

Hancké, Bob; Casper, Steven

Working Paper

ISO 9000 in French and German car industry: how international quality standards support varieties of capitalism

WZB Discussion Paper, No. FS I 96-313

Provided in Cooperation with:

WZB Berlin Social Science Center

Suggested Citation: Hancké, Bob; Casper, Steven (1996) : ISO 9000 in French and German car industry: how international quality standards support varieties of capitalism, WZB Discussion Paper, No. FS I 96-313, Wissenschaftszentrum Berlin für Sozialforschung (WZB), Berlin

This Version is available at:

<https://hdl.handle.net/10419/44087>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

discussion paper

WZB

WISSENSCHAFTSZENTRUM BERLIN
FÜR SOZIALFORSCHUNG

SOCIAL SCIENCE RESEARCH
CENTER BERLIN

FS I 96 - 313

**ISO 9000 in the French and German
Car Industry**

How internal quality standards
support varieties of capitalism

Bob Hancké / Steven Casper

August 1996
ISSN Nr. 1011-9523

**Research Area:
Labour Market and
Employment**

**Forschungsschwerpunkt:
Arbeitsmarkt und
Beschäftigung**

**Research Unit:
Economic Change and
Employment**

**Abteilung:
Wirtschaftswandel und
Beschäftigung**

We thank Laurent Duclos, Bruce Kogut, David Soskice, Jay Tate and Günther Teubner for stimulating discussions and insightful comments on the topic of this paper, and the many people we interviewed for the time and attention they gave us. The usual disclaimer applies.

ZITIERWEISE / CITATION

Bob Hancké / Steven Casper

ISO 9000 in the French and German Car Industry

How international quality standards
support varieties of capitalism

Discussion Paper FS I 96 - 313
Wissenschaftszentrum Berlin für Sozialforschung 1996

Forschungsschwerpunkt:

Arbeitsmarkt und
Beschäftigung

Research Area:

Labour Market and
Employment

Abteilung:

Wirtschaftswandel und
Beschäftigung

Research Unit:

Economic Change and
Employment

Wissenschaftszentrum Berlin für Sozialforschung
Reichpietschufer 50
D-10785 Berlin

Abstract

This paper discusses the introduction and implementation of ISO 9000 quality standards in the German and French car industry. Rather than a transfer of a set of concrete, well-understood rules, which are ready to be implemented, the paper argues, the quality standards have to be reconstructed and redefined by the relevant social actors during their introduction and implementation. They therefore provide solutions to very different problems in the two countries, and convergence in the organisation of production, in principle more likely in this setting than any other, thus does not result from this process.

Zusammenfassung

In dem Papier werden die Einführung und Anwendung der ISO 9000 Qualitätsnormen in der deutschen und französischen Automobilindustrie dargestellt und analysiert. Statt eines einfachen Transfers von präzisen und vertrauten Regeln, aufbereitet zur Einführung, müssen - so wird hier argumentiert - die Qualitätsstandards von den Akteuren neu festgelegt und genau definiert werden, während sie gleichzeitig eingeführt und angewendet werden. Folglich werden dadurch in beiden Ländern Lösungen für ganz unterschiedliche Probleme entwickelt. Eine Konvergenz der Produktionsorganisation, a priori gerade in diesem Industriebereich eher wahrscheinlich als in anderen Branchen, tritt deshalb nicht ein.

Table of Contents

	Page
1. Introduction	1
2. ISO 9000, transfer and convergence	3
2.1. ISO 9000 in the landscape of industrial standards	3
2.2. Why do firms adopt ISO 9000?	4
2.3. ISO 9000 in the car industry	5
2.4. Why does, despite all of this, the widespread adoption of ISO 9000 norms not lead to a convergence in production regimes?	6
3. Quality in cars: persistent differences despite universalistic rhetoric	7
3.1. France: control of and through quality	8
3.2. Germany: product quality as a safeguard of autonomy	13
4. Conclusion: quality standards, the politics of production and convergence	20
5. References	22

1. Introduction

The emergence, in the last decade, of new ideas on work organisation, supplier networks and product development compelled firms to adopt more rigorous procedures for the organisation of production and of quality control. Since their introduction by the *International Standards Organisation* (ISO) in 1987, the ISO 9000 quality control standards have become, in different versions branched out from the same core, a common instrument in many industries and service firms in all OECD-countries. As a result of this rapid widespread introduction of ISO 9000 standards in industry, firms were forced to change their traditional ways of producing goods and delivering services, rethink their internal organisation, reorganise their links with subcontractors and suppliers, and re-engineer themselves in order to be fit for the successful implementation of ISO 9000.

This paper discusses the impact of ISO 9000 upon different production regimes (Thelen 1991). It asks how ISO 9000 influenced the reorganisation of industry, and what the effects of this reorganisation were for the production systems of different capitalist countries. The answer to this question is provided by a detailed analysis of the introduction and implementation of ISO 9000 in the French and German car industry.

Our main finding is that the introduction of ISO 9000 standards was very different in both countries. In France, the quality standards reproduced, while modernising, the underlying Taylorist company organisation and the hierarchical links between final assemblers and their suppliers. In Germany, in contrast, ISO 9000 norms were embedded within new production concepts, where they ended up reinforcing the autonomy of skilled workers. In inter-firm relationships, they act as an informal insurance clause against the new systemic risks associated with network forms of organisation, thus safeguarding the autonomy of small firms. ISO 9000 therefore reproduced the previously existing differences between the organisation of production in the two countries in subtle ways. This is so, we argue, because the ISO 9000 norms are not really exogenously given, ready to be implemented by industry, but have to be re-interpreted, re-defined and re-constructed by the relevant actors, and thus become, in fact, very different institutional innovations in the two countries. This explains why they have the different effects in the two countries.

Put this way, the argument is part of a broader research program on the historical-institutional differences between different types of late-twentieth century capitalism (Soskice 1996; Crouch & Streeck 1995). The core hypothesis of that research program is that the systemic character of

institutions in late capitalist societies forces innovations and imported elements to be moulded to fit the broader institutional order: they have to be compatible with the pre-existing institutions (Sorge 1991).

While our argument adheres to this general systemic-institutionalist position, however, it also differs in some respects. First of all, precisely since new elements have to be moulded, i.e. have to be re-interpreted and redefined to fit the existing institutional set-up, they inevitably change in character as a result of the actions of the economic agents. The system of international quality standards appears to be the same in different countries, yet it performs very different functions because of the way it is introduced in and grafted upon the existing industrial-institutional structure. These fundamental differences in their operation imply that these norms in fact are not just exogenously given and adapted through institutions, but are simultaneously endogenously constructed.

Secondly, looking at the actual operation of such universally accepted transferred institutions as quality control standards also means that we try to understand their inner workings. In this regard as well, we depart from the more conventional analyses, who regard the mediation between institutions and agents as largely irrelevant: entering this black box, we hope, will contribute to a more dynamic and socially embedded understanding of the role of institutions in economic action.

This comparative study has broader implications. Since ISO 9000 standards are written up in a clear and unequivocal language, are by definition not locally or nationally embedded, but internationally defined, deal with production processes instead of product specifications, and since the car industry is the most internationalised traded goods sector, this paper sheds light on the old question of economic and industrial convergence. For if even under these highly favourable conditions convergence fails to take place, serious doubts arise if it would at all, particularly in less conducive settings where national traditions and institutions may play a much more important role in retaining the original setting.

We have organised the paper, which is based on interviews and plant visits with the main car producers in both countries, their suppliers and industry experts,¹ around this broader question. Section 2 discusses why and how studying international quality standards in the car industry contributes to an understanding of the debate on convergence and divergence. Section 3 presents the empirical details on work reorganisation, supplier relationships and

¹The list, in some detail is: BMW, Citroën, Ford, Mercedes-Benz, Opel, Renault, VW, some of their first and second-tier suppliers in France and Germany; the AFAQ, CFDT, CGT, FO in France; and the BDI, DIN, the VDA, IG Metall in Germany. For some of these, one interview was sufficient, in others, we had a series of interviews. In all, we base our research results on some 80 such plant and industry interviews in both countries.

ISO 9000 norms in French and German car industry. The fourth and final section concludes by recapitulating the main points of the paper and draws some further conclusions.

2. ISO 9000, transfer and convergence

What follows sets the stage for the empirical part of the paper. It explains what ISO 9000 quality standards are, and why they are important in today's industry. Section 2.3. discusses the practical aspects of their introduction and implementation in the car industry, where they have become the standard instruments for organising links between final assemblers and suppliers. The final part discusses why all of this has not led to a convergence of the patterns in the organisation of production.

2.1. ISO 9000 in the landscape of industrial standards

Industrial standards or norms are the rules which govern most of the technical, day-to-day relationships within and between firms. At a time when companies are reorganising from large, vertically integrated, hierarchical systems into a more loosely defined set of relationships between semi-autonomous production units, both inside and in their relations with suppliers, industrial standards provide a common language across specialties and firms to organise these links. Industrial standards are therefore critical to the smooth functioning of a complex industrial system (such as car assembly) which requires a vast amount of coordination between departments and units.

There are two broad varieties of industrial standards and norms: national norms and international standards. The first are typically product norms, which specify the technical characteristics of materials and products. For a variety of reasons beyond the scope of this paper (see Lane 1995; Lane & Bachmann 1996), these are embedded in national institutions, and convergence is therefore rather limited in this field. The international standards systems developed by ISO are considerably more relevant for the purposes of this paper. By definition, they do not follow national practice in their construction, and are themselves both sufficiently standardised and sufficiently unequivocal so that they can be used in different settings.

Within the ISO system, one group of standards is not product-oriented but process-based; they do not deal with the technical specifications of the products and materials, but with how they are made. These are the famous ISO

9000 norm series, which govern the organization of quality control.² Originally these standards were developed in the US Department of Defense, where they were used for the production of complex, sophisticated weapons systems. At a later stage, they were slightly remodelled to be useful for commercial enterprises as well, and thus found their way into the formal ISO system in 1987.

There are, in all, three series, the base series ISO 9001 and 9002, which are relatively similar and deal with quality assurance in production, installation and servicing, and the ISO 9003 series which incorporates statistical process control. The norm series 9000 and 9004 are essentially guidelines for selection of the standards used in developing quality management systems (Paradis et al. 1996). These norms, and particularly the first of these are extremely relevant, since they deal directly with the organisation of important parts of production: they specify how a firm should measure quality, take corrective action when quality drops, and most importantly, implement preventive quality control.

Over the past decade, ISO 9000 has gradually become a standard instrument in the relations between and within companies. Practically all large manufacturing firms in France and Germany use them in-house for quality control and expect their most important suppliers to be capable of implementing them.

2.2. Why do firms adopt ISO 9000?

One critical question, logically prior to any other is why ISO 9000 found its way into today's industry. Why did firms begin to adopt the relatively distant and unknown ISO system, given that all paid attention to quality before? What are, in other words, the presumed benefits of the ISO system over other quality control arrangements?

The answer lies in the type of information conveyed through the ISO system. As a general rule, ISO 9000 makes the quality process transparent, even to third parties, who are not necessarily knowledgeable about actual production questions, but who need this information for an evaluation of the company. Banks, for example, rely on ISO 9000 certification as a parameter in

²Recently a new set of norms, dealing with environmental issues, was introduced, the ISO 14000 series. These are the only other ones which treat, at least in part, production processes, and therefore are relevant to this paper as well. However, it is too early, really, to tell if these norms have an impact at all, and one could wonder what their effect will be, as long as economic incentives for environmental care are very limited.

risk assessment, and insurance companies can lower premiums if firms are ISO-certified.

This argument can be generalised. ISO-certification saves the large firm from making big investments in finding information on the capabilities of their suppliers, which could be extremely difficult to obtain. The information associated with ISO 9000 is both (at least in part) public and transparent, through which firms save on transaction costs.³

For a foreign firm, the ISO 9000 series therefore provides a relatively easy tool for an assessment of a potential supplier in another country. Because of the quasi-official nature of the norms, and the implicit sanctioning capacity of the certifying agencies, a foreign buyer can rely on the value of the ISO norms, and at the same time, because they are reasonably well-understood, can assume itself to have sufficient inside knowledge about the supplier to be able to enter a transaction without the usual profound information asymmetries.

Conversely, for the domestic clients, ISO 9000 has advantages as well. They allow the supplier to position itself favourably on international markets, which leads to economies of scale and potential learning externalities; these in turn, feed back into the domestic buyer's operations as reduced prices. Hence the transparency provided by the norms indirectly leads to lower parts prices.

2.3. ISO 9000 in the car industry

The car industry is a laboratory for new management techniques and organisational principles. More than in any other sector do market pressures, organisational learning, and the active transfer of "best practice" models pushing firms to converge around a single best system. For over ten years now, there have been conscious attempts to identify and copy best practice; the best—but by no means only—example is probably the 1990 IMVP report on the car industry (DiMaggio & Powell 1991; Florida & Kenny 1991; Womack et al. 1991).

³ It is possible that ISO 9000 quality standards actually lower the formal quality requirements as compared to non-ISO 9000 quality control measures. Frequently the previously existing quality control systems were extremely robust, as, for example, in Germany before the introduction of ISO 9000. However, these quality control systems were also highly idiosyncratic, and therefore all but transparent to outsiders. As long as buyers of parts understood the organisation of the supplying company well, this hardly mattered. However, as soon as this relatively certain information could not be taken for granted anymore, for instance when suppliers increasingly were international firms, increased transparency became a must.

In order to reposition themselves in the aggressive markets of the 1980s and 1990s, car firms had to revise their operations. In different ways in different countries and market segments, this led to a reorganisation of internal operations (“lean production”) and of the links between car firms and suppliers (just-in-time supply of complex subassemblies instead of large inventory of single parts). Managing these new, considerably more fragile production systems required more attention to quality. Since almost a decade, therefore, ISO 9000 norms are actively used by the car firms for their own final assembly operations and for their links with suppliers.

The car sector is a highly internationalised sector: roughly half of the US trade deficit with Japan in 1991 was attributable to cars, and international car trade has been a major topic of negotiation in the GATT and WTO talks and was, until recently, a highly protected sector. Internationalisation thus puts additional pressure on car firms to adopt the most competitive production methods –i.e. choose from among a small set of functionally equivalent production systems—since under these open trade systems, any competitive lag in a saturated market is quickly sanctioned.

2.4. Why does, despite all of this, the widespread adoption of ISO 9000 norms not lead to a convergence in production regimes?

Given these two considerations —the disproportionate international openness of the sector and the universal adoption of standardised norms that deal with the organisation of production— one would expect that ISO 9000 norms lead or at least contribute critically to a convergence in the organisation of production in the car industry. The material presented below on the implementation of ISO 9000 norms in the French and German car industry, however, suggests that such a convergence is not taking place. While there are certainly areas where more similarities exist today than fifteen years ago —in plants in Sweden, Germany, Belgium, France and Portugal, the walls are covered with the same statistical control sheets and quality circle reports as in the US, for example— on balance the ISO 9000 norms do not at all induce convergence by erasing the idiosyncrasies of the national production systems.

In France, the quality standards are means to reproduce and modernize the neo-taylorist practices in the workplace and the hierarchical dependency relationships between firms. In Germany, on the other hand, the ISO 9000 norms graft themselves upon a very different initial structure of team work, and end up reinforcing the autonomy of workers in the workplace; in interfirm relationships, the quality norms play the role of an informal insurance clause, thus also insuring the autonomy of small firms. In short, instead of being one of

the driving forces behind convergence between patterns of the organisation of production in the two countries, the ISO 9000 standards, because of how they encountered very different existing industrial traditions and institutions, actually contribute to a reproduction of the differences between production systems in different countries.

The explanation for this rather puzzling observation is that the ISO norms are not really imported from outside into the systems, but that they are truly redefined and re-constructed by the crucial actors within each of the countries to fit their own views of what they can contribute to their industries and production systems. They are, in other words, only partly given, and it is rather unclear from the account that follows, which part of them really is sufficiently “unnegotiable” and “hard” to be able to impose a universal logic overriding the existing institutional constructions. This paper suggests, in fact, that this “hard” part –assuming that it exists– is extremely small. Without the active re-interpretation and, hence, the contextualisation of the ISO 9000 norms, they would not exist at all (Latour 1989).

These divergent interpretations of the norms, in turn, are possible because the quality standards are sufficiently flexible for such multiple uses. ISO 9000 norms are, in other words, not the same things in different countries. Through the remoulding, they become something else for the relevant actors –workers, firms, and industry. They are solutions for very different problems, with very different issues at stake, and intersect with very different practices and identities.

What follows will demonstrate how different actors were involved in the construction and implementation of the ISO 9000 norms in the car industries in each of the two countries, how the norms were articulated with very different institutional landscapes, and how they thus ended up having very different effects for the reorganisation of industry.

3. Quality in cars: persistent differences despite universalistic rhetoric

In the two large empirical sections which follow, we will discuss the introduction, implementation and effects of ISO 9000 norms in, respectively, the French and German car industries. The two sections will follow the same basic pattern. First we present a thumbnail sketch of the situation prior to the introduction of ISO 9000 norms. We then move on to the concrete setting in which attention for quality increased, and how this translated into the adoption of ISO 9000 standards. The next part discusses the institutional and organisational setting of ISO 9000 certification, and we end up with a discussion of how the norms

interact with work organisation and with the construction of supplier relationships in French and German car companies.

3.1. France: control of and through quality

The situation in French industry prior to the introduction of ISO 9000 norms is relatively easy to summarize. Workplaces were extremely hierarchical and tasks were subdivided in extremely small parts (Friedmann 1956). The “specialised worker —*“ouvrier spécialisé”* or OS (Crozier 1964; Bernoux et al. 1973; Linhart 1981; Sabel 1982) — was in reality a low to semi-skilled worker who was qualified by means of a set of abstract rules to perform only a very small number of tasks (Maurice et al. 1986). As this suggests, the gap between the conception of products and tasks, on the one hand, and the actual execution, on the other, was wide: engineers planned and the OS executed, strictly following detailed orders (Friedmann 1956; Linhart 1991; Linhart 1994). In fact, since the early 1960s, this division increasingly expressed itself geographically. The Paris headquarters were staffed with product engineers, “*bureaux de méthodes,*” and strategic management, while production took place in the provinces (Veltz 1996, pp. 24-29). Taylorism thus had a geographical as well as a social face.

The relation between large companies and their suppliers mirrored this picture of work organisation. The product engineers defined all the crucial product characteristics, and treated their suppliers as non-integrated workshops, which had to follow their detailed specifications. The suppliers themselves, on the other hand, were technologically incapable of rising above these minimal expectations, and under-financed, which made a technological leap very difficult. “Inter-firm Taylorism,” a report on the electronics industry published as late as 1987 (Rochard 1987), called the situation, evoking parallels with the situation described above (Gomel et al. 1992; Gorgeu & Mathieu 1993a; Gorgeu & Mathieu 1993b).

Despite its obvious shortcomings, as long as markets were sufficiently stable, and workers and suppliers (reluctantly, perhaps, but nonetheless) willing to accept their subservient position, the system easily survived. However, those two things changed. Markets became saturated, and workers refused — on several occasions between 1968 and 1985 — to play the role that the system prescribed for them. Suppliers, on the other hand, needed a nudge from the outside —which came quickly in the early 1980s, with the generalised introduction of JIT delivery systems.

Just-in-time delivery systems were introduced in France under severe economic pressure. After the U-turn of the Mauroy government in 1983, and the

decision to stay within the EMS (Halimi 1992; Cameron 1996), several things changed in the relationship between government and large firms. First, the defense of the franc and the anti-inflationary policies expressed themselves in extremely high interest rates, the highest in OECD countries during the years 1979-85 (Hall 1986). Second, because of the self-imposed budget constraints, the government was unable to bail out the large firms in crisis. Third, and in part as a result of the shift in government policy, the large firms in France, which all went through a severe profitability and debt crisis in the early 1980s (see Cohen 1989; Armstrong et al. 1991; Hart 1992), were forced them to find both rapid and structural internal solutions to their problems, instead of waiting for government subsidies. JIT delivery was an obvious answer: it allowed the large firms to externalise the costs of carrying inventory, and they could therefore start reducing their debts.

The integration of suppliers into tighter production schedules and subsequent attempts to rethink work organisation in order to meet the new demands imposed by JIT production, led to a situation in which instruments were needed that acted simultaneously as a performance indicator and as a guide to organise training and improvement programs. It is in this context of rapid adjustment, that quality standards found their way into France. At first, the norms were introduced in a somewhat isolated manner by different large companies, usually as a way to reduce the uncertainty in the supplier relationships (Baudry 1994; Baudry 1995), but in 1988 an agency was created, the *Association Française pour l'Assurance de Qualité* or AFAQ, which organised the spread and adoption of the ISO 9000 quality norms that were introduced in 1987. The agency is a private agency, financed and organised largely by the industry associations and the large firms — in contrast to the *Association Française pour la Normalisation* (AFNOR), the state-organised agency for product normalisation.

Given the predominant role of the state in most areas having to do with French industry, one might be surprised to find that the AFAQ is a private agency. In all the situation appears very similar to the “private governments” that organise the German industrial world, such as DIN, the industry associations, etc. (Streeck 1987; Casper 1996; Streeck & Schmitter 1985). Underneath these appearances, however, a very “French” world unfolds. In March 1993 the AFAQ and the AFNOR, the state agency responsible for the construction and certification of product norms, concluded an agreement in which they vowed to mutually recognise each other’s certifications. Because of the authority vested in public agencies by the French state, this agreement primarily transfers authority from AFNOR to AFAQ. This interpretation is corroborated by the role of the large firms in the AFAQ-certification: as with product norms, they are the crucial agents in the actual legitimation of the standards by imposing them upon their suppliers. What emerges is therefore quite a conventional state-centered method, in which the state and large firms co-operate in the construction and implementation of quality norms.

The AFAQ, located in Paris, is the officially recognised ISO 9000 certifier for all of France; the French ISO 9000 diploma is called an “AFAQ-certification.” The certification procedure itself is relatively simple. A supplier is told by one of its clients that contract renewal crucially depends on solid quality control, i.e. AFAQ certification. The company prepares for the test, and when it thinks it is ready, contacts the AFAQ for an inspection. The AFAQ typically sends out two people: one quality expert and one sectoral expert. These two check the quality control system —i.e. production follow-up, checks, corrections and training— in place, and when they judge it to be conform to their standards, the company is certified. If not, detailed comments are given about what to improve and how to implement the improvements.

How, then, do ISO 9000 norms work in practice in the French setting? Workplaces have undergone many changes since the early 1980s, and differ in many respects from the idealtypical sketch above. Most importantly, perhaps, is the change in task composition and naming: instead of narrowly trained *ouvriers spécialisés* (OS), companies have tried to integrate several such descriptions into one “*opérateur*.” Typically, an *opérateur* is able to perform different tasks of the former OS; its true novelty, however, resides in the amount of peripheral tasks. Currently, the car firms expect their line workers to be able to manage their own work place; do basic on-line quality control; check, discuss and improve parts quality with suppliers; and participate in team-like structures where they discuss potential improvements in work organisation, machinery and process design. Moreover, in its latest model, the *Mégane*, Renault let workers design both product (“ease for assembly”) and process in co-operation with engineers.

Alongside legal changes, new management ideas and changing demands from workers, ISO 9000 was part of this workplace revolution. In order for firms to be able to deal with ISO 9000 in an appropriate and meaningful way, workers’ skills have to be broader and more systematic, while workplace institutions that allow for a smooth flow of information between the operators and process engineers have are necessary. In ISO 9000, in other words, many of the other organisational innovations in French firms found their culmination.

However, in their implementation, the quality standards also reinforce elements in the French workplaces that reduced worker autonomy. Rather than conduits for a profound de-taylorisation, therefore, the ISO 9000 standards are probably better understood as elements that recreate the traditional Taylorist workplaces in a new shape (Linhart 1991). First, all the basic elements of classical Taylorism are still there: workers still have detailed task descriptions (there are just more of them), working rhythms are still imposed by machines, and there is, as before, a strong division between conceptual and executive work (Duval 1996). Between 1984 and 1991, the allegedly “post-taylorist” boom years, the numbers of workers in the French engineering sector who said they

performed repetitive work increased by almost a third, and those who claimed to be working under machine-imposed rhythms by almost 40%. Within the engineering sector, the same survey reports, the car industry easily beat all the other subsectors: almost the entire increase between 1984 and 1991 was attributable to the re-taylorisation of assembly work (Duval 1996, pp. 36-37).

In these modernised French car companies, ISO 9000 norms reinforced the neo-taylorist nature of the workplace by removing uncontrollable risks and other worker-related hazards from the workplace. In order to assure quality, according to the dominant translation of ISO 9000 norms in the French context, work processes have to be standardised as much as possible —exactly what the car industry had been offering all along, and refined in the second half of the 1980s with the introduction of lean manufacturing concepts (Berggren 1993). ISO 9000 quality control and the neo-taylorist workplaces thus entered into a happy marriage, where both worked in the same direction: reducing variability in processes by reducing workers' autonomy in decision-making (see also Campinos-Dubernet 1994).

A similar modernisation took place in the relationships between the assemblers and their suppliers. Here too, many things have changed and are still changing. From close to 2000 suppliers in 1985, Peugeot (PSA) and Renault went to some 700 each in 1996, with further reductions in sight. This reduction accompanied an increase in the expectations toward suppliers: from simple parts suppliers, they were transformed into full-fledged systems suppliers, often responsible for product development as well as production and delivery. Both large concerns therefore adopted a policy of reducing their links with suppliers who are likely to be incapable of becoming systems suppliers: they are actively forging mergers between complementary suppliers whose turnover is below FF 50 Mio (roughly DM 15 Mio) in order to assure that these are technologically sophisticated (ref. interview). Finally, through a variety of direct and indirect instruments, ranging from assistance in obtaining finance, over technology transfer and licensing agreements, to expertise, consultancy and training, the car companies are actively pursuing policies to upgrade the suppliers technologically. Taken together, all these changes amount to a sharp break with the hierarchical, technologically underdeveloped past.

Here too, ISO 9000 norms were instrumental in shaping these new production relationships. They were, as for workers in the firms, the standards which guided SMEs in their self-assessment and improvement programs: they proposed a well-understood and reasonably transparent minimum performance level against which each firm could judge itself. Their generalised introduction in French industry, where practically all large firms have imposed ISO 9000 as a minimum requirement, thus certainly contributed to the recent rise in technological capabilities of the SMEs, and the revolution in supplier relationships.

Alongside this generalised upgrade, however, a different process reproduced the old order in subtle ways. The *ensemble* of the quality instruments, with ISO 9000 at its core, is at the basic of this reproduction. In order to understand the influence of ISO 9000 in the links between car firms and their suppliers, one needs to take into account how ISO 9000 standards blend into a wider arsenal of quality-related instruments.

The most important of these is the quality audit performed by the car firms among their suppliers. PSA and Renault jointly run a suppliers selection agency, which on regular intervals screens the activities of the suppliers with an eye to quality, and to other company functions which may bear on quality. Because of this broad interpretation, the audit really entails every facet of the company: finance, training, marketing, technological capabilities, etc. The quality audit thus amounts to a general company audit.

AFAQ certifications appear to make this highly hierarchical relationship in French industry slightly more equal; less so, however, for the car companies. Whereas many large firms have abolished their customised quality audits (with the exception of safety-related quality as, for example, in the chemical, nuclear and defense industries) and solely rely on the AFAQ-certification for quality standards, the car firms decided to keep their bilateral quality audits.⁴

The broader context is necessary for a proper understanding of why they do so. The quality audits in the car industry are one link among many between the final assemblers and their suppliers. By means of the quality audit, the large firm obtains information on the general situation of its supplier —not just on its quality operations— which it can use to improve the suppliers operations, to organise expertise missions and training systems, or to support the small firm in its relations with banks and regional development authorities (Hancké & Cieply 1996). The extreme openness of the suppliers that the large firm imposes, thus makes the SME very dependent in at least two ways: directly, because the car firm is frequently the most important client; indirectly, since the assembler is its interface with the outside world (Ganne 1992).

ISO 9000 standards play a dual role in this setting. The first is ideological: the generalised emphasis on quality allows the large firm to reorganise its operation with the suppliers. Put simply, without the presence of an outside,

⁴ In large measure the car firms keeping their own customised audits is related to the type of links that car assemblers are trying to build with their suppliers. Because of the relatively tight integration, itself a result of the externalisation of some product development functions and, most of all, since the car industry is farthest along the JIT delivery path, the assemblers may, rightly or wrongly, think that ISO 9000 standards do not solve all their problems. As discussed below, since the German car producers also have kept their customised quality checks, the persistence of customised quality audits is likely to be related to the particulars of the sector.

“neutral,” official agency responsible for these things, the actions of the large firms would be deemed highly illegitimate—a mere showing of force, in fact. The second reason is practical: since the car companies have kept their quality audits, the AFAQ-certification serves as a filter. It selects from among the suppliers those who are capable of meeting a first test.

Bringing in the wider institutional context helps to understand how quality is used in the relations between the car firms and their suppliers. Beside its technical aspects—i.e. the assurance of a certain minimum quality level in JIT delivery systems—it also acts as a means to reproduce, while modernising, the dependent relations between large firm and their suppliers. The same is true of how ISO 9000 interacts with the modernised workplaces: beside the first-order contribution—making work processes more transparent and thus amenable to improvement—it is also a way to reclaim from the workforce the autonomy it may have gained over the past decades.

As the next section will demonstrate, this general picture contrasts very sharply with the situation in the German car industry. Instead of acting, in effect, as instruments which increase the dependence of suppliers and reduce the autonomy of the workforce, ISO 9000 norms in Germany do exactly the opposite: in subtle ways, they safeguard small firm autonomy, and fit relatively well with the prevailing organisation of work and distribution of skills in the industry.

3.2. Germany: product quality as a safeguard of autonomy

In Germany the organization of markets is based on strong legal and institutional supports designed to provide autonomy to the traditionally weak: workers and small firms. The training system is organised in such a way that workers obtain relatively broad general portable skills, which allow them to adapt flexibly to new work environments (Maurice et al. 1986). The structure of workers' interest representation within the firm complements the autonomy thus gained (Streeck 1984): the works council has important veto rights over many aspects of work organisation, which the workers have used to protect their position. The labour unions, finally, are the outside supports of the system. By providing the works councils with independently gathered information and ideas, for example, the sectoral union IG Metall has become an important actor in the modernisation of the car industry (Turner 1991).

A parallel system governs inter-firm relationships. Though German industrial politics at the national level is dominated by large firms, at the local level a rich constellation of institutions exists to promote small or *Mittelstand* firms. Small firms have access to finance through local development banks

(Deeg 1992; Vitols 1995), technology through local research and development consortia sponsored by local governments, research institutes, and technical schools (Lütz 1993), and trained workers through participation in the apprenticeship system. In addition German contract law contains strong legal protection against contractual exploitation by large firms (Casper 1995). The importance of small firms is most prominent in the machine tool sector (Herrigel 1989), but, as we will see, small firms are critical to the success of the auto parts supplier industry as well.

Until the late 1980s, most suppliers made thousands of uniform and fairly simple stamped metal parts with relatively simple production processes. Workers were highly skilled: they were responsible for setting up and maintaining their machines, setting cycle times, and performing quality control, often according to a very effective, but highly idiosyncratic system. Under German liability law, final assemblers were obligated to perform “entry inspections” of unfinished parts they bought from suppliers (Graf von Westphalen 1982; Steinmann 1993). Small firms knew that most random defects would be spotted by final assemblers. If the final assembler did not perform the entry inspection, it, instead of the supplier, would be responsible should a product liability problem occur. While major quality control problems could result in a supplier losing its contract, the absence of legal sanctions implied that they could organise their quality control system more loosely than producers of final products.

As in France, the introduction of new production concepts was also the critical force within the German car industry, but because the institutions within which German firms are embedded are radically different, both the problems caused by JIT and the set of possible solutions within the firm made possible by ISO 9000 varied substantially from France.

Particularly after 1989, German parts suppliers had to compete with low wage production in Eastern Europe. In part in response to the adjustments of the 1980s (Streeck 1989), most car producers within Germany were switching to a “system supplier” strategy: large final assemblers in Germany were reducing their internal production from 40-50 percent down to 20-30 percent. This gave virtually all supplier firms a chance to upgrade. Larger firms used the opportunity to turn themselves into “full service” suppliers responsible for the design and production of entire subassemblies. Smaller firms, on the other hand, tried to escape competition from new eastern German producers by becoming important “second tier” suppliers to the large system suppliers. Thus, instead of producing simple parts, small firms were vying to win contracts for more sophisticated components used in larger subassemblies –often in niche markets. Transmission producers, for example, began outsourcing contracts for specialty parts needed for automatic transmissions, seat producers began outsourcing contracts for head-rests, and so on.

More sophisticated production necessitated a major reorganization of the work process within most supplier firms. For many firms upgrading meant shifting from simple to complicated multi-step work processes. For example, instead of individually operating a stamping machine, workers increasingly found themselves as one member of a production cell where a group of workers collectively produced a more complicated subassembly. For most firms trying to upgrade, the introduction of a more complex division of labour threatened to throw the delicate quality control procedures created by workers out of balance.

At the same time, virtually all supplier firms were forced to deliver products on a JIT basis. This did not just mean daily or every other day deliveries. In designating all firms as JIT suppliers, final assemblers found a convenient way to redesign legal contracts in such a way as to rid themselves of the “entry inspection” requirement and legal burdens they entailed. Final assemblers argued that they could no longer inspect all incoming parts, since the essence of JIT is delivery straight to the assembly line for immediate use. Even if defects were found, the lack of inventories would still cause expensive production delays. New contracts introduced in the late 1980s thus asked suppliers to perform “exit inspections” in place of the normal “entry inspections” of the final assemblers that the law prescribed, pledged suppliers to a “zero defect” guarantee, and forced them to assume all liability costs should defective parts cause damages of any kind to either the final assembler or end consumers (Ensthaler 1994; Casper 1996).

For all suppliers, these radically increased liability risks were not hypothetical problems to be faced later should a major problem occur. Insurance companies immediately demanded higher premiums for liability insurance. Because most product liability risks were previously held by the final assembler, insurance was cheap. The new contracts made insurance much more expensive. Furthermore, in order to better gauge a supplier’s risk profile, insurers insisted on conducting expensive audits of every supplier’s quality control system. If suppliers wanted affordable liability insurance, they would have to replace the idiosyncratic routines created by workers, however robust these may be, with a quality control system that insurance auditors could understand. This was provided by ISO 9000 norms, who became the key to both the process reengineering of German supplier firms and one of the major instruments for making new supplier relationships tolerable within German liability law.

Even though the new JIT contractual arrangements relieve them of most liability risks, if defective products reach final consumers, the final assembler’s reputation could be ruined. Thus, as in France, ISO 9000 norms became important to German suppliers when, as a result of the generalised introduction of JIT delivery, all German final assemblers needed to monitor quality control processes used by suppliers. Starting in the late 1980s German car assemblers

began inserting clauses into contracts mandating that suppliers obtain ISO 9000 certification. From this point onwards, however, the story differs from that in France.

First of all, there is a private standard setting organization with strong ties to industry, the *Deutsches Institut für Normung e.V.* (DIN). Most German industry associations are members of the DIN, and they have mandated the DIN to formally create technical norms that describe particular products (but which are developed by the industry associations), and to import norms created by international standard setting institutions like the ISO into the German system. Since German courts have recognized product and process descriptions contained in DIN norms as legally binding when specified in contracts (Marburger 1983), the DIN has, despite its private status, become the *de facto* official German norm-setting agency. In this role, the DIN played an important part in the diffusion of ISO 9000 norms: immediately upon the introduction of the ISO 9000 norms in 1987, the DIN incorporated them in its official catalog of technical norms.

Persuading firms to adopt the norms or organize the certification process, however, was not the DIN's contribution, but the work of the German automobile trade association (VDA). Quality control representatives from each of the major final assemblers and selected supplier companies are members of a working group within the VDA which is responsible for standardizing technical norms. This group has agreed to adopt a common set of ISO 9000 based norms and mutually accept each other's auditing results. In contrast to France, therefore, where the large firms are at the heart of quality control, in Germany the industry associations –who also represent small firms and who get their strength and autonomy from the public goods they provide for industry– are the main actors.

As noted before, there are actually three different series of quality management standards contained within ISO 9000. The most important task of the VDA working group has been to consolidate the most useful standards from each of these series into a common quality management system package used in the German car industry. For example, the ISO 9001 series contain the most basic norms, which describe process checks that must be integrated into the work process. This has been adapted wholesale into the VDA series. The higher level norm series are designed for more sophisticated production processes. For example, small-batch manufacturers of niche products like machine tools rarely need to introduce statistical process controls. For mass producers of sophisticated components delivered on a JIT basis, however, statistical process controls are one of the most important checks used to prevent potentially catastrophic serial defects. Guidelines for statistical process controls are found in the higher level ISO 9003 series and have been adapted into the VDA series.

The end result of the of the VDA committee was a modular package that contained all of the basic ISO 9001 series norms and the more sophisticated norms from the higher level (i.e. statistical process control from 9003) series when applicable. The grading criteria are configured in such a way that suppliers with fairly simple production processes can be differentiated from more sophisticated companies. About 70% of the norms in the total series come from the ISO 9000 series, which are the basic requirements for all firms. Conveniently, firms meeting 70% of the requirements earn a “C” rating, the lowest acceptable rate for firms with relatively simple production processes. More sophisticated suppliers are required to have more sophisticated quality control systems, which they substantiate through earning a “B” or “A” rating, implying that 80% and 90% percent of the standards, respectively, are met.

Suppliers to German car producers can be certified via two routes. Some final assemblers routinely send quality auditing teams to suppliers in order to make extensive examinations of process organization within firms and offer specific instructions for improvement in order to reduce costs and improve quality. As part of these extensive quality audits, Volkswagen, BMW, and Mercedes Benz conduct ISO 9000 certification tests. If the supplier passes these tests, it can share these results with other final assemblers. Others, however, such as Ford or Opel, do not conduct detailed quality audits. Instead they ask that suppliers hire a private certification firm from a list of quality auditing companies which have been approved by the VDA.

The diffusion of ISO-9000 based norms have helped both final assemblers and suppliers. The collective development of the customized ISO 9000 based norm set within the VDA, spared final assemblers the cost of doing so themselves. Furthermore, by allowing the results to be shared, they save on auditing costs and, more importantly, can more easily scan the market of parts suppliers with a recognised and well-understood yardstick. Most final assemblers have realized that the best suppliers usually have multiple supplier contracts. Not only does multiple-sourcing reduce the dependency of a supplier on any one final assembler, important learning economies develop through the additional business and feed back to each of the final assemblers individually. It is therefore in the interest of all final assemblers to make the best supplier as transparent as possible. Standardized certification results are an important indicator of overall excellence.

Suppliers benefit even more. As we will examine momentarily, the ISO 9000 norms provide a blue-print with which suppliers can introduce a more systematic and robust quality control system. But the benefits in terms of supplier network organization are also substantial. Mutual recognition of results based on a common system reduce the resources each supplier must use preparing for audits. Furthermore, because the excellence of each supplier’s system can be judged by all interested final assemblers according to a uniform

basis, suppliers with high scores can use them as a marketing device to attract new business. Purchasing managers at Opel and Ford use ISO 9000 norms for their quality audits world wide. They do this partly as a way of screening and comparing suppliers from different regions. Having entered this system, German suppliers now have both an increased chance of winning regional sourcing contracts from Ford and Opel and have a benchmark with which to compare themselves with suppliers from other parts of the world. Of course, this cuts both ways: ISO 9000 also levels the field for outside suppliers to come in and compete with German suppliers.

From a comparative institutional perspective, however, the most interesting aspect of the ISO 9000 story in Germany regards their use in solving many of the insurance problems caused by JIT production. Before, the dramatically increased liability risks faced by most German suppliers forced insurance companies to conduct their own technical audits in order to establish each firm's risk profile. In the last few years, these insurers' audits were gradually replaced by the VDA quality audits. Between 1992 and 1995 ongoing discussions between the trade association which represents German liability insurers (VDS) and a the umbrella trade association of German manufacturing Industry (BDI), of which the VDA is one of the most influential members, were held to discuss these problems. One result of these negotiations was an agreement that all German liability insurers would accept ISO 9000 auditing scores conducted under the customized VDA system as a substitute for technical audits carried out by the insurers themselves. Furthermore, the agreement recommends that all firms who qualify with A or B certifications and have good prior records, are exempted from the premium surcharges caused by the new legal risks (VDS 1995).

This agreement does not eliminate the legal problems caused by JIT contracts. But it does provide a clear road map that firms can follow in order to substantially reduce them. According to industry experts, over 70% of supplier firms have been able to meet the new guidelines by 1996 and consequently do not have higher insurance premiums.⁵

Every firm within the German automobile industry has had to implement quality management systems based upon ISO 9000 and the insurance industry statistics show that a large majority has done so successfully. However, one

⁵ This information was provided by Walter Heim (Siemens AG), in a speech at the conference on Quality insurance agreements (Qualitätssicherungsvereinbarungen), organised by the Europforum, in the Düsseldorf Hilton Hotel, 21 May 1996 (on file with authors). The real problem is faced by the 30% of firms who have either poor quality control records or have only obtained "C" certification scores. The new system at least provides these firms with clear goals to reduce these problems. But these are usually small parts suppliers who have not successfully upgraded into more sophisticated component suppliers. Because they also feel the full brunt of low wage competition from the East, the future for many of these companies is bleak.

critical set of questions remain. As discussed before, in France ISO 9000 norms contributed to a neo-taylorist work reorganization. ISO 9000 norms also originated in the United States, the cradle of Taylorism. Do ISO 9000 norms therefore intrinsically contain a separation of execution and control, which explains their use as neo-taylorist control instruments? Or, conversely, will the highly touted German system of work organization based on highly skilled, autonomous workers be transformed into an American (or French) style system as a result of ISO 9000 quality control imperatives?

ISO 9000 does lead to a formalization of quality control functions and a systematic reengineering of many parts of the work process to better incorporate quality control checks into every step of work. Practically all areas of work, such as preparatory steps for full scale production, machine maintenance, statistical process controls, defect investigation –what in most German firms were local procedures developed by highly skilled workers– are incorporated into a formal system with meticulously kept records.

Yet both the logic by which ISO 9000 norms are organized and our research within a small number of German suppliers which have successfully adopted ISO 9000 norms suggest that these standards can easily be adapted to German style work organization. While the potential for a rationalisation of work around Tayloristic principles is clearly there, a careful reading of the actual norms (for example Randall 1995; Paradis et al. 1996) shows that there is neither a formal delegation or assignment of responsibility for these duties or a precise specification of how they are to be performed. In fact, workers, foremen, or white-collar specialists can undertake all production-related quality control responsibilities.

Given this intrinsic flexibility of the ISO standards, the prevailing logic of work organization within German companies is the determining variable for the final outcome. Because German workers are already highly skilled and fiercely guard their autonomy (Sabel 1982; Kern & Schuman 1984; Herrigel 1995), skilled workers became responsible for implementing the new system. Furthermore, the established voice over work organization by German works councils provides a collective forum for workers to protect these rights. What emerged, therefore, was that workers incorporated most quality control duties into their work and had a large voice in negotiations with industrial engineers and the quality control manager of how this was to be done.

An illustrative example is provided by one firm that we visited which made sophisticated car axles. Before the incorporation of ISO 9000 quality management procedures, this company had already organized its shop into a number of production cells, each of which contained about eight skilled workers who collectively created their own division of labour according to group work principles. When this firm accepted a JIT delivery contract it underwent a

thorough reorganization of quality control in order to meet the top (“A”) level ISO 9000 certification requirements. As a result, one of these cells had incorporated statistical process control checks into its work process. Workers took control of detailed tolerance measurement on selected parts and recorded the results according to procedures satisfying ISO 9000 norms. In most French firms this is a production step that would usually be taken over by specialists. But within the German context, quality control, even of a more formalized nature, has remained under the control of skilled workers.

In Germany existing patterns of work organization and relationships between firms were inadequate to meet the needs of new production concepts that car producers have introduced world-wide in recent years. Final assemblers needed a robust quality control framework to monitor the quality control of suppliers, while suppliers needed to both upgrade their quality control and find a way to reduce insurance costs caused by the redistribution of liability risks contained in JIT contracts.

In both areas, ISO 9000 norms have become a crucial ingredient in the reconfiguration of the German model of both work organization and inter-firm relationships. The way this new system was set up confirms our basic hypothesis: instead of pushing German institutions structuring work organization and inter-firm relationships down the neo-taylorist, respectively hierarchical path of French industry, the ISO 9000 standards have been adopted by the existing German system to create a new framework. In both cases, the implementation of ISO 9000 quality control norms protected the autonomy of workers and small firms.

4. Conclusion: quality standards, the politics of production and convergence

The introduction of ISO 9000 quality standards had very different effects, and produced very different end results in France and Germany. In France, they became an element in the re-taylorisation of the workplace, and they reinforced a modernised version of the hierarchical relationships between large firms and their suppliers. In Germany, in contrast, ISO 9000 quality standards ended up reinforcing the autonomy of skilled workers, and in subtle ways became an instrument with which the small firms could keep and enlarge their autonomy vis-à-vis the large firms.

The reason for these very different outcomes, we argued, is that the ISO 9000 norm series were not just introduced, but had to be re-interpreted, redefined and reconstructed through the institutions governing industrial

organisation in the two countries, in order for them to be fully compatible with existing practices. This is not a mere cosmetic matter: without such a reconstruction, we would argue, the ISO 9000 norms simply would not exist. Like a foreign body, they would not be recognised by the system and ultimately rejected.

The introduction of ISO 9000 norms in the car industry, we argued, provides us with a critical case for studying convergence in industrial organisation. What we discovered was that ISO 9000 reproduced the existing order in many subtle ways. Given this result, there is little doubt that a convergence of industrial and economic systems toward one universal pattern is not very likely to occur. Underneath the “clean” process of the universal adoption of new, more efficient production techniques, and the transfer of best practice institutions, a different logic unfolds, where fierce struggles are waged over the costs of adjustment, the identities of workers and firms, and the legitimacy of the wider social and economic order. Politics is, indeed, at the basis of these persistent differences.

Politics is, however, not just an obstacle against convergence. The transfer and or introduction of institutions itself is a profoundly political process (Jacoby 1995b). The struggles between large firms and their suppliers, between management and workers, and how these were mediated (or not) by institutions such as labour unions, industry associations and (quasi-) public agencies, were not just a distant background setting against which ISO 9000 norms were introduced in the industry; they *were* the substance of the introduction of the standards, and it is simply impossible, as we demonstrated, to fully understand the outcomes without understanding this re-construction of the institutions.

In sum, this explains why convergence is extremely unlikely to occur. Because of these struggles, not just the final outcome is very different in the process of transfer and institutional innovation. The politics of institutional transfer, combined with the inherent flexibility of the institutions to-be-transferred raise doubts as to whether everyone involved is actually transferring or introducing the same objectively existing institution. Our research, which is part of a larger and growing body of work in this dynamic institutionalist, contextualising line of thought (see Sorge 1991; Teubner 1993; Jacoby 1995a; Locke & Thelen 1995 for examples), suggests that this is not the case. Actors are actually transferring different things. Just one layer below the internationalising, homogenising world of late-twentieth century capitalism, therefore, diversity persists with just as much vigour as before.

5. References

- Armstrong, P., et al. (1991). *Capitalism since 1945*. (London, Blackwell).
- Baudry, B. (1994). "De la confiance dans la relation d'emploi ou de sous-traitance." *Sociologie du Travail* **36**(1): 43-60.
- Baudry, B. (1995). *L'économie des relations interentreprises*. (Paris, La Découverte).
- Berggren, C. (1993). *Volvo Uddevalla - A dead horse or a car dealer's dream?*. Royal Institute of Technology, Stockholm, manuscript.
- Bernoux, P., et al. (1973). *Trois Ateliers d'OS*. (Paris, Editions Ouvrières).
- Cameron, D. R. (1996). Exchange Rate Politics in France, 1981-1983: The Regime-Defining Choices of the Mitterrand Presidency. *The Mitterrand Era. Policy Alternatives and Political Mobilization in France*. A. Daley ed. (London, MacMillan).
- Campinos-Dubernet, M. (1994). Le client-cible ou le client-acteur des politiques de qualité: quels problèmes de coordination? *Mutations de l'entreprise et performance. Coopérer, oui... mais comment? Actes du Colloque, Paris, 30 novembre 1994, Cahier de Recherche no 70*. P. Charpentier et al. ed. (Paris, GIP Mutations Industrielles).
- Casper, S. (1995). *How Public Law Influences Decentralized Supplier Network Organization in Germany: The cases of BMW and Audi*. Wissenschaftszentrum Berlin für Sozialforschung, Discussion Paper FS I 95-314.
- Casper, S. (1996). *German Industrial Associations and the Diffusion of Innovative Economic Organization*. Wissenschaftszentrum Berlin für Sozialforschung, Discussion Paper FS I 96 - 306.
- Cohen, E. (1989). *L'état brancardier. Politiques du déclin industriel 1974-1984*. (Paris, Calmann-Lévy).
- Crouch, C. & W. Streeck, ed. (1995). *Modern Capitalism or Modern Capitalisms?* (London, Francis Pinter).
- Crozier, M. (1964). *Le phénomène bureaucratique*. (Paris, Le Seuil).
- Deeg, R. (1992). *Banks and the State in Germany. The critical role of subnational institutions in economic governance*. Political Science. Cambridge MA, MIT.
- DiMaggio, P. J. & W. W. Powell (1991). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality. *The New Institutionalism in Organizational Analysis*. W. W. Powell & P. J. DiMaggio ed. (Chicago, Chicago University Press).
- Duval, G. (1996). "Les habits neufs du taylorisme." *Alternatives Economiques*(137).
- Ensthaler, J. (1994). "Haftungsrechtliche Bedeutung von Qualitätssicherungsvereinbarung." *Neue Juristische Wochenschrift* **47**: 817-832.
- Florida, R. & M. Kenny (1991). "Organization vs. Culture: Japanese automotive transplants in the US." *Industrial Relations Journal* **22**(3): 181-196.
- Friedmann, G. (1956). *Le travail en miettes. Spécialisation et loisirs*. (Paris, Gallimard).
- Ganne, B. (1992). Place et évolution des systèmes industriels locaux en France. Economie politique d'une transformation. *Les régions qui gagnent. Districts et réseaux: les nouveaux*

paradigmes de la géographie économique. G. Benko & A. Lipietz ed. (Paris, Presses Universitaires France).

- Gomel, B., et al. (1992). "Les PMI sous-traitantes: gestion de la qualité et formation." *La lettre d'information du C.E.E.*(24, June).
- Gorgeu, A. & R. Mathieu (1993a). "Dix ans de relations de sous-traitance dans l'industrie française." *Travail* **28**(Spring).
- Gorgeu, A. & R. Mathieu (1993b). "Les fournisseurs de l'industrie: nouveaux impératifs, nouvelles localisations." *La lettre d'information du C.E.E.* **29**(September).
- Graf von Westphalen, F. (1982). "Einkaufsbedingungen der Automobil-Hersteller und das AGB-Gesetz." *Der Betrieb* **35**: 1655-1662.
- Halimi, S. (1992). *Sisyphus est fatigué. Les échecs de la gauche au pouvoir*. (Paris, Robert Laffont).
- Hall, P. A. (1986). *Governing the Economy. The Politics of State Intervention in Britain and France*. (Oxford, Oxford University Press).
- Hart, J. A. (1992). *Rival Capitalists. International Competitiveness in the United States, Japan, and Western Europe*. (Ithaca NY, Cornell University Press).
- Herrigel, G. (1989). Industrial order and the politics of industrial change: Mechanical Engineering. *Industry and Politics in West Germany. Toward the Third Republic*. P. J. Katzenstein ed. (Ithaca NY, Cornell University Press).
- Herrigel, G. (1995). *Crisis in German Decentralized Production: Unexpected Rigidity and the Challenge of an Alternative Form of Flexible Organization in Baden-Württemberg*. Department of Political Science, University of Chicago, manuscript.
- Jacoby, W. (1995a). *Learning, Tinkering or Building? Speculations on Institutional Transfer in Advanced Economies*. Workshop on Economic Adjustment and Mutual Learning; USA-Germany, (Wissenschaftszentrum Berlin für Sozialforschung, 15-16 December).
- Jacoby, W. (1995b). *Two Postwar Reconstructions: Institutional Transfer in Germany, 1945-1994*. Department of Political Science, MIT.
- Kern, H. & M. Schuman (1984). *Das Ende der Arbeitsteilung?* (Munich, Beck).
- Lane, C. (1995). *The Governance of Inter-firm Relations in Britain and Germany with Special Reference to the Role of Technical Standards*. University of Cambridge, manuscript.
- Lane, C. & R. Bachmann (1996). "The social construction of trust: Supplier Relations in Britain and Germany." *Organization Studies* **17**(3): 365-396.
- Latour, B. (1989). *Science en Action*. (Paris, La Découverte).
- Linhart, D. (1991). *Le torticolis de l'autruche. L'éternelle modernisation des entreprises françaises*. (Paris, Le Seuil).
- Linhart, D. (1994). *La modernisation des entreprises*. (Paris, Éditions La Découverte).
- Linhart, R. (1981). *The assembly line*. (Amherst, University of Massachusetts Press).
- Locke, R. M. & K. Thelen (1995). "Apples and Oranges Revisited: Contextualized Comparison and the Study of Comparative Labor Politics." *Politics and Society* **23**(3).

- Lütz, S. (1993). *Die Steuerung industrieller Forschungsk Kooperation*. (Frankfurt am Main, Campus).
- Marburger, P. (1983). "Die Haftungs- und versicherungsrechtliche Bedeutung technischer Regeln." *Versicherungsrecht* **34**: 597-608.
- Maurice, M., et al. (1986). *The Social Foundations of Industrial Power*. (Cambridge MA, MIT Press).
- Paradis, G. W., et al. (1996). *Demystifying ISO 9000*. (Reading MA, Addison-Wesley).
- Randall, R. C. (1995). *Randall's Practical Guide to ISO 9000*. (Reading MA, Addison-Wesley Publishing).
- Rochard, M. B. (1987). *La sous-traitance: entreprises et emplois. Le secteur de l'électronique professionnelle*. CEE-CEREQ-SESSI,
- Sabel, C. F. (1982). *Work and Politics*. (Cambridge, Cambridge University Press).
- Sorge, A. (1991). "Strategic fit and the societal effect: interpreting cross-national comparisons of technology, organization and human resources." *Organization Studies* **12**(2).
- Soskice, D. (1996). *Divergent Production Regimes*. manuscript.
- Steinmann, C. (1993). "Abdingbarkeit der Wareneingangsprüfung in Qualitätssicherungsvereinbarungen." *Betriebsberater* **34**: 873-879.
- Streeck, W. (1984). Neo-Corporatist Industrial Relations and the Economic Crisis in West Germany. *Order and Conflict in Contemporary Capitalism. Studies in the Political Economy of Western European Nations*. J. H. Goldthorpe ed. (New York, Oxford University Press).
- Streeck, W. (1987). *The Role of the Social Partners in Vocational Training in Germany*. (Berlin, CEDEFOP).
- Streeck, W. & P. C. Schmitter, ed. (1985). *Private interest government. Beyond market and state*. (London, Sage).
- Teubner, G. (1993). *Law as an Autopoietic System*. (Oxford, Basil Blackwell).
- Thelen, K. (1991). *Union of Parts*. (Ithaca NY, Cornell University Press).
- Turner, L. (1991). *Democracy at Work. Changing World Markets and the Future of Labor Unions*. (Ithaca NY, Cornell University Press).
- VDS (1995). *Qualitätssicherungsvereinbarungen*. Verband der Schadenversicherer, Haftpflicht-Fachinformation HFI 92, 21.07.95.
- Veltz, P. (1996). *Mondialisation, villes et territoires. L'économie d'archipel*. (Paris, Presses Universitaires de France).
- Vitols, S. (1995). *German Banks and the Modernization of the Small Firm Sector: Long-Term Finance in Comparative Perspective*. Wissenschaftszentrum Berlin für Sozialforschung, Discussion Paper FS I 95-309.
- Womack, J., et al. (1991). *The Machine that Changed the World*. (New York, Harper and Row).