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Varieties of Vertical Disintegration: The Global Trend Toward Heterogeneous Supply  
Relations and the Reproduction of Difference in US and German Manufacturing

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**Varieties of Vertical Disintegration:  
The Global Trend Toward Heterogeneous Supply Relations and the Reproduction of  
Difference in US and German Manufacturing**

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As is well known, there is a global trend toward vertical disintegration in manufacturing. Large manufacturing firms, across a broad array of industrial sectors, are radically reducing the amount of their product that they both produce and design themselves. Instead they are turning to suppliers for key design, component, and even system in-puts. This shift has created a great deal of business for specialized suppliers in a vast array of areas throughout the global manufacturing economy. But it has also created an entirely new and challenging – often quite contradictory—terrain of relations between suppliers and their customers. Our claim in this chapter is that relations between suppliers and customers in manufacturing are becoming systematically more heterogeneous within all advanced industrial societies. Further, this global trend is exacerbated by the diversity of institutional architectures and production practices in different political economies. In making this argument, we show that neither neoliberal nor particular forms of institutionalist arguments (in particular the Varieties of Capitalism perspective) adequately capture current global dynamics in manufacturing.

The chapter is in three sections. The first describes the changing dynamics between suppliers and customers in contemporary manufacturing in the advanced industrial countries. The second section then constructs a typology of the range of supplier-customer relationships that seem to be emerging in the contemporary global manufacturing environment. The third section then moves to a discussion of the way in which these relationships are being realized in different national market contexts, in particular the United States and Germany.<sup>1</sup>

### **1.: Changing dynamics between suppliers and customers in manufacturing:**

For over a decade now, the literatures on the automobile and electronics industries have been preoccupied with the process of vertical disintegration in production.<sup>2</sup> Recently, observers of lower volume sectors of manufacturing, such as the production of agricultural equipment, construction machinery and other forms of industrial machinery have also been describing this phenomenon.<sup>3</sup> The contemporary logic of vertical disintegration is the following. Due to intensifying global competition, rapid technological change, shortening product life cycles, and greatly variegated consumer demand for product customization, the spatial, financial, manpower and organizational resources of firms become overtaxed and cannot respond efficiently. In order to save time and resources, diversify exposure to risk and enhance flexibility, OEMs concentrate their activities on so-called “core competence” areas—i.e.: on particular functions, such as marketing or overall styling and product design, and/or on particular aspects of the manufacturing process in which they for one reason or another hold a competitive advantage or have valuable, difficult to replicate, expertise. In all other areas outside core competences, OEMs rely on suppliers to contribute essential components, systems and aspects of product development.

This change in the purchasing strategies of OEM firms has not simply increased the amount of business available to component suppliers and other specialists. Rather, it has also dramatically changed the kinds of demands that OEMs place on them. Suppliers are now expected to

- provide their customers with significant know how (in the form of product design and/or manufacturing expertise),
- produce at extraordinarily high levels of quality (fewer than 100 defective parts per million is increasingly standard),
- provide a variety of services for the customer (in the shape of logistics and sub assembly)

- all while continuously reducing the cost at which they provide these things.

Moreover, it is also increasingly rare that customers simply trust that their suppliers are doing these things. Even long time customers are now subjecting their traditional suppliers to constant benchmarking procedures, which place their performance in comparison to “best practice” in their market. Importantly, this is not simply a disciplining tactic on the part of newly dependent OEM’s to protect against potential supplier opportunism (though it can have that effect). Rather, even in cases where there is extensive collaboration and mutual dependence between customer and supplier, constant benchmarking and comparison of supplier performance and capabilities stems from the OEM’s urgent need for information about new developments in technology and manufacturing practice. Because they are increasingly dependent on outside knowledge of these things, and because their future technological and manufacturing needs are uncertain and always subject to change, the process of surveying suppliers has become a crucial mechanism for learning for the customer firm.<sup>4</sup>

In the same direction, with a slightly different accent: When OEMs are increasingly dependent on the capabilities of their supply base, it becomes crucial for them to be vigilant in surveying the ways in which this external pool of capabilities is changing. It is not simply a matter of determining, in the narrow sense of “benchmarking”, how much better one supplier is at doing something than another. Instead, OEMs seek to systematically survey the supply base in order to determine, in general, what can be expected or gained from available pools of expertise.

As a result of all of this surveying, benchmarking and comparison on the part of OEM’s, suppliers, as we shall see below, must learn to live with the paradoxical reality of customers becoming both more reliant on them for know how and manufacturing input, while they simultaneously become more demanding and actively survey (and contract with) the suppliers competitors for newer, better and lower cost alternatives.

Finally, it is important to emphasize that even though the trends toward vertical disintegration just described are unmistakable, the practices of OEM’s in manufacturing are far from uniform. There are at least three significant aspects of the situation in which OEM’s find themselves that produce broad heterogeneity in their practices in production and in relationship to suppliers.<sup>5</sup>

First, many OEMs are very large multinational corporations with far flung operations involving multiple plants and production facilities in many locations. Moreover, such firms produce a broad and wide array of products and models across those far flung plants. Companies of this scale and complexity do not vertically disintegrate massively, all at once, and in toto. Instead, they seek to do it piecemeal in locations where it is very easy to do, or where it is most urgently needed --or they introduce new models as “experiments” with disintegrated production in locations where there will be no entrenched in house opposition. In other production locations, or with respect to a particular product model, where internal resistance to disintegration is great or where in house production continues to be profitable, vertical disintegration does not occur.

This reality creates great complexity in customer supplier relations because neither internal engineers and purchasers nor outside suppliers are ever completely sure what the internal capacities of the OEM are. For example, certain plants of a large Automobile producer may abandon stamping, while one or two others maintain it because they have productive machinery that is not yet amortized or that is running at full capacity due to the success of a

particular product model. In such a situation, an outside stamping supplier may find that it is drawn into intimate design and product development discussions on one project and yet is then completely shut out of discussions on another with the same customer because the latter development team regards stamping as a core competence! The same customer is not always the same customer.

Second, even in cases where it is clear that an OEM does not view a particular aspect of production as a long term core competence or as possessing special competitive advantage for the firm, it may nonetheless retain some internal production capacity in that area simply to retain some in house know how and enhance its ability to engage in knowledgeable collaboration with (and evaluation of) outside suppliers. In house production facilities can be made to bid on projects against outsiders to facilitate this. In some cases the supplier could win the bid and be brought intimately into the development process of a model, while in other cases the in house unit is the victor. This kind of competition between in house and external suppliers can exist for extended periods of time, with the outcomes continuously changing and unpredictable.

Thirdly, heterogeneity in practice with respect to suppliers arises out of the sheer complexity of the contracting that vertical disintegration in production produces for any given model or product—and the content of heterogeneity changes over time. OEM's seek to gain cost savings and know how from their suppliers.<sup>6</sup> But it is not necessarily true that the OEM seeks to maximize both of those goals in every contract with every supplier every time. For example, a buyer for an OEM may need to achieve certain aggregate cost reduction targets on a particular model and she can achieve those targets by using leverage with one or two suppliers (or helping them achieve leverage) or by bidding out a relatively standard or mature component or sub-assembly that had been designed and until then produced by a particular specialized supplier.

This move to push a supplier further away, however, can be undertaken to create space for OEM engineers to engage in a valuable but relatively expensive collaboration with another supplier of a different component or sub-assembly for the same product. Thus, the same OEM on the same product model may be engaging in a variety of different sorts of relations with suppliers simultaneously. And, as the product is redesigned, OEM behavior toward suppliers may change—those pushed away may be offered greater intimacy (and better margins), while the intimate partners of the past suddenly find themselves having to bid on their own designs against competitors. As we will see, suppliers learn to participate in this kind of waltz with their customers, often agreeing to (or offering) a cost reduction that ruins the margin of profit on one contract in exchange for future business with the customer, at a better rate.

All of these examples are intended to show that although the evidence is incontrovertible that there is a secular trend toward vertical disintegration in manufacturing across industries world wide, this has in no way produced uniformity in the practices of OEMs across industries, within industries or even within single firms and plants. There are multiple and changing strategic calculations in play. In the following sections, we will attempt to outline the range of relationships that seem to be emerging and the differing contributions of national context in their emergence and governance.

## **2.: Typology of emerging OEM-supplier relations**

All of this change in the kinds of demands that are being placed on suppliers as well as the variety of practices that OEM's pursue has given rise to a great deal of turbulence in the way in which relationships between OEM's and suppliers are constituted. We suggest that vertical disintegration can produce (at least) five ideal typical forms of Customer – Supplier relations in manufacturing: 1.) Arms Length/Spot Market relation; 2.) Autocratic or Captive Supplier relation; 3.) Contract Manufacturing; 4.) Collaborative Manufacturing; and 5.) Sustained Contingent Collaboration. The first four types derive from our reading of the most prominent types of relations described in the contemporary literature on supply chains and vertical disintegration. The fifth type is our own. Our claim is that the environment is such that it is possible to find each of these relationships in practice today, but that types 3, 4 and 5 are the most historically distinctive, and type 5 in particular seems to be rapidly emerging as the most stable and modal relation.

**Type 1: Arms Length/Spot Market Relation:** For a core part of the twentieth century in many of the most developed industrial economies, vertical integration was a dominant strategy in manufacturing across many sectors. In this context, the typical supplier relationship was an arms-length one in which the price mechanism in the market governed the logic of exchange. In this kind of relationship, suppliers either constructed complex parts according to designs made by the OEM, or they sold commodity or standardized products to the OEM. In both cases, the relationship was characterized by a strict division between product development and production and by a strong emphasis on price. Contracts went to the lowest bidder.

These relationships continue to exist in the current environment of increasing vertical disintegration, though now they exist as one of several different kinds of ties between suppliers and customers, and tend to appear under relatively specific and quite constrained conditions. In all cases of spot market sub-contracting, the competences between customer and supplier are very clearly defined and the contours of the desired component are very precisely specified. In particular, no customized design input from the supplier is needed. There is neither ambiguity nor competition between customer and supplier on their respective roles in the process of developing and producing the customer's product.

Under these conditions, there are two ways in which arms length relationships come into being. First, normed or standard parts, typically purchased in high volume, are classic components in which price is the central determinant of the exchange. In such cases, the contours of the product are well known so that product designers can build the components into their own designs and suppliers make no design contribution to the customer's product. Further, the manufacture of the component does not belong to the designated manufacturing core competences of the customer firm, so that the outside supplier does not compete with in house production units. The second manner in which arms length contracting emerges is in the classic case of "capacity subcontracting" or "verlängerte Werkbank" subcontracting.<sup>7</sup> Here the component part is well defined by the customer, no design input is needed from the supplier, but the manufacture of the component counts as a core competence of the customer firm. Under such conditions, arms length contracting takes place when in house operations at the customer run into capacity bottlenecks. Firms then solicit bids from supplier firms on their own in house component blue prints. The lowest bidder gets the work.

This is not an historically novel relationship nor is it an especially problematic one for either customer or supplier. There is no loyalty, no informal trust, no obligation between the parties beyond that specified in the contract. In a sense there is no history in the relationship—gaining repeated contracts with a customer is an indication of a supplier firm's efficiency and does not in any way lessen the likelihood that the customer will turn to an alternative supplier

with a lower price in a subsequent round of contracting. At the margin, components that can be produced within this kind of relationship have a great potential to migrate to low cost production locations. But there are also many countervailing trends such that one still finds significant amounts of this kind of contracting taking place among customers and suppliers in high wage regions.

**Type 2: Autocratic or Captive Supplier Relations:** This kind of relationship exists in only very specific contexts, most quintessentially within Japanese Keiretsu networks. Here the competences in design and production of the supplier and customer are complementary, but the relationship is extremely hierarchical. The supplier is typically utterly dependent on a single customer, and follows the lead of the customer in design and production. The contours of the product can be uncertain at the beginning of the relationship, but the solution to design and manufacture problems follow the lead of the customer and there is no ambiguity on the distribution of returns. In the Japanese case, such relationships are possible because suppliers are integrated in a larger Keiretsu network which structures the flow of resources among a large end assembler and its suppliers (finance, technology, skilled labor, etc). Cooperation and flexibility among the players within this context is high and improves over time as the constancy of the tie (neither supplier nor OEM have alternatives) allows for learning and continuous improvement in the joint undertaking. Moreover, the moral hazard risks typically associated with bilateral mutual dependence are significantly mitigated due to mutual embedding of the supplier and customer in the keiretsu network.<sup>8</sup>

In many ways, these relationships resemble vertically integrated relations, and as a consequence it is not surprising that they seem to be under significant stress in the contemporary environment.<sup>9</sup> One very important limitation in the captive relation is that its practical business ties to specialists and bearers of know how outside the keiretsu, much less outside the industry, is limited. While learning occurs through the process of joint problem solving among the dependent parties, neither party aggressively or systematically either cultivates or seeks analogous relations with competing specialists or customers in order to survey the terrain of technology and practice.

**Type 3: Contract Manufacturing:** The distinctive feature of the customer-supplier relation here is a clear and unambiguous separation between processes of product design and product manufacture. OEM's do the design (and also marketing and distribution) and award production contracts to sophisticated suppliers who conduct and coordinate all of the production and assembly of the item. There is virtually no supplier input into the design of a product, but there can be interaction and negotiation between supplier and customer in the process of applying designs to manufacturing processes. Customers undertake no production.

As such, there is a strong mutual dependence between customer and supplier within this type and relationships can be long term and grow stronger over time. On the whole, this clean separation is made possible by a far reaching standardization and modularization in the base technology of the sector. Products are composed out of modules with distinctive content, interlinked by standard interfaces. Indeed, nearly all of the hardware components manufactured by suppliers is in some way standardized—volumes are very high and supplier competitiveness hinges strongly on its capacity to achieve leverage. The quintessential realm for contract manufacture in the contemporary manufacturing environment is product level electronics (computers, consumer electronics etc).<sup>10</sup>

The relationship between OEM and supplier in this relation is very close, but limited. In some ways, the limitation allows for the deepening of the relationship over time. Because suppliers have no ambition to design and customers have no ambition to produce, both have

an incentive to work together to exploit one another's strengths. History strengthens the tie and improves the character and efficiency of limited collaboration. Because the roles and boundaries between customer and supplier are in this way so clear, contract manufacturing relations, at least as an ideal type, are less plagued by the kinds of heterogeneous OEM sourcing strategies and behaviors described in section one. OEM's are never competitors of their suppliers.

This is not to say that such pressures for heterogeneity do not exist—indeed, they could even be intensifying. Unpredictability and instability in this relationship is introduced by two factors: The desire on the part of OEM's to avoid capture by powerful contract suppliers and the need on the part of both parties to seek alternative customers and suppliers as a way to survey the relevant terrain in their sector for emergent technological and organizational possibilities. Both of these factors push OEM's to limit their commitments to a single supplier or even to a stable pool of suppliers in the interest of gaining technological and cost reduction leverage. For their part, contract suppliers search the terrain for additional technological and organizational possibilities as well, causing them (opportunity cost) to bound their commitments even to their most trusted and reliable customers.

In the long run, this search process is not only valuable to the individual development of customer and suppliers; it can also strengthen the on going relationship between the parties because what each learns from its relations with others allows them to contribute more creatively to mutual projects. In the short run, however, such mutual searching creates difficulties as finite quantities of work have to be parceled between traditional and new suppliers(customers). Compromises and concessions on all sides must be made and this can produce considerable heterogeneity in the quality of relationships. For example, customers may give existing suppliers less lucrative work, while it expands production with another contractor in a more attractive area—with a promise that in another product round the old supplier will be back in the cue for the high margin business. Such suppliers accept the business to preserve the long term relation, but at the same time seek to compensate for the lost business by expanding its business with other OEM's.

Such creeping heterogeneity in the character and quality of relations destabilizes, or at least complicates, the contract manufacturing type and pushes it in the direction of what we will call “sustained contingent collaboration” below. It deserves to be its own type, though, due to the strict division of labor between customer and supplier. The role boundary between development and production is never crossed.

**Type 4: Collaborative Manufacturing.** This is the limit case in the global trend toward vertical disintegration. The relationship differs from the captive supplier relationship in that there is near parity in the power balance between customer and supplier: Each depends on the other for the definition and production of the desired part, and both bring know how to the relationship that neither could nor would be interested in acquiring on its own. Thus, competences are fully complementary and leverage is counterbalancing. Collaborative manufacturing also differs from the contract manufacturing relationship in that the competence and capacities of both parties are jointly indispensable not only for the production of a desired component, but for its design and development as well. In this limiting case, collaboration begins as a joint exploration of the possibilities for the definition of a product between customer and supplier; neither party has a clear idea ex ante what the precise contours of the final product of the collaboration will be nor of its specific articulation or interface with the overall design of the end product. But both parties recognize that they require the competences of the other and their collaboration defines the content of both design



and production. As a result, the collaborating parties view the outcome of their collaboration as a joint product from which equal rents should be drawn.<sup>11</sup>

As a type of relation between customer and supplier, collaborative manufacturing is defined by the systematic integration of development and manufacture between the parties. Both bring competence in both to the joint project. This distinctive characteristic of the relation, however, is also what makes collaborative manufacturing a limiting case in the typology. While it is possible to imagine stable collaborative manufacturing for the life of a particular joint product, it is extremely difficult to identify conditions under which relations between customers and suppliers could be characterized by full integration of production and development capability over multiple contracts over time. In part, the explanation for this is the same one that contributed to greater heterogeneity within the contract manufacturing relation: The need to enlarge the pool of ties in search of new possibilities is in tension with the reality of a finite amount of work and capacity at any given time. Through their efforts to learn, in other words, customers and producers are forced into trade offs and compromises in an effort to preserve old ties while developing new ones.

Unlike the case of contract manufacturing, however, where the distinctiveness of the type is preserved despite increasing heterogeneity because the type-defining role division between design and production is never breached, it is extremely difficult for collaborative manufacturing as a type to maintain integrity of its defining feature over time in the context of the search process. Trade offs and compromises invariably lead to the separation of development and manufacture between customer and supplier. Customers vary the quality of the contracts they establish with a single customer, some involving full blown collaboration, others involving only manufacture or more limited collaboration on design, in order to expand the number of potential suppliers it has available for collaboration. As such, over time and multiple contracts, collaborative manufacturing as a type has a very strong tendency to degenerate into our fifth and final type, sustained contingent collaboration.

**Type 5: Sustained Contingent Collaboration.** If the collaborative relation is the limit case in the current environment, sustained contingent collaboration is the modal one.<sup>12</sup> This relationship can only be understood as a tie that exists between customer and supplier over time. It emerges under conditions where both customer and supplier have important capabilities in both design and production. This makes role definition a central point of negotiation between the contracting parties. As we saw above, collaboration is one limiting—and reproducible—moment within a sustained contingent collaboration. But the definition of roles turns out to be much more heterogeneous within a relationship of sustained contingent collaboration due to two factors (both already mentioned) in the current global competitive environment:

- 1.) the tendency of both customers and suppliers in the process of searching their environments for new technological organizational capacities to vary the quality and character of their relations with even their most valued partners in the interest of expanding the size of their pool of ties/partners;
- 2.) the fact that the volatile, complex and non-simultaneous character of product change in the current environment leads OEM firms to separate their aggregate goals for the outside acquisition of know how and cost reduction from the particular relationship that they establish with individual suppliers.

The mutual desire for access to outside capability results in variation in the intensity of the tie between customer and supplier over time and across projects. Because both customer and supplier have both development and manufacturing capabilities, the parties can negotiate on the definition of the roles they will play in each contract round. A customer and supplier involved in intense and intimate collaboration on one project may opt for a more limited relation (perhaps the supplier manufactures a component according to someone else's designs) for a different project on a different product. The variation allows each party to seek rewarding ties to others without exhausting their own capacities and while also avoiding the possibility that their relations will be entirely severed once the older very intimately collaborative project runs out. The more flexibly partners can vary the roles they play, the greater is their capacity to search their environment for innovation and the more enduring can their relations with any particular partner be over time.

Thus, the first factor above explains how a relationship between a single customer and supplier that is variously constituted over time can nonetheless be thought of as a sustained collaboration. The second factor helps to elaborate how such collaboration can also be contingent. OEM's maximize the know how gains and cost reduction contributions they receive from suppliers at an aggregate level, rather than at the level of each individual supplier relation, because it gives them more flexibility. In many cases, they attempt to realize both cost reductions and know how gains in the same relationship through collaboration with the supplier. But in other cases, circumstances may be such that the OEM would like to lure an attractive specialist into its pool of suppliers, so it will be willing to pay a premium for that specialist's know how. In order to meet aggregate cost targets for the whole product, however, such a move will have to be compensated by significant cost reductions from other suppliers in the pool. The OEM can use its market power, leverage or very frequently the promise of more lucrative work in a subsequent round to extract extra cost concessions from suppliers.

This kind of multiple goal contracting with suppliers engenders significant role ambiguity and hence contingency and even conflict in the character of relations between suppliers and customers. Suppliers are never sure what role they will play, or even are playing, at any moment in time—will they be courted for their know how, integrated into a collaborative process of combined development and cost reduction, or will they simply be pressed for cost concessions on components that were once understood to be one of the previous two categories? OEM's foster this ambiguity because it is in their interest to have a supply base with broad capacities. Good suppliers should have both technological know how and a skilled understanding of how cost can be eliminated from their role in the supply chain. Suppliers, naturally, resent providing cost reductions because it threatens their margins. Hence, they continually resist OEM pressures by attempting to define their role as a know how providing, premium deserving, collaborator. It is in the OEM's interest to allow the supplier to succeed sometimes in their counter arguments regarding their role (otherwise they risk losing the supplier and its know how). It is also in the supplier's interest to develop the skill of being able to supply cost reduction when demanded without such reductions irreparably damaging the supplier's margins. If it cannot do this, the OEM is likely to regard the supplier as unskilled and too costly to keep within the pool of suppliers. Strategic interest in the present and concern for future business make customer supplier relations into a sustained contingent collaboration.

Strictly speaking, the logic of the first factor causing heterogeneity in customer-supplier relations is distinct from that of the second. The search for know how in a world of finite contracts is different than endemic conflict over role definition. In practice, however, the two

logics blend into one another and produce powerful systematic pressures for the production and reproduction of heterogeneity in customer-supplier relations.

This is especially obvious in the case of cost reduction. Supplier firms have an incentive to seek contracts with a range of customers so that they have access to new forms of both technological and organizational know how. This increases their competence and enhances their case vis a vis a particular customer that they be defined as a premium supplier of know how. But since all customers seek both know how and cost reduction in equal measure (and in similarly flexible ways), suppliers find that they must have the ability to produce cost reductions wherever they go. Skill at providing give backs without sacrificing either margins or production quality, it turns out, is just as attractive to customers as is special technological know how. The more experience one accumulates through multiple contracts with multiple customers, the better one becomes at being able to accommodate customer demands—and in being able to bargain with the customer about the role that the supplier firm should be playing. But then, the more adroit a supplier becomes at adopting multiple roles with a customer, the more the customer will exploit this flexibility on the part of suppliers. All of this has a tendency to systematically reproduce broad heterogeneity in the quality and character of customer-supplier relations in the contemporary context of vertical disintegration in manufacturing.

### **3.) Vertical disintegration in national context.**

Heterogeneity of relations in the context of secular vertical disintegration is a global trend. It is occurring in all national manufacturing contexts. Indeed, the uniqueness of the current period is that “best practice” in manufacturing has been nearly entirely decoupled from the particular institutional characteristics of national political economies. Unlike the practice of much of the 1990s when firms looked to producers in the US, or twenty years ago when they looked to Japan, or a hundred years ago when they looked to Britain, today technological sophistication and organizational innovation (and pressure to change) is broadly distributed across the major developed regions of the world. In the process of “chunking” a new product down into its many sub systems, components and production processes, product development actors, manufacturing teams and purchasing managers in both OEMs and suppliers look “beneath” national models, so to speak, to particular mechanisms, techniques, forms of organization and design developed by their competitors that could enable them to improve their own practices and achieve their goals. In this way, global trends work their way into all national systems in a self conscious but very local, and piecemeal fashion. Moreover, since the process of benchmarking is continuous, no one can rest on their laurels and hence no national system is spared pressure to change at some level.

In this section, we will argue that in the context of the global trend toward vertical disintegration and decentralized best practice, producers in both Germany and the US are struggling to construct and govern the array of relations we have outlined in the previous section. In particular, we will focus on efforts to construct our modal type: sustained contingent collaboration. The claim is that sustained contingent collaboration is emerging as the norm in both Germany and the US. But the difficulties that firms encounter in constructing and governing these relations, while overlapping, are not identical in each country. The institutional and experiential resource base (*habitus*), for producers is different so the distribution of possibilities, strengths and weaknesses in capabilities and competences, is different.<sup>13</sup> Sustained contingent collaborations are prevalent in both the German and the US political economies, yet they are entwined and enacted quite differently in both societies.

In this sense, we agree with the institutionalist claim, against neo-liberalism, that there is variety or diversity in the forms of capitalism in the contemporary world.<sup>14</sup> Nonetheless, it is important to see that our argument departs quite substantially from the claims of a central school of contemporary institutionalism, the Varieties of Capitalism (VoC) approach pioneered by Peter Hall and David Soskice and their colleagues and collaborators, in two ways.

First, we reject the strong Hall and Soskice argument that societies are endowed with comparative institutional advantages.<sup>15</sup> For Hall and Soskice, successful German OEM manufacturers, because they are embedded in the institutional architecture of a “coordinated market economy” (cooperative labor relations, corporate governance with labor participation, patient capital, regulatory law), are most likely to construct cooperative (non-market) relations with both labor and their suppliers and pursue competitive market strategies that are characterized by product quality and incremental innovation. By contrast, because US OEM producers are embedded in the institutional architecture of a “liberal market economy” (conflictual labor relations, capital dominated corporate governance, a financial system concerned only with profitable return and strict contract law), their labor and supply chain relations will be distant and arms length, characterized by conflict, wage and price pressure, all of which diverts producer attention from gradual improvements and incremental innovation.<sup>16</sup>

As the next section (3.1) will report, however, this is not what the available evidence shows regarding supplier relations. Producers in both the US and Germany are engaging in cooperation AND in arms length conflict and price struggle. Indeed, producers in both countries are trying to construct forms of governance that enable them to continue to innovate and improve their products at the same time that they help them cope with the pressures generated by sustained contingent collaboration.

Second, we also reject the related, but not identical, institutionalist claim that national institutional systems change in path dependent ways: i.e., in the absence of a significant exogenous shock such as a war or terrible economic catastrophe, the coherence of institutional complementarities within a national architecture of institutions encourage actors to seek solutions to governance problems that are compatible with (if not reinforcing of) existing arrangements and constrain them from adopting governance solutions that are “fundamentally” incompatible with those arrangements.<sup>17</sup>

In what follows (section 3.2), we will show that, at least in the case of the relations emerging out of the vertical disintegration of manufacturing, actors in both the United States and Germany are to a surprising extent neither significantly constrained nor especially enabled by the institutional architecture of the political economy. Indeed, in many ways the institutional architectures in both the US and Germany, as coherent systems, have been overtaken by events and stand awkwardly by as actors seek to construct new relations and forms of governance alongside them. This is not to say that there are no efforts to reform or adapt existing institutional arrangements to changing circumstances. There are.<sup>18</sup> Nor do we want to claim that actors are entirely ignorant of the normative dispositions constituting institutional rules. Far from it! In crucial ways we find that they are guided by these dispositions.<sup>19</sup> But we find both that actors act independently of institutional incentives and constraints AND that they try to use institutional mechanisms in new or un-standard ways in order to achieve their governance ends—that is, that they try to change the incentives and constraints that institutions provide to make them more suitable to the new context.

Stated in a positive way, rather than looking, as institutionalists do, for structural constraints or enablers, we view the social terrain of the economy in the US and Germany as peopled by a community of reflexive agents, beset by common problems of their own definition (though not necessarily of their own making), seeking to construct solutions to the problems they encounter in practice. And, rather than looking for institutional complementarities between system parts and greater and less “coherence” for the system as a whole, we conceive of the (very different) institutional architectures of the political economy in the US and Germany as constituting sets of resources for actors to use, not use, deconstruct or redefine in their efforts to contend with the problems of industrial transformation that beset them in practice. In our view, institutions help actors solve governance problems. If they do not solve (or even address) the problems that actors have, then institutions are either ignored or changed.

At the end of the day, experimentation upon the social terrain of OEM supplier relations in both the United States and Germany is very widespread, and there are many different kinds of “solutions” to the governance problems posed by the new production relations being constructed. In the conclusion, we suggest that this process of experimentation is slowly recomposing the institutional character of the political economies of both Germany and the United States in ways that nonetheless reproduce significant differences between the two political economies.

### **3.1: Sustained contingent collaboration in Germany and the United States.**

We constructed sustained contingent collaboration as a type in section two based on qualitative observation of supplier-OEM relations in both the US and Germany, so we are convinced that this type of relation can be found in both countries. But there is no reason to take our word for it. Indeed, there is a strong presumption within the VoC camp that relations in the US and Germany will systematically diverge, with German relations likely to be more cooperative and US relations likely to be more arms length and market defined. Appeal to some neutral and broadly representative data would therefore seem to be in order.

Numerous quantitative studies have been undertaken over the course of the last decade to determine the extent to which supply relations in manufacturing (particularly in the automobile industry) have become more collaborative and structured by the precepts of “lean manufacturing” (low inventory, low work in process, early supplier involvement in product design, team work, transparency on costs between supplier and customer—etc). Happily for us, most of the evidence is extremely contradictory. Researchers find conflict and collaboration, trust and distrust almost in equal measure in both societies.

Sue Helper, for example, in studying supplier relations in the US automobile industry, has repeatedly found that many US suppliers are being asked to engage in product development, are being incorporated earlier into the product development process and have adopted a wide array of cost reducing and transparency enhancing arrangements in production.<sup>20</sup> In comparison to the conflictual and arms length practices of thirty and forty years ago in the US, there is a remarkable amount of cooperation in contemporary US manufacturing. But Helper also finds that US suppliers have a low level of trust in their customers. Many feel that their relationships with customers involve one way exchanges of know how. Customers press supplier margins in the name of mutually beneficial cost reduction. Customers solicit innovative design from their suppliers only to shop those designs around to supplier competitors. And, OEM requests for just in time delivery are experienced as inventory shifting rather than inventory eliminating moves on the part of OEM.<sup>21</sup>

For Helper, the contradictory character of this evidence is viewed as a marker for the incompleteness of the transition to lean production in the US and above all as an indication of the legacy of arms length contracting in US manufacturing for much of the 20<sup>th</sup> century.<sup>22</sup> From the perspective on the VoC school, such contradictory data is evidence for the strength of the market tradition in the US and of the absence (or weakness) of institutions capable of sanctioning self dealing in non market relations.<sup>23</sup> From our point of view, however, the contradictory impulses observed in Helper's findings provide evidence for the kind of sustained contingent collaboration relations we believe are being systematically created in today's competitive environment in spite of the institutional arrangements encouraging or discouraging particular forms of behavior in the society.<sup>24</sup> The challenge for producers in the US, we will see, is to create forms of governance that allow them to cope with the contradictory pressures being generated.

Evidence is similarly contradictory in studies of German manufacturing supplier relations. One very extensive study, conducted by three major economic research institutes in Germany at the end of the 1990s of the automobile, electrical and mechanical engineering industries, found that German suppliers were indeed being asked to participate in product development at much earlier stages than they had been in the past.<sup>25</sup> Forty one percent of automobile suppliers, 44.4% of electromechanical industry suppliers and 47.1% of mechanical engineering industry suppliers indicated that they were involved in intensive cooperation with other firms (though not all of these collaborative ties were with their direct customers).<sup>26</sup> The survey also indicated that production cycle times were drastically declining across the supply base and that suppliers were adopting production level procedures (longer machine utilization rates, cross functional teams, ISO 9000 certification) to create greater cost transparency, improve quality and lower inventory.<sup>27</sup>

Yet, at the same time, the survey also showed that over 91% of all surveyed firms in all surveyed industries ranked price pressure from OEMs as the greatest problem for suppliers; 61.1% said that inconsistent delivery terms were a significant problem and 47.6% said that OEM's were forcing them to hold inventory (rather than seeking to eliminate it from the supply chain).<sup>28</sup> Of those firms engaged in collaborative research and development with their customers, 57% said that they were partially compensated (as opposed to fully compensated) for their efforts (nearly 50% of firms with fewer than 100 employees indicated that they typically received no compensation at all for their research contributions).<sup>29</sup> In addition, the report notes that 42.9% of all German automobile suppliers complain of Customers shopping the supplier's designs around to their competitors.<sup>30</sup>

As in the American case, the evidence here is strikingly contradictory. German suppliers are engaging in collaborative relations, but there is considerable conflict and struggle among the producers for the rents from the relationship and significant variety in the quality of relations. Seen with the institutionalist lenses of the VoC framework, this kind of contradiction within a coordinated market economy is a sign of systemic distress. The system of constraints and enablers is not functioning in a way that inhibits the diffusion of arms length market relations in Germany. We agree that the constraints and enablers are not working in this way, though given the fact that there is considerable cooperation in the US where there are no institutional incentives for it, it is unclear to us that even the cooperation observable in German OEM supplier relations is in any significant way traceable to the "beneficial constraints" of the institutional architecture in the German coordinated market economy.<sup>31</sup> From our point of view, the evidence fits very well into the logic we have attempted to portray of sustained contingent collaboration. The challenge for German producers is to construct forms of governance that enable them to cope with the contradictory character of the current situation.

Judging by the evidence presented, it seems fairly clear that both German and American manufacturing supplier relations today have strong elements of both conflict and partnership within them. It is also clear that the institutional architectures in each of the political economies are not only achieving the outcomes they are thought to be able to produce; they are also allowing for the achievement of those that they are not supposed to produce. For us, this is a sign that in order to understand the character of practical, relational and institutional recomposition in Germany and the United States one should not start by observing the performance of institutions, but by looking concretely at the efforts of both suppliers and OEMs to cope with the contradictory character of their situation.

### **3.2: Coping with the problem of sustained contingent collaboration in Germany and the US**

The situation that confronts both US and German suppliers and OEMs in the context of the trend toward vertical disintegration and the emergence of sustained contingent collaboration as the modal relationship between OEMs and suppliers is one of continuous change: the character of relations, technology, specific workplace arrangements, skills, markets etc are continuously changing. Actors (and regions) unable to cope with this kind of environment are unlikely to reproduce themselves. In this context, there are two different governance problems for which actors in both societies have had to devise mechanisms to cope: The problem of initial learning, and the problem of cost reduction.

By initial learning, we refer to the processes by which producers acquire information and know how in order to be able to participate in the new style of relationship. How do firms learn, for example, about new style production arrangements (team work, cellular manufacturing, low work in process etc) and services (just in time delivery, sub assembly, logistics) that are needed to participate competitively in the new supply chains? How are they able to develop the capacity to participate in collaborative design and product development?<sup>32</sup> By cost reduction, we refer to the strategies and procedures suppliers and OEMs use to organize the generation of continuous cost reductions in production. Analysis of both of these problem areas will reveal some commonalities but also significant differences in the way in which producers in the US and Germany cope with such demands.

#### **3.2.a Initial learning:**

Prior to the onset of the trend toward vertical disintegration in the 1980s, suppliers and OEM's in both Germany and the US were primarily engaged in Type 1 style relations: i.e., short term, arms length relations in which suppliers either produced standardized commodity products or produced overflow capacity for OEMs during periods of peak demand. On the whole, price was the determining factor for sales in old style manufacturing supply chains in the US and Germany. OEMs were very vertically integrated and supplier structures in both countries tended to be divided between a relatively small number of large standard component producers, such as Robert Bosch or Borg Warner in the automobile industry and multitudes of small and medium sized contract shops engaged in capacity subcontracting.<sup>33</sup>

For the bulk of supplier firms in both economies, the trend of vertical disintegration and the shift toward sustained contingent collaboration has therefore involved significant pressures to upgrade their technological capabilities, production quality, service delivery capacities and

internal cost management procedures. This has pressed suppliers into large investments in new engineering personnel, to profound recomposition of their manpower usage and training practices, and to the reorganization of the work flow in production, forward to the customer and back to their own suppliers. Mechanisms and methods facilitating this adjustment in both the United States and Germany have been parallel but systematically divergent.

### *Initial Learning in the US<sup>34</sup>*

Initially in the US, OEMs themselves invested significant direct effort and cost in the form of “supplier development” to instruct their suppliers, one by one, in the new techniques.<sup>35</sup> This, however, is a mechanism that has begun to disappear. Supplier development was always accompanied and supplemented by consulting services that firms could acquire over the market, and these practices continue (though they are often too expensive for many smaller firms to make extensive use of). Additionally, firms with the resources (and some without them) sought to acquire knowledge of the new techniques, and also new competences in technology and service, through the acquisition of complementary firms and/or rivals in the market. The pressures placed on supplier firms by OEMs to enhance their development capabilities has led to significant mergers and organizational recomposition in the industry, at all levels, as actors have sought to create entities capable of efficiently participating in sustained contingent collaborations.

The market is a traditional mechanism for resolving governance problems in the US, but it has not been the only one in play in the current adjustment period. There has also been a very broad array of public and private and cooperative experiments attempting to upgrade the capabilities of the supply base in the areas of production quality, service provision and cost reduction. The experiments can be categorized as consortial, associational, and corporate. In each case, public support may or may not play an important role.

The Wisconsin Manufacturers Development Consortium (WMDC), described in detail by Whitford and Zeitlin is an example of a public-private consortium of large OEM firms, public agencies such as the Wisconsin Manufacturing Extension Partnership (WMEP) and technical colleges devoted to the improvement of the capacity of local component manufacturers to compete at the levels of production quality and cost reduction capability that the participating manufacturers require.<sup>36</sup> Component supplier firms serving the members of the consortium have their participation subsidized by public money and they gain significant access to OEM know-how through participation in consortia-sponsored courses. A similar program has been started in Pennsylvania, in the US.

There are two different examples of associational leadership in the provision of service to firms seeking to learn how to square the circle of quality, service and low cost that is constitutive of sustained contingent collaboration. The first is a program for supplier training directed by the Industrial Training Program (ITP) in Illinois’s Department of Commerce and Community Affairs.<sup>37</sup> This program provides public funds to a variety of Illinois industry associations with membership structures composed primarily of small and medium-sized component manufacturers. In the case of the Valley Industrial Association (VIA) (in the outer western Suburbs of Chicago)<sup>38</sup> or of Norbic (a membership based Industrial Development Association on the north side of Chicago serving primarily small and medium-sized producers), the ITP awards the associations funds and member firms make specific proposals to the association for training subsidies. Fifty per cent of the expense of training is paid for by the program. VIA encourages members to make use of the funds (which they do in large numbers), but does not give advice or assistance as to the types of training that may be



necessary. Norbic provides consulting services to its members to help them optimize the kind of training they utilize and then provides grants to firms for the training.<sup>39</sup>

The final variant of governance mechanisms capable of balancing manufacturing quality with continuous cost reduction is a corporate one. Here there are two different kinds of mechanisms: one directed by internal corporate consulting units on operating units that are active as component suppliers; the other directed by OEM firms toward their component suppliers.

The first mechanism can be found among large component and complex subassembly producers such as Emerson Electric, Danaher, GKN, and more specialized component producers such as ITW. These firms operate their own internal organizational consultancies, often through their corporate “Technology Centers”. Firms such as Danaher are widely known for their uniformly “lean” production operations and they are able to achieve this across a broad array of operating units and subsidiaries through the use of corporate training programs for operating unit engineers, managers and workers (often run through their corporate university) and technical consultants who benchmark subsidiaries within the conglomerate and disseminate information on successful organizational forms. These corporate institutions broker solutions for independent operating units, bringing knowledge and expertise to a local production level which those local units would not have been able to marshal on their own.<sup>40</sup>

The second mechanism is in many ways a variant on the now increasingly discontinued practice of supplier development, although here the aim is to provide training to groups of suppliers to enable them to reorganize rather than to directly reorganize individual suppliers. Moreover, in the most prominent case, this corporate policy is undertaken with local government subsidy. The same Illinois ITP program mentioned in the discussion of associational initiatives above also makes supplier training money available directly to the three largest Illinois manufacturing OEMs—Caterpillar, John Deere and the Ford Motor Company (which operates a massive assembly complex on the south side of Chicago). These firms are charged with using the money to train suppliers that they identify as needing production quality assistance and improved cost reduction capability. In these cases, the large OEM designs the curriculum and offers training that it believes will enable suppliers to consistently achieve quality and cost reduction targets that the firm establishes.<sup>41</sup> In effect, the state of Illinois outsources regional industrial policy to the major actors and shapers of industrial practice in the state. The effect, however, is to insure that small and medium sized component suppliers cross the initial learning threshold for participation in the new style subcontracting relations.

In sum, the governance of initial learning on the American side is characterized by processes of merger and firm recomposition guided by the market as well as by an array of non market experiments: associational, consortial, and corporate. Some of the mechanisms that have been set up (in particular the state sponsored corporate programs in Illinois) have the traditional character of firm led or arms length incentive creating industrial policy for which the US has long been known. But others are more path breaking: the consortial and associational programs in Wisconsin, Illinois and Pennsylvania and some of the intra-corporate consulting agencies are interesting because they are deliberative. They involve systematic contact for information and experience exchange among the principle parties (OEM, Supplier, Association, State agency) in both the conception and execution of policy. The difficulty that all struggle with is how to accommodate local initiative and adaptability to central benchmarking and direction.

### *Initial learning in Germany*

As in the US, efforts to help producers to develop the capability to participate in the new subcontracting arrangements have been quite varied in Germany. Different mechanisms have been in play (market, corporate, and associational) and the use and impact of the different mechanisms has been different in different regions. In some ways, the mechanisms observed are quite consistent with the kind of governance that traditionally has existed in industrial Germany, but in other ways the current experiments mark a clear departure from the path.

One traditional mechanism (often underplayed in discussions of Germany) has been the market. Private consultancies, for example, have been very important vehicles for the diffusion of knowledge about the new production and supply relations in Germany.<sup>42</sup> Mergers have also been very prominent in the component supplier market, again at all levels. In Baden Württemberg alone, the largest region of automobile component production in the country, the number of prominent first tier suppliers to OEMs has been consolidated from somewhere between 25 or 30 players to less than 10 over the course of the last decade. Plainly, in both the US and in Germany, many firms have found it easier to acquire new capabilities by merging with actors who possess them (particularly in the technology and development area) than they have to develop them from scratch in house.

There have been other efforts, however, involving the cooperation of state, associational, firm and educational entities, that resemble the kinds of governance arrangement that is extensively discussed regarding the German case in the varieties of capitalism literature. For example, beginning in the mid 1990s, a series of Länder government “supplier initiatives” were created in the automobile industry (after strong lobbying by component industry associations) which brought together large automobile firms, their suppliers and local technical universities into an informational network. For several years, these initiatives sponsored regular events in which details about the new production arrangements and supplier relations were extensively discussed. Stronger and more enthusiastically attended in some regions than others<sup>43</sup>, such initiatives made information available to those suppliers interested in receiving it. In large part such efforts stopped at the boundary of the supplier firm, but they facilitated consulting business for the local technical university experts among member firms in the Initiative. Finally, the traditional German system of co-determination has also played an effective role in helping to diffuse the workplace and production arrangements of “lean production” (in particular team work, continuous improvement procedures and cellular production) though the issuance of central guidelines for the adoption of the various elements of lean manufacture.<sup>44</sup>

Such reactions to the challenge of the new supplier-OEM arrangements constitute a kind of systemic reflex: The German institutional architecture doing what it can to help producers adjust to a new set of conditions. Such reflexes have been significant, but in crucial ways they have not always been enough for producers. The supplier initiatives had very uneven coverage (in many ways their success depended on the interest of the local OEM). Concretely, they facilitated information exchange and created networks for consultants, but this was often either too little information or too expensive (or both) for many firms to benefit from. The industrial relations system had success with problems related to work organization and production flow within firms, but it was crucially inattentive to the elements of the new system that involved inter-firm relations—logistics, services, cooperation in design and product development. As a result, many German supplier firms felt left in the cold by the traditional institutional architecture. This opened up a space for very interesting experiments in governance that depart quite dramatically from the German norm.

One remarkable experiment of this kind has been taking place in the Bergisches Land in Nordrhein Westfalen. This region is the second largest center of automobile components production in Germany and the largest concentration of small and medium-sized component producers in that sector. For traditional reasons, public policy for suppliers has been very underdeveloped in the Bergisches Land.<sup>45</sup> Local banks are overwhelmed and cash poor; larger banks are pulling away from the industrial Mittelstand (SMEs); employers' associations are traditionally fractionalized and as a result passive. In this case, the institutions of German coordinated capitalism are truly in disarray.

As a result, and somewhat ironically, it has been the local IG Metall union, the strongest extra-firm institution in the region, that has stepped into the breach and begun pushing firms to upgrade and embrace not only newer forms of work and production organization, but new production services and logistics as well. IG Metall's involvement in restructuring takes place in one of two ways.<sup>46</sup> First, in a significant array of cases, agents from the trade union district office in Wuppertal act directly as consultants, offering firms advice on how to restructure their product palette, their labor and production arrangements, and their finances in order to be able to achieve the quality and cost targets demanded by large automobile industry OEMs. Second, and more often, the union acts as an intermediary between the firm and consultants who come in, audit the company and provide advice and consulting on how to restructure the firm to be competitive.

Typically the union becomes involved (in either of the above ways) because it is asked to do so, first by the works council in a troubled firm (either in bankruptcy or in financial trouble) and then by the management itself. The union establishes a set of conditions with the firm on restructuring—i.e., they will help with connections and line up consultants as long as the firm agrees to certain parameters (in the interest of IG Metall members) in the restructuring process. With agreement, the union then goes ahead and lines up the consultant. There are a number of very skilled local consultants who have had success in local restructuring. They know the firms, know the regional culture, know the industry etc. But the union also uses its position to pressure the works council (to the extent it is resistant) to adopt practices in the long-term interest of the competitiveness of the firm (cells, teams, continuous monitoring, benchmarking of best practices in the industry, etc.).

In these ways, IG Metall is playing a pivotal role in the management of small and medium-sized firm adjustment in the region. The union is simultaneously a broker and a conveyor of specialized knowledge. IG Metall mediates consultants who help troubled firms restructure; it establishes guidelines for the general restructuring process with the firm before the consultants are deployed; it engages itself in the internal restructuring discussion and is typically given access to the firms' books. Moreover, due to the structure of the German Federal Works Constitution Act, the union is in a remarkably good position to be able to evaluate the performance of the various actors it engages and sets into action in the restructuring process. Union officials from the local district office sit on the supervisory boards of important mega-suppliers (core customers of local SME firms) and are hence privy to very intimate info on the mega-supplier's practices and strategies—world wide. IG Metall knows what the customers of local firms want and is in a position to helpfully convey that information to its clients and critically evaluate management suggestions and the performance of consultants.

It is important to emphasize that this kind of intervention constitutes a dramatic departure from traditional practice for IG Metall. It is improvisation in the context of a failure of the traditional system to provide for area firms. In one sense, the union's actions have a very traditional interest: to protect jobs in the region by enhancing the competitiveness of the firms

that are located there. But in order to achieve this goal the union has had to break from the traditional confines of union activity within the German system. In effect they are constructing a system of “co-management” within local firms where the trade union and works council deliberate on strategic questions regarding the firm’s future and its customer relations that go well beyond the relatively circumscribed work place and labor market arenas demarcated in the system of codetermination and works constitution statutes in German law. At the same time, they are acting as a regional benchmarking agent, distributing information regarding best practice among area firms and even using information about international best practice that they are able to access through other roles they play in the system of codetermination (i.e. sitting on boards of multinational corporations headquartered in the region).

This example for how the process of initial learning is being organized in Wuppertal is dramatic, but there are myriad other forms of departure and innovation occurring across the German industrial landscape as firms and associations seek to cope with the limits of the existing institutional architecture. As in the US then, the problem of initial learning in Germany is being confronted in ways that both conform with and depart from the traditional path. Crucially, the departures from path in each case do not converge. Although they perform some of the same services and functions, for example, the Wisconsin supplier consortium and the Wuppertal experiment in Union led restructuring constitute quite distinct and different institutional efforts to cope with initial learning.

### **3.2.b Coping with Cost Reduction Pressures:**

Cost reduction pressure in the current environment stems from the permanent pressure that producers feel to be technologically innovative. Firms must allocate increasing amounts of resources to research and development—and moreover, in areas that are not always part of the traditional strengths of the business (e.g.: plastics or electronics for automobile producers). In order to be able to do this, they must withdraw resources from other areas—hence the trend toward outsourcing and a focus on core competences. But in addition to these measures, the pressure to remain innovative imposes permanent pressure on in house operations and on suppliers to continually reduce costs. As we indicated in our discussion of the sustained contingent collaboration relation, a firm’s facility in cost reduction is a major competitive advantage for it in dynamically changing relations.

Being able to cope with this continuous pressure is a crucial governance issue in manufacturing today. Firms must develop the in house procedures to be able to continuously generate and identify cost reduction possibilities. Producers in both the United States and Germany, in different ways, have made interesting and significant strides in this direction.

#### *Internal Governance of Cost Reduction Processes in the US and Germany*

The overarching challenge in achieving continuous cost reduction is to create organization that encourages all actors in the product design, development and manufacturing processes to reveal to others what they know about their area of preoccupation. Such organizational transparency facilitates the identification of inefficiencies within functions as well as possibilities for improvement in the interfaces between functions. Actors have to abandon the opportunistic impulse to protect information for local advantage and recognize that transparency is in the interest of everyone in the process.

There are layers of mechanisms for the realization of this kind of voluntary transparency.

At the level of work and production organization, the core arrangements of lean production (teams, production cells, kaizen practices) make continuous improvement one of their objectives. Typically these arrangements encourage actors to reveal to one another what they know by grouping all relevant functions in the creation and production of a product together in a governance structure that directs its production—hence the outcome/reward for each function is dependent on the outcome/reward for all the others. All recognize their common stake in the successful delivery and continuous improvement of the product. Such arrangements seem to have diffused quite broadly in both the US and Germany at this point, though the transformation continues to be incomplete and the emphases in each political economy differ slightly.<sup>47</sup>

Cost reduction is also a key component of the search process that all producers in the sustained contingent collaboration relationship engage in. Firms scan the terrain, both through collaborative benchmarking procedures in the product development process and through serial contracting with specialists, not only for technological know how, but also for organizational innovation and cost reduction expertise. And, as the discussion in the previous section makes clear, practices in the US and Germany are remarkably convergent.

Both of these layers of cost reduction practice are limited, however, in that they tend to be focused on particular projects or parts of the production process and as a result lack a sense of the overarching situation of multiple projects and multiple production processes in the enterprise as a whole. But it is precisely at this level that much of the “waltz” of cost reduction takes place between firms in sustained contingent collaborations. Consequently, firms have had to develop internal mechanisms which encourage product dedicated teams to reveal to super-ordinate internal scanning actors what they know. This makes it possible for the scanners both to identify cost reduction possibilities throughout the firm (including projects whose profitability can be sacrificed to achieve a customer's cost reduction demand in the interest of the extension and development of other very profitable projects) and to help diffuse innovations and practices that product-dedicated teams may be developing. At this level of internal scanning, American and German firms have some similarities, but on the whole they have been developing different sorts of mechanisms.

The similarities can be found in the smallest firms. Here in both countries the super-ordinate monitoring role is frequently assumed by the principle owner of the firm. In both countries, the effectiveness of this role depends very much on the local balance of power: If the owner acts autocratically, based on what she can observe rather than on what is revealed to her by the various product cells, cost reduction is often a battle over givebacks and wages between production workers and management. This kind of arrangement is less successful, in large part because the top down structure of governance does not encourage actors in production to truthfully reveal what they know. If, on the other hand, the owner facilitates exchange between the various parts of his firm and engages in regularized consultation with shop floor personnel—team leaders, project coordinators, etc -- the results are better. Cost reduction is most successful when it becomes a process of collective self examination across roles and lines of authority in the firm.

An alternative mechanism, found in small firms we visited in both the US and Germany, involves the creation of actors with roles in the firm that systematically cross functions and stages in the production process. In one small family owned machine component producer we interviewed in Germany, for example, the owner described their internal deliberation procedures, in which works councilors and production workers met regularly with

management and ownership, as designed to “systematically produce surprises” about plant layout, machine operation, work organization, material flow as well as possibilities for new products. The key to the success of this was the existence of tool makers and set up personnel who were allowed (expected) to float back and forth between design engineering and machine operators and across product lines. Similarly, one small US deep draw stamping firm in western Michigan that we interviewed organized cost reduction scanning through the construction of dramatically expansive job descriptions for skilled tool makers in their shop. These skilled workers shepherded projects from beginning design to end manufacture and met regularly with one another as well as plant management and machine operators to discuss progress. In both the German and US cases, the key to success was that management and work teams both identified their success with the improvement of the product and the cost reduction process. Skilled workers who were intimately involved at all stages of the production process act as key integrating figures between the shop floor and firm management.

In larger firms, however, the formation of a super-ordinate internal scanning practice differs between US and German firms. In the US, two sorts of scanning practices predominate. One is an autocratic role for finance departments in internal deliberations about cost. Because public US firms are required to make costs more transparent to the outside, finance people are able to use the force of accounting and share holder value arguments to impose particular decisions on multiple projects. The criterion used is purely financial without consideration for the location strategically of particular projects in the historical relationship between the firm and its customer. In this case, the powerful role of finance departments is very much in line with what one would expect from the institutional structure of the US “liberal market economy”.

A second mechanism, often conceived of as a counterweight to the force of finance departments, has been to establish ongoing inter- and intra- operating unit cost reduction conversations among the relevant actors in the production process. Such conversations (organized in the form of weekly meetings or teleconferences between project teams --often including key sub-suppliers) bring together all those responsible for contracts with particular clients to exchange information and discuss collective possibilities for meeting the client’s targets. The parties all have an interest in coming up with something to satisfy the client—each recognizes that future business with the client may depend on it. Such meetings tend both to identify best practice within the firm (through self reporting), and create a forum in which the generalization of such practice can be discussed.

Rather than by hierarchical direction or financial leverage, such mechanisms turn mutual learning and information exchange to the competitive advantage of the firm as a whole. It is in many cases true that the genesis of these institutionalized conversations has occurred because of the unrelenting internal pressure of finance departments in American corporations: The institutional goal of the cross project and cross functional conversations is to achieve (or beat) the goals established by finance, but in ways that are consistent with the health of both internal and customer relations as well as long term efficiency of production within the enterprise. Regardless of how they are generated, the key to their success is the representation of all stakeholders in the products going to a particular client are incorporated in the conversation. Needless to say, this kind of mutual monitoring and sharing of information, as a form of organization, marks an interesting departure from the “liberal market” practices associated with VoC characterizations of the American production system.

In the German case, the institutional form of the super-ordinate scanner is different because the basic institutional contour of the firm is different than in the US. Many large firms, for

example, do not have the same kind of external pressure from finance markets that embolden (and strengthen) the hand of the finance department in US corporations. Engineering and production are far stronger within German corporations than in American ones. But cost reduction pressure, for the reasons given above, is just as intense in Germany, so firms have had to develop alternative mechanisms to identify firm wide cost reduction possibilities. Three different kinds of experiments in this regard suggest the flavor and range of organizational recomposition that is taking place.

The first, currently being developed at a large first tier automobile supplier resembles in some ways the internal consulting groups in American corporations that have played such an important role in initial learning. This is a cross functional team charged with what the firm calls *Leistungsorientiertes Management* (Performance Oriented Management) whose charge is to monitor operations across the firm seeking efficiencies and cost reduction possibilities that may be neglected by the structure of team projects: e.g.: material purchases that could be combined, common design possibilities, complementary machine usage rates, etc. These teams are given general cost reduction targets, but they can only achieve them in consultation with project and production teams. In turn, the production teams, who experience direct pressure from their customers for specific give back percentages, view the performance oriented team as a resource.

The second and third mechanisms seek to achieve the kind of continuous conversation among stakeholders described above in the American context. But the conversations are realized via different institutional actors and catalyzing agents. The second mechanism being deployed by many German firms is to redraw the role of logistics departments in extremely expansive ways, such that agents from that department concern themselves with all organizational and product development issues within and across projects. Logistics teams engage with all existing product development and production teams, at all stages of the development and production process, in an effort to generate and diffuse continuous cost reduction throughout the product development and production cycle. The logistics departments also concentrate, in conjunction with purchasing, finance and development departments, in achieving the flexibility to balance varying intensities of cost reduction pressure across all projects within the firm. In these ways, logistics players have their incentives aligned both with the teams associated with specific projects and with the general cost reduction targets associated with the department as a whole within the enterprise.

A third kind of experiment, at once the most remarkably German but also perhaps the most at odds with the traditional institutional structure of the German production system, involves the systematic involvement of works councils, in collaboration with plant management, to scan for cost reduction potential. In the case of one large supplier to the mechanical engineering industry, in which the IG Metall is very strongly represented (over 90% workforce organization, including management), the works council pursues an extremely expansive version of German co-management. Instead of confining their activities to the narrow tasks of workplace training, wages, scheduling and arbitration, this works council contributes detailed proposals for work, production and product design reorganization to plant management (in most cases themselves IG Metall members).

Initially, the works council became involved in the presentation of proposals for reorganization in an effort to present management with alternatives to proposals developed by outside management consultants. With time, however, as it became clear that pressure for cost reduction was unremitting, the works council devoted an increasing share of its resources to the problem (devoting two full time members of the works council exclusively to the problem of cost reduction). It has gone so far that the works council has become involved not

only in the optimization of organization in the servicing of existing contracts. They have also become actively involved in the way in which the company constructs its bids on new contracts. These activities are in line with the general role of German works councils—to make the employment of its members secure. But it pursues this goal in a very unconventional manner—involving itself with engineering and controlling departments in addition to production level management in an effort to achieve internal efficiencies that allow the firm to meet existing cost reduction targets and to win new contracts.

As in the case of the new style logistics departments (and in some was, the newly defined boundary spanning tool makers in the small firm examples), the advantage of the works council in the process is that it is, as an actor, both part of the local level in the plant and involved in superordinate scanning. Local players are willing to reveal what they know regarding the strengths and weaknesses of their area because they know that the works council has no incentive to punish them with that information. The result is greater transparency regarding cost throughout the firm.

As we have indicated, in many of these German and American examples there are clear departures from the traditional path. There are no constraints or enabling rules in the institutional system in the US to create cost reduction conversations or boundary crossing toolmakers; nor are the new style logistics departments or cost reduction oriented works councils enacting a logic prescribed by the German institutional architecture. In all these cases, actors are innovating despite the rules of the game. The institutional arrangements are not so much constraints or enablers as they are resources in the creative process of experimentation.

Finally, although we believe these examples constitute departures from the path, we also believe strongly that they should be viewed as experiments. We do not intend to suggest that the above illustrations constitute the emergence of a new “system” in either institutional setting. Rather, by outlining an array of experiments, we want to convey the breadth of current experimentation that exists at a local level. We see institutional adaptation through the recomposition of organizational design or the redefinition of roles. Many of the experiments involve departures either from the traditional roles of actors within the institutional architecture of the German and American production systems or from the organizational ecology established by those architectures. All the experiments draw on existing resources, but apply them in new and creative ways.

## **Conclusion.**

In conclusion, we would like to review and underscore three points about the argument and evidence in this paper. First, we have argued that the process of vertical disintegration and the emergence of sustained contingent collaboration is a global trend. It is occurring in similar ways across different political economies. But unlike neo-liberal arguments, ours is not a claim about the diffusion of a single standard of efficiency throughout the global economy. We are not making a “one best way” argument about institutional convergence. Instead, our argument, embodied in the characterization of OEM behavior in section 1 and the typology we develop in section 2, is that there is great heterogeneity of practice in the current global manufacturing environment. OEMs pursue a wide array of practices and strategies even as their commitments to vertical disintegration intensifies. In our view, sustained contingent collaboration as a type of relation between OEM and supplier is emerging across advanced industrial societies as the modal relation, but it remains only one possibility among



several others. Finally, we show that even our modal relation, sustained contingent collaboration, is emerging under a broad array of different governance mechanisms in both Germany and the United States. Vertical disintegration and the emergence of sustained contingent collaborations are global trends. But this is not in any register evidence for the veracity of neoliberal claims regarding the economic processes of globalization.

Second, this paper has been an extended reflection on the limits of contemporary institutional analysis, particularly that of the Varieties of Capitalism school, in accounting for the differences that continue to exist in developed political economies. In insisting on the difference between our argument and the strong convergence claims of contemporary neoliberalism, we are in agreement with much institutionalist writing on the persistence of differences across advanced political economies in the context of contemporary trends. But, in our view, contemporary institutionalism of the VoC variety goes too far in its emphasis on comparative institutional advantage and the path dependent character of systemic change. In a way that is inconsistent with the VoC characterization of the national institutional advantages in the US and Germany, we have shown that sustained contingent collaborations are emerging in both societies. Germany does not have a greater preponderance of nor display any particular advantage in cooperative practices. US firms are neither more invested in arms-length contracting nor more capable of radical organizational recomposition than their German counterparts. Instead, conflict and cooperation and institutional recomposition and experimentation characterize actors's strategies in both societies.

Similarly, regarding institutionalist claims about path dependence, our evidence shows that with the diffusion of sustained contingent collaboration, actor's efforts to cope with pressures for adjustment are producing a variety of significant departures from the path of action generally thought to be encouraged by either the US or German institutional architectures. The cooperative deliberation within large US firms regarding cost reduction and the collaborative supplier training consortia in the US and Union led restructuring and works council-driven cost reduction in Germany all are significant departures from the path. In some cases, actors are guided by traditional conceptions of their institutional roles, yet find it to be necessary to act in unconventional ways to be able to realize those goals (e.g. the IG Metall in Wuppertal or works councils engaging in systematic scanning for cost reduction). But in other cases, actors respond to challenges posed by the competitive environment in ways that appear to be neither systematically constrained nor encouraged by the institutional architecture in which they are embedded. That is, actors respond creatively to their situation (e.g.: the expansive role for logistics departments in Germany or the expansive cross functional role of tool makers within US and German small firms).

All of this evidence, in our view, underscores the reflexive character of action within a social economy. Actors are not confined within a rigid institutional system of constraints and incentives, but instead exist within a social system of contingently coupled dispositions and habits<sup>48</sup>. They solve problems through collective self-reflection and experimentation using and recomposing the resources (institutional and otherwise) that they have on hand. The result, as we have shown, is not only that actors appear at times to be oblivious to the constraints or incentives provided by their institutional surround. They also recreate institutional difference across political economies as actors creatively recompose and even break from the framework for practice that their institutional context provides.

The third and final point we would like to underscore here concerns the experimental and ultimately piecemeal character of change in both the German and US political economies. None of the examples of institutional innovation and recomposition outlined in the second half of the paper in the areas of initial learning and cost reduction constitute a dominant form

of adjustment within either the US or Germany. Adjustment in both societies is extremely fractured and driven by local experimentation. It is not for this reason to be taken less seriously. Instead, we believe that the transformation of institutional architectures within contemporary advanced political economies is occurring in precisely this sort of decentralized, local and piecemeal fashion. Giants are felled by thousands of arrows.

We put to the side the question of whether or not this is a general matter regarding the nature of institutional transformation in all times and all places. But the current character of global competition, characterized as it is by virtually permanent technological change and organizational uncertainty, leads to the following boundedly general consideration. Much of the literature on institutional systems, not least the VoC tradition, discusses the historical development of institutional architectures in the imagery of periods of stability marked by dramatic junctures of upheaval and change followed again by a period of stability. One can be critical of this historical imagery as a general matter<sup>49</sup>, but it seems particularly inappropriate to impose narrative expectations of a coming period of institutional stability (equilibrium) on the current situation. In large part this is because what stands out about the experiments that one observes today is their self consciously provisional character. They have been brought into being because actors perceive common problems that are not being addressed by the traditional institutional instruments available to them for the purpose of addressing such problems. Actors are not willing to describe what they are doing as a new order because they are too acutely aware of the possibility that they will have to change again in the current turbulent environment. The distinctiveness of current problems is that they are never definitively resolved: Innovation and Cost reduction, and the institutional tinkering and recomposition that they entail are continuous processes. Old institutional rules today are not only being broken, but new ones are continually being defined and then redefined.

## NOTES:

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<sup>1</sup> The primary empirical foundation for this paper is nearly 100 interviews conducted by the authors at manufacturing firms, trade unions, regional governments and trade associations in the United States and Germany since the year 2000. We have also relied on the work of our colleagues in a research consortium devoted to the study of the manufacturing components industry in the USA, known as the Advanced Manufacturing Project (AMP). AMP includes scholars from the University of Wisconsin, the University of Chicago, Case Western Reserve University and the Michigan Manufacturing Technology Center. We thank the Alexander v Humboldt Foundation's Trans Coop Program and the Alfred P. Sloan Foundation for generous funding for our research. All references in the text to case examples not otherwise indicated stems from this research.

<sup>2</sup> James Womack, Daniel Jones and Daniel Roos, The Machine that Changed the World, (New York: Harper Row, 1990); Kim Clark and Takahiro Fujimoto, Product Development Performance. Strategy, Organization and Management in the World Auto Industry, (Boston: Harvard Business School Press, 1991); Michael Borrus and John Zysman (1997) "Globalization with Borders: The Rise of Wintelism as the Future of Global Competition" in Industry and Innovation, Volume 4, Number 2, 1997, pages 141-166; Jeffrey K Liker; Fruin, W. Mark, ; Adler, Paul S, Remade in America : transplanting and transforming Japanese management systems (New York : Oxford University Press, 1999); David McKendrick, Richard Doner, Stephan Haggard, 2000, From Silicon Valley to Singapore. Location and Competitive Advantage in the Hard Disk Drive Industry (Stanford: Stanford University Press); Timothy J. Sturgeon, 2002, "Modular Production Networks: A New American Model of Industrial Organization" in Industrial and Corporate Change, Volume 11, Number 3, 2002, pages 451-496.

<sup>3</sup> Luiz Mesquita and Thomas Brush, "Relationship Management in Vertical Manufacturing Alliances, Supplier Development and Supplier Performance" working paper, Purdue University, Krannert School of Management, 2001; see also the comprehensive treatment of this subject in the new dissertation by Josh Whitford, 'After the Outsourcing: Networks, Institutions, and the New Old Economy'. Unpublished Ph.D. thesis, University of Wisconsin-Madison., 2003

<sup>4</sup> Sue Helper, John Paul MacDuffie and Charles Sabel, "Pragmatic Collaborations" Advancing Knowledge While Controlling Opportunism" in Industrial and Corporate Change, Volume 9, Number 3, 2000, pages 443-488; cf also, Charles F. Sabel, "Learning by Monitoring" in Neil Smelser and Richard Swedberg, eds., The Handbook of Economic Sociology, (Princeton: Princeton University Press, 1995)

<sup>5</sup> For an extended discussion of this point, see Gary Herrigel, "Emerging Strategies and Forms of Governance in the Components Industry in High Wage Regions" forthcoming in Industry and Innovation, 11/1-2, 2004

<sup>6</sup> They also insist on production quality—but unlike cost reduction and know how acquisition, this demand on suppliers tends not to vary across relationships. Virtually anyone one talks to in manufacturing indicates that "production quality" is taken for granted in supplier relations. It is a minimal price of admission into the game being described here.

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<sup>7</sup> See Josh Whitford and Jonathan Zeitlin, “Governing Decentralized Production: Institutions, Public Policy, and the Prospects for Inter-Firm Cooperation in the United States” forthcoming in Industry and Innovation, 11/1-2 2004 for the distinction between specialized and capacity subcontracting, as well as a general discussion.

<sup>8</sup> Toshihiro Nishiguchi and Jonathan Brookfield “The evolution of Japanese subcontracting”, in MIT Sloan Management Review; Fall 1997; 39, 1; Toshihiro Nishiguchi, Strategic Industrial Sourcing, (Oxford University Press, 1994); Michael J. Smitka, Competitive ties : subcontracting in the Japanese automotive industry (New York: Columbia University Press, 1991)

<sup>9</sup> See Jeffrey Dyer, Dung Sung Cho, and Wujin Chu, “Strategic Supplier Segmentation: The Next ‘Best Practice’ in Supply Chain Management” in California Management Review, Vol 40, No 2, 1998, pages 57-77

<sup>10</sup> Timothy J. Sturgeon, 2002: “Modular Production Networks: A New American Model of Industrial Organization” in Industrial and Corporate Change, Volume 11, Number 3, 2002, pages 451-496; Boy Lüthje, “Electronics Contract Manufacturing: Global Production and the International Division of Labor in the Age of the Internet” in Industry and Innovation, Volume 9, Number 3, pages 227-247, December 2002; Boy Lüthje., Schumm, W. and Sproll, M. , Contract Manufacturing: Transnationale Produktion und Industriearbeit im IT-Sektor (Frankfurt and New York: Campus., 2002)

<sup>11</sup> This is an ideal type and there is no single theoretical view that elaborates the stylized notion of collaboration presented in the text. A one sided reading of Helper et al, “Pragmatic Collaborations: Advancing Knowledge While Controlling Opportunism” could produce the idea of the collaborative relation elaborated in the text. But it is also possible (and much more in line with the sensibility of that text) to slot Helper et al as developing something akin to our next type—sustained contingent collaboration. Indeed, we understand ourselves to be developing ideas that were initially posed by the Helper et al article.

<sup>12</sup> We have struggled with the term we use to describe this type. Alternatives could be either “conflictual partnership” or “pragmatic collaboration”. The former has the advantage of conveying the contradictory quality of the relation we want to describe. It also suggests that the relationship is sustaining. It is misleading, however, in that it invokes power and conflict more centrally than we perceive either to be relevant for understanding the dynamic we are describing (It is a term that has been used to characterize German industrial relations—an inexact analogy to the OEM-supplier relations we are describing). Pragmatic collaboration conveys perhaps more concisely than the term we have chosen the paradox of sustained contingency, continual remaking, in a joint social project that we are striving for. But it is very closely associated with the Helper et al article which has a spirit we endorse, but imprecision in formulation that we are trying to move beyond.

<sup>13</sup> For an understanding of the institutional and experiential resource base as a habitus, see Pierre Bourdieu, Outline of a Theory of Practice, (New York: Cambridge University Press, 1977). Our thinking about how to conceptualize transformation has been informed by Bourdieu and by John Dewey, Human Nature and Conduct (Mineola NY: Dover Publications, 2002 (1922)). Everything has also been filtered through many conversations with Chuck Sabel, for which we are grateful (though he will doubtlessly not like everything about how we have formulated our position).

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<sup>14</sup> For institutionalist critiques of neo liberal claims to convergence in the contemporary global environment and arguments for continued diversity in capitalisms see: J Rogers Hollingsworth and Robert Boyer, eds, Contemporary Capitalism, (New York: Oxford University Press, 1997); Suzanne Berger and Ronald Dore, eds, National Diversity and Global Capitalism (Ithaca, NY: Cornell University Press, 1996); Richard Whitley, Divergent Capitalisms. The Social Structuring and change of Business Systems, (Oxford, 1999); Kozo Yamamura and Wolfgang Streeck, eds, The End of Diversity? Prospects for German and Japanese Capitalism, (Ithaca: Cornell University Press, 2003); Peter Hall and David Soskice, eds., Varieties of Capitalism. The Institutional Foundations of Comparative Advantage, (New York: Oxford University Press, 2001)

<sup>15</sup> The argument for comparative institutional advantage in David Soskice and Peter Hall, “An Introduction to Varieties of Capitalism” in Hall and Soskice, eds, Varieties of Capitalism. The Institutional Foundations of Comparative Advantage, (New York: Oxford, 2001) pages 36-44

<sup>16</sup> The flip side of the destructive effect that the US institutional architecture has on the competitiveness of producers in traditional or mature manufacturing industries is that the same architecture pays large payoffs to radical innovators. Coordinated Market economies tend to discourage radical innovation. The Varieties of Capitalism perspective has been applied to the problem of subcontracting by Steven Casper. See: Steven Casper “The Legal Framework for Corporate Governance: The Influence of Contract Law on Company Strategies in Germany and the United States” in Peter Hall and David Soskice, eds, Varieties of Capitalism, (NY: Oxford University Press, 2001); Steven Casper “How public law influences decentralized supplier network organization in Germany: The cases of BMW and Audi” Discussion Paper FS I 95-314, Wissenschaftszentrum, Berlin, 1995; and “Nationale Institutionengefüge und innovative Industrieorganisation: Zulieferbeziehungen in Deutschland” in Frieder Naschold, David Soskice, Bob Hancke and Ulrich Jürgens, eds, Oekonomische Leistungsfähigkeit und institutionelle Innovation: Das deutsche Produktions- und Politikregime im globalen Wettbewerb, (Berlin: WZB Jahrbuch, 1997)

<sup>17</sup> On path dependence and institutional change, see Paul Pierson, “Increasing returns, path dependence and the study of politics” American Political Science Review, 94: 251-68 and James Mahoney “Path dependence in historical sociology” in Theory and Society, 29:507-48. Ideas of path dependence inform ideas about change within many of the contributions in Soskice and Hall, Varieties of Capitalism. For a recent collection that critically engages with the notion of path dependent institutional change, see Kozo Yamamura and Wolfgang Streeck, eds., The End of Diversity? Prospects for German and Japanese Capitalism, (Ithaca: Cornell University Press, 2003). For another alternative perspective somewhat coincident with our own see Kathleen Thelen, “How Institutions Evolve. Insights from Comparative Historical Analysis” in James Mahoney and Dietrich Rueschemeyer, eds, Comparative Historical Analysis in the Social Sciences, (New York: Cambridge University Press, 2003) pages 208-240

<sup>18</sup> Many of the essays in the Yamamura-Streeck volume show quite extensively how current institutions are being altered in the face of change. See in particular, the essays by Thelen and Kume, Jürgens and Boyer

<sup>19</sup> On action independent of institutional rule but nonetheless informed by dispositions that also constitute those rules, see John Dewey, Human Nature and Conduct, page 14-88

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<sup>20</sup> Helper, Susan and Mari Sako 1995: "Supplier Relations in Japan and the United States: Are They Converging?" Sloan Management Review 36(3): 77-84.; and Helper and Sako 1998: "Determinants of Trust in Supplier Relations: Evidence from the Automotive Industry in Japan and the United States", Journal of Economic Behavior and Organization 34: 387-417. For confirming evidence and interpretations of the contradictory mix of cooperation and arms length competition in the US see Daniel Luria 1996a: "Toward Lean or Rich? What Performance Benchmarking Tells Us About SME Performance, and Some Implications for Extension Center Services and Mission", Atlanta: conference on Manufacturing Modernization: Learning From Evaluation Practices and Results; Luria 1996b: "Why Markets Tolerate Mediocre Manufacturing", Challenge: 11-16. and Josh Whitford and Jonathan Zeitlin, "Governing Decentralized Production: Institutions, Public Policy, and the Prospects for Inter-Firm Collaboration in US Manufacturing"

<sup>21</sup> A very recent study by the Michigan Manufacturing Technology Center, based on survey data collected by Dan Luria and Sue Helper in association with the Advanced Manufacturing Project, confirms the contradictory character of American supplier-OEM relations:

"If the data lead us to one observation, it is that most of the suppliers responding to this survey are both more involved with, yet feel more abused by (their customers) than in the past.

- The majority have done business with their largest customers for at least 10 years; yet many do so without any formal contract extending past one year
- The majority report playing a larger role in the product design than they did three years earlier; yet fewer than one in five report having received any design ideas from customers
- More than seven in ten report that their customers are open to their suggestions for design changes that reduce costs; yet one in three reports customers stringing them out for payment more than 120 days after delivery.
- Nearly half report selling primarily into the engineering, rather than purchasing, functions of their key customers; yet nearly one in five report that customers have made inappropriate use of design information they furnished and almost half saw they are not confident that the information they share will be kept confidential.
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Quote from: Kristen Dziczek, Daniel Luria and Edith Wiarda, "Critical Relationships in Manufacturing." A special supplement to Performance Benchmarking, Ann Arbor MI, November 10, 2003, page 1

<sup>22</sup> see Helper & Sako 1995 & 1998; Whitford and Zeitlin, 2004. See also Helper, "Strategy and Irreversibility in Supplier Relations: The Case of the US Automobile Industry" in Business History Review, v65 n 4 (winter) p 781-824

<sup>23</sup> see in particular Casper, "The Legal Framework for Corporate Governance....." 2001

<sup>24</sup> For additional evidence consistent with our interpretation of the data, see Josh Whitford, 'After the Outsourcing: Networks, Institutions, and the New Old Economy'

<sup>25</sup> Robert Fieten, Werner Friedrich and Bernhard Lageman, Globalisierung der Märkte – Herausforderung und Optionen für kleine und mittlere Unternehmen insbesondere für Zulieferer, Gutachten im Auftrag des Bundesministeriums für Wirtschaft, Schriften zur Mittelstandsforschung, Nr 73 NF (Stuttgart: Verlag Schäffer-Poeschel, 1997)

<sup>26</sup> Ibid pages 232-238, table 235

<sup>27</sup> Ibid. pages 152-175

<sup>28</sup> Ibid. page 152 (Table II.2.2) and 152ff

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<sup>29</sup> Ibid. page (p 282-283).

<sup>30</sup> Ibid. page 289

<sup>31</sup> On the notion of beneficial constraints, see Wolfgang Streeck, “Beneficial Constraint: On the Economic Limits of Relational Voluntarism” in J Rogers Hollingsworth, Robert Boyer, eds, Contemporary Capitalism, (New York: Oxford University Press, 1997).

<sup>32</sup> For an earlier formulation of this problem as that of “de-regionalization and re-regionalization” see Herrigel, “Large Firms and Industrial Districts in Europe: De-regionalization, Re-Regionalization and the Transformation of Manufacturing Flexibility” in John Dunning, ed., Regions, Globalization and the Knowledge Based Economy, (Oxford University Press, 2002)

<sup>33</sup> VoC writers, such as Casper, tend to assume that supplier relations in Germany were traditionally more cooperative than those in the US, even prior to the current trend toward vertical disintegration. This is not, however, an accurate assumption. Indeed, due to the somewhat earlier shift toward lean production methods in the US in the late 1980s and early 1990s, several studies showed that US supplier relations were significantly more cooperative than those in Germany. See, for e.g.: Schrader, Stephan., and Henrik Sattler. “Zwischenbetriebliche Kooperation: Informaler Informationsaustausch in den USA und Deutschland.” Die Betriebswirtschaft (DBW) 53, no. 5 (1993) and Birou, Laura M., and Stanley E. Fawcett. “Supplier Involvement in Integrated Product development: A Comparison of US and European Practices.” International Journal of Physical Distribution & Logistics Management 24, no. 5 (1994): 4-14. For a very interesting discussion of supplier relations prior to the 1990s in Germany and the US, see Hyeong-Ki Kwon, 2002: “Fairness and Division of Labor in Market Society: A Comparison of US and German Automotive Parts Markets”, *Ph.D dissertation, Department of Political Science, University of Chicago*, December, chapters 2- 4. On the earlier relations in the US, see also Susan Helper, “Strategy and irreversibility in supplier relations: The case of the US automobile industry” in Business History Review, v 65 n 4 (Winter 1991) p 781-824

<sup>34</sup> This section and the next one on Germany borrow from a more comparative analysis presented in Herrigel, “Emerging Strategies and Forms of Governance in High Wage Component Manufacturing Regions” I&I 2004

<sup>35</sup> See the very interesting US case study, John Paul McDuffie and Susan Helper, “Creating Lean Suppliers: Diffusing Lean Production Through the Supply Chain” in California Management Review, vol 39. No 4, Summer 1997, pages 118-151

<sup>36</sup> The final section of Whitford and Zeitlin “Governing Decentralized Production” is devoted to a detailed discussion of this mechanism in Wisconsin. For more, see also Jeffrey Rickert, Jonathan Zeitlin, Darya Vassina, and Joel Rogers, 2000: “Common Problems and Collaborative Solutions: OEM-Supplier Relationships and the Wisconsin Manufacturing Partnership’s Supplier Training Consortium”, Draft report produced for the Center on Wisconsin Strategy, January, and the presentations by Mike Schmidt (Harley Davidson), Paul Erickson (John Deere) and Mike Klonsinski (WMEP) at the conference on “Supply Chain Governance and Regional Development in the Global Economy”, University of Wisconsin-Madison, September 10, 2002, available at <http://www.cows.org/supplychain/presentations.asp>.

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<sup>37</sup> Carol Kulek, 2002: “State of Illinois, Department of Commerce and Community Affairs, Industrial Training Program” power point presentation at the conference: *Supply Chain Governance and Regional Development in the Global Economy*, University of Wisconsin, September 10, 2002. See <http://www.cows.org/supplychain/presentations.asp>

<sup>38</sup> Judy Whalen, 2002: “Valley Industrial Association: Multi-Training Grant” power point presentations at the conference: *Supply Chain Governance and Regional Development in the Global Economy*, University of Wisconsin, September 10, 2002. See <http://www.cows.org/supplychain/presentations.asp>

<sup>39</sup> On Norbic’s activities, see : <http://www.norbic.org/>. On Norbic’s industrial training grants, see: [http://www.norbic.org/industrial\\_training\\_program.htm](http://www.norbic.org/industrial_training_program.htm)

<sup>40</sup> The danger, of course, is that these centralized mechanisms undercut the strengths of the local units in their efforts to impose a unitary idea of best practice. It is safe to say that the best results in these cases come in cases where the center and the local units engage in an open dialogue about possibilities and capabilities. For an extensive discussion and critique of this kind of centralized top down benchmarking in the context of multinational companies, see Peer Hull Christensen and Jonathan Zeitlin, *Local Players in Global Games*, (Oxford University Press, forthcoming 2005), chapters 8-13.

<sup>41</sup> Donald R. DeDobbelaere, 2002: “John Deere: Global Learning and Development” power point presentations at the conference: *Supply Chain Governance and Regional Development in the Global Economy*, University of Wisconsin, September 10, 2002. See <http://www.cows.org/supplychain/presentations.asp>

<sup>42</sup> Ulrich Jürgens, “Transformation and Interaction: Japanese, US and German Production models in the 1990s” in Kazuo Yamamura and Wolfgang Streeck, eds, *The End of Diversity? Prospects for German and Japanese Capitalism*, (Ithaca: Cornell University Press, 2003) pages 212-239

<sup>43</sup> Rheinland Pfalz and Baden Württemberg had energetic initiatives; Nordrhein Westfalen and Hessen more fragmented and lackluster ones.

<sup>44</sup> Ulrich Jürgens, “Germany: Implementing Lean Production” and Siegfried Roth, “Germany: Labor’s perspective on Lean Production” both in Thomas Kochan, Russell Lansbury and John Paul MacDuffie, eds, *After lean Production. Evolving Employment Practices in the World Auto Industry*, (Ithaca: Cornell University Press, 1997) pages 109-136. See also Jürgens, “Transformation and Interaction....”

<sup>45</sup> Gary Herrigel, *Industrial Constructions. The Sources of German Industrial Power*, (New York: Cambridge University Press, 1996) chapter 5

<sup>46</sup> A description of IG Metall’s activities in Wuppertal was presented (in English) by Fritz Janitz at the Wisconsin Conference on “Supply Chain Governance and Regional Development in the Global Economy”, September 10, 2002, <http://www.cows.org/supplychain/presentations.asp>.

<sup>47</sup> The literature seems to indicate that the slight differences that do exist can be traced to the subtleties of the different institutional architectures in both countries. See Ulrich Jürgens,



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“Transformation and Interaction”. Streeck, for example, reports that “German lean production does not...include the kaizen practice of a systematic and regular reduction of labor input both following and compelling improvements in productivity” in Wolfgang Streeck and Kazuo Yamamura: “Introduction: Convergence or Diversity? Stability and Change in German and Japanese Capitalism” in idem & idem, eds., The End of Diversity? Page 29

<sup>48</sup> Again, we rely theoretically here on the work of Dewey and Bourdieu referenced earlier

<sup>49</sup> see for example Charles F Sabel and Zeitlin, Jonathan (1997). ‘Stories, Strategies, Structures: Rethinking Historical Alternatives to Mass Production’, in Charles F. Sabel and Jonathan Zeitlin (eds), World of Possibilities: Flexibility and Mass Production in Western Industrialization. (Cambridge: Cambridge University Press), 1-33. From a different perspective to the same end, see Andrew Abbott, Time Matters. On Theory and Method, (Chicago: University of Chicago Press, 2001)