primarily utilizing practices common to Japanese auto plants (i.e., work teams with job rotation and standardized job assignments), have evolved toward a hybrid mixture including some practices typical of American auto plants (i.e., wage rates tied to jobs, no rotating shift schedule, election rather than appointment of team leaders), and some new practices (i.e., the peer review discharge procedure used at Honda). It remains to be seen if major modifications occur within the transplants' practices as the work forces in these plants age and the plants confront the periodic severe downturns common in the American auto market. The variation among the transplants may also increase over time. The unionized transplants may move toward a different hybrid model than the nonunion ones, and the transplants of the smaller Japanese companies may face more difficulties coping with the turbulence in the competitive environment as compared to the plants of Toyota, Honda, and Nissan who can rely on more substantial corporate resources.

The UAW is certain to focus sizeable future resources and energy around the unionization of the transplants, even in the face of the limited returns they have to date received from those efforts. The nonunion BMW and Mercedes-Benz plants that will open in South Carolina and Alabama, respectively, in 1996-97 will presumably also be targets for organizing. The success of these organizing efforts in turn is likely to be

influenced by the image projected by the UAW and the union's decisions concerning the strategic choices discussed above. In this way, the fate of industrial relations at the Big Three and the Japanese (and now German) transplants may become closely intertwined. The results of the UAW's organizing efforts also will have significant ramifications for the auto parts sector and for the American labor movement overall, given the traditional interindustry pattern-setting role of the UAW.

Whatever strategies labor and management choose at the Big Three and the Japanese transplants, the central role played by industrial relations in the future of the auto assembly sector is likely to persist. Indeed, the dynamics of industrial relations in the next five years may be the most important influence on the three central issues confronting the industry—the competitive success of the Big Three in relation to Japanese rivals, the extent to which the Japanese transplants evolve away from the "lean production" model as practiced in Japan, and the degree to which the UAW articulates a clear strategy toward industry restructuring and new production methods.[47]

Endnotes

[1] Thirty-and-out pensions provide that a worker can retire and receive pension benefits after 30 years of service regardless of age.

[2] For an analysis of the internal political operation of the UAW, see Steiber (1962).

[3] For lively accounts of the early history of the UAW, see Reuther (1976) and Howe and Widick (1949). An interesting account of the UAW during World War II is provided in Lichtenstein (1982).

[4] Womack, Jones, and Roos (1990). Ford was by far the most vertically integrated of the Big Three early in the century, approaching 100% in the heyday of the Rouge complex. However, it reduced this level to about 50% after World War II and then to 40% during the 1980s.

[5] The Flat Rock plant, which opened in 1987, was initially owned 100% by Mazda. However, Ford has had an important relationship with the plant from the start: Ford owns 25% of Mazda, provided the land from a former foundry for the new plant, was instrumental in arranging Mazda's pre-launch recognition of the UAW, and purchases up to half of the plant's output, badged as Ford products. In 1992, when Mazda was faced with an extreme financial crunch, it sold half of the plant to Ford, and AutoAlliance Inc. was formed. In a reversal of the Ford-Mazda arrangement, Chrysler and Mitsubishi owned the Diamond-Star plant jointly from the time it opened in 1989, but in 1992 Chrysler sold its share back to Mitsubishi to raise cash. Thus the Diamond-Star plant is the only wholly owned Japanese plant to be unionized.

[6] Although we cover only U.S. plants here, there are four transplants (three Japanese and one Korean) in Canada as well: a GM-Suzuki joint venture known as CAMI, which has union representation through the CAW; a Honda plant in Alliston, Ontario; a Toyota plant in Cambridge, Ontario; and a Hyundai plant in Bromont, Quebec. The latter three plants are all nonunion.

[7] These are 1986 estimates, but the degree of vertical integration has changed little at Japanese companies in recent years. See Nishiguchi (1994).

[8] There is no universally accepted definition of local content, but the most common formulation was developed by the Environmental Protection Agency in the late 1970s. It calculates "domestic content" as the declared value of imported components divided by the average dealer wholesale price of the vehicle, subtracted from 100; by this measure, labor costs, advertising costs, and other "local" expenditures are included. Both American and Canadian parts are considered "domestic," under terms of the U.S.-Canada Auto Pact of 1965. On this basis, the average domestic content for the Big Three is 89% and for the transplants is 57%, with Honda of America Manufacturing, the first transplant operation, at a level of 68%; both Honda and Toyota have set targets of 75% domestic content within the next few years. Critics of the transplants use measures that attempt to evaluate the value of domestic parts directly and exclude other costs, and derive a lower "domestic content" estimate for the transplants of 48% (Economic Strategy Institute 1992).

[9] At this time, the U.S. and Japanese governments established the Voluntary Reduction Act (VRA) agreement to keep Japanese automotive imports at this level.

[10] The year 1992 was somewhat better for the Big Three, with automotive business losses of $1.5 billion at GM, $0.4 billion at Ford, and a profit at Chrysler of $0.7 billion. These gains from the low point of 1991 were overshadowed, however, by GM and Ford's decision to adopt new accounting standards requiring that pension liabilities be fully reflected on the company's books. As a result, they reported historic losses: $7.4 billion at Ford and $23 billion at GM. Chrysler adopted this accounting standard in 1993.

[11] Chrysler's 1993 operating profit of $2.4 billion was offset by adoption of the new accounting standards on pensions that were adopted by GM and Ford in 1992. With this charge, Chrysler reported a loss of $2.55 billion in 1993.

[12] We were not able to identify official Big Three employment or UAW membership statistics. The figures cited in the chapter are from unpublished UAW series, various years.

[13] The coproduction arrangements created in the assembly sector also have a broader impact on the competitive environment, as companies join in the exchange of parts, joint product development, or collaborative R&D projects.

[14] These factors are also apparent in some new coproduction arrangements, not involving joint ownership, in which U.S.-owned and managed plants build niche vehicles for Japanese companies. For example, in the early 1990s, Ford-owned and managed plants in Avon Lake, Ohio and Louisville, Kentucky began to manufacture vehicles for sale under Nissan and Mazda badges, respectively. While there is no direct management role for Nissan or Mazda, these plants (and the Ford plants in

Wayne, Michigan and Hermosillo, Mexico that make Mazda-designed Escorts) are more likely to implement Japanese-style work organization policies (e.g., teams, reduced job classifications) than other Ford plants.

[15] See Joel Çutcher-Gershenfeld and Patrick McHugh's chapter on the auto parts sector in this volume.

[16] An illustration of this leverage came in the summer of 1992 when a strike at GM-owned parts plants in Lordstown, Ohio forced the Saturn plant in Tennessee to stop production of its hot-selling new product. While this accelerated the settlement of the strike on terms favorable to the local union, it also prompted public criticism of the strike by the president of the Saturn local union. It is not yet clear what lessons are being drawn from this experience by both parties. GM may decide to boost its inventory buffers to avoid a recurrence or may work harder to avoid future strike activity. The UAW may use this leverage in more local disputes or may pressure locals to avoid such action for the sake of GM's overall financial health.

[17] This research used a methodology for productivity that adjusts for differences in vertical integration, product size, option content, and absenteeism in order to ensure comparability across plants. Quality data are derived from J.D. Power's Initial Quality Survey, adjusted to include only those defects that the assembly plant has some control over. The average labor productivity for the Japanese transplants was 20.9 hours per vehicle, compared with 16.8 hours per vehicle for Japanese plants in Japan and 24.9 hours per vehicle for Big Three plants in the U.S. For quality, the transplant performance, at 54.7 defects per 100 vehicles, was virtually equivalent to plants in Japan, at 42.1 plants per 100 vehicles, and substantially better than the Big Three plants at 78.4 defects per 100 vehicles.

[18] Williams and Haslam claim that performance differentials observed in the MIT Assembly Plant Study are not valid because such plant-level comparisons cannot be made accurately. However, their own case rests on shaky empirical evidence, including national industry data that includes both car and truck producers as well as suppliers, and company data that is unadjusted for vertical integration, among other problems.

[19] These issues were the focus of a conference in May 1993 at Wayne State University, entitled "Lean Production and Labor: Critical and Comparative Perspectives," proceedings forthcoming.

[20] The impact of programmable technologies on plant performance with respect to cost, quality, and variety appears to vary substantially based on the prevailing approach to organizing the production systems. Jaikumar (1986) notes the tendency for U.S. metalworking plants to use Flexible Manufacturing System (FMS) technology primarily for a small number of high-volume parts, both because of a legacy of large-batch mass production and in order to meet return-on-investment criteria. Japanese and German plants used the same technology to make many more parts in low-volume runs. The MIT Assembly Plant Study also revealed a difference in the relationship between the level of automation and labor productivity at plants with different production systems. A large subset of "high-tech" plants with relatively traditional mass production systems (including several Big Three plants) have much lower levels of performance on average—36% more hours per vehicle and 61% more

defects per 100 vehicles—than the plants that combine lean production methods with high levels of automation.

[21] See Piore and Sabel (1984) for a more elaborate discussion of how macroeconomic and structural changes in the world economy have increased the need for flexibility on the shop floor.

[22] The Japanese use of just-in-time inventories appeared to lower inventory costs and the Japanese *nenko* pay system with fewer job classifications and fewer links between specific job duties and pay seemed to contribute to lower production costs. For further description of labor relations and work organization practices in the Japanese auto industry see Cole (1971, 1979).

[23] In fact, even in the late 1970s and early 1980s, Japanese companies produced quite high levels of product variety for their *domestic market*, and that capability has facilitated their move into new market segments for larger, more option-laden (and higher margin) vehicles.

[24] Data from the MIT Assembly Plant Study suggests that Japanese "lean production" plants are able to absorb relatively high levels of product variety without any adverse impact on cost and quality, in contrast with U.S. and European mass production plants (MacDuffie, Sethuraman, and Fisher 1993).

[25] The few efforts of the American companies to produce niche vehicles at low volumes were relatively unsuccessful (e.g., the Fiero and the Reatta at GM). These failures may have had more to do with product design than with manufacturing cost and quality, but they did have the effect of curtailing support among the Big Three for moving very far toward a more flexible form of production system.

[26] Product variety trends at other plants are mixed. Most Japanese companies, in their plants in Japan, are also now reducing product variety, particularly in terms of the number of model variants and major options (e.g., engine/transmission combinations) offered for a given platform. The Japanese transplants, on the other hand, have tended to start their operations with very low complexity and then to add more models, more body styles, and more options over time.

[27] For example, central to General Motors' current drive to regain profitability is a steady cutback in platforms and product variants. The number of car platforms will be reduced to five and the number of product development teams to just three. Models are being trimmed from 144 in 1991 to 126 in 1992 and 117 in 1993 (*Automotive News*, May 17, 1993). Ford has also revived the "world car" strategy with a new product jointly developed between the U.S. and Europe known as the Mondeo, launched in Europe in March 1993 and replacing the Tempo/Topaz line in the U.S. for the 1994 model year. Unlike the Escort of the early 1980s, where the European and American versions shared almost no parts due to rivalries between design groups and different market requirements, the two versions of the Mondeo are said to share 70% to 80% of their parts. It remains to be seen whether this design achievement makes the "world car" strategy more feasible this time around.

[28] Another reason for this locational clustering is population movements which make this location a convenient distribution point.

[29] See Chris Erickson's chapter in this volume for a discussion of the relationship between auto and agricultural implement collective bargaining settlements.

[30] The history of wage setting in the U.S. auto industry is discussed in more detail in Harbison (1950), Reder (1949), Ross (1949), and Katz (1985).

[31] A chronology of postwar bargaining in the U.S. auto industry is in Bureau of National Affairs (various years) and U.S. Department of Labor (1969).

[32] Job control unionism is not synonymous with business unionism. The latter refers to the political philosophy of the labor movement. There are labor movements such as the Japanese that could be characterized as business unionist but not job control oriented.

[33] The wide diversity in shop floor relations is revealed by the variation in plant-level industrial relations performance indicators from two GM divisions. See Katz (1985: Chapter 5).

[34] See Katz (1985, 1988) for descriptions of early and mid-1980s bargaining.

[35] Assembler hourly wages at Ford were nearly identical to those at GM, while earnings at Chrysler were lower in the early and mid-1980s due to the special concessions described above. Skilled trades workers (such as tool and die makers and electricians) earned base hourly wages that were approximately 18% higher than the earnings of auto assemblers over the 1980s.

[36] See Katz and Meltz (1991).

[37] Note, the 1993 profit-sharing payout at Chrysler was the highest ever received by hourly workers at the Big Three. Profit-sharing bonuses were also very large for executives at Ford and Chrysler in 1993. In 1993, 200 Chrysler executives received bonuses that amounted to 100% of their annual salaries (Lavin 1994).

[38] These and other job and income security programs are described more fully in Katz (1985, 1988).

[39] The transplants, both union and nonunion, typically pay wages that are close to Big Three levels. However, the transplants have pension, medical care, and other fringe benefits that differ substantially from the benefits provided at the Big Three (the transplants often provide lower benefits) and from one another, often based on local labor market conditions.

[40] These are often relatively new plants where no major technological upgrading is needed to remain relatively viable economically, but can include old plants where a popular product allows a continuation of the status quo. Included in this category would be plants such as Chrysler's St. Louis #2 minivan plant, GM's Lake Orion plant making the Cadillac DeVille, and Ford's Chicago plant making the Taurus/Sable. According to Kumar and Meltz (1992), many Canadian plants of the Big Three also fit into this category.

[41] Included in this category would be plants such as NUMMI, where the same work force and union officials returned to an old GM facility under Toyota management (albeit after a two-year shutdown and a rehiring process that screened out some of the old employees); the Ford plant in Wayne, Michigan which, while closed

to prepare for producing the new Escort, introduced a new contract to implement a team system in part of the plant, while retaining a traditional contract for the rest of the plant; the Ford plant in Avon Lake, Ohio, which introduced a new contract with flexible work practices during the shutdown period before production of the new Ford-Nissan jointly designed minivan; and the Jefferson North plant of Chrysler, a new plant built to produce a new Jeep model but retaining the work force from the old Jefferson East plant which had been torn down.

[42] An account of the evolution of Chrysler's MOA plants by a research team from MIT and George Washington University, prepared initially for Chrysler and the UAW, will soon be released in abridged form by the Department of Labor.

[43] Evaluation of the impact of work restructuring on plant-level industrial relations and economic performance is provided in Katz, Kochan and Keefe (1987) and Katz, Kochan and Gobeille (1983).

[44] The role of supervisors does vary substantially even across sites that have introduced some sort of team system. As described below, at Saturn UAW members take on most of the responsibilities performed traditionally by supervisors while at NUMMI and some other sites relatively strong supervisory roles persist.

[45] The innovative contract at Saturn and where any additional Saturn assembly plant should be located has been the source of much controversy within the UAW at times exacerbating the tension that exists between the president of the UAW local union at Saturn (Michael Bennett) and Stephen Yokich, the head of the GM department of the UAW (see *Daily Labor Reports* 1994a).

[46] A chronology of the conflict between the New Directions Movement and the Administrative Caucus is provided in Katz and Kochan (1992:159).

[47] Further thoughts on the implications of lean production for workers and unions can be found in MacDuffie (1994b).

References

Adler, Paul. Forthcoming. "The 'Learning Bureaucracy': New United Motor Manufacturing, Inc." In B.M. Staw and L.L. Cummings, eds. *Research in Organizational Behavior*, Greenwich, CT: JAI Press.

Altshuler, Alan et al. 1984. *The Future of the Automobile*. Cambridge: MIT Press.

Babson, Steve. 1993. "Lean or Mean: Lean Production at Mazda," *Labor Studies Journal*, Vol. 18, no. 2 (Summer).

BNA (Bureau of National Affairs). 1980. "Ford Motor, EEOC Settle Nationwide Job Bias Action." *Daily Labor Report*, November 25, A-3, A-4.

_____. 1982a. "Auto Workers Held Entitled to Enforcement of Neutrality Pact with Dana Corporation." *Daily Labor Report*, June 8, A-3, A-4.

_____. 1982b. "General Motors Accepts Union Proposal to Pass Labor Costs Savings to Consumers." *Daily Labor Report*, January 12, A-11.

_____. 1983a. "Autoworkers Accept New Contract at Dana as Parties Sever Link with Auto Pattern." *Daily Labor Report*, December 12, A-1.

_____. 1983b. "EEOC, General Motors Sign $42 Million Agreement to Settle 10-Year-Old Charge." *Daily Labor Report*, October 10, A-3-A-5.

_____. Various years. Collective Bargaining Negotiations and Contracts: Wage Patterns. Washington, DC.

Brown, Clair, and Michael Reich. 1989. "When Does Union-Management Cooperation Work? A Look at NUMMI and GM-Van Nuys," *California Management Review*, Vol. 31, No. 4.

Budd, John W. 1992. "The Determinants and Extent of UAW Pattern Bargaining." *Industrial and Labor Relations Review*, Vol. 45, no. 3 (April), pp. 523-39.

CAW. 1993. *Work Reorganization: Responding to Lean Production*. North York, Ontario: The Canadian Auto Workers Union.

Cole, Robert E. 1979. *Work, Mobility and Participation*, Berkeley and Los Angeles: University of California Press.

_____. 1971. *Japanese Blue Collar*, Berkeley and Los Angeles: University of California Press.

Daily Labor Report. 1994a. "UAW Leaders Agree Saturn Must Expand Despite Problems With Current Contract," January 13, pp. A-7 and 8.

_____. 1994b. "UAW Accepts Local Agreement At Truck Plant," January 19, pp. A-17 and 18.

Economic Strategy Institute. 1992. "The Future of the Auto Industry: It Can Compete, Can It Survive?," Washington, DC.

Ferman, Louis A., et al. 1991. *Joint Training Programs: A Union-Management Approach to Preparing Workers for the Future*. Ithaca, New York: ILR Press.

Florida, Richard, and Martin Kenney. 1993. *Beyond Mass Production: The Japanese System and Its Transfer to the U.S.* New York: Oxford University Press.

Fucini, Joseph, and Suzy Fucini. 1990. *Working for the Japanese: Inside Mazda's American Auto Plant*. New York: Free Press.

Gelsanliter, David. 1990. *Jump Start: Japan Comes to the Heartland*. New York: Farrar, Straus, Giroux.

Haimsen, Joshua. 1992. "Just-In-Time, Supplier Proximity, and Productivity in the U.S. Auto Industry." Working paper, IMVP, MIT, Cambridge, MA.

Harbison, Fredrick H. 1950. "The General Motors-United Auto Workers Agreement of 1950." *Journal of Political Economy* Vol. 58 (October), pp. 397-411.

Howe, Irving, and B.J. Widick. 1949. *The UAW and Walter Reuther*. New York: Random House.

Jaikumar, Ramchandran. 1986. "Post-Industrial Manufacturing," *Harvard Business Review* (Nov.-Dec.), pp. 69-76.

Katz, Harry C. 1985. *Shifting Gears: Changing Labor Relations in the U.S. Automobile Industry*. Cambridge, MA: MIT Press.

_____. 1988. "Automobiles." In D. Lipsky and C. Donn, eds., *Collective Bargaining in American Industry*. Lexington, MA: D.C. Heath, pp. 13-54.

_____. 1993. "The Decentralization of Collective Bargaining: A Literature Review and Comparative Analysis." *Industrial and Labor Relations Review*, Vol. 47, no. 1 (October), pp. 3-22.

Katz, Harry C., and Thomas A. Kochan. 1992. *An Introduction to Collective Bargaining and Industrial Relations*. New York: McGraw-Hill.

Katz, Harry C., Thomas A. Kochan, and Kenneth R. Gobeille. 1983. "Industrial Relations Performance, Economic Performance, and QWL Programs: An Interplant Analysis." *Industrial and Labor Relations Review*, Vol. 37, no. 1 (October), pp. 3-17.

Katz, Harry C., Thomas A. Kochan, and Jeffrey H. Keefe. 1987. "Industrial Relations Performance and Productivity in the U.S. Automobile Industry." *Brookings Papers on Economic Activity*, Vol. 3, pp. 685-715.

Katz, Harry C., and Noah Meltz. 1991. "Profit Sharing and Auto Workers' Earnings: The United States vs. Canada," *Relations Industrielles*, Vol. 42, No. 3, pp. 513-530.

Katz, Harry C. and Charles F. Sabel. 1985. "Industrial Relations and Industrial Adjustment in the Car Industry," *Industrial Relations*, Vol. 24 (Fall), pp. 295-315.

Krafcik, John F. 1986. "Learning from NUMMI." Working paper, IMVP, MIT.

Krafcik, John F., and J.P. MacDuffie. 1989. "Explaining High Performance Manufacturing: The International Assembly Plant Study." Working paper, IMVP, MIT.

Kumar, Pradeep, and Noah Meltz. 1992. "Industrial Relations in the Canadian Automobile Industry." In R. Chaykowski and A. Verma, eds., *Industrial Relations in Canadian Industry*. Toronto: Dryden.

Kumar, Pradeep, and John Holmes. Forthcoming. "Change, But in What Direction? Divergent Union Responses to Work Restructuring in the Integrated North American Auto Industry." In F. Deyo, ed., *Global Capital, Local Labour*. London: Macmillan.

Lavin, Douglas. 1994. "Chrysler Aides To Get Bonuses Equal to Salaries," *Wall Street Journal*, p. A-3.

Lichtenstein, Nelson. 1982. *Labor's War at Home*. London: Cambridge University Press.

MacDuffie, John Paul. Forthcoming. "Human Resource Bundles and Manufacturing Performance: Flexible Production Systems in the World Auto Industry." *Industrial and Labor Relations Review*.

_____. 1994b. "Workers' Roles in Lean Production: The Implications for Worker Representation," forthcoming in volume of papers from "Lean Production and Labor: Critical Perspectives" conference at Wayne State University, May 1993.

_____. 1991. "Beyond Mass Production: Flexible Production Systems and Manufacturing Performance in the World Auto Industry." Ph.D. dissertation, Sloan School of Management, MIT.

MacDuffie, John Paul, and John F. Krafcik. 1992. "Integrating Technology and Human Resources for High Performance Manufacturing: Evidence from the World Auto Industry." In T.A. Kochan and M. Useem, eds., *Transforming Organizations*. New York: Oxford University Press.

MacDuffie, John Paul, K. Sethuraman, and M.L. Fisher. 1994. "Product Variety and Manufacturing Performance: Evidence from the International Automotive Assembly Plant Study," under revision at *Management Science*.

Nishiguchi, Toshihiro. 1994. *Strategic Industrial Sourcing: The Japanese Advantage*. New York: Oxford University Press.

Parker, Mike, and Jane Slaughter. 1988. *Choosing Sides: Unions and the Team Concept*. Boston: South End Press.

Piore, Michael J. 1982. "American Labor and the Industrial Crisis." *Challenge* 25 (March-April), pp. 5-11.

Piore, Michael J., and Charles F. Sabel. 1984. *The Second Industrial Divide*. New York: Basic Books.

Reder, Melvin W. 1949. "The Structure of the 1948 General Motors Agreement." *Review of Economics and Statistics* Vol. 31 (February), pp. 7-14.

Reuther, Victor G. 1976. *The Brothers Reuther and the Story of the UAW: A Memoir*. Boston: Houghton Mifflin.

Robertson, David, et al. 1993. *The CAMI Report: Lean Production in a Unionized Auto Plant*. North York, Ontario: CAW-Canada Research Department.

Robertson, David, James Rinehart, and Christopher Huxley. 1992. "Team Concept and Kaizen: Japanese Production Management in a Unionized Canadian Auto Plant." *Studies in Political Economy* Vol. 39 (Autumn), pp. 77-107.

Ross, Arthur M. 1949. The General Motors Wage Agreement of 1948. *Review of Economic and Statistics* Vol. 31 (February), pp. 1-7.

Rubenstein, Saul, Michael Bennett, and Thomas A. Kochan. 1993. "The Saturn Partnership: Co-Management and the Reinvention of the Local Union." In B. Kaufman and M. Kleiner, eds., *Employee Representation: Alternatives and Future Directions*. Madison, WI: Industrial Relations Research Association.

Shimada, Haruo, and John Paul MacDuffie. 1987. "Industrial Relations and 'Humanware': Japanese Investments in Automobile Manufacturing in the United States," Working paper, Sloan School of Management, MIT.

Stieber, Jack. 1962. *Governing the UAW*. New York: Wiley.

Templin, Neil, and Joseph B. White. 1994. "GM to Add Truck Capacity; Union Says Firm Dropped Plans to Slash 1,200 Jobs," *Wall Street Journal*, February 16, p. A-4.

U.S. Department of Labor, Bureau of Labor Statistics. 1969. "Wage Chronology—General Motors Corporation, 1939-68." Bulletin 1532. Washington, DC: GPO.

Womack, James P., Dan Jones, and Dan Roos. 1990. *The Machine that Changed the World*, Rawson Associates, New York.