

# Economic and Industrial Democracy

<http://eid.sagepub.com/>

---

## **Industrial Relations and Industrial Change: The Restructuring of the World Automobile Industry in the 1970s and 1980s**

Wolfgang Streeck

*Economic and Industrial Democracy* 1987 8: 437

DOI: 10.1177/0143831X8784002

The online version of this article can be found at:

<http://eid.sagepub.com/content/8/4/437>

---

Published by:



<http://www.sagepublications.com>

On behalf of:

Department of Economic History, Uppsala University, Sweden

**Additional services and information for *Economic and Industrial Democracy* can be  
found at:**

**Email Alerts:** <http://eid.sagepub.com/cgi/alerts>

**Subscriptions:** <http://eid.sagepub.com/subscriptions>

**Reprints:** <http://www.sagepub.com/journalsReprints.nav>

**Permissions:** <http://www.sagepub.com/journalsPermissions.nav>

**Citations:** <http://eid.sagepub.com/content/8/4/437.refs.html>

# Industrial Relations and Industrial Change: the Restructuring of the World Automobile Industry in the 1970s and 1980s

---

Wolfgang Streeck

Wissenschaftszentrum, Berlin

The paper discusses differences in industrial relations systems between the 'winners' and 'losers' of the auto industry's restructuring period in the 1970s and 1980s. It describes a set of sometimes counter-intuitive relationships between economic success in turbulent markets, product strategies, the use of modern technology, work organization, industrial relations 'rigidities', and patterns of skills and skill generation. Arguing that specific institutional constraints imposed by industrial relations may induce and, indeed, compel managements and firms to exploit new economic opportunities, the paper urges students of industrial relations to define their subject more broadly and, in particular, not to exclude central issues such as economic efficiency and competitiveness from their concerns.

By the early 1970s, the prospects for the motor industry in the old producer countries of Western Europe and North America had begun to look extremely inauspicious.<sup>1</sup> A number of factors, each threatening enough by itself, had coincided (Altshuler et al., 1984: 1ff). Domestic markets had for some time been showing signs of saturation. The first 'oil shock' of 1973–4 brought energy shortages and higher petrol prices, resulting in a need for substantial investment in fuel economy, and the ensuing general economic crisis was bound to reduce purchasing power and depress further the demand for new cars. The breakdown of the Bretton Woods agreement and of its benevolent international trade regime added to the uncertainty of an industry heavily dependent, in most countries, on foreign markets. As if this had not yet been enough, the Japanese, with their superior production system and with products of unmatched price and quality

---

*Economic and Industrial Democracy* (SAGE, London, Newbury Park, Beverly Hills and New Delhi), Vol. 8 (1987), 437–462.

that uniquely suited the changed consumer preferences, were beginning to mount their export offensive, and lurking over the horizon were the newly developing countries with their huge supply of cheap labour. Not least, the surge of worker militancy in the late 1960s throughout the Western world had increased the industry's wage bill, challenged managerial authority, and articulated a lingering deep resentment against the Taylorist work organization of traditional mass manufacturing.

Little more than a decade later, the gloomy predictions of an inevitable decline and gradual disappearance of one of the key industries of Western economies, so popular in their time, have themselves become history. World-wide production of passenger cars has increased. Far from saturation, the domestic markets of the traditional producers today absorb as many or more new cars than in 1973. The energy problem turned out to be less dramatic than it had appeared, and it was in any case considerably eased by technical innovations cutting, in the case of the United States, average fuel consumption of new cars by about one half (Altshuler et al., 1984: 51). Japanese competition was countered with a wave of product and process innovations in what had been seen before as a mature mass-production industry. A spectacular restructuring effort went under way, involving unprecedented levels of investment. New methods of supply management and work organization were introduced, relations between suppliers and assemblers were reorganized and a number of joint ventures were established both among Western producers and with Japanese firms. While in the process several large firms verged on the brink of collapse (VW, Chrysler, BL, Fiat, Peugeot-Citroën), by the mid-1980s they had again, with a little help from their political friends, become more or less profitable. On the whole, the response of the Western car industry to the challenges of the 1970s and 1980s was remarkably successful and is certainly far from lending support to speculations about an imminent 'end of industrial society'.

Some, of course, fared better than others. As the motor industry is perhaps the most important provider of manufacturing jobs in large industrial countries, employment figures offer a valid measure of comparative success. Total employment in the five traditional European producer countries — France, Italy, Sweden, the United Kingdom and West Germany — does not seem to have declined much since the early 1970s (Streeck and Hoff, 1983). This is in itself worth noting in the light of earlier predictions of a massive

employment shift to newly industrializing countries, expected from a supposedly easy transfer of a 'mature' production technology under a multinational 'world car' strategy. Within Europe, however, the balance of employment changed. Italy and, in particular, the United Kingdom had to take dramatic employment cuts in the late 1970s and early 1980s, and France followed suit a short time later. Employment in Sweden, on the other hand, increased during the crisis, and the same holds for West Germany (Streeck and Hoff, 1983). The West German case is particularly interesting since employment, in a decade of 'micro electronic revolution', has been growing for several consecutive years, with an increase of 20,000 between 1984 and 1985 to a total of 689,000 (IG Metall, 1985) which is well above the pre-crisis peak of 1971. Part of the recent employment growth is attributed, by the union at least, to the reduction of working hours to 38.5 per week following the strike in 1984 (IG Metall, 1985: 6). While this may or may not be justified, it is worth noting in itself that the strike, longer and more embittered than any other in the last twenty-five years, had certainly done nothing to weaken the industry's employment performance.

Employment winners and employment losers differ on a number of economic characteristics. Sweden and West Germany have been, and have remained, strong exporters; the former selling two-thirds and the latter more than half of total production abroad. Italian exports have always been much lower, at around one-third throughout the 1970s and 1980s (1983: 35 percent). The British export share in 1970 was about 40 percent and declined to 27 percent in 1983. Industries with a history of intensive world market exposure were obviously better equipped to survive in the more competitive environment of the restructuring phase than industries that had mainly served their domestic markets. The same applies to the United States whose export share has always been negligible.

Export performance and product strategy are closely related. The two Swedish manufacturers are specialists producing not a full range of models but concentrating on a comparatively secure niche in the world market for expensive high quality and high performance cars. Their market was largely unaffected by the crisis and has as yet remained unchallenged by the Japanese. During the restructuring period, Swedish producers kept to their traditional strategy of low volume, high margin production, cutting out smaller product lines, increasing steadily the value added per unit, and thereby adding employment even in years when the number of cars built declined

(Streeck and Hoff, 1983). In Germany, Daimler-Benz, BMW and Porsche are also specialists, although to different degrees, and followed essentially the same strategy as Volvo and Saab. Production of specialist cars is much less present in the United Kingdom — an obvious exception is Jaguar which has recently been highly successful — and it is of similarly little quantitative importance in Italy.

Although specialist production has always played a more important part in the West German motor industry than in any other except Sweden — with turnover of Daimler Benz on passenger cars amounting to half of total VW turnover, and with a model range of both Daimler Benz and BMW extending well into the family car market segment — it cannot alone account for the industry's comparative success as the bulk of German car production remains in the volume range. On the other hand, it has been argued that the very distinction between specialist and volume production has been eroded in the 1970s. While the 'conventional wisdom' in the industry was 'Be a GM or a BMW, but nothing in between' (Altshuler et al. 1984: 139), the success of Japanese manufacturers in the small and medium-sized mass market was not least due to the fact that they introduced in this segment a level of quality and a variety of features and options that had previously been confined to large specialist cars. To this, and to the unmatched price competitiveness of the Japanese, German mass manufacturers responded by moving up-market — by improving product design and product quality; offering a much broader range of options and model specifications to meet the individual customer's preferences and thus evade the pressures of price competition; and generally increasing the value added per car, thereby largely offsetting the negative employment effects of the simultaneous introduction of microelectronic production equipment. Most notable in this respect was VW which fully renewed its model range in the mid-1970s — introducing among others a car like the Golf GTI which combines the features of a mass-market car with those of a specialist car — while at the same time not only extending its separate upmarket Audi line but also using Audi technology for design cross-fertilization. In many ways, this was a 'Swedish' product strategy adopted by what had been a classical mass manufacturer, with marketing methods abroad that successfully exploited national stereotypes of German quality manufacturing and with a pricing policy of high margins, especially in foreign countries.

It is above all this product and process strategy of an upmarket shift within the traditional mass-market segment — with high

product variety, flexible specifications, a strong emphasis on quality engineering and manufacturing — that brought commercial success in the face of increased competition and sustained high and growing employment in spite of more efficient production technologies. In effect, what happened in the German car industry in the 1970s was a restructuring of mass production in the mould of specialist production, with important elements of the latter being blended into the former and with small-batch production of highly specific model variations becoming enveloped in large-batch production of basic models. This strategy may well have been inspired by the strong specialist tradition in the German motor industry, and in particular by the presence of specialist producers like BMW and Daimler Benz which had for a long time been applying quality manufacturing methods to mass production (with Daimler Benz today having a higher market share in West Germany than Ford and producing more passenger cars than BL). This configuration of *high volume specialist production*, based on superior product design and rigorous quality control, is now generally regarded as the most likely success formula for motor-car production in old industrial high-wage countries. Moreover, it seems to be of importance far beyond the car industry itself, potentially providing a model of restructuring and adjustment for other old industries trying to find new profitable markets, and offering a promising approach to the preservation of employment in manufacturing (Piore and Sabel, 1984).

### **Commercial Strategy and Industrial Relations**

What has all this to do with industrial relations? The conventional approach to the nexus of industrial relations and industrial restructuring is to look for ‘trade union resistance to change’ (Streeck, 1985a). In this respect, the history of the motor industry in the late 1970s and early 1980s has little to offer. Swedish workers and their unions supported the far-reaching changes in work organization and production arrangements that were made in the 1970s and later (Enström and Levinson, 1982). In Germany, the metalworkers union agreed to the massive internal reorganization of VW after the cash crisis of 1974. It also went along with the decision to set up production facilities in the United States (Streeck, 1984), and when two years ago we tried to do a case study of the German car industry on conflicts over the introduction of industrial robots, we were

unable to identify a single case that would have been worth studying (Windolf, 1985b). Even the unprecedented advance of robotics in final assembly, with the start-up of the Golf II in the autumn of 1983, resulting in a notional loss of no less than 1,000 jobs compared to traditional technology (Streeck, 1985a: 16), was accompanied by the whole-hearted support of union and works council.

So much — or so little — one might have expected. But in France, with its tradition of politicized worker militancy, nothing much happened either until 1983–4, in part certainly because industrial change was delayed by the government for political reasons. When adjustment could no longer be postponed, a violent strike broke out at Peugeot, with heavy political and ethnic undertones, and was defeated (Windolf, 1985a). In the United States, the powerful union of automobile workers contributed its share to the Chrysler rescue and agreed to painful rounds of concession bargaining (Katz, 1985: 54–5). In Italy and the United Kingdom, industrial restructuring may arguably have been delayed for a few years by shop-floor resistance although a host of other factors, both political and economic, were clearly also involved. However this may have been, when it came to the crunch in the late 1970s, an assertive management found it surprisingly easy to break the backbone of the once apparently so powerful shop floor, appealing successfully in both countries to the ‘good sense’ of individual workers and persuading them to desert their trade-union representatives (Becchi and Negrelli, 1983; Willman and Winch, 1985). Massive employment cuts were implemented, managerial authority was forcefully reestablished, and major restructuring projects, such as the new Metro line at BL in Longbridge or the highly automated body shop at Fiat Rivalta, were carried out even with trade-union support (Willman and Winch, 1985; Winch et al., 1985; Negrelli, 1985).

By the mid-1980s, many had come to believe that the importance of industrial relations for industrial change had been overestimated, and that the past emphasis on building institutions of interest accommodation between management and workers was misplaced. Workers and trade unions may for a limited time be able to forestall necessary adjustment, and if they choose to do so experience is believed to have shown that institutions, however designed, cannot stop them. But when as a result an industry is on the brink of collapse workers have no choice but to acquiesce. Fiat and, to some extent, BL reemerged as profitable producers without cooperative industrial relations. The Robogate at Fiat Rivalta was installed as swiftly as the

automated final assembly at VW in Wolfsburg, co-determination or not. The Metro line would not be any different had there been no machinery of consultation, and indeed the project went ahead unchanged when consultation broke down (Willman and Winch, 1985: Ch. 5).

The lesson of the crisis, then, seems to be that all depends on strong and confident management. Many, especially in Britain, believe that had this been in place before, with appropriate support from the government, adjustment would have started earlier, and losses might have been smaller. What counts at the end of the day, to paraphrase a car industry manager interviewed for one of our studies, is to have the right technology and the right product. Admittedly, countries like Japan, Sweden and West Germany have peaceful and cooperative industrial relations, but this is seen to be the effect, not the cause, of prosperity and employment. The cause, so the argument runs, is that their car manufacturers happened to have superior marketing, better products, better access to finance, and more advanced labour-saving technology. This in turn is explained by management in these countries being permitted to manage as co-determination and Japanese-style consultation are ultimately nothing other than sophisticated devices to keep the unions quiet — a view which incidentally is often shared not just by managerial hardliners but also by their adversaries among Italian and British trade unionists.

Such seems to be the received wisdom of the 1980s, markedly different from what was almost universally accepted one or two decades ago. Those who disagree with it are well-advised to offer more than a reiteration of the liberal view that accommodative institutions are necessary to overcome 'resistance to change'; under the present distribution of market power this point is likely to be lost. Nor can dissidents afford to dismiss the emphasis of latter-day managerial *Realpolitik* on economic efficiency and success as illegitimate; while this might have been possible at a time when wealth creation could be taken for granted, it becomes difficult to sustain in a period of long-drawn stagnation and high unemployment. But then, there may be no need to be defensive. The present 're-integration' of the practical conduct of industrial relations in comprehensive entrepreneurial strategies (Strauss, 1984) only confirms that the mainstream of industrial relations research and theory, led astray by the temporary and historically contingent 'relative autonomy' of what was in its time called the 'industrial relations subsystem', has defined its subject too narrowly. This narrow definition seems to have



been at the root of the discipline's perennial dilemma between the danger of degenerating into a practitioner's guide of how to remove the notorious 'resistance to change', and — where efforts were made to avoid this — its tendency to limit itself to distributional as opposed to production issues in line with trade-union ideology if not practice. However, there is no reason why the study of the relations between capital and labour should be limited to the restrictions placed by social institutions in the labour market and at the point of production on the *execution* of managerial strategies, and why it should not also look at the influence of such institutions on their *conception*. Differences in commercial success depend not only on the different degrees to which managements are permitted to implement their adopted restructuring strategies, but also, and probably at least as much, on differences in strategies themselves; these, however, are unlikely to be entirely exogeneous to the social, political and cultural system of capital-labour relations. The following analysis will attempt to shed light on some aspects of the complex configuration of constraints and opportunities created by industrial relations institutions for managerial strategic choice, focusing in particular on the specific commercial strategy characterized above as the blending of mass and specialist production that seems so uniquely suited to the competitive needs of old manufacturing countries in today's world markets.

### **Rigidity and Flexibility: Constraints and Opportunities**

Industrial relations in the Swedish and German motor industries have a variety of characteristics in common that set them apart from France, Italy, the United Kingdom and the United States and make them in many ways similar to Japan. Most conspicuous among these is a strong commitment of employers to employment stability which has added an important element of status right to the contractual basis of the employment relationship (Fox, 1974; Tannenbaum, 1964). Japanese lifetime employment is nothing sensational to Swedish motor manufacturers; in fact, there are reasons to believe that employment in the Swedish motor industry is more 'lifetime' than in Japan (see, for example, Peterson, 1983: 26; and the statistics in Streeck and Hoff, 1983). In Germany Daimler Benz, the first mass-producing specialist manufacturer, has for decades kept an

informal undertaking, part of the 'corporate culture', that no worker will be involuntarily dismissed for economic reasons. Exactly the same applies to BMW. But there has also been a shift from contract to status in the rest of the German motor industry which, remarkably enough, coincided with the restructuring period of the late 1970s. While the short-term sensitivity of employment to declining output was always lower in West Germany than anywhere else except Sweden (Streeck and Hoff, 1983), it declined further in the second half of the 1970s when it increased in other countries. Again, the lead was taken by the first specializing mass producer, VW, which in 1976, in the aftermath of its employment crisis of the mid-1970s, committed itself, short but not much short of legal liability, to a guarantee of employment for its existing workforce (Streeck, 1984: 99f).

Cross-national differences in the social meaning of the employment relationship covary with a wide range of other factors, forming a complex pattern that is difficult and challenging to disentangle. Firms that try to provide stable employment operate elaborate manpower-planning systems that show clear parallels to what is known about manpower management in Japan (Koshiro, 1983). In a case study of a large Swedish motor manufacturing plant conducted in 1982 under the MIT 'Future of the Automobile' programme (Altshuler et al., 1984), it was reported that management expected voluntary turnover to decline sharply in coming years, as a result of higher general unemployment (Peterson, 1983). This was seen by trade union and management alike to require improved methods of manpower planning to avoid lay-offs and dismissals. Significant new recruitment was ruled out for a long time under conservative estimates of future labour demand (Peterson, 1983: 11). At the time of the study, new administrative techniques and supporting social science research methods were being introduced — among other things, a biannual complete survey of the workforce covering skills, aspirations for further training, attitudes towards work, health conditions, etc. — to ensure continuous adjustment of an effectively fixed labour force to changing economic and technical conditions (Peterson, 1983: 24). Alternative ways of organizing work were studied to find the best match with existing skills and skill potentials. An extensive training effort was launched, with the intention eventually to devote 3 percent of working time to education (Peterson, 1983: 31). Strangely enough at first glance but quite consistent with the notion of a fixed workforce, priority in retraining was given to older workers because their retraining would become

more difficult as time passed (Peterson, 1983: 30). Preparations were made to integrate manpower management more closely with investment planning and engineering. To quote, 'investment plans will in the future be complemented with information on labour requirements and the need for new types of qualifications, along with information concerning alternative possibilities of work organization' (Peterson, 1983: 24; cf. also 22ff). In particular, management and trade union agreed that physical investment, rather than being permitted to dictate unilaterally the organization of work and the skill mix of the workforce, should be geared as much as possible to the need to make optimal use of existing skills, to facilitate continuous skill development, to maintain and improve positive motivation of workers towards work and retraining, and to provide useful employment for handicapped workers and the growing number of older workers (Peterson, 1983: *passim*).

While the Swedish case study showed a system of manpower planning in development, the parallel West German study described one in operation (Hoff, 1984). The firm in question, Audi, was using a recently devised management instrument, called Investment Analysis, to assess the employment consequences of its investment projects. The introduction of Investment Analysis coincided with the start of a comprehensive restructuring programme that preceded the firm's emergence in the late 1970s as a successful upmarket producer (Hoff, 1984: 4). Even before investment projects are presented to the supervisory board for approval — which may be two or three years ahead of completion — their effect on employment, quantitative and qualitative, is assessed in detail by a special team which is supported by designated production and manpower managers at the works level. Estimates are continuously revised as projects progress, among other things on the basis of lengthy questionnaires to be filled in by line managers (Hoff, 1984: 11ff.). Works council representatives are fully involved in the procedure from the start, thus becoming in effect part of both the Investment Analysis group and project management teams. Investment Analysis data can be used by the works council to demand anticipatory measures of retraining and, if necessary, income protection. The practice of Investment Analysis, which had originally met with resistance especially by production departments (Hoff, 1984: 11), was well established at the time of the study and had become part of the enterprise's everyday routine.

It is important to emphasize that, certainly in Sweden and West Germany, stable employment and long-term manpower planning are

not paternalist handouts unilaterally granted to undermine trade unions and easily withdrawn at will. In Sweden, large firms are under considerable legal, political and economic pressure not to dismiss workers (Peterson, 1983: 26). The same applies, perhaps to a lesser degree, to West Germany. More importantly, Swedish and West German motor manufacturers are subject to extensive co-determination — which is one more characteristic that distinguishes them from their competitors in other countries. In Germany the works council, the extended arm of the union under co-determination, has legal rights to participation in manpower policy including the right to demand that manpower planning be formally undertaken (Streeck, 1984). While formal institutions differ, the situation is essentially the same as in Sweden. As a result, access to the external labour market, both to reduce labour input and to change the structure of the workforce, is under normal circumstances foreclosed to large car manufacturers in Sweden and West Germany. This is clearly not the case in the United Kingdom where the explanation for the absence of anything like Swedish or German manpower planning is that firms can much more easily turn to the external labour market for workforce adjustment (Marsden et al., 1985: Ch. 4). Thus, when the new Metro line was started, skilled workers were hired from the outside (Willman and Winch, 1985: 145ff.) — which even a weak works council in Germany could have prevented, making the employer instead retrain other workers in time. Neither was there manpower planning in Italy although Fiat was faced in the late 1970s with both an almost ironclad legal ban on dismissals and strong shop-floor militancy (Becchi and Negrelli, 1983). But in the absence of co-determination, management was free to gamble on the rapid deterioration of the firm's economic performance providing it with an opportunity to claim back the right to hire and fire. When this political breakthrough was finally achieved, it resulted in a cut in domestic employment of 18,000 between 1979 and 1981 (Becchi and Negrelli, 1983: 22).

Medium- and long-term manpower planning is a necessary condition of flexibility in an internal labour market closed by powerful external rigidities (Streeck and Hoff, 1983; Marsden et al., 1985: Ch. 4). Trade unions interested in employment stability and economic performance — the latter being a precondition of the former — are likely to concede internal flexibility in compensation for the external rigidities of which they are the main source and guarantor. The ensuing shift from contract to status is not without a price for trade

unions, involving for example in the case of VW in 1975–6 a commitment to overtime, short-time work and almost unlimited internal mobility as ways of adjusting labour input to product demand; an agreement not to press for recruitment of new workers unless they can be covered by the same employment guarantee as the existing workforce; and in the long run acceptance of a more flexible working time regime (Streeck, 1984). In exchange, the union tends to become the co-manager, or even the principal manager, of the internal labour market, not only because this is inevitable given its rights to co-determination but also since the implementation of highly complex manpower policies without a collective intermediary is likely to exceed the capacities of even a well-staffed personnel department. Trade union co-management furthermore serves to ensure that workers can have trust in the fairness of internal labour market arrangements — a trust that would be difficult to generate under a policy of ‘unionism without unions’ (Garbarino, 1984).

Like their Japanese competitors, in the case of a catastrophic decline of economic performance Swedish and German motor manufacturers will undoubtedly shed labour, if necessary by involuntary dismissals. In this sense, stable employment and the kind of enterprise social policy that we have referred to as manpower planning indeed depend on competitive success in the market place. On the other hand, and in the light of widely held beliefs about the institutional requirements of industrial competitiveness, it is worth noting that, as shown by the history of the ‘winners’ in the restructuring period of the world motor industry, a commitment to stable employment need not necessarily stand in the way of commercial success in highly competitive markets. In fact, there are indications that it may contribute to it and that in certain conditions, the internal flexibility firms can gain in exchange for acceptance of external rigidities may be more conducive to high performance than the external flexibility associated with unstable employment. This at least seems to be the rationale behind the efforts of the American motor manufacturers to persuade the UAW to give up important elements of the externally flexible but internally rigid seniority system in exchange for guaranteed employment (Katz, 1985: 163–4; Katz and Sabel, 1985).

However, there seems to be yet another connection between stable employment and economic success which bears directly on the subject of industrial restructuring. While a well-developed and co-managed internal labour market can offer firms with a ‘fixed’

workforce a considerable degree of flexibility, this will probably always fall short of what can be achieved by recourse to the external labour market. Firms that have to live with strong external rigidities may therefore find themselves compelled to search for markets where demand is either stable or can be stabilized and extended through product innovations. In other words, strong trade unions able to impose effective employment (and wage) rigidities may be an important causal factor explaining why firms may choose to invest in a product range that is quality rather than price competitive. In fact, it is hard to imagine that Swedish and German motor manufacturers, given the industrial relations constraints that they are facing, could have placed their bets on a strategy much different from the one they have adopted. The question whether in Sweden and West Germany the low sensitivity of employment to the number of cars produced is due to institutional factors or to the increase in value added per car may thus be pointless, given that the latter may in part be due to the former. In any case, there is no a priori reason to exclude industrial relations constraints from the factors that influence managerial strategic thinking in product markets, and indeed the examples of Sweden and West Germany suggest that industrial relations pressures may even push firms into market segments in which they are ultimately less vulnerable than firms that have enjoyed enough flexibility to stay within the confines of traditional mass production.

### **Sociotechnical Systems, Commercial Strategy and Trade Union Intervention**

As yet, however, the picture is far from complete. Employment stability, long-term manpower management and co-determination have been found to form what is called, in technical language, a 'cluster': where one is present, the others tend to be also present, and where one is absent, the others are likely to be absent as well. But it is not just these three factors that seem to covary. Differences in work organization also fall into the pattern. The introduction of work teams with delegated responsibilities for the flow of production and the allocation of tasks was pioneered in the Swedish motor industry. The original motive was to reduce worker discontent which had resulted in high turnover and unsatisfactory product quality. But a flexible work organization with broad job descriptions is also well suited to accommodating change in an internal labour market, as

demonstrated by the Japanese system. It is instructive that at VW, the commitment to employment stability was followed in 1980 by a comprehensive industrial agreement on an entirely new payment and grading system, based on work groups as the principal units of organization and aiming at both higher work satisfaction and easier redeployment without frictions over possible losses of pay (Hildebrandt, 1981). The very same objectives were pursued by the Quality of Working Life experiments in the United States (Katz, 1985). Nothing of this dimension has occurred in the two industries with easy external labour market access. While the introduction of team work seems to have been considered at various stages of the Metro project, it was abandoned due to lack of interest on the part of both the unions and management (Willman and Winch, 1985: Ch. 7). And Fiat, having just defeated the union to restore managerial prerogatives and in particular the right to hire and fire, imposed traditional structures of authority and division of labour even on its technically highly advanced Rivalta plant (Negrelli, 1985).

There are numerous reasons why, under a commercial strategy of upmarket expansion, internal labour markets and co-determination should go together with a flexible and decentralized organization of work. Employers which have to come to terms with an essentially fixed workforce depend more on positive motivation of workers than if they are free to turn to the external labour market, and worker satisfaction is enhanced by a non-Taylorist work organization. At the same time, satisfaction at work and the identification with product and enterprise that it engenders contribute to product quality — which in turn is an important condition of upmarket success. To the extent that co-determination gives trade unions a chance to intervene in the design of work organization, their activities may thus, more or less intentionally, improve the prospects of such success. But it is also possible that in industries that move upmarket towards diversified quality production, trade unions may find their employers promoting a departure from Taylorism with the same or even greater enthusiasm than they themselves — something that may create considerable confusion among union activists who may find it hard to comprehend that some of their more avant-gardistic demands of the past decade do make economic sense as a form of adjustment to the competitive conditions of the 1980s.

How strong the move away from Taylorism has become is shown in a recent study on the German car, chemical and machine tool industries the title of which is translated, tellingly enough, as 'The



End of the Division of Labour' (Kern and Schumann, 1984; cf. Sorge 1985b). The book quotes from memoranda written by motor industry production managers to their superiors in which they describe the disutilities of the traditional subdivision of tasks, and in particular of the separation of conception and execution, using language that reads like sociological seminar papers of the early 1970s (Kern and Schumann, 1984: 91; for Sweden see Peterson, 1983: 37). Relating the observed changes in work organization explicitly to the new product strategy of high quality and product diversity (Kern and Schumann, 1984: 40ff), the study observes that, 'There are today — one can confidently say, for the first time in the history of the motor industry — relevant restructuring projects, some of them already completed, that do not as a matter of course draw on Taylorist recipes and on the method of polarization of tasks so dear to production planners in the 1960s' (Kern and Schumann, 1984: 98). It is worth noting that the authors have made their names some ten years ago with a fairly Bravermanian theory of increasing 'polarization' of skills and skill requirements in industry. Their recent study is based on empirical evidence from the same plants that they had investigated in the late 1960s and early 1970s and thus represents a uniquely valid documentation of the changes that have meanwhile taken place.

Work organization is closely linked with technology, just as technology conditions, and is in turn conditioned by, the design and the variety of products (Sorge et al., 1983). Microelectronic circuitry can be used for rationalization inside the traditional mass production paradigm, i.e. to save labour and to reinforce and extend the separation of conception and execution. But it can also be used for flexibly specialized small-batch production, with its high versatility making it possible to produce customized quality goods at a price much reduced in comparison to older technologies. Indeed it is argued that it is this capacity of the new technology that has permitted small specialist producers in the motor industry to survive and that has failed widely held expectations that by the end of the century, the world motor industry would consist of no more than three or four 'mega producers' (Altshuler et al, 1984: 181ff). Generally, microelectronic technology has changed the economies of scale both in mass and specialist production, enabling manufacturers to reach the break-even point with a much smaller number of cars than was thought possible only a few years ago. At the same time, it has also given rise to what has aptly been called 'economies of scope' (Sorge et al., 1983) in that its high flexibility has made it possible to



introduce a previously unknown variety of products in large production runs — or what we have called, above, the ‘blending of specialist production into mass production’.

Depending on whether new technology is used for further automation of mass production or for flexible manufacturing, it tends to be associated with highly different forms of work organization. Exploitation of the new technical potential for flexibility seems to be enhanced by an ‘intelligent’ work organization in which retooling and maintenance is to a significant extent delegated to machine operators. Everywhere in the motor industry, technical change has raised questions on the traditional differentiation between production and maintenance functions and between direct and indirect work (Streeck and Hoff, 1983). But the responses were quite different, with the merger of previously separated functions having advanced much further among the upmarket producers of Sweden and West Germany — and, of course, in Japan (for the opposite case of the UK see Willman and Winch, 1985: 155, *passim*). In the German study mentioned above, this development is referred to as an emergent ‘re-professionalisation of production labour’ (Kern and Schumann, 1984: 81) closely corresponding to the simultaneous shift towards customised, quality competitive production.

The rise of ‘intelligent’ sociotechnical systems is related not just to product strategies but also to industrial relations, and in fact work organization seems to constitute an important mediating factor between the two. Using the new technology primarily for rationalization purposes when, due to industrial relations constraints, the labour force is more or less fixed does not make much sense for employers. With a strong trade union firmly established in the enterprise’s decision-making process, employers may not have much of a choice but have to take advantage of the ‘flexible specialisation’ (Piore and Sabel, 1984) potential of microelectronics. In any case, the flexible work organization required for this may as such be a trade-union objective, as it is in Sweden and West Germany where unions use their co-determination rights to press for an organization of work that requires advanced skills. In turn, the cooperative industrial relations that can be gained by concessions on work organization make it easier for employers to have the confidence that the workforce will use its increased discretion responsibly. Indeed, it has been suggested that the relative rigidity of the technology used for the BL Metro line reflects in part the dominant intention on the part of management to restore workforce discipline and is indicative of a

lack of trust between management and workers (Willman and Winch, 1985: 190). It has also been observed that the combination of flexible technology with a traditional, hierarchical work organization at Fiat has given rise to strong dissatisfaction among workers that is likely to come to the fore if and when the power of the union should be restored (Negrelli, 1985).

Activating the small-batch potential of new technology and operating a flexible, trust-based work organization requires a highly and broadly skilled workforce (Warner, 1985), as again shown by the Japanese case. The social definition and the generation of skills are intimately connected with industrial relations although the institutions in which they take place are not normally included in accounts of industrial relations systems. Investment by employers in skills is likely to rise when external labour markets are not easily accessible. But even then, if decisions on the amount and content of training are left to individual firms, they are likely to be too closely determined by immediate needs and short-term economic considerations, resulting in underinvestment or in skills being too narrowly defined. Much depends, therefore, on the extent to which training is considered a public good and a public responsibility. During the restructuring crisis of the motor industry in the late 1970s, the number of apprentices in car manufacturing firms declined sharply, not only in absolute terms but often also in percent of the — shrinking — workforce. The only exception, again excluding Japan where the training system is too different for direct comparison, was West Germany where the number of apprentices increased even in years when overall employment declined (Streeck and Hoff, 1983). This is explained by the fact that the West German industrial training system, operated as it is through a tripartite arrangement involving the government, the employers associations and the trade unions, with works councils having rights to co-determination on individual employers' training policy, has a capacity to make employers train above and beyond their perceived needs (Casey, 1986). This capacity has been extensively drawn upon in recent years to fight unemployment among school leavers, and the increasing training efforts of the motor industry have been paralleled in most other sectors of the economy.

Excess training may be an important asset in economic restructuring even though, or precisely because, it is unlikely to be generated by the market. Employers in West Germany do not have to offer continued employment to apprentices after they have passed their examination. But works councils see it as part of their responsibilities

to press for young workers being retained, and in large firms such pressure can be very effective. The vast expansion of the apprenticeship system in the past decade, however, has made it increasingly difficult for firms to offer their former apprentices skilled jobs and, under the impression of general unemployment, works councils have more often than not agreed to them being employed as direct production workers if no other work was available. Several studies (Kern and Schumann, 1984; Köhler and Schultz-Wild, 1983) have observed that this has given rise to a quite unexpected dynamic. Employers are well aware that skilled workers employed in unskilled jobs will leave at the first opportunity, and if they have received their training in a large motor manufacturing firm some such opportunity will sooner or later arise. Since this would mean that employers would have to write off part of their — rather high — training investment, the presence of former apprentices in direct production jobs offers employers a strong inducement to lay out new technology in such a way that their skills can be better used. Moreover, the skilled workers waiting to move into adequate jobs form an important constituency for works councils demanding broader and enriched job descriptions and a more decentralized work organization. This constellation is an ideal seedbed for the ‘professionalisation of production labour’ (Kern and Schumann, 1984: 81). Due to the increase in their training efforts which was largely imposed on them from the outside — and not least by trade unions and works councils — German motor manufacturers today have a large pool of excess skill at their disposal that places them in a unique position in relation to product strategies that require an infusion of craft skills into mass production.

This development has not escaped the attention of trade unions, and there is discussion today particularly in the metalworkers union of an aggressive trade-union training policy based on the fullest possible utilization of co-determination rights and aimed at further increasing the present oversupply of skills (IG Metall, 1984: 36, 50–6). This strategy is not limited to the vocational training of school leavers. In addition, the union has proposed to use future paid reductions of working hours for training and retraining at the workplace rather than for more free time (IG Metall, 1984: 52). The underlying idea is that a continuing accumulation of excess skills will increase the pressure on Taylorist work organization, promote a further integration of direct and indirect work roles, support existing trends towards payment systems based on skills rather than jobs

performed, facilitate and in fact make inevitable a flexible use of new technology, and ultimately leave employers no choice but to opt for production strategies for which a decentralized, intelligent, flexible work organization commanding broadly based and versatile craft skills is best suited. A trade-union strategy like this would obviously go far beyond the traditional limits of industrial relations, amounting in effect to an active industrial and production policy which would give the notion of union 'control over the labour supply', as the principal basis of trade-union power, an entirely new meaning.

### **Conclusion: a Virtuous Circle of Upmarket Industrial Adjustment?**

We are now in a position to try to pull the threads together and summarize the complex pattern of interaction between industrial relations and industrial restructuring that we have found.

1. Successful industrial restructuring in traditional manufacturing sectors and countries does not necessarily imply capacity cuts and employment losses. High-wage industries and countries can compete successfully and provide even growing employment if they make use of the 'economies of scope' of advanced technology to take advantage of markets for *individualized high quality products*. Trade-union strength and considerable 'rigidities' in the employment system do not stand in the way of firms and industries escaping in this way from the pressures of price competition. In fact, there seems to be a strong 'elective affinity' (Weber) between upmarket strategies of industrial adjustment — requiring as they do high and long-term investment in marketing and product development, a flexible sociotechnical production system, a motivated workforce, and an abundant supply of broad qualifications — and a 'cluster' of industrial relations characteristics comprising stable employment, co-determination, shared responsibility for the management of a well-developed internal labour market, a flexible work organization, and a market-independent training system.

2. *Strong trade unions with an institutionalized presence in the polity at large and in the enterprise*, with the power to defend high wages and to foreclose recourse to the external labour market, and with established rights to co-management of the internal labour market, may leave management no alternative but to embark on the demanding path of upmarket restructuring. At the same time, institutionalized strength, in giving trade unions the confidence that

the future benefits of cooperation with management will not be kept from their members, makes it possible for them to adopt the same long-term perspective on economic rewards that an upmarket restructuring strategy requires of management and capital givers. In turn, 'responsible' trade union restraint, motivated though it is by an ultimate interest in — eventually — high wages, reassures management that restructuring projects with a long time of fruition will not be undermined by short-term opportunistic wage militancy. In this sense, institutionalized trade-union influence may make it possible for both sides to behave like prudent investors and defer short-term gratifications in favour of larger and more secure long-term benefits.

3. An *efficient internal labour market* gives rise to identification of workers with the economic fate of the enterprise and generates motivations conducive to quality performance. It thereby fosters cooperative industrial relations which in turn seem to be an important precondition of competitiveness in non-price competitive markets. Trade-union co-management of internal labour markets contributes to reassuring workers of fair, equitable and, as it were, constitutional industrial governance. It also relieves personnel management from part of the technical burden of administering a large and differentiated internal labour market.

4. A *flexible sociotechnical system of work* — with a decentralized and 'intelligent', non-Taylorist work organization matching an advanced flexible technology — is an important precondition of efficient manufacturing of customized quality goods. It also increases satisfaction at work, removing some of the causes of the discontent of the 1970s with factory organization, and thus makes an independent contribution to high motivation of workers and cooperative relations between management and the workforce. Moreover, to the extent that a non-Taylorist work organization is a trade-union objective in its own right, it may be imposed on management by a strong union in the independent pursuit of worker interests, and this may then leave management no alternative but to search for a product strategy for which an intelligent work organization is an asset rather than a liability.

5. Finally, a *market-independent system of industrial skill generation* seems to be optimally suited to create a sufficient supply of the qualifications and motivations required to operate flexible manufacturing systems. Trade-union involvement in the determination of levels and content of training, both at the societal and the enterprise level, may help avoid potential market failures resulting in too few and too

narrow qualifications. Trade unions that make employers provide more and broader training than required by their immediate needs help build a pool of excess skills on which strategies of competitive industrial upgrading can draw. Moreover, an ample supply of skilled labour lends substance to trade-union demands for a flexible work organization and a non-Taylorist use of new technology. In the end, given sufficient rigidity of the institutionalized structures that provide the basis for internal labour-market flexibility, a 'trickle-up' process is conceivable in the course of which the presence of skills, through a long chain of cause, effect and interdependence, attracts, supports and makes inevitable restructuring strategies that generate profitable and stable employment for what without restructuring would have been an oversupply of skilled labour.

Far from having nothing to do with each other, then, industrial relations and industrial restructuring are connected by a dense web of interactive relationships, and sometimes in a quite surprising way. It has long been pointed out that industrial relations offer both constraints and opportunities for industrial change. What we have argued in addition is that what from one perspective may appear to be a constraint, may from another turn out an opportunity — for example, institutional structures that prevent management from going for easy and obvious 'economies of scale' solutions and thereby manoeuvring firms in old industrial countries in (down) market segments where their long-term (price) competitiveness is doubtful. It is true that trade-union influence on the conception of industrial adjustment strategies has as yet remained largely indirect, unintended and imperceptible, mediated as it is by the interplay of a large number of economic, political and cultural factors. But at least in the countries with co-determination, this need not always remain so. With growing recognition that there are paths of industrial adjustment that permit the realization of important trade-union objectives, trade unions may begin to perceive it as part of their mission to press management to find more intelligent marketing, product and production concepts than those that come naturally to people trained in the Fordist–Taylorist mass production paradigm. For well-staffed and well-funded trade unions, it should not be a priori impossible to acquire the expertise and the entrepreneurship to compete with management on its own territory, in a challenge to managerial authority that would for once be productive. After all, it is primarily the jobs of their members that are at stake. Capital can always move to low wage countries, but labour cannot. Leaving to management

the difficult task of finding avenues of industrial change that preserve the manufacturing base of old industrial countries would appear an exceedingly and unnecessarily risky strategy for trade unions.

Having advanced this far, it may be useful to look again at West Germany in particular. Here, the picture now appears strangely familiar. Could it be that what we have initially called restructuring was in reality, in this case at least but perhaps also in others, no more than the extension and confirmation of a much older, 'cultural' pattern? The craft tradition of German manufacturing and the characteristic German pursuit of product quality have often been noted, and so have the longer term investment aims and performance standards of German firms (Lawrence, 1980; Cox and Kriegbaum, 1980). Co-determination, although extended in the 1970s, has existed for a long time, as has the tradition of 'social partnership' at the workplace. Moreover, comparative industrial sociology has provided ample evidence of national differences in the application of technology and in the way in which labour is divided, with a tendency in Germany towards broader job descriptions and less rigid separation between conception and execution than, for example, in France and the United Kingdom (Maurice et al., 1980; Hartmann et al., 1983; Sorge et al., 1983). And, of course, the origins of the corporatist system of vocational training date back at least to the last century (Sorge, 1985a Ch. 6). This configuration has not been intentionally created to meet the new challenges of world-market competition in the 1980s; that it happened to be there was hardly more than a felicitous coincidence. It could have been otherwise, and in any case it was either absent or failed to be activated in other industries in the same country, such as ship building. There are also considerable elements of strain and contradiction within the configuration itself which would require separate analysis. Moreover, such are the intricacies of manufacturing as a cultural activity that not only 'functionally equivalent' — if not superior — but also structurally similar responses can arise from widely different cultural and historical contexts — witness the obvious parallels between countries like Sweden, West Germany and, in particular, Japan. Whether or not a society's social capital of institutions and traditions is activated at the right moment and for the right purpose seems to depend on many contingent factors, one of which is certainly the strategic decisions made by people and organizations at critical historical junctures — as with the decision, so discredited by later events, of



German ship-building firms in the early 1970s to turn away from craft-style to 'modern' mass production. Far from being able to provide an analytical causal theory of industrial failure and success, all that comparative sociology can offer is an attempt at improved interpretative understanding of the endlessly complex structures of essentially different 'historical individuals'.

Previous discussions of the relevance of industrial relations for economic success have tended to single out trade unions as the main or only cause of industrial inefficiency. But success and failure in manufacturing are of long making; they are the result of complex configurations of forces that seem to be deeply rooted in national and organizational traditions. This is why sociological analysis cannot come up with easily applicable, 'practical' recommendations. The optimistic idea of scientifically based social engineering, cherished by so many inside and outside the social science professions in the 1960s and 1970s, has lost much of its credibility. A succession of countries — the United States, West Germany, Japan — have been held up as universal 'models' of industrial relations to be emulated by others, only to prove the point that the immunity barriers of a body politic are too high for cultural transplants to be accepted, and to confirm that a nation's heritage of institutions, attitudes, values and habits cannot be manipulated at will. Nobody knows for certain where the 'virtuous circle' of industrial upgrading — of which appropriate institutions of industrial relations are but one part — takes off and where the interactive constellation of forces begins that brings about manufacturing success. As each of the individual elements of the pattern that we have observed seems to be interdependent with all others, isolating one or two of them and putting them in place in the hope that the others will follow suit may not necessarily accomplish the desired results. Nevertheless, in the practical world there may be no other alternative, and both employment stability (Gutchess, 1985) and training have been singled out as potential 'prime movers' in the shift towards quality competitive production. Of particular interest in this respect are the recent initiatives in the car industry of the United States, epitomized in the 'Saturn project' of General Motors, that can in many ways be seen as an attempt to recreate in one step the complex 'Gestalt' of factors that seems to have been at work in the more successful firms and countries during the 1970s and 1980s. National cultures seem to differ not least in their receptiveness to large-scale social experimentation, and the present reconstruction of



the American car industry may offer an important test case for the limits and possibilities of intentional social change in the political economies of industrialized countries.

## Note

1. Public lecture held at the University of Warwick, 23 October 1985, under the auspices of the 1985 Leverhulme Visiting Professorship in European Industrial Relations. The author would like to express his gratitude to Richard Hyman for critical comments and collegial encouragement.

## References

- Altshuler, A., Anderson, M., Jones, D., Roos, D. and Womack, J. (1984) *The Future of the Automobile: The Report of MIT's International Automobile Program*, Cambridge, Mass.: The MIT Press.
- Becchi, A. and Negrelli, S. (1983) 'Personnel Planning and Industrial Relations: Fiat — A Case Study of Italy's Auto Industry', in W. Streeck and A. Hoff (eds) 'Workforce Restructuring, Manpower Management and Industrial Relations in the World Automobile Industry, II'. A Report and Seven Case Studies Submitted to the Commission of the European Communities.
- Casey, B. (1986) 'Ne'er the Rose Without the Thorn. The "Dual System" and the Recruitment and Retention of Young Persons in the Federal Republic of Germany', *British Journal of Industrial Relations* 24, (1) March.
- Cox, J. C. and Kriegbaum, H. (1980) *Growth, Innovation and Employment: An Anglo-German Comparison*. London: Anglo-German Foundation for the study of Industrial Society.
- Enström, P. and Levinson, K. (1982) 'Industrial Relations in the Swedish Auto Industry: Developments in the Seventies'. Paper presented at a Workshop on 'Recent Developments in Automobile Industrial Relations', Berlin, (26–7 March).
- Fox, A. (1974) *Beyond Contract: Work, Power and Trust Relations*. London: Faber and Faber.
- Garbarino, J. W. (1984) 'Unionism without Unions: The New Industrial Relations', *Industrial Relations* 23 (1): 40–51.
- Gutchess, J. F. (1985) *Employment Security in Action: Strategies that Work*. New York: Pergamon Press.
- Hartmann, G. et al. (1983) 'Computerized Machine Tools, Manpower Consequences and Skill Utilization: A Study of British and West German Manufacturing Firms', *British Journal of Industrial Relations* 21: 221–31.
- Hildebrandt, E. (1981) 'Der VW-Tarifvertrag zur Lohndifferenzierung', *IIVG preprints*: 81–216, Berlin: Wissenschaftszentrum.
- Hoff, A. (1984) 'Assessing Investment-Related Medium-Term Manpower Needs: A Case Study from the German Automobile Industry', *Discussion Paper IIM/LMP* 84–3, Berlin: Wissenschaftszentrum.
- IG Metall (1984) 'Beschäftigungsrisiken in der Autoindustrie. Vorschläge der IG

- Metall zur Beschäftigungssicherung und zur Strukturpolitik in diesem Industriebereich'. Frankfurt am Main (November).
- IG Metall (1985) 'Beschäftigungsrisiken in der Autoindustrie: Eine aktualisierte Berichterstattung zur Entwicklung der Beschäftigung in der Autoindustrie unter Einbeziehung der Arbeitsplatzeffekte aus der Verkürzung der Arbeitszeit. Vorgelegt vom Vorstand der IG Metall'. Frankfurt am Main (September).
- Katz, H. (1985) *Shifting Gears: Changing Labor Relations in the U.S. Automobile Industry*. Cambridge, Mass.: The MIT Press.
- Katz, H. C. and Sabel, Ch. F. (1985) 'Industrial Relations and Industrial Adjustment: The World Car Industry'. Paper presented at the Conference on 'The Future of Industrial Relations', Berkeley (22–3 February).
- Kern, H. and Schumann, M. (1984) *Das Ende der Arbeitsteilung? Rationalisierung in der industriellen Produktion* ('The End of the Division of Labour?'). München: C. H. Beck.
- Köhler, Chr. and Schultz-Wild, R. (1983) 'Flexible Manufacturing Systems — Manpower Problems and Policies'. Paper presented at the 1983 World Congress on 'the Human Aspects of Automation' (8–11 August). Ann Arbor, Michigan.
- Koshiro, K. (1983) 'Personnel Planning, Technological Change and Outsourcing in the Japanese Automobile Industry', In W. Streeck and A. Hoff (eds) 'Workforce Restructuring, Manpower Management and Industrial Relations in the World Automobile Industry, II'. A Report and Seven Case Studies Submitted to the Commission of the European Communities.
- Lawrence, P. (1980) *Managers and Management in West Germany*. London: Croom Helm.
- Marsden, D., Morris, T., Willman, P., Wood, S. (1985) *The Car Industry: Labour Relations and Industrial Adjustment*. London and New York: Tavistock Publications.
- Maurice, M., Sorge, A., and Warner, M. (1980) 'Societal Differences in Organizing Manufacturing Units: A Comparison of France, West Germany and Great Britain', *Organisation Studies*, 1: 59–86.
- Negrelli, S. (1985) 'The Robogate System at Fiat: Technology, Organization of Work and Industrial Relations', in W. Streeck (ed.) *Discussion Paper IIM/LMP*. Berlin: Wissenschaftszentrum.
- Peterson, W. in collaboration with J. Forslin and B. Forsberg (1983) 'Personnel Planning in the Swedish Automobile Industry', in W. Streeck and A. Hoff (eds) 'Workforce Restructuring, Manpower Management and Industrial Relations in the World Automobile Industry, II'. A Report and Seven Case Studies Submitted to the Commission of the European Communities.
- Piore, M. J. and Sabel, Ch. F. (1984) *The Second Industrial Divide*. New York: Basic Books.
- Sorge, A. (1985a) *Informationstechnik und Arbeit im sozialen Prozeß: Arbeitsorganisation, Qualifikation und Produktivkraftentwicklung*. Frankfurt am Main: Campus.
- Sorge, A. (1985b) 'Book Review of H. Kern and M. Schumann, *Das Ende der Arbeitsteilung?*', *Economic and Industrial Democracy* 6 (4): 501–3.
- Sorge, A., Hartmann, G., Warner, M., and Nicholas, I. (1983) *Microelectronics and Manpower in Manufacturing*. Aldershot: Gower.
- Strauss, G., (1984) 'Industrial Relations: Times of Change', *Industrial Relations* 23 (1): 1–15.
- Streeck, W. (1984) *Industrial Relations in West Germany: A Case Study of the Car Industry*. London: Heinemann; New York: St. Martin's Press.

- Streeck, W. (1985a) 'Introduction: Industrial Relations, Technical Change and Economic Restructuring', in W. Streeck, (ed.) *Discussion Paper IIM/LMP 85-5*. Berlin: Wissenschaftszentrum.
- Streeck, W. (ed.) (1985b) 'Industrial Relations and Technical Change in the British, Italian and German Automobile Industry: Three Case Studies', *Discussion Paper IIM/LMP 85-5*, Berlin: Wissenschaftszentrum.
- Streeck, W. and Hoff, A. (1983) 'Manpower Management and Industrial Relations in the Restructuring of the World Automobile Industry', *Discussion Paper IIM/LMP 83-35*. Berlin: Wissenschaftszentrum.
- Tannenbaum, F. (1964) *The True Society: A Philosophy of Labour*. London: Jonathan Cape.
- Warner, M. (1985) 'Microelectronics, Technical Change and Industrialised Economies: An Overview', *Industrial Relations Journal* 16: 9-18.
- Willman, P. and Winch, G. (1985) *Innovation and Management Control: Labour Relations at BL Cars*. Cambridge: Cambridge University Press.
- Winch, G., Francis, A., Snell, M., and Willman, P. (1985): 'Industrial Relations and Technological Change in the British Motor Industry: The Case of the BL Metro', in W. Streeck (ed.) *Discussion Paper IIM/LMP 85-5*. Berlin: Wissenschaftszentrum.
- Windolf, P. (1985a) 'Streik und Betriebsbesetzung bei Talbot/Peugeot: Die französische Industriepolitik in der Krise', *Leviathan* 13: 38-69.
- Windolf, P. (1985b) 'Industrial Robots in the German Automobile Industry: New Technology in the Context of Industrial Relations', in W. Streeck (ed.) *Discussion Paper IIM/LMP 85-5*. Berlin: Wissenschaftszentrum.

## Wolfgang Streeck

is a Senior Research Fellow at the Wissenschaftszentrum, Berlin (WZB). He has published widely on interest organizations, industrial relations and industrial policy. In 1985, he was Leverhulme Visiting Professor in European Industrial Relations at the University of Warwick, England.