

Space and Governance in New Old Economy Manufacturing Industries¹

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¹ This is a revision of a paper that appeared in the SECONS FORUM, an online journal edited by Gernot Grabher: <http://www.giub.uni-bonn.de/grabher/downloads/Herrigel.pdf>. Essentially it attempts to update the argument by incorporating subsequent writing on the same set of issues that for various reasons never made it into an actual paper. The present paper consequently exhibits the roughness and unflattering bulginess of hurried cut and pasting. Apologies

This is a paper about the changing spatial character and attendant governance innovations currently being generated by adjustment processes in old line manufacturing industries in the United States and Europe. The paper seeks to rethink a set of views about both space and governance that have structured debate (at least in my own head) about the organization of these industries for at least the last twenty years. For example, 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.²

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: social³ and territorial proximity were assumed to be overlapping. The second assumption (often embedded in discourses about trust and informality) was that

² There were many voices in this discussion: see Piore & Sabel 1984, Saxenian, 1992, Storper, 1998, Streeck, 1989, Grabher 1991, Pyke & Sengenberger 1992, Harrison 199X, Zeitlin 1992, Amin & Robbins 1990, Hirst & Zeitlin 1993, Florida & Kenny, Kogut 1991, Powell, 199X, Scott & Storper 1988, Harvey 198X, Gertler 199X

³ On the idea of social proximity, see Simmel 1950 a&b, Allen 2000

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 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.⁴ 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 given rise to new more porous and recombinatory organizational forms that have, among other things, dislodged industrial communities from their traditional territorial moorings. The new, vertically disintegrated, organizations are characterized by pervasive collaboration among specialized units. Driven by the need to both innovate and reduce costs, these collaborative ties are highly unstable and subject to more or less continuous re-combination and redefinition. In this context, industrial communities are today constituted on multiple scales and the spatial character of community,

⁴ 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, Joshua Whitford 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, 2005). In slightly altered and re-composed form, the consortium is now turning to look at the way in which the same cluster of industrial players is coping with the rise of offshore outsourcing and transnational production networks.

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 that have led to the diffusion of new organizational forms and new spatial coordinates have also generated 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. Against the taken for granted in the earlier discussion of flexible industrial organization, flexibility today seems to be driven far more by formalization, than by a reliance on informality and tacit forms of knowledge in organization.

After reviewing the way in which the new governance forms are emerging at the level of the division of labor in production and in intra-corporate relations between and among the center and specialized units, the paper 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, operating unit and intra-corporate 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.

1.) Vertical disintegration, the emergence of new organizational forms, 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. These vertical relationships were organized into bureaucratic hierarchies and governed by principle agent principles of incentive alignment. Both hierarchy and principle-agent governance relied on the separation of conception and execution not only into different phases but also into different roles in the design and production of a product. Hierarchy created a series of specialized and non-

overlapping roles with information running from the top and most conceptual down to the bottom and most practical part of the organization. Principle agent governance was a system to enforce orderly coordination among the specialties and prevent hold-up and recalcitrance on the part of the specialists. Principles—top managers—coordinate roles among specialists (agents) and devise sanctions to ensure that the specialists have an incentive to comply with the goals of the organization. In many cases, these new organizational forms were achieved through the incorporation of capable external suppliers (e.g. Fischer Body into General Motors). But they were 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.

Regarding customer supplier relations, 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 Westfalia 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 both disrupted the internal mechanisms of governance within the firm and shifted supplier relations from arms length contracting among large numbers of suppliers to closer collaborative ties with fewer suppliers.⁵ 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 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 lowering costs on existing product lines. This has led a.) to the break up of hierarchies, the abandonment of principle agent mechanisms for control and the introduction of new forms of collaborative and recombinable forms of internal organization; and b.) to the increasing reliance on the expertise and production capability of outside suppliers.

The old hierarchical and principle agent governance structures have been cast aside because they have proven to be too cumbersome, slow moving and wasteful. In today's volatile environment it is rarely possible to formulate clear and precise goals in advance for a complex new product, so it is difficult to identify, *ex ante*, all the required roles and specialties that will be needed for the

⁵ though as we will see, new ties are neither exclusively collaborative, nor entirely exclusive.

design, development and production of the product. Moreover, efforts to control from the top and circumscribe the role of specialist units places barriers on the flow of information through an organization and discourages the creativity of specialists—both factors that inhibit rather than enhance the capacity of the firm to innovate and keep up with new developments in technology and markets.

Hence, firms have sought to break up hierarchies and construct general roles within the organization that allow themselves to be redefined, both from product cycle to product cycle, and, crucially, within a given product development cycle itself. This has been accompanied by a loosening of the boundaries of the firm: New local specialists, seeking innovation and cost reduction, turn to specialized outsiders to help them achieve their goals. The deconstruction of hierarchy and the growth of collaboration with suppliers, in other words, are linked. Firms seek to create organizational conditions under which information can flow both upwards and downwards (as well as sideways), by creating groups with general competences rather than narrow specialties and by fostering collaboration and encouraging openness among them (both within and across firm boundaries).

In contrast to the rigid hierarchical separation of design and production in the old vertically integrated firms, in the new organizations product ideas, designs and the means to produce them emerge together through iterated processes of collaborative problem solving: General designs are set provisionally at the higher levels and are revised in light of proposals by lower level groups responsible for executing key sub-systems. Roles, among in house team actors and outside suppliers, are made more precise iteration by iteration as a design moves toward production and as specialists are drawn in and defined out. With each iteration in the process, everyone involved knows that the roles they have jointly defined are provisional and subject to change either after

greater definition is achieved, or in the next round of iterations with a new product. Collaborators are rewarded for achieving broad goals according to standards defined through the process by which the goals themselves are set. But everyone also has an incentive to enhance their knowledge and capacity to creatively contribute to the iterated development process.

As we will see in the next section, this broad diffusion of collaboration and the constant recombination and redefinition of relations among players has given rise to a distinctive and quite new set of governance arrangements both within and across firm boundaries. Before turning to that aspect of the problem, however, it is important to note the consequences that this “collaborative turn” has had for the development of supplier-customer relations as a social space.

First of all, the move toward collaboration has drastically reduced the number 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, suppliers increasingly specialize on a narrow range of competences in order to maximize the quality of value added they can offer their customers. At the same time, however, they also avoid longstanding bilateral ties, even when they are lucrative, in order to 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 firms attempt to enhance their capacities and know how reserves by 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 2005).

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 indistinguishable⁶ 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

⁶ 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.

production, in other words, have also produced significant scale ambiguity for both producers and regions.

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

The recurrent juxtaposition of pressures for exclusivity and openness, mutual dependence and contingency, within firms and in the supply chain have led to the widespread diffusion of new style governance arrangements that ensure transparency and mutual accountability in collaboration at three levels: a.) the division of labor in production; b.) intra-firm relations between and among the center and operating units; and c.) at the level of the region in which firms are (were) embedded.

At the level of the division of labor in production the new style governance relations have been referred to as the “new pragmatic disciplines”: e.g.: benchmarking, simultaneous engineering, procedural quality standards, ‘root cause’ error detection and correction analysis, etc (Sabel 2006, Helper et al 2000). Perhaps most familiarly associated with the principles of lean production first developed in Japan, though now adapted and diffused well beyond that notable point of origin, the new forms of governance deploy surprisingly formal arrangements, such as continuous benchmarking, iterative co-design and root cause error detection practices, in an effort to make tacit organizational knowledge explicit to actors, uproot routines, and force participants to search for superior alternative possibilities in design, organization, strategy, technology and policy. The mechanisms have been called “pragmatist” because they oblige those engaged in collaboration to routinely identify and question the suitability of their own taken for granted practices and continuously readjust their ends and means to one another in light of the results of such questioning.

In the case of benchmarking, for example, the participants in a design team (representatives of OEMs and suppliers) by formal agreement engage in systematic surveying of the terrain of technologies relevant for the composition of the product (or sub-system) they are charged with making—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 design ideas for the sub-system. This process of iterative self examination through external 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).

From the point of view of traditional organizational and economic analysis, the success of the new pragmatic forms of governance is quite counter-intuitive: They combine flexibility with formal procedures, learning with monitoring, local experimentation and creativity with central

discipline and optimization. The response to turbulence in the environment has been, in other words, to devise mechanisms that allow actors not to minimize that turbulence, but to live with it. 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.⁷

These new forms of “pragmatic” formal governance are defusing at the intra-corporate level as well. The problem at the intra-corporate level is posed in the following way: How is it possible, as central corporate management, to monitor the performance of lower level units in a way that allows for local experimentation and innovation while at the same time disciplining those units and holding them to best practice standards consistent with an overarching set of goals and strategies for the corporation as a whole? How to allow for broad experimentation without making everything allowable? Too much autonomy can be counterproductive for the center, while too little can be counterproductive for the local units: both scenarios lead to corporate underperformance. It is crucial to be able to strike a balance and come up with an agreed upon method for establishing effective and legitimate enterprise wide priorities.

⁷ 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).

Evidence from the AMP project (and elsewhere) suggests that the core pragmatic governance principles of benchmarking, iterated co-design and self correction can be (and are being) applied to this broad set of problems inside multi-unit enterprises. Take, for example, the choice of strategy or goals for the corporation and its units. The center, in conjunction with sub-units can benchmark its overall objectives by scanning the corporate landscape, looking for goals “like” its own, but better on some dimension. In the same way, each of the corporation’s business units can do the same regarding its own responsibilities. The results of this process then can be compared to the initial general goals and the latter can be revised accordingly. By involving both the center and the local units in the construction and re-evaluation of central goals, corporate wide pragmatic searches can be made consistent with those being undertaken locally. Collaborative and iterated pooling of benchmark goals makes it possible for the center and the sub-units to establish organization wide priorities which make it further possible to rank the kinds of projects and searches that the sub-units undertake.

I will present two examples of how these general principles are being realized in particular settings.⁸ The first is the Illinois Tool Works (ITW), a second tier, broadly diversified manufacturer of plastic and metal components for end users in a broad array of old line manufacturing sectors that we encountered in our AMP research. The firm is organized as a federation of approximately 600 units. The units look to the central headquarters for financing as well as access to corporate research and development facilities. But within these limits the units are largely independent. Each is responsible for setting its own goals, and is held accountable for outcomes.

⁸ The ITW example comes from my own interviewing in conjunction with the AMP project. I interviewed people in multiple operating units of ITW as well as in the central administration. The Cisco example comes from an article by Martin Kenny and xxxx and is outlined in Sabel 2006. Sabel also provides a gloss on the ITW case in that article. This section is actually culled from an unpublished paper on which Sabel and I collaborated.

The key governance rule for goal setting in ITW is a seemingly innocuous formal mechanism derived from Pareto's general principle that only a small fraction--about 20 percent--of all the causes of an outcome account for some 80 percent of the total effect. In accordance with the rule the units are regularly obligated to re-determine *which* 20 percent of their activities account for (roughly) 80 percent of their profits. They are then expected to strengthen those activities that are successful and spin off or simply abandon the rest. Naturally this is a very complicated process that forces units to explore the counter-intuitive: Each unit bundles its capacities to different customers in different ways, so the way in which a core 20% bundle is established unavoidably involves a process of deep strategic self examination by the unit. It must decide what to be (identity) through a process of benchmarking its current goals against a variety of hypothetical versions of itself—in effect forcing the unit to disentrench its own taken for granted routines.

Because the center recognizes that the results of this kind of process of self re-invention are based in part on speculation, ITW has a subsidiary governance rule that provides that managers should not be penalized for (some small number) of wrong decisions. Unit managers do, however, face immediate sanctions if they are caught pursuing strategies that have not been disclosed and justified to headquarters. Thus, paradoxically, managers, throughout the broadly federated enterprise engaged in formally imposed processes of self-recreation are encouraged by the transparency of the process to take risks, and be creative. In large part due to this kind of intra – enterprise system of corporate governance, ITW has been able to continuously grow in a sector that has been plagued by anemic growth and bankruptcy.

A second example is the system of governance in place at Cisco Systems, a manufacturer of network routers, switches and interface devices. Cisco is a research intensive firm, but the most

distinctive element of its corporate strategy is its systematic practice of acquiring technology and products developed by small firms and then working with the management of the acquired unit to develop them further. This has been an extremely successful strategy for Cisco, and its success hinges on two governance rules.

The first is a disentrenching rule which obligates business units to conduct a “make or buy” review when preparing their annual business plan. This requires each unit to compare the strengths and weaknesses of its current product or service, and closely related variants of these, to those alternatives under development or already produced by competitors. As in the ITW case, business units are enjoined to re-conceive themselves, though in this case by surveying the landscape of their competition for alternative possible versions of themselves. In case of an acquisition, a second governance rule provides that the inside managers are rewarded for retaining the managers of the target firm, and integrating them into Cisco. Together the two rules not only encourage (as at ITW) regular reassessment and occasional brusque change of strategy at the business—unit level, but also, by making outsiders into insiders, increase the cognitive diversity of management generally, and so facilitate the next rounds of assessment and change.⁹

Finally, turning to the extra firm, regional level, there is evidence that these new pragmatic principles of governance are also being mimicked by non-firm actors within the regions in which

⁹ These are only two examples of what seems to be a rapidly emerging form of new pragmatic governance in multi-unit firms. My evidence is largely anecdotal, however, and in future research the plan is to map out the range of practices that seem to be emerging, such as:

the kinds of disentrenching techniques that are deployed

the way in which internal performance standards are set

what those standards are (financial, product market based, a mix etc)

the ways in which the legitimacy of such standards can both be established and called into question.

old line manufacturing industries have traditionally been located. 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 as well. 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 regional 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-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 and governance 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-scalar arrangements in different regions. The process of globalization (described, in the unfortunate reifying language of that discourse, as “neo-liberalism”) that have given rise to re-scaling pressures have 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 reform efforts 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—though they lack the formal

disentrenching mechanisms characteristic of intra-firm and production level governance practices.

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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