

Challenges & Options for Wisconsin Component Manufacturing

Final AMP Report to the Wisconsin
Manufacturing Extension Partnership

Matt Vidal
Josh Whitford
Joel Rogers
Jonathan Zeitlin

The Center on Wisconsin Strategy

June 2003

Executive Summary

U.S. manufacturing is again in crisis, having lost over two million jobs since 2000, and nearly 75,000 of those in Wisconsin. Most if not all of these were “good” jobs, paying above-average wages and benefits. Their disappearance is not only wrenching for the workers who once held them, but for the communities in which they live. Losses on this scale, if sustained, are also threatening to the well-being of the national economy, which relies on manufacturing as a motor in technological advance and as the keystone in trade with the rest of the world.

This report summarizes our research on Wisconsin component manufacturing undertaken during the recent period. The component manufacturing industry group, heavily concentrated in the Upper Midwest, supplies parts and subsystems to the leading national end-user manufacturing industries, including autos; farm, mining, and construction equipment; and electrical appliances. As a sub-sector of manufacturing, it stands in the value chain between machine tools and the large end-user industries it feeds and provides a base. Its critical location makes it an exemplary nexus of more general pressures on U.S. manufacturing, and of great strategic importance in their resolution. Our research has examined those pressures and firm strategy of response in three areas: the relation of supplier firms and their customer OEMs (original equipment manufacturers); intermediary institutions within industry; and public policy.

What we have found is that the present loss of manufacturing jobs is not inevitable. Many OEMs and their suppliers, including many in Wisconsin, are developing adjustment strategies that permit the maintenance and even expansion of jobs in this region. They have done so through greater specialization in product mix, and increased collaboration in productivity enhancement. As OEMs have simultaneously retrenched to their “core competencies” and hived a larger part of the work within them to suppliers, those suppliers — sometimes with the assistance of their customer OEMs — have deepened and diversified their own capacities to serve OEMs as “one stop” shops, and sometimes expanded their own customer base in doing so. Small and medium sized component manufacturers are thus in some cases finding promising niches, variously combining strategies of specialization and diversification, and more intimate as well as numerous, relations with OEM customers.

But such positive adjustment in the balance between OEMs and suppliers is not yet the industry norm. While everywhere encouraging this capacity-building within their supply base, OEMs are typically reluctant to share its cost. They apply unrelenting pressures for price reduction on suppliers, and offer little loyalty to them during needed restructuring. OEMs also benefit from the steady development of supplier capacity abroad — most recently and dramatically in China. This provides a credible threat of exit from existing domestic supplier relations, an exit that in recent years has increasingly again been taken.

June 2003

Center on Wisconsin Strategy

University of Wisconsin-Madison
1180 Observatory Drive
Room 7122
Madison, WI 53706

TEL: 608.263.3889
FAX: 608.262.9046
E-MAIL: cows-info@cows.org
WEBSITE: www.cows.org

Successfully navigating these pressures in component manufacturing will require changing the institutional surround of firms — in effect building a new infrastructure to promote the needed collaboration and productivity-enhancing practices needed to survive as a high wage region. Fortunately for Wisconsin, many of the elements in this needed infrastructure already exist. The task now is to bring them to greater scale and more complete coverage.

One example of such infrastructure, and a particular focus on our research, is the Wisconsin Manufacturers' Development Consortium (WMDC), a consortial OEM effort at supplier upgrading that is supported by the Wisconsin Manufacturing Extension Partnership (WMEP). By promoting the joint address of common problems, the WMDC facilitates their solution. It improves information flow and learning across firms, and collectivizes some of the costs and risks of supplier upgrading that individual OEMs find prohibitive. Critical to the success of the WMDC are both the WMEP as an "honest broker" (a credible, independent third-party), and the existence of participating "good citizen" OEMs with a significant degree of loyalty to the state/region.

Another example is the Wisconsin Regional Training Partnership (WRTP), which brings some hundred firms and their employees' unions together around problems in training, modernization, and the recruitment of a future workforce. Like the WMDC, the WRTP generates improved information and capacity across individual firms, permitting them to solve together problems they cannot solve on their own. Of particular importance is the role that unions play in WRTP program and governance. This provides workers with confidence that restructuring will be done in ways that benefit them, and provides local management with a partner in that process, from design to implementation, of a sort that remains exceptional in U.S. labor-management relations. Like the WMEP and "good citizens" in the WMDC case, the union presence in the WRTP is a source of stability and honest dealing — a guard against opportunism, easy exit, and guile — in what is almost always a contentious situation.

Such intermediary institutions are essential to the future prosperity, perhaps even survival, of Wisconsin component manufacturing. The report that follows drives to this conclusion. We can only hope that policymakers, private as well as public, will soon reach it as well.

Introduction

Challenges and Options for Wisconsin Component Manufacturing

Matt Vidal, Josh Whitford, Joel Rogers, Jonathan Zeitlin¹

In spite of popular and business press enthusiasm about the “new economy” and the arrival of postindustrial society, manufacturing — including the durable-goods manufacturing that dominated the so-called old economy — remains critical to the health of the American economy. This sector, and particularly its component manufacturing base, faces enormous pressures from all sides: heightened international competition, especially from low-wage regions (often with government subsidies); persistent recession at home; and relentless demands for price reductions coupled with continuous improvement in quality, delivery and design.

There is no panacea for the many problems communities face when they lose high-paying manufacturing jobs. Nor is there a one-size-fits-all strategy for firms. But some community and firm responses are better than others, and some collective strategy is needed to support the best of them. Here we discuss some of the better strategies we have found in our research, focusing on three levels: supplier firms and their original equipment manufacturer (OEM) customers; intermediary institutions; and public policy.

This report summarizes research conducted over the last three years by the Advanced Manufacturing Project (AMP)² conducted out of the Center on Wisconsin Strategy (COWS), with a particular focus on research on Wisconsin and the Wisconsin Manufacturers’ Development Consortium (WMDC).³ Our analysis is based on over 50 in-depth interviews with both suppliers and OEMs, in which we have documented the enormous variation across component manufacturers in value-added per worker, the adoption of new technologies, labor-management cooperation and employee involvement, product innovation, the adoption of modern logistics and process controls, and a host of other important indicators of high-performance manufacturing. We see similar variation in

¹ All the authors are associated with the Center on Wisconsin Strategy, University of Wisconsin-Madison. Our thanks to WMEP for its support on this work over the past two years, to our colleagues in the AMP (Advanced Manufacturing Project) research consortium of which our work is one part, and to the Sloan Foundation that provides principal funding of AMP.

² For more details on AMP, a research consortium investigating the determinants and possible policy supports of high-performance manufacturing in the components sector, see the website from the AMP conference on supply chain governance: <http://www.cows.org/supplychain/>.

³ The WMDC, in conjunction with the Wisconsin Manufacturing Extension Partnership, was formed in 1998 to improve supplier performance and to promote progressive supply management practices in the state of Wisconsin. The consortium is comprised of Ariens, CNH, Harley-Davidson, John Deere, Mercury Marine, Trane and Oshkosh Truck. Mercury Marine, an original member, recently withdrew from the consortium.

customer-supplier relations, as well as in cooperative, institutional and state approaches to manufacturing modernization and economic development.

Apart from this introduction and a conclusion this report has three sections. The first provides an overview of the importance of manufacturing to both the state and national economy and discusses some of the patterns and effects of the current recession in manufacturing. The second describes some of the positive adjustment strategies currently being pursued by small and medium-sized component manufacturers. The third explores the role of intermediary institutions in this adjustment. This section focuses primarily on the Wisconsin Manufacturing Development Consortium (WMDC) and Wisconsin Manufacturing Extension Partnership (WMEP), and secondarily on the Wisconsin Regional Training Partnership (WRTP), but it also considers the more general role that policy can play in stimulating the inter-firm linkages necessary for dynamic industrial clusters.

In contrast to our three previous reports (available at www.cows.org/supplychain/), which discussed specific empirical findings in depth, here we zoom back out to a more general level. Even in our review of firm strategies, we emphasize how the WMDC, the WMEP, and other institutions fit into the big picture of economic development and improved living standards. As background, however, we summarize those previous reports here.

Previous reports on the WMDC

In June of 2000, COWS released *Common Problems and Collaborative Solutions*, a study of the changing relations between original equipment manufacturers (OEMs) and their suppliers. The report showed that the shift to greater vertical disintegration creates new problems for both OEMs and suppliers. To help resolve these “common problems,” the WMDC was formed. In this first report, we were able to provide strong preliminary evidence of the ability of the WMDC to stimulate mutually rewarding collaborative relationships between OEMs and suppliers, though cautioning as well that aspects of OEM procurement strategies can in fact be the source of some supplier performance problems.

COWS then followed up with *Down the Line...: Supplier Upgrading, Evolving OEM-Supplier Relations, and Directions for Future Manufacturing Modernization Policy and Research in Wisconsin*, showing that in such important manufacturing metrics as cycle time, productivity, and on-time delivery (among others), the WMDC has measurable positive impacts on the performance of suppliers. Like the first report, the interviews for *Down the Line* suggest that long run supplier performance would be aided by convergent and consistent OEM practices, including a willingness to share the gains of improvement with the supplier base.

The first report focused particularly on the role of the WMDC in solving a problem for OEMs, while the second showed that the WMDC can also effectively help the suppliers themselves. Our third report, *Wisconsin Manufacturers' Development Consortium: Cluster Development Policy in Action?*, indicated that the WMDC can make the collectivity operate as more than the sum of its parts. The public provision of supplier training through a consortial structure such as the WMDC can leverage ongoing OEM efforts to improve their own suppliers' performance. Importantly, however, even in cases where suppliers don't have extensive interaction with the supplier development resources of their customers, WMEP can

use their relationship with the OEMs to provide services to suppliers otherwise relatively independent of OEMs. Even in cases where OEM-supplier relationship is not leveraged, the nomination of suppliers can provide benefits for both them and the WMEP, strengthening the linkages that diffuse knowledge and generate regional cluster competitiveness. Furthermore, supplier firms themselves are able to leverage the public supplier training programs to support internal modernization efforts. Suppliers often used WMEP training to assist in much wider internal restructuring efforts than originally required by their OEM customers.

Of course, any training program that improves the competitiveness of the shared supply base of firms in the cluster is, by definition, "cluster development policy." The problem is that *implementation is the hard part*. The unique aspect of the WMDC is that it also seeks to leverage the existing interfirm relationships within the cluster to enhance the probability that training and modernization services will be used. In its simplest form, the WMDC is a series of "stand-alone" courses selected to ensure a fit with the strategies of sponsoring OEMs — as discussed in COWS' first two reports on the WMDC, suppliers are often favored by fitting their own operations to the strategies of their customers, and are thus already more likely to implement the lessons of the training. However, training can be much more than a "stand-alone" good, and in many important cases is supplemented either by OEM personnel working with key suppliers to upgrade operations, or by WMEP "manufacturing specialists" able to help to apply the lessons provided in the training courses.

I. An Overview of U.S. Manufacturing in Recession

A vital sector

In more ways than one, the manufacturing sector plays a key role in economic growth and regional prosperity, and manufacturing employment historically leads the economy both into and out of recessions. Viewed in terms of technological innovation and productivity growth, manufacturing is clearly still an essential component of a strong, vibrant economy. But, despite many new economy pronouncements, it is not just in the so-called high-tech industries that the sector makes its mark. Technology has a so-called “spillover” property: after the initial investment, it often can be used in other applications with little or no cost. Thus, from streamlined and computerized logistics, inventory and production control such as “faxban” replenishment/inventory pull systems, to computerized and programmable machine tools, information technology (IT) is thoroughly penetrating old economy industries. Indeed, it is increasingly understood that knowledge and know-how are absolutely essential to the traditional industries.

There are many ways in which manufacturing disproportionately contributes to the health of the overall economy. Perhaps most important, manufacturing on average provides families with better paying jobs, generating effective demand both in the local community and at the macroeconomic level. For example, in 1997 the combined retail trade, accommodation and food service sectors accounted for 23% of total employment but less than 12% of total annual aggregate payroll, while the manufacturing sector accounted for about 17% of total employment and nearly 20% of total payroll.⁴ Payroll per employee in manufacturing is 118% of the overall US average (albeit falling in recent years), making these jobs well worth keeping.

Within manufacturing, the components industry — supplier firms that sell parts and subsystems principally to other manufacturers — is a critical subsector, standing at the base of end-user industries from autos to farm and construction machinery to electrical appliances. Because of its critical position within American manufacturing, the health and strategic choices of firms in this sector have a huge impact on the future of U.S. manufacturing generally.

A relatively large and traditionally prosperous sector, component manufacturers in 1997 claimed close to 2 million employees, more than 10 percent of U.S. manufacturing employment, with a payroll per employee within the sector is 120% of the overall U.S. average.⁵ Especially for the Midwest region in which it is concentrated, this sector

⁴ Authors' calculations from the Economic Census. Total payroll includes all forms of compensation, including salaries, wages, commissions, bonuses, etc.

⁵ The following statistics are for SIC codes 308 (plastic products), 346 (forgings and stampings), 359 (pistons, valves, small motors), and 3714 (motor vehicle parts). These SIC's are illustrative rather than definitive of the sector.

has a large impact on living standards more generally: about 80% of its employees are not college educated (compared to 70% for the nation as a whole), but because of their above-average wages, component manufacturers have offered an important path to a “middle class” life, particularly for African Americans.

However, even before the recession hit in 2001, and particularly in the sector’s traditional Midwest base, many firms in the sector were having problems responding to a changing economy. While good productivity data are not readily available for the sector, a study of one part of it — auto suppliers — revealed stagnation in productivity growth in the 1980s-90s, despite robust productivity growth at their customer auto assemblers⁶. The component manufacturing sector’s performance looks particularly bad when compared to sectors such as computers, semiconductors, and telecommunications equipment that have at times reached double-digit annual productivity growth. There is also evidence that the weakness of the component manufacturing sector has held back the performance of its OEM customers. Moreover, poor supplier firm ability to modify products and processes makes it harder for them to take advantage of new product markets, even as consumer demand in such traditional markets as autos and appliances approaches saturation.

Spreading the pain: industrial restructuring, recession and crisis

While many parts of the manufacturing sector, including much of its supply base, have seen some rough times over the last two decades, the current recession has been particularly brutal and nondiscriminatory. As Figure 1 shows, having shed over two million jobs since 2000, the present hemorrhage is worse, in some respects, than the waves of “deindustrialization” from 1979–1982 and 1989–1992. In the latter two, the deindustrialization was largely deurbanization and deunionization (Figures 2 & 3). As the work moved away from the cities and their larger unionized plants to smaller rural plants, the black working class was hit particularly hard. From 1973 to 1988, the percentage of Midwestern black males in durable manufacturing jobs decreased 69% (as compared to 36% for white males) from 42 to 13%. The disastrous results of the loss of these usually unionized and higher-paying jobs are painfully evident in Figure 4, which shows the massive increase in extreme poverty in the city of Milwaukee. Such concentrated poverty, due in no small part to the loss of manufacturing jobs, clearly reverberates through the rest of the community and regional economy.

Indeed, relative to metro areas, rural areas have accounted for a larger, and increasing, share of layoffs due to plant closures since 1996.⁷ As of this writing, manufacturing employment has declined for 34 consecutive months since its most recent peak in April 1998. As shown in Table 1, employment in each of six major industries in durable goods, encompassing both OEMs and their suppliers, declined between 11 and 20% from 1998 through the end of 2002.

⁶ Okamoto, Yumiko, “Multinationals, Production Efficiency, and Spillover Effects: The Case of the US Auto Industry,” *Weltwirtschaftliches Archiv*, 135 (2): 241-260, 1999.

⁷ See *Manufacturing and Technology News* May 2, 2003, p. 10.

Indeed, 2003 has seen the “revival” of the Congressional Manufacturing Task Force⁸, broad support for the MEP program in Congress (despite some antipathy from the Bush administration),⁹ and widespread recognition of the crisis from manufacturing associations calling for some sort of government action. A look at Figure 5 displays why such broad recognition exists. Comparing the periods between 1989–1998 and 1998–2000, the number of congressional districts that saw manufacturing plant loss of greater than 10 percent more than doubled, while the number that had growth in manufacturing plants dropped from 211 to just 29.

But the agreement ends at the ultimate causes and potential solutions to the crisis. We believe that this hemorrhaging of manufacturing jobs is not simply a cyclical phenomenon. Perhaps some is due to increased or sustained productivity; but demand growth has remained relatively strong despite falling output. In fact, “the U.S. manufacturing sector is now producing \$1 billion per day less than its own domestic markets demand.”¹⁰ Much of the current crisis is the result of the ongoing process of industrial restructuring, and thus based on private corporate decisions. These decisions, however, are not made in a vacuum, and are often fundamentally affected by the policy choices of state and local governments.

The reality, often unfortunate for American workers, is that fierce global competition from low-wage regions makes the loss of some work inevitable. And as many small component manufacturers, union members and other workers will quickly note, much of this work, once gone, will not come back. But there is nothing inevitable about the decline of component manufacturing in regions like Wisconsin and the Upper Midwest.

In fact, there is considerable evidence that many Wisconsin OEMs and suppliers are developing the sorts of positive adjustment strategies that can make them part of a productive and flexible decentralized production system able to compete effectively even in a high-wage region. In Section III, we will describe these strategies, turning then in Section IV to a discussion of some of the policies and intermediary institutions that can enable firms to adopt these positive adjustment strategies, thereby providing the necessary infrastructure for a full-fledged manufacturing cluster.

In the remainder of this section, however, we deliver a final note of caution: there is also considerable evidence that OEM sourcing decisions are not always made based on the right economic criteria, fully accounting for the variations in total product life-cycle costs, in terms of quality, reliability and flexibility between local and remote suppliers. There is little reason for supplier firms to restructure to meet the changing needs of their customers if those customers do not in turn reward investments in high-quality flexible production and design capacities.

⁸ See *Ibid.* March 3, 2003.

⁹ See *Ibid.* May 2, 2003, p. 11.

¹⁰ McMillion, in *Ibid.* May 16, 2003, p. 6.

Contributing to the pain: misaligned incentives and bad decisions

The focus of AMP research at COWS has recently been extended from inter-firm to intra-firm relations, examining both restructuring within component manufacturers and sourcing decisions within OEMs. In this field research, we have identified two related problems in OEM sourcing behavior which may be leading to shifts of production to low-wage areas that could be viably — and profitably — retained in a high-wage cluster. First, decisions to shift production or source from low-wage regions are too often made simply on the basis of piece price rather than “total acquisition cost.” Second, such behavior is often reinforced by the incentive structures of large multinational OEMs — for example, when bonuses in the purchasing department are awarded solely on price reductions or when foreign sourcing becomes a metric in itself.

As one manager revealed:

All that matters is piece price. And I'm on the Total Acquisition Cost Team; we're trying to calculate a formula for total acquisition cost. And it's just awful because what it means is that when we do this, people just want to say, “Okay, well, if it's \$10 across the street and we've got a supplier with plenty of capacity, they can flex, they can do anything we want, you know, we can work with them to design it. Or we've got this supplier in China that will sell it to us for \$9.50, you'd better go, you know, the shipped price, you better go with the one for \$9.50.” And that ignores the fact there's greater risk, there's political uncertainty. ... What's the long-term currency forecast? You know, eventually they'll be as expensive as anybody else in Asia, you know, and we're training our competition. It's just, we don't look at those costs, it's just piece price, piece price, piece price.

So there's this great battle within [the firm] between people who want the long term, you know, “Let's get the good suppliers; they're going to be with us for the long term,” and the people who just want short term performance or a stock looks good in the next year so they get their options and bonuses maxed out. . . . Right now the short-term people are winning big. We are now having foreign sourcing as a metric, meaning even if they're \$10 in China, it's now foreign sourcing for foreign sourcing's sake.

One senior purchasing manager in a large Wisconsin OEM, who indicated that upper-level purchasing managers were often the most myopic about potential hidden costs of overseas sourcing (relative to lower-level purchasers who had voiced more concern), recalled the following story. A consultant was called in to evaluate a line, and “One of their conclusions is you're not very good at purchasing, because you buy too much in North America. And why do you have a supplier development group because it's really irrelevant to try to make domestic suppliers competitive with China or India because they never will be? And that's exactly what they [the rest of upper management] want to hear.”

Although there are no fully representative data available, our own research and other anecdotal evidence suggest that much of the current wave of foreign sourcing is driven by such crude piece-price and wage-cost criteria. This point was reinforced in interviews with union members in large OEMs interviewed, who said that some managers care more about foreign sourcing as a metric than quality. One example, heard from workers in different OEMs, was that there were often recurring problems with particular parts sourced overseas. Yet when management was made aware of this, they continued *not* to include the costs of the rework into their accounting of the cost of the sourced parts.

Now, there are also sound economic reasons for subcontracting and overseas sourcing by individual firms.¹¹ Most purchasing managers interviewed claimed to use total acquisition cost models in making sourcing decisions, and to integrate outsourcing into longer-term competitive strategies for their firms. But from the perspective of local communities, living standards, and long-term economic viability, we should be very concerned about the “hollowing out” of the state’s manufacturing base. And the key issues extend far beyond outsourcing and global sourcing decisions based on dubious accounting criteria or misaligned incentives. In particular, the general trend towards productive decentralization and vertical disintegration in large OEMs, combined with intense foreign competition, means that supplier modernization (training, reorganization, etc.), industrial learning and economic coordination have become critical *public* — and thus policy — issues.

There are economically sound and, we think, politically viable policy responses to the problems of industrial restructuring in a globalizing economy, including the sectoral and regional approaches that are the focus of the final section. But to help better understand what is feasible and desirable in today’s decentralized manufacturing environment, we first describe emerging strategies of component manufacturers in their new environment, with a particular view to identifying what’s working and what institutions and public policies can do to help.

¹¹ While economically rational for firms, such outsourcing may have a harmful impact on at least part of their workforce if, e.g., it leads to permanent layoffs and loss of income. But there are also cases of “win-win” or “high-road” outsourcing like that of John Deere Horicon Works, which contracted out all of its machining in the early 1990s, but was then able to increase employment on the remaining in-house operations. The labor-management cooperation involved in this restructuring process in turn helped to prepare the ground for the extension of collaborative relations to suppliers through the WMDC.

II. Restructuring in Midwest Component Manufacturers

Multiple and contradictory processes of productive decentralization

In many key end-user industries — including automobiles and other transportation equipment; industrial, farm and construction machinery; and electrical appliances — OEMs have seen years of relative stability in their core technologies (steel and mechanical engineering) shaken by the incorporation of innovations developed in other sectors, such as new materials and electronics. Many of these large firms have actively engaged this new environment by retrenching to their “core competencies” in design, marketing and assembly, electing to subcontract (outsource) other activities to a series of smaller suppliers that now do much of the “real” manufacturing of components. These firms now often find themselves operating simultaneously in the supply chains of several relatively disparate end-user industries.

In deciphering the increased propensity of OEMs to decentralize production, it is useful to distinguish amongst the various reasons for subcontracting. At the broadest level, the key *relative* shift is from “capacity” to “specialized” subcontracting. In the former type, the OEM retains substantial internal capacity, only sourcing externally to meet demand peaks; in the latter, the OEM becomes reliant — at least in the short and medium term — on the subcontractors’ specialized technology and/or labor skills.

There are myriad, complex, and often mixed motives for subcontracting a particular process or component — all made more salient by the changed competitive context. More fragmented and uncertain demand increases the risks of investment in both innovation and productive capacity, creating an incentive for OEMs to look for partners with whom to hedge that risk. Large firms use subcontracting to reduce their fixed costs, collectivizing work to ensure the efficient use of specialized labor and capital goods. Companies seeking to integrate new technologies into their products look outside for access to specialized skills that are difficult to “make” internally, and OEMs will sometimes consciously seek new knowledge by sourcing work to suppliers who serve other customers and other industries.

It is also useful to differentiate *analytically* between simple risk-shifting and piece-price/wage-driven strategies of exploitative outsourcing on the one hand and positive-sum subcontracting in which OEMs seek to establish long-term partnerships with key suppliers on the other. In practice, given that firms, especially large OEMs, are often factionalized, the corporate actor may be pursuing contradictory strategies. Such factionalization was illustrated above by the manager’s discussion of the “great battle” between short- and long-term people in his purchasing department. More generally, the use of a broad array of sourcing strategies is often *consciously cultivated* within OEMs. As AMP colleague Gary Herrigel explains,

Within OEMs it is both the case that managers in charge of sourcing seek to maintain a diversity of in house capacities and sub-contracting relations AND that different strategic sourcing practices . . . compete with one another for dominance (or at least a place) within the firm. In reaction to this de facto multiplicity of OEM sourcing strategies, the component producers are developing a broad range of firm strategies that take advantage of the (sometimes quite unpredictable) variety of OEM sourcing practices.¹²

The processes of OEM vertical disintegration are thus multiple and contradictory. Practices of strategic sourcing, positive-sum collaboration with workers and suppliers, long-term planning and supply chain management, and supplier benchmarking and upgrading occur in many OEMs. Yet, pathologies remain. Many OEMs also still employ traditional procurement practices, seeking to leverage suppliers against one another and to drive down margins to unsustainable levels for short term gains, just as there remain many suppliers quite willing to play the same game in reverse. As we showed in *Common Problems and Collaborative Solutions* (see Section IV), even the OEMs of the WMDC — despite espousing a real commitment to supplier partnership — often fail to live up to their end of the bargain. OEM practices that negatively affect supplier performance include: organizational obstacles (staff turnover, communication barriers, corporate-plant disjunction) that lead to deviations from apparently well-designed official procurement strategies; and short-term exploitation of vulnerabilities opened up by the new collaborative relationships, motivated in part by the same organizational obstacles that cause deviations from official policies.

These problems contribute substantially to suppliers' continued inability to develop advanced manufacturing capabilities, and in the final section, we will how joint public-private ventures like the WMDC and other such institutions can both contribute to supplier upgrading and continuous improvement *and* to improving the OEM-supplier relationship. First, however, we give our overview of the positive adjustment strategies available to suppliers in the face of contradictory OEM practices and processes of productive decentralization. These "positive" strategies show how small and medium sized component manufacturers can effectively plug into a decentralized manufacturing structure, doing their part to generate high-wage jobs in a high-productivity industrial cluster.

The two key underlying logics of supplier strategy for small and medium sized firms that we found in our interviews are *specialization* and *diversification*. These logics, we emphasize, do not contrast, but in fact, complement each other, and in practice may be combined in various ways.

¹² Herrigel, Gary. "Emerging Strategies and Forms of Governance in the Components Industry in High Wage Regions," manuscript, 2003, p. 2. Found at <http://www.cows.org/supplychain/research.asp>.

Specialization

The most prominent strategy amongst suppliers served by the Wisconsin consortium was specialization on a particular set of processes or products, with the smaller firms mirroring the OEMs' focus on a limited set of core competencies. Rather than seeing just-in-time (JIT) production as a form of inventory shifting, such suppliers seek to reduce cycle times in an effort to drive stocks, work-in-progress, and thus costs out of the entire supply chain. These companies become the real experts in production, using this position to reduce costs from or add value to the product by focusing on process or design improvements in ways not possible before, when they simply built to specifications provided by OEM engineering departments so unconcerned with inter-firm collaboration that they did not even tell suppliers the end use of components. As they specialize, they may even "fire" important customers whose needs no longer fit with the capabilities of the supplier.

The rationale behind this intensive focus on a single business was clarified by a wire harness manufacturer who had previously also done welding, but had eliminated that aspect of the business and shifted the composition of its end-user industries (and hence customers) by investing in capital equipment to focus exclusively on harnesses. This firm had recently acquired a contract from a major OEM known for keeping work inside because "[the OEM] realized their internal costing was [bad]. They don't use automated equipment, we use automated equipment" and can thus make the parts more cheaply. The OEMs do not necessarily have more advanced capital goods and better productivity; suppliers can specialize.

There is a risk, however, to a pure logic of specialization for supplier firms unless they are able to acquire new customers, especially given the current focus on cost-containment. With a static customer base, suppliers will eventually experience declining profits even if they maintain margins as efforts to reduce product cost simply translate into declining turnover. A pure specialization strategy is sustainable only if the suppliers' customers continuously grow or if they are still in supply-chain trimming mode, so that the best specialists acquire competitors' market shares.

In response to this risk, some suppliers also utilize a logic of diversification, which takes two main forms. "Vertical diversification" seeks to capitalize on the OEMs' desire to reduce the size of the supplier base, while "horizontal diversification" derives from an effort to spread risk across a wider range of customers and industries.

Vertical Diversification

Following a logic of vertical diversification, firms bring additional process and/or design capability under a single roof, with the goal of becoming a "one-stop-shop" for OEM customers. They believe that as OEMs lurch towards the purchase of full modules and subsystem, suppliers with sufficient capacity to provide multiple services will be advantaged, as customers will not want to manage relationships with multiple specialists. In cost-competitive markets with thin margins, these firms also hope that they will be able to capture a larger portion of the value chain by encompassing multiple processes, and believe that having many operations in-house complements the OEMs' need for ever shorter lead times.

Past efforts to avoid being constantly buffeted by the cyclical fluctuations of capacity subcontracting sometimes led small firms to venture into areas where they were less capable, including at times unprofitable proprietary products taken on to get “control of their destinies.” These firms simply tried to get business — any business, from any value chain, no matter how profitable — in the door to amortize overhead. Now, in specializing firms focused on a coherent set of core activities, revenue enhancement depends on capturing more of the same value chain, either by improving quality to move upmarket and adding design capabilities, or by adding complementary upstream and/or downstream operations, without encroaching too much on the core competencies of either their customers or suppliers.

Among suppliers interviewed, elements of this verticalization strategy were common, from a product specialist buying a small gearbox manufacturer so that they could provide a more complete system, to a process specialist who had gotten into proprietary products in the early 1990s to supplement irregular orders from OEMs but that was now getting out. Describing the Wisconsin consortium as indicative of a fundamental change, the interviewee claimed that although his customers are better, perhaps, at designing and marketing products, his firm is good at production. Upon this realization, his firm sold the proprietary product line, restructured to build exclusively for OEMs, and is now looking for ways to increase value-added by performing adjacent operations. They have a contract to make parts and then do final assembly work for some large items designed and marketed by an OEM, and will quote jobs in multiple ways (when customers give them sufficient information about a part’s eventual use), with and without supplementary steps to see if they are competitive on these additional steps.

There was also ample evidence among suppliers interviewed that some use their role as specialists producing particular components to provide increased design and services. One small supplier that has steadily become increasingly engineering driven (from two engineers to six in just five years) comments that “the OEMs don’t have the [design] horsepower anymore, they don’t want to mess with it. They recognize that we are the experts at handling [our specialized operation].... They ask us to help with design and we do that,” adding that “in my short time (12 years) with this company, I have watched it go from OEMs going ‘no, no, no, don’t touch our drawings to OEMs saying ‘hey what’s the matter with my drawings’ or ‘give me suggestions.’ They have gotten to that point, now all they have to work on is making the changes.” For suppliers doing more intensive or specialized design, customers often do not come to them with blueprints ready, because, one commented, much of the information required to complete those prints resides with suppliers’ engineers.

The importance of design and service to the niche being carved out by some of these suppliers is, on one level, obvious. If a supplier can make a customer dependent for design work, or convince them to use proprietary materials or processes, the customer is temporarily “locked in.” Likewise, through engineering and service, suppliers are able to improve margins or add more value. Nevertheless, suppliers interviewed explicitly recognized that the ability to be a “partner” — including offering service and design — is often what it takes to get to the table in the current economy, and that the balance of power still sits with their larger customers. This point was well put by one supplier who explained that while it was useful to get customers to use their patented materials,

they could not really turn this significantly to their advantage in price negotiations because “a supplier who is trying to put forward his 2 to 3% [increase] every year is in big trouble. You will get shopped around. If you are not holding prices, you are a bad supplier” and you will be replaced. It is just a matter of time before the customer finds a way out.

Followed to its endpoint — though there is no reason suppliers cannot stop somewhere on this continuum — the logic of vertical diversification leads to a convergence of both product and process specialization strategies. The supplier becomes a full first-tier systems supplier, co-designing the product with the OEM, building those portions that fit its own core competencies and sourcing the rest to other process specialists (upon whom they perhaps also depend for some design help).

There are, however, two fundamental risks to a strategy of vertical diversification. First, it is not easy to manage, and potential diseconomies of scope abound. Despite efforts to maintain coherence in the competencies acquired, diversifying suppliers may have difficulty managing multiple processes or products without adding costly overhead, leaving their market share vulnerable to leaner process specialists. Second, as suppliers are tooling up to become module-makers, and positioning themselves to acquire “first-mover” quasi-rents, some will inevitably run ahead of the market, face OEMs slow to devolve full responsibility (and hence, share of value-added) to the supply base, and find themselves burdened with capacities they cannot sell. Many large first-tier auto suppliers, which have integrated rapidly through mergers and acquisitions, such as Federal Mogul, Dana, Tenneco, and TRW, are painfully discovering the disadvantages of having become “wannabe module-makers” without obtaining enough module business to cover the costs involved.

Horizontal diversification

A horizontal diversification strategy resembles in certain respects that of the “capacity subcontractor” in that the supplier takes existing process capabilities and seeks to diversify the customer base, ideally expanding across multiple sectors. This strategy may complement aspects of vertical diversification (especially in terms of adding new process capabilities), but differs in its underlying logic by focusing primarily on spreading risk across supply chains, rather than enhancing value-added within them. It also differs from a verticalization logic in that the supplier will utilize its varied capacities separately, rather than integrating them into a single product, thereby underscoring the point that we are dealing with a continuum of strategies.

Among interviewed firms, this strategy is well exemplified by a metal fabricator producing parts and subassemblies for OEMs in agriculture and construction markets which also does contract manufacturing for the computer industry, making the metal parts for servers and doing other subassemblies, or by a tube-bender that uses its capabilities to make both motorcycle frames and mufflers for off-road vehicles.

The advantages of risk diversification are obvious, and horizontalization is particularly desirable for suppliers operating in highly seasonal markets, which would otherwise be left with excess capacity in off-peak seasons. Horizontalizing firms may also benefit from industrial “cross-fertilization,” acquiring ideas from one sector and creatively applying them to others. But this strategy has its own problems. The loss of focus inherent in horizontal diversification can be problematic in the context of constant

demands for creative cost reduction suggestions. Furthermore, firms diversifying vertically into new processes also often build up fixed capital debt, creating a structural tendency towards horizontalization and an incentive to “buy business” by cutting margins to keep the machines busy, even though the firm may never become sufficiently expert in the new field to make the “investment” pay off.

In sum, small and medium sized component manufacturers are finding promising niches, variously combining strategies of specialization and diversification. But problems abound: even genuinely collaborative relationships are marked by pathological behaviors; and opportunism and market failures persist. While there is no single solution, there are institutional structures that can be built upon and created to help suppliers find their niches, temper opportunism, solve market failures and generate new efficiencies (both within and across firms). And public policy can play a direct role in creating/expanding such institutions largely, as the saying goes, by working smarter, not harder.

III. The Role of Intermediary Institutions

In regional economics and cluster theory, perhaps *the* core idea is that dense agglomerations of economic activity generate *collective efficiencies* through complementarities, economies of scope and positive network externalities. As it is explained by Harvard Business School economist Michael Porter (2000), “industrial clusters, or “geographic concentrations of interconnected companies,” involve the many entities that interlink to create regional competitiveness. These entities include suppliers of specialized inputs and infrastructure, governmental and other institutions that provided needed training and technical support, as well as trade associations and unions, which together generate new forms of efficiency and productivity through what economists call “external” or “agglomeration” economies.

This is important because competitive market economies generate at least two types of inefficiencies: when firms fail to act (e.g., by not training workers or suppliers) because they will not fully recoup the cost of their investments (workers will be poached; supplier upgrading benefits competitors); and when individual firms make certain types of investments that could be more effectively provided in concert. These “market failures” can be at least partially overcome, Porter explains, when “interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions” develop into industrial clusters.¹³ But even if all the actors are present, there is no guarantee that collective efficiencies will be realized. And this is where public policy can be not only instrumental but essential.

Industrial policy and economic development in the US

“Traditional” durable goods manufacturing, especially in the new environment of decentralized production, is a high-tech, knowledge-based sector. As such, traditional economic development programs such as subsidies and tax incentives to get large firms to locate in the state are wrongheaded, at their *best* a race to the bottom between states seeking to see who can give away a greater portion of tax revenues. This is particularly true given that the large OEMs that are the target of such policies typically purchase up to 75% or more of their final cost of goods sold (COGS) — components that can be purchased anywhere in the world.¹⁴

¹³ Porter, Michael, “Location, Competition, and Economic Development: Local Clusters in a Global Economy,” *Economic Development Quarterly* 14(1): 15-34, 2000, p. 15.

¹⁴ See Ericksen, Paul, Joel Rogers, Josh Whitford and Jonathan Zeitlin, “Leveraging Manufacturing Excellence: A Supplier Strategy for Wisconsin,” a paper prepared for presentation at Wisconsin Economic Summit III, Milwaukee, WI, October 14-16, 2002.

However, public policy can identify and strengthen linkages and institutions that foster positive adjustment strategies. This does not mean only the direct provision of “modernization” services. Public policy can help fashion intermediary institutions responsive to changing needs of component manufacturers as they seek to develop particular strategic capacities, helping firms learn to meet the relentless pressures for continuous improvements that are — and will be — a fact of modern industrial life. Key issues are governance — to assure that market failures are minimized — and intermediation — to encourage positive network externalities and scope economies by facilitating collaborative solutions to common problems.

The Manufacturing Extension Partnership (MEP) program, based out of the National Institute of Standards and Technology (NIST), is the key federal program providing direct aid to small and medium sized manufacturers. Consisting of regional or state centers administered in a very decentralized manner, the network covers all fifty states. Federal funding is only partial, with the centers required to raise the majority of funds from other sources (often state government, as well as by selling services to firms), which NIST then matches at 33%. The program has been embattled on and off throughout its history — including right now, with continued bickering over the 2004 budget — but support and lobbying from the many firms the program has served has made the program popular on Capitol Hill.

The extremely decentralized nature of the MEP, in which “states and localities” are given “the responsibility for designing centers to address regional issues” results in what is at its best an extremely flexible program reflecting the “trappings of a new division of labor between the national government and states regarding economic development” and providing ample space for variant strategies and local experimentation.¹⁵

The WMDC is a result of just such experimentation, as it involves the Wisconsin MEP, which combines with the state’s technical college system to represent the “public” in this public-private effort to upgrade the Wisconsin supply base and to sustain collaboration between OEMs and suppliers.

Originally called the Wisconsin Supplier Training Consortium, the Wisconsin Manufacturers’ Development Consortium (WMDC) began as a joint effort between the WMEP and John Deere,¹⁶ which already had a stand-alone supplier training program in Illinois subsidized by the Illinois Industrial Training Program (ITP). In Wisconsin, instead, Deere was a founding member of this more expansive vision that includes the development resources of the MEP and the coordinating capacity of multiple OEMs, providing tangible benefits to all involved.

The distinctiveness — and advantages — of the WMDC are in fact particularly underscored by a brief comparison with the strategy taken by the Illinois Industrial Training Program. Housed in the Illinois Department of Commerce and Community Affairs, disburses approximately twelve million dollars directly for training to manufacturing firms. Approximately

¹⁵ Turner, Robert, “Public Policies for Manufacturing Revitalization: Competing Models in Three American States,” unpublished Ph.D. Thesis, Madison: University of Wisconsin-Madison, 1999, pp. 218-19, 222.

¹⁶ For details on the history and structure of the WMDC, along with in-depth empirical material, see *Common Problems and Down the Line*....

15% of this money goes to a competitive grant program in which individual firms apply for money, while the remainder goes to “multi-company” programs that supply training to many different manufacturing firms at 50% subsidized rates. The multi-company training programs can be administered either “horizontally” — grants are given to associations that subsidize training for their members, often at local community colleges or from private training providers — or “vertically” — with money provided to single OEMs who then use it to subsidize relatively unrestricted training programs for their own suppliers.

Whether distributed to suppliers through associations or through OEMs, however, there is a key difference between the ITP and the WMDC that we believe make the WMDC a more cost-effective program: the consortial structure of the WMDC allows for the leveraging of multiple types of relationships to generate positive externalities.

A key goal of the WMDC is to leverage the development resources of the MEP and the coordinating capacity of multiple OEMs, generating efficiencies across firms (at the level of the consortium) and stimulating collaborative linkages.

First, the WMDC simultaneously constructs vertical, horizontal and cross-cutting linkages among firms (Figure 6). These multiple, cross-cutting linkages — with the WMEP as a credible independent third party and, perhaps multiple, OEMs — provide assurances to suppliers that the technical assistance and organizational models being pushed are broadly viable. This contrasts the reticence that many suppliers feel when it comes to working with a single customer or consultant.¹⁷ With OEM supplier development and the WMEP on the same page, suppliers have more confidence that they’re getting state-of-the-art manufacturing principles. Furthermore, the WMEP holds the position of “honest broker,” to ensure that the costs and benefits are shared out fairly among the participants, and to discourage opportunism by firms who often compete for the same customers and suppliers.

Another important aspect of the WMDC is that is able to both encourage and depend on cooperation between OEMs, which helps to generate *strategic alignment* by giving suppliers a signal of their customers’ credible commitment to a collaborative purchasing model. As it was explained by the owner of a firm supplying two of the founding OEMs:

The idea that two of my major customers would form a consortium with other people to help train their supply base, ... I saw that as ‘we’re in a whole different world now.’ This is no longer ‘we do three quotes and send it to the lowest bidder and every year we go out and rebid it ... and if things slow up at all, we cancel everybody’s orders and we make it in our own shop.’

Finally, the network of multiple linkages can also provide *external support for internal reform initiatives*. We noted above that OEMs are often factionalized. One of the most significant cleavages is between those who think that in today’s volatile markets, companies must accept a short-term focus on the bottom line (or quarterly profits) and those who think that real flexibility depends on longer-term relationships that give

¹⁷ See the third COWS report on the WMDC, as well as Mesquita, Luiz and Thomas Brush, “Relationship Management in Vertical Manufacturing Alliances, Supplier Development and Supplier Performance,” manuscript, Purdue University, 2001.

you flexibility down the road. Those in the latter camp, which we might call “collaborationists,” believe that their companies should risk something today to ensure the long-term health of their suppliers, encouraging them to develop the capacities to provide “more than just parts.”

The WMDC can be a useful support to these collaborationist factions, who can use the training program to encourage suppliers to develop new competencies that in turn will help them to develop joint “true cost” reductions, making more credible the position of these factions within the member OEMs. This incentive to high-road practices can generate a positive feedback mechanism: the more suppliers with collaborative competencies, the more collaborationist factions in OEMs are able to achieve bottom-line results.

In sum, the consortial model helps participants to develop common problems to collaborative solutions, generating increasing returns in the regional economy. By both leveraging and improving the linkages between the many involved firms, the WMDC contributes to the strengthening of the Wisconsin manufacturing base in three key ways:

1. Facilitating information flow

The partnership structure of the consortium allows the WMEP to aggregate the common needs of OEMs and transmit these to suppliers and training providers. The curriculum development and review process of OEM representatives can lead to greater transparency for suppliers about current and potential customers’ quality and service needs, thereby assisting them to adjust their operations to meet the latter’s expectations. This in itself is a solution to a general problem of competitive market economies. By facilitating information flow about common problems, and providing the basis for collaboration in addressing these problems, the WMDC helps to manage a set of (joint) problems that would otherwise be addressed individually and, hence, suboptimally.

2. Sharing out the costs and benefits of widely-needed services

Many suppliers work for several competing OEMs. A consortial organization allows OEMs to contribute technical expertise and support to upgrade their suppliers’ capabilities without incurring the high fixed costs of in-house training operations, and with less risk that the benefits will be appropriated by competitors. The complementarities among firms that are generated by these cross-cutting linkages again increase collective efficiency. Public subsidies reduce the cost of training to hard-pressed SMEs, while the watchful eye of the OEM provides an incentive for supplier participation. WMEP can thus devote less of its time and resources to marketing to potential clients and focus more on the provision of core services, while also ensuring that training activities reach a minimum efficient scale.

Through the creation of collective efficiencies, the WMDC generates positive feedbacks to the extent that supplier upgrading effectively imparts suppliers with the capacity for continuous improvement. The consortium functions as a knowledge network capable not simply of diffusing but also of systematically benchmarking best practices. Again, while the WMDC is not a panacea, it is part of a larger strategy aimed at cultivating multiple, horizontal and vertical, cross-cutting linkages that are the necessary *relational* infrastructure for a dynamic regional economy.

3. Promoting mutual learning

The WMDC is in a strong position to promote mutual learning among the participants above and beyond the specific content of the training courses themselves. Although this is the area in which the consortium has thus far accomplished least, the consortium is discussing developing common supplier qualification and certification procedures. And while no systematic framework has been created to allow suppliers to learn from one another or to use their responses to training courses and to OEM procurement practices to improve the work of the consortium, there are steps in that direction. The supplier representatives to the board have organized supplier networking meetings on training issues, and are developing a regular supplier forum to discuss more general topics.

We stress, however, that the WMDC by no means embodies all that consortial a model *could* do to overcome the many relational barriers to OEM-supplier collaboration. For example, the different OEMs have quite varied and even contradictory expectations of suppliers in some areas. Likewise, assessment and guidance to suppliers as to OEM needs — while an essential part of the strategic vision — has been somewhat sporadic.

Nonetheless, the WMDC is exactly the *kind* of initiative appropriate to contemporary economic reality. So we look forward here to how we can improve, build on, deepen, and expand such institutional initiatives. In the conclusion we discuss what the WMDC can do to achieve improve in these areas, but first we want to emphasize that it is but one of the many sorts of intermediary institutions that help to build the relational infrastructure so important to a globally competitive manufacturing economy. Like the WMDC, the Wisconsin Regional Training Partnership (WRTP) also focuses on stimulating linkages and cultivating relationships (though largely on labor-management relations). Ultimately interested in improved performance, both intermediaries work by helping to solve governance problems.

Another key cluster intermediary: the Wisconsin Regional Training Partnership (WRTP)

Part of the most recent round of AMP research has been to examine restructuring process within component manufacturers, focusing on the relationship between firm strategy, modernization efforts and the effects of these on workers. In particular, we have been looking at the role of intermediaries such as unions and the WRTP in work restructuring and supplier upgrading. The WRTP works to complement the efforts of the WMEP, supporting and enabling the positive adjustment strategies of supplier firms.

The WRTP is a labor market intermediary in southeastern Wisconsin that assists firms in incumbent worker training, modernization, and future workforce development.¹⁸ It is a sectoral training consortium, targeting particular industries and seeking to build labor-management cooperation and build high-quality jobs. Based originally in manufacturing and now

¹⁸ For more information see www.wrtp.org and Bernhardt, Annette, Laura Dresser and Joel Rogers, "Taking the High Road in Milwaukee: The Wisconsin Regional Training Partnership," *Working USA: The Journal of Labor and Society* Winter 2001/2002, 5(3): 109-130, 2001.

extended into other sectors including health care and hospitality, the WRTP now has over 100 member firms employing roughly 60,000 workers.

The close collaboration between the WRTP and WMEP generates economies of scope in the supplier upgrading process. For instance, the WRTP works with firms on creating labor-management cooperation designed to devolve decision-making power to workers through a core labor-management committee and a number of other standing sub-committees for issues such as training and continuous improvement. Such work complements the training in lean production offered by the WMEP. With such a close working relationship between the two — indeed, sometimes with field agents working for both organizations — member firms experience increased efficiencies in their individual restructuring processes through collaboration and shared experiences.

The existence of the WRTP as workforce intermediary complements other modernization initiatives. As one supplier who was receiving technical assistance from a parent corporation commented on the WRTP incumbent worker training:

So here's this guy trying to learn a machine, can't even read the print, who can't even do basic math, and how are you going to progress? And that's exactly somewhere where we really stumbled. We've spent a lot of time with our less tenured people and gotten very little out of it, and we've logged a lot of on-the-job training hours, but these guys are stumbling along because they're not only just learning the machine and the nuances of that, they're learning everything.

Another desirable feature of the WRTP is its close relationship with unions. There is strong empirical evidence by economists showing that productivity is actually higher in unionized establishments than in comparable nonunion ones. The presence of unions reduces turnover, and allows a potential mechanism for increasing worker input, settling conflict, organizing training, and giving workers a protected stake in the firm. Indeed, unionized shops provide the environment in which true and effective labor-management cooperation, where joint committees have significant decision-making power, is most likely to succeed. And these offer the best possibility for an empowered workforce to self-manage team production.¹⁹

However, getting over years or even decades of antagonistic labor management relations isn't easy. It's here that the WRTP can play an essential role. As one manager said:

It's the old style union-management: you do this to me, I going to do this to you, and you just keep going back and forth. [The WRTP] really played an instrumental role in getting together with the leadership team and union

¹⁹ In a nationally representative sample, Black and Lynch (1999) find labor productivity to be 9 percentage points higher in union plants adopting high performance work practices, than in non-union plants adopting similar practices. Black, S., and L. Lynch, "How to Compete: The Impact of Workplace Practices and Information Technology on Productivity," manuscript, 1999, Boston: Tufts University (cited in Appelbaum, Eileen, Thomas Baily, Peter Berg, and Arne L. Kalleberg, *Manufacturing Advantage: Why High Performance Work Systems Pay Off* Ithaca: Cornell University Press, 2000). See also Richard B. Freeman and James Medoff, *What Do Unions Do?* New York: Basic, 1984.

committee outside the management group and got with the management group and said there are some boundaries we all need to work under. [They were] really helpful in getting us back together as a group, saying we need to monitor how we are doing things."

This firm, once in danger of shutting down completely due to lack of profitability, had used a private consultant to install cells to "lean up" its entire operation. The machines were easy to move; really learning the new system was the hard part. After a new management was installed with a mandate and the desire to change, they called in the WRTP, which "played an instrumental role" in getting the dedicated but weary union to work together with the new management as a team. The firm is now on its feet again, continuing to devolve production authority and running about as lean as imaginable, requiring only four total supervisory staff (out of 80 employees).

Thus, like the WMEP, the WRTP can play the role of honest broker, effectively solving problems that individual parties are not able to solve on their own. Often management is not ready to devolve decision-making authority, and labor is not ready to fully cooperate with management. Even union leaders who want to cooperate need be mindful of their members' skepticism of "getting in bed with management." The WRTP is able, in many cases, to convince both sides that cooperation and the devolution of decision-making are in their mutual interests. Like the WMDC training that links up with suppliers' individual modernization efforts, WRTP intermediation helps firms set up the structures to foster a continuous improvement environment.

As the WRTP gives workers a central role in the restructuring process, rather than being passive recipients of new management orders, the likelihood that managements' efforts will be effective in the long run is increased. For many, unions have a reputation for blocking efforts at modernization. But the WRTP helps to turn unions into a competitive advantage. And, indeed, the role of *unions themselves* as intermediaries should not be neglected. Breaking down job classifications and work rules is anathema to the traditional union stance. But in fact many unions, such as the International Association of Machinists and Aerospace Workers (IAM) and the United Steelworkers of America (USWA) are now leading the charge toward high performance work organization.²⁰ For example, the IAM now has a High Performance Work Organization (HPWO) department at the international level, which will help train workers in partnering with management and HPWO principles. As one manager working with the WRTP and the IAM HPWO department commented:

Whereas in the past it was just management's fad of the month, just a program to exert on the workforce. Again it was the typically adversarial relationship between the company and the union. What's nice now, with the International IAM coming in to play [the workers are] hearing it also now from the International: hey, people wake up . . . we don't want to shut another plant down. And that's quite honestly what we're up against if we don't change.

²⁰ See the IAM Field Manual, "High Performance Work Organization Partnerships," January 1999.

IV. Conclusion: Options for Policy

Wisconsin already has an important manufacturing cluster, whose center is the large base of component manufacturers, but this cluster must not be taken for granted. We also already have a good institutional infrastructure that also must not be taken for granted, but that should instead be improved, deepened and widened to ensure that this cluster retains long-term dynamism and innovative capacity.

Wisconsin's manufacturing base is capable of carving out a series of niches of distinctive, high-value added production able to retain and, hopefully, create quality family-sustaining jobs. How, then, do we work toward this ensuring this goal? From a public policy standpoint, institutions like the WMDC, WMEP, and WRTP should be supported, and held up as models of the sort of public-private collaborative problem-solving required for the effective governance of decentralized manufacturing.

We conclude with our recommendations for further improving the WMDC as a cost-effective and essential model for cluster development policy.

1. Surviving the recession and budget crisis.

The current recession has hit the manufacturing economy extremely hard, with two likely — and opposite — effects on firm strategy as regards their interests in consortial supplier development. One possible consequence is that OEMs seeing a profit squeeze will utilize short-term positional bargaining to salvage profits now, which increases price-pressure on suppliers. Likewise, in response to tough times, supplier firms may simply “hunker down” to weather the storm, investing less in people they are not sure they will be able to keep. This threatens the consortium, which will quickly die without a commitment from both the OEM partners and their suppliers to working together to improve operations for gains down the line. But there is also an opposite pressure. A recession can lead the OEMs to look more closely at their own organizations to identify areas where they can reduce their own fixed costs, which can make a ceding of control and reliance on external public resources more attractive, even if this requires sharing strategic control of those resources with other firms and with state agencies.

Significantly, however, the greatest threat to the consortium's survival comes not from a lack of business coordination but from the state fiscal crisis. With Wisconsin's enormous budget crisis and the need to cut billions from the two-year budget, even the relatively small state outlay to WMEP — \$ 1.5 million — is threatened. WMEP was originally “zeroed out” in early 2003 — which would also result in an additional loss of the corresponding 33% match from NIST — but after intense lobbying efforts particularly by the governing OEMs as well as by many of the suppliers that have been served, it appears (at least at

time of writing) that a significant portion of the funding will be restored.²¹ We certainly augur that indeed occur. The WMEP and WMDC are part of the skeleton of a dynamic industrial cluster. It is essential that state policymakers do not destroy these institutions in the pursuit of short-term budgetary solutions that will only generate bigger problems down the road.

2. Deepening impact: aligning expectations and practices, better accounting, building new capacities.

Access to effective training and supplier development resources is an important problem, and is well handled by the consortial model discussed here. But supplier firms' larger problem remains that their customers, even those who talk the talk of open and collaborative supplier relations, often do not always walk the walk, partly because of internal organizational barriers. In theory, the subsidies could be used as a "stick" to monitor OEM behavior, but the sums involved are extremely small relative to the sales turnover of these firms; hence the OEMs would likely simply walk away from any such enforcement. But there are ways in which a multi-firm public-private partnership can be used to help these firms to resolve these characteristic dilemmas of large bureaucratic organizations in ways that they themselves perceive as beneficial and cost-effective.

For example, the consortium could encourage participating OEMs to draw up a common code of good supplier relations practice, based on member firms' own official procurement policies. The compilation of such a code could stimulate the identification and diffusion of good practice among participating OEMs, while also guiding suppliers towards common performance expectations. Implementation of this code of practice within the consortium, together with the tangible impact of training provided on supplier performance, could be assessed by independent third-party monitoring, as in the case of ISO 9000 quality assurance programs. Participating OEMs found to be in breach of the consortium's code of good supplier relations practice could be asked to submit plans for correcting the problems identified by the external monitors within a reasonable time period. In cases of persistent uncorrected breaches of the code, consortium members and the MEP could then consider a range of possible sanctions, culminating in exclusion from the consortium.

Such a mechanism, aligning expectations and practices, could also be expanded in other ways to benefit both OEMs and their suppliers. Each of the OEMs has their own auditing practices for supplier performance involving qualification and certification. The members have discussed common standards in auditing procedures, which would be relatively easy to implement as part of a code. Similarly, such a code could be extended from auditing of suppliers to OEMs' own accounting practices. One example would be jointly to develop total life cycle costing models for sourcing.

The third-party monitoring process could itself be harnessed to mutual learning through benchmarking of supplier training practices and related research on OEM-supplier relations, thereby providing a systematic mechanism for generating improvements to the consortium's curricular offerings and code of good practice. Third-party reporting on the OEMs'

²¹ Note that the state contribution, for the most part, goes to WMEP's operating budget and not to subsidizing the consortium per se.

performance in implementing the collaborative supplier relations policies to which they are formally committed could potentially mitigate many of the organizational dysfunctions discussed above, strengthening the position of reformers in these companies. In assessing such a “code of conduct” (or any such proposal to leverage the consortium to improve OEM practices), it is essential to recognize that it is unlikely to work unless the OEMs can be convinced that it is beneficial to seek such external reinforcement as a means to enforce adherence to their own official procurement policies across plants.²²

3. Widening the reach.

Beyond the “deepening” of the existing consortium, there are also questions of “widening” and equity. Does the existence of the WMDC create a “privileged club” of suppliers? To premise the delivery of manufacturing extension services on consortial models requires more than seven OEMs and their suppliers. Wholesale expansion, beyond a few new members, of the existing consortium is problematic given the importance of the focus and commitment of the governing partners to its effective functioning. A more logical solution would be to stimulate the formation of additional consortia of locally-rooted OEMs with a sufficient commonality of purpose and a substantial shared in-state supply base, as Pennsylvania appears to be doing. The existence of multiple consortia would also permit the different groups to benchmark their performance against each other to promote continuous improvement.

Supply chains do not stop at state lines, but the historic base of component manufacturing is heavily concentrated in the Upper Midwest states of Wisconsin, Illinois, Indiana, Michigan and Ohio. There is evident scope for cooperation between MEPs and consortia in these and other neighboring states to ensure the continued viability of this “supply base region,” by benchmarking each other’s programs, exchanging good practices, and discouraging counterproductive “smokestack chasing”.

4. Build on existing intermediary institutions for cluster development

The Wisconsin Manufacturers’ Development Consortium offers a promising if unfinished and evolving model of the sorts of public-private partnerships that could serve as the institutional framework for highly competitive manufacturing cluster. The WRTP, nationally recognized as a best-practice model for improving labor market and vocational training coordination, provides another example of the sort of institutions needed in today’s decentralized manufacturing environment.

Even — indeed, especially — in these tough budgetary times, the state should not forget the important role the public policy plays in the creation and maintenance of intermediary institutions that enable firms to successfully negotiate a rapidly changing world. Such public-private ventures need not be “handouts” or “corporate welfare,” but, properly executed, represent instead a highly efficient use of state dollars, the provision of seed money to leverage the interest of many parties in the creation of important public goods. Models like the WMDC and the WRTP

²² For a related approach to the improvement of domestic and international labor standards through third-party monitoring and certification of corporate codes of conduct, see Fung, Archon, Dara O’Rourke, and Charles Sabel, *Can We Put an End to Sweatshops?* Boston: Beacon Press, 2001.

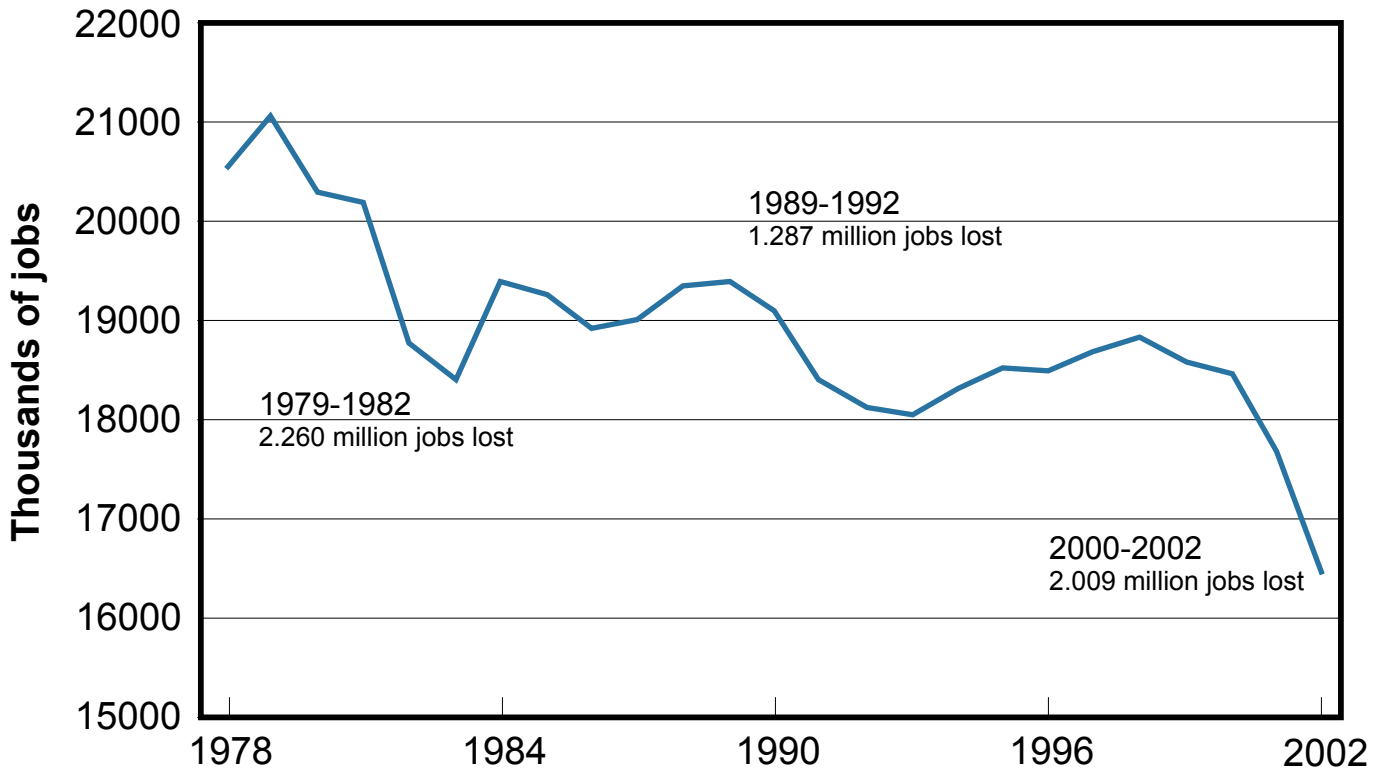
that require their constituent members — be they OEMs, suppliers, unions, WMEP, the technical college system, the university — to work together to jointly define problems and develop intermediaries to help solve those problems are a “best practice” of which Wisconsin should be proud.

We do not, however, want to suggest that the two cluster intermediaries we cite in this report are a solution to all the problems of the state's manufacturing base, nor that they represent everything that a coherent “cluster development strategy” might entail. There are many other problems that will likely involve the creation of new intermediaries. But once again, in clusters, the trick is always to look at what you have, and to see if there are way to make the whole greater than the sum of its parts. In this, the existence of these established intermediaries should make the building of new ones easier, both by providing a model, and perhaps by leveraging the relationships strengthened by the WRTP and WMDC.

For example, many smaller suppliers are being asked to provide ever more product development support, which is suggestive of the need for new intermediary capacities. To meet this need, a public-private governing body could be created to run, in conjunction with the technical college and/or university system, a product development center for small and medium sized manufacturers. Of course, the precise types of product development support needed, and the structure of any center and governing body cannot be decided in advance. As with building any type of intermediary capacity, the details will emerge from a deliberative process involving industry, unions, government and academics. Indeed, such deliberation over the particulars of ends and means by all the actors involved is one of the strengths of the approach.

Figure 1

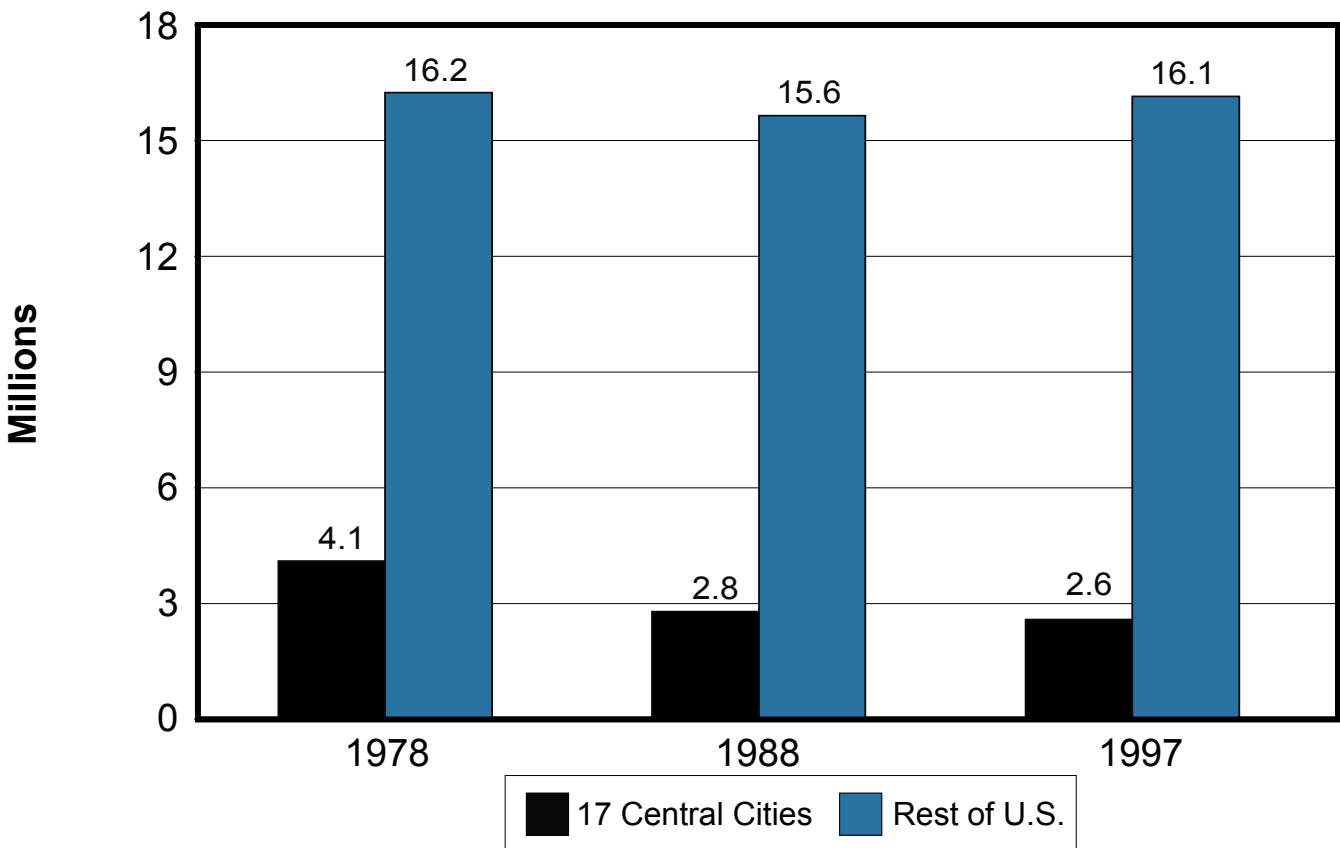
Manufacturing employment in the United States, 1978-2002



Source: Economic Census, U.S. Census Bureau.

Figure 2

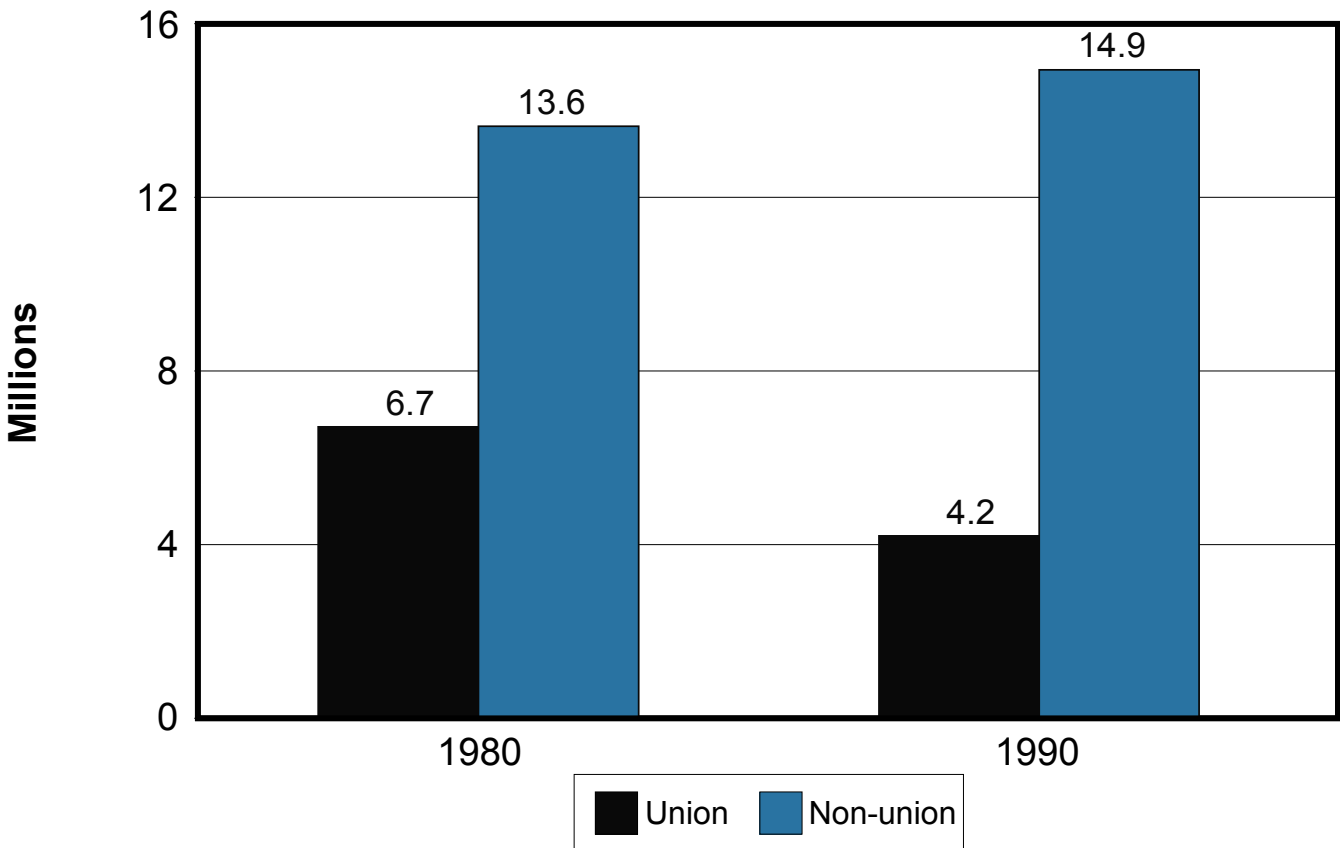
Manufacturing employment share by location, 1978 v. 1988 v. 1997



Source: Luria, Daniel, "Good Manufacturing Jobs: Recipe Known, Outlook Uncertain." Paper presented to conference on "What Future for Manufacturing: Trade Unions and the Challenges of Change in Manufacturing," Harvard University, 2000.

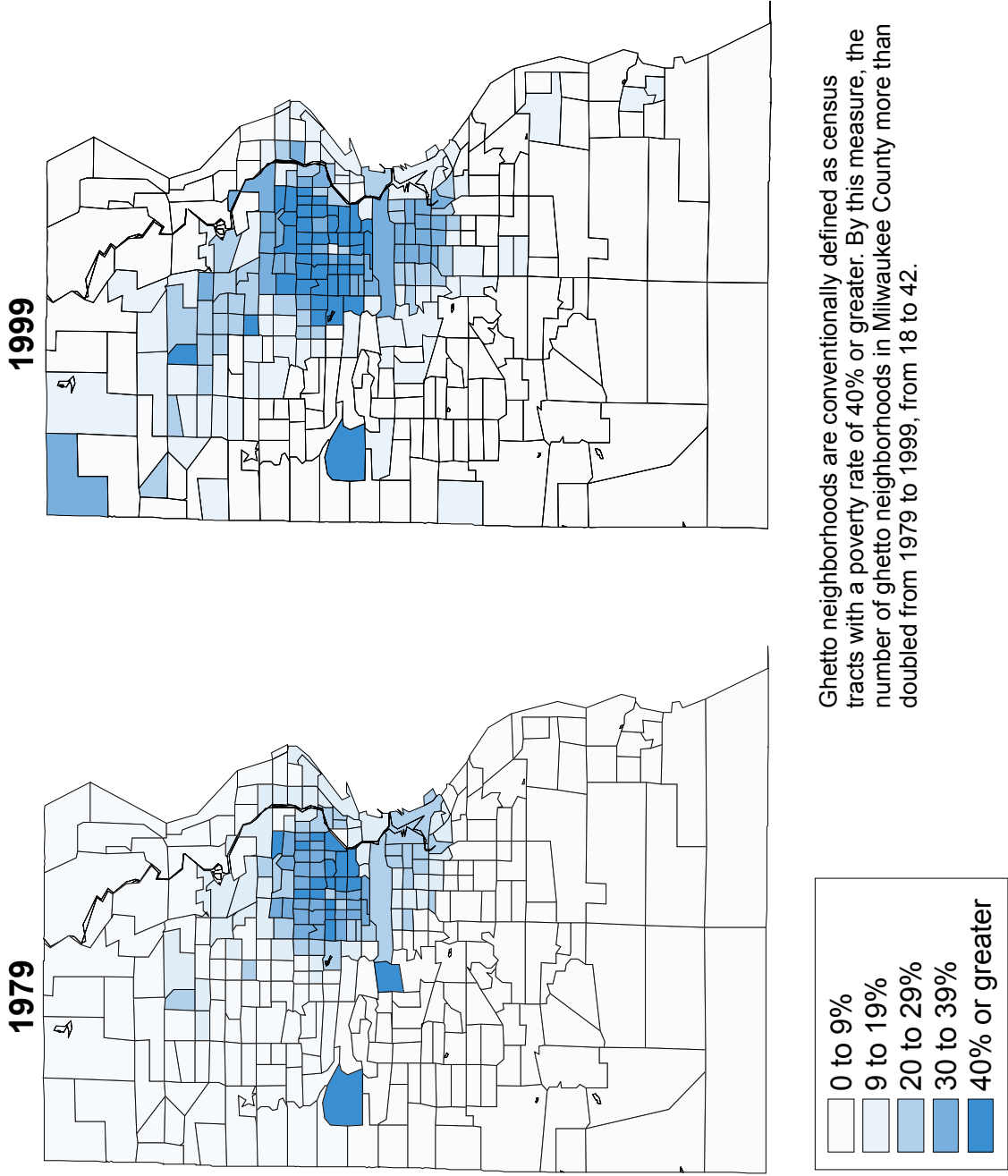
Figure 3

Manufacturing employment share by union status, 1980 v. 1990



Source: "Good Manufacturing Jobs: Recipe Known, Outlook Uncertain." Paper presented to conference on "What Future for Manufacturing: Trade Unions and the Challenges of Change in Manufacturing," Harvard University, 2000.

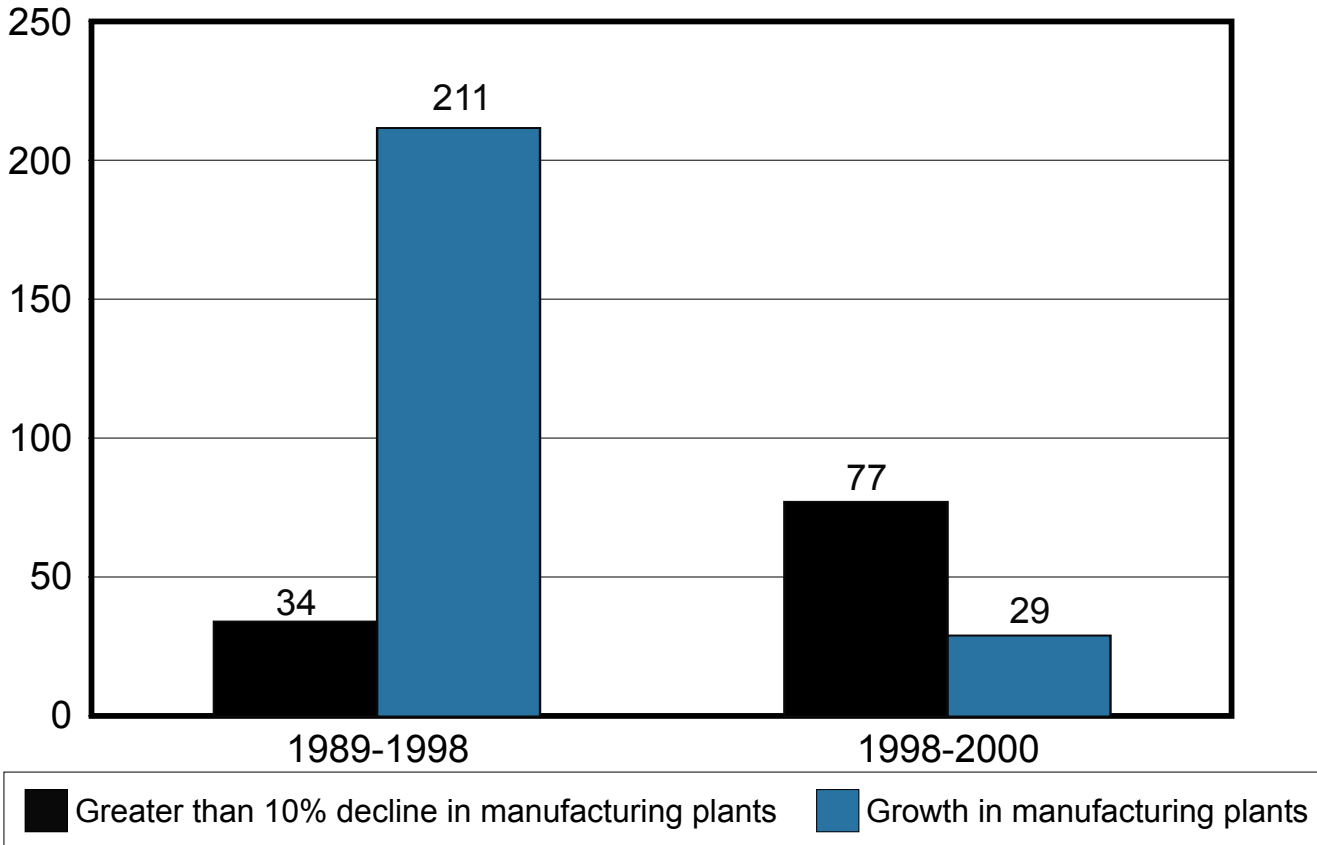
Figure 4
Poverty rate by census tract, Milwaukee County, Wisconsin, 1979 & 1999



Source: Decennial Census, U.S. Census Bureau.

Figure 5

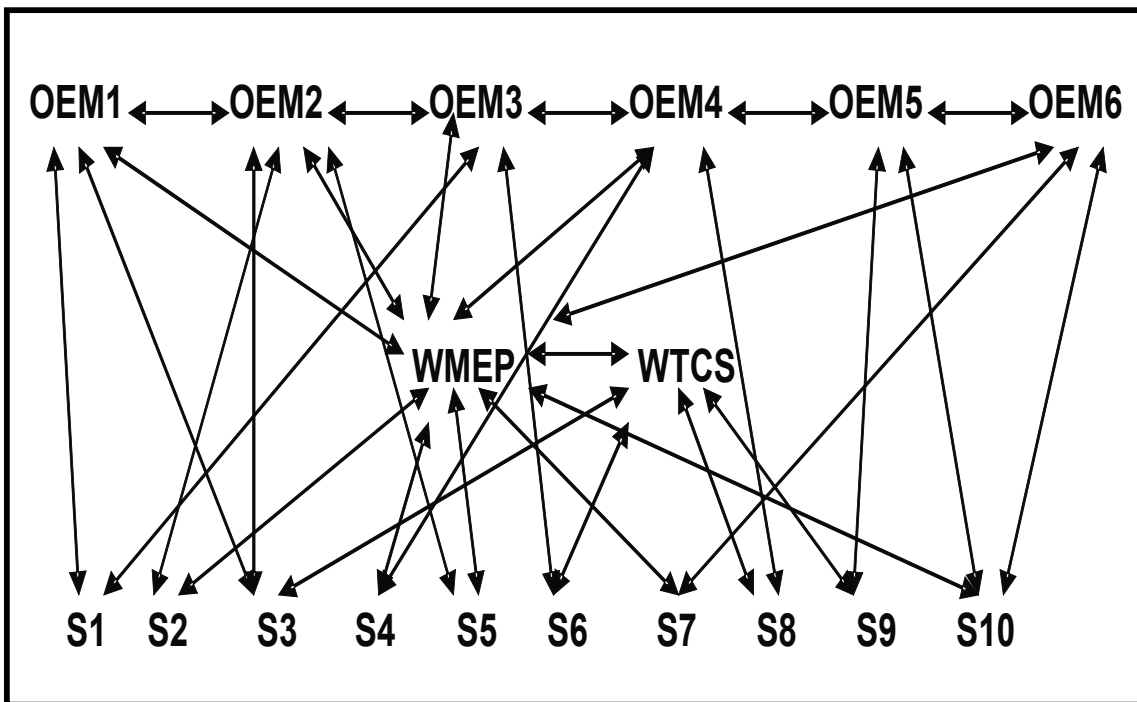
Number congressional districts with growth or decline in manufacturing plants, 1989-1998 v. 1998-2001



Source: Zip Code Business Patterns data, U.S. Census Bureau.

Figure 6

A model of Wisconsin Manufacturers' Development Consortium



Multiple linkages between OEMs, the Wisconsin Manufacturing Extension Partnership (WMEP), the Wisconsin Technical College System (WTCS), and supplier firms.

Table 1

Job loss in selected industries, 1998-2002

	Employment (thousands)		Total job loss	
	1998	2002	Number	Percent
Primary metals	641.5	510.9	130.6	20.4
Fabricated metal products	1739.5	1547.8	191.7	11.0
Machinery	1511.9	1237.4	274.5	18.2
Computer and electronic products	1830.9	1521.3	309.6	16.9
Electrical equipment and appliances	591.6	498.9	92.7	15.7
Transportation equipment	2077.0	1828.5	248.5	12.0

Source: Bureau of Labor Statistics.