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**Thoughts on the Potential Consequences of the Current Process of
Industrial Transformation in the West German Political Economy**

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**Thoughts on the Potential Consequences of the Current Process of
Industrial Transformation in the West German Political Economy**

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This talk will make two points.

First, industrial organization in West Germany is undergoing a dramatic transformation.

Second, this transformation poses extremely serious challenges to the Union movement, and, potentially, to the future relationship between central and local branches of government

Transformation of Industrial Organization in the late 1980s¹:

German industrial corporations have been forced to compete in an extremely turbulent market environment for much of the 1980s. Initially adjustment pressures began to be felt within German industry when lower wage countries from developing areas began to enter the world market for manufactured products. Unable to compete against these producers, German producers steadily and systematically moved up market: i.e., they began to concentrate on more highly valued and technologically sophisticated wares in a variety of industries. At the same time, in an increasingly large array of sectors, ranging from machinery production to plastics to chemicals, producers sought to customize their products to the needs of producers.

In itself, this was a fairly successful strategy for the Germans, but it called forth a competitive dynamic in Europe which gave rise to additional changes. The problem was that it was not only German producers that were moving up market, away from mass production, seeking to avoid the murderous competition of low wage countries.

Many other European producers moved in this direction as well: especially the Italians, Swiss and Swedes have been consistent rivals of the Germans. Moreover, the Japanese have been slowly entering the European market by increasing the value and sophistication of their products. In the 1970s Germans adopted the reasonable strategy of seeking to combat new competitors by moving upwards away from them. In the 1980s, they find that more and more competitors inhabit these upper regions of technology and customization.

This new high level of competition has shaped the strategic market environment for firms in two ways. First, it has dramatically reduced the size of product-life cycles. New technologies such as micro-electronics, photovoltaics or high density plastics are developing extremely rapidly, and their potential applications expand exponentially with every new generation of product. Second, this very fact has driven development costs that firms must incur through the roof. An automobile company such as BMW must now not only be able to produce high quality engines, but it must be expert in outfitting its cars with the most modern electronic controls and plastics -- two very complicated areas of technology with which the firm traditionally has had extremely little experience. Developing it costs money.

Needless to say, when a company is forced to spend more money in technologies that it does not understand, in a market environment that is constantly changing, the level of risk that firms must bear or in some way adjust to, is enormous.

Types of Strategic Response among West German firms:

The responses of West German industrial corporations to these characteristics of

their environment can be divided into three distinct categories.

The first is the strategy that the Daimler Benz corporation has pursued over the last four years. This strategy aims at reducing the amount of risk that the firm has to confront in the world market by increasing the amount of the firm's total revenues that come from stable, almost guaranteed contracts with public customers. Rather than reorganize internally to be able to confront the entry of Japanese, Italian and French producers into European luxury car markets, Daimler Benz has sought to reduce the amount of its total business that it does in automobiles. Moreover, by moving strongly into weapons and defense related areas of production, the firm enters one of the few remaining areas of high technology production that is insulated enough politically, even within Europe, to provide the large company a reasonable amount of confidence in its long term capacity to make money. (Daimler had already become a dominant weapons producers with the purchase of Dornier and AEG in 1985. The recent purchase of MBB only seals the lid on the strategy)

Daimler has gone the furthest down this path -- its strategic movements have certainly been the most highly publicized -- but most of the very large corporations in Germany do military related work. Mannesmann in particular, with its recent purchase of the large tank maker Krauss Maffaei, shows the seriousness of the trend. In a turbulent environment, investments in businesses that will do stable business with the public sector are prudent.

Nevertheless, few companies have been able to insulate themselves as dramatically as Daimler has. As a result, they have been forced to follow a second form of adjustment strategy. Here firms seek to discover a way to stay competitive in the

turbulent environment by transforming the strategic organization of production and its administration within the firm.

This strategy has two dimensions.

Internal Decentralization:

First, in order to increase the speed with which products are developed, firms attempt to bring development and production much closer together in their organizations. In most large companies, this has involved shifting development capacity -- engineers and money -- from central research offices down into the operating production units. These latter, in turn, are given a great deal more autonomy in their ability to turn ideas -- frequently gotten from direct interaction with their customers -- into new products.

This dramatic internal decentralization or deconstruction of the hierarchical industrial corporation has been typical of a broad array of companies in almost every sector². MAN (formerly GHH), Thyssen, Mannesmann, etc have all self-consciously loosened the control that the central office exercises over the strategic behavior of their operating units in order to make them less encumbered by procedure and internal bureaucratic process in responding to market change. All of these firms are now holding companies in which the central office stands at arms length to help with financing, long term strategic development and intra-concern communication.

Other companies, such as Robert Bosch and Siemens, have shied away from formally converting themselves into holding companies, but the central offices in these

combines relate to their operating units in similar ways.

External Decentralization:

The second dimension of this strategy involves a dramatic external decentralization of production. In order to reduce the costs of development, and to enhance their technological flexibility, firms are dramatically reducing their levels of vertical integration. By engaging in sub-contracting relations with specialist sub-suppliers a firm can utilize the sub-contractors expertise for its own ends without having to assume the costs associated with developing and producing a given form of know how.

The paradox of this sub-contracting strategy is that it is intimately tied to a manufacturing upgrading strategy in the in house production that remains within the firm. On the one hand, the savings gained from sub-contracting free up resources in the firm that can be shifted into areas of technology that the firm deems particularly strategic for its future position in the market. On the other hand, by continuing to develop and manufacture firm specific strategic technologies in house, a firm can insure that it continues to have the capacity to be able to select an appropriate specialist on the outside to work with. By pushing the boundaries of internal technological knowledge, in other words, firms are able to push the boundaries of external technological knowledge.

This new orientation toward production demands an extremely high degree of flexibility, both in the kinds of production technologies that are implemented as well as in the kind of worker needed to operate them.

The flexibility requirement stems from the fact that because technology and products are changing so rapidly, it is impossible for the firm to be able to say definitively what is a core technology for its competitive purposes (i.e, something that must be produced in house) and what is not and therefore can be purchased from outside specialists. On the contrary, rather than think in terms of core versus expendable portions of the product, companies evaluate every part, all the time, in purely strategic terms. A change in the market or in technology could easily mean that something that appeared to be solidly in the core could suddenly be given out in the interest of directing resources to something more immediately important. Everything about the location of production has become strategic.

This indeterminacy in production has lead to an intensified adoption of programmable forms of automation technology. The by now familiar idea here is to outfit the production facility with equipment that is as general purpose as possible.

Reprogrammable flexibility allows firms to decrease turnaround times from product to product in production as well as garnering cost advantages in the production of any given workpiece. Examples in Germany are the new body assembly facility of Volkswagen's at Emden in which clusters of robots are arranged into twenty different boxes. Raw auto chassis flow into any one of the available boxes on robocars that communicate to the cluster the particular constellation of tasks the robots are to perform. Similar box arrangements are observable in the arrangement of flexible manufacturing cells in machinery plants.

Interestingly, the same indeterminacy in production has lead to the creation of more intensive information network linkages between the various flexible systems. Robo-

cars communicate with honeycombed boxes of robots, the order in which chassis emerge from the boxes is communicated automatically to the assembly line.

Increasingly this kind of CAD facilitated information flow stretches as far as the manufacturing operations of important suppliers.

Sophisticated production of this kind has created demand for extremely sophisticated workers. Training in programming and engineering as well as in more traditional blue collar skills, as the work of Kern and Schumann shows, is becoming increasingly the rule among West German production workers. Workers need the conceptual breadth such training affords to be capable of mastering the tremendous range of production tasks encountered on the shop floor.

The best example of a large firm pursuing this strategy of external decentralization is BMW. This firm has been attempting to reduce the design of a car into a system of discrete sub-systems, or modules. It then seeks to find a specialist sub-contractor (or consortia of sub-contractors) to, say, completely design, produce and deliver electronically controlled seats, gas tanks, sophisticated interior plastics, ABS-brake units and even parts of the engine system. BMW moreover, will demand that the supplier firm produce in broad variety and completely in sequence with the flow of the BMW assembly line.

By shifting production -- and development and design -- in some sub-systemic areas of the automobile onto outside suppliers, BMW can devote its resources to the development of new products, such as new applications for sophisticated plastics, or micro-electronics etc.

From the point of view of the organization of production and its administration, this strategy makes BMW into a kind of "Systems Integrator." It takes responsibility for the overall design of the car and the development of certain key technologies and then integrates together the specialist parts that it purchases -- always through very intimate collaborations -- from sub-suppliers.

At the same time, BMW has invested heavily in technologies that improve and make more flexible its own in house production. The new assembly facility in Regensburg, for example, currently assembles only the 300 series, but the equipment in the plant is designed to be able to accommodate the entire BMW product range -- as well as prospective new models. In order to accommodate variety, special orders and customization, each car is transported individually through the assembly process on self-propelled platforms, capable of entering and exiting the line at almost any time.

So, these two dimensions of strategic adjustment to market turbulence in Germany -- internal decentralization and external decentralization -- constitutes the second fairly pervasive form of industrial adjustment happening today in Germany.

The third kind of response involves the way in which small and medium sized -- and even large sized-- supplier firms have shifted to respond to the changes in their major customers behavior. If the producers of end products are moving to become systems integrator, traditional supplier firms are moving to become suppliers of systems.

Once again, this has involved two forms of strategic adjustment on their part:

First, rather than focus on the production of a particular discrete product, firms have begun to focus on their capacity to provide particular kinds of system know how. Robert Bosch, to take a well known supplier firm, has increasingly become a general specialist in the matching together of micro-mechanical and micro-electronic technologies. The company produces literally thousands of products that carry these characteristics -- and the product palette is continually changing.

Bosch is a large firm, but there are thousands of smaller and medium sized enterprises in the West German economy, especially in regions traditionally dominated by small and medium sized firms (Baden Wuerttemberg, the Bergisches Land, the catholic Rhineland) which pursue similar strategies: producers of pneumatic devices, specialists in the production of foam rubber cutting equipment, producers of special plastics --etc.

Second, in order to be better able to specialize on system know how, these supplier firms have to be themselves reliant on specialist suppliers. Because the particular product/system they deliver is specific -- that is literally customized for the user and not standardized, every particular order tends to have a lot or a little that is different in it. Sub-suppliers are used to give the supplier firm the flexibility it needs to be able to deliver its systems.

If you step back and look at the consequences of these kinds of adjustment strategies within West German industry, the effect of the organizational and strategic changes has been to radically decentralize know how and expertise throughout the economy. End product producers in all industries use a continually shifting array of

specialist suppliers. These suppliers themselves not only deal with a continually shifting array of customers, they combine and recombine with other suppliers depending upon the particular kind of system they are being asked for.

All of the organizational changes that have taken place facilitate this decentralization as much as they constitute it. The key is to create organizational structures that allow themselves to be continually recombined with other organizations and kinds of know how.

POLITICAL CONSEQUENCES

Now, My colleagues Charles Sabel, Horst Kern and I view these kinds of changes as having very dramatic implications for the way in which the West German economy is governed politically. In particular, it poses grave challenges to the trade unions and to the current character of relations between central and local governmental authorities.

For the unions, such changes in industry pose three problems, which when compounded, can be considered potentially devastating.³

First the kinds of changes that are occurring in the organization of work, particularly in the area of new production technologies, are creating, in increasingly important numbers, a new kind of worker that will be difficult for the trade unions to recruit in the traditional fashion. He or she is highly skilled, not only with traditional blue collar skills, but with new programing and system interpretive skills as well. Increasingly these workers have training at a Fachhochschulen (community

colleges) or even at a university. Typically, the new worker first serves an apprenticeship within the traditional structure of the West German dual system of vocational training and then immediately afterwards moves on to further training.

This new trajectory keeps the new workers out of the milieu of the factory, and away from the traditions of the trade unions, for longer periods of time at formative periods in their careers. Examples of such workers are technicians, maintenance specialists, highly qualified system regulators and increasingly, highly skilled tradesmen (machinists, toolmakers etc).

Furthermore, the traditional issues that have been at the heart of trade union policies -- a focus on income and job security, protection from speed ups etc -- are not the problems that these new workers are concerned with. While, on the other hand, the issues that do resonate with such workers -- problems of the opacity of plant decision making and power structures, the absence of any real opportunity for worker influence in product development, concern for their own long term ability to continue to be able to adapt their hard won skills to the rapidly changing technological demands of the firm's production -- fall outside the traditional bargaining issues of the trade unions.

If these workers tend to proportionally grow within the German workforce -- and all signs are that they will -- then without an adjustment on the part of the unions, a growing proportion of the German working class could potentially fall outside the union movement.

Secondly, the decentralization of production threatens to undermine the union's

traditional strategy of focusing its recruiting and bargaining strength on large firms. The internal fragmentation of the large firms make it difficult for the union to develop a coherent strategy for a single company because increasingly, the operating units -- and, hence, the works councils in those operating units -- pursue very different strategies. Consensus within the whole firm level Betriebsrat (Works Council) is often difficult to achieve as the possible points of conflict within a company multiply.

The decentralization of production outside of firms complicates this problem still more. On the one hand because the larger union may now have to reconcile the interests of members in a variety of bargaining regions. And on the other hand because the intensity of sub-contracting has often forced two different unions (eg in the automobile case the IG metall with the IG Chemie workers that produce plastics, or the Textile and Apparel workers that produce car seats.) The traditional German trade union practice of concentrating on large firms and stable industries will have a difficult time dealing with this decentralization. Easy institutional and strategic adjustments to these problems simply do not exist and the possible lines of intra and inter union conflict are only now beginning to become apparent.

Indeed, in light of these problems, it will be interesting to see how the projected strike in the metal working sector this spring develops. The IG Metall has not gone through a bargaining round in three years -- due to a remarkable agreement with the metalworking employers to suspend the traditional yearly wage rounds to allow both camps to regroup -- and it is possible that the problems outlined here will become apparent to the union in trying to coordinate the strike.

Finally, third, it is often the case that the pressures of the moment press the union into adopting the least promising long term strategy. Because the company they deal with has become so complex, and increasingly all dimensions of production have become reduced to strategic chips in a larger corporate game, the Betriebsrat cannot address all the potential problems its members face all at once. Consequently -- and rightly from a moral standpoint I might add - the Betriebsrat focuses on the most immediate problem of defending the jobs of the weakest, and lowest qualified members of the workforce whose jobs are especially jeopardized by outsourcing. Indeed, this strategy is often effective because the betriebsrat can find allies within the company itself among particular plant managers who oppose the current changes, or whose particular area of management is threatened by the trend toward decentralization.

Yet, as understandable as this strategy is, it is clear that if one views the changes in the industrial economy described earlier as more than merely ephemeral, this strategy places the union in an awkward position. In attempting to save low skilled work, they run the risk of forcing the company to sub-contract the kinds of work that would involve higher skilled jobs outside. The possibility that the skills and the workers of the 1990s all are located outside of areas of union strength could potentially result, at least in part, directly from union actions themselves.

It is not clear what the proper trade union response to the current situation should be. Kern and Sabel have suggested that the unions attempt to develop organizational skills which allow it to perform flexible tasks of continuous recombination with workers and skills in the labor market in a manner that is analogous to the emergent organizational forms in industry. What is clear, however, is that without

serious organizational reform in the unions, the possibility of growing emargination is frighteningly real.

The second constellation of political dilemmas that the current transformation of the industrial economy seems to be creating concerns the relationship between local and central governmental authorities. On the one hand, the process of decentralization has elevated the role of the local level state to one of strategic economic and industrial importance. Small and medium sized specialist firms and systems suppliers are very dependent upon the infrastructural services provided by local governments - - the best studied example is Baden Wuerttemberg. The decentralization of production in Germany is embedded in a thick network of Fachhochschulen, Land consulting agencies, technology policies for small and medium sized firms, trade associations, Land level foreign trade missions -- etc.

In order for the strategy of decentralization to succeed in Germany, it is imperative that the local level governments be allowed to have the autonomy to be able to respond to the needs of local producers. In a way, the principle is the same as that which explains the internal decentralization of large firms. Local autonomy helps to bring the problems of problem diagnosis and policy cure closer together --making for more responsive governmental policy.

But the difficulties with such a policy that emerge for the central state are also clear. The more successful the regions in which decentralization is currently flourishing become, the richer and more attractive they will become for investment. Capital will flow into these regions and away from others. Moreover, tax revenue

will naturally grow to be imbalanced. The dilemma for the central state is how to support and encourage the autonomy of the local governments while at the same time preventing the emergence of regional economic (and political) imbalances.

It is not clear to me that there is at the moment a clear solution to this problem developing in the BRD. This may not be a problem because at the moment the problem of regional imbalances remains only a problem, it is not a crisis. But the extended Reagan boom in the world economy is bound to end sometime, at which time the currently vulnerable will suffer more than the presently dynamic and strong regions. Moreover, the inflows and outflows of capital and investment into flourishing decentralized regions once the larger capital market in Europe has been created in 1992 will intensify the current character of the problem significantly.

These are the problems of West German political economy that we have to look forward to in the 1990s.

Notes:

1. This section is drawn from my MIT dissertation: Industrial Organization and the Politics of Industry: Centralized and Decentralized Production in Germany, (Department of Political Science, MIT, 1989). The field work in part took place in the context of a collaborative project with Horst Kern of the Universitaet Goettingen and Charles Sabel of MIT which was financed by MIT's International Motor Vehicle Program. Our collaborative project resulted in a paper: Charles Sabel, Horst Kern, Gary Herrigel, "Collaborative Manufacturing: New Supplier Relations in the Automobile Industry and the Redefinition of the Industrial Corporation", MS, 1989, MIT
2. for a more detailed discussion of this development, see my essay, "Industrial Order and Industrial Change: The Case of Mechanical Engineering" in Peter J. Katzenstein, ed., Industry and Politics in West Germany: Toward a Third Republic, (Ithaca: Cornell, 1989)
3. this discussion relies on Horst Kern and Charles Sabel, "Gewerkschaften im Prozess der industriellen Reorganisation. Eine Skisse strategischer Probleme" forthcoming in Gewerkschaftliches Monatshefte, Fall 1989