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**The geography of lean manufacturing:  
Recent evidence from the  
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**Index for 1995**

**Can alternative forms of governance  
help metropolitan areas?**

FEDERAL RESERVE BANK  
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# The geography of lean manufacturing: Recent evidence from the U.S. auto industry

Thomas H. Klier



Since lean manufacturing was pioneered by Toyota Motor Company in the 1950s, it has become the standard practice of many Japanese manufacturing companies. During the last decade American manufacturers started to adopt it in order to compete effectively at home and abroad, and it is fast becoming the standard in manufacturing plants across the country. Lean manufacturing is characterized by an emphasis on product quality, an integrated approach to the various aspects of manufacturing, reliance on subcontractors to produce a greater proportion of the value added, and an emphasis on speed in order processing, production, and delivery. One central feature of the system is the tiering of the supplier structure, which greatly reduces the number of companies the assembler deals with directly. Another feature is close relationships and frequent interactions between assemblers and suppliers.<sup>1</sup>

It has been argued that efforts to reduce inventory stocks and arrange for “just-in-time” delivery function most effectively when the supplying and receiving plants are in reasonably close proximity.<sup>2</sup> The concomitant increase in the frequency of interaction and communication between assembler and supplier companies is expected to strengthen that effect further.<sup>3</sup> On the other hand, there is some evidence that spatial clustering is not a necessary condition for the successful operation of lean manufacturing.<sup>4</sup> The question to what extent the arrival of lean manufacturing has altered the geography of supplier networks

has not been definitively answered.<sup>5</sup> The answer will have implications for regional development efforts. Proponents of the spatial clustering hypothesis argue for a just-in-time-based local and regional development strategy.<sup>6</sup> Such an approach was apparent during Mercedes’ recent search for an assembly plant site in North America. Alabama offered major tax breaks to the company, apparently on the assumption that the assembly plant would attract a fair number of its supplier plants to locate nearby.<sup>7</sup>

This article attempts to shed new light on the spatial effects of lean manufacturing by examining the emerging geographical structure of lean manufacturing supplier networks in the auto industry, often highlighted for its bellwether role in the adoption of the new manufacturing system. First, I present an overview of previous studies. This is followed by a detailed analysis of the U.S. supplier networks of eight auto assemblers located in the United States. While some of these networks have been the subject of previous research, this article goes beyond the existing literature by investigating both domestic and transplant suppliers and by identifying both the tier and the age of individual supplier plants.<sup>8</sup> The evidence of emerging supplier location patterns is discussed both at the sample and assembly plant level. Conclusions follow in the final section.

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Thomas H. Klier is a senior economist at the Federal Reserve Bank of Chicago. The author would like to thank Jason Brown and Shinobu Suzuki for excellent research assistance.

## Review of previous evidence

As one of the most important and most visible manufacturing industries, the automobile industry has been of interest to economic geographers for some time.<sup>9</sup> Since the arrival of lean manufacturing by way of Japanese transplant assembly and parts facilities in North America, questions have been raised about its impact on the existing spatial structure of manufacturing. In Japan, auto assembly and parts production are heavily concentrated in the core industrial regions of Tokyo-Yokohama, the Nagoya region, and to a lesser extent, the Osaka area. Three factors are cited as an explanation for this concentration: “urban-industrial agglomeration factors stemming from the dependence of the auto and other assembly-type industries on a wide range of parts, components, engineering processes and labor skills; ready access to the largest domestic markets; and access to port facilities for interregional and export shipment.”<sup>10</sup>

Evidence from other industries and other countries indicates that the magnitude of the effect of lean manufacturing on location varies by industry and by country.<sup>11</sup> For example, a recent analysis of 71 auto parts plants in nine countries suggests that the degree of dispersion of a country’s supply base is partly a function of the country’s size.<sup>12</sup> Japan’s auto industry is characterized by the most geographically concentrated supply base, with 82 percent of the suppliers located within a four-hour journey by truck from the assembly plant. In contrast, the percentages for the U.S., U.K., and Germany are 35, 53, and 52, respectively. Sadler (1994) studied parts purchasing at several Japanese assembly plants in Europe and found that Japanese transplants in Europe “placed far greater emphasis on working with an existing supplier base in Europe than on encouraging rapid transnationalization of the Japanese components industry.” At the same time, they were implementing the familiar mix of lean manufacturing production and procurement practices.<sup>13</sup>

Did the arrival of lean manufacturing in North America lead to a similarly compact spatial structure? To understand the existing structure of the U.S. auto supplier industry, one must first distinguish between so-called captive and independent suppliers. Among the Big Three, the distribution of captive suppliers (that is, suppliers that are Big Three subsidiaries or divisions) varies by assembler. Even today,

however, these suppliers generally remain located in the upper Midwest.<sup>14</sup> For example, Ford historically operated within a highly centralized model of production with clusters in Detroit and Dearborn; today the company’s parts operations are mostly clustered in southeastern Michigan and northern Ohio. General Motors, on the other hand, started out with multiple centers of operation in Michigan (Detroit, Flint, Lansing, and Pontiac), and soon afterward expanded its parts operations into other, predominantly mid-western states, mainly by acquiring independent supplier companies. Before World War II, the company’s captive suppliers were largely clustered in the southern Great Lakes region. Since then, GM has pursued a policy of spatial division of labor. Products requiring relatively skilled workers, such as engine and drivetrain components, have remained concentrated in the southern Great Lakes region. Lower-skill tasks, such as much of the manufacturing of electrical components, have been relocated to the south.<sup>15</sup>

As lean manufacturing has increased the degree of outsourcing, the more interesting question is how the location pattern of independent supplier plants has been evolving. Historically, parts suppliers have been clustered in southeastern Michigan and the adjacent southern Great Lakes states.<sup>16</sup> A significant change in the observed location of independent suppliers occurred during the 1970s, when a noticeable number of supplier plants moved southward into Kentucky, Tennessee, Alabama, Georgia, Virginia, and North Carolina.<sup>17</sup> These relocations were related to location decisions of auto assembly plants. For example, during the 1970s GM, in search of lower-cost nonunionized labor, built or planned fourteen plants in the south, primarily in rural areas of small towns.<sup>18</sup>

The latest development influencing the location decisions of suppliers has been the arrival of lean manufacturing in North America, generally dated around 1980 when the first Japanese transplant assembly facilities opened. Early evidence indicates the emergence of a structure in which supplier plants locate closer to their assembly plant customers than under the previous system of mass production.<sup>19</sup>

A set of recent studies investigates the effect of lean manufacturing on the spatial structure of independent supplier plants in the United States. Rubenstein and Reid (1987) and Rubenstein (1988) analyzed data for the state



of Ohio. They could not identify a clear-cut effect of lean manufacturing on supplier plant location, yet they did find a change in the locational pattern after 1970. New firms were more likely to locate in the state's rural counties and the central region, and less likely to locate in northeastern Ohio.

Most of the existing analyses of the location effect of lean manufacturing, however, concern Japanese-owned suppliers within the United States. This is not surprising, as these plants were generally set up to meet the demands of lean manufacturing assemblers. In addition, most of them are new plants established at so-called greenfield sites, which makes them a preferred object of study.<sup>20</sup> Studies of these plants consistently find a concentration of Japanese suppliers in a region encompassing Michigan, Indiana, Ohio, Kentucky, and Tennessee, commonly referred to as the I-75/I-65 auto corridor because it is defined by those two interstate highways. At the local level, suppliers are dispersed to avoid their drawing from the same labor market.<sup>21</sup> From the perspective of the southern Great Lakes states, it seems that the arrival of lean manufacturing reversed the trend toward regional decentralization that started in the early 1970s. However, the sites chosen by transplants were not traditionally associated with motor vehicle assembly or parts production. Accordingly, a complex pattern of industrial growth and decline emerged in the Midwest.<sup>22</sup>

### The data

"Mapping the spatial distribution of parts suppliers at one point in time, let alone changes, is a formidable task."<sup>23</sup> The *Census of Manufactures* can offer only incomplete information, because it distinguishes neither between original equipment manufacturers and producers of replacement parts nor between different tiers of suppliers. In addition, because of the large variety of parts that make up an automobile, suppliers are classified in 18 of the 20 two-digit SIC categories. Finally, census data provide no information about linkages between suppliers and their customers.

The data used in this study come from the ELM GUIDE data-

base on the auto supplier industry, produced by a company in Michigan.<sup>24</sup> The data available for analysis represent the year 1993 and cover 2,477 supplier plants located in the United States. As a first step I grouped the plants by tiers. Of the total, 1,383 plants were tier 1 suppliers, that is, they ship their products exclusively to auto assembly plants and not to other suppliers or other customers; 373 were "mixed" plants, that is, they ship also to other supplier plants and/or nonautomotive assemblers; 721 plants had to be excluded from the analysis as they did not provide information on which customer(s) they shipped to.<sup>25</sup>

As the customer information in the ELM database is provided at the company rather than plant level, I focused on the set of auto assemblers that operate only one plant, or plants at only one location, in the U.S. in order to be able to establish linkages between assembly and supplier plants; 511 (37 percent) of the 1,383 identifiable first-tier supplier plants ship to these 9 assembly plants (see table 1).<sup>26</sup> I then added several variables to the database. Information on start-up year of the supplier plants was obtained from various state manufacturing directories; information on Japanese ownership was obtained from a publication of the Japan Economic Institute.<sup>27</sup> The start-up date for 41 plants in the sample could not be identified from state industrial directories. I sent these plants a questionnaire to obtain the missing information. Of the 20 returned questionnaires, 16 indicated plants that were still operational. Therefore, the number of observa-

	<b>Location</b>	<b>Start-up year</b>
Honda	Marysville, OH	1982
Honda	East Liberty, OH	1989
Nissan	Smyrna, TN	1983
NUMMI (GM-Toyota)	Fremont, CA	1984
AutoAlliance (Ford-Mazda)	Flat Rock, MI	1987
Diamond-Star (Mitsub.-Chrysler)	Normal, IL	1988
Toyota	Georgetown, KY	1988
Subaru-Isuzu	Lafayette, IN	1989
Saturn	Spring Hill, TN	1990

Source: Ward's Communications (various years).

TABLE 2				
Top seven states for tier 1 supplier plants				
% of total plants (1,383)			% of sample plants (486)	
Michigan	25.6		Michigan	20.4
Ohio	13.6		Ohio	15.8
Indiana	10.6	Top 3: 49.8%	Indiana	10.7
Illinois	6.8		Tennessee	10.3
Tennessee	5.9	Top 5: 62.5%	Kentucky	8.2
Kentucky	4.0		Illinois	6.0
North Carolina	3.5		North Carolina	3.3

Source: ELM International, Inc. (1993) and author's calculations.

tions for the following analysis is 486. The resulting data allow for a comparison of more recent location decisions with older ones that were presumably not influenced by lean manufacturing. However, this is not equivalent to a time-series analysis since the sample only contains plants operating during 1993 and none that were shut down in earlier years.

**Where do plants locate? The spatial pattern of the sample**

It is interesting to relate the geographic distribution of the sample to the population of tier 1 supplier plants. Table 2 shows that the sample plants were slightly more concentrated in five states and were located to the south of the population of identifiable tier 1 plants. Michigan, the most frequent location choice among the 486 plants in the sample, was less dominating in the sample than in the identifiable population of tier 1 supplier plants, while

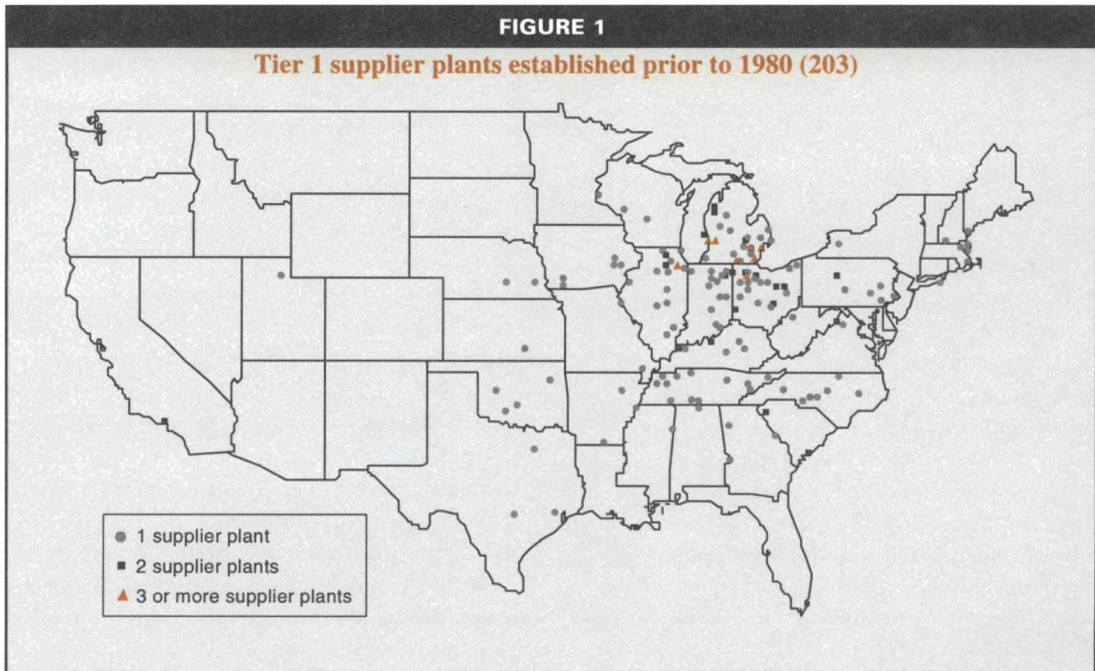
Ohio, Tennessee, and Kentucky each attracted a higher share of sample plants. This pattern is not surprising, as the assemblers for which linkages to supplier plants could be established were located to the south of the traditional assembly plant region. Nonetheless, on the whole the sample was geographically distributed quite similarly to the overall distribution of total identifiable tier 1 supplier plants.

Since the sample plants were identified by start-up year and by affiliation with a Japanese company, it was possible to assess the location pattern by age of plant and plant ownership. Because transplant assemblers started operating in the U.S. as early as 1982, I chose 1980 as the cutoff year to compare location patterns before and after the implementation of lean manufacturing techniques.<sup>28</sup> Table 3 shows that about 42 percent or 203 of the 486 supplier plants were established before 1980; the vast majority of them (187) were domestic. The

TABLE 3				
Location of sample plants				
	Established prior to 1980 (203)		Established 1980 or later (283)	
	Domestic (187)	Transplant (16)	Domestic (118)	Transplant (165)
Michigan	26.7%	25.0%	25.4%	9.1%
Ohio	15.5	6.3	9.3	21.8
Illinois	8.0	25.0	3.4	3.6
Indiana	7.0	6.3	13.6	13.3
Tennessee	5.9	6.3	12.7	13.9
Kentucky	4.3	0	4.2	16.4
California	0.5	6.3	2.5	4.2
Largest 3	50.2	56.3	51.7	52.1
Largest 5	63.1	68.9	65.2	74.5

Source: ELM International, Inc. (1993) and author's calculations.



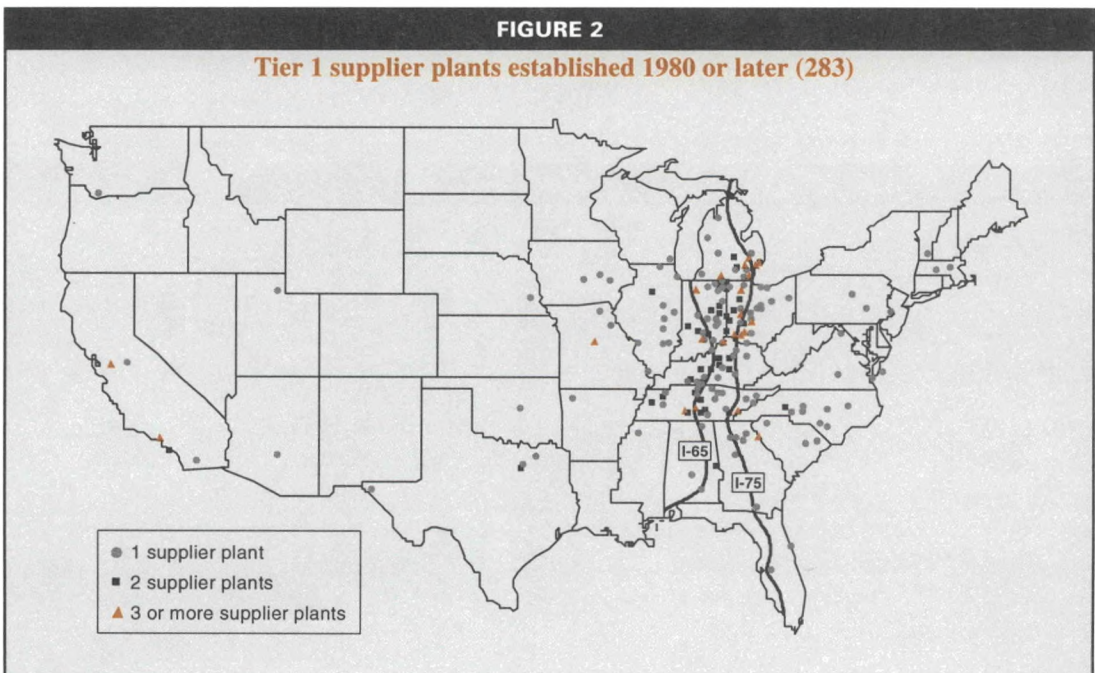


location pattern of those 203 followed very closely the distribution shown in table 2 (see also figure 1). Too few transplant supplier plants were established prior to 1980 to show any discernible pattern. Figure 2 shows a remarkably different location pattern for tier 1 plants established since 1980. Most pronounced is the development of the so-called auto corridor, a rather compact and densely

populated area stretching north-south along I-75 and I-65.<sup>29</sup>

To what extent does this auto corridor represent locational choices of transplant and domestic supplier plants, respectively?

Dividing the sample by age of plant revealed two very interesting findings. First, compared with their older counterparts, post-1980 domestic plants were located more to the



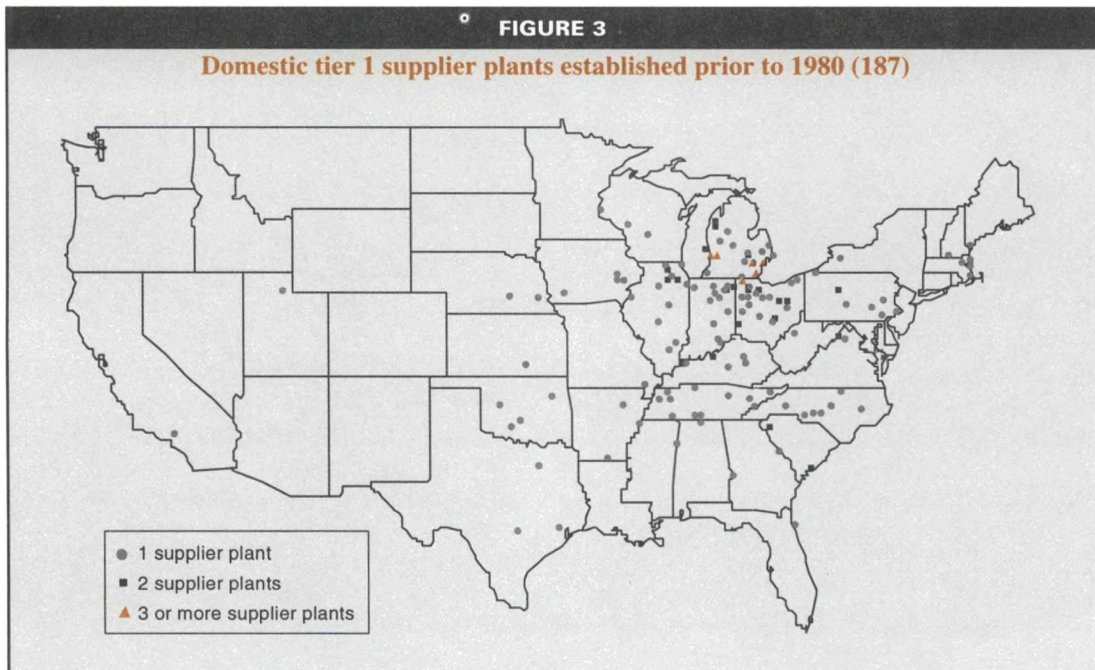
southeast. Ohio and Illinois lost considerable share, while Indiana and Tennessee became more frequent location choices. However, the overall concentration in the top three and top five states hardly changed.<sup>30</sup> These findings are displayed in figures 3 and 4. The most striking contrast, however, is between recently established domestic and transplant suppliers (see figures 4 and 5). First, the number of transplant suppliers increased dramatically after 1980 (see table 4). Furthermore, 75 percent of the 165 transplant suppliers opened since 1980 located in only five states—Kentucky, Ohio, Tennessee, Indiana, and Michigan—a higher proportion than any other subset of the sample.<sup>31</sup> The aggregate picture in table 3 and figures 1 through 5 reveals the leading role played by the transplants in establishing a different location pattern in the U.S. auto supplier industry. In addition, there is evidence, albeit to a smaller extent, for a changing location pattern among domestic suppliers since 1980.<sup>32</sup>

Table 3 and figures 1 through 5 contain two additional interesting pieces of information. First, among the traditional auto states, Michigan stands out for remaining the preferred location of domestic supplier plants, even after 1980. One possible explanation is a stronger orientation of domestic suppliers to the Big Three as customers.<sup>33</sup> In addition, the data suggest that certain characteristics of a plant's

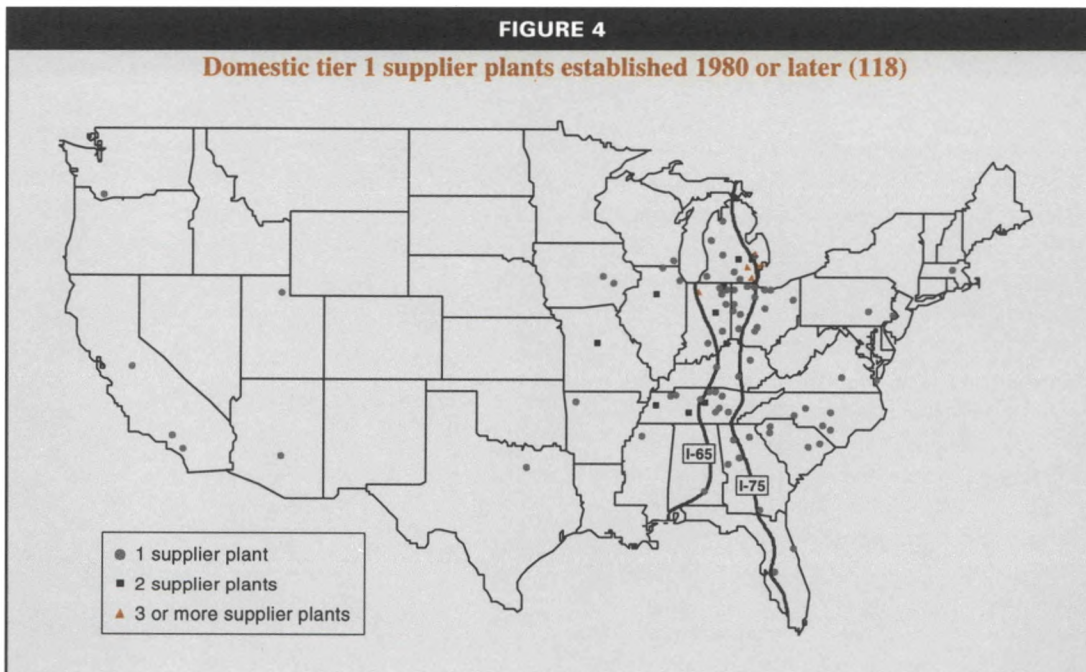
TABLE 4	
Transplant auto supplier start-ups	
	Number of facilities
1981	1
1982	5
1983	6
1984	5
1985	13
1986	25
1987	50
1988	67
1989	40
1990	17
1991	2

Source: McAlinden and Smith (1993).

output seem to influence its location decision. For example, the production of sensors (such as airbag or temperature sensors), a lightweight electronic part, is widely dispersed, with a noticeable number of plants in California and adjacent states. On the other hand, the production of seats—a part that involves various levels of subassembly including frames and upholstery, and is consistently quoted in the automotive press as one of the parts delivered to assembly lines by the hour—is concentrated within the automotive corridor, close to the







assembler customers.<sup>34</sup> The recently opened domestic plants in Michigan tend to be concentrated in the production of interior body system parts and components as well as body components and trim (including parts such as instrument panels, dashboards, and relatively heavy items such as hoods and doors). Comparing the product classifications of older and younger domestic plants in Michigan, one finds a

reduction in the start-up of plants producing engines and engine components since 1980, especially parts such as exhaust and intake manifolds and crankshafts.

Second, several new plants located outside the I-75/I-65 corridor after 1980. Since the data set available for this study does not include information on production level and/or customer-specific shipments, it was not possi-

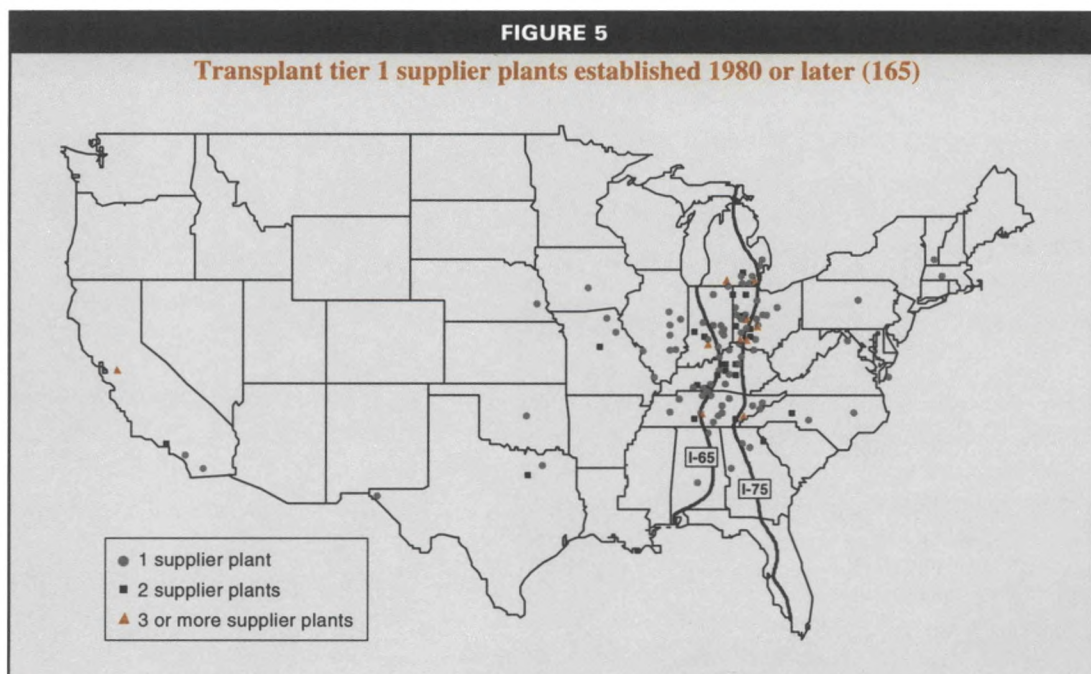
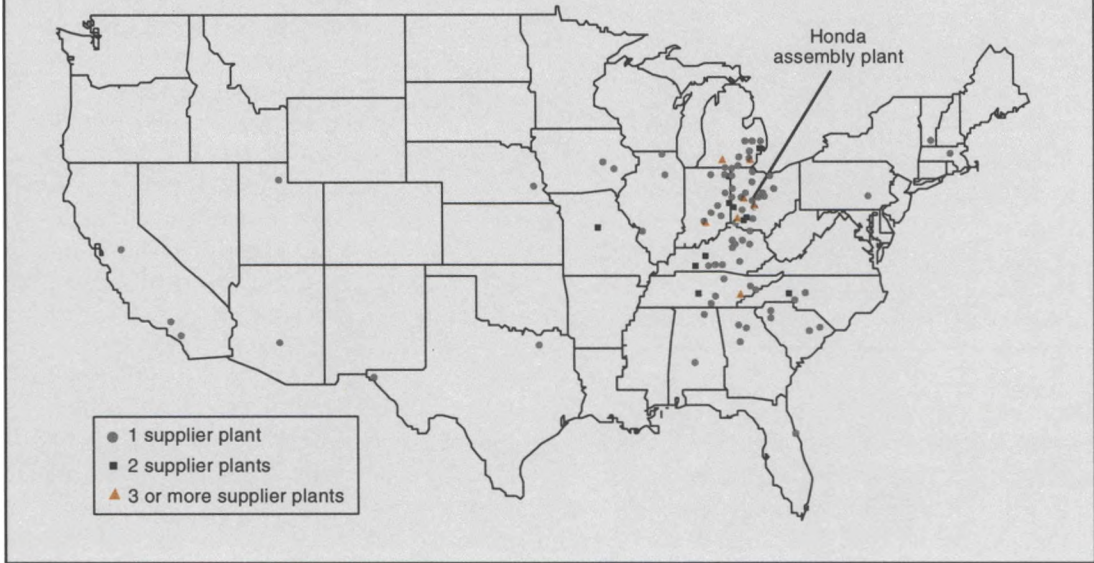


FIGURE 6

Honda's tier 1 supplier plants established 1982 or later (122)



ble to test whether those plants rely more heavily on nonautomotive business.<sup>35</sup>

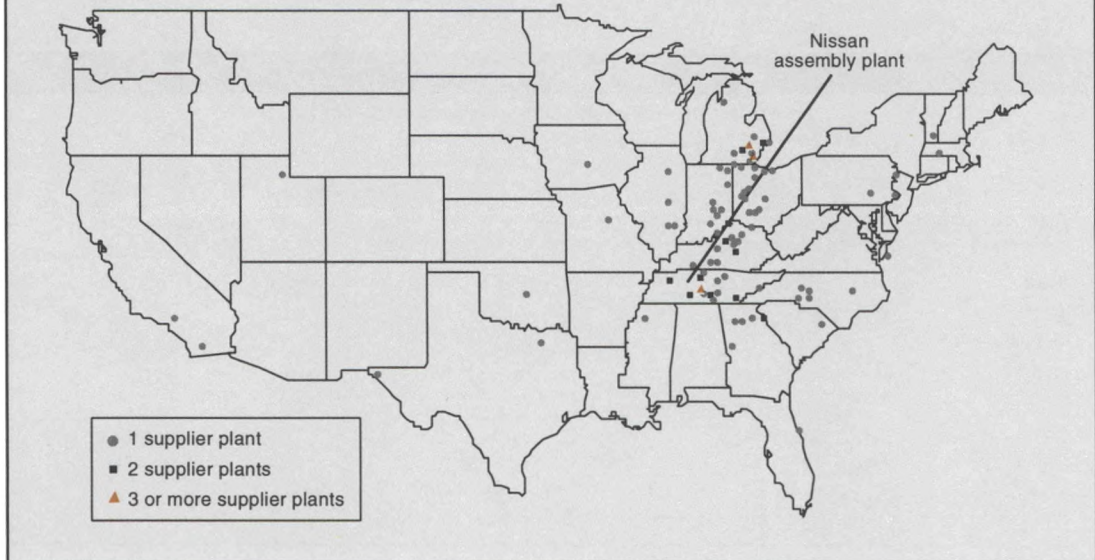
**Who is closer? An analysis of four supplier networks**

A closer look at the tier 1 supplier networks of specific assembly plants provides a more detailed picture of the changes in the location pattern of those suppliers during the

1980s. There is a striking difference between the pre-1980 and post-1980 location patterns similar to that observed among total sample plants. However, the analysis in this section will concentrate on suppliers that opened no earlier than the year during which their respective assembly plants started operating. This focus enables us to isolate the effect that lean manufacturing assembly had on the location of

FIGURE 7

Nissan's tier 1 supplier plants established 1983 or later (106)





**TABLE 5**

**Average distance between supplier and assembler**  
(suppliers that opened after assemblers)

Assembler	Network average	Domestic suppliers	Transplant suppliers
	(-----miles-----)		
Honda	287	399*	244*
Nissan	317	360	287
AutoAlliance	359	371	353
Toyota	325	466**	237**

\*Difference significant at the .10 level.  
\*\*Difference significant at the .05 level.  
Sources: ELM International, Inc. (1993) and author's calculations.

suppliers.<sup>36</sup> As one cannot directly compare the pre- and post-1980 location patterns, this section presents statistical evidence on a related question: For the four transplant assembly plants analyzed, do both domestic and transplant tier 1 suppliers make similar location decisions?

First, the locations of these assemblers' tier 1 suppliers produce very similar images (see figures 6 through 8). While the networks include more post-1980 plants the longer the assembly plant has been in operation, they are all focused on the I-75/I-65 auto corridor, whether the assembly plant is located in the center (like Honda in Ohio), at the northern end (like AutoAlliance in Michigan), or the southern end (like Nissan in Tennessee) of that region.

Second, a comparison of domestic and transplant suppliers shows that transplants are typically somewhat closer to their assem-

blers than are domestic suppliers (see figures 9 through 12). However, even the latter locate in a noticeable network pattern in relation to the various assemblers in the sample. By calculating the distance between each supplier plant and the assembly plant for each of the four networks, I formally tested for differences in the location decisions of domestic and transplant suppliers.<sup>37</sup> Table 5 shows the average distances between the individual suppliers and their respective assemblers in the sample. A test of the similarity

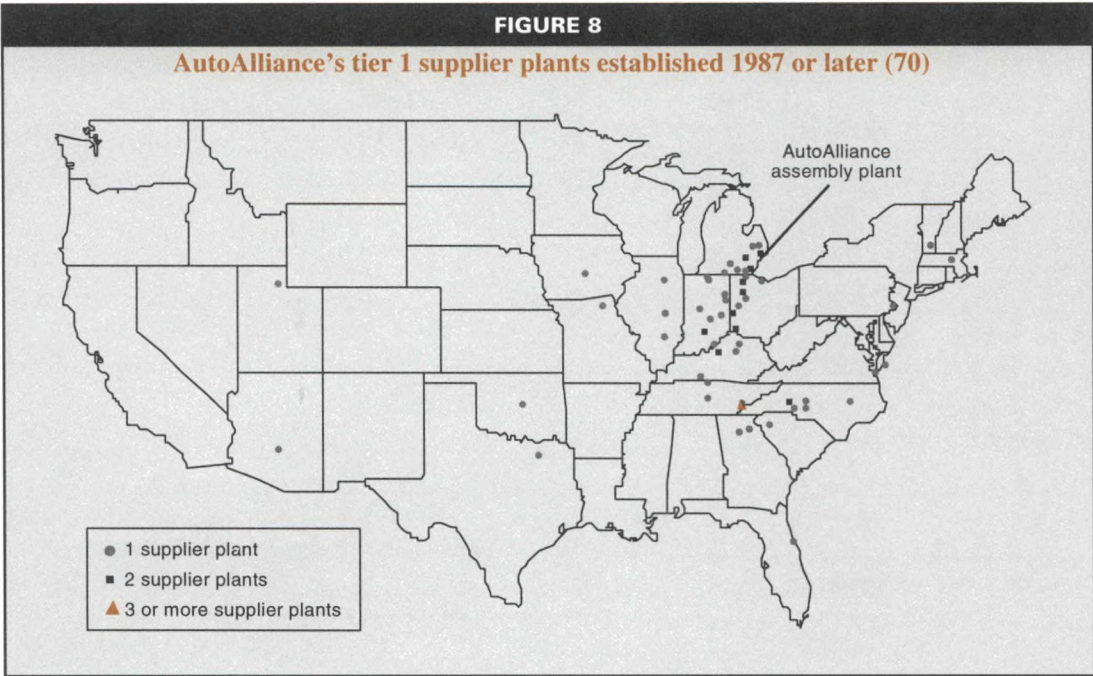
of the location pattern showed a significant difference between the average distances of domestic and transplant suppliers in two of the four networks.<sup>38</sup> Domestic suppliers that opened after the start-up of their respective assemblers were consistently located farther away than the transplant suppliers of comparable vintage.<sup>39</sup> This is a surprising result, as it indicates significant differences in the location effects of lean manufacturing on transplant and domestic suppliers. It is conceivable that more of the customers of domestic suppliers than transplant suppliers are located in the traditional auto region, which would explain the larger average distances to the three transplant assemblers located in the auto corridor. As the location of the Big Three assembly plants is not identified in the database, only indirect ways of testing that explanation remain. When one excludes AutoAlliance, the Mazda-Ford joint

**TABLE 6**

**Supplier plants by distance to assembly plant**  
(suppliers that opened after assembler)

Distance in miles	Honda		Nissan		AutoAlliance		Toyota	
	D	T	D	T	D	T	D	T
0-50	5.9	19.3	2.2	1.6	17.4	6.4	5.5	6.9
51-100	8.8	17.0	13.6	8.0	21.7	10.6	0	20.7
101-200	29.4	27.3	4.5	38.7	17.4	10.6	11.1	37.9
201-400	26.5	21.6	40.9	33.9	4.3	29.8	66.7	20.7
401-800	20.6	10.2	36.4	12.9	26.1	36.2	5.5	10.3
> 800	8.8	4.5	2.2	4.8	13.0	6.4	11.1	3.4

Note: D = domestic; T = transplant.  
Sources: ELM International, Inc. (1993) and author's calculations.



venture in Flat Rock, Michigan, and its suppliers, the percentage of tier 1 suppliers shipping only to non-Big Three assembly plants is more than twice as large for transplants as for domestic suppliers.<sup>40</sup> However, when one focuses on the subset of suppliers not shipping to the Big Three, the average distances for *both* transplant and domestic suppliers are lower than those listed in table 5.<sup>41</sup>

Table 6 presents more detailed information on the distribution of supplier plants around specific auto assembly plants. It suggests that the statistical differences in table 5 are driven by differences in the number of suppliers that locate very close to the assembler. A somewhat smaller share of domestic than transplant suppliers locate very close to the assembler (see table 6).<sup>42</sup> A large share of both Honda's

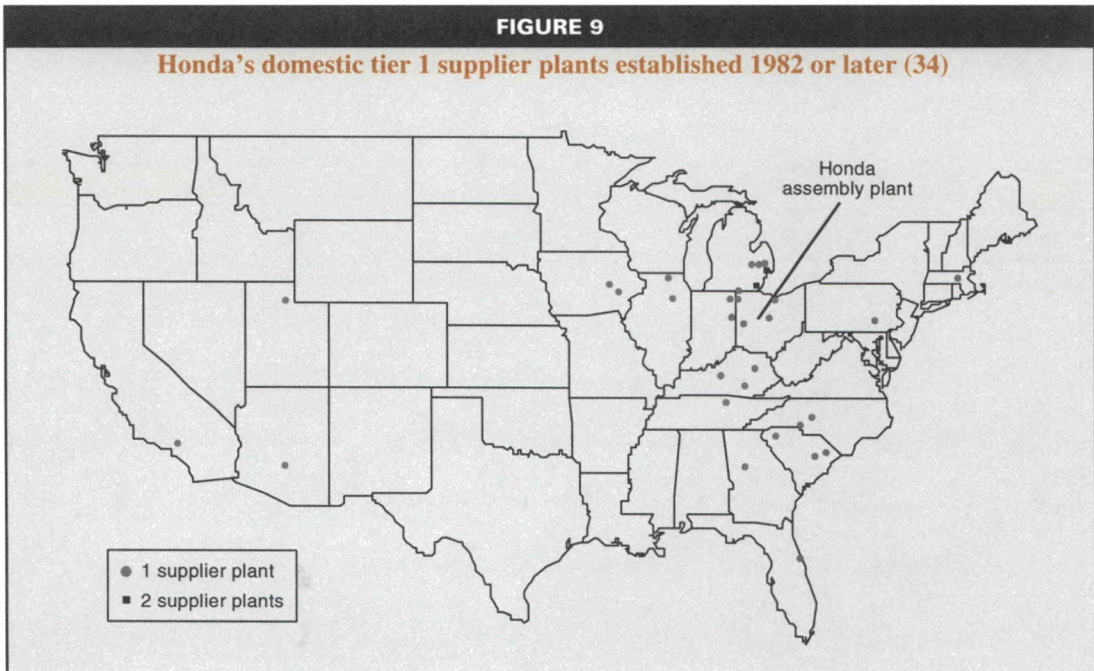
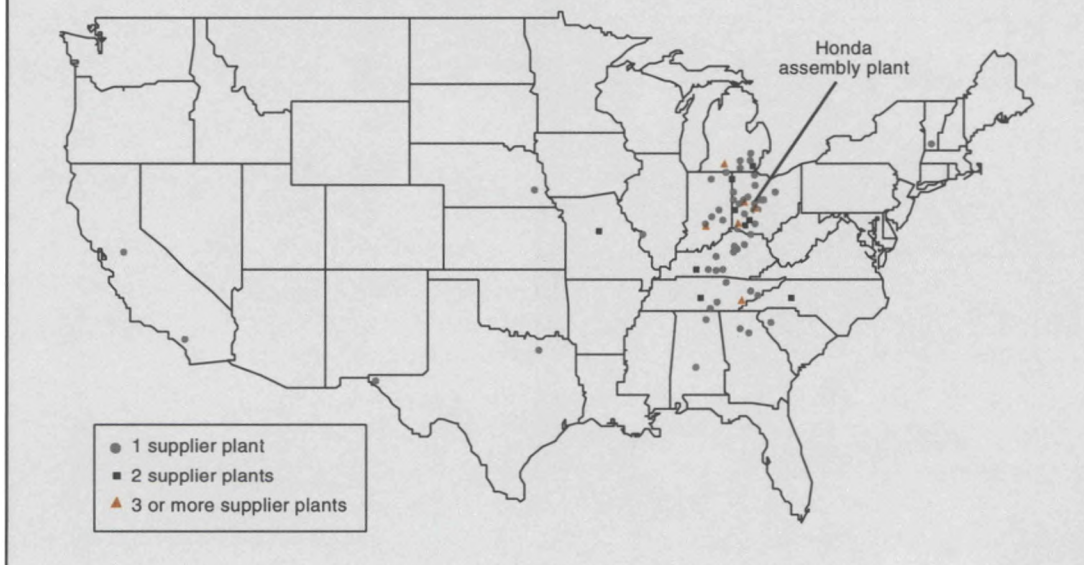




FIGURE 10

**Honda's transplant tier 1 supplier plants established 1982 or later (88)**



and Toyota's transplant tier 1 suppliers are located within 100 miles (two hours' driving time) of the assembly plant (36.3 percent and 27.6 percent respectively, compared with 14.7 percent and 5.5 percent of Honda's and Toyota's domestic supplier plants). In the case of AutoAlliance, about two-thirds of its domestic tier 1 suppliers that opened plants after AutoAlliance started operating chose to locate

in southeastern Michigan and northern Illinois, Indiana, and Ohio. Accordingly, table 6 shows that about 40 percent of its domestic supplier plants are located within 100 miles of the assembly plant. The statistical test produced no evidence of a significant difference between the average distances of AutoAlliance's domestic versus transplant suppliers.

FIGURE 11

**Toyota's domestic tier 1 supplier plants established 1988 or later (18)**

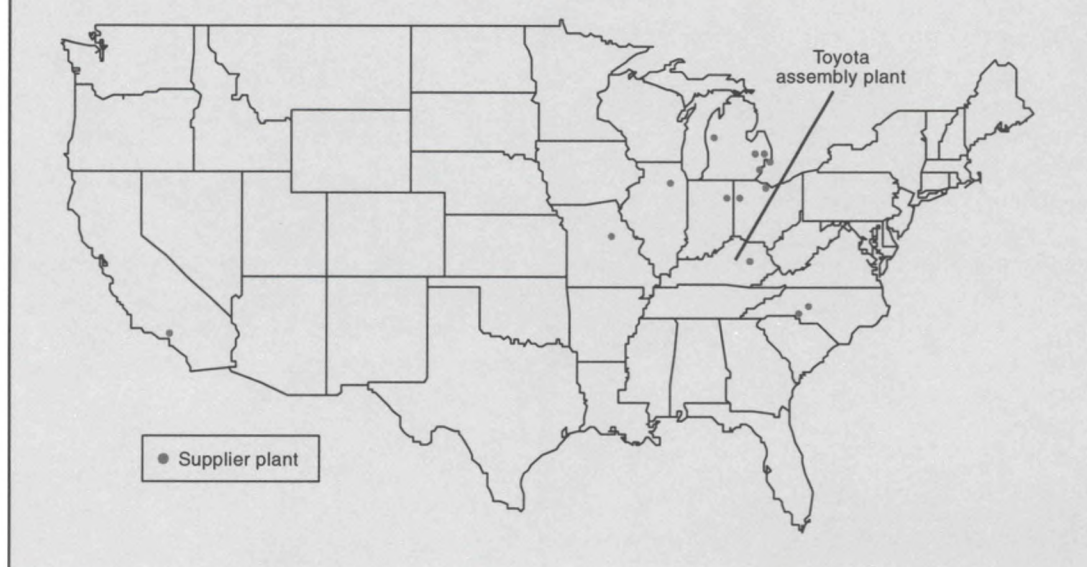
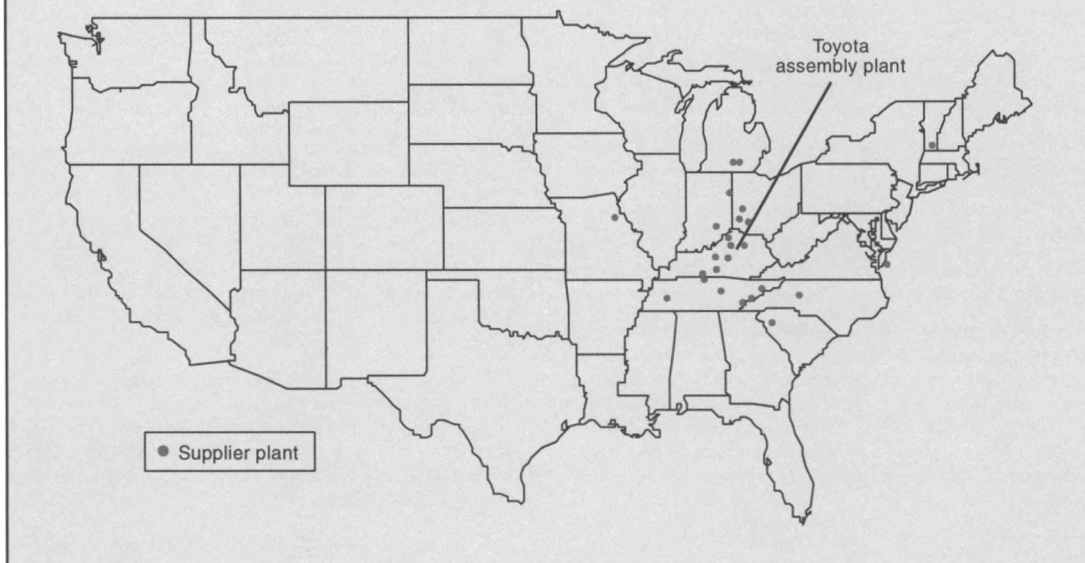


FIGURE 12

Toyota's transplant tier 1 supplier plants established 1988 or later (29)



**Summary and conclusion**

Lean manufacturing has been implemented in the American manufacturing sector for some time now. While there is agreement that this has raised productivity at the assembly plant level, it has not been clear what effect it has had on the geographic distribution of the supplier base. By refining a commercially available database, I was able to examine the supplier networks of some recently opened auto assembly plants located in the United States, focusing in particular on the spatial relationship between assemblers and their tier 1 suppliers. While I could not test changes in the spatial patterns of Big Three suppliers during the last decade, I have presented some new information on a set of mostly transplant assembly plants and their suppliers. This information affords a better understanding of the evolving geography of lean manufacturing.

Earlier findings about a movement of supplier plants toward the I-75/I-65 automotive corridor were confirmed. In addition, by distinguishing the age and ownership of the plants in the sample, this study found that since 1980 the majority of newly established tier 1 supplier plants that ship to at least one of the assemblers in the sample chose to locate within the so-called automotive corridor. The data show

the establishment of transplant supplier plants to be the main force in shaping a new geography in the supplier industry. While domestic suppliers were found to have located in the I-75/I-65 corridor as well, their average distance to the assembly plants in the sample is significantly larger. In addition, the data indicate that there are agglomeration effects in the automotive corridor and that the type of output produced also influences the location chosen.

The implications of these findings for regional development policy are neither clear-cut nor simple. While the evidence suggests the establishment of a new geography in the U.S. auto supplier industry, it is clear that that industry will not be nearly as geographically concentrated as it is in Japan.<sup>43</sup> Thus a state's ability to attract an assembly plant does not necessarily mean that a significant number of suppliers will set up shop nearby.

In further research on this topic, I will extend the analysis to the supplier networks of Big Three assembly plants and will apply formal location models to the data on hand. It would also be very interesting to obtain additional information for the sample plants, such as the location of the plant of the primary assembly customer.



## NOTES

<sup>1</sup>The importance of supplier networks is featured in a recent study on lean manufacturing in the auto industry (Andersen 1994) which suggests the management of the supply chain to be one of the key competitive factors. See also Bennet (1994) and Klier (1994). Rather than coordinating its entire supplier structure, an assembler prefers to deal directly with only a small number of supplier companies, referred to as tier 1 suppliers.

<sup>2</sup>Estall (1985), Kenney and Florida (1992), Mair (1992), and Dyer (1994).

<sup>3</sup>See Helper (1991) on the increased frequency of communication.

<sup>4</sup>See, for example, Glasmeier and McCluskey (1987), Reid (1995), and the references cited therein.

<sup>5</sup>See, for example, Mair (1992) and Erickson (1994). The issue is complicated by the fact that location patterns, once established, tend not to change over a short period of time, as they involve decisions with relatively long time horizons. See, for example, Ondrich and Wasylenko (1993) for a formal treatment of the location decision and Krugman (1991) for an explanation of the influence of history on the spatial pattern of economic activity.

<sup>6</sup>For example, Mair (1993).

<sup>7</sup>Cooper and Ruffenach (1993).

<sup>8</sup>Automobile assembly and component plants that are fully or partly owned by foreign companies are generally referred to as transplants. For the purposes of this study, the defining characteristic distinguishing transplant from domestic suppliers is the ownership of the plant, not its customers.

<sup>9</sup>See Henrickson (1951), Boas (1961), and especially Rubenstein (1992) for a historical overview of the geography of the U.S. automobile industry.

<sup>10</sup>Sheard (1983).

<sup>11</sup>See, for example, Angel (1994), Jones and North (1991), and Schamp (1991).

<sup>12</sup>Andersen (1994).

<sup>13</sup>Sadler (1994) suggests that the resulting smaller increase in spatial proximity is due to the relatively fragmented market for cars, supporting a range of independent automotive companies, prior to the arrival of Japanese transplants.

<sup>14</sup>McAlinden and Smith (1993); Miller (1988).

<sup>15</sup>Rubenstein (1992).

<sup>16</sup>Rubenstein (1992); Henrickson (1951).

<sup>17</sup>Glasmeier and McCluskey (1987).

<sup>18</sup>"Four were built in Mississippi, three in Louisiana, two each in Alabama and Georgia, and one each in Oklahoma, Texas, and Virginia" (Rubenstein 1992, p. 238). According to Rubenstein (1992), the proliferation of different models since 1960 led to a fragmentation of the market for passenger cars and reduced the need for branch assembly plants, that is, plants producing identical models at centers of demand for regional distribution. That resulted in a fair amount of restructuring at the assembly plant and, consequently, at the supplier plant level.

<sup>19</sup>In his study on the North American auto industry, Miller (1988) finds that the introduction of new supply philosophies has shifted suppliers slightly closer to assemblers.

<sup>20</sup>See Glasmeier and McCluskey (1987), Mair *et al.* (1988), Rubenstein (1992), Woodward (1992), and Mair (1994).

<sup>21</sup>See Mair *et al.* (1988).

<sup>22</sup>Rubenstein (1992); Klier (1993).

<sup>23</sup>Rubenstein (1992).

<sup>24</sup>ELM (1993), the ELM GUIDE supplier database. This database includes, among other things, the addresses of the supplier plants, a listing of each plant's customers, and a very detailed classification of products produced and materials used.

<sup>25</sup>It is difficult to accurately assess the coverage of this database, since the size of the true population is unknown. However, anecdotal evidence on Honda (Mair 1994) and Nissan (Bennet 1994) indicates reasonably good coverage of the tier 1 supplier plants. Furthermore, the information obtained from the ELM database is qualitatively consistent with previously published accounts (see Mair *et al.* 1988, Kenney and Florida 1992, Rubenstein 1992, and Mair 1994). Therefore I do not expect the results to be biased.

<sup>26</sup>The nine assembly plants were all opened after 1980 and were mostly transplants. Ideally one would like to investigate the supplier networks of all U.S. assembly plants opened after 1980 and compare them to pre-lean manufacturing patterns. However, geographic linkages between assemblers and suppliers at the plant level were available only for the eight assemblers listed in table 1. In addition, I could find no comparable information on pre-1980 supplier networks. As Honda's two Ohio assembly plants are only about 15 miles apart, I treated them as one site.

Eight Big Three assembly plants have been opened since 1980: GM's plants in Orion Township, MI; Bowling Green, KY; Fort Wayne, IN; Wentzville, MO; and Hamtramck, MI; and Chrysler's plants in Detroit, MI (Mack Ave. and Jefferson Ave.), and in Sterling Heights, MI. Almost all of these are in the traditional assembly region of the lower Great Lakes states (see Boas 1961). Also excluded from the study were the 20 pre-1980 U.S. car assembly plants of the Big Three that were in operation during 1993. (See *Ward's Automotive Yearbook*, various years.)

Because of the weak coverage of "mixed" plants, I excluded that segment from further analysis.

<sup>27</sup>Japan Economic Institute (1992).

<sup>28</sup>Glasmeier and McCluskey (1987) compared "recently built" facilities with the overall pattern of auto parts production. However, in their study they do not indicate the time frame used to define these plants. Moreover, from the 17 observations they had in the "recently built" category, the authors can only speculate as to possible implications.

<sup>29</sup>See Mair *et al.* (1988).

<sup>30</sup>As recently as 1988, Miller found no evidence of a noticeable shift in parts-making activities (Miller 1988).

<sup>31</sup>Ohio experienced both a very significant decrease in the percentage of domestic plant openings and a dramatic increase in the percentage of transplant plant openings since 1980. This makes Ohio a very interesting case study (see Rubenstein and Reid 1987).

<sup>32</sup>Given the nature of the sample, I could obtain no evidence on possible changes in the location patterns of the networks of Big Three assembly plants. In addition, the smaller effect of location changes among domestic tier 1 suppliers might well be related to the extent that transplant assembler plants resemble secondary customers of these supplier plants. However, information to support this claim is currently not available. See the following section for evidence of spatial patterns of domestic supplier plants at the network level.

<sup>33</sup>Of the 118 domestic supplier plants opened since 1980, only 13.6 percent had no Big Three companies listed as customers. That compares to 36 percent of the 165 transplant supplier plants that opened during the same time period (see ELM

1993). However, the lack of information on the relative importance of a supplier plant's customers prevents a more detailed look at that issue.

<sup>34</sup>Of the 1,383 tier 1 plants identified in the database, 38 list sensors as one of their products. Only 39 percent of these plants are located in the five automotive corridor states, Michigan, Indiana, Ohio, Kentucky, and Tennessee. By comparison, 10 of the 13 seat plants are located in the automotive corridor.

<sup>35</sup>In terms of the type of parts produced, no particular group dominates the recently established non-auto-corridor plants. However, the parts tend to be relatively lightweight. Plants located in the Northeast tend to produce electronic and electrical parts.

<sup>36</sup>As only nine suppliers to Saturn opened plants since 1990, the start-up year for the Tennessee assembly plant, its network is not discussed in detail. In addition, no further analysis is undertaken for the networks of NUMMI, Subaru-Isuzu, and Diamond-Star. The fact that neither could attract a noticeable number of supplier plants close to the assembly plant is probably an indication of agglomeration effects in the automotive corridor.

<sup>37</sup>The distances were calculated by means of the mapping software MAPINFO at the county resolution.

<sup>38</sup>In the case of Nissan, the difference is significant just above the .10 level.

<sup>39</sup>Dyer (1994) reports that the average distance between Toyota's assembly plants and its independent suppliers in Japan is only 87 miles. In contrast, he reports that the average distance between GM's assembly plants and its independent suppliers in the U.S. is 427 miles.

In a study done over 40 years ago, Henrickson (1951) lists sources of metal automobile parts to the Buick assembly plant complex in Flint. The average distance between independent supplier plants pre-1950 (58 plants) to the Buick plant can be calculated as 294 miles; information reported for the year 1950 (39 plants) results in an average distance of 309 miles.

<sup>40</sup>Saturn was not included in the definition of Big Three. The actual percentages are as follows: 45.5 percent of Honda's transplant suppliers do not list Big Three customers, versus 14.7 percent of its domestic suppliers; Nissan, 27.4 percent versus 11.4 percent; AutoAlliance, 19.1 percent versus 13.0 percent; and Toyota, 48.3 percent versus 22.2 percent.

<sup>41</sup>The number of observations in the "domestic" supplier category is too small for meaningful tests of statistical difference in the average distances within that subsample.

<sup>42</sup>A closer look at the parts produced by supplier plants located within very close range of the assembly plant reveals an emphasis on interior body systems and components (such as dashboards, seats, door panels, and instrument panels) and body glass and components (such as windshields and rear and side windows).

<sup>43</sup>Andersen (1994) and Dyer (1994).

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## Can alternative forms of governance help metropolitan areas?

Richard H. Mattoon



Economic development theorists are increasingly promoting the development of strong regional economies as the key to successfully attracting and maintaining economic activity when global competition and technological change are making business location choices increasingly far-flung.<sup>1</sup> At the core of healthy regions are metropolitan areas that offer the amenities and services that businesses demand. One school of thought suggests that while metropolitan areas are particularly critical to regional economic success, current growth patterns are leading to urban sprawl and the inefficient delivery of public goods and services that will ultimately undermine the economic prospects of entire metropolitan regions. Yet deconcentration of economic activity is entirely rational given the present rules of the economic development game. Research has shown that any town will receive a tax benefit from securing commercial development even if that development has negative spillover effects on the region.<sup>2</sup> However, since there are no political and economic structures to promote the region's interests over those of individual towns, the pattern of uncoordinated growth continues. The most frequently suggested solution to this problem is some form of centralized metropolitan or regional government that can coordinate growth and help the entire region to share the benefits of economic growth.

In addition to the potential benefits of coordinated regional growth, supporters of consolidated metropolitan governments usually

suggest that economies of scale in the production and distribution of public goods are available to larger government units.<sup>3</sup> These efficiencies lower the cost of government while providing the types of uniform governmental services that should appeal to businesses when making locating and operating decisions.

The issue of metropolitan governance is of particular interest to the Midwest. Central cities in the region have been experiencing population declines. Recent economic and population growth in metropolitan areas has been achieved largely by the spread of activity into more distant suburbs, resulting in a pattern of uncoordinated land use. Such development is occurring in metropolitan areas across the nation, but it is more noticeable in the industrial cities of the Midwest, where central cities historically had high densities of both economic activity and population. While newer metropolitan areas can be designed to accommodate the infrastructure that is needed to promote commerce, midwestern cities are often left with an aging infrastructure that was designed to support the commerce of the early 1900s, not that of the 1990s. Given this disadvantage, promoting a healthy and integrated region is arguably more critical to the Midwest than to other regions.

The Midwest is an appropriate arena in which to examine the issue of metropolitan governance, for it is home to some of the most

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extreme examples of both consolidated and fragmented government in the nation. From the relatively tightly knit structure of Unigov in Indianapolis to the highly fragmented structure of overlapping governments in Chicago, the full range of government types is available.

This article will address the question of whether there are advantages to changing some aspects of metropolitan governance. It will further assess some midwestern experiments in metropolitan government.

### How have metropolitan areas in the Midwest changed?

Population movement in the early 1900s tended to be from rural areas to the central city. Today, population is still moving from rural areas to metropolitan areas, but at the same time, the population within metropolitan areas is spreading out of the central city into the surrounding suburbs and outskirts. Thus in many midwestern cities, while metropolitan population has grown, the population of the central urban areas has declined (see table 1). This is the most significant dynamic influencing midwestern metropolitan areas.<sup>4</sup>

The spread of population out of the center city is not a bad thing in itself. Some would argue that the high population density in the city helped create pollution, overcrowding, and a variety of problems associated with congestion. Some support for lower population density can be drawn from the fact that density in the fastest growing Sun Belt cities is significantly lower than in "sister" midwestern cities. This fact is sometimes interpreted to indicate that lower density is better suited to promoting growth in the current economy (see figure 1). One urban analyst, David Rusk, has even suggested that modern cities appear to have difficulty growing economically once their population density exceeds 5,000 people per square mile.<sup>5</sup> This is at least partially due to Americans' apparent preference for living in lower-density communities.

The economic conditions that once favored the development of high-density central cities have moderated for several reasons. First of all, many midwestern cities grew because they were close to a natural resource that gave them a comparative advantage over other locations. Often this was a river or other body of water on which commerce could be transported. This economic advantage created others

**TABLE 1**  
**Population growth, 1950-90**

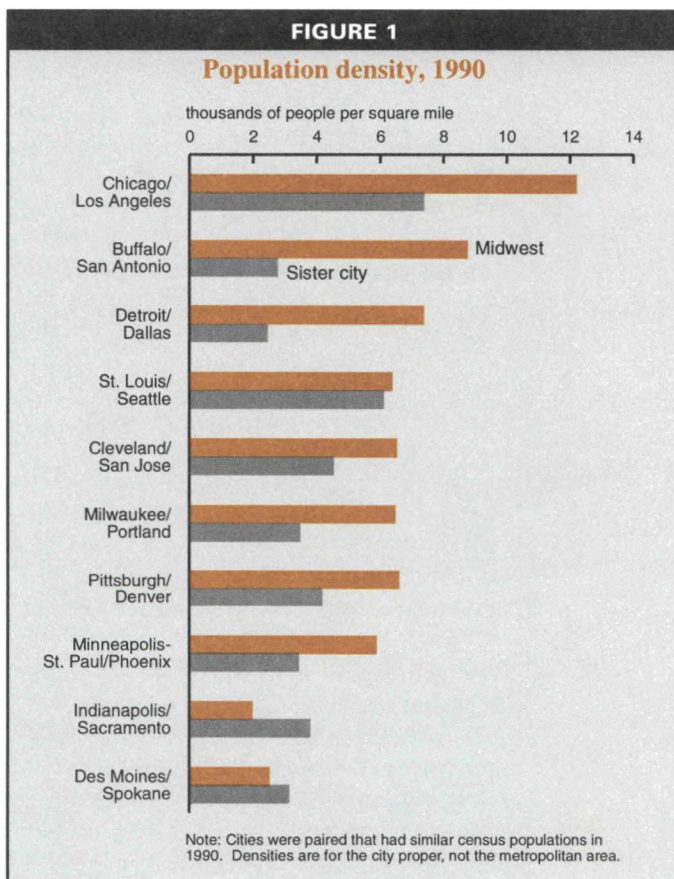
	Percent change
Chicago metropolitan	35
Chicago city	-23
Cleveland metropolitan	19
Cleveland city	-45
Columbus metropolitan	89
Columbus city	68
Detroit metropolitan	35
Detroit city	-44
Indianapolis metropolitan	72
Indianapolis city	71
Milwaukee metropolitan	41
Milwaukee city	-1

Sources: For Chicago, author's calculations. For other cities, Rusk (1993).

that encouraged the clustering of the labor force in the city.<sup>6</sup> Today economic activity is more often associated with concentrations of capital and human skills than with natural resource endowments. Since both capital and labor are significantly more footloose than natural resources, this has weakened the comparative advantage that cities derived from their natural resources. Accordingly, growth no longer needs to concentrate at a central place. Instead, it has become multimodal, with pockets of economic activity emerging throughout a metropolitan region, in proximity to each other but spread over a larger area. In the process the boundaries between urban, suburban, and rural areas have become blurred, and the entire metropolitan region has become more economically homogeneous.

Not all aspects of this deconcentration are benign, and numerous analysts have questioned whether it represents a new pattern of rational economic growth or simply unregulated sprawl.<sup>7</sup> While the forces leading metropolitan areas to spread out may reflect the natural demands of the economy, the response of local governments in dealing with the trend may be producing new problems. Anthony Downs argues that as development has moved out of the cities, individual towns have adopted policies that protect their interests but create a patchwork of regulations that ultimately harm region-wide development prospects.<sup>8</sup> Initially





towns often pursue new commercial development at virtually any cost, using tax breaks and land write-downs as incentives. Little attention is paid to the increased congestion and pollution that may spill over into surrounding communities, which may lack the infrastructure to support these new burdens. Since the property tax advantages of commercial development are limited to the town in which the development occurs, adjacent communities are often forced to accommodate the development without any greater fiscal resources. Once residents decide that additional growth is not desired, towns may move to the next stage of this process, instituting growth-management policies to force development elsewhere or to regulate closely the type of development that can occur.

### A second issue: Optimal government size

Even if the potential harmful effects of urban sprawl were not a consideration, metropolitan governance may be warranted on the grounds of optimal government size. The efficiency with which government provides its

services is receiving growing attention, as efficient firms need efficient government to help (or at least not hinder) their performance in the world economy.

A substantial body of research since the 1920s has examined whether larger consolidated governments are more efficient in producing services than smaller, more fragmented units. Bish and Nourse (1975) summarize the assumptions in favor of a single consolidated government across three dimensions. First, a metropolitan area is actually a single community linked by a shared economy but artificially divided by fragmented government jurisdictions. Second, the metropolitan-wide needs of citizens and businesses cannot be met by this fragmented governmental structure. Third, the elimination of fragmented jurisdictions will eliminate duplication and overlap among governmental units in favor of a single metropolitan government that can more effi-

ciently provide public goods and services at greater economies of scale.<sup>9</sup> As the authors point out, evidence as to whether this last assumption is true has been contradictory.

In an attempt to identify the optimal size of government, economists have tried to estimate the spillover effects and the scale economies that are produced when a central government provides a uniform service across a metropolitan region.<sup>10</sup> If positive spillovers and significant scale economies exist, centralized provision of services may be warranted. In general, this appears to be the case most often with government services that are well-suited to technical solutions. For example, water, sewage disposal, and electric services appear to be most efficiently provided by a centralized metropolitan-wide government. Supporters of such government also argue that mass transit, transit planning, and even land use planning also appear to benefit from central provision. Services that tend to be poorly provided by centralized governments are many social services such as education and

welfare. Moreover, localities may prefer to decide for themselves what levels of these services to provide.<sup>11</sup>

Economists in general have been careful not to overstate the potential benefits of having governmental services provided by single, metropolitan-wide governments. Much of the criticism of such government rests on the work of Tiebout (1956), who suggested that consumers are best served when they are free to move and can choose communities that provide their desired level of public services. The resulting competition among communities not only allows individual towns to provide their own unique set of services, but also should in principle control the size of government.

This view is supported by Eberts and Gronberg (1988), who found a statistically significant relationship between the number of general-purpose governments at the metropolitan and county level and their size as measured by the share of personal income devoted to local governmental expenditures. The more general-purpose governments there are, the smaller the share of personal income required to support local government. While this finding supports the idea that decentralized government promotes fiscal competition and holds

down the cost of government, it does not indicate whether such governments can provide better-quality services than more centralized governments. Not surprisingly, this uncertainty has led to the policy prescription that a hybrid approach to providing governmental services works best. Rather than uniformly supporting either a centralized or a fragmented government structure, this prescription argues that one should consider the nature of the service and assign its provision to the appropriate level of government.

### Can centralized metropolitan governance help with sprawl?

Whether a more centralized model of governance could alter the current pattern of metropolitan deconcentration really depends on which forces are causing the population to spread out.<sup>12</sup> If deconcentration is occurring because more efficient production and lower transportation costs are available outside the central city, then policies to reverse deconcentration may simply promote inefficiency. If, however, it is due to negative externalities associated with the city such as social problems, then deconcentration may indicate an inefficient distribution of available resources.

**TABLE 2**  
**Correlations: Central city with metropolitan area and suburbs**

	Metropolitan area	All suburban counties <sup>a</sup>	Counties with no central cities	Counties with central cities
<b>Population growth</b>				
1960–70	0.609	-0.188	-0.041	-0.322
1970–80	0.729	0.261	0.233	0.317
1980–90	0.709	0.273	0.239	0.401
<b>Real per capita income growth</b>				
1960–70	0.815	0.456	0.398	0.503
1970–80	0.872	0.552	0.479	0.686
1980–90	0.835	0.605	0.603	0.599
<b>Average real house value growth<sup>b</sup></b>				
1970–80	0.906	0.525	0.480	0.706
1980–90	0.939	0.849	0.820	0.877
<b>Number of observations</b>	281	656	391	265

<sup>a</sup>Includes all parts of the county except the central city.  
<sup>b</sup>City and suburban average house value correlations have fewer observations; reading across, the numbers of observations for the 1970s are 224, 569, 359, and 210; for the 1980s they are 279, 651, 388, and 263.  
Source: Voith (1993).



In this latter case, deconcentration may not reflect some optimal reconfiguration of regional resources, but rather, a type of sorting process in which people and firms relocate to areas that serve their individual needs but do not necessarily promote the interests of the region. Anecdotal evidence about the growing pains associated with suburban growth suggests that deconcentration is at least partially being driven more by “flight from blight” than from some optimal reconfiguring of resources to maximize efficiency in the regional economy.<sup>13</sup>

However, a frequent criticism of efforts to introduce metropolitan governance is that they are thinly disguised attempts to force development back into the central city. Those analysts who believe metropolitan deconcentration will improve regional economic efficiency suggest that central cities may be an anachronism, and that the increasing preference of firms for suburban locations can result in healthy suburbs able to function without a healthy central city. In the Midwest, Detroit is often presented as an example of such a scenario. On the surface, it appears that the suburbs surrounding Detroit have continued to flourish despite the sharp decline of the central city. Those suburbs may have absorbed the industries that have left the city, in which case economic activity has not left the area but simply has redistributed itself. Since commercial development usually benefits the community in which it is located,<sup>14</sup> it is not clear that suburban communities would embrace a new form of governance that was expected to channel commercial development back into the urban area. If they did so, they would surrender the tax benefits they would receive if they captured the development themselves. However, evidence suggests that healthy suburbs need healthy cities in order to grow.<sup>15</sup> Furthermore, anecdotal evidence suggests that many of the healthiest metropolitan areas rely more heavily on various forms of regional governance.

Establishing a structure to promote regional problem-solving and consensus-building has become more important as cities and their suburbs appear to have become more interdependent in important ways. A variety of research has found links between the health of central cities and the development prospects of the suburbs.<sup>16</sup> Gains in city and suburban populations, per capita income, and housing values are

positively correlated, and these relationships have strengthened every decade since 1960 (see table 2).<sup>17</sup> Such positive relationships suggest that population, income, and housing values in the suburbs are related to (or at the very least not independent of) the vitality of the central city. However, one must interpret such correlations carefully. Rather than reflecting greater interdependence between city and suburbs, they may simply indicate that as economic activity has moved to the suburbs, suburban economies have begun to resemble city economies and now react to external forces in the same manner as their city counterparts.

While much of this research is still quite new, it has yielded two interesting findings. First, the age of the city matters when it comes to growth prospects. Second, the period over which deconcentration is examined matters when it comes to measuring whether suburbs can flourish without a healthy central city. Norton (1979) found that U.S. cities that developed before 1920 have faced significantly different economic prospects than cities developed after 1920. The pre-1920 or “old” cities are characterized as being largely landlocked, constructed before automobile transportation was the dominant form of transportation, and having high population densities. The younger, post-1920 cities have lower population densities, tend to have fewer spatial restrictions, and have grown through active annexation of surrounding areas. Norton examined the trends in population, density, age of housing stock, and the ratio of household incomes of city dwellers versus suburbanites from 1950 to 1975 in order to assess how the age of a city influenced growth. The “old” cities in the sample, which had large percentages of housing stock built before 1939, shrank during this era; the young cities grew. Norton’s sample included four midwestern cities—Chicago and Detroit labeled old, Indianapolis labeled young, and Milwaukee somewhere in-between and labeled anomalous. If the variables Norton examined are updated to 1990 for these cities, the pattern remains much the same except in Milwaukee, which now appears to behave more like the old cities than the new (see table 3).

Initial decline in the central city may not seem to set off any alarm bells, but over time, it will affect the suburbs as well. Scholars of metropolitan development have suggested that

TABLE 3					
Differences between "old" and "young" midwestern cities					
A. 1975					
		Population change, 1950-75	Population density	Pre-1939 housing	Ratio of household income, city/SMSA ring
		(percent)	(000s per sq. mile)	(percent)	
OLD	Chicago	-14	15.1	67	73
	Detroit	-28	11.0	62	82
ANOMALOUS	Milwaukee	4	7.6	55	73
YOUNG	Indianapolis	67	1.9	40	107
B. 1990					
		Population change, 1970-90	Population density	Pre-1939 housing	Ratio of per capita income, city/suburb, 1989
		(percent)	(000s per sq. mile)	(percent)	
OLD	Chicago	-12.7	8.9	45	66
	Detroit	-21.4	4.2	36	53
ANOMALOUS	Milwaukee	-4.5	6	38	62
YOUNG	Indianapolis	-1.6	2	19	90

Sources: For 1975 data, Norton (1979). For 1990 data, author's calculations.

it passes through six stages, as illustrated in table 4.<sup>18</sup> According to Rothblatt, the majority of U.S. cities are operating at stage 5, "absolute decentralization."<sup>19</sup> In this stage, the central city's population is shrinking, the metropolitan area's population is growing, and the perceived characteristics of the metropolitan area (such as tax burden, infrastructure, or congestion) are seen as worsening. If the process moves to the next stage, the decline of these characteristics will accelerate. Rothblatt points out that the consequences of this evolution are particularly worrisome in an increasingly global economy, in which firms have more choice in location and can leave declining areas. As urban markets expand and become more competitive, firms must be efficient in order to survive. This in turn requires well-managed and supportive metropolitan areas. If deconcentration leads to metropolitan diseconomies such as traffic congestion and higher housing prices, firms will begin to seek other loca-

tions. Initially these may only be farther-outlying suburbs, but as diseconomies spread throughout the metropolitan area, economic activity will begin to leave the area altogether.

Such a scenario makes clear that the problems and growth prospects of metropolitan areas have become more interdependent. It also makes clear the importance of establishing regional mechanisms to promote regional consensus-building and problem-solving.

TABLE 4			
Metropolitan development and population change			
Stage	Core	Ring	Metropolitan area
1. Centralization	+	-	+
2. Absolute centralization	++	+	++
3. Relative centralization	+	++	+
4. Relative decentralization	-	+	+
5. Absolute decentralization	-	+	-
6. Decentralization	-	-	-

Source: Rothblatt (1993).



### Is there a better way?

Developing a better structure for governing metropolitan growth has long been of interest to planners and academics. Voters and politicians, however, have viewed such proposals with suspicion, envisioning an additional layer of government that would only duplicate existing governmental functions without providing any clear benefits. In addition, local governments are unlikely to want to cede powers to a new level of government.

Nevertheless, some notable examples of metropolitan governance allow us to assess its potential benefits. In the Midwest, these include the Metropolitan Council of Minneapolis/St. Paul, Unigov in Indianapolis, and the Allegheny Regional Asset District in Pittsburgh. None of these has been as ambitious or as successful in many ways as large-scale efforts such as Toronto's.<sup>20</sup> In most cases, metropolitan governments have been established to fill planning gaps between other existing levels of government. These governments are not designed to function in any comprehensive fashion. As such, they provide limited examples of the potential for metropolitan governance rather than serving as ready-made models to be implemented elsewhere.

#### *Minneapolis-St. Paul*

Metropolitan governance has a longer history in the Twin Cities than in virtually any other U.S. city. As early as 1957, the Metropolitan Planning Commission (MPC) was established to coordinate issues of regional growth.<sup>21</sup> However, this was a voluntary council of governments that proved largely ineffective in managing growth. While the MPC was well equipped to study the nature of growth problems and to suggest potential solutions, it could not enforce any of its suggestions. Once this became apparent, the MPC was supplanted by the Metropolitan Council of the Twin Cities in 1967. The council has been credited with notable successes, but significant obstacles still prevent it from operating as a fully developed regional policymaker.

The Metropolitan Council covers seven counties in the metropolitan area containing roughly 272 governments: 7 county, 138 city, 50 township, 49 school district, 6 metropolitan, and 22 special purpose districts. Probably none of these governments has a signifi-

cant interest in reducing its own authority. Accordingly, the role of the council from the beginning was to fill the gaps, handling issues that other governments were unwilling or unable to manage. Its charge was to coordinate planning, particularly in the area of physical infrastructure.

The council's structure has several unique aspects. First, although its interactions are with local and county governments, it was created by the state legislature, to which it reports. This suggests that the council's primary audience may be state rather than local government, although over time, local considerations appear to have become more influential in the council's deliberations. Second, all 17 council members are appointed by the governor, with some input from legislators from the metropolitan area's districts. Being appointed may help protect council members from feeling particularly beholden to parochial interests, since they are not forced to respond to a local constituency. On the other hand, it reduces the leverage of the council members, since they lack broad-based public support and are rarely well known within the metropolitan area. Third, by design the council has very little operating authority. While it oversees and approves the budgets of some smaller regional operating authorities, its main charge is to review and plan for long-range expenditures in the region. The council has proven to be reasonably effective in carrying out this charge in the area of physical infrastructure. Critics have suggested that the council has been less effective in social policy; its efforts in health care and education have so far been largely unsuccessful.

Two widely acknowledged partial successes for the council were its 1973 Metropolitan Development Guide and its successful tax-base sharing program. The former was an ambitious state-mandated plan to rationalize growth within the region in order to prevent urban sprawl. Its major goal was to stop development from leapfrogging into rural locations, directing it instead to the central city and the already heavily developed first-ring suburbs with existing infrastructure. In addition to this primary goal, the plan had subsidiary goals of preserving the natural environment, expanding people's social choices, lowering the concentration of minorities in the central city, and diversifying the sources of

regional economic growth. Two other objectives were to increase the equitability of financing for public services and increase citizen involvement in regional governance.

Assessments of the council's efforts to channel development have been mixed. Clearly, the Twin Cities shifted some development into the central city during the mid-1970s and 1980s. Commercial construction in the city remained strong, and the economic prominence of Minneapolis-St. Paul was enhanced. The central city did lose population during this period, particularly in comparison to the outer-ring suburbs. But there is some evidence that growth was channeled into the first-ring suburbs, which suggests that the council's efforts were at least partly successful. Population density in the close-in suburbs rose, perhaps because in-fill development appeared more attractive. While population growth accelerated in the outlying suburbs, commercial development did not leapfrog in the usual pattern. Enforcing this containment were limitations on sewer and water extensions onto working farmland.

The plan's success was limited in another way as well. While development within the designated planning area was influenced, uncontrolled development continued in the fringe area just outside the five districts under the council's jurisdiction. Since the plan did not allow the districts to annex the surrounding areas, growth on the fringe went largely unchecked.

A second major effort of the council that has met with some success is mandated tax-base sharing. In 1974, Minnesota's Fiscal Disparities Act was passed with the goal of reducing the disparities in the tax base between towns caused by the concentration of commercial activity. Proponents of the act argued that towns that attracted commercial activity received significant tax benefits, while neighboring areas had to deal with the spillover effects without receiving any tax benefit. Using 1971 as the base year, the law stipulated that 40 percent of the net gain in new commercial and industrial development would be dedicated to a tax-base-sharing pool that would channel money to communities unable to attract commercial development. Allocations would be based on a formula that took into account population growth and the fiscal capacity of each town. With this plan, the ratio between the highest and lowest commercial and industrial tax base

per capita in 1991 was 4 to 1; without the plan, it would have been 22 to 1.<sup>22</sup> The primary beneficiaries of this plan have been fast-growing residential areas lacking commercial development. Ironically, because of the concentration of commercial construction downtown, the central city has ended up a net contributor.

Many analysts have rated the Metropolitan Council as at least a partial success. It has had a significant influence in planning infrastructure, ranging from development of the metropolitan airport to the siting of the Metrodome sports complex and the giant retail center, the Mall of America. However, because the council lacks enforcement power, its influence is largely limited to its powers of persuasion. Part of its success is attributed to the belief that the Twin Cities region appears to be more accepting of the notion that without a strong and vital central city, the region will be unable to compete for jobs and new industries. The region's alleged acceptance of this notion in turn appears due to two factors. First, it is the only significant metropolitan area within a 400-mile radius. This relative isolation means that no other place in the region is likely to be a significant draw for new economic activity. Second, intraregional options for economic growth are few. Growth in the region's agricultural industries appears limited, and the region's traditional mining activity has faded. Accordingly, the health of Minnesota's economy has become more heavily dependent on the success of the metropolitan Minneapolis-St. Paul area.

Perhaps another reason for the greater acceptance of metropolitan governance is cultural. The northern European population that was initially drawn to this area embraced cooperative ventures, with farming, dairy, electrification, and even housing co-ops relatively common. Some analysts have suggested that this has carried over into a greater acceptance of government structures drawing on broad networks of resources. A final reason for the success of the Twin Cities' regional governance may be the area's cultural homogeneity. Some evidence suggests that the more racially different the populations of the central city and the surrounding suburbs, the less likely the region is to embrace metropolitan governance, particularly when it perceives such governance as primarily a measure to help the central city at the suburbs' expense. As the Twin Cities'



minority population stands at only 12 percent, this is the most homogeneous metropolitan area of the thirty largest in the country.<sup>23</sup>

These factors may have combined to make acceptance of metropolitan governance more likely in the Twin Cities region. However, even in this more friendly environment, such a structure is seen largely as filling gaps between other layers of government. Without enforcement powers and without the ability to annex new areas as the region grows, the future of the Metropolitan Council is still unclear. It has yet to demonstrate that it can successfully address social infrastructure problems. As with most governments, once its role is defined, it may have difficulty reinventing itself.

### *Indianapolis and Unigov*

Another Midwest experiment in regional governance is Unigov in Indianapolis. In the late 1960s, Indianapolis Mayor Richard Lugar established the Governmental Reorganization Task Force to investigate the potential for creating a unified county-city governance structure for Indianapolis and the surrounding municipalities in Marion County. The original goal was not a single body responsible for all governmental functions in the area, but only a unified legislative body—the City-County Council, with the mayor of Indianapolis as its Chair.<sup>24</sup>

Initial support for Unigov was not overwhelming. Many city constituents, particularly black residents, saw it as an attempt to dilute their political influence. Although minorities were a growing segment of the city's population, Unigov would add 113,000 mostly white suburban residents to the electorate that would then total 406,000 voters. These numbers would swing the city-county elections to the Republicans. Proponents of Unigov recognized that support for the new consolidated structure might not run deep and chose not to seek a voter referendum to approve it. Instead, Unigov was ultimately approved only by the Indiana legislature. Unigov's proponents brought a voluntary lawsuit against themselves in order to ratify the legitimacy of the new structure and forestall potential court challenges.<sup>25</sup>

Marion County still contains 50 separate local governments and 100 taxing units. But the Unigov legislation created Indiana's only consolidated city, with geographic boundaries that roughly equate to those of Marion County.

The boundaries of Indianapolis expanded from 82 to 402 square miles, its population from 480,000 to 740,000. The legislative body responsible for governing the area is the 29-member City-County Council elected to four-year terms, 25 from single districts, 4 at large. The mayor is the executive of the consolidated city and is elected city-wide.

The consolidated city has six administrative departments below the mayor's office: Administration, Metropolitan Development, Parks and Recreation, Public Safety, Public Works and Transportation, and Public Health. Housed in the executive branch, these departments provide county-wide services that had previously been performed by 16 independent special-purpose corporations. Six independent municipal corporations remain outside the consolidated city's direct control. These corporations tend to be single-function governments (the Health and Hospital Corporation, the Airport Authority, the Public Transit Authority, and the Public Library), but they also include the more broadly chartered Capital Improvement Board and the City-County Building Authority. Even though these remain independent corporations, the City-County Council has been given the power to review their budgets and appoint governing members to their boards.

Other notable government units not contained in Unigov include the Marion County government, which still exists in a diminished form, and the county court system. In addition, when Unigov was created, four municipalities received "excluded cities" status and retained their own government structures. Another 17 municipalities received the ambiguous designation of "included towns," which meant that while they maintained their own local government, they could vote in the county-city elections because they paid taxes and received certain consolidated city services. Finally, independent school districts were left out of the Unigov structure. The disadvantage of this structure is that it makes for a patchwork in terms of the geographic area and way in which services are provided.<sup>26</sup>

Despite this somewhat awkward framework, Unigov has provided revenue benefits to the consolidated city and has permitted revenue diversification that probably would not have occurred otherwise. Some of this diversifica-

tion has been forced on the consolidated city by actions of the state and federal government, but the enlarged scope of the city has enabled greater flexibility in dealing with changes in revenue structure. For example, in 1973 the state legislature passed a property-tax reform measure designed to limit the growth in the property-tax rate. Towns were compensated through a state property-tax replacement fund, whose revenues were derived from an increase in the sales tax. Since this measure put a limit on future growth in the property tax, the search for alternative revenues became increasingly important. Similarly, the decline in federal support, particularly block grants, made local revenue-raising more important. Unigov helped expand the fiscal base of the city and allowed the passage of new revenue-raising options that have not made the central city prohibitively more expensive (from a tax perspective) than adjacent communities. A county option income tax was adopted in 1983; a 10 percent county excise tax on automobiles and a wheel tax on trucks were also adopted. Fees and charges on sewers, solid waste collection, building permits, and other services have also been adopted, but since these are county-wide, they do not unduly distort the city's tax base relative to other communities.

Similarly, Indianapolis has pursued the usual array of tax incentives to attract and retain businesses in the area, but because it can draw on the larger tax base of the consolidated city, the cost of the incentives to the individual town is reduced. In turn, the benefits of added economic development can be shared county-wide. The city-county government has also used its powers of eminent domain to rationalize economic development by assembling appropriate parcels of land for development.

While these measures have helped with both economic growth and revenue-raising, they have not eliminated disparities in property tax rates between counties. In 1992 there were 60 applicable property tax levies and 63 defined taxing jurisdictions within Marion County. Nominal property tax rates ranged from \$7.92 to \$13.09 per \$100 assessed valuation. This variation is because certain services are still supported only by the local tax base, not that of the consolidated city. In the community with the highest tax rate (Center Township in downtown Indianapolis), public assistance

needs run high and are supported exclusively by property taxes imposed on Center Township properties.

Finally, one fiscal advantage that Unigov has provided is the ability to borrow money. The expansion of the city's boundaries to include the surrounding suburbs has made it easier to finance large-scale capital projects, since the expanded tax base can support them. It has also arguably lowered debt costs, since the increased flexibility provided by the larger and more diverse tax base has led bond rating agencies to give Indianapolis consistently high debt ratings.<sup>27</sup>

### **Allegheny Regional Asset District**

One of the most recent attempts at regional government is the Pittsburgh-area Allegheny Regional Asset District.<sup>28</sup> Established in 1994, this governmental body was designed by the County Commissioners to address five policy objectives: improving and stabilizing funding for regional assets, correcting funding inequities for Pittsburgh, relieving overreliance on selected taxes (particularly property taxes), reducing fiscal disparities between rich and poor communities, and enhancing regional cooperation. The district has no direct taxing authority but receives 50 percent of the proceeds from the 1 percent county-wide local option sales tax. It uses these funds to support so-called regional crown jewels—amenities located in Allegheny County that benefit all residents.

In 1995, 30 percent of the district's funds went to parks and 32 percent to libraries. Other recipients were sports venues, cultural entities, and special facilities such as zoos. Many of these regional assets are in the city of Pittsburgh and have a recent history of financial distress. City resources for funding them have become strained as the central city's growth has lagged that of the suburbs. This left Pittsburgh in an awkward position. While it was still the heart of the region's economy, it was having to fund amenities that no longer primarily benefited city residents. For example, the city zoo was funded primarily by the city before the district was created, although 75 percent to 85 percent of the visitors to the zoo lived outside the city limits. The creation of the district has saved the city approximately \$16 million in annual expenditures on this and other crown jewels.



The county government and 128 municipal governments spend the remaining 50 percent of the sales tax proceeds on the other policy objectives endorsed by the County Commissioners. Allegheny County uses its 25 percent of the total sales tax revenues to reduce property taxes by 25 percent and to eliminate the county-wide personal property tax. The remaining funds are distributed to municipalities on a formula basis that recognizes municipal need. The local governments are required to use two-thirds of the revenue to reduce local taxes. Specifically, Pittsburgh is required to use all of its sales tax revenues to eliminate the city's portion of the personal property tax and to cut the city's admissions tax for sports and entertainment events from 10 percent to 5 percent.

The district is run by a seven-member citizen board. Board members may not be public employees, elected officials, or relatives of elected officials. Four members of the board are appointed by the County Commissioners and two by the mayor of Pittsburgh; the seventh member is chosen by the other six from a list of nominees provided by regional agencies within the area. The governor is also allowed to appoint an eighth non-voting member. Board members decide which regional assets are eligible for funding. Although a few assets are specifically excluded (schools, health care facilities, and parks of less than 200 acres), virtually anything else can qualify. Funding is provided only if six of the seven board members approve.

It is too soon to assess the success of the Allegheny County effort, but as a new experiment in regional government, this method of supporting regional assets will receive a great deal of attention in the future. The concept of identifying and supporting assets that benefit the entire region and enhance its image as a good place to live and work is intuitively appealing. Thanks to a regional funding structure, the area's crown jewels can be maintained even if they are located in places whose tax base can no longer provide the support they require. Finally, the regional governance structure may foster a more coordinated strategy for promoting the benefits of

the region, rather than those of individual towns. By supporting regional assets, this structure may lessen the friction between urban and suburban interests.

### **Conclusion: Why is metropolitan governance important now?**

The purpose of creating a more cohesive metropolitan region is worth restating. Efficient firms cannot function for very long in inefficiently configured metropolitan regions. With efficiency and productivity considerations guiding the development of many firms, local barriers that prevent firms from improving their situation will certainly hurt the development prospects of most regions. Metropolitan governance, or at the very least a mechanism for recognizing regional goals for development, can help rationalize growth and help prevent the many problems that occur when each town charts a development course that provides only for its own interests.

Much of what metropolitan governance can do is related to better land use planning. Infrastructure and development plans can be coordinated to ensure that balanced development can occur and that commercial development is balanced with needed regional amenities such as parks and open spaces. Ultimately, the purpose of metropolitan governance is to promote a highly efficient metropolitan region that is properly configured to support growth in a more rational form. The characteristics of this metropolitan region would most likely include a governmental structure that promotes regional planning and problem-solving, high- or mixed-density bounded-growth communities surrounded by open space, and greenbelt areas related to mass transit facilities that move people to and from jobs and shopping centers. Finally, new jobs would be concentrated in defined employment clusters where employment growth could best be accommodated.

While the above characteristics are perhaps the ideal, simply recognizing the linkages within metropolitan regions would benefit midwestern cities as they attempt to reinvent themselves for the economy of the next century. Clearly the current pattern of economic growth does not appear sustainable.

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## NOTES

<sup>1</sup>See Mattoon (1993).

<sup>2</sup>Oakland and Testa (1995).

<sup>3</sup>For a discussion of issues concerning optimal government size, see Zax (1988). For a different perspective, see Eberts and Gronberg (1990).

<sup>4</sup>Szatan and Testa (1994) chronicle this dynamic.

<sup>5</sup>Rusk (1993), p. 14.

<sup>6</sup>Hansen (1974).

<sup>7</sup>See, for example, Downs (1994) or Rusk (1993).

<sup>8</sup>Downs (1994).

<sup>9</sup>Bish and Nourse (1975), p. 200.

<sup>10</sup>Oates (1977), p. 6.

<sup>11</sup>Bish and Nourse (1975), p. 201.

<sup>12</sup>Voith (1993), p. 3.

<sup>13</sup>For a discussion of “flight from blight,” see Voith (1992).

<sup>14</sup>Oakland and Testa (1995).

<sup>15</sup>Savitch *et al.* (1993); Voith (1993).

<sup>16</sup>Voith (1992 and 1993), Van Der Veer (1994), and Savitch *et al.* (1993).

<sup>17</sup>Voith (1993), p. 2.

<sup>18</sup>Rothblatt (1993).

<sup>19</sup>*Ibid.*

<sup>20</sup>Metro Toronto was created in 1953 to fuse the city of Toronto and 12 of its suburbs into a metropolitan government. It has been widely hailed as a model of efficiency in land use and infrastructure development. For an evaluation of Metro Toronto, see Frisken (1993).

<sup>21</sup>The following description of Minneapolis-St. Paul’s experience with metropolitan governance is based on Martin (1993).

<sup>22</sup>Smith (1994).

<sup>23</sup>Martin (1993), p. 207.

<sup>24</sup>Blomquest (1994a).

<sup>25</sup>Blomquest (1994c).

<sup>26</sup>Blomquest (1994b).

<sup>27</sup>Kirk (1994).

<sup>28</sup>Turner (1995).

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