



Space and Governance in New Old Economy Manufacturing Industries

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SECONS Discussion Forum
Contribution No.7

April 2004

SECONS Discussion Forum
Socio -Economics of Space
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Introduction

I am somewhat of an outsider to debates among economic geographers and sociologists of globalization where the “spatial turn” seems to have had its strongest disciplinary impact. The closest that I have ever come to serious engagement with such theoretical debates came in the mid-1990s when I served on the dissertation committee of Neil Brenner, a very talented scholar, now a sociologist at NYU. Brenner wrote a very interesting dissertation on the recomposition of scale in contemporary globalization processes (Brenner 2004). And though I did not then and do not now share his (to my taste overly structuralist) theoretical perspective on the problem, his incredible enthusiasm, impressive intelligence and broad learning forced me to be more attentive to space and scale in my own work. In particular, the encounter with Neil forced me to pay more attention to the assumptions I was making about space and industrial practice.

I first became interested in the importance of space in the economy when I was doing my dissertation research on regional variety in the character of industrialization in Germany (Herrigel 1996). At that time, debates about flexible specialization, alternative patterns of industrialization, the crisis of Fordism, etc consistently pointed to the centrality of regional networks and supporting institutions, particularly in more decentralized, small and medium-sized firm dominated districts. In that debate, at least in the way that I participated in it, the spatial dimension grew out of a critique of firm centered analysis in economics. It was clear that in order to understand the success of the alternative more flexible forms of organization that were the focus of attention in those days, one had to look past the boundaries of the firm and see how producers were embedded in regionally specific institutions and networks.

In retrospect, it has become clear that this discussion relied on two key assumptions that were perhaps at the time warranted, but which in the subsequent passage of time have clearly become problematic. The first assumption was that industrial communities were located in specific and discreetly bounded territories: social¹ and territorial proximity were assumed to be overlapping. The second assumption (often embedded in discourses about trust and informality), was that flexibility and cooperation were possible where formal organizational rules failed to apply or where they were so general that one had to rely on informal cooperation and tacit knowledge in order to get anything done. Flexible producers were in many ways generalizations of the notion of a craft producer who turned the limitations of formal rule into a virtue in contexts where production volume was low and customization high and/or where demand

¹ On the idea of social proximity, see Simmel 1950 a&b, Allen 2000

was volatile and frequently changing (Stinchcombe 1959, Sabel 1981, Piore and Sabel 1984).

In my contribution here, I would like to outline how my current research on the restructuring of supply chains and supplier-customer relations in old economy manufacturing industries (Motor Vehicles, Mechanical and Electrical Engineering industries) in North America and Europe has caused me to significantly re-examine both of those assumptions.² My claim will be, first, that the peculiar contradictory pressures felt by all producers within the supply chain (customers and suppliers alike), in the context of a general trend toward vertical disintegration, have dislodged industrial communities from their traditional territorial moorings. Industrial communities are today constituted on multiple scales and the spatial character of community, much like the division of roles in production, has become extremely fluid and subject to constant change. Second, I will argue that the same contemporary pressures have led to the diffusion of new style governance practices that make constantly recurring collaborative ties subject to formal procedures of joint goal setting and mutual evaluation. These procedures, known as the “New Pragmatic Disciplines” (Sabel 2004), systematically make tacit knowledge explicit in order to achieve continuous improvement in efficiency, cost reduction and innovation.

I will conclude by pointing out that these spatial and governance dynamics have begun to reveal the inadequacies in many of the existing traditional regional architectures of public governance in the industrial economy. Many experimental efforts to cope with this new spatial governance problem borrow and adapt the principles of deliberative goal setting and accountability through systematic mutual comparison that have diffused in manufacturing supply chains at the project and operating unit levels of practice. Understanding the character of these experiments, determining the conditions for their success and identifying obstacles to their diffusion is, in my view, an extremely significant area for future research.

² My recent research has been in conjunction with the Advanced Manufacturing Project (AMP) and its affiliates. AMP is a research consortium of scholars from the University of Wisconsin (Jonathan Zeitlin and Joel Rogers), the University of Chicago (Gary Herrigel), Case Western Reserve University (Susan Helper) and the Michigan Manufacturing Technology Center (Dan Luria). There are also affiliated scholars from Germany (Volker Wittke of the SOFI Institute in Göttingen), Italy (Aldo Enrietti, Massimo Follis of the University of Turin), and Denmark (Peer Hull Christiansen, Copenhagen Business School). The project has been funded by the Alfred P Sloan Foundation. A link to AMP's website, where research papers, policy reports and conference proceedings are available, is: <http://www.cows.org/supplychain/>. My own contributions are (Herrigel 2000, 2002, 2004, and Herrigel and Wittke, 2004 forthcoming).

Vertical disintegration, the emergence of role ambiguity and new relations of proximity and distance in the old economy

Most observers (and actors) agree that production in old-line metal manufacturing industries such as automobiles, construction machinery, agricultural equipment and other forms of industrial equipment is dramatically different today than it was even 20 years ago. In particular, a broad trend toward vertical disintegration has profoundly changed the character of relations between suppliers and customers (OEMs) in these industries. In order to understand the distinctiveness of relations and practices in the present it is useful to contrast them to those that existed in the more vertically integrated past (though one should recall that all such characterizations are stylized and oversimplified).

Vertical integration was a widely undertaken, yet incompletely realized, project for large producers during the middle decades of the twentieth century. Prior to the wave of vertical integration, production in industries such as automobiles, machinery and electrical equipment, in both Europe and North America, was more disintegrated, in many cases with strong and capable suppliers collaborating with strong and capable customers in a specific regional context (Schwartz 2000, Herrigel 1996). The move toward integration came in different ways and for different reasons in different places, but on the whole it sought to internalize as much know how (manufacturing and design) about a firm's end product as was possible. In many cases, this was achieved through the incorporation of capable external suppliers (e.g. Fischer Body into General Motors). But it was also achieved through internal expansion and development, replacing the services rendered by suppliers with those provided internally. Many strong suppliers survived this wave of integration, such as Robert Bosch and the Zahnradfabrik Friedrichshafen in Germany, or Timken and Borg Warner in the automobile industry. But in many other cases, the process of integration fundamentally altered the terms and conditions under which supplier firms related to OEMs.

The dominant feature of the vertically integrated regime was that collaboration with suppliers was minimized. Indeed, apart from the prominent cases where strong suppliers had successfully defended their position in proprietary technologies, OEMs did not cooperate with their suppliers at all. Instead, when they turned to suppliers, they did so when their in house capacity was under-supplying the market, or when they required large volumes of normed and standard components (such as nuts and bolts, or spark plugs). In the former case, suppliers placed bids on very specific, already designed parts and the contract went to the bidder with the lowest price. In the standard product cases, suppliers did not produce with specific customers in mind and firms purchased the parts from catalogues and warehouses. In both cases, the role of the supplier and the role of the customer were very well defined: OEM's designed and developed parts and suppliers produced them. In cases where the OEM also produced, the supplier's role was clearly a secondary one: there was never

competition between OEM production and supplier production. Customers showed no loyalty to suppliers: Longstanding relations produced familiarity and routine, but they never produced commitment.

Such arms length contracting had two paradoxical consequences for the community of producers in a particular industry. First, arms length contracting resulted in huge numbers of OEM-supplier relations, all dominated by the leverage of the OEM. OEMs cultivated multiple suppliers for each individual part in order to avoid bilateral monopolies. This produced large and often quite vibrant agglomerations of suppliers around the OEM. Daimler Benz, for example, had relations with nearly 10,000 suppliers in the mid 1960s—and numbers for other European and American producers were of similar magnitudes (Daimler Benz AG 1962). Relations of power in such agglomerations were, of course, massively unbalanced: Individual suppliers were often dependent on the OEM but the OEM was never dependent on any one individual supplier.

The second consequence of such contracting was that suppliers were located in close territorial proximity to OEMs. Transportation costs affected the price of parts and price was a crucial determinate of the supplier-OEM relation. Moreover, geographic closeness to the OEM, and to other firms with relations to the OEM, enabled suppliers to gain information about potential jobs to bid on. This classic locational logic produced agglomerations of suppliers in the vicinity of OEM production facilities—a bit like clouds around mountain peaks-- or, even more apt (since these agglomerations of arms length contractors and large OEMs were communities), like small houses and apartment buildings around a parish church in a European village or city quarter. Regions with dense supplier populations were also regions with strong OEMs: Baden-Württemberg and North Rhine-Westphalia in Germany, Piedmont in Italy, the Great Lakes States in the United States. On the whole, suppliers produced for their local OEM (or OEMs). They had very little contact with OEMs or even other suppliers in other regions.

The trend toward vertical disintegration on the part of OEMs has shifted relations from arms length contracting among large numbers of suppliers to closer collaborative ties with fewer suppliers—though as we will see, new ties are neither exclusively collaborative, nor entirely exclusive. This shift has thrown the kinds of local communities of (unequal) producers that existed under the old contracting regime into crisis. Industrial communities are currently recomposing themselves with new sets of relations/practices that involve significantly different conceptions of proximity and distance (and indeed, new conceptions of the boundaries and structure of community).

The shift toward vertical disintegration and collaboration with smaller numbers of suppliers stems from the fact that contemporary OEMs experience contradictory pressures in the current competitive environment. They must divert increasing amounts of resources to new areas of technological development and the discovery of new market possibilities, while at the same time, continuously

improving design, production quality, customer service and costs on existing product lines. Even if firms could financially afford to deploy their resources for both ends (which few can), it has proven extremely difficult to square this circle with the old hierarchical vertically integrated bureaucracies of the previous era. Instead, firms save resources for research and new product development by hiving off parts of the internal value chain that are not crucial or that they cannot make as well as outsiders can. Then they focus their remaining organization around multifunctional product teams that collaborate with skilled outsiders in both design and production.

This move toward collaboration drastically reduces the numbers of suppliers an OEM uses. Daimler Benz's suppliers, to follow the previous example, now number in the high hundreds, rather than the multiple thousands (Kwon 2003, Enrietti and Bianchi 1999). The role of suppliers has shifted from providing a service or part to the OEM that the latter has designed and developed to providing something known to both parties only through the process of collaboration itself. Unlike the arms length supplier's work, the collaborative supplier's product can only with great difficulty and expense be replaced by that of another. Supplier concentration is an artifact of the growing dependence of OEMs on the increasingly sophisticated development and production input of suppliers.

This concentration process is pronounced, but it is not unfettered. There are counter pressures as well. OEMs rely on supplier's for know how, but the intensity of competition in manufacturing is such that they must continually search the global terrain in their industry for innovative technologies and organizational forms. This is done very frequently by cultivating collaborative ties with an array of specialist suppliers, and in particular ones from different locations with experiences with different markets and other OEMs. Terrain searching and collaboration go hand in hand, but they produce conflicting pressures for exclusivity and openness on relationships among suppliers and OEMs.

Naturally, this shift in practice on the part of OEMs has created great turbulence and opportunity in the community of suppliers. They must develop strategies and competences to match the changing needs of OEMs. This means investing, considerably, in new equipment, improving their production quality, enhancing their own internal development and design capacities and developing expertise in the areas of continuous improvement and cost reduction. Under such circumstances, it should be no surprise that suppliers themselves increasingly specialize on a narrow range of competences and engage in forms of search through serial collaboration with other OEMs and a broad array of knowledgeable sub-suppliers in the interest of technological and organizational learning. Survival in the industry comes from constant innovation and this is only possible if firms are capable of continuously surveying the terrain of competences in their industry.

All of this competence redefinition and continuous terrain searching among both OEMs and suppliers, ultimately, makes the division of competences among producers very frequently unclear to all parties. At each stage in a given development and production cycle, as well as between development and production rounds, OEMs and potential suppliers nearly always have an array of both complementary and overlapping capabilities. They negotiate over when and in what way whose competences can be brought to bear. Sometimes a supplier is integrated strongly and intimately in a fully cooperative project; other times the OEM may ask that same supplier for only a small slice of its competence (e.g. production only) because it chooses to use its own or another supplier's competences instead; on still other product development rounds the same supplier may be shut out completely. The supplier indulges the OEM in this relational variety for two reasons. One, a variety of more and less intimate ties—the ability to play multiple roles-- creates flexibility for the producer to cultivate (a variety of) ties elsewhere. Two, taking unchallenging contracts from an OEM with whom one has long standing and often much more intimate and collaborative ties shows good will. Though the developmental attentions of both OEM and supplier may at the moment be turned elsewhere, the tie is not broken and the availability of the supplier for future business is demonstrated.

The division of roles in the development and production chain is in this way chronically ambiguous and always subject to negotiation. Who has competence, in what way, in what role is continuously changing for both OEM and supplier: Ex ante, neither party knows the role it will play. Over time this produces extremely heterogeneous relations between an OEM and its suppliers as a collectivity, as well as an ever changing bilateral relation between OEMs and individual suppliers. Collaborative and arms length, intimate and distant relations can be found in the supply chain at any given point in time and can characterize relations between the same OEM and supplier over time. Elsewhere, we have called this emerging bundle of practices: “sustained contingent collaboration” (Herrigel and Wittke 2004-forthcoming).

This transformation in the way in which roles are constituted in production has radically changed the quality and spatial scope of community among producers in three ways.

First, the contradictory pressures for collaboration and search (exclusivity and openness; intimacy and distance) on both OEMs and suppliers has led each to enlarge and redefine the scope of their community. OEMs have expanded their operations into foreign national markets (many of which contain the home regions of rival OEMs) in an effort both to secure market access and to survey the innovative capabilities within those (previously) foreign communities. As a consequence, the space of reasonable collaborators has been enlarged and redefined as OEM ties to suppliers located in the community agglomerations of other OEMs across the globe have begun to expand significantly. German automobile companies, for example, collaborate with French, Italian and US

suppliers, not only in operations located in those regions, but also in their home regions. The industry's community has become global and in many cases "close" and "intimate" supplier partners can be located quite far away. Similar trends exist in construction machinery, agricultural equipment and electrical engineering.

For their part, suppliers have been following similar trajectories of community enlargement (and spatial compression). For a time, many larger "local" suppliers were encouraged by "their" OEMs to follow their example and move operations to foreign markets. The constantly changing quality of the relation with "their" OEM, however, driven by both parties' desire to expand access to new technological and organizational competences, inexorably led the follower supplier firms to cultivate ties with other OEMs (and suppliers) in the new regions. Suppliers serviced those customers not only with local resources, but with the resources and competences of their organizations in their home markets. Further, constantly self recomposing disintegrated production chains created the possibility for ties between smaller specialist suppliers with operations in only one region and large OEMs and supplier collaborators located in other regions.

All of these changes recast old notions of proximity, distance and community. In the old world of OEM-supplier relations, intimacy, proximity and community were all rooted in specific territorial spaces. The new industrial dynamic has severed the link between community and territory by creating the possibility for intimate and self reproducing ties across significant distances.

Second, role ambiguity has produced a specific kind of power leveling across the community of producers. In the old subcontracting world, power was structurally stable: suppliers were a community of proximate producers dependent on one or a few local OEMs for work. The OEM, in turn, could view itself as a kind of privileged prince capable of producing prosperity for its underling suppliers but ever conscious of its need to do so with a firm and strict hand. In the new world, power continues to be a central dimension of OEM-supplier relations—especially in cases where role definition is relatively clear ex ante and/or arms length ties are in play. But even in the latter cases, there is the crucial difference that neither OEM nor supplier views their power advantage as privileged, or even secure: power relations are contextually defined and constantly shifting in both local and foreign contexts.

In cases where roles are ambiguous and ties are collaborative, power in the sense of asymmetric advantage is also very often simply elusive: Ambiguity, mutual dependence and joint competence definition cause interest in the identification of possibilities for opportunism and the realization of asymmetric advantage to give way to the imperatives of joint problem solving. So, in an important sense, the new paradoxical mixture of exclusivity and openness in the supply chain has produced a leveling in the community (though, significantly, without eliminating power imbalances!).

Third, the same pressures that have disconnected industrial community from specific territory and produced a specific kind of leveling in power relations have also produced a new and more fluid conception of the meaning and boundaries of the “local” among members of the new industrial communities. The old notion of “local” was identified with territorial proximity, communities with stable roles and hierarchies and a sense of self-containment. Baden-Württemberg machinery producers, to take an example close to my own heart (Herrigel 1993), were thought to have a comparative advantage on world markets because of the special institutional and cultural features of their districts. They took their knowledge (which they themselves often believed to be completely tacit) to the world. Today, those producers (and the regional institutions that support them) do not have the same kind of confidence. They need to cultivate, very systematically, an openness to the know how that is being generated in the rest of the world in order to be able to remain competitive even in their own region. Part of the current transformation in the “local”, in other words, is that it has become (or needs to become) global (Sabel, 2003).

But there is more than that. The new “local” is also a highly fractured one that contains multiple scales. With the expansion of intimate ties across wider territories, conventions for understanding even territorial proximity have been changing. South German automobile producers integrate Italian, French and north German suppliers (not to mention Czech, Polish and Hungarian ones) into the flow of their production in ways that are indistinguishable³ from their ties to specialists on the Schwäbisches Alb or in the Allgäu—all are in a sense “local”. Similarly, in the US, “Detroit” can refer to a city, producers in the Great Lakes region or, indeed, to the entire US automobile complex. The same pressures that have given rise to pervasive role ambiguity in production, in other words, have also produced significant scale ambiguity for both producers and regions.

New Forms of Governance to Cope with Fluidity, Contradiction and Ambiguity

The dramatic changes in supply chain dynamics and their effects on the quality and spatial scope of industrial community pose significant governance problems for product teams and operating units, for players at higher levels of the corporation where responsibility for multiple products, projects and locations is located, and for non-firm regional governance actors (governments, associations, trade unions etc). How are all of these different sorts of relations governed? How are possibilities for opportunism and the exploitation of asymmetric informational advantages in collaborative arrangements and search processes curbed and prevented? How, in particular, are ambiguities and complexities of space dealt with?

³ Indistinguishable in terms of the character of intimacy in cooperation. Eastern European collaborators, as a group, may be distinguished from south German producers by their level of wages.

At the level of project teams and products, the recurrent juxtaposition of pressures for exclusivity and openness, mutual dependence and contingency, in the supply chain have led to the widespread diffusion of arrangements that ensure transparency and mutual accountability in collaboration, often referred to as the “new pragmatic disciplines”: e.g.: benchmarking, simultaneous engineering, procedural quality standards, ‘root cause’ error detection and correction analysis, etc. (Sabel 2004, Helper et al 2000). These governance practices depart quite dramatically from the kinds of hierarchical, principle-agent forms of control and monitoring that characterized governance in the old world of vertical integration, stable roles and clear hierarchy (Miller 1993). Instead, the new disciplines take advantage of the power leveling inherent in role ambiguity and ensure transparency by making all participants in a collaborative project formally and jointly responsible both for the definition of project goals and for the evaluation of the initial plausibility and subsequent effects of one another’s contributions.

In the case of benchmarking, for example, the participants in a design team (OEMs and suppliers) engage in systematic surveying of the terrain of technologies relevant for the composition of the product (or sub-system)—e.g. a front end module on an automobile. The team identifies the range of functional features that exist on competing products throughout the industry as well as the various engineering and technological ways in which those functions have been elaborated. The results are then compared to one another and to their own capacities, giving rise to the revision and specification of original designs of the sub-system. This process of iterative self examination through comparison produces learning and innovation because it reveals to the participants strengths and weaknesses in their own capacities that they were not initially aware of. Simultaneous engineering, procedural quality standards and “root cause” error detection methods work in a similar manner. They make the joint definition of goals between different participants in the process (OEMs and suppliers, design and manufacturing departments within a firm, different stages in the manufacturing process) a formal feature of process. Joint goals are then continuously revised and optimized through monitoring procedures that involve formal and mutual accountability: such as written and standardized tracking systems in ISO 9000 quality standards, or 5 why systems of error detection (for an extensive discussion of these “new disciplines, see Sabel 2004; see also MacDuffie, 1997).

The core innovation of these new pragmatic disciplines is that formal procedures for deliberative goal setting and for the evaluation of performance are devised. The procedures are explicitly open and it is expected that they will be redefined in light of experiences. Such procedures seek to make tacit forms of knowledge in organization and technical designs explicit to actors and thereby facilitate constant improvement and innovation in design and production across functional and geographic boundaries. As such, these modes of governance enforce a

regime of continuous collaborative self-revision and improvement (learning by monitoring) at virtually all levels of product design, development and production.

As I suggested, these new forms of governance are quite widespread in old economy manufacturing today (though the coverage is far from complete and their implementation is not always free of contradiction and self blockage (Whitford and Zeitlin, 2004, Herrigel 2004, Whitford 2004). There are some indications that these kinds of self-revising governance mechanisms that facilitate transparency through mutual accountability are also being established at higher levels of aggregation, both within multinational corporations and in the public realm, especially (though not exclusively) at the regional level (Sabel 2003, 2004). In the interest of space, I will refer the reader to the extensive discussion of the possibilities and dilemmas associated with the construction of these kinds of structures within the Multinational Corporation contained in the forthcoming book by Peer Hull Christensen and Jonathan Zeitlin (Christiansen and Zeitlin 2004).

In what follows, I will briefly outline the dilemma that the new dynamics in manufacturing subcontracting pose to traditional regional governance arrangements and then discuss why it makes sense that regional actors would mimic the governance mechanisms deployed by industrial ones. Two examples of regional governance experiments that deploy the alternative kinds of governance arrangements will be presented by way of illustration.

In most regions with traditions of old economy manufacturing, the architecture of institutions serving the regional economy was constructed to deliver services to producers with clear roles who were positioned within a stable hierarchy. Moreover, the boundaries of those architectures (more or less) reflected the prevailing identity of community and territory. Under the more volatile conditions of vertical disintegration in which role ambiguity, exclusivity and openness, power leveling and spatial fracturing have come to the fore, the traditional extra-firm architectures have become less effective and as a result are less attractive (and less relevant) to producers. Because markets, technologies, organizational boundaries, actor's roles and the character of "local" ties are constantly changing, the content of useful public services and public goods is continuously changing. Producers and regional actors are confronted with the challenge of constructing new channels of communication. Moreover, they must do so in ways that can respond to the fluidity of identities, roles, and goods. Given the nature of these challenges, it is not surprising that some of the most interesting contemporary experiments in industrial region governance either involve entirely new (and improbable) sets of public actors; or involve the engagement of traditional actors in very new ways. Nor is it surprising, given the character of fluidity of industrial needs, that the new experiments involve many of the sorts of deliberative, mutual accountability enforcing, self revising procedures that one finds in the supply chain in the form of the New Pragmatic Disciplines.

I will present two examples, one from Wisconsin in the US and one from Wuppertal in Germany, that illustrate the character of contemporary adjustment in regional industrial governance. Both cases show actors seeking to develop self-revising regimes of mutual accountability at the level of multiple firms and multiple projects. Both cases have important limitations, however and the limits point to the importance of incorporating more attention to the spatial dimensions of regional policy adjustments in future research.

The Wisconsin example is the Wisconsin Manufacturers' Development Consortium (WMDC), a public-private consortium of large OEM firms, public agencies and regional technical colleges (for a full description see Whitford and Zeitlin 2004 and Whitford 2003). The WMDC was created in response to the observed need in the region for the improvement of component supplier competence. OEMs were vertically disintegrating and were relying increasingly on suppliers for significant design and manufacturing input. This turn to suppliers created an upgrading challenge for suppliers that they were not able to achieve quickly and effectively enough to meet OEM needs. The existing infrastructure of industrial policy was not in a position to address this rapidly emerging public good problem, so the OEMs allied with one another and with sympathetic public actors to provide for supplier training. Participants in the consortium collaborate in the construction of the curriculum for suppliers and continuously revise it in response to regular evaluation of the results, as presented by both training participants and other evaluators from within and outside of the consortium. 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.

The German example is of the efforts by the IG Metall Metalworker's union in the city of Wuppertal to coordinate the regional upgrading of supplier firms (see Herrigel and Wittke 2004 for fuller description). Wuppertal is located in the Bergisches Land, the densest agglomeration of automobile suppliers in Germany. The IG Metall began pushing firms to upgrade and embrace newer forms of work and production organization, as well as new production services and logistics (i.e., the new pragmatic disciplines) when it became clear that the changing demands on local producers made by OEMs were proving to be overwhelming and none of the other local industrial policy institutions proved either willing or able to take action. IG Metall both directly consults with firms (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) and acts as an intermediary between the firm and consultants who audit the company and provide advice and consulting on how to restructure the firm to be competitive. In addition, the Union has constructed networks of works councils, employers and other relevant local players in the region who meet regularly to discuss ways in which knowledge about how to continuously improve firm competences and performance can be transferred to local producers. The trade union has also

begun to construct a formal procedure for the evaluation of its own role and the role of consultants in this process.

In both cases, new collaborative and mutually accountable mechanisms of governance have emerged because local actors have recognized a new form of public good problem that the existing industrial policy infrastructure was not capable of addressing. Also, in both cases, the new arrangements seek to enhance capacity of the participants to revise their role (as well as the joint assessment of the public good) based on systematic and open evaluation of the effects of their own actions. The results in both cases are not only effective; they are innovative (even contextually novel) institutional experiments in governance.

Neither example is without limitations, however. And, as a way to conclude this essay on space in the new old economy, I will highlight the ways in which space constitutes a significant limitation on the effectiveness of both experiments in public governance. In both cases, the collaborative projects confine themselves to territories that are much smaller than the actual community of producers that could benefit from the services rendered. In the Wisconsin case, the seven participating OEMs actually engage with significant numbers of suppliers that are outside the state of Wisconsin—especially in Iowa, Minnesota, Illinois, Indiana and Michigan. Those producers are part of the industrial community that the WMDC serves, but they cannot benefit from the services the WMDC provides because public subsidies (provided by the state of Wisconsin) may only be given to producers within the state's boundaries. Hence, the innovative effort is actually prevented by law from providing the public good to the entire community of producers.

Similarly, in the Wuppertal case, the IG Metall in Wuppertal has jurisdiction only over firms located within the boundaries of the Union's administrative unit. Firms in the neighboring city of Remscheid, for example, which are equally in need of the services provided by the public network, are legally prevented from participating. The IG Metall in Remscheid has begun to develop a similar program, but its traditions are different and the "local" players in that city have different interests in the process of adjustment. At best, a public good common to a community of producers is served in a number of different and incommensurable ways; at worst, as in Wisconsin, parts of the community are left unserved.

The fractured character of the "local" in the contemporary industrial environment is both a result of and a stimulant for the continuous flow of knowledge and innovation among firms. Yet it also poses problems for the effective delivery of public goods and infrastructural services. The limitations apparent here in the two cases discussed show how the fracturing of space actually can undercut the ability of regional institutions to provide public goods to the community of producers. An analog to the mechanisms in production that allow producers to

overcome role ambiguity through joint goal setting and mutual evaluation is needed in this realm of scale ambiguity.

It is not impossible to think of ways in which these limitations could be overcome: The creation of supra-regional deliberative bodies of affected actors (public and private) charged with monitoring the performance of lower level experiments, evaluating the results and transferring best practices would seem to be one logical move to make. At the moment, however, we know too little about the political and social processes that shape (enable and deter) the construction of such higher order governance arrangements. Regional experiments and the character of spatial fracturing is very heterogeneous, as is the specific content of local public goods. More spatially informed research on the specific character of these processes of adaptation and experimentation is needed in order to properly understand the changing character of extra-firm governance in the spatially fractured contemporary manufacturing environment.

There are promising efforts of this kind now underway in parallel policy areas from which students of economic governance can learn. This is particularly true regarding research on contemporary reform of the welfare state in the US and Europe. There, conflicts between multiple jurisdictions at multiple levels of government figure quite centrally as research objects, as does the examination and comparison of experiments attempting to coordinate policy-making across different levels (scales) of governance in the absence of a strong central set of guidelines (Zeitlin and Trubek 2003). Multiple level complexity in these areas, as well as the institutional and policy diversity that exists across regions and countries, has increasingly been viewed not as an obstacle to the provision of effective policy, but as a resource for flexibility, adaptation and innovation. In particular, the development of the Open Method of Coordination (OMC), which helps European Union member states learn from one another through continuous cycles of contextualized benchmarking, peer review and exchange of good practices, provides a very suggestive model for how supra-regional economic governance might be governed. The crucial quality of the OMC for the specific problem addressed here is that it allows actors to address problems that stem from institutional and scalar complexity in ways that preserve local diversity at the same time that competences at the local level are improved through exposure to solutions developed elsewhere in different social, institutional and political environments.

Similar empirically and theoretically informed research (in a different tradition) is also taking place in the study of the transformation of cities. Here, the concern is for the ways in which governance arrangements are being recast and for the influence that the complexity of multiple scales has on that process (Brenner & Theodore 2002). As in the welfare state research, the focus here is on the paradoxical continuing relevance of the local at the same time that it is being penetrated by pressures and flows of resources and knowledge emanating from

other scales. The strength of this literature is in its insistence on the contingency and composite character of emerging multi-scaler arrangements in different regions. The process of globalization (described, in the unfortunate reifying language of that discourse, as “neo-liberalism”) that has given rise to re-scaling pressures has not resulted in uniformity or convergence in institutions and practices across the advanced industrial nations. Rather, the unpredictability of local political struggles and their relation to the particular, and ever changing, pressures at higher scales, shape the possibilities and limits of local experiments. Crucially, this literature emphasizes the ways in which the causal pressures of restructuring are mutually constitutive: local efforts and reforms give rise to recalibration at higher levels even as the local responds to those pressures. Such reciprocally constitutive processes resonate well with the kinds of adjustment processes currently occurring within regional industrial adjustment processes.

The emergence of multi-scaler governance problems in industrial regions will be a central object of research in the field in the coming decade. There are suggestive places for scholars concerned with the transformation of governance in industrial regions to look for theoretical and empirical guidance. Moreover, given the incomplete and emerging quality of the transformations those literatures have in eye, scholars working on regional industrial governance issues have an opportunity to contribute to more general theoretical problems of openness, contingency, power and reflexivity in the contemporary global transformation of capitalism. Critical engagement among scholars across these literatures should yield a dialogue that is mutually beneficial to all of the research traditions.

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