This chapter examines how the relationship between the broad institutional configurations of the German and U.S. political economies affects the adaptation, among their firms, of innovative patterns of economic organization. In particular, it examines the transfer of a critical new organizational practice, “just-in-time” (JIT) delivery, from Japan to the U.S. and German economies. Car producers and other large companies have begun outsourcing the production of many sophisticated subassemblies to suppliers under JIT. Despite international markets for capital and goods and services, important differences still exist in institutional frameworks—specifically, in corporate law and industrial relations systems, the two areas most strongly influencing the introduction of JIT delivery strategies. This chapter argues that although JIT delivery has been successfully diffused from Japan to Germany and the United States, differences in national institutional structures have created important differences in the ways that firms in each country support the new system. Furthermore, examining the processes by which JIT delivery has been transferred to the United States and Germany lends insights into the governance of innovation in the two countries.

Innovative forms of economic organization like JIT delivery must be supported by laws and by informal rules negotiated between firms. Together these comprise governance structures that facilitate the flexi-
bility and dynamism created by the new arrangements. At the same
time, this organization creates ways to distribute important legal and
market risks. JIT delivery is an especially problematic relationship to
organize. The delivery of parts directly to final assembly lines that
have neither quality-control checks nor large inventories of replace-
ment parts leads to a number of well-known problems. Some defects,
particularly nonrandom defects, can halt production and, if not
detected before use in assembly, can damage expensive capital equip-
ment or create extensive reworking costs. Because the costs of break-
downs are often large, firms must create both legal entitlements
distributing these risks and rules establishing the technical division of
labor between companies, in particular, quality-control procedures.

Institutional frameworks influence how companies create the gov-
ernance structures needed to regulate their relationships. Virtually all
studies of the Japanese production system emphasize that JIT delivery
emerged as the solution to a unique set of problems and opportunities
posed by the structure of Japanese markets and the institutional organi-
zation of the Japanese economy (Cusumano 1985). Supplier relation-
ships in the United States and Germany were until recently based on
arms-length relationships between large, vertically integrated final
assemblers and thousands of small parts suppliers. In Japan, however,
final assemblers could not attain such extreme vertical integration.
Instead, the keiretsu system of cross-ownership within industry groups
engendered long-term relationships with key suppliers. Because these
suppliers are usually members of the same keiretsu industry grouping,
final assemblers and suppliers have an incentive to share the legal and
market risks entailed in JIT production. As a result, Japanese car man-
ufacturers developed highly collaborative manufacturing relationships
with their suppliers. Most of the technical governance problems
caused by JIT, such as developing robust quality-control management
procedures at supplier companies, were solved through these informal
relationships (Sabel 1993).

At least in the short term, institutional frameworks often prevent
firms from engaging in innovative forms of organization. How and
when can such institutional obstacles be overcome, or, more usefully,
reconfigured to help firms introduce modern industrial practices? One
solution is convergence. This means that in order for innovative busi-
ness practices to be transferred across systems, either the relevant mar-
ket-regulating institutions will have to be changed, or firms wishing to implement new practices will have to opt out of national models and create their own, largely private arrangements. Indeed, some firms in both the United States and Germany have adopted private contracting arrangements between suppliers and final assemblers that mimic key aspects of the Japanese solution, but most have not. Instead, most U.S. and German companies have found alternative governance structures supporting JIT delivery that are compatible with their own institutional environments, which differ substantially from those used by the Japanese. Furthermore, in the German case, the alternatives have been accompanied by a substantial reconfiguration of contracting laws used to demarcate both the legal and technical division of labor between companies in the supplier network. These changes represent a partial reconfiguration (as opposed to a wholesale change) of the German model.

The United States, unlike Germany, has a highly decentralized or “uncoordinated” political economy (Soskice 1999). In general, neither business nor labor has the organizational capacity to develop or enforce collective agreements across labor and/or business organizations. As a result, both the legal system and work organization framework are decentralized and oriented toward private contracting between autonomous agents, in contrast to Germany’s “coordinated” business system. In addition to the apprenticeship program and other well-known features of the German industrial relations system, strong business coordination allows the Germans to create a qualitatively different system of legal rules. Under government supervision, important parts of legal frameworks are negotiated between different business associations that represent different corporate interests (manufacturing firms, banks, insurers). This system develops policy instruments that the government can use to regulate how firms distribute legal risks among themselves when setting up supplier network contracts.

More specifically, this chapter makes the following arguments about the transfer of JIT delivery to the United States and Germany. Despite significant problems caused by prevailing supplier relationships in the United States up until the late 1980s, institutional frameworks do not create fundamental hurdles to JIT delivery. While the legal system does not actively promote or transfer the type of arrangements needed for JIT contracting, it does allow firms tremendous lati-
tude in designing their own agreements, which in many cases are successful. In the area of quality control, patterns of work organization in U.S. plants were actually conducive to developing a new breed of sophisticated quality management systems that facilitate JIT. Innovation, then, stems from organizations rather than institutions.

In Germany, despite a history of longer-term supplier relationships and, through the apprenticeship system, the existence of skilled workers in most factories, institutional rigidities hinder the introduction of JIT production, at least in the short term. German legal frameworks actively inhibit the development of the contracts needed to manage the risks created by JIT. Traditional patterns of work organization are not conducive to the introduction of quality management systems. Furthermore, gaps in the law have obfuscated what are usually very strict legal regulations that detail how contracting risks are to be spread among firms. This legal uncertainty has prompted a power struggle between final assemblers and suppliers. Most final assemblers have pushed responsibility for a number of new legal risks onto suppliers, exacerbating an already difficult transition to JIT delivery. In these ways, Germany differs strongly from the United States case.

However, in the long term, the German institutional system has a reconfigurative capacity that is lacking in the United States. Elements of business coordination, exemplified by firms bargaining within trade associations and guided by strong government regulatory oversight, have led to the modification of existing legal frameworks and created new agreements to solve some of the obstacles to JIT delivery. These agreements have recently been packaged into a new trade association legal framework that is being widely diffused across German industry. In short, these legal frameworks serve as “blueprints” that firms can use to develop complex industrial organization. Here again, the German case is quite unlike that in the United States.

The remainder of the chapter elaborates these arguments in detail. The next section examines JIT delivery in the United States. This is followed by a section examining the problems created by the German legal framework in adopting JIT delivery and the initial attempts by companies to overcome them. Then comes an analysis of the broader processes within the German political economy that have reconfigured legal frameworks regulating JIT delivery. In the conclusion, I summa-
rize the argument and restate the implications of introducing foreign innovations in the two countries.

**JIT DELIVERY IN THE UNITED STATES**

For decades, U.S. car manufacturers maintained a highly profitable production system, and for this reason, they were slow to see the need for change in automotive technologies during the 1950s and 1960s when manufacturers in Japan and Germany were making advances. An oligopolistic domestic market structure, combined with a lack of serious international competition, allowed final producers to develop very long (five- or six-year) product cycles of basic models and to compete only on the basis of essentially cosmetic annual design changes. Because of the huge size of the U.S. market, large economies of scale could be introduced through mass production with specialized factory equipment. Under these conditions, it made sense for final assemblers to become highly integrated, performing any part of the production process where scale economies could be obtained, which meant that most value-added work took place in-house (Piore and Sabel 1984).

Final assemblers used thousands of suppliers, who produced very simple parts with very little value added. Because these parts were simple to produce, final assemblers routinely kept large inventories of spare parts. Thus, quality was supplied by in-house value-added work, and the price of parts was the main focus of competition among suppliers. Final assemblers typically signed one-year contracts with suppliers. Assemblers usually relied on a number of subcontractors for each outsourced part to ensure fierce competition for contracts. Kenney and Florida (1993, p. 130) quoted a manager of a U.S. supplier company who characterized the traditional system as follows: “The strategy was line ’em up and beat ’em up until you get ’em to a point where they can’t make money anymore. Then you’ve got the best price.”

Today, to keep competitive, all car producers in the U.S. marketplace must introduce much shorter (three-year) product cycles, as well as a wealth of new subassemblies based on quickly changing electronics and chemical technologies. Under the old system, U.S. producers kept over 50 percent of the value added in-house. Today they hope to
produce no more than 20–30 percent, outsourcing the rest to suppliers who design their own parts and use JIT delivery systems. A number of commentators have pointed out that the traditional U.S. supplier system presented a substantial obstacle to implementing a modern production system (Helper 1991; Womack, Jones, and Roos 1990; Kenney and Florida 1993).

However, recent studies have conclusively shown that a tremendous shift in the organization of U.S. supplier relationships has taken place. Studies conducted between 1992 and 1995 show that the United States has caught up with Japan both in the standard length of contracts offered to suppliers and in the percentage of suppliers using JIT delivery systems (Helper and Sako 1994), and that the United States is actually ahead of Japan in collaborating with suppliers in product development (Ellison, Clark, and Fujimoto 1995; Liker et al. 1996). These results are especially persuasive because similar studies conducted in the late 1980s, often by the same researchers, showed sizable deficits in each of these areas (Helper 1991; Clark and Fujimoto 1991; Womack, Jones, and Roos 1990).

To explain how this transformation was possible, it is necessary first to analyze the traditional system and then investigate the problems that had to be overcome. The old system had two major obstacles to modernizing supplier relationships. First, existing supplier firms were largely unsophisticated, simple parts producers. In the late 1980s, because of the brutality of price competition under the old system, these firms had few resources to invest in the advanced production technology, design capacity, or quality-control procedures needed for more sophisticated production. The first problem in transforming the system was to find sophisticated suppliers or companies capable of becoming “full service.” The second problem concerned obstacles to creating effective governance structures to support JIT delivery, as well as obstacles to other parts of new, decentralized supplier networks such as joint product development and long-term price contracts. This problem was exacerbated by the prevailing atmosphere of distrust between suppliers and final assemblers, given decades of ruthless supplier politics. Difficulties in creating effective governance structures were also rooted in the institutional organization of the American political economy.
As to the first obstacle, increased technological sophistication has made it possible for suppliers to produce higher-value-added auto parts. This has spurred a huge entry of sophisticated manufacturing companies into supplier markets. These new suppliers have the resources to establish wholly dedicated production sites to meet the JIT delivery needs of particular final assemblers. Their individual plants are usually very small. The newest seat production plants of both Johnson Controls and Lear Seating, the largest American JIT seat producers, employ fewer than 45 production workers per shift; but these small production sites are backed up by tremendous corporate resources, including research and development facilities, quality-control and production engineering departments, large financial reserves, and highly trained management teams dedicated to large purchasing, engineering, and sales departments. The nature of the supplier industry has been qualitatively transformed since the late 1980s. The huge size of the U.S. market and direct investment by large foreign suppliers facilitated this transformation. Furthermore, as we will see in more detail, U.S. final assemblers faced virtually no legal obligations to the old supplier base and could easily cut ties.

Understanding the second major obstacle—creating effective governance structures needed to support JIT delivery—is more complex. This requires a systematic examination of the incentives and constraints presented by the broad institutional configuration of the U.S. political economy.

Laws Regulating Interfirm Relationships

In the United States, most sophisticated firms either have their own legal departments or long-standing relationships with large private legal practices. Trade associations play an insignificant role in regulating the contractual dealings of companies. Unlike in Germany, they are for the most part uninvolved in formulating standardized contracts or mediating disputes between companies. While laws and court precedent influence the variety and magnitude of various risks (as in product liability law), they generally do not provide firms with governance structures to regulate their dealings. Legal resources are decentralized among companies and private law firms. As a result of this decentralization of legal resources, the American private sector is in fact highly
innovative, but only in providing incentives for firms to create new legal structures facilitating new governance arrangements between companies. There exists no public legal infrastructure to transform innovative private legal arrangements into industry frameworks that can be transferred from firm to firm. Furthermore, the U.S. court system is limited in the type of contracts it can adjudicate because it has no access to private information generated within complex contracting relationships.

U.S. contract law is constructed around classical principles. It assumes that all parties are sophisticated agents; through the enforcement of formal written agreements, it protects their freedom to contract (Macneil 1978). Calls for court reinterpretation of contracts when circumstances have changed, or when the bargaining power between agents is unbalanced, are rare. In adjudicating most breach of contract disputes between firms, U.S. courts usually insist on the fulfillment of even flawed written contracts (Schwartz 1992). Though tort law, especially in the products liability field, provides for large, often punitive sanctions against those responsible for injuring third parties (Priest 1985), contract law does not regulate how contracting parties distribute such liability risks. Parties may contract them out as they see fit. This means that in JIT delivery and other supplier contracts, neither the final assembler nor the supplier has preexisting legal protection against various liability claims.

JIT contracting does not present any fundamentally new legal challenges for U.S. firms. The content of the legally binding part of JIT contracts is settled entirely by the relative bargaining power of the parties involved, on a case-by-case basis. Because final assemblers continue to have tremendous bargaining power over most supplier companies, the legal risks created by JIT are usually borne by suppliers. While JIT delivery creates a dramatic increase in risk exposure to suppliers, from a legal perspective it does not create a dramatically new state of affairs (Bennett 1985); suppliers always have been responsible for damages caused by their defective products. If a defective part is not spotted until after use in assembly, the supplier pays supplementary “rework” costs. If a defective part damages the final assembler’s machine tools, the supplier is liable for these damages as well. JIT delivery just increases these risks. It also creates an incentive for sup-
pliers to create and for final assemblers to monitor high-quality control systems.

The Introduction of ISO 9000 Technical Norms

Even with these clear-cut legal rules, there are some risks that cannot be contracted out. Most important are damages to the final assembler’s reputation created when defective products reach consumers. It is also difficult to recover all costs from production shutdowns that often occur under JIT delivery when systematic defects are found in outsourced parts. Final assemblers must add informal rules and procedures to the formal contract to manage these extra risks. When large volumes of usually very simple standardized parts were delivered to final assemblers, most defects could be easily spotted by workers and simply replaced through large inventories. Increasingly, defects cannot be easily spotted because they are contained in more complicated components such as brake systems, seats, or preassembled instrument panels assembled by system suppliers with technical know-how that the final assembler does not possess. Furthermore, JIT delivery often makes inspections impossible, either because no spare parts exist or because parts are customized according to flexible logistical systems with very short procurement times (often less than four hours).

Only suppliers’ direct monitoring of quality-control procedures can solve these problems. Final assemblers across Japan, Europe, and North America have thus formed relationships with suppliers to monitor their quality control. These agreements vary tremendously, both in style and legal consequences. Japanese-owned manufacturers, both in Japan and in U.S. transplants, rely on informal “hands-on” or collaborative relationships between large quality-management staffs of the final assembler and suppliers (Kenney and Florida 1993). Quality management personnel develop customized quality-control goals with each supplier. They routinely conduct informal audits of each supplier, leading to suggestions for improvements. Repeated visits by assemblers’ quality-control staffs, along with the threat that the contract could be terminated, ensure that problems are solved by suppliers (see Sabel 1993 for a more detailed description of this system).

The Japanese transplant producers have successfully introduced collaborative quality-control projects in the United States, both with
Japanese and U.S.-owned supplier companies (Kenney and Florida 1993, pp. 130–145). However, these firms have three advantages. First, they access management know-how from Japan. Second, they do not suffer from negative reputations caused by the mismanagement of supplier relationships that tar American-owned car assemblers. Finally, most Japanese transplant suppliers had preexisting long-term relationships and, in many cases, financial and/or ownership ties with their major customers (Kenney and Florida 1993; Abo 1994). These relationships allowed the Japanese transplants to re-create collaborative quality-control relationships in the United States. When dealing with American-owned suppliers, the Japanese companies have transferred to the United States some of the private institutional arrangements that in Japan facilitate trustful supplier relationships. Toyota, for example, quickly organized supplier associations in an effort to socialize their American-owned suppliers into the Japanese system of organizing supplier relationships (Kenney and Florida 1993, p. 151).

U.S.-owned car manufacturers faced a very different situation. After decades of adversarial “hands-off” relationships, final assemblers lacked both organizational competency (i.e., large quality-control staffs in the purchasing department) and experience in this area. Furthermore, informal quality-control relationships are risky to suppliers. Even though U.S.-owned manufacturers have systematically begun to offer four- to five-year contracts to sophisticated suppliers using JIT delivery, price clauses are still renegotiated yearly. Detailed inspections of the manufacturing process by quality-control experts from the assembler could lead to improved quality control but also expose inside information concerning the company’s operating costs. Given a history of opportunistic price politics, suppliers have reason to be risk averse when contemplating collaborative quality-control relationships.

Over time, the big three U.S. car manufacturers might have been able to develop both the organizational competencies and cooperative supplier relationships needed to pursue collaborative quality-control projects. However, they have pursued a different and very interesting course. Sophisticated companies moving into the automobile parts business usually already have quality management systems because they have long been exposed to full legal liability for most damages caused by their products. New companies, or those upgrading from simple parts production to full-service suppliers, have every incentive
to introduce such systems. However, from the final assembler’s point of view, if JIT delivery is to be used, it is necessary to verify that an air-tight quality-control regime exists. In a rare example of extensive cooperation, GM, Ford, and Chrysler jointly developed an ingenious industry framework that not only allows monitoring of each supplier’s quality management system without detailed audits by the final assembler, but also provides a blueprint suppliers can use to upgrade or introduce a quality management system. This system was later adopted by the International Standards Organization and became the ISO 9000 set of technical norms.

From a comparative institutional perspective, the development of the ISO 9000 system is extremely interesting, because aspects of U.S. work organization, which in other contexts have proven to be deficient, have actually facilitated the development and diffusion of ISO 9000 norms throughout U.S. manufacturing. Most blue-collar workers in the United States have not been formally trained in industrial skills through an apprenticeship program; instead, they learn on the job. American industrial relations scholars have concluded that a primary reason why a German-style vocational training system has not developed in the United States is the lack of strong employer associations or other coordinating institutions that could jointly develop a curriculum or, more importantly, prevent “free riders” from poaching employees trained by other companies (Soskice 1999; Wever 1995).

When institutional or other constraints hinder the development of one set of competencies within one part of an organization, these competencies must be developed elsewhere if the organization is to survive in a competitive market setting. Most U.S. manufacturing firms have no highly trained workers educated to organize their own work and perform machine maintenance and quality-control duties. As a result, work organization has long been controlled by large middle management staffs of industrial engineers, human resource specialists, technicians, and quality-control experts. Even though many U.S.-owned car manufacturing plants now use extensive job rotation within work groups and train workers in basic machine maintenance and set-up tasks, there is still a broad consensus that the separation of execution and conception that has long characterized American manufacturing plants still exists (Turner 1991). A similar division of work between largely unskilled labor and large specialist middle management staff
exists in most sophisticated supplier firms. Hence, most suppliers possess quality-control and other managerial experts who can be used to implement sophisticated quality management schemes.

It is not surprising that broad “scientific management” principles were invented and widely diffused in U.S. firms, because large U.S. corporations were heavily reliant on large middle management staffs to organize all aspects of work (Guillen 1994). These large staffs still exist today and are ideally placed to implement ISO 9000 quality-control norms. Though now diffused worldwide, U.S. car manufacturers were among the first large companies to introduce this system commercially to help alleviate quality-control problems caused by JIT production.

The prototype for the ISO 9000 system was first developed by the U.S. Department of Defense in the 1970s to aid its procurement decisions with commercial contractors. General Motors (GM), as a supplier of jeeps and other military vehicles, had been forced to comply with the military version of the ISO 9000 norm (Casper and Hancké 1999, pp. 964–965). GM worked with Ford and Chrysler to reconfigure the military version of the system into a quality management system suitable for commercial use. By the mid 1980s, the Japanese producers had taken over more than one-third of the U.S. domestic market. GM, Chrysler, and Ford were each attempting to improve quality control at its suppliers in order to introduce both the system supplier strategy and JIT procurement. Facing a common threat and using many of the same local suppliers, the big three could lose little and gain much by cooperating on designing a common quality management system for suppliers.

As this common system now stands, companies meeting different versions of the ISO 9000 norms must incorporate modern quality-control techniques into their assembly operations. The ISO 9000 technical norms are not tailored to particular industries or technologies. Rather, they broadly cover the organization of quality management processes, including design, manufacturing, and packaging and distribution. Procedures examined include statistical process controls, the introduction of quality-control inspections and record keeping within all aspects production, machine maintenance and setup, and the introduction of systematic quality-control meetings and suggestion programs that include production workers, management, and design staff (Paradis
There are different levels of certification, depending on both the type of activities engaged in by the firm and the number of norms actually met (Casper and Hancké 1999).

Widespread use of the ISO 9000 system has prompted the development of certification agencies qualified to conduct ISO 9000–based audits as well as consultants trained to help firms reorganize their quality-control system to meet the norms.

ISO 9000 certification signifies nothing about the excellence or performance of the products of the company being evaluated. These qualities are inherent in the broader design of the product, of which ISO 9000 norms say nothing. But, the norms do ensure that a large number of critical process controls are implemented, which minimizes the probability that defective products will be produced and shipped to the customer. It is particularly important for JIT production that the systematic introduction of statistical process controls virtually eliminates serial defects, which can quickly halt production at the final assembler.

It is not surprising that ISO 9000 norms work well in the context of the U.S. work organization. Workers do not need to be well trained to participate in the system, because in U.S. firms most sophisticated process checks, such as statistical process controls, are performed by specialists. The introduction of documented process checks into most routine work processes also complements job mobility within the firm by increasing job standardization.

The overall result has been a tremendous success. The ISO 9000 norms have helped to rapidly introduce JIT delivery techniques into the U.S. car industry without the accompanying informal quality-control relationships used by the Japanese. In 1991, GM, Ford, and Chrysler again cooperated to modernize the norm series, adding supplementary norms specialized to mass production processes particularly prevalent in the automobile industry.

In sum, incentives provided by the institutional organization of the U.S. political economy combine with the often ingenious strategies of firms to produce a viable new set of supplier network relationships. Facing strong Japanese competition, U.S.-owned car manufacturers rapidly reorganized the composition of their supplier chains and developed and quickly adopted the ISO 9000 technical norms to monitor the quality control of JIT suppliers. While the new strategies were devel-
oped by companies, the institutional organization of the political economy facilitated the transformation. The legal system’s free-contracting principles acclimated companies to the harsh liability regime introduced by JIT and created few legal obstacles to the rapid change in the supplier base serving final assemblers. The ISO 9000 system allowed the hands-off monitoring needed to overcome a legacy of distrust between U.S. final assemblers and their suppliers. Somewhat paradoxically, ISO 9000 technical norms work so well in the U.S. industrial context because they take advantage of large technical management staffs that are commonly created in U.S. companies because of inadequacies in the vocational training system.

The next section examines the parallel introduction of JIT delivery in Germany. Though the problems facing companies are similar, differences in both the legal and industrial relations systems have necessitated very different strategies by large companies.

**JIT DELIVERY IN GERMANY**

A large literature describes how “business coordination” facilitates collective solutions within many important domains of German economic life, such as collective wage bargaining, training, and finance (Thelen 1991; Streeck 1984; Wever 1995). Other scholars have pointed out how these frameworks often serve as “para-public institutions” (Katzenstein 1989) linking private economic governance with public regulatory oversight and support of training, research and development, and many other areas of the business system. While there is a large literature connecting the organization of Germany’s political economy to its unique patterns of industrial relations, comparatively little analysis has been given to the German legal system. While patterns of work organization are important in Germany, the legal system has been the primary institutional framework influencing the development of governance structures for JIT delivery.

Compared with U.S. law, German law provides a fundamentally different legal context within which firms in supplier relationships must regulate their dealings. In the U.S. case, the legal system was largely benign, neither promoting nor hindering the development of
contracting structures suitable for JIT delivery. German companies, on the other hand, faced important legal obstacles when first organizing JIT delivery relationships in the mid 1980s. These obstacles made it difficult for firms to create the necessary legal structures to manage risks. They also combined with incentives produced by the German industrial relations system to hinder the development of adequate quality-control arrangements within supplier firms.

Recently, some German firms have engaged trade associations and other para-public institutions to reconfigure some parts of this legal framework, an ability of the German political economy lacking in the United States. The ultimate aim of this section of the chapter is to explain how and when these agreements emerged. First, however, the section examines the broad character of German legal frameworks regulating supplier networks, how these laws affect companies trying to organize governance structures needed for JIT delivery, and finally, the private, short-term strategies that companies have developed to solve these problems.

**Legal Problems Caused by JIT Delivery**

Germany’s coordinated system of economic governance facilitates the creation of a qualitatively different type of legal environment than exists in the United States. While “good faith” principles have long dominated German commercial law, the broad reorganization of the German economy along “social market” principles after World War II solidified its protective nature. While German law allows large companies extensive freedom to design contracts with other large companies, it strongly regulates contracts between large and small companies. The 1976 passage of the law regulating standardized contracts (AGB-Gesetz) created a broad tool that courts have used to police contracts between large and small companies. Before implementation of the AGB-Gesetz, powerful firms could redesign standard legal entitlements to their advantage and force smaller firms to accept their terms. The AGB-Gesetz provides a legal instrument courts use to control the types of contractual burdens placed on users of preformulated contracts. The general principle of the AGB-Gesetz is that a preformulated clause violates Article 9 of the law when, for economic motives, the contract clause shifts contracting risks in favor of the party
writing the contract by inappropriately modifying contract laws set out in standard German civil and commercial law. The most sophisticated supplier chains in the automobile industry still involve dozens, if not hundreds, of firms. As a result, even very complicated long-term contracts regulating relationships with JIT suppliers are often preformulated by the final producer and therefore fall under the scrutiny of the AGB-Gesetz (Grünewald 1995).

Though the technical organization of JIT delivery in Germany is similar to that in the United States, differences in the legal context mean that the same JIT delivery relationships that cause no legal problems in the United States create substantial difficulties in Germany. Articles 377 and 378 of the German commercial code (HGB) contain a nearly 100-year-old law requiring that the (final assembler) undertake a “speedy and thorough” examination of all goods upon delivery. This law limits suppliers’ liability when inspections do not take place. In such cases, the final assembler loses all warranty rights and must assume partial responsibility for product liability damages.4 Because liability cases routinely end in multimillion–deutsche Mark settlements, these legal entitlements are important to the firms involved.

The problem is that the essence of JIT logistical systems is delivery directly to the assembly line for immediate use. Final assemblers argue that the technical organization of JIT precludes them from performing their duties under Articles 377–378 HGB. However, because the “entry inspections” carry with them critical legal entitlements, eliminating them creates a conflict of interest between final assemblers and suppliers concerning the distribution of liability risks associated with defects.

From the final assembler’s perspective, if contracts shift the legal responsibility for Article 377–378 HGB inspections to suppliers, substantial liability burdens are also shifted onto suppliers. Final assemblers could demand compensation for both parts and wages incurred in the assembly and the repair of products found faulty due to defects in parts supplied via JIT delivery. Under the old system these defects would be spotted by entry inspections, and legal liability would lie with the assembler. Suppliers would find themselves liable for damages in product liability cases where random defects in parts slip through the production process unnoticed and later cause harm to customers (Grof von Westphalen 1990). Supplier firms turn this logic around. They see
Patterns of work organization in small German firms compound the legal problems. Most German workers are highly trained and spend their entire career with one firm. Quality control at most German manufacturing firms is good, but idiosyncratic. Instead of systematized routines developed and implemented by management specialists, skilled workers in German firms usually developed their own quality-control procedures (Schmidt-Salzer 1996; see also Thelen 1991 and Turner 1991 for more on German work organization). Quality-control routines were rarely systematized into formal procedures or supplemented by detailed record keeping. Because the same work groups often survived for decades, informal routines were enough: new recruits could easily learn such procedures from the existing cadre of workers, usually during their three-year apprenticeship. Over the long term, supplier firms could not rely on the strong legal protection from liability damages provided by Articles 377–378 HGB, because their customers could always stop doing business with them if they had continuous quality-control problems; but when introducing new products or work procedures, the law provided short-term protection from quality-control problems.

In the 1960s and 1970s, the German auto parts industry was similar to that in the United States. Most supplier plants produced large quantities of standardized parts. As a result, the work process was fairly simple. Workers were highly skilled, responsible for setting up and maintaining their machines, setting cycle times, and performing quality control according to very effective but often highly idiosyncratic systems. However, in the 1980s and 1990s, as part of the broad switch to the JIT supplier strategy, many supplier firms in the German automobile industry attempted to upgrade their manufacturing processes to win more lucrative contracts for more complicated components or, in some cases, complete subassemblies. For most suppliers, this involved a major redesign of the work process. The new procedures contained more steps. Furthermore, many suppliers had to create flexible manufacturing processes that met different product specifications. This change in processes was an essential part of the JIT strategy.

Because the old informal quality-control procedures often cannot meet the demands of a more complicated work process, suppliers are
now more likely to suffer quality-control problems, with their inherent liability problems. But at the same time, most suppliers have been asked to sign a new breed of contract that cedes their traditional Article 377–378 HGB protection against important liability risks.

The Creation of “Quality-Control Agreements” by German Final Assemblers

In the short term, the uncertainty of existing laws has created a void that firms must fill with their own contractual structures. To a certain extent, this creates a bargaining game not unlike that in the United States. Strengthened by their bargaining power over suppliers, final assemblers in the German car industry can create new contracting structures as they see fit. However, they must remain mindful of the likely legal validity of their interpretations should they come under judicial review. Most of these firms use standardized contracting structures, which fall under the purview of the AGB-Gesetz.

When developing JIT delivery contracts, most of the German car manufacturers combined legal clauses with technical agreements regulating quality control. German business practice is for the most part similar to that in the United States in that technical aspects of supplier relationships (such as product specifications or quality-control standards) are normally separated from the formal contract that distributes different legal and market risks. However, faced with the combined problems of developing a more complicated division of technical labor with suppliers and solving the legal uncertainties caused by JIT delivery, the legal departments of most German final assemblers have joined forces with their quality-control experts to create comprehensive “quality-control agreements” (Qualitätssicherungsvereinbarungen, henceforward “QCAs”).

These agreements usually contain formal abrogations of Article 377–378 HGB inspections, other legal or quasi-legal rules covering warranties and product liability responsibilities, and provisions for settling various problems, such as delay in delivery due to traffic and rework costs. In addition to product specifications, technical provisions contain numerical goals of acceptable error rates and outline the type of quality-control system to be maintained by the supplier. From the late 1980s onwards, most final assemblers adopted the same ISO
9000 norms used in the United States (Casper and Hancké 1999). The final assembler takes responsibility for monitoring whether or not these goals are being met and helps deficient suppliers upgrade their quality-control systems.

While most of the German car producers have set up QCAs containing abrogations of Article 377–378 HGB inspections, important details in their implementation dramatically influence their actual consequences (see Casper 1996 for case studies). The high-end specialist producer BMW, for example, organizes collaborative quality-control relationships that are similar to those of Japanese-owned producers. BMW sends its own auditors to perform supplier certifications, which are supplemented by product technology checks that differ substantially across different types of producers (e.g., textile versus metalworking or electronic technology). Most of the other German car producers pursue more formal quality-control arrangements that look more like those in the United States. Suppliers sign legally binding contracts abrogating Article 377–378 HGB rights allowing “zero defects.” They are then supposed to introduce a quality management system specified by the final assembler to achieve these goals. Because the ISO 9000 system is ideal for monitoring quality control across a diverse array of firms, this is the system used by all final assemblers.

German final assemblers have a strong incentive to designate as many firms as possible JIT suppliers and ask them to sign QCAs because it substantially shifts legal risk from their responsibilities. Volkswagen, for example, has recently designated all suppliers making a customized part for VW as JIT. When setting up a new production facility in East Germany, VW explicitly organized its new production site along decentralized production principles. Volkswagen has four JIT suppliers in the area. Deliveries occur several times a day with substantial variation in product specifications. Nine other suppliers deliver complicated but standardized subassemblies on a daily basis. Then there are more than two dozen other local suppliers, most of which make simple stamped parts that are delivered anywhere from daily to weekly. All these firms are officially JIT suppliers that must face the full gauntlet of new legal risks (see Casper 1997 for more on this case).

Because they are an entirely new breed of contract, QCAs have fostered an intense legal debate in Germany. The key issue is whether
the Article 377–378 HGB abrogations contained in these documents violate the AGB-Gesetz. Lawyers working for final assemblers argue that they are in effect carrying out Article 377–378 HGB obligations through both stipulating desired quality-control targets and practices to be carried out by suppliers and then monitoring their enactment. Because QCAs substantially improve quality control within supplier firms (to the high levels sufficient for JIT delivery), final assemblers suggest that QCAs make entry inspections superfluous.

Though a number of related court cases point to the interpretation that some QCAs violate the AGB-Gesetz, there has as yet been no specific individual precedent (Casper 1996). This is in part because German parts producers value their long-term supplier relationships more than the possible short-term gains that might be won in a court decision. However, coordinated German supplier companies have other policy instruments at their disposal that American companies lack. Important parts of the industry frameworks governing JIT delivery are being reconfigured to solve some of these problems.

**Reconfiguring German Industry Frameworks**

“Private lawmaking” has long formed a central part of German associational law. A key difference in the German (relative to Anglo-American) legal system is that in German law, voluntary associations, such as trade associations, have also been allowed to partake in a corporate character and develop strong legal roles and responsibilities (Hueck 1991). Although trade associations in both the United States and Germany have legal departments, those in Germany are much larger and more specialized than those in the United States. In addition to providing services for individual member firms and lobbying the government, trade association lawyers have developed model firm-level contractual agreements. Industry frameworks serve as legal tool kits, helping companies develop the contracting structures needed to set up innovative business dealings. Until recently, these contractual models were usually fairly simple buying or selling agreements (*allgemeine Geschäftsbedingungen*) that small member firms without legal resources could use to set up legally secure business deals. But as the proportion of firms setting up more complicated business ventures has increased, trade association lawyers have attempted to develop more
complex model contractual agreements. Though many of these ventures have failed due to lack of consensus among member firms, there have been some successful agreements.

The German Cartel Office is charged with reviewing all proposed industry agreements to assure that agreements break none of Germany’s cartel laws. Because of the tightening of German cartel law after World War II, these reviews are very strict. Any trade association agreement whose implementation can foreseeably restrict future competition within a market can be struck down. The principle of voluntarism is at the center of this review, because any model contractual agreement in which participation is binding will be voided. As a result, bargaining within trade associations is usually based on consensus. Where conflicts of interests prevail within a trade association, negotiations will often fail.

The institutional capacity to develop collective solutions to some of the problems posed by JIT delivery is fragile. Even though quality control agreements were first widely used in the German auto industry, conflicts of interest between final assemblers and suppliers have prevented new industry standards from emerging in this sector. Most German car producers oppose the development of a standardized QCA within the Verband deutsche Automobilindustrie (VDA). The hierarchical industrial organization of the automobile sector explains why final assemblers can so easily develop standardized QCA agreements and then present them to suppliers on a take-it-or-leave-it basis.

Instead, an important industry agreement has emerged elsewhere. Though QCAs were initially used most intensely within the auto industry, they have also been employed by companies in other industries with complex supplier relationships. This is particularly true in other advanced technology sectors, such as the machine tool and electronics industries. The trade association representing the electronics industry (ZVEI) has recently developed an important QCA framework that is changing the contours of the JIT delivery debate throughout Germany industry.

Patterns of business coordination are more vibrant in the electronics sector because of its organizational features and the technologies involved. First, most firms are small or medium in size. Relationships with suppliers are typically more balanced because of this greater equality in size. Therefore, individual firms can seldom impose their
preferred contractual solution on their supplier partners. Furthermore, the largest two firms in the sector, Bosch and Siemens, are both suppliers and final producers. Their dual role has tempered their willingness to write overtly opportunistic QCAs. Lawyers from Siemens actually played a key role in developing the ZVEI framework.

Technological factors have also played a role. Articles 377–378 HGB only mandate a “feasible” inspection for “visible” damages. Because most electronic parts are microscopic, this limits a feasible-entry inspection. Most firms agree that they should include inspections for obvious physical damages and assurances that products are properly labeled. But because more detailed inspections cannot take place, the supplier must assume liability for other defects. Because of this naturally clear-cut distribution of liability risks and inspection duties, conflict over Article 377–378 HGB inspections is not as great in the electronics sector.

The ZVEI agreement obliges final assemblers to conduct simple Article 377–378 HGB entry inspections, which creates a clear boundary to the risks that must be accepted by suppliers. Entry inspections include checks for transport damages and limited examinations of products to check for visible defects. This modified version of Article 377–378 HGB entry inspection is based on a legal interpretation by ZVEI lawyers, supported by German High Court cases, that final assemblers cannot be expected make entry inspections that demand the development of special expertise or resources (Grünewald 1995). In the electronics industry, the vast majority of errors can only be found through detailed testing of integrated circuits contained in electronic devices. For this technological reason, most supplier firms have adopted detailed quality-control checks into their production processes. Simple spot checks by final assemblers are all that is required to fulfill Article 377–378 HGB obligations. These nominal entry inspections prevent final assemblers from labeling supplier relationships as “just-in-time” purely to serve opportunistic legal strategies that would limit liability through Article 377–378 HGB abrogations.

The agreement also contains supplemental provisions pertaining to the supplier’s quality-control system. Like all QCAs, the ZVEI agreement obliges supplier firms to set up a quality management system. However, the precise specifications of this system are determined by the parties to the agreement themselves. ZVEI representatives suggest
that most firms will simply use the ISO 9000 norm series most suitable to the technical specification of the supplier’s production process, but firms have the option of setting very detailed customized agreements to provide for unique cases.

Overall, the most important attribute of this industry framework is that it creates a reasonable solution to risk distribution issues, through modified exit inspections. Companies using it can direct their energies towards developing the customized supplemental agreements, without fear that these informal parts of their QCA will radically reshuffle contracting risks or break important legal codes. This elasticity shows that it is not only possible to develop complex contracting structures within Germany’s associative governance system, but also to structure these agreements so as to place broad limits around the risk distribution issues that often undermine complex contracting relationships.

Furthermore, the ZVEI agreement contains a workable blend of standardized contract terms and supplemental agreement provisions that allow for relationship-specific concerns. The standardized legal terms maintain standard legal entitlements. This brackets off negotiation over many contentious risk distribution issues and assures integration of the agreement with broader German legal codes. Supplementary agreements negotiated by the parties themselves allow some of the relational contracting flexibility that can customize innovative and complex economic relationships.

The ZVEI agreement is one of the most promising examples to date of developing a complex contracting structure within the German associational governance system. Though its review by other trade associations and by the Cartel Office was only completed in January 1995, early signs indicate that it may become widely used within German industry. In the first part of 1995 alone, the ZVEI received over 10,000 requests for copies of the agreement from companies, trade associations, and others. Though there are as yet no statistics on actual usage, interviews suggests that knowledge of the agreement within firms is high, even in non-elektronics-related sectors (Casper 1996). For example, the lawyer specializing in contract law within the VDMA, the influential trade association representing the machine tool sector, noted in an interview that the agreement will become a model solution to the Article 377–378 dilemma within German law, stating that it has already been adopted by some machine tool producers.
If the ZVEI agreement is broadly used in the electronics and machine tool industry, it might soon spread to the auto industry as well. This will first happen when powerful suppliers with monopolies on important technologies begin to insist that the ZVEI agreement, or QCAs closely modeled after it, be used in their contract relationships. In the longer term, however, court precedents will play a major role. If, as many German legal scholars predict, the standardized QCA agreements used by most final assemblers are found to violate the AGB-Gesetz, then the ZVEI agreement will begin to look like an increasingly attractive alternative.

CONCLUSION

Innovative organizational practices can be transferred among nations with varying national institutional frameworks. The JIT delivery case shows that, in the face of intense international competition from Japan, companies can engage company organizational structures as well as broader institutional resources existing within their political economies to create new solutions. Companies in Germany and the United States have created viable governance for JIT delivery, but the organization of these governance structures and the way they are regulated within national legal systems differ.

In the United States, the legal system played a passive role and the system of industrial relations, in a somewhat perverse way (because inadequacies of the United States vocational training system were a facilitating factor), provided an ideal setting for the transfer of ISO 9000 quality-control norms from the military procurement system into private industry. In Germany, the highly regulative legal system created important institutional constraints. These constraints were first overcome by the development of quasi-legal quality-control agreements in the auto industry. While the end result in many cases looks similar to the arrangements used in the United States, in Germany these agreements are embedded within an entirely different legal context. In Germany, quality-control norms were formally merged with legal clauses to allow final assemblers to transfer important liability risks to supplier firms. This was facilitated by gaps in the law and by
the asymmetrical distribution of bargaining power between final assemblers and suppliers. Industry frameworks are now being developed within trade associations to reregulate JIT delivery within traditional contract law restrictions concerning the distribution of liability risks.

The distinction between “coordinated” and “uncoordinated” political economies allows us to understand key aspects of these differences. In the United States, the lack of coordinating mechanisms means that industries cannot quickly adapt regulations supporting innovative business organization (for example, trade associations are not in a position to incorporate innovative changes into industry frameworks). Part of the reason why JIT spread quickly in the United States, even without this advantage, was the lack of highly regulative laws. Furthermore, companies had developed considerable private technical and legal resources that allowed them to compete on the basis of innovative governance structures. In this context, it is no surprise that the ISO 9000 norms were reorganized for commercial use in the United States. The drawback is that firms must create their own legal frameworks and cannot gain transaction cost advantages by cooperating within powerful trade associations. Because firms must create their own system of property rights, at least in terms of how contracting risks are managed, the contracting process is often contentious.

The German system allows key aspects of the governance structures used for new patterns of industry organization to become incorporated into public legal frameworks. We have seen how this mitigates some of the risk distribution issues that firms face. Commentators have long noted the importance of the small firm sector in Germany (Acs and Audretsch 1993; Vitols 1995). Germany’s regulative system of contract law helps shield small companies from important market and legal risks. This is an important institutional factor influencing patterns of industrial adjustment.

However, highly regulative legal systems are likely to unravel quickly in the face of innovative forms of business organization. This is precisely what happened in the JIT delivery case. In this context, the “reconfigurative capacity” made possible through the system of business coordination becomes a driving feature of the German political economy. Courts and other state actors cannot predict the forms of industrial organization that large companies will adopt or the gover-
nance structures they might need to manage complex relationships. However, we have also seen that when the Article 377–378 HGB liability law is applied to JIT delivery contracts, the same large companies lose important legal rights. A fascinating aspect of the German law-making process is that the large companies that are disadvantaged by contract law are simultaneously the pivotal actors in creating and legalizing new frameworks.

Large German companies create industry frameworks because the governance structures they contain in their organization help socialize the cost of competing internationally and at the same time limit domestic competition over governance structure innovation. Instead of competing privately to create new legal and technical arrangements, many large companies engage trade associations to collectively develop and legalize new legal and technical arrangements for them through the associations’ links with the state. So long as the gains from these activities outweigh the costs, large German companies will continue to engage trade associations. However, we have seen that in the auto industry, distributional issues have caused a breakdown in trade association bargaining. Only in the electronics sector, where differences in industrial organization and technology have created a more favorable setting, has a new trade association been created.

Notes

1. These include large American technology companies such as TRW, which has become one of the largest suppliers of instrument panels; Japanese transplant suppliers servicing both Japanese and U.S. final assemblers; former parts divisions from the big three producers, which have been spun off into private companies; and many traditional suppliers that have managed to upgrade their competencies.

2. Though there unfortunately exist no studies of this trend, it seems likely that many of the old parts suppliers were consolidated through mergers and acquisitions into larger firms able to meet the new market conditions.

3. This has led to a major debate within the legal studies field, spurred by the most recent version of the Uniform Commercial Code, which makes “good faith” a central tenet and thus gives ample legal precedent for courts to take a more activist stance if they so choose (Schwartz 1992; Dawson 1983). The most persuasive analyses locate this reluctance to reinterpret the law squarely in the broader fragmented organization of the U.S. business system.
4. The law states that if the purchaser had properly performed its duties under Articles 377–378 HGB, visible defects would have been found and the future damages avoided (Grünewald 1995).

5. Some legal experts argue that through the incorporation of statistical process controls into inspection systems, final assemblers can still perform entry inspections that satisfy Articles 377–378 HGB while maintaining JIT delivery (Grünewald 1995). Though such checks might decrease the overall efficiency of a firm’s JIT logistical system, they would satisfy legal requirements and maintain a traditional allocation of risks between suppliers and final assemblers.

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