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ABSTRACT

During 1995-96, the Federal Reserve Bank of Chicago's (Illinois) Research Department carried out a comprehensive study of the Midwest economy. Researchers looked at the region's performance over the past 10-15 years to look for lessons for the future. The study included a series of academic symposia which brought together academic, private sector, and government economists. Some of the strongest findings of the project dealt with labor markets. Structural changes in the economy have altered how work is carried out, as well as the kinds and quantity of work that is available. This curriculum package highlights the study's key findings. The curriculum package contains four items: (1) all symposium summaries packaged to provide background on the research for teachers; (2) an article summarizing the policy implications of the project, intended for students; (3) full-page transparency masters of all charts, tables, and graphs presented in the summaries; and (4) a series of suggested activities that can be done with students to focus on the project's key findings and policy implications, including: a quick, 1-day activity; a longer research-oriented project; and an activity in which students consider what the project's findings may mean to them as they plan for the future. This package can be used when studying issues related to economic structure and growth, and in examining the role of numerous economic factors in the economy; as such, it is better as a culminating activity than an introduction. (BT)

A Resource for

High School

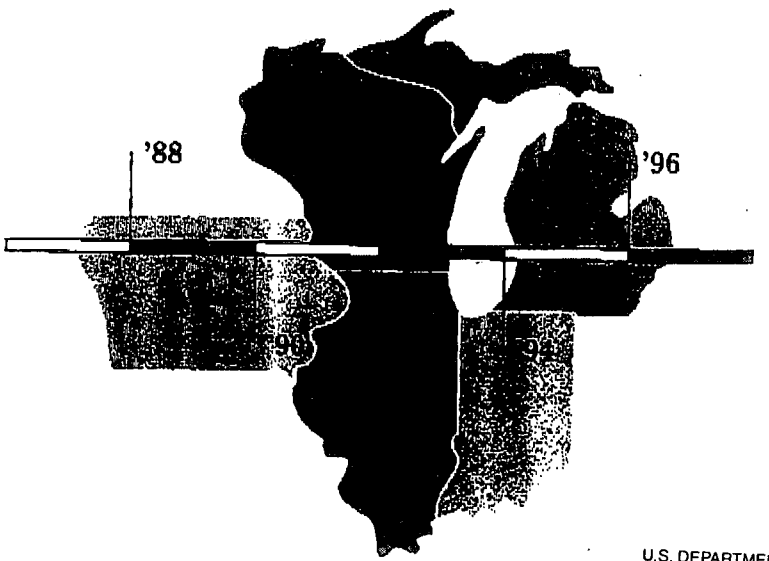
Teachers from the

Federal Reserve

Bank of Chicago

The Midwest Economy Curriculum Package

An Examination of the Midwest Economy and Its Prospects



FEDERAL RESERVE BANK
OF CHICAGO

Midwest Assessment Curriculum Package

During 1995-96, the Federal Reserve Bank of Chicago's Research Department carried out a comprehensive study of the Midwest economy. Researchers looked at the region's performance over the past 10 - 15 years to look for lessons for the future. The study included a series of academic symposiums, which brought together academic, private sector, and government economists. Symposium summaries were then made available to the public.

Some of the strongest findings of the project dealt with labor markets. Structural changes in the economy have changed how we work, as well as the kind and quantity of work that is available. Since this has implications for our young people, the Federal Reserve Bank of Chicago has created a curriculum package highlighting the studies' key findings.

This curriculum package contains four items.

1. All the symposium summaries packaged to provide background on the research. These are intended for teachers to use as background but selected portions may be appropriate for advanced students.
2. An article summarizing the policy implications of the project, intended for students.
3. Full-page transparency masters of all charts, tables and graphs presented in the summaries.
4. A series of suggested activities that can be done with students to focus on the project's key findings and policy implications. These include a quick, one-day activity; a longer, research-oriented project; and an activity for students to consider what the project's findings may mean to them as they plan for the future.

This package can be used when studying issues related to economic structure and growth, and in examining the role of numerous economic factors in the economy. As such, it is probably a better culminating activity than an introduction.

It is our hope that this package provides some interesting, motivating, and important information for you and your students as you jointly prepare for the future of the Midwest Economy.

For further information, suggestions, comments, etc. please contact the:

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Contents

PART 1: SUGGESTED ACTIVITIES

A series of activities, including an activity to help students assess and interpret basic data that pertains to the study and its implications; a longer, problem-solving approach that asks students to determine future economic activity; and a chance for students to assess their future plans based on the findings.

The first lesson asks students to read a brief article based on the project's research, examine various pieces of data, and determine whether the data supports or counters basic findings.

The second lesson asks students to consider where to locate a new business. Keeping in mind the policy implications provided in a summary essay and various charts and graphs, students must make a recommendation and support their decision.

A third activity allows students to apply what they have learned about the Midwest economy to their own future. Based on the information available, students are asked to justify decisions about their career plans, where they would like to live, and quality of life issues.

The activity(ies) can also be used in a concept-mastery approach, since they involve understanding of productivity, the role of government in the economy, aspects of economic growth, and international trade concepts, as well as basic concepts such as opportunity cost and markets.

PART 2: ARTICLE "LESSONS FROM THE PAST"

A black line master for duplication. This article summarizes some of the findings of the project and puts forth some policy considerations in light of the research.

PART 3: SYMPOSIUM SUMMARIES

- Midwestern Metropolitan Areas: Performance & Policy
- The Midwest Economy: Structure & Performance
- The Changing Rural Economy of the Midwest
- Workforce Developments: Issues for the Midwest Economy
- Designing State-Local Fiscal Policy for Growth & Development
- Global Linkages to the Midwest Economy

PART 4: CHARTS, TABLES, GRAPHS

Full-page black line masters, suitable for transparencies or handouts. The masters are also concept-coded to assist in identifying those which may help in discussing certain concepts.

ACTIVITY 1

Objective:

After reading the article summarizing the findings of the research project, students will identify the four key issues that surfaced in the findings. They will then examine various charts and indicate whether the charts support the findings.

Concepts:

Economic growth, role of government, structural change, labor, international trade, markets and prices.

Skills:

Reading, analysis, evaluation, reading charts/graphs/tables.

Activity:

Provide students with a copy of the article, "Lessons from the Past." Ask them to read the article. Have students list the four main points. Students should arrive with statements similar to the following:

1. Much of the region's economic growth during the past 10-15 years is due to changes in technology or how technology is applied to the production process.
2. Much of the region's economic growth during the past 10-15 years is due to increased globalization of the national/regional economy and increased volume of international trade.
3. Much of the region's economic growth during the past 10-15 years is due to the skills of the region's workforce.
4. Labor skills in the Midwest region are a significant factor in accounting for the successful application of technology and increased globalization in the region.

After listing the four statements, divide the students into four groups, assigning one of the four statements to each group. Then, put copies of the following charts on the overhead:

Sum. 1-Table 3	Sum. 3-Figure 1	Sum. 5-Figure 2
Sum. 1-Figure 2	Sum. 3-Figure 2	Sum. 5-Figure 4
Sum. 1-Figure 3	Sum. 3-Figure 3	Sum. 5-Figure 5
Sum. 2-Figure 1	Sum. 4-Table 1	Sum. 6-Table 5
Sum. 2-Figure 2	Sum. 4-Table 2	Sum. 6-Figure 2
Sum. 2-Figure 7	Sum. 4-Figure 7	Sum. 6-Figure 3

Then, have each group determine whether each chart/table will support their statement. Each group should indicate the chart/table's relevance to their statement and support their reasoning.

ACTIVITY 2

Objective:

Using data and research summaries provided by the teacher, students will examine a business's decision on where to locate a new facility. They will then make a recommendation to the firm, and support their recommendation using the data and research available.

Concepts:

Productivity, International Trade, Role of Government, Economic Growth

Skills:

Planning, analysis, decision-making, writing/speaking

Activity:

A large business has asked you to help it decide on a location for a new facility. The firm in question is interested in locating in the upper Midwest (Illinois, Indiana, Iowa, Michigan or Wisconsin) but is open to any alternative suggestions. The firm derives its revenues from a mix of light manufacturing (70% of revenues and 40% of profits) of mostly electronic parts, some of which have applications in the auto industry, and from retail and repair services of those parts (30% of revenues and 60% of profits). This latter part of the business is relatively new for the firm. Furthermore, it has several customers outside the U.S. (22% of revenues and 12% of profits), almost exclusively in other North American countries. The supplies it needs for manufacturing are available throughout the Midwest but can be found in many other parts of the country. The firm has a good reputation as a supporter of the communities in which it is located, regardless of the size of their presence in those communities.

Start by reading the article titled, "Lessons from the Past." Then you need to do the following:

a) Make a recommendation on locating the firm in the Midwest (provide support for your decision based on the data available).
b) If you recommend location in the Midwest, suggest a specific site in one of the states. The site can be rural, urban or suburban. The site recommendation must answer all the questions raised in the article. If you recommend locating somewhere other than the Midwest, you must support the decision. The recommendation must cover the following considerations:

LABOR FORCE: What skill level will you likely need for current and future workers? What level of education is needed for future workers? Are there enough adequately skilled workers in the location of choice? Some further questions may include:

- Does the population density of a large/medium/small metro area offer an advantage/disadvantage to growth?
- Do you need to consider the match between workers skills and the types of jobs you want to fill? Why or why not?
- Which skills and credentials might you be looking for?
- How does the Midwest rank in terms of income opportunity?
- Does the amount of trade with other countries impact on the skills you need?

TECHNOLOGY/PRODUCTIVITY: What levels of technology are required? What are your current transportation needs? Where are your suppliers/customers? What relationship do you have to key industries (autos, agriculture)? Are there advantages to using lean manufacturing techniques? Other sample questions may include :

- Why have metropolitan statistical areas (MSAs) grown as they have?
- What factors may affect their pattern of growth?
- What products or resources in the Midwest might affect the shape of food processing and other manufacturing in the Midwest, or vice-versa?
- How might "lean manufacturing" affect employment?
- What job skills are necessary in this environment?
- What business sectors seem to be expanding?

INTERNATIONAL TRADE: Is access to international markets (customers and suppliers) needed/available? Are there trade barriers to consider? Are there foreign exchange issues to consider? Is access to foreign exchange markets valuable? Other questions to consider might include :

- What business sectors seem to have undergone the most significant changes related to trade?
- What areas of the world trade with the Midwest most frequently?
- How is the second question related to the first?
- What are the primary sources of foreign investment in the Midwest?
- What factors may influence the decision of foreign firms to invest in the Midwest?
- What effect do foreign exchange rates have on the Midwest business climate?
- How does the volume and composition of the Midwest's trade with the rest of the world compare with that of the United States?

BUSINESS CLIMATE: How have the policies and activities of state/local government contributed to the overall fiscal climate in the state/region? What is the site's relationship to major metropolitan areas (customer, labor and supplier bases)? Other questions to consider might include:

- What do rural counties and small MSAs have to offer to businesses?
- What are the effects of workplace literacy programs?
- What do 'after-tax-rates-of-return' have to do with business investment?
- How does this compare with other measures of growth?
- How do taxes relate to other business expenditures?
- Is there a relationship between highway investment, congestion and the productivity of public investment?

SOCIAL ISSUES: What attitude does the firm have toward the underprivileged? What attitude does the firm have toward education? Are there relevant land use issues, transportation issues, air quality issues? Other questions to consider may include:

- How does transportation investment affect growth and quality of life?
- Which MSAs have the strongest real growth?
- Does the population density of large/medium/small MSAs offer an advantage/disadvantage in terms of social amenities?
- Are land use policies pro- or anti-growth and responsible?
- How might the food-processing industry impact land use and air quality issues?
- What type of job support programs exist and how do they differ from previous programs?
- What are the effects of workplace literacy programs?

Additional Resources

Any Federal Reserve Web site can provide additional economic data about the specific region covered by its Bank. All Federal Reserve Bank Web sites can be contacted in the Website of the Federal Reserve Bank of Chicago at:

http://www.frbchi.org.

Other valuable data is available in the Economic Report of the President through the U.S. Government Printing Office, Superintendent of Documents, Mailstop: SSOP, Washington, DC 20402-9328 or the Web site of the Bureau of Labor Statistics at:

http://stats.bls.gov.

ACTIVITY 3

Objective:
Students will examine the same set of data and information used in activity 2 and discuss the impact it may have on their decisions about their future.

Concepts:
Choices, opportunity cost, markets & prices, labor, income.

Skills:
Planning, analysis, writing/speaking, decision-making.

Activity:
As a result of the analysis in the first activity, ask students to think about their future. Does the information have relevance to their choice of careers, where they would like to live, the quality of life, or their ability/desire to stay in the Midwest?

"Lessons from the Past"

Written off as "the Rustbelt" during the 1970s and 1980s, the Midwest has a distinctive new shine to it these days. The region has emerged as a center of lean and agile manufacturers, with unemployment rates consistently lower than the rest of the nation in recent years. The region's future looks bright.

Recently, the Federal Reserve Bank of Chicago and a diverse group of experts from throughout the Midwest carried out a comprehensive study of the regional economy. The goal of the study was to gain a better understanding of the Midwest's remarkable turnaround. Gaining a better understanding of the region helps the Chicago Reserve Bank carry out its national monetary policy responsibilities. The study will also help state and local decisionmakers develop policy that will help sustain the Midwest's momentum.

The study included six seminars as well as a final session to discuss the results. The seminars highlighted issues crucial to the success of the regional economy:

- The quality of the labor force and worker training.
- An examination of the region's trade activity.
- The quality of metropolitan areas, often a barometer of a region's success and a catalyst for economic growth.
- State and local government tax and regulatory policies, with an eye on whether they support economic growth.
- The Midwest's industrial structure and the factors contributing to its re-emergence.
- The turnaround of the rural economy.

One of the reasons the Chicago Fed took on the study is because regional economic advantage is fleeting. The Midwest does not have an abundance of natural resources. And other regions in the U.S. and the world will become more competitive. The Midwest has an opportunity now to build on its success and to foster public policy that will soften the blow if economic conditions turn sour.

This article summarizes some of the study's and related viewpoints. The issues covered in the study are all related and important and will help determine whether the region will move ahead or fall behind.

Is the region's work force prepared to sustain growth and development?

Workers are prepared, but training opportunities and methods for certain segments of the work force need to be improved.

The productivity of the Midwest workforce has clearly contributed to the region's turnaround. But, to maintain this productivity, the skills of all types of workers need to be continuously upgraded. Creating the highest-quality work force depends on giving individuals the skills to be life-long learners. High-quality elementary and secondary education is a key starting point. For those already in the work force, new training methods are emerging that better develop the needs of employers. Improving training and employment opportunities for the disadvantaged is also important to creating a workforce that will sustain growth and development.

Conference participants pointed out that training efforts have to match the new realities of the labor market. Workers are likely to work for more than just one firm over the course of their career, and it needs to be easier for them to change jobs. This means developing portable health care and pension plans as well as industry-based, certifiable standards that give workers recognized credentials that will make it easier to adapt to changing labor markets. Training also needs to be an ongoing process in the workplace.

Students entering the work force need more and better information about labor markets and career prospects. One approach is software developed by Chicago Fed economists. The software allows students in the Chicago City College system to examine the earnings and growth potential for a wide range of careers. It also identifies college courses needed to enter those fields.

The Midwestern economy's need for more workers as well as the recent national and state efforts to restructure welfare have intensified the need to develop better methods for bringing the disadvantaged into the workforce. Many new programs favor immediate exposure to the workplace supported by counseling, training and other services. This approach often shows more promise than traditional methods of providing the training before a client takes the job.

To help prepare the workforce for future challenges, policymakers should consider the following options:

- Promote the continuous improvement of workers' skills, with training reflecting the new labor market reality that workers are likely to hold more jobs. Establishing industry-based certified skills is a key step.
- Encourage better information about labor markets so that training programs can develop the skills needed by employers.
- Study programs that have been most successful in bringing the disadvantaged into the work force and use this information to develop better programs.

How can the Midwest continue to improve industrial productivity?

An increase in industrial productivity has been key to the region's turnaround. Much of the Midwest's resurgence is due to gains in two historically important sectors: manufacturing and agriculture. New production methods and technology have expanded trade opportunities and helped these sectors reclaim their share of the domestic market. Sharing these efficiency improvements with all types of industries will continue to improve the region's economy.

In the manufacturing sector, the auto industry's strong performance has been an important aspect of the region's turnaround. The industry has continued to concentrate in the Midwest. Thirty-one out of 58 auto assembly plants nationally are in the Midwest. Although nine auto plants closed in the region from 1979-1996, 13 new plants opened, including a number of foreign producers. New production techniques arrived with this combination of domestic and foreign auto producers.

Foremost among these new techniques was the increased use of lean manufacturing, including innovations such as "just-in-time inventory." These productivity enhancing methods are being applied at all types of manufacturing firms — old and new. The challenge is transferring these methods to even more companies to ensure that both large and small operations can take advantage of them.

Agriculture is a key sector in the Midwest economy. Farm productivity is up, as measured by higher crop yields and livestock production and increasing export demands. This strong performance might be a springboard for increased opportunities for attracting food-processing firms to the region as a complement to the existing agricultural sector.

To encourage continued productivity gains, policymakers should consider the following options:

- Encourage the development of a better understanding of how to apply new production methods, such as lean manufacturing. Promote stronger relationships between suppliers and the manufacturers who buy their products.
- Examine prospects for developing industries that will compliment existing areas of regional strength — such as the case of food processing with production agriculture.
- Promote the adoption of the best methods, models, and technology to all types of businesses.

How can the Midwest continue to prosper in the global economy?

The product mix of Midwestern businesses is well-suited to the needs of high-growth emerging markets throughout the world. Durable goods and agricultural products are in high demand, and that has contributed to the region's recent strong performance. Additionally, foreign investment in the Midwest has brought the area new capital and in many cases new production methods. Overall, globalization has made Midwestern firms more competitive both at home and abroad.

Midwestern firms are well positioned to benefit from the growing liberalization of world trade, particularly as it applies to emerging markets. Recent trade pacts have opened new markets. Some studies suggest that U.S. firms that pursue these opportunities often end up growing faster and paying higher wages to their workers.

U.S. goods have been widely viewed as a better buy overseas because of a decline in the value of the U.S. dollar relative to key foreign currencies such as the Japanese yen and the German mark. A weaker dollar helps to make U.S. products less expensive to buyers in foreign countries. However, a study by Chicago Fed economists indicates that Midwest producers did not have a built-in price advantage. This suggests that the renewed demand for Midwestern goods is not simply the result of a weaker dollar. Rather, Midwest producers have increased trade in the face of a stronger dollar in markets to which we export.

To take advantage of the global economy, policymakers consider the following options:

- Encourage a better understanding of which domestic and international markets are most closely linked to Midwestern products.
- Develop policies that encourage firms to export products.
- Encourage a better understanding of the effect of exchange rate movements on the competitive position of Midwestern firms.

How can state and local policy sustain the region's momentum?

State and local policymakers in the Midwest have received national attention for their creative approaches in devising programs such as new welfare policies, changes in school funding, and new delivery systems for education. At the same time, conservative fiscal policies have restored the governments' financial stability, which is key to the well-being of the region's economy.

Midwestern states have taken advantage of the resurgent regional economy to improve their fiscal position. These states have avoided major tax increases throughout the 1990s, building up substantial budget reserves and avoiding the creation of expensive new spending programs. This prudent fiscal policy leaves the region's governments in good shape to accept new responsibilities from the federal government.

As the federal government gives more responsibility to the states, state and local governments are delivering services previously provided by the federal government. In the Midwest, several states appear ready to accept the challenge and have devised new programs that use state resources to provide welfare, education and job training.

Many states have worked hard to reverse the image of the Midwest as a haven for high taxes, particularly by reducing their reliance on the property tax. Chicago Fed research suggests the need for more long-term improvements in state tax structures, such as taxing businesses based on the cost of the benefits they receive from their state. This type of change could prompt future economic growth, as the distortionary effect taxes have on the choice of where to locate a business is reduced.

Policymakers should also recognize that Midwestern firms trade most extensively with other regions in the U.S. In some cases, however, states have differing rules and regulation that hamper trade between regions. To encourage intra-regional trade, policymakers should examine barriers, such as occupational licenses, to ensure that they are necessary.

- To help sustain the region's momentum, policymakers should consider the following options:
- Encourage the development of equitable and diversified tax systems that rely on more than one primary source of revenue.
- Promote spending policies that support sustainable growth.
- Pursue innovative ways to provide essential services and evaluate carefully the effects of new programs.
- Promote the development of a wide spectrum of state and regional economic information to ensure that policy makers are fully informed when crafting policy options.

Will the Midwest's cities and metropolitan areas be a source of strength or weakness?

Central cities continue to face social and economic problems, yet they have emerged as significant economic centers for providing key business services.

While metropolitan areas continue to expand, the growth is more dispersed. That makes it more difficult to assess whether the consequences of growth are beneficial or harmful. As metro areas reinvent themselves, it is important to investigate whether this pattern of dispersed growth helps or hinders the economy. Investigating relationships between cities and their suburbs that promote efficient and attractive metropolitan areas will be a key to the region's continued success.

A key development is how urban areas have taken advantage of technology to convert from manufacturing to service economies. Technological breakthroughs are now permitting service jobs to move out of the central city. If metropolitan areas are going to be a source of the region's economic strength, policymakers need to understand the relationship of technology and public policy in the location of economic activity.

Another factor to consider is land usage, particularly policies geared toward improving the redevelopment prospects of environmentally contaminated land, often referred to as brownfields. Urban land issues — including the size of available parcels, environmental contamination and related tax, and regulatory burdens — need to be considered in determining whether urban brownfield or suburban greenfield locations are best suited for future development.

Another issue facing the region is the mismatch that often exists in urban areas between where jobs are located and where potential workers live. Among the many promising approaches for addressing this mismatch are programs designed to transport urban workers to available suburban jobs.

To help metropolitan areas prosper, policymakers should consider the following options:

- Investigate the different ways metropolitan areas grow and devise policies that promote fair and efficient patterns of growth.
- Understand what forms of development are realistic in urban areas, including how land availability and environmental conditions can affect development opportunities.
- Encourage a better understanding of the effect that technology has on the geographic location of economic activity.

Can rural areas sustain their turnaround?

Agriculture will continue to dominate rural economies but will require fewer workers. To sustain growth in rural economies, manufacturing and new industries will need to supplement agriculture.

Midwestern rural areas have shaken off much of the ill effects of the farm crisis of the 1970s and early 1980s. New production methods and technologies have made farms highly productive, and growth in domestic and foreign export markets has sparked demand for Midwestern agricultural products. Still, for rural areas to sustain their recovery, new types of industries need to be identified.

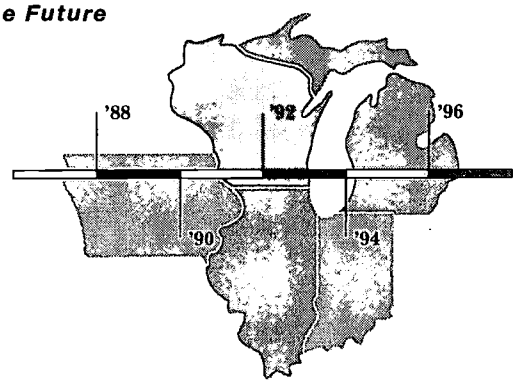
A positive sign is an increase in rural population in recent years. For decades, Midwestern rural areas have been losing population. During the 1980s alone, rural areas in the Midwest lost 2.2 percent of their population. However, in the 1990s, rural population began to increase. From 1990-94, 74 percent of the rural counties in the Midwest gained population, representing total growth of 2.4 percent. Even more encouraging is that over half of this gain can be attributed to the arrival of new rural residents.

The movement of manufacturing to rural areas is also a positive development. Manufacturing growth in rural areas has greatly exceeded that in metropolitan areas. This growth can help diversify rural economies and provide new employment opportunities as farming continues to reduce jobs.

While farm technology and production methods contribute to growth, they sometimes conflict with quality of life issues. For example, a new entity, the mega-farm, has emerged, significantly increasing the size and scale of hog farms. These mega-farms raise questions about the quality of life for surrounding communities. States such as North Carolina have been more willing to accept mega-farms than many Midwestern locations. Staying competitive in hog production without adopting mega-farms could present a challenge for the Midwest.

To help rural areas sustain their turnaround, policymakers should consider the following options:

- Encourage the development of industries such as manufacturing, particularly complementary industries, such as food processing and agricultural services.
- Promote better understanding of the impact of changing farm technologies and production methods.
- Distribute knowledge about the most efficient way for farms to operate.
- Develop policies that will exploit emerging markets and current export demand for Midwest agricultural products, both domestic and international.



Midwestern Metropolitan Areas: Performance and Policy

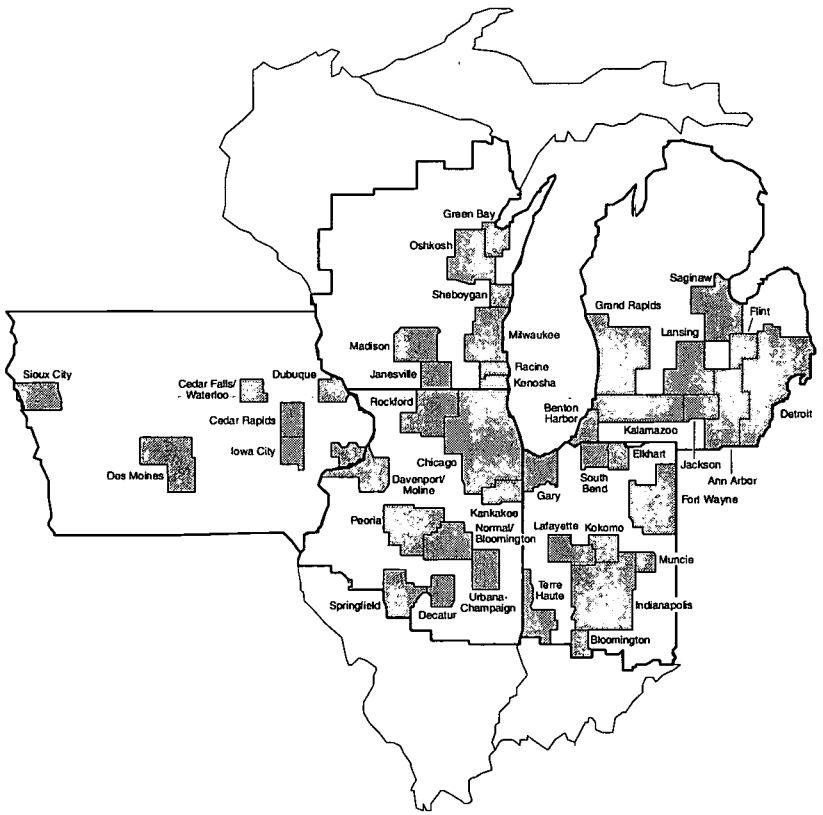
First in a series of workshops to be held at the Federal Reserve Bank of Chicago.

The Federal Reserve Bank of Chicago recently initiated a comprehensive, long-term study of the regional economy, *Assessing the Midwest Economy: Looking Back for the Future* (see page 15). The study is intended to foster a better understanding of the Midwest's prospects by examining the turnaround in the region's economy since the early 1980s. On November 28, 1995, the Bank held its first project workshop as part of the year-long study. The workshop focused on the economies of the region's metropolitan areas. This is the first in a series of reports which will summarize the findings/directions identified at project workshops.

In the Seventh District, 76 percent of the population resides in the region's 41 metropolitan areas and, similar to the nation, 46 percent of the region's population resides in metropolitan areas that have one million or more residents—Chicago, Indianapolis, Detroit, and Milwaukee.

Why approach the changing Midwest economy from the perspective of metropolitan areas? Most fundamentally, we have become a nation of metropolitan areas. In the Seventh District and throughout the U.S., population and jobs continue to become concentrated into metropolitan areas. Over the course of this century, metropolitan population has increased from 30 to 40 percent of the nation to almost 80 percent today. In the Seventh District, 76 percent of the population resides in the region's 41 metropolitan areas and, similar to the nation, 46 percent of the region's population resides in metropolitan areas that have one million or more residents—Chicago, Indianapolis, Detroit, and Milwaukee (figure 1, table 1).

Figure 1 Geography of Metro Areas, Seventh Federal Reserve District



Note: Heavy black line indicates border of the Seventh District.
Source: U.S. Office of Management and Budget.

Table 1 Metro/Nonmetro Population, 1993 (000s)

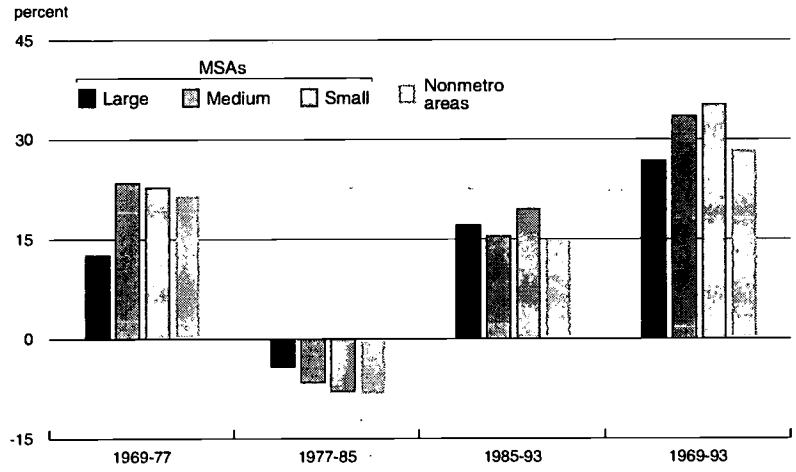
	Metro	Non-metro	% Metro	% Non-metro
U.S.	205,489.0	52,294.0	79.7	20.3
Illinois	9,817.6	1,868.3	84.0	16.0
Indiana	4,088.0	1,617.5	71.7	28.3
Iowa	1,238.5	1,582.8	43.9	56.1
Michigan	7,813.3	1,646.4	82.6	17.4
Wisconsin	3,431.2	1,312.8	72.3	27.7
Seventh District	26,388.6	8,027.8	76.7	23.3

Source: U.S. Department of Commerce, Bureau of Economic Analysis (BEA), Regional Economic Information System (REIS).

It is not surprising, therefore, that the Midwest's current economic turnaround has been manifested in metro-area performance (figure 2). Metro and nonmetro counties alike have rebounded from the late 1970s through the first half of the 1980s when income and production fell sharply in both manufacturing and agriculture. The common direction of income growth experienced by metro areas (irrespective of size) and nonmetro counties suggests that the Midwest often experiences a common economic fate, either because of market links with other regions or because of tight economic links within the region.

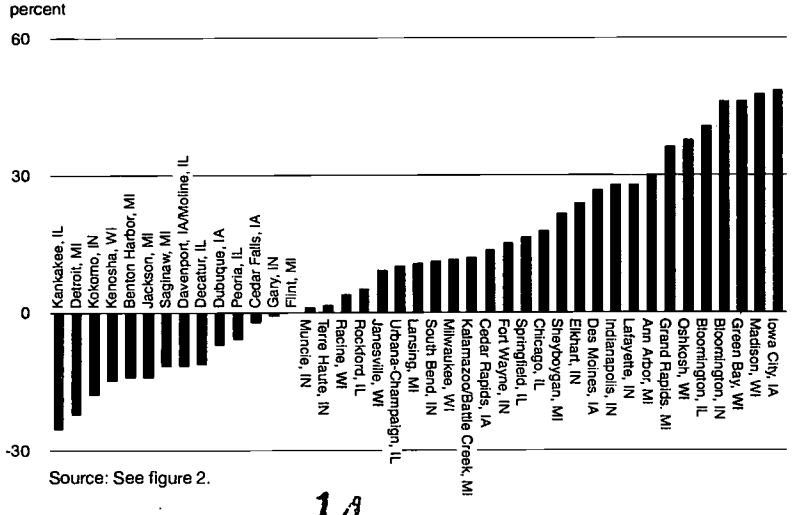
Despite the region's aggregate fate, individual metropolitan areas of the Seventh District experienced sharp disparities in income growth from 1977 to 1993 (figure 3). An understanding of these disparities could provide important insight into the region's performance. Many analysts assert that the metropolitan area has become the fundamental and cohesive geographic unit. Any individual metropolitan economy relies on a common labor force, federal and state government (typically), location, climate, and infrastructure. Over time, barriers to world trade and investment have fallen, and the typical metro area's specialization in production has increased. Consequently, metropolitan areas have become more distinct as their trading relationships with the world economy have grown.

Figure 2 Change in Real Personal Income by MSA Size, 1977–93



Source: U.S. Department of Commerce, Bureau of Economic Analysis (BEA), Regional Economic Information System (REIS).

Figure 3 Change in Real Personal Income by MSA, 1977–93



Source: See figure 2.

One example of the increasing economic specialization of the metropolitan area was offered by Geoff Hewings, director of the Regional Economics Applications Laboratory (REAL) at the University of Illinois at Urbana-Champaign, and Phil Israilevich, senior economist and research officer at the Federal Reserve Bank of Chicago. In their innovative approach to modeling and analyzing the Chicago-area economy, they found that many of the factory-to-factory trading linkages *within* the Chicago-area economy have disappeared during recent decades as the region has lost 300,000 manufacturing jobs. Overall, this industrial transition, in which the Chicago-area economy has been "hollowed out," has been less harsh than expected. Israilevich suggested that economic transformation is often a less difficult process than may be thought. As jobs relating to outdated or unproductive functions are eliminated, new jobs tend to be created. To understand the labor force implications of economic change, it is increasingly important to view labor growth relative to output. Israilevich stressed that increases in final demand for products were critical in determining trends in manufacturing employment.

Chicago's estimated exports to Mexico amount to approximately $1 billion per year and Canada $7 billion per year, while the region's trade with the rest of the U.S. is gauged at $140 billion.

Hewings stressed that productivity and output growth have been sustained as the Chicago metro area has replaced its internal trading linkages with external partners—not necessarily with foreign trading partners, but rather with other large U.S. metro areas. Chicago's estimated exports to Mexico amount to approximately $1 billion per year and Canada $7 billion per year, while the region's trade with the rest of the U.S. is gauged at $140 billion.

As metropolitan areas become more linked and competitive with external economies, what characteristics will determine their economic fortunes (and those of their regions)? Richard Mattoon, senior economist at the Federal Reserve Bank of Chicago, suggested that the arrangements by which metropolitan areas are governed in the U.S. vary greatly. Our highly decentralized system of local government has yielded a highly fragmented system in many of our metropolitan areas, with much variance from region to region and from state to state (table 2).

Table 2 Number of Governments

	Municipal		Special Districts	
Metropolitan Area*	**1957**	**1992**	**1957**	**1992**
Chicago	248	315	333	605
Des Moines	42	41	21	38
Detroit	106	120	23	46
Indianapolis	70	62	28	136
Milwaukee	59	65	15	39

*Defined identically for 1957 and 1992.
Source: U.S. Department of Commerce, Bureau of the Census, *Census of Governments* (various years).

Accordingly, it has been suggested that regionwide governance policies might promote the health of the metropolitan area by redressing the inefficiencies associated with a fragmented system of government. There are only a few regional institutions available to serve as case studies for evaluating this thesis. Still, some midwestern models do exist, and Mattoon suggested that their experiences may encourage some metro areas to adopt more

cooperative or even unified government structures. For some time now, Indianapolis and Minneapolis-St. Paul have operated various forms of metropolitan government in an effort to channel growth while fostering more efficient delivery of government services.

Much discussion of regional metropolitan governance centers on the relationship of central cities to their suburbs, perhaps because lagging performance is evident in many older central cities of the Northeast and Midwest. Some have suggested that the changing needs of the economy in the 1990s has rendered these older, high-density central cities obsolete. Businesses and people have spread out across metropolitan areas because doing so is rational and efficient. However, recent empirical and anecdotal evidence also suggests that healthy suburbs may stagnate without healthy central cities. Others assert that the decline of central cities has been unduly subsidized—perhaps deliberately—through an array of government tax policies and expenditure programs which have encouraged expansion toward the urban fringe.

A corollary of these findings might suggest that entire metropolitan areas—both city and suburbs—should be optimally configured. Some cite evidence that the current pattern of economic and population deconcentration may not be beneficial to the prospects for the entire metro area, as suggested by increasing congestion on suburban roads, income inequality among communities, and towns entering into unproductive bidding wars to capture commercial development. Without a regional government structure, or a structure in which disparate governments can reach agreement, it will remain common for towns to consider only their narrow self-interests in pursuing new development.

In Indianapolis and Minneapolis, policies such as regional tax base sharing for commercial development and regionwide planning for land-use decisions reduce the tendency for towns to bid destructively for commercial development, and arguably improve siting decisions for large regional developments.

In Indianapolis and Minneapolis, policies such as regional tax base sharing for commercial development and regionwide planning for land-use decisions reduce the tendency for towns to bid destructively for commercial development, and arguably improve siting decisions for large regional developments. In addition, the regional tax base makes revenues more diversified and improves the bond ratings of the area. Furthermore, it is easier to support the development of parks, open space land, and other public land uses when all communities in the region feel that they directly share in the benefits of any commercial development. In contrast, fragmented government often leads suburban residents to eschew support for those city assets benefiting the entire metro area, such as museums and zoos. At the same time, fragmented government itself arises from the residential location process in which higher-income residents collect in exclusive suburbs to avoid subsidizing public services consumed by the poor. As one prototype solution to underprovision of central city facilities, Mattoon cited Pittsburgh's "regional asset" approach, whereby facilities such as museums, parks, and zoos are funded on a regionwide basis even though they may be located in or controlled by the central city.

A second argument in favor of metropolitanwide governance arrangements is to improve the cost-efficiency of the delivery of public services. Mattoon suggested that, just as firms have increasingly focused on improving their internal efficiency, they will soon begin to demand similar efficiency from government in providing public services. Currently, many metropolitan areas have overlapping governments that may be providing uncoordinated services. Economies of scale and scope might be achieved if metropolitanwide structures could deliver many of these services. Most research suggests that technical services, such as sewers, transit, waste disposal, and infrastructure, can be provided more efficiently by a metropolitanwide structure. However, where metropolitanwide provision appears less efficient is in the area of social services, such as education and welfare; many large inner city school systems are seen as failures.

With political power increasingly shifting to the suburbs, it is possible that all of the desirable public services will come to be provided through a metropolitan structure, while the undesirable services pertaining to crime and welfare will be retained by central city governments.

In response to Mattoon's presentation, William Oakland, chair of the economics department at Tulane University, suggested that some metropolitan services should be provided by a metropolitan government, and noted that in many cases this already occurs through single-function metropolitan governments, such as transit authorities and sanitary districts. However, Oakland cautioned against being too enthusiastic about the prospects of "metropolitanizing" many services as a means of achieving fiscal equity between have-not city residents and more-prosperous suburbanites. With political power increasingly shifting to the suburbs, it is possible that all of the desirable public services will come to be provided through a metropolitan structure, while the undesirable services pertaining to crime and welfare will be retained by central city governments. It is also possible that metropolitan-wide land-use control could end up stopping development altogether if the dominant political structure turns anti-growth.

John McDonald, economics professor of the University of Illinois at Chicago, questioned the assertion that the deconcentration of economic activity away from central cities and into so-called edge cities is inefficient. He suggested that research into metropolitan patterns of growth is still young, and that these new forms of small, highly concentrated centers of economic activity may improve the performance of the entire metro region. Similarly, McDonald suggested that it is insufficient to try to understand the development of metro areas solely in terms of the relationship between central cities and their suburbs. It must be recognized that there is significant variation in the types and forms of suburbs that exist and that more attention needs to be paid to identifying the unique characteristics of the towns and cities that comprise a metro area. For example, highly concentrated development in specific suburban locations—edge cities or employment subcenters—may not represent sprawl, but rather a positive force for overall metrowide growth. The Schaumburg "subcenter" in the Chicago metro area was cited as one example where economic activity continues to concentrate, even after initial development. New metropolitan forms may be developing that we do not yet fully understand. Unduly constraining new urban forms—by imposing growth controls at the fringe, or channeling development back into the city center—may damage a region's growth prospects.

The Role of Technology in Metropolitan Development

Robert Atkinson, a project director in the U.S. Congress' Office of Technology Assessment (OTA), discussed a recently completed study on the effects of technology on metro areas. Technological forces are clearly shaping new urban forms. In the process, these technological forces may be favoring certain metropolitan areas based on population size, location, or industry structure. The study examines the effects of technology on individual industry sectors, paying particular attention to the effect of information technology on the operations and physical location of service firms. Atkinson stressed that although the effects of changing technology are yet to be fully understood, three broad implications can be drawn.

- Information technology will significantly improve service sector productivity and will cause productivity gains between the service sector and manufacturers to converge.
- Technology will continue to have a significant impact on the workplace and on how business is conducted; services can increasingly be sold and delivered far from the customer.
- Technology implies greater freedom for service firms in choosing locations.

In particular, the emerging digital transfer of information will become vital to many service firms. At the same time, digital information transfer will allow firms to locate in less expensive areas, improving their chances of survival in increasingly competitive industries.

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Nonmetro counties in the Seventh District had a 17 percent lower manufacturing concentration than the overall Seventh District in 1969, but now maintain an 11 percent greater concentration.

Despite increased freedom to produce and deliver services from afar, however, Atkinson cautioned that there is little evidence that these technology-related location shifts will necessarily benefit rural areas. Suburbs and small to medium-sized metropolitan areas appear best able to provide a hospitable environment for those specialized service functions that can be digitized. The optimal scale of service establishments has been growing, even while that of many manufacturing facilities has been shrinking. As a result, it is often the scale at which service workers desire to live—which ultimately translates into the firm's labor costs—that is helping to determine the location of new service establishments. If population density climbs too high, ultimately raising the cost of living and wages, service establishments will attempt to find labor elsewhere. Atkinson cited the rise of many medium-sized Sun Belt cities—Charlotte, Nashville, and Jacksonville—as examples of metro areas where living costs remain low while population size is sufficient to support popular amenities such as professional sports teams. There are important exceptions, however, involving those service firms attracted to large city airport and conference facilities, a very specialized labor force, or highly specialized support service activities. Small entrepreneurial service firms are also often cited as being incubated in large cities where specialized support services and a specialized labor force are available.

The consequences of these technological shifts in optimal scale are reflected in the changing industry concentrations within metropolitan areas of the Seventh District (table 3). As measured by real personal income, the large metropolitan statistical areas (MSAs) have seen manufacturing edge downward since the 1970s, with sharp declines in their core counties. Small and medium-sized metro areas now find that manufacturing accounts for a much larger share of personal income. The most dramatic shift has been experienced by nonmetro counties in the Seventh District, which had a 17 percent lower manufacturing concentration than the overall Seventh District in 1969, but now maintain an 11 percent greater concentration. Reasons behind the rise of manufacturing in rural areas include not only the smaller scale at which manufacturing can now take place but also changes in transportation, which have favored trucking rather than locations at central rail terminals.

Table 3 Real Personal Income (Indexes of Concentration)

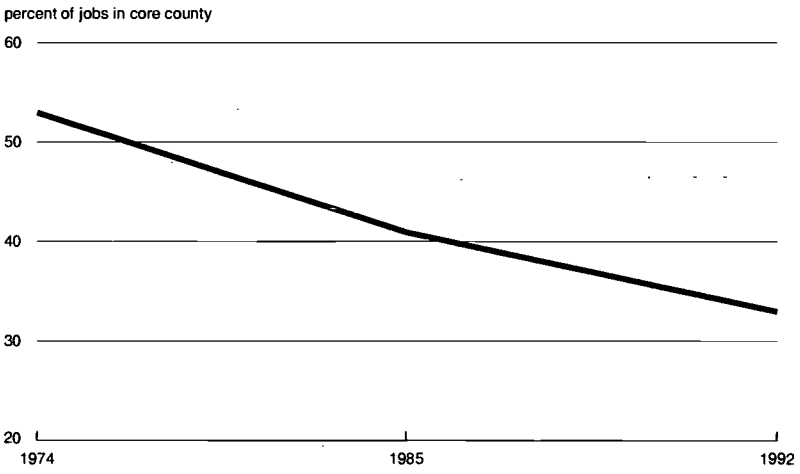
	Versus the U.S.				Versus the Seventh District			
	1969	1977	1985	1993	1969	1977	1985	1993
Manufacturing								
Large MSAs	1.31	1.35	1.29	1.27	0.99	0.98	0.92	0.89
Core counties	1.28	1.34	1.22	1.18	0.97	0.96	0.88	0.82
Med. MSAs	1.52	1.63	1.70	1.67	1.15	1.18	1.22	1.16
Small MSAs	1.41	1.48	1.55	1.66	1.07	1.07	1.11	1.16
Nonmetro	1.10	1.19	1.34	1.59	0.83	0.86	0.96	1.11
FIRE								
Large MSAs	1.00	1.09	1.14	1.14	1.19	1.22	1.27	1.27
Core counties	1.12	1.22	1.37	1.30	1.32	1.37	1.53	1.45
Med. MSAs	0.70	0.71	0.70	0.77	0.83	0.80	0.79	0.86
Small MSAs	0.71	0.73	0.71	0.69	0.84	0.82	0.79	0.77
Nonmetro	0.60	0.62	0.51	0.46	0.71	0.70	0.57	0.51
Business services								
Large MSAs	1.06	1.07	1.16	1.14	1.34	1.32	1.34	1.30
Core counties	1.13	1.02	1.01	1.00	1.43	1.26	1.17	1.14
Med. MSAs	0.52	0.58	0.63	0.74	0.66	0.71	0.73	0.84
Small MSAs	0.43	0.51	0.54	0.62	0.55	0.63	0.63	0.71
Nonmetro	0.49	0.53	0.44	0.40	0.62	0.65	0.51	0.46

Note: Index value is the ratio of industry share in the MSA to the share in the U.S. (or Seventh District).
Source: See table 1.

Financial and business service trends are moving in the opposite direction to manufacturing (table 3). For the finance, insurance, and real estate sector (FIRE), large and medium-sized MSAs have gained concentration—especially core counties of large MSAs. In contrast, small metro areas and nonmetro counties are losing this income base. Business services are also slipping away from nonmetro counties, even while Seventh District MSAs in each size category experienced increasing concentration over the 1969–93 period.

In contrast to the trend for FIRE, core counties of large Seventh District MSAs have lost share in the business service industry sector. In the central city-suburban context, changing information technology has encouraged movement of business service industries to the suburbs, according to Atkinson. Those services that can be "digitized" are the best prospects for moving to the suburbs. As evidence of this, the concentration of data-processing jobs has shifted dramatically (figure 4). Suburban locations have an advantage when it comes to accommodating the needs of digitized services. It is easier to outfit new buildings with "smart" technologies than to retrofit existing urban structures. The brokerage firm Fidelity has established a "megacenter" for processing in suburban Dallas, and insurance firms such as Aetna continue to consolidate claims processing centers into suburban locations.

Figure 4 Core County Employment in Data Processing within Metro Areas



Source: U.S. Office of Technology Assessment, *The Technology Shaping of Metropolitan America,* September 1995, p. 84.

According to Atkinson, one marked characteristic of many large service establishments locating in suburban areas is the apparent absence of interindustry linkage with the remainder of the economy. As specialized service functions are moved out to suburbs, they do not appear to create a significant need for other services. Specialized megacenters are often self-contained and require little in the way of additional professional or other services. The economic multiplier from landing such a center can therefore be smaller than anticipated.

In the wake of these changes, central cities are often left with highly specialized functions that require workers with the highest skill levels. The problem is that such workers may not be available in sufficient numbers in the urban center. Atkinson's view was that, as information technology grows, this mismatch between city jobs and city residents will worsen and the attractiveness of suburban locations will increase.

The loss of manufacturing jobs experienced by central cities is being extended to the service sector. The only way to reverse this trend is to concentrate on the skills of the labor force.

Randall Eberts, executive director of the Upjohn Institute in Kalamazoo, Michigan, questioned whether the impact of new technology might not provide opportunities for metro areas rather than simply creating problems. The popular literature increasingly attributes the success of firms to the competence and commitment of their work force, and their ability to coordinate both internal and external functions. Eberts suggested that cities need to understand these dynamics and develop ways in which these factors can be enhanced through government services. Additionally, Eberts said that amenities will play an increasingly important role in determining the location of economic activity, and that the concentration of cultural and recreational amenities in central cities may provide some advantage in retaining economic activity.

Oakland commented that the OTA report should put us on alert that the loss of manufacturing jobs experienced by central cities is being extended to the service sector. The only way to reverse this trend is to concentrate on the skills of the labor force. Metro areas that are able to develop and offer the best human capital will have a decided advantage in economic development. This calls for an emphasis on people rather than place strategies. Oakland suggested that the development strategy of metro areas take a supply-side perspective. Metro areas that are able to offer a greater supply of resources will attract more economic activity. However, McDonald noted that programs such as the new "empowerment zones" are trying to promote development in communities that lack resources, particularly when it comes to the labor force. For example, 50 percent to 60 percent of the adult population in Chicago's empowerment zones were cited as being without high school diplomas.

Mortgage Lending in Urban Areas

William C. Hunter, senior vice president and director of research of the Federal Reserve Bank of Chicago, presented his research on the issue of lending discrimination.

Hunter's study has taken the Home Mortgage Disclosure Act data used in the Federal Reserve Bank of Boston's 1992 study and extracted a rigorously "cleaned" subset of the original data that examines lending behavior in Boston in 1990. The study then uses 25 variables to determine which aspects of a loan application would be the most significant in determining whether the loan would be approved.

One finding specific to the topic of metropolitan and central city investment is that geographic discrimination was not found to occur.

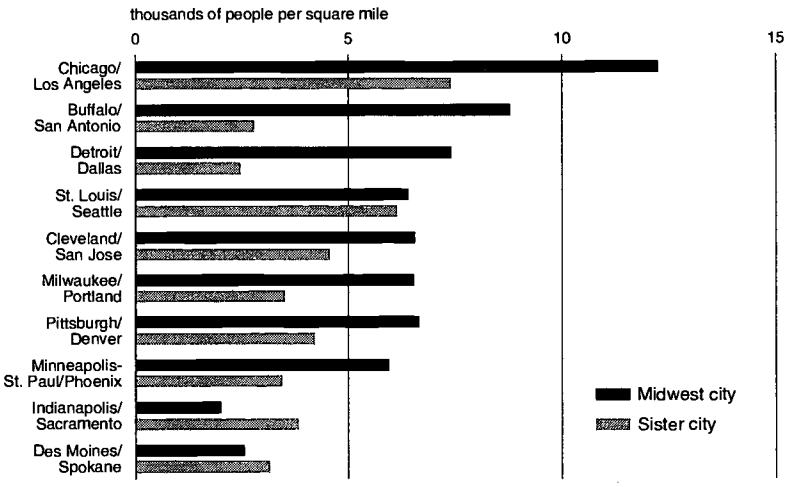
One finding specific to the topic of metropolitan and central city investment is that geographic discrimination was not found to occur. "Redlining" of neighborhoods by lenders was not found, as it appears that individual characteristics of the borrower are far more important than the location of the property when it comes to determining whether a loan is made. However, general workshop discussion concurred that loan application is but one fraction of the community/residential investment transaction. Knowledge and awareness of loan procedures and opportunities, for example, may also determine a community's residential development. More broadly, the dynamics and interaction of community housing decisions with other important activities affecting overall community development, such as schooling and job location, are not fully understood at this juncture.

The findings of the study are interesting with regard to race. When examining the likelihood of a white or a minority applicant with a good credit history getting approved for a mortgage, it appears that race is insignificant. Both applicants have similar approval rates. However, race does become significant in the case of applicants with poor credit histories. In the case of these marginal applicants, the white applicant has a significantly better chance of being approved for a loan than a minority applicant with the same characteristics. Hunter suggested that this may be occurring because white loan officers, owing to their cultural affinity for white applicants, find it easier to determine whether the white borrower will be an acceptable credit risk despite the marginal qualifications.

Urban Land Assembly and Brownfields

Midwest metro areas apparently face larger growth impediments than many of their Sun Belt counterparts. New urban forms are apparently emerging, but new forms are less costly to establish in a developing area than in a long-developed one. Midwest metro areas feature high density urban cores, often having narrow streets, smaller land plots, and a social/governance environment that has evolved to their disadvantage (figure 5).

Figure 5 Population Density in the Midwest and Sister Cities,* 1990



*Cities were paired that had similar census population in 1990. Densities are for the city proper, not the metropolitan area.

Source: U.S. Department of Commerce, Bureau of the Census, *Urban Areas of the United States and Puerto Rico*, December 1993.

Ziona Austrian, associate director of the Economic Development Program, and Thomas Bier, director of Housing Policy Research at Cleveland State University's Urban Center, focused on the particular disadvantage of land availability in central cities and core counties in the Midwest. Austrian and Bier argued that there is demand for urban sites but the lack of pristine greenfield land or contiguous land that can be assembled into appropriate parcels for development makes urban development difficult. For example, in Cleveland an estimated 120 acres of land is sought by developers that cannot be provided by the city. The city has no greenfield land and financial, legal, and political barriers are making it difficult to assemble brownfield parcels in a manner that would make them attractive. Not surprisingly this lack of available land in both the central city and the core county is causing the real property tax base to shift to the outskirts of the metro area.

Since central cities and increasingly core counties lack available, easy to develop land, they must recycle the land they have or face inevitable decline.

Austrian and Bier suggested that this pattern is being repeated all over the Midwest and provided data on seven Ohio cities and seven midwestern cities to support this notion. At the core of this analysis is the proposition that land availability is central to the economic health of the metro economy. Since central cities and increasingly core counties lack available, easy to develop land, they must recycle the land they have or face inevitable decline. Austrian and Bier examined trends in building permits and property values in each of these cities. The central cities' and core counties' share of building permits has been declining, while suburban counties have seen growth in the share of building permits. In Cleveland, this decline also extends to the value of industrial permits.

Each city was examined in terms of building permit trends for all types of construction, including residential, commercial, and industrial. Six core counties (containing the cities of Toledo, Cincinnati, Pittsburgh, Milwaukee, Chicago, and Minneapolis) lost market share in each of these categories. Austrian and Bier argue that without new development in these cities, the property tax base of these core counties is bound to decline as depreciated structures are not replaced by new structures. Given this trend, policymakers may need to focus their attention on reclaiming brownfield land in order to promote growth.

Responding to the presentation, McDonald suggested that it is important to view the findings of slow growth in central cities and core counties in the context of the entire metro region. Why do some entire metro areas grow slower or faster than other areas? McDonald suggested that "structurally unemployed land" may be at the root of the question, but cautioned that economic theory suggests that urban land would be redeveloped if its price declined to a market clearing price. Instead, urban land appears slow to redevelop, and this may have as much to do with the inability to assemble urban land as to other barriers such as crime and environmental degradation.

Brownfields

Charles Bartsch, senior analyst at the Northeast-Midwest Institute in Washington, DC, discussed efforts to return environmentally contaminated land to productive use. Bartsch stressed that part of the problem in looking at so-called brownfields is that there is no single definition that reflects their status. In some cases, the contamination is minor and the cost of preparing the land for new development is only marginally higher than for a pristine site. However, in other cases, the degree of contamination can be extensive and determining how much a cleanup will ultimately cost can be difficult. This uncertainty often makes these sites so unattractive that they are abandoned.

The barriers to brownfield development include the lack of an established process for handling cleanups and certifying them as "clean," the inability to secure financing because of the uncertain potential liability attached to the site, and, of course, the cleanup costs, which can make a brownfield development cost three or four times more than a greenfield site.

The barriers to brownfield development are easy to identify. They include the lack of an established process for handling cleanups and certifying them as "clean," the inability to secure financing because of the uncertain potential liability attached to the site, and, of course, the cleanup costs, which can make a brownfield development cost three or four times more than a greenfield site. With an estimated 500,000 brownfield sites in the U.S., addressing these issues must be an important element in any strategy to make land available, particularly in urban areas where these sites are more heavily concentrated.

At the federal level, establishing a liability standard is particularly important. If the federal government could establish clear liability standards for both lenders and property owners, it would be easier to determine the economic viability of brownfields. Federal standards also have the advantage of not allowing each state to set a different liability standard. In contrast, individual state standards often vary and also run the risk of allowing some states to set very lax standards, which will put pressure on other states to lower their standards to compete for economic development. Some success has been achieved through permitting the use of industrial development bond financing for cleanups, providing tax incentives, and even creating Brownfield IRAs, in which firms can put aside pretax funds to pay for future cleanup needs. Permitting banks to include loans for brownfield cleanup as part of their Community Reinvestment Act (CRA) compliance record is another helpful step.

State policy in this area has been particularly active, with programs focusing on capping liability or providing letters that certify the appropriateness of the cleanup effort and releasing the firm from liability for undiscovered contamination being common policies (see table 4). Still, it is unclear what the legal standing of these state release letters will be if they are challenged on federal grounds.

Table 4 Seventh District State Brownfield Initiatives

State	Program Description	Liability Provision	Participant Requirements	State Assurances Provided
Illinois	Pre-Notice Site Cleanup Program	State liability is strict, joint, and several for potentially responsible parties (PRPs).	$5,000 initial fee for oversight costs.	"Clean" letters issued for successful cleanups. Re-openers apply in the case of changes in land use.
Indiana	Voluntary Cleanup Program	Liability is strict, joint, and several.	$1,000 fee for application submittal including site history and description.	Certificate of completion issued by the Indiana Department of Environmental Management. Governor's office then issues a "covenant not to sue."
Iowa	None at this time.			
Michigan	Natural Resources Environmental Protection Act	Strict retroactive liability still applies to potentially responsible parties, although new law exempts owners from liability at current sites if they did not cause the release.	"Affirmative obligations" now exist for owners and operators of sites suspected or known to be contaminated to remediate and restore the site.	Covenant not to sue available for redevelopers of industrial sites. Letter of determination provided to anyone purchasing property. Letter protects purchaser from liability pending approved baseline assessment of site.
Wisconsin	Land Recycling Act	Prospective purchasers and innocent landowners may participate; responsible parties are pursued for cleanup costs in the event voluntary agreements fail. Municipalities and lenders are generally exempt from liability for properties obtained through foreclosure.	Currently no fee is required.	Release from liability offered under the state's Hazardous Substance Discharge Law. Release is transferrable to future owners.

Source: Adapted from Charles Bartsch, "Brownfield Policies in the Midwest," working draft, Northeast-Midwest Institute, Washington, DC, November 15, 1995.

Bartsch concluded that better information is needed about the magnitude of the brownfield problem before we can be certain that the best strategies are being pursued. Each brownfield is a unique site with its own set of issues, and policymakers should resist attempts to create "one size fits all" solutions. Determining the proper level of public support for cleaning up brownfields requires a realistic assessment of the redevelopment prospects of each site. Even a clean parcel of urban land may not attract any redevelopment if other urban problems are really at the root of stopping development.

McDonald suggested that contamination may be a marginal issue in development, in the sense that it only becomes significant when there is demand for redeveloping the site. Looking at how the market discounts the value of contaminated sites would help researchers to define just how significant contamination is in inhibiting redevelopment.

A Clarifying Perspective

How important are such issues and impediments as environmental remediation and urban land assembly policies to redevelopment of urban cores and to the overall growth of metropolitan areas? Much of the workshop dialogue centered on the central city-suburban trend in which urban development has been rapidly moving outward while the core is declining. However, a healthy debate exists as to whether this phenomenon largely derives from artificial subsidies and government policies or from technological changes that will ultimately become necessary for the well-being of entire metro areas. Knowing the answer would help to shape policies—should we dismantle and reverse existing policies which encourage deconcentration, or should we assist older metropolitan areas to take on newer and possibly more efficient forms?

Joseph Persky, professor of economics, and Wim Wiewel, special assistant to the chancellor of the University of Illinois at Chicago, assessed the optimal location of hypothetical firms—a service firm and a manufacturing firm—in both a central city site and a suburban site in the Chicago metro area. The model attempted to measure the costs and benefits of each type of site by accounting for social considerations, such as traffic congestion and better use of existing infrastructure, while it also considered the firm's perspective of differences in wages and other operational costs. For this reason, both public and private costs and benefits of the choice of site location were compiled. The approach measured the marginal effects of a single facility (one manufacturing facility, one service facility) locating at a suburban and city site.

When these factors were summed for each location, the total societal benefits were found to be roughly the same. While the societal benefit of the firm locating at an urban location was higher in terms of the public benefits that the investment generated, the suburban location was markedly better in terms of private benefits. This raises a distribution question—namely, who is capturing the benefit of suburban versus urban development?—but it does not suggest that suburban development is inefficient. In terms of the aggregate benefits of development, both locations appeared to provide roughly equal benefits to society. Most importantly, these results, although case-specific and preliminary, suggest that there are strong private market incentives that continue to propel economic activity toward more spread out formations in metropolitan areas; a reversal of this trend would require broad and concerted policy efforts.

Strong private market incentives continue to propel economic activity toward more spread out formations in metropolitan areas; a reversal of this trend would require broad and concerted policy efforts.

Summing Up

The first conference of the Federal Reserve Bank of Chicago's year-long effort to assess the performance and prospects for the Midwest economy found that understanding metropolitan areas and enhancing their growth prospects will be important in sustaining the region's economy. Metropolitan areas have become a dominant feature of the economic landscape, and individual metropolitan areas are becoming distinct and specialized as they establish important economic linkages throughout the nation and the world. Technological changes are taking place in the processing of information which portend dramatic changes for the workplace and for the desired location of emerging service firms. Metropolitan areas that are suitable or those that can adapt to these changes will be more likely to grow and prosper. Quality of life and cost of living as they relate to labor supply have become increasingly important for many types of service establishments.

Historically, Midwest metro areas have been more heavily oriented toward manufacturing, so that the nation's service industry conversions may be more challenging for this region. So too, environmental remediation of former industrial sites may present a larger hurdle for the Midwest.

Midwest metropolitan areas can be distinguished from those in other regions, and their differences will affect their prospects for growth and influence their optimal public policy focus and direction. Historically, Midwest metro areas have been more heavily oriented toward manufacturing, so that the nation's service industry conversions may be more challenging for this region. So too, environmental remediation of former industrial sites may present a larger hurdle for the Midwest.

The region's most rapid development took place during the world's age of mass industrialization from the late 1800s into the early 1900s. For this reason, midwestern cities often have a very dense core of population, with older buildings and infrastructure. Residential and, more recently, economic activity has been spreading out toward the urban fringe, leaving behind redevelopment problems for the core. It is an open question whether the current pattern of economic deconcentration can or should be stopped. A richer understanding of the factors that favor deconcentration and the linkages within and between metro areas is needed.

Many central cities will continue to face the many problems of transforming to a lower density of living and working. Fragmentation of governmental arrangements have made public service provision to the poor a central city responsibility—along with other public facilities that benefit the wider region. Moreover, policies such as federal legislation to remediate environmentally contaminated sites seem to have ample room for improvement—even with such policy improvements, decontamination alone may not suffice. Central cities may also need to fashion policies to assemble large parcels of land for redevelopment, even though the financial resources for such projects may not be readily available.

Finally, if they are to achieve growth or prosperity, city and suburb alike will need to address the supply side of the development equation. Workplace changes which require a changing level and mix of skills will be an important determinant. Some areas will also need to address development from a "human" perspective, involving social issues such as health, crime, and education.

About the Workshop

Correspondence related to the November 28 workshop should be directed to conference convenor Richard H. Mattoon, senior economist in the Research Department at the Federal Reserve Bank of Chicago. Participants in the workshop included the following:

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About the Project

The Federal Reserve Bank of Chicago is undertaking an extensive analysis of the Midwest economy. The goal of the project is to understand the Midwest's turnaround in economic performance since the early 1980s. In the Seventh Federal Reserve District—which includes Iowa and large portions of Illinois, Indiana, Michigan, and Wisconsin—unemployment rates are, at the time of this writing, lower than at any time since the 1977–78 period, as well as being below the national average.

The Midwest project will involve a series of workshops and research studies which will be carried out by Federal Reserve analysts and other researchers from the region. An advisory board representing a cross section of Midwest leaders will provide guidance for the project (see next page). Workshops scheduled for 1996 will consider (1) the economic performance of the broad Midwest economy and the transformation of its manufacturing industries; (2) the rural economy of the Midwest; (3) labor force training and education; (4) global linkages with the region's economy; and (5) tax, spending, and regulatory influences on regional performance. The findings of the workshops will be communicated through a series of publications and broad public forums. The project will conclude with a conference and publication toward the end of 1996.

At the Bank, the "Assessing the Midwest Economy" project is being conducted through a cooperative effort of the Office of the President, Michael H. Moskow, president; Research Department, William C. Hunter, senior vice president and director of research; and Community and Information Services, Nancy M. Goodman, senior vice president.

Inquiries should be directed to William A. Testa, senior economist and assistant vice president, Research Department, or James Holland, public affairs officer.

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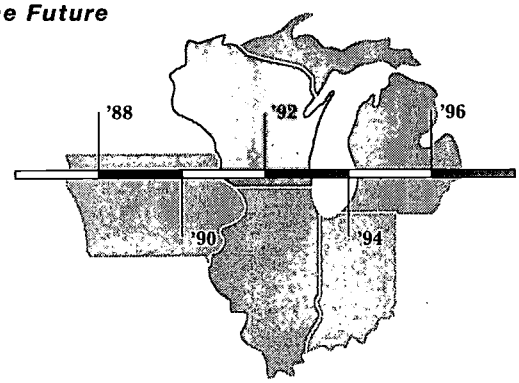


The Midwest Economy: Structure and Performance

Second in a series of workshops to be held at the Federal Reserve Bank of Chicago.

The second workshop as part of the Bank's long-term study of the regional economy was held on February 13, 1996. This workshop focused on the structure and performance of the Midwest economy, particularly with regard to manufacturing which continues to be its dominant industry sector. The first part of the program included a look at the current status of the region's economy, as well at its development in a broad, historical context. Current baseline data were contrasted with longer-term developments and trends to get a better view of what might lie ahead. The second half focused on the manufacturing sector. How is this crucial element of the region's economy being shaped by ongoing structural changes, in an environment where best manufacturing techniques are transferred across borders with apparent ease and amazing speed? What implications have these structural changes for the region's public policy decisions?

State of the Region

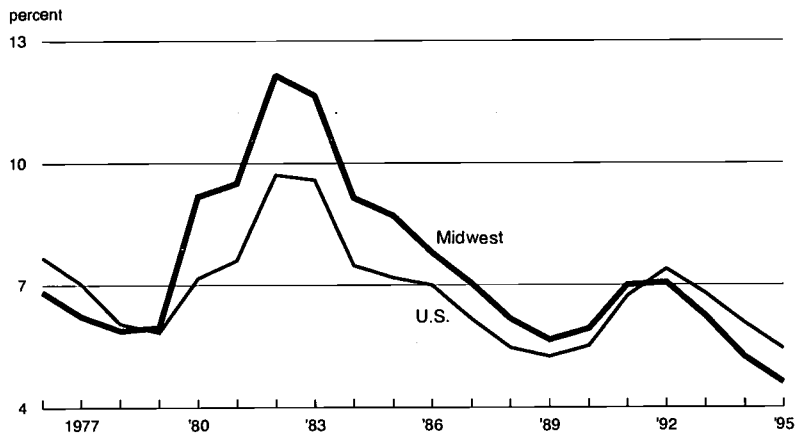
David Allardice, senior vice president and manager of the Detroit Branch of the Federal Reserve Bank of Chicago, presented an overview of the current state of the Midwest region. Manufacturing activity and closely associated services continue to account for a significantly greater share of personal income in the Great Lakes than the nation. While some have made gloomy forecasts for the region, reacting mainly to the severe recession of the early 1980s, the performance of the Midwest in the most recent recession, recovery, and current expansion has been remarkable.

While the Midwest did not escape the recession of the early 1990s, its unemployment rate continued to *improve* relative to the national average from 1989 to 1991, as it had since the early 1980s (see figure 1). In previous recessions, the region's unemployment rate had consistently shown greater deterioration than the nation's.

The region's unemployment rate (on average and in each of its states) has been below the national average in each of the past three years—in Michigan, labor markets are stronger than at any time in the past two decades. Figure 2 shows an index of hiring plans in the Midwest relative to the U.S. Since 1990, the region's hiring plans have outpaced the nation's, and in 1995 the survey of Manpower hiring recorded the largest increase since it was started in 1977.

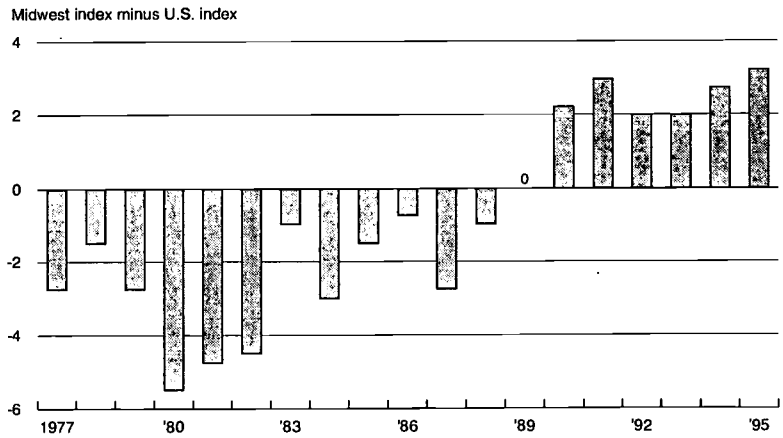
While the Midwest did not escape the recession of the early 1990s, its unemployment rate continued to improve relative to the national average from 1989 to 1991, as it had since the early 1980s.

Figure 1 Unemployment Rates



Sources: Bureau of Labor Statistics and state employment agencies.

Figure 2 Midwest Hiring Plans, Relative Strength



Source: Manpower, Inc., hiring survey.

Housing industry data and indicators of manufacturing output also point to stronger activity in the region than the nation during the 1990–91 recession, with continuing relative strength through the early 1990s (see figure 3).

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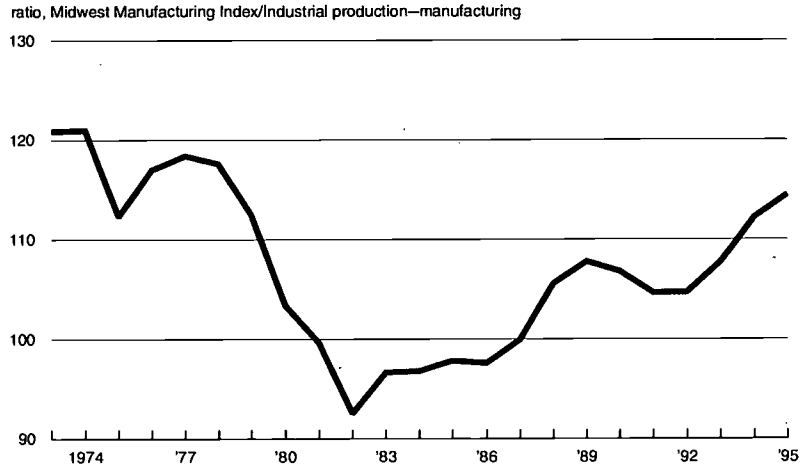
Figure 3 Relative Strength in Midwest Industrial Production



Source: Board of Governors of the Federal Reserve System and Federal Reserve Bank of Chicago.

In assessing the state of the region, however, one needs to consider three important external factors that have influenced its fortunes during the last decade: declining real energy prices, important both as an input to the region's industries and as a determinant of demand for its products; declining interest rates, stimulating demand for durable goods; and the declining dollar since the mid-1980s, which has improved the international competitiveness of the region's companies. While these effects are difficult to isolate and quantify with any reasonable degree of precision, Allardice and William Bergman, economist at the Detroit branch of the Federal Reserve Bank of Chicago, argued that productivity improvements, implemented in the region's plants since the early 1980s, have probably played the most important role in the region's revival. They stated that the lessons learned during the harsh recession of the early 1980s are no less important today. Continued focus on efficiency improvement, human capital development, and investment will foster regional performance should important forces external to the region, so favorable today, turn hostile tomorrow.

Productivity improvements, implemented in the region's plants since the early 1980s, have probably played the most important role in the region's revival.

Long-Term Trends in Regional Development

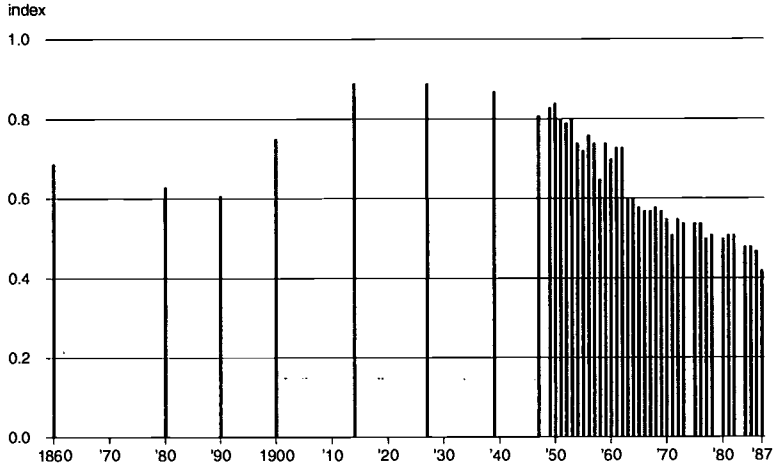
Changing Structure of Regions

Following the presentation on the current state of the Midwest economy, the workshop focused on analysis of longer-term trends in the development of regional economies in the U.S. Sukkoo Kim, economics professor at Washington University in St. Louis, presented a historical perspective on the changing structure of U.S. regions. This presentation aimed to provide a framework for evaluating the state of the Midwest economy in the context of an evolving national economy. From 1860 to 1947, as the Midwest (defined by Kim as the East-North-Central census region, encompassing Ohio, Indiana, Illinois, Michigan, and Wisconsin) became the dominant manufacturing region of the U.S., its share of national manufacturing employment rose from 12.7% to 30.2%. In the second half of the twentieth century, however, the Midwest's share of national manufacturing employment began to decline, going from 26.7% to 22.1% between 1967 and 1987.

From 1860 to 1947, the Midwest's share of national manufacturing employment rose from 12.7% to 30.2%. In the second half of the twentieth century, however, the Midwest's share of national manufacturing employment began to decline, going from 26.7% to 22.1% between 1967 and 1987.

The first 30 years or so of the period analyzed were characterized by a rapid increase in integration of the various regions of the U.S. For example, the advent of the railroad and the construction of numerous railroad lines between the 1840s and 1890s dramatically reduced the cost of transportation over land. Railroad mileage in operation increased sharply from 30,626 miles in 1860 to 166,703 miles in 1890. The increase in integration set the stage for specialization within regions. In order to track the various regions over time, Kim calculated an index of regional specialization at various points in time. The index relates industry-specific employment to overall employment for two regions. If it is equal to zero, then the two regions are completely despecialized. Conversely, complete regional specialization corresponds to an index value of 2. An aggregate index is then derived by averaging across the biregional indices.

Figure 4 Index of Regional Specialization for Manufacturing, 1860–1987



Source: Sukkoo Kim, "Changing Structure of U.S. Regions: A Historical Perspective," paper prepared for the workshop *Structure and Performance, 1996.*

The aggregate index of specialization shown in figure 4 suggests that the extent of regional specialization was about 35% in 1860, 43% in 1927 and 1939, and 23% in 1987. This pattern is found to be robust for each of the biregional comparisons. In general, each region becomes more specialized compared with any other region between 1860 and the turn of the twentieth century and then less specialized toward the second half of the twentieth century.

Kim suggests an explanation of his findings that is based on the effect of scale economies and the availability of resources. As transportation costs fell between 1860 and the turn of the twentieth century, firms adopted large-scale production methods that were intensive in relatively immobile resources and energy sources. The rise in scale and the use of immobile resources caused regions to become more specialized. As factors became increasingly more mobile and as technological innovations favored the development of substitutes, regional resource differences diminished. This trend and a fall in scale economies caused regions to become despecialized between WWII and today.

The data provide little support for a prominent role of external economies. Instead of the spatial concentration one would expect to find for high-tech industries, according to the external economies argument frequently associated with Paul Krugman, Kim's industry-level data show decreasing spatial concentration for high-tech industries such as chemicals and increasing concentration for low-tech industries such as textiles. Accordingly, Kim

Kim explains the rise and subsequent decline of the Midwest as a manufacturing belt as brought about by changes in the regional comparative advantage of manufacturing in conjunction with sectoral changes in the economy.

explains the rise and subsequent decline of the Midwest as a manufacturing belt as brought about by changes in the regional comparative advantage of manufacturing in conjunction with sectoral changes in the economy.

The discussion raised several issues relating to the historical economic development of U.S. regions. Charles Leven, economics professor at Washington University, pointed out that the development of regions is affected by the distribution of skills and consumption patterns. In that sense, amenities are expected to influence regional fortunes; therefore, one needs to consider the effect of utility maximizing migration in explaining regional development. In terms of drawing lessons for the future from the observed historical patterns, one needs to keep in mind that the underlying data reflect both short- and long-term cycles, for example driven by the durability of capital as well as the development of technologies, which determine the economic fortunes of regions over time. Finally, Leven cautioned against short memories. While we frequently associate Silicon Valley with the production of computer chips, that industry got started just outside Boston. Similarly, of the hundreds of auto companies that were in operation in the early part of this century, none subsequently moved to Detroit. These are important reality checks we need to put on simplified dependency-type arguments.

Charles Bonser, director of the Institute for Development Strategies at Indiana University at Bloomington, wondered about the policy implications of Kim's work. Kim explained that if the type of adjustment mechanisms he finds in his analysis explain U.S. regional growth and specialization, subsidies and policies such as location incentives are inefficient, because it is the regions' respective advantages that will determine the level of specialization. On the other hand, if one believes in a Krugman-type world, characterized by externalities, timely and well-focused subsidies could shift specialization in favor of a region. Leven suggested that local and regional policies ought to concentrate on efforts to grow the economy, not to attract particular plants. The ability of governments to fashion timely and well-focused subsidies is highly dubious.

James Rubenstein, professor of geography at Miami University, noted that in basing the analysis on fairly aggregate SIC data, one misses substantial variations within industries as far as products and markets are concerned. Kim explained that he felt comfortable with the results obtained as he found factor intensities to be similar for the various product categories included at the two-digit SIC-code level. William Oakland, chair of the economics department at Tulane University, warned against discarding Krugman's externality explanation too early. He felt more data analysis was necessary to reach such a strong conclusion.

Regional Income Trends

Fred Giertz, professor of economics at the University of Illinois in Urbana-Champaign, presented data on the development of regional income trends over the last four decades. The issue of convergence of per capita income has been of interest to economists for some time, as it relates to one of the basic premises of economics: the mobility of capital and labor tends to equalize prices across markets. Accordingly, there exists a rather large literature on the subject. Income convergence refers to the phenomenon of per capita differences among regions, for example, states in the United States or countries in the world, diminishing over time. Relative convergence characterizes a situation where low-income areas grow at a faster rate than high-income areas; absolute convergence is said to occur when the incomes of low-income areas increase in absolute amounts more rapidly than in high-income areas. Previous studies generally found income convergence among countries and states, respectively. Giertz's presentation revisited the data for the U.S. (see figure 5).

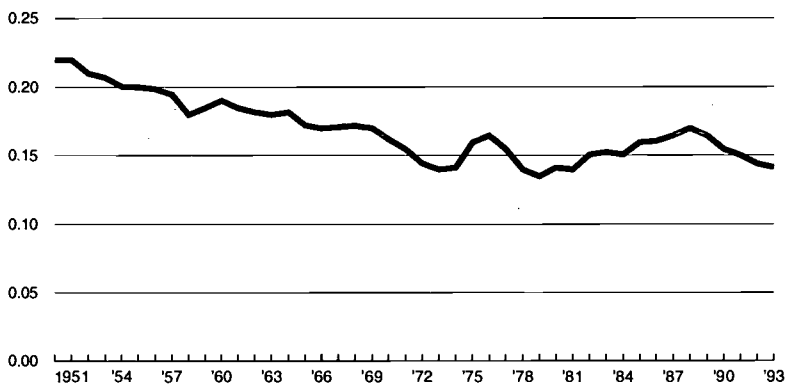
On the whole, income dispersion across states has declined from 1950 to 1993, but not in a smooth, consistent manner.

Figure 5 shows the trend in dispersion of per capita income among the states of the U.S., measured by the Gini coefficient (a coefficient of zero indicates absolute equality of income distribution, a coefficient of 1 absolute inequality). It indicates that, on the whole, income dispersion across states has declined from 1950 to 1993, but not in a smooth, consistent manner. Giertz distinguished four relatively distinct periods. From 1950 to 1973, convergence among states was strong, indicated by the unbroken falling trendline. From 1974 to 1980 dispersion remained relatively constant (aside from the blip from 1974 to 1978, probably the consequence of the large increase in energy prices after the 1973 oil embargo). This was followed by divergence from 1980 to 1988, a period marked by a severe recession and a major restructuring of American industry. Convergence occurred again from 1988 through 1993.

Giertz offered several explanations for the observed income convergence: diminishing returns to capital, relative speed of the diffusion of technology, free trade in goods leading to factor price equality, homogenization of population characteristics, and government policies. In his concluding remarks, Giertz suggested that long-term convergence has taken place among regions and states in the U.S., as well as among states in the Midwest. However, in the last two decades convergence has often been halted or even reversed for short time periods, probably in response to shocks caused by changes in the economy, such as shifts in comparative advantage among regions (see figure 6).

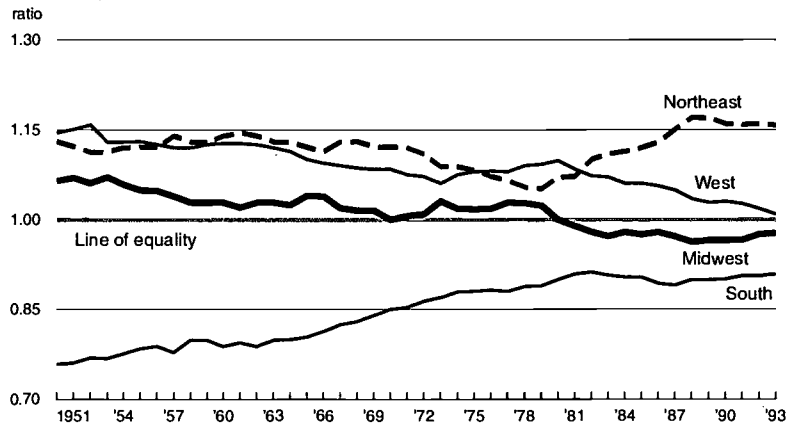
Explanations for the observed income convergence [include] diminishing returns to capital, relative speed of the diffusion of technology, free trade in goods leading to factor price equality, homogenization of population characteristics, and government policies.

Figure 5 Dispersion of Per Capita Income among States (Gini Coefficient), 1950–93



Source: Fred Giertz, "Regional Income Trends and Convergence," paper prepared for the workshop *Structure and Performance, 1996.*

Figure 6 Ratios of Regional Per Capita Income to U.S. Average, 1950–93



Source: Fred Giertz, "Regional Income Trends and Convergence," paper prepared for the workshop *Structure and Performance, 1996.*

Randall Eberts, executive director of the Upjohn Institute, agreed with Giertz's basic point: The long era of regional convergence may have abated around 1970; and the 1980s may have seen a reversal of this trend at least for a few years and for a few regions. This story has also been well documented in the convergence literature. The questions then are, What is the source of this new trend, and What does it suggest for the economic fortunes of the various regions?

Eberts agreed with the explanation that regional per capita differences may be the result of discrete shocks in which individuals react to the changing short-run fortunes of various regions. For example, Carolyn Sherwood-Call from the Federal Reserve Bank of San Francisco has shown that shocks were much more persistent after 1970 than before and, thus, shocks become more important in explaining changes in dispersion.

Consistent with the hypothesis of adjustments taking place in response to discrete shocks rather than to a long-run equilibrating process, Eberts noted that (a) data show that the key contributor to changes in relative income levels in the 1980s was earnings, and not property income or transfers; (b) the dispersion in wages was due primarily to regional differences in market valuations of worker characteristics rather than shifts in work force characteristics; and (c) locally adjusted wages generally converged throughout the 1980s, when nominal wages and regional cost of living indexes diverged. Furthermore, these adjustments may be competing as firms respond to nominal wages and workers to locally adjusted wages. With households and firms valuing amenities, we may find an equilibrating process that no longer converges when viewed only in terms of wages, but does converge when viewed in "real" terms.

Finally, Eberts noted that if amenities are increasingly important determinants of the adjustment process of per capita income, it is important to understand where the cities of the Midwest stand with respect to consumptive and productive amenities (cities with high-productivity enhancing site characteristics increase the demand for labor, and cities with high-amenity site characteristics increase the supply of labor [see table 1]).

Table 1 Classification of Cities

High Productivity	Low Productivity	High Amenity	Low Amenity
New York, NY	Tampa, FL	Boston, MA	Cleveland, OH
Newark, NJ	San Antonio, TX	San Diego, CA	Cincinnati, OH
Los Angeles, CA	Salt Lake City, UT	Milwaukee, WI	Pittsburgh, PA
Seattle, WA	New Orleans, LA	Denver, CO	Philadelphia, PA
San Francisco, CA	Columbus, OH	Riverside, CA	Baltimore, MD
Minneapolis, MN	Sacramento, CA	Portland, OR	St. Louis, MO
Anaheim, CA	Phoenix, AZ	Ft. Lauderdale, FL	Indianapolis, IN
Nassau-Suffolk, NY	Kansas City, MO	Miami, FL	Dallas, TX
Chicago, IL			Atlanta, GA
Washington, DC			
San Jose, CA			
Houston, TX			
Detroit, MI			

Productivity cities are listed from most amenable to least amenable, amenity cities are listed from most productive to least productive.

Source: Eberts and Beeson, "Identifying Amenity and Productivity Cities Using Wage and Rent Differentials," Federal Reserve Bank of Cleveland, *Economic Review*, Quarter 3, 1987, pp. 16–25.

During the brief discussion, Oakland suggested that one needs to look at both aggregate personal income and relative per capita income measures. Regions are not indifferent to an increase in aggregate personal income, as it can afford greater markets for local firms. John Baldwin, director of the Micro-Economics Analysis Division at Statistics Canada, related some information from Canada, where there is national wage convergence within industries. However, looking across various industries one finds divergence; the wage rate increases where a region and its workers have a comparative advantage. The overall net of these two effects varies by region, but is less interesting than the elements that contribute to it.

As the Chicago region experienced a "hollowing out" with the loss of about 500,000 manufacturing jobs from 1970 to 1990, its interstate trading relationships have gained importance.

The Role of Interregional Linkages

Geoffrey Hewings, director of the regional economics applications laboratory (REAL) at the University of Illinois at Urbana-Champaign, gave a luncheon presentation on changes in the Midwest economy, specifically, the spatial dimension of interdependence. Hewings suggested that regional growth theory has much to offer in terms of explaining movements of capital and labor, as well as convergence/divergence trends. However, the nature of linkages between firms remains largely unexplored. Hewings presented findings of research on interdependence in regional systems conducted by REAL, a joint venture between the University of Illinois and the Federal Reserve Bank of Chicago. Since 1970 a persistent decline was identified in the level of intra-regional dependence in the Chicago region. Hewings submitted that, as the Chicago region experienced a "hollowing out" with the loss of about 500,000 manufacturing jobs from 1970 to 1990, its interstate trading relationships have gained importance. According to REAL, of the $140 billion in exports from the Chicagoland region during 1995, $119 billion went to the rest of the U.S., $10 billion went to Canada, $1 billion went to Mexico, and $10 billion went to the rest of the world. These numbers suggest that linkages among companies in the Midwest represent shipments of goods of around $200 to $800 billion annually. The size of these numbers, in combination with the hollowing out mentioned earlier, makes it imperative that we improve our understanding of these interregional linkages.

Hewings noted that within the U.S., the Midwest competes with the Rocky Mountain states and the Southwest. In contrast, a complementary economic relationship is found to exist between the Midwest and the far western and Mid-Atlantic states. Combining that information with the export data, one can see that the economy of the Midwest is directly tied to that of North America, and indirectly to those of Europe and Asia (see table 2).

Table 2 Foreign Destination Shares of Regional Industrial Production, 1987

	Foreign Destination Area							
U.S. region of production	North America	Central America	South America	Europe	Asia	Oceania*	Africa	All**
Midwest	52.6	5.1	3.0	20.1	15.3	2.3	1.6	100
Mid-Atlantic	25.7	5.5	6.7	31.4	25.5	2.6	2.7	100
New England	23.7	2.9	2.3	39.6	25.6	4.9	1.0	100
Plains	38.8	3.8	2.6	25.9	24.2	3.1	1.6	100
Rocky Mtn.	22.1	4.0	1.3	32.3	36.2	3.4	0.8	100
South Atlantic	15.1	13.8	12.0	30.7	23.7	2.4	2.3	100
South Central	23.2	9.7	6.7	31.8	22.2	2.6	3.9	100
Southwest	11.8	24.3	7.4	23.4	27.1	2.1	3.9	100
West	11.3	5.5	3.4	30.3	44.1	4.0	1.4	100
U.S.	27.3	8.0	5.1	28.0	26.5	3.0	2.1	100

**Islands in the Pacific, including New Zealand, Australia, and the Malay Archipelago.*
***Totals may not add to 100% due to rounding.*

Source: U.S. Bureau of the Census, unpublished data.

In conclusion, Hewings raised the following questions: How is the pattern of interregional linkages evolving? Are there significant interstate flows in services as well as manufactured goods? What are some of the regulatory, tax, and fiscal issues that may be limiting the potential of interstate trade, such as different weight limits on trucks or different state tax regimes? Subsequent discussion by workshop participants concerned the nature and magnitude of interstate trade obstacles and their overall effects. Oakland wondered about the nature of the hollowing-out process and the subsequent increase in interregional relationships. For example, it is possible that a firm leaves the Chicago area but continues to purchase materials from it. That would suggest the need to distinguish linkages at the input and final goods levels.

Focus Manufacturing: Aspects and Implications of Structural Change

Application of Lean Manufacturing

In addition to the importance of interregional trade, the implementation of best manufacturing practices may have helped revitalize Midwest manufacturing. Thomas Klier, senior economist at the Federal Reserve Bank of Chicago, focused the participants' attention on a more recent phenomenon, that is, the arrival of lean manufacturing technologies. Is there a connection between the revival of Midwest manufacturing and the application of the new manufacturing techniques?

Lean manufacturing combines aspects of both craft and mass production, ranging from teamwork on the shop floor, emphasis on low inventory, and flexible production equipment, to close relationships with suppliers.

Lean manufacturing refers to a production system that gained widespread attention in the early 1980s. It combines aspects of both craft and mass production, ranging from teamwork on the shop floor, emphasis on low inventory, and flexible production equipment, to close relationships with suppliers. We are all quite familiar with the changes the U.S. auto industry experienced after implementing lean manufacturing techniques in its plants and management approach. But to what extent is that experience characteristic of manufacturing in general?

Two large-scale studies help shed some light on this issue. Both Statistics Canada (in 1988) and the U.S. Census Bureau (1988 and 1993) administered surveys of manufacturing technologies in order to measure the extent and type of advanced manufacturing technologies used in their respective country's manufacturing plants. Both surveys showed the following: the application of advanced manufacturing technologies was found to be widespread across plants and industries, typically with multiple technologies applied per establishment. Larger plants were found to adopt the technologies surveyed more rapidly than smaller plants; and the age of the plant did not affect the implementation of these technologies (see table 3). These results indicate that advanced manufacturing techniques are reshaping manufacturing on a broad scale.

Table 3 Application of Flexible Manufacturing Cells (FMCs) by Employment Size and Age of Plant

Plant Employment	% of Plants Using FMCs	Age of Plant	% of Plants Using FMCs
20–99	7.6	< 5 yrs.	13.4
100–499	21.4	5–15	13.3
500+	40.4	16–30	13.4
		> 30	15.2

Percentages do not add up to 100% as "% of plants using FMCs" is only one of the categories per plant size and plant age, respectively.

Source: U.S. Department of Commerce, Bureau of the Census, "Current Industrial Reports," *Manufacturing Technology: Prevalence and Plans for Use*, 1993, tables 4D and 4E.

Klier suggested that surveys alone may not capture the entire process of technical diffusion. By relying on purely quantitative measures in assessing the effect of lean manufacturing technologies, we may miss crucial linkages of this production system. For example, a recent study administered by the National Association of Manufacturers suggests that computer aided design is a precursor technology to computer numerically controlled machines and computer aided manufacturing.

In addition, it may be helpful to understand the returns from new technology in the context of the management and goals of an entire plant. The issues are complex. Management must first decide what the goal of implementing lean manufacturing should be: improved product, production, or process flexibility. Second, management must decide how to set rewards and incentives that are related to achieving that objective. For example, a practice of continuing to reward workers for maximum capacity utilization and output per hour may work well in a plant that is trying to achieve economies of scale, but in the context of striving for improved flexibility, appropriate management incentives might be reduced changeover and/or lead times, and increased process range.

It was found that plants that used advanced manufacturing technology experienced increases in market share relative to non-users (this effect was especially prominent for those plants adopting several combinations of technologies) in relative labor productivity and in relative wage rate.

Baldwin added first-hand information on the issue of technology adoption. By linking the results of the survey on manufacturing technology to longitudinal census data, he and his colleagues were able to track the technology adoption of specific establishments over time. It was found that plants that used advanced manufacturing technology experienced increases in market share relative to non-users (this effect was especially prominent for those plants adopting several combinations of technologies) in relative labor productivity and in relative wage rate. In that sense the survey suggests a Schumpeter story: Establishments that innovate do better in the marketplace.

Baldwin emphasized the need to improve technology adoption in small plants. He suggested, as a first step, assessing the regional effects of technology adoption by looking at plant size distribution across regions. In combination with the differences in technology adoption for small versus large plants, this information could foretell regional fortunes.

Baldwin reiterated the relevance of organizational and management issues in the context of technology implementation and adoption. According to a survey of plant managers by Statistics Canada, difficulties related to organizational change ranked highest among impediments to technical acquisition, even above issues such as skill shortages and labor training needs.

During the ensuing discussion, a competing interpretation of the "Schumpeter story" found in the Statistics Canada data was suggested: It is the successful firms that can afford to innovate. In rebuttal, Baldwin related that the evidence from the longitudinal data does not seem to favor such an interpretation. The data strongly suggest that firm success after technology implementation is observed regardless of the initial position of the firm.

Emerging Geography of the Auto Industry

The recent location trends in the U.S. auto industry represent a fundamental reversal of Henry Ford's legacy: Assembly plants have returned to the Midwest, whereas parts plants are less likely to be located there.

In examining the changing focus and location of the U.S. auto industry, Rubenstein considered changes in technology, industry organization, and transportation costs. He pointed out that the recent location trends in the U.S. auto industry represent a fundamental reversal of Henry Ford's legacy: Assembly plants have returned to the Midwest, whereas parts plants are less likely to be located there.

The costs of distributing the final product to the customer have always been important in deciding the location of auto assembly plants. Henry Ford opened far-flung branch assembly plants to produce identical Model T cars close to the population centers outside the Midwest, thus reversing the trend of locating assembly plants in the heart of the country. According to his rationale, it was cheaper to ship parts to branch assembly plants than to ship finished automobiles all across the country from a centrally located assembly plant.

The automotive parts industry has also restructured: Many parts once made in-house are now being made by independent suppliers; the number of companies that supply parts directly to car producers—known as tier one suppliers—has been cut in half; and car producers are reducing inventory in their final assembly plants by demanding just-in-time delivery of large modules from tier one suppliers.

Soon, both General Motors and Chrysler emulated that strategy. For example, GM produced Chevrolets in ten different assembly plants during the 1950s. However, by the 1960s the proliferation of car and truck models began to change the conditions that made that location strategy an optimal one. The number of different car and truck models sold in the U.S. increased five-fold, from 30 in 1955 to 142 in 1989, while sales only doubled from about 8 million units to about 16 million in 1989. With reduced output per individual model, the entire output would best be produced at one plant only and, consequently, the geographic argument for an interior location became compelling; that way the company can minimize the cost of distributing the output to a national market. As a result, during the past 16 years auto producers have opened assembly plants in the interior, especially along the I-65/I-75 corridor, and closed coastal plants (see table 4).

Table 4 Distribution of Auto Assembly Plants over Time, by Region

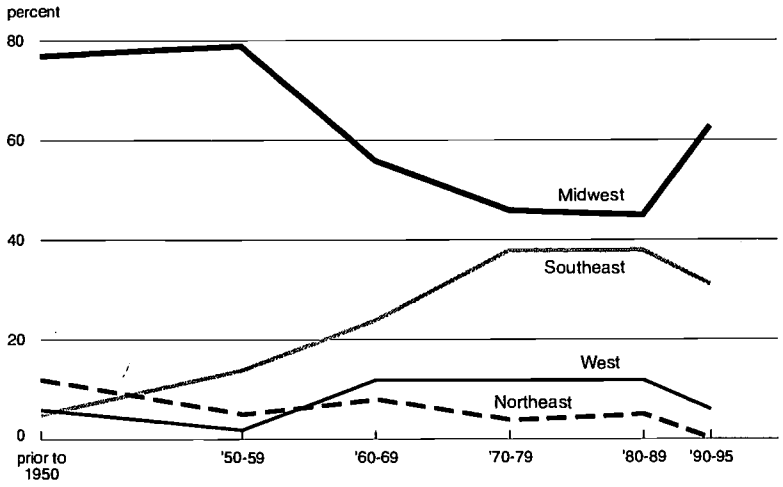
	Status of Plant			
Region	**Open in 1979**	**Closed 1979–96**	**Open 1979–96**	**Open in '96**
Midwest	27	9	13	31
Southeast	6	1	8	13
West	15	6	1	10
Northeast	9	5	0	4
Total	**57**	**21**	**22**	**58**
I-65/I-75 corridor	27	8	20	39
Other	30	13	2	19

Source: Adapted from James Rubenstein, "The Evolving Geography of Production: Is Manufacturing Activity Moving Out of the Midwest? Evidence from the Auto Industry," paper prepared for the workshop *Structure and Performance, 1996.*

The automotive parts industry has also restructured: Many parts once made in-house are now being made by independent suppliers; the number of companies that supply parts directly to car producers—known as tier one suppliers—has been cut in half; and car producers are reducing inventory in their final assembly plants by demanding just-in-time delivery of large modules from tier one suppliers. This restructuring has encouraged two opposing locational trends. On the one hand, suppliers want to be near the corporate offices, research centers, and production facilities maintained in Michigan by their customers, primarily the Big Three. On the other hand, suppliers face pressure to locate some production in the Southeast to make use of the region's lower-cost, nonunion work force and to deliver just-in-time to the region's new foreign-owned assembly plants.

Rubenstein provided information on the locational characteristics of 881 plants that manufacture components for new vehicles. The data represent plants of the 150 largest auto supplier companies in North America, as identified by *Automotive News,* the industry's principal trade paper. Rubenstein found that 65% of these component plants are located in the Midwest, with Michigan being home to the largest number of plants (234). For the 647 plants whose opening dates could be identified, Rubenstein traced out the geographic distribution over time (see figure 7). He found that the trend to locate in the Southeast has been underway since the 1960s. The recent increase in locations in the Midwest represents too few observations to draw strong conclusions.

Figure 7 Auto Supplier Plants by Region and Start-Up Date



Source: Adapted from James Rubenstein, "The Evolving Geography of Production: Is Manufacturing Activity Moving Out of the Midwest? Evidence from the Auto Industry," paper prepared for the workshop *Structure and Performance, 1996.*

Rubenstein also detected some effects of plant ownership and product type on the location choice of his sample plants. The drift to the Southeast has been sustained in recent years less by the relocation of U.S.-owned suppliers than by the arrival of a large number of foreign companies (see table 5). Within the Midwest, new facilities are less likely to locate in the Detroit area and more likely to be in southwestern Michigan, northeastern Indiana, and western Ohio. Regional distribution of plants varied widely according to type of product or system. High-value-added components requiring highly skilled workers, such as engines and brakes, are most likely to remain in the Midwest. In contrast, the Southeast has a higher percentage of factories making bulky, low-value-added components, such as tires, although in some cases Southeast or coastal location was extended to components based on "stand-alone" new technology, such as air bags and air conditioners.

Table 5 Auto Supplier Plants by Region and Ownership

	Ownership status			
Region	**Big 3 subsidiary**	**Independent U.S.-owned**	**Foreign-owned**	**All**
Midwest	80%	54%	41%	56%
Southeast	9	27	40	27
West	4	12	9	10
Northeast	7	7	9	7
Number of plants in sample	129	603	149	881

Source: Adapted from James Rubenstein, "The Evolving Geography of Production: Is Manufacturing Activity Moving Out of the Midwest? Evidence from the Auto Industry," paper prepared for the workshop *Structure and Performance, 1996.*

Daniel Knudsen, professor of geography at Indiana University, suggested viewing the locational shifts in the larger context of the socioeconomic environment. Specifically, he argued that three different types of a new production system are currently emerging: the "neo-Fordist" system, typified by the U.S. auto industry; lean production, which is associated with the Toyota corporation in Japan, and the system of flexible specialization, mostly found in Europe. Knudsen's main point was that lean manufacturing does not provide us with a blueprint for manufacturing in general; rather these different concepts are applicable at certain plant sizes in specific regions and cultures.

Donald Smith, director of the Center for Economic Development at Carnegie Mellon University, asked how the location strategies for U.S. parts plants compare to the tight supplier complexes one finds in Japan, as well as for Japanese transplants in the U.S. Rubenstein stated that the current restructuring tends to favor the large tier one suppliers. Large companies, in turn, can decide to locate their production operations relatively independently because they are more like equals to the large auto assembler companies.

With regard to assembly plant location, Rubenstein explained that because of the importance of transportation costs, auto assemblers now think of the auto region as the area between Chicago and Michigan, reaching south all the way to Tennessee, an area that does not necessarily coincide with any of the traditional boundaries of U.S regional economic analysis. However, the recognition of this "auto region" does not preclude competition between states in that region to attract a new assembly plant. More generally, one can say that the Midwest (and its southern extension) has a location advantage when the final product is bulky, generally one plant produces that product, there is a national market, and inputs are easily shipped. Peter Eisinger, director of the La Follette Institute of Public Affairs at the University of Wisconsin, wondered why Daimler Benz had recently decided to locate in Alabama rather than in the auto region defined above. Rubenstein replied that the generous package of location incentives provided by the state of Alabama probably more than compensated for the higher transportation costs to serve the U.S. market from the Alabama plant.

One can say that the Midwest (and its southern extension) has a location advantage when the final product is bulky, generally one plant produces that product, there is a national market, and inputs are easily shipped.

The Midwest economy is uniquely positioned to adapt its manufacturing sector to high-performance manufacturing and to other leading edge technologies as the best U.S., European, and Japanese manufacturers all have a presence in this region.

How Can the Region Stay Competitive in the New Environment?

The workshop concluded with the presentation of four different views on public policy options to address issues related to the changes in manufacturing. Smith referred to work that he and Richard Florida had done in conjunction with the Council of Great Lakes Governors on high-performance manufacturing, a system of production organization that maximizes information flows both within companies and in their dealings with suppliers. This approach to manufacturing was brought to the Midwest by Japanese auto transplants. Today the Midwest economy is uniquely positioned to adapt its manufacturing sector to high-performance manufacturing and to other leading edge technologies as the best U.S., European, and Japanese manufacturers all have a presence in this region.

Smith emphasized the following policy recommendations: (a) It is important to reduce the size of barriers to trade, transport, and migration across the region; (b) technology networks and alliances are important vehicles for implementing new manufacturing techniques; (c) the Midwest needs to address its lack of entrepreneurship relative to other regions; and (d) the aging labor force in midwestern plants could signal looming labor and skill shortages.

Robert Sheets, director of research and development of business and industry services at Northern Illinois University, presented his views on major challenges and policy options in work force development. He made four main points with respect to state and local investment in work force training. First, in light of changing work-place requirements, it is necessary to expand and improve the basic skills of front-line workers. Second, he suggested that training and skill-upgrading should move from a school-based system to one

Training and skill-upgrading should move from a school-based system to one that is workplace-based, which would require expanded performance support systems within companies, as well as industry-based consortia for small and medium-sized companies.

Among the advantages of the Midwest as a manufacturing location are: skilled and trainable work force, low energy and land costs, existing agglomeration of manufacturing, and easy access to domestic markets.

Economic theory suggests that the firm has very little incentive to provide training in general skills to its workers; rather it will provide training in firm-specific skills.

that is workplace-based, which would require expanded performance support systems within companies, as well as industry-based consortia for small and medium-sized companies. Third, the shift in demand for education associated with the growth of adult upgrading and retraining markets and alternative models for developing the work force, such as industry supplier networks, calls for improvements in the competitiveness of the education and training industry. Fourth, Sheets mentioned the need to improve the access of low-income workers to workplace- and technology-based training, for example, through non-profit community-based organizations.

Kerry Sutten, regional economist at the Northeast-Midwest Institute, presented a summary of the Institute's recent work on federal policies to foster the manufacturing sector. Among the advantages of the Midwest as a manufacturing location are: skilled and trainable work force, low energy and land costs, existing agglomeration of manufacturing, and easy access to domestic markets. Among the disadvantages, Sutten listed: old industrial infrastructure, reliance on capital intensive industries, aging work force, high regulatory compliance, and poor air transport access. His policy suggestions included the provision of an extension network for retooling, school-to-work initiatives, financial incentives for capital intensive industries, information technologies, and an increase in air transportation.

Oakland reacted to the policy suggestions put forward by the three other panel members. In the past, remedies to the aforementioned problems have repeatedly proven difficult for governments to address. Accordingly, Oakland was critical of the lack of specific proposals. For example, on the issue of education at the firm level, economic theory suggests that the firm has very little incentive to provide training in general skills to its workers; rather it will provide training in firm-specific skills. Meanwhile, government subsidies to firms to provide general training or government-run programs have often been ineffectual. Oakland also suggested that some of the school-to-work problems stem from too strong of an emphasis on higher education. The problem might be substantially corrected by universities being more selective, and at the same time having vocational alternatives available to young people. Similarly, if possible, vocational education should be structured so as to add prestige and value for those who pursue it.

Finally, commenting on the need for economic development in general terms, Oakland argued that in order to justify the use of public monies to subsidize economic development, the existence of externalities or market failure must first be shown. It then needs to be demonstrated how a particular public policy program would alleviate the externality problem in a cost-effective way. Oakland suggested focusing on the big picture—by improving investment incentives, modernizing the education system, and taking a revisionist look at existing regulation.

During the discussion, Sheets related that he has found that companies do perform a large amount of general skills training, for example, improving upon third-grade reading levels by means of on-the-job training. With the changes in production systems now underway, companies must also deal with changing skill requirements. Eberts referred to complaints by employers about the lack of skilled workers, as well as community colleges not providing enough skilled labor (the fourth workshop of the Midwest assessment, to be held May 15, will specifically deal with work force issues).

Michael Moskow, president of the Federal Reserve Bank of Chicago, raised the issue of income distribution. What do we know about the impact of the new manufacturing technologies on income and earnings distribution? How do the cyclical movements of the economy affect income distribution? Smith cited Pittsburgh, where the percentage of employment in manufacturing has fallen from over 30% in the 1970s to a current level of below 10%, which significantly widened income disparities. Eberts commented that areas with higher-than-average income disparities are not faring as well during the current expansion.

Jean Allard, president of the Metropolitan Planning Council, argued that it is very important to ask if urban areas are becoming less economically viable because they are more severely affected by the loss of high-income jobs (see the summary of the first workshop, which focused on the issues affecting metropolitan areas in the Midwest).

Regional income differences (especially those related to wages) have largely converged over the course of this century.

In the Midwest, the performance of manufacturing continues to be central to the issue of income growth.

Summing Up

This workshop addressed the issues currently challenging the continued vitality of the Midwest economy. The opening presentation, which discussed the Midwest's extraordinary performance versus the nation during the last few years, set the stage for a deeper analysis of the region's economic structure. How much of this recent success is due to factors external to the region, how much to business and policy decisions, and what are the challenges the region needs to prepare for in order to stay competitive and economically viable?

A long-term analysis of the development of regions in the U.S. economy stressed changing comparative advantages as the driving factor in regional specialization trends. Data analysis suggests that the region's loss of manufacturing has bottomed out. Some evidence of restructuring in manufacturing relates to the development of interregional linkages among the region's plants and firms. While currently we know little about the structure of these linkages, research indicates that the fortunes of the Midwest depend primarily on the fortunes of the North American economy and indirectly on developments in Europe and Asia.

Regional income differences (especially those related to wages) have largely converged over the course of this century. After the negative shocks to the Midwest region (and its income) during 1979–1982, regional income has stabilized as manufacturing has rebounded. Changing regional differences in amenity values seem to be a (largely unobserved) reason for the lack of full convergence in nominal wages. Productivity differences accompanied by cost-of-living adjustments may also explain why remaining regional income disparities may be more apparent than real. Furthermore, regional income differences appear to be jolted away from approximate convergence in response to shocks in energy prices and short-term hikes in returns to certain occupational categories and skills. Indeed, the issue of widened income gaps among the haves and have-nots has supplanted geographic income disparities during the 1990s.

In the Midwest, the performance of manufacturing continues to be central to the issue of income growth. There is ample evidence for the widespread application and implementation of so-called advanced manufacturing technologies. However, to fully comprehend the nature of this adjustment process, the region needs to integrate critical elements of management-labor relations and strategic planning. A geographic analysis of the auto industry, the largest industry in the region, exemplified how multifaceted and complex the adjustments to new technologies can be. While assembly plants are returning to the heart of the country, parts plants are opening in both the Midwest and Southeast, their location being influenced by factors such as plant ownership and type of output produced.

It is apparent that little is known on how the adjustment to new manufacturing technologies plays out on the regional level. It seems a regional breakdown of available data and comparisons with similar regions in Europe and Japan are necessary to improve our understanding. The adjustment processes and ensuing structural changes observed in manufacturing raised several policy-related issues: the need for retraining and upgrading of skills and the means by which that training could best be delivered; as well as the appropriate scope for state and local economic development policies.

About the Workshop

Correspondence related to the February 13 workshop should be directed to conference convenor Thomas H. Klier, senior economist in the Research Department at the Federal Reserve Bank of Chicago. Participants in the workshop included the following:

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Federal Reserve Bank of Chicago

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Metropolitan Planning Council

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William Bergman
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Richard Bingham
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Charles Bonser
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Upjohn Institute

Peter Eisinger
University of Wisconsin-Madison

Ed Field
The Economist

Fred Giertz*
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Tulane University

Howard Roth
Bank of America

James Rubenstein*
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Robert Sheets*
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Mike Singer
Federal Reserve Bank of Chicago

Donald Smith*
Carnegie Mellon University

William Strauss
Federal Reserve Bank of Chicago

Daniel Sullivan
Federal Reserve Bank of Chicago

Kerry Sutten*
Northeast-Midwest Institute

William Testa
Federal Reserve Bank of Chicago

Stephen Thorp
Great Lakes Commission

David Wolfe
University of Toronto

**Presenter, discussant, or moderator*

Single copies of this summary are available free of charge. Please send requests for single and multiple copies to Public Information Center, Federal Reserve Bank of Chicago, P.O. Box 834, Chicago, Illinois 60690-0834 or telephone (312) 322-5111.

Workshop Agenda

The workshop "The Midwest Economy: Structure and Performance" was held on February 13, 1996 at the Federal Reserve Bank of Chicago, 230 S. LaSalle St., Chicago, IL 60604.

I. 9:15 a.m.

Welcome and Opening Remarks

Presenter: *Michael Moskow,* Federal Reserve Bank of Chicago

II. 9:30 a.m.

State of the Region
Overview of the Region's Economic Performance

Presenters: *David Allardice/William Bergman,* Federal Reserve Bank of Chicago

III. 10:00 a.m. - 12:00 p.m.

Session 1: Where Do We Go from Here?

Changing Structure of U.S. Regions: A Historical Perspective

Presenter: *Sukkoo Kim,* Washington University

Regional Income Trends and Convergence

Presenter: *Fred Giertz,* University of Illinois at Urbana-Champaign

Respondents:
Charles Leven, Washington University
Randall Eberts, Upjohn Institute

IV. 12:00 - 1:30 p.m. Lunch

The Transformation of the Midwest Economy

Speaker: *Geoffrey Hewings,* REAL

V. 1:30 - 3:30 p.m.

Session 2: Structural Change? Arrival of Lean Production

Structural Change and Technology in the Manufacturing Sector

Presenter: *Thomas Klier,* Federal Reserve Bank of Chicago

The Evolving Geography of Production: Is Manufacturing Activity Moving Out of the Midwest? Evidence from the Auto Industry

Presenter: *James Rubenstein,* Miami University

Respondents:
John Baldwin, Statistics Canada
Daniel Knudsen, Indiana University

VI. 3:30 p.m. Coffee Break

VII. 3:45 - 5:00 p.m.

Panel on Public Policy Options
How Can the Region Stay Competitive in the New Environment?

Panelists:
Donald Smith, Carnegie Mellon University
Robert Sheets, Northern Illinois University
Kerry Sutten, Northeast-Midwest Institute
William Oakland, Tulane University

About the Project

The Federal Reserve Bank of Chicago is undertaking an extensive analysis of the Midwest economy. The goal of the project is to understand the Midwest's turnaround in economic performance since the early 1980s. In the Seventh Federal Reserve District—which includes Iowa and large portions of Illinois, Indiana, Michigan, and Wisconsin—unemployment rates are, at the time of this writing, lower than at any time since the 1977–78 period, as well as being below the national average.

The Midwest project will involve a series of workshops and research studies which will be carried out by Federal Reserve analysts and other researchers from the region. An advisory board representing a cross-section of Midwest leaders will provide guidance for the project (see back page). Workshops scheduled for 1996 will consider (1) the economic performance of the broad Midwest economy and the transformation of its manufacturing industries; (2) the rural economy of the Midwest; (3) labor force training and education; (4) global linkages with the region's economy; and (5) tax, spending, and regulatory influences on regional performance. The findings of the workshops will be communicated through a series of publications and broad public forums. The project will conclude with a conference and publication toward the end of 1996.

At the Bank, the "Assessing the Midwest Economy" project is being conducted through a cooperative effort of the Office of the President, Michael H. Moskow, president; Research Department, William C. Hunter, senior vice president and director of research; and Community and Information Services, Nancy M. Goodman, senior vice president.

Inquiries should be directed to William A. Testa, senior economist and assistant vice president, Research Department, or James Holland, public affairs officer.

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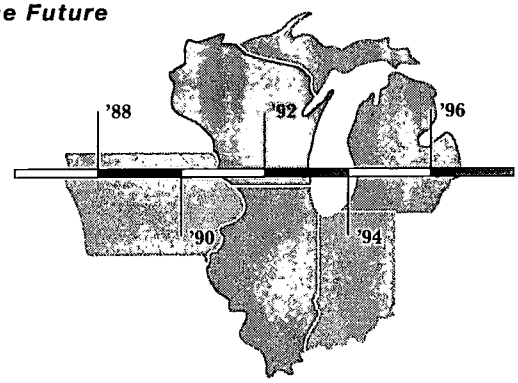
Number 3

ASSESSING THE MIDWEST ECONOMY
Looking Back for the Future



The Changing Rural Economy of the Midwest

Third in a series of workshops to be held at the Federal Reserve Bank of Chicago.

The third workshop in conjunction with the Bank's long-term assessment of the Midwest economy was held at the Federal Reserve Bank of Chicago on March 8, 1996. This workshop explored the changing rural economy, assessing its recent performance and its prospects for the future. The first session of the workshop focused on human dimensions of the rural economy, especially the demographic trends, the quality of education, and worker productivity. The second session examined recent trends in manufacturing and the scope of the food processing industry. Following a luncheon address on *The Role of Government in the Rural Economy*, the workshop explored the contribution of the service industry to the rural Midwest economy. The concluding session addressed changes underway in key components of Midwest agriculture. The workshop presentations were mixed in tone, yet offered some optimism that rural areas will make a bigger contribution to the future economic performance of the Midwest.

Federal Reserve Bank
of Chicago

The Human Dimensions

Demographic Trends

Population growth through migration in rural areas has exceeded that for urban areas in recent years. The only other recent era that saw faster migration gains in rural areas than in urban areas was during the "population turnaround of the 1970s."

The workshop began with a session that looked at some of the key human dimensions of the rural economy. Ken Johnson of Loyola University of Chicago presented the first paper, which looked at demographic trends. He compared population growth patterns in the 1990s with those of prior years, using the most recent (1993) delineations between metropolitan and nonmetropolitan counties. He concluded that the latest population estimates, although lacking the rigor of the decennial census, show that rural population growth has rebounded appreciably in the 1990s and narrowed the gap with urban growth.

Table 1 Population Growth Has Rebounded in Rural Areas

	% Change in Population			% of Counties with Population Gains	
	Rural	Urban	Total	Rural	Urban
United States					
1980-90	2.7	11.8	9.8	45	81
1990-94	3.9	4.9	4.7	74	91
Midwest[a]					
1980-90	-2.2	1.3	0.4	30	67
1990-94	2.4	3.0	2.9	74	92

[a]Illinois, Indiana, Iowa, Michigan, and Wisconsin.

Source: Kenneth M. Johnson, "Recent Nonmetropolitan Demographic Trends in the Midwest," paper presented at the workshop "The Changing Rural Economy of the Midwest," held at the Federal Reserve Bank of Chicago, March 8, 1996.

Johnson found that the population of rural counties nationwide rose 3.9% between April 1990 and July 1994. That increase substantially exceeded the 2.7% gain recorded in rural areas for the full decade of the 1980s, but trailed the 4.9% rise in metropolitan areas so far in the 1990s. Population growth in rural counties in the Midwest through mid-1994 was slightly lower than elsewhere, at 2.4% for the five-state region comprising Illinois, Indiana, Iowa, Michigan, and Wisconsin. However, this was in vivid contrast to the 2.2% decline that occurred during the 1980s. Moreover, the recent population gains in rural areas have been widespread. Some 74% of all rural counties in the Midwest and elsewhere have witnessed an increase in population so far in the 1990s (see table 1).

In analyzing the components of the latest population changes, Johnson noted a reversal of past norms in migration flows and natural change (births less deaths). So far in the 1990s, well over half of the population gain in rural areas has stemmed from migration gains. This contrasts sharply with the pattern of migration declines in rural areas that occurred during the 1980s. (See figure 1.) Moreover, population growth through migration in rural areas has exceeded that for urban areas in recent years. As Johnson noted, the only other recent era that saw faster migration gains in rural areas than in urban areas was during the "population turnaround of the 1970s." An agricultural boom that decade led to an upturn in population in many rural areas.

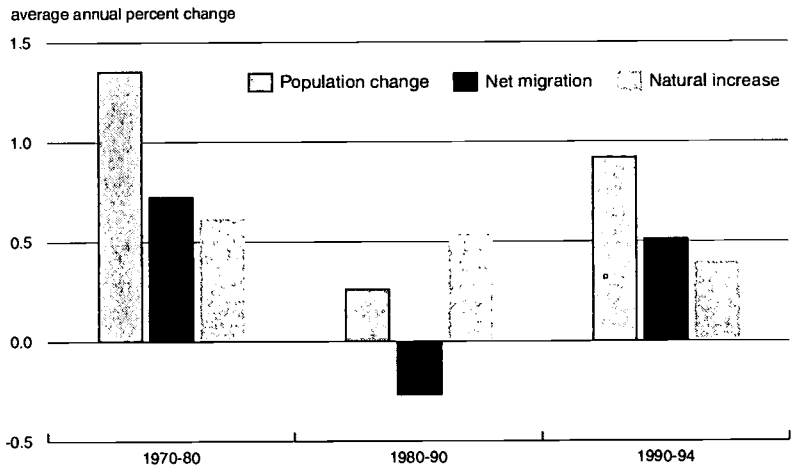
The renewed population growth first evident in nonmetropolitan areas during the 1970s is continuing in the 1990s after a lull in the 1980s.

Conversely, the annual rate of natural population change has slowed in rural areas and accelerated elsewhere. Through most of this century, population growth in rural areas has been sustained by births exceeding deaths. But that pattern has been broken in the 1990s, as an increasing share of rural counties nationwide have experienced natural decrease (deaths exceeding births). Johnson noted that "the incidence of natural decrease in American counties is now higher than at any point in history" and that it apparently continues to rise at an unprecedented rate. In the five-state Midwest region, 30% of rural counties have experienced a natural decline in population so far in the 1990s, up from less than 11% in the 1980s. A protracted migration of young adults from rural areas and the aging of the remaining population were judged to be the most important factors behind the trend.

Johnson found the rural Midwest population gains in recent years have been widespread in Wisconsin, the lower peninsula of Michigan, and most of Indiana, but tended to cluster around the metropolitan areas of Illinois and Iowa. Evidence of the population rebound is strongest in south and central Indiana and Illinois, eastern Iowa, and northern Wisconsin and Michigan, areas where a number of rural counties have recorded a shift from population declines in the 1980s to gains so far in the 1990s. These patterns were consistent with Johnson's conclusions that rural counties that were destinations for retirement age migrants or centers for recreation were the fastest growing during the early 1990s. In addition, population gains were more likely in counties near metropolitan centers and in manufacturing- and government-related counties. Conversely, counties dependent on farming were least likely to gain population.

Johnson concluded that the "renewed population growth first evident in nonmetropolitan areas during the 1970s is continuing in the 1990s after a lull in the 1980s." This represents a significant departure from the more typical view that the slow—or negative—growth in many rural areas in the 1980s was a return to the prevailing trend after a temporary disruption from the rural boom in the 1970s. Johnson noted that future rural growth or decline will be increasingly dependent on net migration and trends which are likely to become increasingly sensitive to national and global economic, political, and social forces.

Figure 1 Recent Population Gains in Rural Areas Parallel the Pattern of the 1970s Boom



Source: Kenneth M. Johnson, "Recent Nonmetropolitan Demographic Trends in the Midwest," paper presented at the workshop "The Changing Rural Economy of the Midwest," held at the Federal Reserve Bank of Chicago, March 8, 1996.

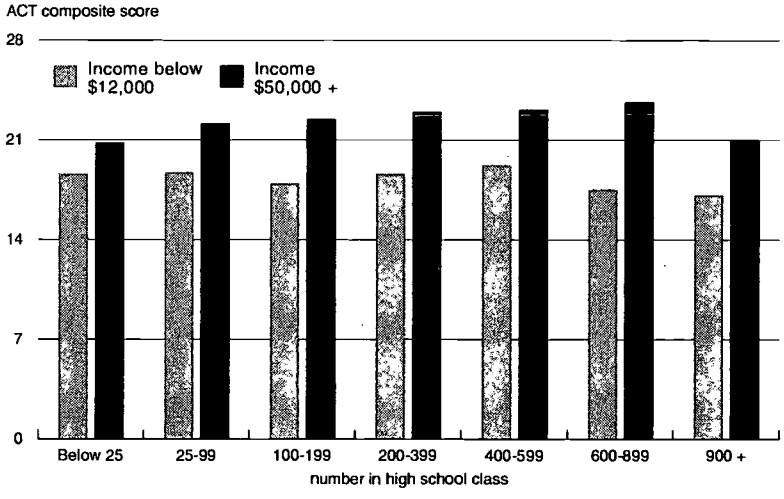
The quality of public elementary and secondary education is increasing for rural and urban students alike.

The Quality of Rural Education

Thomas Pogue, an economist from the University of Iowa, looked at another key human dimension of the rural economy, the quality of rural education. He acknowledged there is a widespread view, in both rural and urban areas, that the educational system is inadequate. In rural areas, the inadequacy is typically attributed to a small and shrinking population, which translates into "declining enrollments, rising costs, and increasing pressure to curtail course offerings or merge with other districts or both." Pogue addressed three questions about the quality of rural education: Is it improving or declining?; Is it comparable to urban education?; and Is it adequate for the times? His conclusions are based on data from the upper Midwest, including Wisconsin, Illinois, and especially Iowa.

Pogue found that "the quality of public elementary and secondary education is increasing for both rural and urban students alike." Standardized tests that measure basic skills and educational development of Iowa students show a trend of stable to improving performance over the past decade and substantially higher performance relative to three decades ago. School drop-out rates have declined, course offerings have widened, and more students are taking advanced courses and pursuing post-secondary education. Scores on American College Testing (ACT) entrance exams, in Iowa and nationwide, have been stable in recent years despite a rising share of students taking those exams.

Figure 2 ACT Composite Scores of 1995 Graduates in Midwestern States, by Income Level and High School Class Size



Source: Thomas F. Pogue, "The Quality of Rural Education in the Midwest," paper presented at the workshop "The Changing Rural Economy of the Midwest," held at the Federal Reserve Bank of Chicago, March 8, 1996.

With respect to rural/urban comparisons, Pogue noted that in Iowa drop-out rates are lower for smaller school districts, while scores on standardized tests show mixed results. Tests of educational development at grade 9 show roughly comparable scores for school districts of all sizes. However, ACT composite test scores tend to average lower among students in Iowa's smaller districts. Comparisons of ACT test scores for several midwestern states confirm the Iowa pattern, showing slightly lower scores for those attending the smallest and the largest high schools (graduating classes of less than 25 and 900 or more, respectively). Pogue said that the lower scores of small schools are not necessarily a reflection of

rural/urban differences in quality of classroom education. He felt other factors that were also correlated with lower ACT scores—such as a lower share of students taking college preparatory courses and a higher share of students from low-income families—and which were more prevalent among both the smallest and the largest schools may account for much of the observed differences in test scores (see figure 2).

Pogue noted that roughly 71% of all public high school graduates from all sizes of districts in Iowa undergo further education or training. But the mix of continuing graduates from small school districts shows fewer enrolling in a four-year college curriculum, and more in a two-year community college program than is the case among graduates from larger districts. For midwestern states in general, the percentage of graduates from small high school classes that plan on pursuing graduate or professional studies tends to be low.

In terms of the resources spent on education, Pogue found that rural districts in Iowa spend about the same per student for current expenditures as urban (large) districts. Rural districts have lower pupil-teacher ratios, but lower teacher salaries tend to keep the instructional costs for rural districts close to the overall average. Despite roughly equal spending, rural districts offer their students fewer curriculum units in major subject areas (e.g., foreign languages, higher levels of math, etc.) and more teachers in rural districts are expected to teach multiple subjects. Moreover, students in rural high schools tend to be more dissatisfied with their high school experience.

All things considered, the quality of rural education in the Midwest is high relative to what was available in the past and roughly on par with urban opportunities and outcomes.

Pogue found consolidation among rural school districts has probably reduced the deficiencies in rural school districts, as have advances in telecommunications and area-wide resource utilization. Moreover, he noted that Iowa has an extensive array of facilities and public programs, often coordinated through community colleges, that are available to most rural communities. These programs and facilities provide traditional continuing education for adults, and, in many cases, offer programs with local businesses to recruit, train (or retrain), and evaluate employees. All things considered, Pogue concluded that the quality of rural education in the Midwest is high relative to what was available in the past and roughly on par with urban opportunities and outcomes.

Productivity of Rural Labor

David McGranahan and Fred Gale of the U.S. Department of Agriculture completed the human dimension session of the workshop with a presentation on *The Productivity of the Rural Labor Force.* McGranahan and Gale noted the productivity issue will largely determine how rural areas fit into the evolving national and international economy. The important question, at least for manufacturing, is whether rural areas will fall into the "low-wage" niche or the "high-productivity" niche. In terms of value added, labor productivity in manufacturing rose in all areas between 1989 and 1992. However, the rural/urban gap widened, as rural labor productivity fell to 23% less than that for metropolitan labor. And although the gap in wage rates is even larger, rural areas seem to be preferred for low-productivity-type manufacturing jobs and unable to attract high-tech jobs.

One hypothesis for the observed productivity gap is that rural manufacturers are slower to adopt new technology. However, McGranahan and Gale's analysis of the data from a 1993 census survey that looked at technology adoption rates for selected industries found that, if anything, rural manufacturers show higher rates of technology use.

Industry mix does appear to explain a considerable portion of the observed rural productivity gap. By comparing over a more consistent mix of industries, the authors found that the rural/urban productivity gap could be reduced from 23% to 15%. And in productivity comparisons for "routine manufacturing" industries—such as food processing, wood products, textiles, and apparel—the gap was even smaller (7%).

It is difficult to know whether rural jobs reflect the education levels of the work force or the work force characteristics in rural areas reflect the types of jobs that are available.

A third possible explanation, the human capital model, assumes the education and training of the rural labor force are of somewhat lower quality than those of the urban labor force. McGranahan and Gale suggested that the smaller percentage of rural workers with a post-high-school education largely reflects differences in types of jobs. Most management and research/development jobs in manufacturing tend to be centralized in urban areas. When educational levels of production workers are compared, most of the education gap is eliminated. Even so, the authors noted that it is difficult to know whether rural jobs reflect the education levels of the work force or the work force characteristics in rural areas reflect the types of jobs that are available. In reviewing the literature, however, the authors concluded that some studies suggest rural productivity is not limited by work force skills and the problem is more the type of jobs demanded. Alternatively, the pilot study for a survey of manufacturers seems to suggest that work force skills may be lower in rural areas.

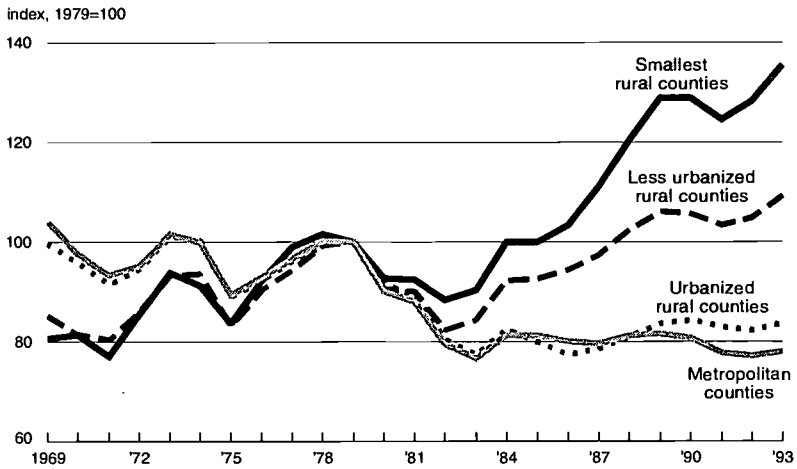
Manufacturing and the Midwest Rural Economy

Recent Trends

Bernat found that virtually all of the growth in rural manufacturing jobs in the Midwest occurred in "small rural" counties and in "less urbanized" rural counties.

A paper prepared by G. Andrew Bernat of the U.S. Department of Commerce gives an overview of recent trends in manufacturing employment for the rural Midwest and addresses some likely implications of these trends. (As Bernat was unable to attend, Bill Testa of the Federal Reserve Bank of Chicago summarized Bernat's paper for the workshop participants). Bernat points out that the overall loss of jobs in the manufacturing sector over the last 15 years or so was an urban phenomenon. While the number of manufacturing jobs in metropolitan counties of the Midwest fell more than one-fifth between 1979 and 1993, the number in rural counties increased slightly. As indicated in figure 3, Bernat found that virtually all of the growth in rural manufacturing jobs in the Midwest (Illinois, Indiana, Iowa, Michigan, and Wisconsin) occurred in "small rural" counties (population of less than 2,500) and in "less urbanized" rural counties (population of 2,500 to 19,999).

Figure 3 Smaller Rural Counties Have Witnessed Most of the Growth in Rural Manufacturing Jobs in the Midwest



Note: Rural counties broken down by population: < 2,500 = the smallest rural counties, 2,500 to 19,999 = less urbanized rural counties, > 20,000 = urbanized rural counties.

Source: G. Andrew Bernat, "Manufacturing and the Midwest Rural Economy: Recent Trends and Implications for the Future," paper presented at the workshop "The Changing Rural Economy of the Midwest," held at the Federal Reserve Bank of Chicago, March 8, 1996.

Although the rise in rural manufacturing jobs translated into higher earnings, the rural/urban gap in earnings per manufacturing job widened. By 1993, rural earnings per job were 29% below urban manufacturing earnings, up from a 25% gap in 1982. Bernat attributes some of this gap to a differing mix of industries, because rural areas tend to have a higher concentration of low-wage industries (such as food processing and apparel). Occupational mix probably explains another significant part of the gap, since urban areas tend to have a greater concentration of higher-paid nonproduction (management, etc.) jobs.

Bernat's paper also addresses the question of whether growth in rural manufacturing employment has been accompanied by overall economic growth. As he and others have suggested, an economy based increasingly on service-producing industries tends to undercut the traditional rural development assumption that manufacturing job growth will automatically be accompanied by overall economic growth. But his cursory look at the data for the Midwest found that population gains and total job growth were far more pronounced in rural areas that experienced manufacturing job growth than in those with no rise in manufacturing jobs. Bernat notes that the positive relationship between manufacturing job growth and overall economic growth runs counter to some recent studies on the determinants of urban economic growth.

With respect to future prospects for the rural Midwest, Bernat views the dependence on durable manufacturing as both a positive and a negative. The positive is that the U.S. is competitive in world markets for many durable products. The negative is that rural counties in the Midwest and elsewhere have a number of durable manufacturing industries with substantial import penetration. Bernat also acknowledges that rapid technological change can lead to substantial increases in output per worker, which, in the face of limited overall economic growth, can translate into fewer rural job opportunities. Significant investment flows into rural areas—which have been lagging—will be needed to sustain future growth in rural manufacturing jobs. Finally, Bernat points out that the manufacturing restructuring process has led to an increased share of nonproduction workers who rely on information flows. He notes that many observers have concluded the restructuring puts more emphasis on centralization, favoring urban areas over rural areas.

The Food Processing Industry

Mike Singer and Chris Barfels, both of the Federal Reserve Bank of Chicago, complemented the session with a paper on *The Food Processing Industry in the Midwest.* They noted that food processing ranks second among some 20 major manufacturing groups in the Midwest in terms of sales and value added and fifth in overall employment. The importance of food processing to rural areas is amplified by the tendency of food processors to locate plants in nonmetropolitan areas and by the fact that the finished consumer products component of U.S. agricultural exports has experienced faster growth during the 1990s than have other components.

Food processing ranks second among some 20 major manufacturing groups in the Midwest in terms of sales and value added and fifth in overall employment.

Singer and Barfels used 1992 data to rank the top 15 food processing industries in the Midwest in terms of value added and to identify "winners" and "losers" among all food industries based on changes in employment and value added over the past decade. As indicated in table 2, the top 15 industries account for about 75% of all food processing in the Midwest and a sizable chunk of all food processing nationwide. Singer and Barfels pointed out the high correlation between the top-ranked industries and the major farm commodities produced in the Midwest and the substantial drop in ranking for meat packing, which presumably relates to declining beef production.

Using a classification system defined by others, the authors found that "demand-oriented" industries (those that locate plants near centers of final use) in the Midwest registered below-average growth in all measures—employment, value added, and shipments—from 1982 to 1992. This paralleled the Seventh District's sluggish population growth during that period. Conversely, "supply-oriented" firms and "footloose" firms registered sizable growth.

The authors also focused on growth prospects for the Midwest food processing industry by reestimating a model developed elsewhere that relates the change in value of shipments to changes in population and wage levels. Based on U.S. Department of Commerce projections of population growth, the model implies that food processing industries in each of the five Midwest states will grow at, or below, the projected annual rate (2.9%) for the nation. The projected growth rates for the five states range from 2.2% in Michigan to 2.9% in Iowa. The slower growth forecast for the Midwest is tied to the region's slower population growth and relatively high wages.

Table 2 The Top 15 Food Processing Industries in the Midwest

	Rank	Rank	Value Added		% of all Midwest Food Processing	
	1992	1982	1992	1982	1992	1982
			(--million dollars--)			
Breakfast Foods	1	3	3,470	1,264	10.6	6.9
Confectionery	2	2	2,489	1,472	7.6	8.0
Wet Corn Milling	3	5	2,386	902	7.3	4.9
Cheese	4	8	2,191	788	6.7	4.3
Meat Processing	5	7	1,849	799	5.7	4.4
Meat Packing	6	1	1,743	1,564	5.3	8.5
Processed Milk	7	9	1,687	783	5.2	4.3
Soft Drinks	8	6	1,654	845	5.1	4.6
Bread	9	4	1,482	1,113	4.5	6.1
Cookies and Crackers	10	15	1,210	521	3.7	2.8
Canned Fruits & Veg.	11	17	937	499	2.9	2.7
Flavorings	12	16	902	521	2.8	2.8
Fluid Milk	13	14	885	545	2.7	3.0
Frozen Specialties	14	18	859	393	2.6	2.1
Animal Feeds	15	13	738	575	2.3	3.1
Top 15			24,482	12,584	74.9	68.7
All Food Processing						
Midwest States			32,687	18,308	100	100
United States			156,843	88,419		

Note: Midwest states are Illinois, Indiana, Iowa, Michigan, and Wisconsin.

Source: Mike Singer and Chris Barfels, "The Food Processing Industry in the Midwest," paper presented at the workshop "The Changing Rural Economy of the Midwest," held at the Federal Reserve Bank of Chicago, March 8, 1996.

Singer and Barfels noted that given the region's strength in supply-oriented food processing industries—e.g., grain processing, dairy processing, and meat packing—policymakers would do well to focus on expanding and developing those industries. In addition, since footloose industries base location decisions on factors other than proximity to raw commodity supplies or final product sales, policymakers attempting to attract such industries could consider alternatives—such as taxes, utilities, and other infrastructure amenities—for making the environment more appealing to such industries. The long-term benefits to the economy from offering such incentives to footloose industries are likely to be greater than from offering similar incentives to supply-oriented or demand-oriented industries.

The Role of Government

D. Gale Johnson of the University of Chicago gave a luncheon address on the *Role of Government in the Rural Economy.* To reinforce his view that there is a proper role for government, Johnson used Central Europe and the former Soviet Union as examples of the inherent inefficiencies of a government that is too deeply imbedded in product and labor markets, and the enormous—and largely unimagined—difficulties that arise when a government's role is abruptly redefined by a shift from a centrally planned economy to one that is market-oriented.

The unparalleled rates of growth of food production in developing countries suggest that the returns to publicly funded agricultural research are "higher than those to the more glamorous...rural investments, such as dams and irrigation."

Johnson argued that research clearly shows the misallocation of resources that arises both from the agricultural policies of developed countries, which typically attempt to benefit farmers, and from the policies of underdeveloped countries, which often exploit farmers to benefit the urban population. Yet his argument is not one of *laissez faire.* Rather, he argued in favor of "...finding those activities for government that markets cannot adequately perform and where, if government adopts appropriate policies, the welfare of rural people will be enhanced."

Accordingly, Johnson acknowledged there is a role for government in the provision of public goods, including the maintenance of law and order, the protection of civil rights, national defense, public parks, agricultural research, some forms of communication, and roads. He also felt there is a role for government in providing (or regulating) goods and services that competitive markets might not provide in adequate amounts due to scale economies or suboptimal utilization by certain segments of the population (low income). The former is an argument for public utilities. The latter is a long-established argument for publicly funded primary and secondary education and, increasingly, for more universal access to health care—two areas that recognize the contribution of human capital investments to economic growth. Johnson also acknowledged a role for government—especially in developing economies—in building and maintaining a rural infrastructure. However, he pointed out that the priority of public infrastructure is often overstated. Accordingly, Johnson cited the unparalleled rates of growth of food production in developing countries as evidence that the returns to publicly funded agricultural research are "higher than those to the more glamorous...rural investments, such as dams and irrigation."

Johnson argued that government also has a role in gathering and disseminating market information and in providing the institutions that enhance a market economy. The latter suggests that government must actively limit the role of monopolies and provide a legal system that will define and enforce such things as property rights and contractual arrangements.

Government has an important role in educating and retraining farm and rural people left in the wake of declining employment opportunities in agriculture.

Johnson concluded with two points that referenced the long history of farm policy dominating rural policy. The first was a note of caution against encouraging government intervention in a functioning market because of the difficulty in ending that intervention when the original needs no longer prevail. To illustrate this point, he noted that agricultural price policies born in the economic distress of the Great Depression still exist some 60 years later, "even though incomes of farm families now exceed urban family incomes." As a counter argument, however, Johnson suggested that a major role for government action is to assist farm and rural people to adjust to declining employment opportunities in agriculture through education and retraining programs. He argued that the "welfare of farm people depends far more on the functioning of labor markets than on the markets for commodities." As such, government has an important role in educating and retraining farm and rural people left in the wake of declining employment opportunities in agriculture.

The Service Industry and the Midwest Rural Economy

The service sector is attracting increasing attention as an area that holds considerable promise for rural development. As one workshop participant noted, the industry's share of employment in the five Midwest states increased from less than 60% in 1980 to nearly 67% in 1990, absorbing all of the shrinking share of manufacturing. The papers presented at the workshop were mixed, but in general provided support for the view that the service sector still offers favorable prospects.

Producer Services

In their analysis of *Producer Services Workers in the Nonmetropolitan Midwest,* Jeff Crump and Norman Walzer of Western Illinois University reached a less than optimistic conclusion about this sector's growth potential. In general, producer services firms provide services to other businesses—such as accounting, advertising, legal, engineering, finance, insurance, and real estate—at comparatively high wages or fees. The consumer services industry includes elements of the above, but also provides restaurant, housekeeping, and auto repair services, which tend to command lower wages. The authors noted that the median annual earnings for producer service workers in the Midwest in 1990 were roughly $17,700, well above the $11,200 median for consumer service workers. However, their analysis showed that the growing producer services jobs in rural areas may not pay wages comparable to metro areas and, in some instances, may not pay much more than consumer services. They therefore concluded that the "expansion in producer services may not be the panacea for nonmetro underemployment that some have suggested."

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Crump and Walzer aggregated counties into labor market areas (LMAs) based on commuting patterns, and matched those regions with the income and employment status of the Census Bureau's public microdata sample. In all, some 69 LMAs were identified for the Midwest, of which 27 were classified as rural LMAs. Analyzing past trends, the authors found that the growth in producer services employment during the 1980s in the rural LMAs of the Midwest lagged behind that nationwide, 33.6% versus 55.8%. Based on a shift-share comparison, the authors concluded that the vast majority of the slower growth in the Midwest was because local industries grew less rapidly than their national counterparts and only a small portion was because the region contained slow-growth industries. Crump and Walzer suggested that a leading cause for the slower Midwest growth may be that service industries depend on regional—rather than national—business conditions and that the manufacturing firms and others served by the producer services industries of the Midwest exhibited subpar growth.

Crump and Walzer found that the earnings gap between rural and urban workers in the Midwest—based on median earnings—was 18%. The biggest gap was for producer services workers, 22%. The authors also found that a substantially higher share of the workers in rural LMAs have median incomes that fall near, or below, the poverty level and that the median annual earnings of rural producer services workers were slightly below those of all other rural workers. This counters the conventional view that producer services workers are highly skilled and command relatively high earnings. The subsequent discussion revealed, however, that these measures of the gap in job quality and earnings may have been distorted by the annualizing of contractual, or short-term employment, earnings and by the lack of an accounting for cost of living differentials between rural and urban areas.

In discussing policy considerations, the authors reiterated the important link between producer services industries and other local businesses. Other local industries must be doing well for producer services to prosper. While expressing some optimism about the prospects of rural communities located near metro areas, Crump and Walzer remained pessimistic for remote areas, which have limited or negative population growth and often lack the amenities and infrastructure that would appeal to many producer service workers.

The "export" revenues from third party health insurance payments—especially for Medicare and Medicaid—can be substantial for a local community that provides health care services only to its local citizenry.

Health Care Services

The second presentation on the service industry focused on *Health Care Services and the Rural Economy.* Sam Cordes of the University of Nebraska explored the interaction between the provision of health care services and the economy of rural communities. In reviewing the important macro linkages, Cordes pointed out that just as investments in education enhance the stock of human capital, investments in health and nutrition can generate dividends in the form of more years of productive work life and more potential for generating economic output. He also noted that economic growth leads to a more healthy population, while economic recessions can have a "significant detrimental effect on both physical and mental health."

In focusing on the impact of health services on the local economy, Cordes noted that there is a substantial multiplier effect associated with wages and revenues in the health care industry. Health care expenditures are large. And when local citizens are forced to go elsewhere for health services, the local community may also lose more of their expenditures for things other than health. However, except for places like the Mayo Clinic in Rochester, Minnesota, health care is not typically considered a basic employer in rural communities and, thus, does not typically fit the rural development preference for attracting industries that "export" their goods or services to other areas. Yet, health care can be organized on a regional basis, exporting services to a limited market. Less appreciated is the important "export" role played by insurance payments in the health care industry. The "export" revenues from third party health insurance payments—especially for Medicare and Medicaid—can be substantial for a local community that provides health care services only to its local citizenry.

Cordes also addressed the role of health services in furthering local rural development efforts and suggested that this may be a more significant attribute of health care in the long run than the direct generation of economic activity. The availability and quality of health care are acknowledged key factors in attracting and retaining residents (especially retirees) and business firms. In addition, a viable local health care industry (and the financial resources it requires) can be an important source for local investment funds and an important contributor to local leadership.

Many people lack the financial resources to transform health needs into effective demand. Thus, if universal health insurance were to become a reality in some form, it could translate into a stronger demand for health care services in rural areas.

Health care should be considered a growth industry, especially as the sizable "baby boomers" generation reaches an older age. Many rural communities can position themselves in a way that will lead to increased economic activity as this industry continues to grow.

The capture of these benefits by rural areas, however, is problematic. The health care industry today is incredibly dynamic as the so-called managed care movement leads to major consolidation and restructuring. Additionally, federal budget pressures will likely lea to major changes in Medicare and Medicaid. To assess the uncertainties, Cordes focused on some issues that may influence health care spending in rural areas. He noted that insurance reimbursement rates—especially for Medicare—for a given health service are typically less for rural providers than for their urban counterparts and that more equitable reimbursement patterns would generate more health dollars into rural areas. He also indicated that the Farm Bill pending in Congress (subsequently enacted) contains some provisions with respect to telemedicine and other options for enhancing health care in rural areas.

Other options for generating more health dollars in rural areas would entail efforts to expand the quantity of services rendered. In an environment of extreme concern about rising health care costs, Cordes acknowledged that the lower cost of health care services in rural areas holds some hope for attracting urban residents to rural providers of health care services. However, he said the two most likely alternatives for expanding the provision of health care services in rural areas were "translating unmet health care needs into a viable demand" and "aiding rural providers to recapture the health services now extended to rural residents by urban providers." Cordes noted that unmet health care needs are directly correlated with the lack of health insurance. Without health insurance, many people lack the financial resources to transform health needs into effective demand. Thus, if universal health insurance were to become a reality in some form, it could translate into a stronger demand for health care services in rural areas, depending on how it was financed.

Other reasons for unmet rural health needs, according to Cordes, include the limited availability of health care services in many rural areas and, in some cases, concerns about the quality of rural health services. Various programs cited by the author offer hope for improving the quantity and quality of rural health resources, which could help convert unmet needs into effective health care demands and help fuel rural economic development. Cordes noted that communities might consider subsidizing local health care services or restructuring the type of health care services extended in the local community. For example, rural communities could collaborate to establish a multicommunity rural health center. Communities might also capitalize on advances in telecommunications and medical science to change the delivery of many types of local health care services from an in-patient (hospital) to an out-patient (clinic) basis. Other forms of viable restructuring for some communities include replacing the functions of a local hospital emergency room with the enhanced emergency medical services that can now be made more readily available in a modern, fully equipped ambulance with a trained crew.

Cordes concluded by noting that health care should be considered a growth industry, especially as the sizable "baby boomers" generation reaches an older age. Many rural communities can position themselves in a way that will lead to increased economic activity as this industry continues to grow.

Retirement and Recreational Services

John Fraser Hart of the University of Minnesota expanded on some of his earlier work in a workshop presentation on *Retirement and Recreational Activities in Rural Communities*. Hart noted that "a summer cottage on a lake has been a symbol of the good life for generations." In many cases, these summer homes or cottages take on a natural life of their own, progressing from primitive hunting shacks to year-round residences for retirement. Resort communities often have a similar history of evolution. The tourist season lengthens considerably over time, requiring and supporting a greater variety of consumer

Resort areas can be as distinct from one another as they are from non-resort areas, with some offering more peace and quiet, some specializing in outdoor activities, and others catering more for families with children.

and business services and a vastly expanded array of employment opportunities in both the private and the public sector. The change often transforms a hitherto sparsely populated location into a vibrant and bustling area for much of the year.

Hart pointed out that resort areas can be as distinct from one another as they are from non-resort areas, with some offering more peace and quiet, some specializing in outdoor activities, and others catering more for families with children.

Hart reviewed the history behind three distinct resort areas in Wisconsin—Door County, Vilas County (and the popular Eagle Chain of Lakes region), and the Wisconsin Dells area. He suggested that "each resort area should do its best to identify, establish, polish, and publicize a particular image, both to attract the kind of visitors who will find it congenial and to avoid attracting people who will be disappointed in it, dislike it, find fault with it, and harm its reputation." Despite their differences, he points out that most resort areas share common problems of disagreement among the local natives as to the character of the evolving development. In his words, the debate is between the "gang plankers"—who want to preserve the area as it was—and the "bulldozers"—who are willing to develop everything if it will bring money to the area.

Students of rural development need to understand "far more about what attracts the attention and interest of large-scale developers."

The author noted attitudes toward development are not predictable. For example, some local residents are eager for development, but local family-run businesses can feel threatened if outside developers open competitive local units of national chains. On the other hand, some second-home owners want to halt all further development, but others want improvements and better services for the local area. Second-home owners are often frustrated in the local policy arena. As nonresident home owners, they contribute—often significantly—to the local tax base but lack voting privileges in local decisions. Their influence may be limited even when they retire and take up permanent residence in the resort community, as the established residents can be "put off by the high and mighty ways of the new residents."

Hart concluded by noting that massive external investment is often the differentiating factor between rural areas that change little over decades and others that seem to change almost overnight. He suggested that students of rural development need to understand "far more about what attracts the attention and interest of large-scale developers."

Changes in Production Agriculture and the Midwest

Industrialization in Pork Production

The final workshop session focused on two key areas of Midwest agriculture, pork and milk production. Due to numerous issues that have accompanied the arrival of the so-called mega producers, many believe the Midwest could lose its dominance in these two commodities. In a presentation on *The Industrialization in Hog Production,* Gary L. Benjamin of the Federal Reserve Bank of Chicago characterized that dominance by noting that the five Midwest states historically have accounted for just under half of nationwide hog sales.

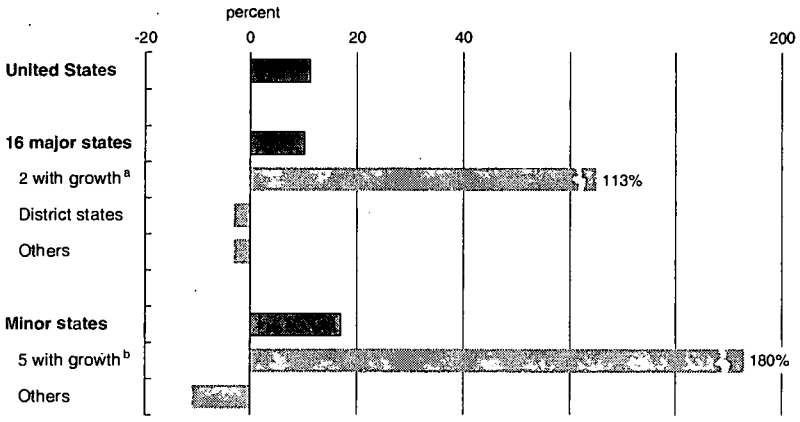
Benjamin noted the recent industrialization phenomenon, in many respects, represents only the latest wave in a decades-long restructuring process among U.S. hog farmers. That restructuring has led to a steep decline in the number of hog farms, a pronounced uptrend in the average size of the farms remaining in business, and little change in the inventory of all hogs on farms. Throughout that long restructuring process, the five Midwest states have maintained their share of production. However, the industrialization of recent years marks a more abrupt shift toward a few very large producers. It has also coincided with a sizable decline in the Midwest's share of U.S. hog numbers in the last three years, from 48% to 42%.

Seven states are capturing most of the growth associated with the industrialization in hog production. None of these are among the key Midwest states and only two of them are among the traditional major hog-raising states

Benjamin found that seven states are capturing most of the growth associated with the industrialization in hog production. None of those are among the five states comprising the Seventh Federal Reserve District. Only two of the "growth" states—Missouri and North Carolina—are among the traditional 16 major hog-raising states. Over the last five years, hog numbers in Missouri and North Carolina combined have more than doubled, while hog numbers in all the other major hog-raising states collectively have retreated 3%. The other five growth states—Colorado, Mississippi, Oklahoma, Utah, and Wyoming—have sprung up among what historically were considered minor hog-raising states. Hog numbers in those five states combined have nearly tripled over the last five years (see figure 4).

Figure 4 The Mega Hog Farms Are Mostly Apparent in a Few "Rapid Growth" States Which Now Account for Nearly One-Fourth of All Hogs

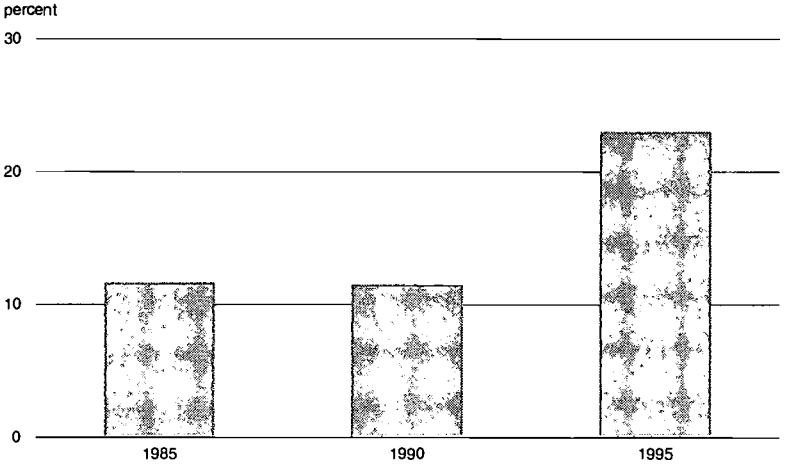
Change in Hog Inventories, 1990–95



[a]Missouri and North Carolina.
[b]Colorado, Mississippi, Oklahoma, Utah, and Wyoming.

Note: District states are Illinois, Indiana, Iowa, Michigan, and Wisconsin.

The "Growth" States' Share of Hogs



Source: Gary L. Benjamin, "The Industrialization in Hog Production," paper presented at the workshop "The Changing Rural Economy of the Midwest," held at the Federal Reserve Bank of Chicago, March 8, 1996.

The large mega producers probably accounted for one of every three hogs raised in this country in recent months.

A ranking of the largest hog producers (those that own at least 10,000 sows) reported by a major farm magazine provides a more dramatic view of the industrialization process. Last October, there were some 44 of these mega producers nationwide that collectively owned more than 1.5 million sows. While the inventory of hogs held for breeding purposes fell 5% nationwide during the year ending September 1, 1995, the inventory of sows among these mega producers rose nearly a third. Benjamin speculated that because of their greater production efficiencies, these large producers probably accounted for one of every three hogs raised in this country in recent months.

Benjamin noted that various studies show the move toward large farms is rooted in technological advances that offer lower production costs and/or enhance the quality of the final product that reaches consumers. Some observers have suggested that the break-even cost of production can range as much as $10 to $12 per hundredweight between the most efficient one-third of producers and the least efficient producers. In addition, the large producers exhibit a highly refined form of integration that has specialized labor and management for each stage of production (farrowing/gestation, nursery, and finishing) and often includes state-of-the-art feed mixing and veterinarian facilities. This integration increasingly extends all the way to the packer, both through direct ownership and through expanding contractual arrangements between producers and packers.

In reviewing whether the Midwest will continue to see its dominance in pork production erode, Benjamin noted that corporate farming laws and regulations, which are common in the Midwest, are often not compatible with the pork producing structures that have evolved during the industrialization process. But a far more serious issue for the Midwest relates to the environmental concerns that have reached a boiling point with the proliferation of large hog producers. These concerns mostly relate to the odor and the water contamination problems that can arise with the handling of the animal wastes. In many cases, these contentious issues in the more popular rural areas of the Midwest have led to very strong NIMBY (not in my backyard) sentiments, pitting the interests of farmers and others against the large producer. Strong pressures for laws and regulations limiting the location and manure-handling practices of all hog producers, with special restraints on large producers, have surfaced in many areas. Some observers have suggested the tendency of the mega hog farms to locate in nontraditional fringe states, despite much higher feed costs, is largely due to more benign environmental views and a stronger perceived need for economic development in those areas.

Changing markets and market-pricing arrangements are also key issues for the more traditional farmer/producer in the Midwest. With a significant, and growing, share of packer-owned or contracted hogs now moving to market, the independent Midwest hog farmer faces growing problems of market access and price volatility. In addition, the growing practice of extending significant price "premiums" to contract producers raises questions about the adequacy and coverage of the market price reporting system.

Another concern raised by Benjamin relates to the implications for the pork packing industry if the Midwest continues to lose its dominance in hog production. This is particularly critical for Iowa which—despite its ranking as the largest hog producing state by far—imports one out of every five hogs that are processed within its borders. The evidence so far clearly demonstrates the tendency of locating large and highly efficient packing plants near the mega producers. If the Midwest continues to lose its dominance in hog production, it will undoubtedly see an erosion of its dominance in hog processing, just as it lost its dominance in beef packing in the 1970s.

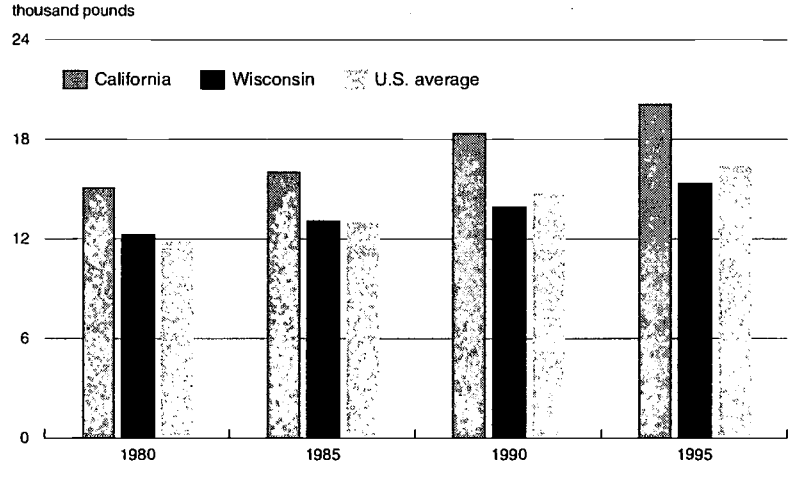
Even if the Midwest retains its dominance in hog production, the structural characteristics of the hog farm of the future will differ markedly from that family farm icon of the past that symbolized a multitude of independent farm operators.

Benjamin concluded that the hog producing/processing model that has evolved with the industrialization process in recent years suggests that all of the pork production for the U.S. could be supplied with about 12 packing plants handling the output of some 50 mega producers. Even if the Midwest retains its dominance in hog production, the structural characteristics of the hog farm of the future will differ markedly from that family farm icon of the past that symbolized a multitude of independent farm operators.

The Changing Dairy Sector

The shifting structure of Midwest livestock production was also a theme in Mary Keough Ledman's remarks on *The Changing Dairy Sector.* Ledman reviewed recent trends in the nation's dairy sector, noting how the downtrend in dairy cow numbers has been offset by rising output per cow and a modest rate of growth (about 1%) in annual milk production. In addressing some of the regional issues in dairy production, Ledman pointed out that the three key upper-Midwest dairy states had experienced a modest decline in their proportionate share of U.S. production, while the Pacific and Southwest regions had carved out a larger share. In 1980, the three-state region of Michigan, Minnesota, and Wisconsin accounted for 29% of U.S. milk production. By 1995, its share had declined to 24%. The share accounted for by Illinois, Indiana, and Iowa retreated from 7% to 6%. By 2000, Ledman expects the seven-state area stretching from the Pacific Northwest through Texas to expand its share of milk production from 31% (in 1995) to 35%, while the combined shares held by the three upper Midwest states and the Northeast region will retreat from about 43% to about 41.5%.

Figure 5 Annual Milk Output per Cow Tends to Be Lower in Midwest States Where Dairy Farms Are Smaller



Source: Mary Keough Ledman, "The Changing Dairy Sector," paper presented at the workshop "The Changing Rural Economy of the Midwest," held at the Federal Reserve Bank of Chicago, March 8, 1996.

Ledman noted that dairy farms in California and the Pacific/Southwest in general tend to be much larger than those in the Midwest and much more likely to specialize in milk production. In 1993, California surpassed Wisconsin to become the largest milk

In 1995, the average dairy cow in California produced over 20.2 thousand pounds of milk, 31% more than the average for Wisconsin and 23% above the nationwide average. Over the last 15 years, the gap in productivity per cow between California and Wisconsin has widened.

producing state. The average dairy herd in California is eight times that in Wisconsin (400 cows, compared with 50 cows). Over half (55%) of the dairy farms in California have 200 cows or more compared to only 1% of the dairy farms in Wisconsin. These large farms account for 95% of all dairy cows in California compared with less than 6% of the dairy cows in Wisconsin. The dairy farms in California tend to focus solely on milking cows, using hired labor and purchasing the feed and forages necessary to sustain the dairy herd. Wisconsin dairy farms tend to make extensive use of family labor, produce the majority of the feed and forage needed for the dairy herd, and often are engaged in other commercial farming activities. A harsher climate also typically requires a larger investment in buildings and structures on the Wisconsin dairy farm. In addition, milk cows tend to be much more productive in the Pacific region than in the upper Midwest. In 1995, the average dairy cow in California produced over 20.2 thousand pounds of milk, 31% more than the average for Wisconsin and 23% above the nationwide average (see figure 5). Over the last 15 years, the gap in productivity per cow between California and Wisconsin dairy farms has widened.

Despite the recent history of a declining share of production and a widening gap in output per cow, Ledman expressed confidence that some areas of the upper Midwest will bounce back in milk production. In particular, she predicted that Wisconsin would recapture the number one state ranking in milk production. She noted there is already some evidence of West Coast dairy producers seeking to relocate closer to the Midwest and its lower feed costs. Moreover, she noted that Wisconsin dairy farms are in the midst of a major restructuring that will lead to a greater number of large-scale producers that tend to be more specialized in dairy production. Wisconsin's renewed focus on promoting dairy and its continued dominance in processing milk and dairy products also auger well for its re-emergence as the leading dairy state, according to Ledman.

Concluding Remarks

The rural Midwest has enjoyed an impressive turnaround in recent years. This is especially apparent in the 2.4% population gain during the four years ending July 1994, a reversal from the decline that occurred during the entire 1980s. Well over half the recent population gain stemmed from net migration into the rural areas of the five-state Midwest region. This pattern of migration gains propelling rural population growth, first evident in the 1970s, appears to be resuming after a lull in the 1980s. This provides renewed hopes and policy challenges regarding the future economic vitality of the rural Midwest.

The rural rebound has been associated largely with two goods-producing industries—agriculture and manufacturing—and the expanding tourism and retirement component of the service industry. Changing fortunes in the Midwest have long been tied to agriculture. Both the sagging agricultural fortunes of the early 1980s and the subsequent recovery through the mid-1990s mirrored the fall and rise in the overall Midwest economy. But agriculture's influence on overall economic performance has waned over the years and no doubt will continue to do so. Rural manufacturing has garnered an increasing influence in recent years. In the Midwest, rural manufacturing jobs rose slightly over the last 15 years, while those in urban areas declined by more than one-fifth.

Despite the rebound, rural population growth still lags that of urban areas. Rural communities face many challenges if the gap is to be narrowed. The linkages between the number and location of jobs and overall economic activity are complex and not always predictable. Ironically, much of the challenge facing the rural Midwest relates to the continuing productivity gains in both agriculture and manufacturing. Those gains are prerequisites for maintaining a competitive edge in an increasingly global marketplace. But they also

can translate into fewer jobs, despite expanding output. Looking to the future, the mega farms that characterize the latest wave of agricultural restructuring foreshadow continued declines in the number of farms and farm families. Perhaps more critically, the issues surrounding mega farms raise concern about whether the Midwest will retain its dominance in pork and milk production and related food-processing activities. Corporate downsizing, the centralizing of informational systems, and the need to stay on the cusp of technological advances may add obstacles to job growth in rural manufacturing. But these obstacles also bring challenges, since the more productive governmental efforts in rural development often lie in programs for retraining those whose jobs have been lost due to changing market conditions.

Other challenges are also evident. The producer services industry has enjoyed rapid growth nationwide in recent years, but in the Midwest, its growth has been comparatively modest. In addition, the rural/urban gap in wages is widening in both manufacturing and the producer services industry. From a broader perspective, high-skill and/or high-paying occupations are increasingly concentrated in metropolitan areas. This may, in part, reflect the perception that amenities, such as health care, cultural activities, and transportation, are better in urban areas. On a more encouraging note, however, it does not appear that rural workers are less productive than urban workers. Nor is the student of the rural school system impeded by a lower-quality education than that offered the urban student. Cause and effect are difficult to untangle, but there is some evidence that the characteristics of rural jobs may be more a reflection of the types of jobs offered than of the skills of the rural labor force.

Rural communities can pursue several avenues toward preservation, renewal, or growth. Lower living costs and access to a well-educated, highly productive labor force in rural areas remain key factors for communities seeking growth. Rural communities may also have important "quality of life" advantages, such as a cleaner environment, less crime, less congestion, and friendlier people. But the availability and quality of rural health care will remain a critical factor in how well rural life is judged. Advanced delivery techniques and strategic restructuring of health care facilities and services are allowing some rural areas to keep more health care dollars at home and to make rural living more appealing to workers and retirees alike.

Some rural areas may choose to develop their assets as resort or recreational facilities. The upper Midwest has much to offer in this regard. But the choices involved in such a pursuit illustrate the dilemma facing many rural communities. Well-chosen and well-directed development may help to preserve a rural lifestyle while enhancing its economic vitality. But externally driven changes can also overwhelm the very character of a rural community that is most appealing to its existing residents. Therein lies Falk's conundrum: Rural communities have the option to change and survive or to refuse to change and run the risk of perishing through the continued out-migration of their most productive workers.

About the Workshop

Correspondence related to the March 8, 1996, workshop, "The Changing Rural Economy of the Midwest," should be directed to conference convenor Gary L. Benjamin, economic adviser and vice president in the Research Department at the Federal Reserve Bank of Chicago. Participants in the workshop included the following:

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Workshop Agenda

The workshop "The Changing Rural Economy of the Midwest" was held on March 8, 1996 at the Federal Reserve Bank of Chicago, 230 S. LaSalle St., Chicago, IL 60604.

I. 8:30 a.m.

Welcome and Opening Remarks

Presenter: *William C. Hunter,* Federal Reserve Bank of Chicago

II. 8:45 a.m.

THE HUMAN DIMENSIONS OF THE MIDWEST RURAL ECONOMY

The Demographic Trends

Presenter: *Kenneth M. Johnson,* Loyola University of Chicago

The Quality of Rural Education

Presenter: *Thomas F. Pogue,* University of Iowa

The Productivity of the Rural Labor Force

Presenters: *David McGranahan and Fred Gale,* U.S. Department of Agriculture

Discussant: *Ron Shaffer,* University of Wisconsin

III. 10:45 a.m.

MANUFACTURING AND THE MIDWEST RURAL ECONOMY

Recent Trends and Implications for the Future

Presenter: *G. Andrew Bernat,* U.S. Department of Commerce

The Food Processing Industry in the Midwest

Presenters: *Mike Singer and Chris Barfels,* Federal Reserve Bank of Chicago

Discussant: *William A. Testa,* Federal Reserve Bank of Chicago

IV. 12:15 p.m. Lunch

THE ROLE OF GOVERNMENT IN THE RURAL ECONOMY

Presenter: *D. Gale Johnson,* University of Chicago

V. 1:30 p.m.

THE SERVICE INDUSTRY AND THE MIDWEST RURAL ECONOMY

Producer Services Workers in the Nonmetropolitan Midwest

Presenters: *Jeff R. Crump and Norm Walzer,* Western Illinois University

Health Care Services and the Rural Economy

Presenter: *Sam Cordes,* University of Nebraska

Retirement and Recreational Activities in Rural Communities

Presenter: *John Fraser Hart,* University of Minnesota

Discussant: *Shirley Porterfield,* Washington University

VI. 3:15 p.m. Coffee Break

VII. 3:30 p.m.

CHANGES IN PRODUCTION AGRICULTURE AND THE MIDWEST

The Industrialization in Hog Production

Presenter: *Gary L. Benjamin,* Federal Reserve Bank of Chicago

The Changing Dairy Sector

Presenter: *Mary Keough Ledman,* Keough Ledman Associates

Discussant: *Stanley R. Johnson,* Iowa State University

About the Project

The Federal Reserve Bank of Chicago is undertaking an extensive analysis of the Midwest economy. The goal of the project is to understand the Midwest's turnaround in economic performance since the early 1980s. In the Seventh Federal Reserve District—which includes Iowa and large portions of Illinois, Indiana, Michigan, and Wisconsin—unemployment rates are, at the time of this writing, lower than at any time since the 1977–78 period, as well as being below the national average.

The Midwest project will involve a series of workshops and research studies which will be carried out by Federal Reserve analysts and other researchers from the region. An advisory board representing a cross-section of Midwest leaders will provide guidance for the project (see back page). Workshops scheduled for 1996 will consider (1) the economic performance of the broad Midwest economy and the transformation of its manufacturing industries; (2) the rural economy of the Midwest; (3) labor force training and education; (4) global linkages with the region's economy; and (5) tax, spending, and regulatory influences on regional performance. The findings of the workshops will be communicated through a series of publications and broad public forums. The project will conclude with a conference and publication toward the end of 1996.

At the Bank, the "Assessing the Midwest Economy" project is being conducted through a cooperative effort of the Office of the President, Michael H. Moskow, president; Research Department, William C. Hunter, senior vice president and director of research; and Community and Information Services, Nancy M. Goodman, senior vice president.

Inquiries should be directed to William A. Testa, senior economist and assistant vice president, Research Department, or James Holland, public affairs officer.

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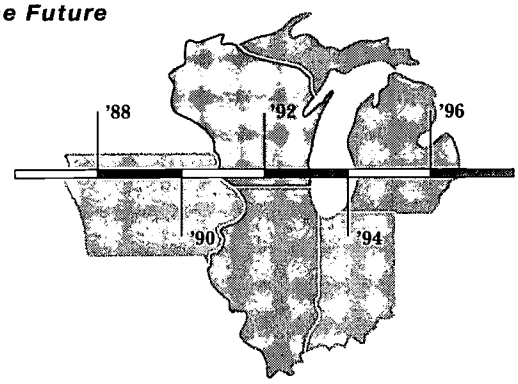


Work Force Developments: Issues for the Midwest Economy

Fourth in a series of workshops to be held at the Federal Reserve Bank of Chicago.

The condition and prospects of the work force were the subjects of the fourth workshop in the Federal Reserve Bank of Chicago's year-long "Assessing the Midwest Economy" project, which was held on May 15, 1996. The morning portion of the program focused on current issues in labor and training, including an examination of the skills being sought by employers, evidence of wage and income inequality, and developments affecting specific segments of the labor market, such as the poor, displaced workers, and the contingent work force. The afternoon sessions focused on the changing environment for work force training in the federal, state, and private sectors and examined how midwestern states are responding to these changes.

Introduction

Federal Reserve Bank of Chicago President Michael Moskow opened the workshop with a discussion of how work force development relates to the goals of the Midwest Assessment project. Moskow began by emphasizing that the quality and availability of the work force are inextricably linked to the health of the Midwest economy. Maximizing the development potential of the region will require promoting policies that foster human capital development at all levels of the work force.

However, determining how this should occur and who should be responsible for guiding work force development is not easy. Moskow suggested that it was clear from the diversity of topics on the workshop agenda that no single program could be expected to address the human capital development needs in the economy. He cautioned that while the workshop focused on the training needs of the adult work force, the critical areas of elementary and secondary education should not be overlooked. Noting that the Bank had sponsored a conference in 1994 on models of school reform in the Midwest, Moskow said that innovations in the delivery of elementary and secondary education are at the root of improving the quality of human capital in the Midwest.

Training is being trumpeted as the solution to various social ills. Still, more needs to be done to understand what types of training actually work.

Moskow observed that interest in training is at historic levels, with training being trumpeted as the solution to various social ills. Still, more needs to be done to understand what types of training actually work. He noted that when placed in a cost/benefit framework, many academic studies of federal experiments in job training, particularly those examining the Comprehensive Employment and Training Act (CETA) and the Job Training Partnership Act (JTPA), have not shown significant benefits. Moskow said that the characteristics of these programs that work best for specific segments of the population need to be identified.

In concluding, Moskow suggested that the demand side of the labor market equation should not be overlooked. This means identifying and understanding what skills firms are seeking in employees. Are we providing the right information to prospective employees to ensure that their training matches the needs of employers? Finally, Moskow stressed the importance of understanding the changing environment for delivering job training. At the federal level, the trend is toward increasing state flexibility in designing training programs via a block grant structure for training funds. In the private sector, firms are aggressively establishing their own training centers and corporate universities and looking at new ways to enhance the skills of their existing work force. Understanding this environment will be critical to molding successful training efforts.

What Does Business Need?

Addressing training needs in the context of changes in the structure of the Midwest economy, Don Smith, director of the Center for Economic Development at Carnegie Mellon University, introduced the concept of the "high-performance heartland." Smith defined a "high-performance" economy as one that maximizes the flow of information, the creation of knowledge, and the application of knowledge through the production chain of firms. Stressing that high performance is more than lean production and high quality, Smith emphasized that it embraces fundamental changes in organizational structure geared toward creating a sustainable advantage.

Today's high-performance firms require workers with significantly more sophisticated social and intellectual skills to support the decisionmaking that now occurs at all levels of the company.

In the context of work force development, this requires the creation of the "knowledge worker." In the past, firms focused on simplifying production tasks so that workers needed to master only one or two specific skills. Today's high-performance firms require workers with significantly more sophisticated social and intellectual skills to support the decisionmaking that now occurs at all levels of the company. This upgrading of skills needs to be a continuous process, which recognizes that problem solving, particularly in group settings, is critical to a firm's success.

Is the education and training system keeping up with the new work environment? Smith suggested that training needs to be more customer focused and based on a just-in-time model. Customized programs that address specific firm needs are often the most useful forms of training. Finally, Smith suggested that we also need to take into consideration the social implications of requiring higher skills in the work force and how we are going to insure that all can participate in a high-performance economy.

Next, Harry Holzer, of the economics department at Michigan State University, discussed the skills businesses are demanding in new employees. Holzer conducted an extensive survey of firms located in four major metropolitan areas (Atlanta, Detroit, Los Angeles, and Boston) to develop a representative sample of the skills and credentials that firms require in hiring new employees. Holzer's general finding is that skill needs for "new" jobs have risen, even in the relatively short time frame of the last five to 10 years. Forty-two percent of employers in the survey indicated that skill needs have risen for all of their new job categories and even in the blue-collar/service category, often perceived as requiring the fewest skills, 32% of the firms indicated that skill needs had increased. Table 1 illustrates the daily tasks and the credentials employers demand in new hires for various job categories.

Table 1 Skills and Credentials Required for New Jobs

	All Jobs	College Required	No College Required	
			White-Collar	Blue-Collar/Service
Daily Task Performance				
Customer Contact	.73	.82	.82	.51
Reading or Writing Paragraphs	.68	.91	.67	.51
Arithmetic	.68	.77	.70	.56
Computer	.56	.74	.70	.20
Required Credentials				
High School Diploma	.78	1.00	.82	.54
GED Accepted	—	—	.66	.44
GED Not Accepted	—	—	.16	.10
General Work Experience	.70	.75	.72	.62
Specific Work Experience	.64	.74	.64	.56
Previous Training or Certification	.43	.56	.39	.37

Notes: All results are sample weighted. A dash indicates information not available.

Source: Harry Holzer, "Employer Skill Needs and Hiring Procedures," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

One of the problems with the rising skills requirements is that many prospective workers in the labor market do not possess these skills. Holzer suggested that in central cities, perhaps as few as 5% of all jobs require none of the skills identified in table 1. However, more than 5% of the central city labor force lack these skills. The jobs that are available to workers who do not possess these skills are of poor quality (e.g., median wage of $7 to $8 an hour in the four metropolitan areas sampled) and usually do not provide benefits. Holzer also found that these "low-skilled" positions were disproportionately filled by black and Hispanic workers—in the four sample metro areas, 47% of the jobs that did not require a high school diploma and 43% of the jobs that did not require the use of math were filled by blacks or Hispanics. The lack of necessary credentials and skills are clear barriers to employment, especially for specific groups trying to enter the mainstream work force.

The next presentation addressed the training strategy of a major company—McDonald's Corporation. Hal Theis, responsible for directing all McDonald's training, described training as instrumental in shaping corporate strategy. McDonald's believes that the ability to learn faster than its competitors may be the company's only sustainable advantage. It works to maintain this advantage by providing training on an ongoing basis to the vast majority of its work force. Part of this commitment emerges from the company's ability to make training pay. Theis noted that 70% of McDonald's store managers and 50% of middle and top management have worked as crew members in McDonald's restaurants.

In an increasingly global company, training becomes even more important to insure that product quality and customer satisfaction are maintained.

Theis stressed that effective training is part of corporate strategy and should not be viewed as a one-time event. In an increasingly global company, training becomes even more important to insure that product quality and customer satisfaction are maintained. With a new McDonald's restaurant opening every 3.5 hours, it is critical that workers develop key core competencies. This means that training needs to 1) help set strategy for the company, 2) serve as a center of excellence at McDonald's, 3) utilize the best learning methods, and 4) provide world leadership for McDonald's. Increasingly, the company is emphasizing team training and developing problem solving skills.

Theis also outlined the short-run objectives for training at McDonald's. While the overall objective is to use training to help drive the business, particular goals for 1996 include simplifying crew training to insure that more training occurs at the crew person's work station. This means imbedding training into the actual operations of the restaurant crew. Other short-term goals include accelerating the development of restaurant managers and working on executive and business consultant development. Theis concluded that a major challenge at McDonald's is to position training as a driver of the company's business strategy, rather than as some adjunct function in the company.

Responding to the presentations, Martin Simon of the National Governors Association suggested that welfare-to-work programs must be realistic in their expectations. Simon said that, given employers' expectations as identified by Harry Holzer, roughly 20% to 30% of people currently on welfare may be unable to get jobs that are not partly subsidized. Davis Jenkins of the University of Illinois at Chicago noted that there are programs that are developing high school students for careers in the service sector. Northern Illinois University, for example, has a partnership program with many large retail firms called the National Youth Apprenticeship in Service Management, which is specifically targeted to developing students' skills for careers in service management.

Dolores Cross of Chicago State University said that the assumptions behind programs such as School to Work 2000 may be unrealistic, because the skills and competencies that this program has identified as critical to success in the work force may no longer be valid by 2000.

Problems of Low-Skilled Labor

The following workshop session examined conditions in the low-skilled labor market. Rebecca Blank, an economics professor at Northwestern University, provided a national perspective and suggested that there is good news and bad news for this segment of the labor market. The good news is the population of workers that can be considered "low skilled" has shrunk. The bottom decile of the labor market is more skilled than in the past. The bad news is that higher skills are demanded today. This means that the set of skills this group possesses will not provide much in the way of labor or income mobility.

People in the low-skilled labor market want to work. However, the quality of jobs available to this population is poor and has worsened over time.

Blank emphasized that people in the low-skilled labor market want to work. Roughly two-thirds of all poor families have one worker in the family. However, the quality of jobs available to this population is poor and has worsened over time. Unemployment rates display wide disparities when skill levels are taken into consideration. In 1994, unemployment among high school dropouts ran at 15% to 16%, while unemployment for college graduates was 4%. As table 2 illustrates, average weekly wages from 1979–93 demonstrated a similar pattern.

Table 2 Change in Average Full-Time Weekly Wages, 1979–93

Education Level	Men	Women
H.S. dropout	–22.5%	–6.3%
H.S. graduate	–11.9	5.7
H.S. graduate (+)	–5.3	11.0
College graduate	9.8	27.1

Source: Rebecca Blank, "The National Perspective," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

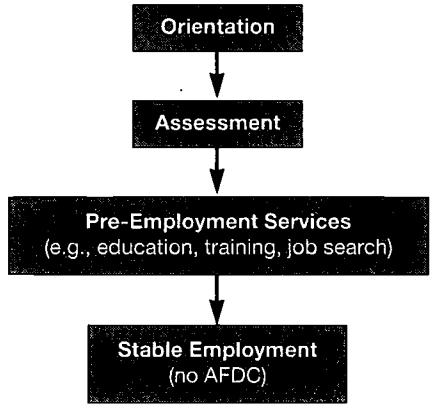
In 1994, unemployment among high school dropouts ran at 15% to 16%, while unemployment for college graduates was 4%.

Blank noted that although women's wages increased during this period, they remained significantly lower than men's. The average female high school dropout earned $287 per week in 1993, compared with $400 per week for the average male high school dropout. For the college educated, a similar gap existed with men earning $1,000 per week, while women got $677. Not surprisingly, with declining real wages, labor force participation has declined. More adult men are simply not looking for work.

Blank concluded by addressing the policy implications for dealing with this segment of the labor market in two areas—compensation and training. The fall in real wages encourages people to drop out of the labor market. However, wages are only part of the problem; the lack of benefits in many jobs also needs to be addressed. One program that has helped, Blank said, is the earned income tax credit, which increases real income for those at the bottom of the employment ladder. Better public schools and education reform are also important for insuring that future workers can learn the skills they need in the work force. Outside the schools, more research is needed to identify what types of training work best for disadvantaged segments of the work force. With the exception of training for women on welfare, few training programs have worked particularly well. Even in welfare-to-work programs, the graduates who secure jobs rarely move out of poverty. Finally, Blank suggested that work force diversity will provide a significant challenge as a non-English speaking immigrant population makes up a larger segment of the labor force.

Toby Herr, director of Project Match for the Erikson Institute, described what has been learned about the process of moving from welfare to work based on a project in Chicago's Cabrini-Green neighborhood underway since 1985. Herr felt that one of the largest problems with welfare-to-work programs is that they are based on an unrealistic "linear" model of how welfare recipients move into the workplace. In this type of approach, the welfare client is sent through a series of defined steps leading to stable employment (see figure 1).

Figure 1 The Typical Welfare-to-Work Program Model: Pre-Employment Services Only



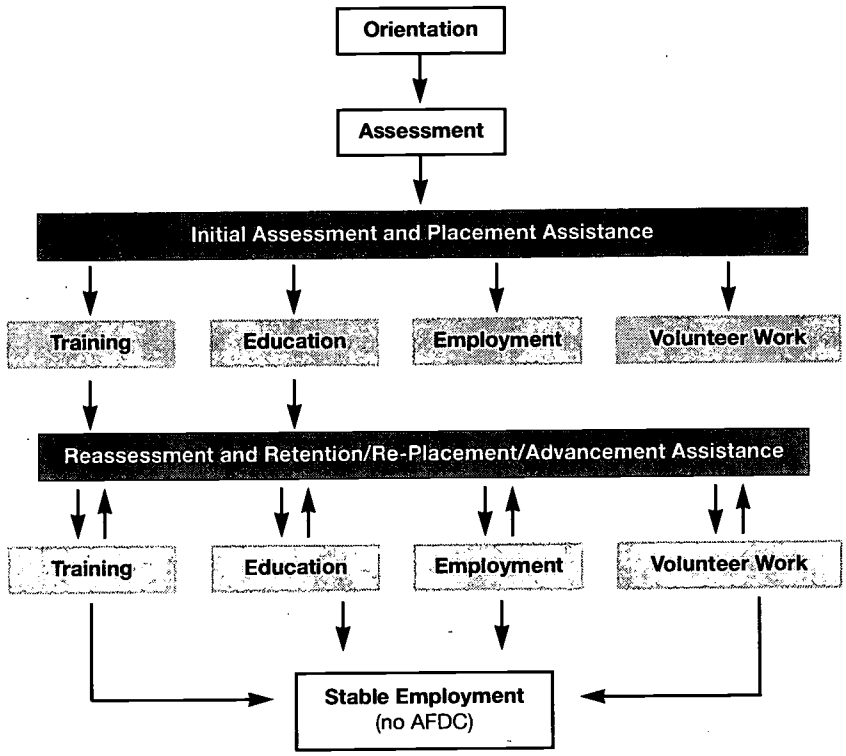
Source: Toby Herr, "Evidence from Chicago—Project Match Materials," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

One of the largest problems with welfare-to-work programs is that they are based on an unrealistic "linear" model of how welfare recipients move into the workplace.

Herr also criticized the traditional model for addressing barriers to self-sufficiency, such as child care needs or problems with domestic violence, drug addiction, housing, and depression. Under the traditional model, each of these problems is identified and then "fixed" prior to training and employment. Herr proposed that a more realistic model would emphasize teaching clients to cope with these problems while going through training, employment, or community volunteering, rather than treating them as separate issues.

Herr explained that the experience from Project Match has led to the development of a far more complex model, with the client requiring services both before and after employment. The model in figure 2 provides a series of different options at each stage of the process, recognizing that there is more to leaving welfare than just getting a job. This model addresses three problems that those making the transition from welfare to work often face. First, people entering the program want to go to work and often do not want to attend school, at least not initially. In many cases, their experience in the education system has been poor and sending them back into a classroom setting may be counterproductive. Second, people with few skills often do not know how to find jobs. For these participants, it is critical that job openings be identified and interviews scheduled. Third is the problem of job retention. Between 60% and 70% of participants will lose their jobs and require additional services to find new employment opportunities.

Figure 2 An Alternative Model: Pre-Employment and Post-Employment Services



Source: Toby Herr, "Evidence from Chicago—Project Match Materials," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

Herr concluded that her experience with Project Match has helped provide an important understanding of the process for moving people off welfare and into the work force. However, she noted that even with such improvements to the welfare-to-work process, 20% to 25% of this population seem unable to come off the welfare rolls. Project Match has been getting this group started with less formal and less demanding activities, such as volunteering at their children's Head Start program, serving on a community advisory board, or even taking their children to extracurricular activities. With proper assistance (and, for some, counseling or treatment), many can use these experiences as stepping stones to school or work.

In the question period that followed this session, Jackie Harder, economic development director for Cook County, raised concern about whether parenting skills were included in the training available to welfare recipients. Noting that the structure of the family is also a problem for society, Harder said that she hoped that welfare-to-work programs did not force women with preschool children to seek employment. Discussing the low job retention rate associated with many of the welfare-to-work clients, Harry Holzer noted that many of the jobs available to these workers are with employers that traditionally have high turnover rates in their work force. The low retention rates might also reflect the poor quality of these jobs. Finally, Bob Edwards, director of the Department of Labor for the

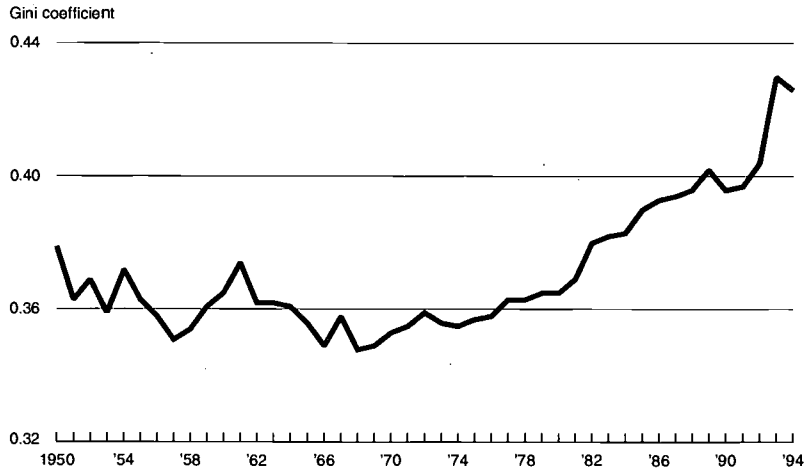
state of Michigan, suggested that in his experience with the inner city work force, distance to work is a major issue. Jobs are often located too far away to justify the transportation costs for relatively low wages. Rebecca Blank concurred and suggested that job networks are marginally more promising than job creation for many central city residents. Suburban areas can be like a "foreign country" to many inner city residents who may have no "cousins, uncles, or friends" to inform them about job prospects.

In the Midwest, income inequality increased faster than the rest of the nation in the industrial states—Illinois, Indiana, Michigan, Ohio, and Wisconsin. However, only Michigan and Illinois had inequality levels above the national average.

The Wage/Income Gap

Mark Partridge of the economics department at St. Cloud State University (Minnesota) presented his research on regional evidence of growing wage and income inequality. Partridge noted that the wage structure has changed dramatically since 1980, even within different education levels. He cited five factors that help explain this wage gap—the changing industrial composition of the economy, increasing foreign trade, immigration and the skill levels of immigrants, the decline of unions, and cultural changes. Figure 3, which shows the Gini coefficient for each year from 1950 through 1994, provides striking evidence of growing family income inequality nationwide. (The Gini coefficient is a widely used measure of income inequality. A Gini coefficient of 0 would indicate perfect equality, i.e., all households would have the same income; a rating of 1 would reflect perfect inequality, with one household receiving all income.)

Figure 3 Family Income Inequality, 1950–94, Gini Coefficients



Source: U.S. Department of Commerce, Bureau of the Census, *Current Population Reports*, Series P60, various years.

In the Midwest, income inequality increased faster than the rest of the nation in the industrial states—Illinois, Indiana, Michigan, Ohio, and Wisconsin. However, only Michigan and Illinois had inequality levels above the national average. Income inequality in the agricultural Midwest—Iowa, Minnesota, Nebraska, and North and South Dakota—also increased, but at a rate that was below the U.S. average (see table 3).

Traditionally, greater economic growth had led to greater income equality, but this pattern does not seem to be holding for many of the states in the Midwest.

Table 3 North Central Region Family Income Inequality Trends, Gini Coefficients

Region	1990 Gini	1990 Gini rank[a]	1960 Gini rank[b]	1970-1990 change in Gini[c]	1970-1990 change in Gini rank[d]	1980-1990 change in Gini[e]	1980-1990 change in Gini rank[f]
East North Central							
Ohio	.3939	26	43	.0809	1	.0587	3
Indiana	.3767	39	33	.0547	12	.0467	16
Illinois	.4094	16	27	.0647	4	.0596	1
Michigan	.3993	21	38	.0703	2	.0534	10
Wisconsin	.3675	46	35	.0415	22	.0365	36
West North Central							
Minnesota	.3804	36	23	.0344	33	.0390	29
Iowa	.3728	43	19	.0258	41	.0110	48
Missouri	.4035	17	16	.0265	40	.0448	17
North Dakota	.3756	42	18	.0066	47	.0304	43
South Dakota	.3842	34	15	–.0018	48	.0265	44
Nebraska	.3774	38	20	.0164	45	.0338	39
Kansas	.3894	30	24	.0394	24	0387	31
U.S. Average	.3984	na	na	.0414	na	.0421	na

Notes: The Gini coefficient is a measure of income equality.
na indicates information is not applicable.

[a] The 1990 Gini rank for the 48 contiguous states. A low rank is associated with relatively *more* family income inequality.
[b] The 1960 Gini rank for the 48 contiguous states. A low rank is associated with relatively *more* family income inequality.
[c] The 1970–90 change in the Gini coefficient. A greater change is associated with a larger increase in inequality.
[d] The rank ordering of the 1970 to 1990 change in the Gini coefficient for the 48 contiguous states.
[e] The 1980–90 change in the Gini coefficient. A greater rank is associated with a larger increase in inequality.
[f] The rank ordering of the 1980 to 1990 change in the Gini coefficient for the 48 contiguous states.

Source: W. Levernier, M. Partridge, and D. Rickman, "Variation in State Income Inequality, 1960–90," *International Regional Science Review*, No. 3, 1996. The data were based on the 1960, 1970, 1980, and 1990 decennial census, where the actual family income was from the preceding year (i.e., 1959, 1969, 1979, and 1989).

Partridge suggested that the relationship between economic growth and income inequality appeared to be inconsistent. Traditionally, greater economic growth had led to greater income equality, but this pattern does not seem to be holding for many of the states in the Midwest. In the agricultural Midwest, a decline in the percentage of the population employed in agricultural jobs has acted to reduce income inequality. Incomes within the agricultural sector vary greatly and this high wage inequality tends to increase the Gini coefficient in states with large or expanding employment in the agricultural sector. Additional factors that seem to be associated with increasing inequality in some regions are increases in the number of female-headed households and increases in immigration. On the other hand, higher labor force participation rates seem to reduce inequality. Partridge found that relative employment growth, race characteristics, education levels, unionization, and productivity per worker were not statistically significant in influencing wage inequality.

Responding to the presentation, Don Turner of the AFL-CIO asked whether any of the changes to the income tax structure during the Reagan era had influenced the growth in wage inequality. Partridge replied that while such changes are not inconsequential, they are of a low order of magnitude. Bill Testa, assistant vice president and senior economist of the Federal Reserve Bank of Chicago, observed that midwestern states with robust growth in manufacturing—Indiana and Wisconsin—have experienced less deterioration in equality than service-oriented states like Illinois.

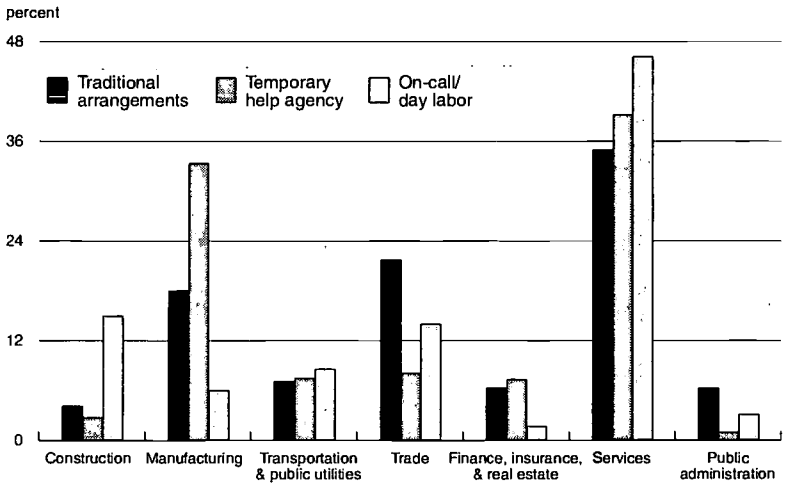
According to the U.S. Department of Labor's 1995 Report on the American Work Force, approximately 2.2% to 4.9% of the labor force considered themselves contingent workers.

The final presentations of the morning addressed two specific segments of the labor market—contingent and displaced workers. Susan Houseman, an economist at the Upjohn Institute, presented her research on the contingent work force in the U.S. and other industrial nations. Contingent workers have nontraditional work arrangements, which often include short-term contracts, part-time schedules, or day labor. These workers often feel that their job is temporary. Houseman noted that in the U.S. there is little hard evidence of this population. According to the U.S. Department of Labor's 1995 *Report on the American Work Force*, approximately 2.2% to 4.9% of the labor force considered themselves contingent workers. Houseman noted that many of these workers are dissatisfied with their work arrangements, with 56% to 64% indicating that they would prefer noncontingent employment. They also usually do not receive benefits; in 1995, between 36% and 47% of these workers did not receive health insurance.

Looking at industry groups, Houseman noted that the use of temporary agency workers has been particularly strong in manufacturing and service firms (see figure 4). The fastest growth has been in business services, reflecting increased outsourcing arrangements by firms. Houseman suggested that some of the attraction for employers may be the potential to use temporary employment agencies as head hunters.

The use of temporary agency workers has been particularly strong in manufacturing and service firms.

Figure 4 Percent of U.S. Workers in Alternative Employment Arrangements, by Industry



Source: U.S. Department of Labor, *Report on the American Work Force*, 1995.

Houseman concluded by looking at the contingent work force in Japan. Because legal requirements make it difficult to lay off permanent workers, Japan has a significantly larger percentage of contingent workers. Houseman presented data on three classes of workers in Japan for three different years (see table 4). She noted that contingent workers in Japan are likely to work full-time hours and the distinction between forms of employment has more to do with status in the firm than work schedules. Much of Japan's growth in contingent workers has been driven by the need to contain labor costs, which makes the use of fixed-term employment contracts attractive.

Table 4 Contingent Workers by Class as Percent of Japanese Work Force

Year	Part-Time	Temp/Day Labor	Temp Agency
1982	11.0	11.5	4.8
1987	14.2	12.0	4.2
1992	16.1	11.2	3.9

Source: Susan Houseman, "Work Force Contingency in the U.S. and Japan," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

Commenting on Houseman's presentation, Dan Sullivan, assistant vice president and senior economist of the Federal Reserve Bank of Chicago, cautioned that the contingent workers category is very hard to analyze given the very heterogenous nature of the jobs undertaken by these workers. Sullivan noted that many "white-collar temps" are doing very well under contingent arrangements and that an important research question is to identify why businesses are increasing their use of temporary workers before concluding whether the trend is good or bad. Sullivan said that the suggestion that firms are simply trying to cut costs by using temps may be inaccurate given the wage premium that firms must pay to get temporary workers. Don Smith suggested that government regulation may have the unintended consequence of encouraging the creation of more contingent workers. Smith noted that Japan's traditional support of life-time employment apparently has encouraged the use of contingent workers. In contrast to the U.S., many European countries impose sanctions on layoffs of permanent employees, thereby encouraging firms to use contingent labor.

In the final session of the morning, Dan Sullivan presented research done with Louis Jacobson and Robert LaLonde on the earnings experience of displaced workers. Sullivan began by defining displaced workers as those who, due to a mass layoff, have lost a permanent job in which they had some seniority. In examining what has happened to this population, Sullivan posed the following questions:

- How costly to workers is job displacement?
- How much does unemployment insurance lessen earnings losses of workers?
- How much of a work disincentive is unemployment insurance?
- Can training help dislocated workers?

Sullivan noted that during the 1980s approximately two million workers per year lost their jobs through mass layoffs. Of these, approximately half had three or more years of seniority on the job. While a great deal is known about the short-term impact of these layoffs, less is known about the long-term impact on earnings of displaced workers. Sullivan and his coauthors have examined this question using a specialized administrative data set on firms and workers in Pennsylvania, covering the period from 1974 to 1991. In this sample, workers were highly attached to the Pennsylvania labor market and had six or more years of tenure on the job.

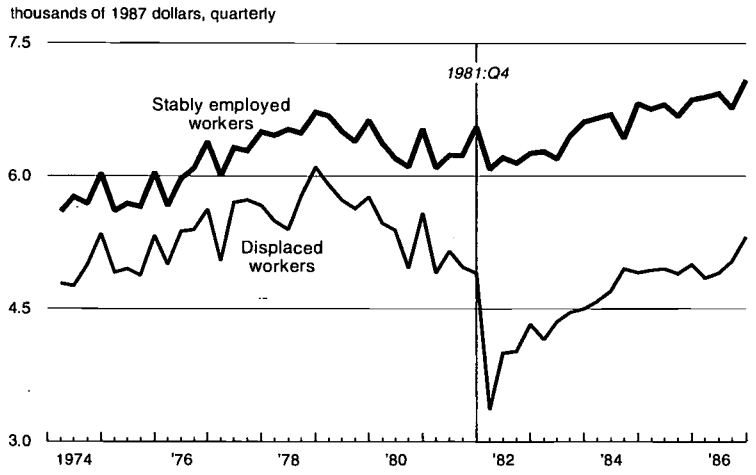
Figure 5 presents earnings histories of displaced and stably employed workers over the study period. Even after the displaced worker is reemployed, there is a significant gap between the worker's new earnings and those of the stably employed workers. Overall, earnings losses six years after separation are $6,000 per year and are large for virtually all classes of workers. In general, workers' earnings losses are 40% of previous earnings in the first year after separation, improving to 25% by the fifth year.

During the 1980s approximately two million workers per year lost their jobs through mass layoffs. Of these, approximately half had three or more years of seniority on the job.

Even after the displaced worker is reemployed, there is a significant gap between the worker's new earnings and those of the stably employed workers.

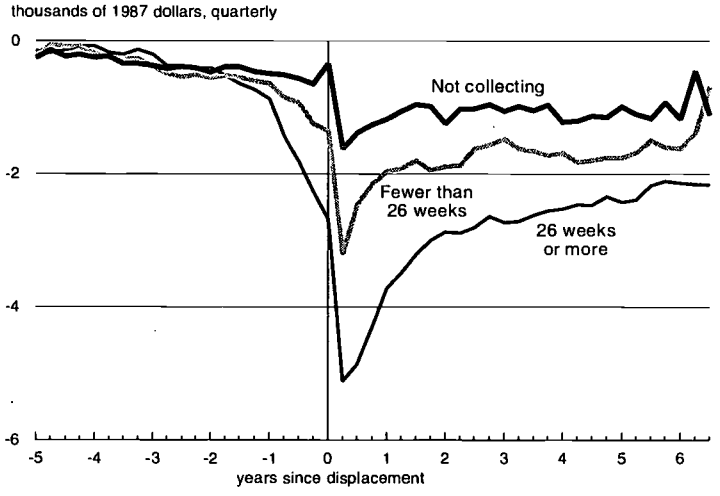
While unemployment insurance benefits clearly help displaced workers during the period of greatest financial hardship, they may slow the return to work for certain workers who find that their unemployment insurance benefits are greater than the wages from new jobs that are available to them.

Figure 5 Earnings Histories of Workers Displaced in 1981:Q4 and Workers Stably Employed through 1986



Source: Daniel Sullivan, "The Earnings Experience of High-Seniority Displaced Workers," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

Figure 6 Earnings Losses for Workers Not Collecting Unemployment Insurance, Collecting Fewer than 26 Weeks, and Collecting 26 Weeks or More



Source: Daniel Sullivan, "The Earnings Experience of High-Seniority Displaced Workers," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

Workers who collect no unemployment insurance following the layoff suffer the smallest long-term earnings losses and appear to have the best reemployment prospects. Workers with long duration on unemployment (26 weeks or more) fare the worst (see figure 6). While unemployment insurance benefits clearly help displaced workers during the period of greatest financial hardship, they may slow the return to work for certain workers who find that their unemployment insurance benefits are greater than the wages from new jobs that are available to them.

Sullivan concluded with a discussion of returns to job training. He divided the types of assistance provided to displaced workers into two categories, job search assistance and subsidized retraining. Job search assistance has proven to be inexpensive and relatively effective on a limited scale. Subsidized retraining is expensive and largely unproven, but may have a significant impact. Sullivan cited research from the Displaced Workers Education and Training Program in Pennsylvania, which looked at displaced workers who were provided with vouchers for classes at the Community College of Allegheny County. The preliminary findings suggest that for men in the sample, one year of academic credit work eventually raised their earnings between 5% and 8% above the earnings of those who did not receive the training. Gains for women in the sample were slightly lower. Still, Sullivan cautioned that these gains were on the low end of the usual range associated with returns to conventional schooling and did not replace the earnings lost relative to the workers' previous jobs. Sullivan also suggested that the returns from training appeared to be influenced by course selection. Those taking technical and science course work generally received a higher return from training.

In response to the presentation, Bob Edwards asked whether Sullivan's findings with regard to unemployment insurance suggested that this program should be recast as an IRA-style program. Rather than simply using unemployment insurance as wage replacement, under an IRA program displaced workers could use the benefits for training or even starting a new business. Sullivan indicated that he had not specifically looked at this issue but believed it would have some appeal. Similarly, offering unemployment insurance payments to employers as a wage subsidy might speed the return to work for some displaced workers. Sullivan also indicated that efforts to "profile" displaced workers, in order to help match them more closely with the needs of the labor market would be beneficial. Rebecca Blank cautioned that any study of displacement should explicitly recognize the differences in local labor markets to insure that conclusions are not drawn too widely.

Bill Testa asked Sullivan how sensitive the size of the earnings loss for displaced workers is to local labor market conditions. Is there a justification for public policies toward displaced workers to be place-specific? Sullivan responded that earnings losses experienced by displaced workers in the Pittsburgh area appeared to be somewhat more severe than in Philadelphia, an area that generally had better labor market conditions during this period. Nonetheless, earnings losses were significant in both areas.

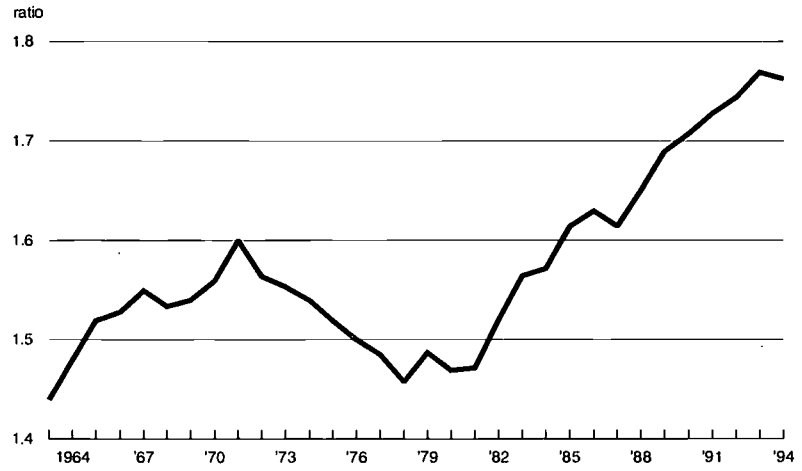
The evidence suggests that among several factors that have contributed to widening gaps in wages, the most prominent is increasing returns to skills and education.

Wage and Income Trends: Policy Issues, Theory, and Evidence

The luncheon presentation featured Kevin Murphy, a professor of the Graduate School of Business at the University of Chicago. Murphy presented evidence from his research on wage inequality and proposed a policy to narrow the wage gap by promoting a "supply side" response in the labor market. The evidence suggests that among several factors that have contributed to widening gaps in wages, the most prominent is increasing returns to skills and education. Murphy's supply side response is notable in that it is driven by increasing the educational investment where returns are the highest and does not suggest providing a disproportionate level of increased investment for the least skilled.

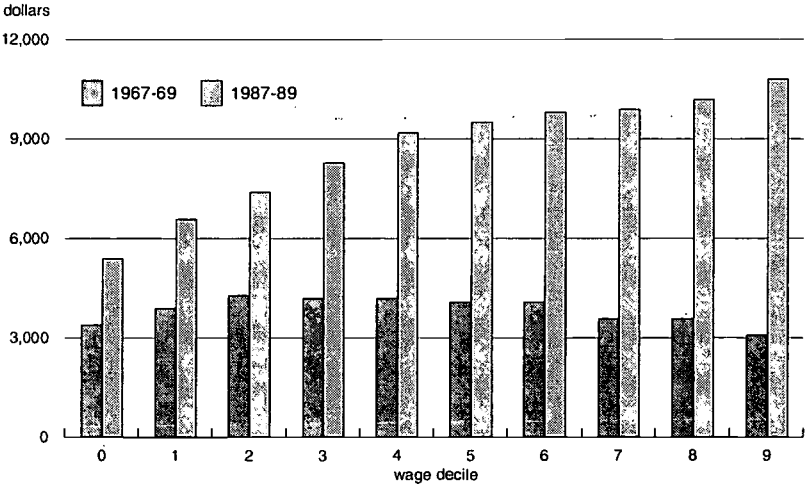
Murphy provided evidence of the dramatic increase in wage premiums for the college educated relative to wages received by high school graduates from 1963 to 1994 (see figure 7). Murphy compared this to the 1970s, when growth in the college educated population caused the wage premium to fall and led many to suggest that Americans were overeducated. However, even as the wage premium was narrowing during the 1970s, the start of wage inequality could be seen. Indexed real wages of the 10th, 50th, and 90th percentiles for men began to separate during the 1970s, and Murphy suggested that this trend accelerated during the 1980s.

Figure 7 Wage Premium, College Educated versus High School Educated



Source: Kevin Murphy, "Wage and Income Disparity Trends," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

Figure 8 Wife's Annual Earnings by Husband's Wage Decile



Source: Kevin Murphy, "Wage and Income Disparity Trends," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

Greater labor force participation rates among high-income/high-wage families, along with higher wages for women vis à vis men, have contributed to the rise of "have-everything" families.

Several developments have accompanied growing wage inequality. One that is infrequently discussed is that the female–male wage ratio within both high school and college educated populations has narrowed considerably over the last 15 years. Ironically, this trend has contributed to a widening distribution of income across husband–wife families (see figure 8). Between 1987 and 1989, men in the highest wage decile tended to be married to women whose annual earnings were also in the highest decile, whereas in 1967–69 annual earnings were lower for wives of high-decile husbands. Greater labor force participation rates among high-income/high-wage families, along with higher wages for women vis à vis men, have contributed to the rise of "have-everything" families.

If the supply of well-educated people is increased, the wage premium that they command will decline. Conversely, the supply of non-college educated workers will shrink, so they too will be able to command better wages even without additional skills.

The cost of being poorly educated is higher today, but this has not necessarily translated into increased participation levels or lower dropout rates (particularly in inner city areas).

Murphy emphasized that a supply side strategy to reduce income inequality should focus on maximizing the returns from education. He proposed that rather than bemoaning the widening wage gap, we need to take advantage of the premium that is associated with high skill levels. If the supply of well-educated people is increased, the wage premium that they command will decline. Conversely, the supply of non-college educated workers will shrink, so they too will be able to command better wages even without additional skills. Murphy also presented evidence that the labor market has begun to respond to the wage premium for college educated workers. The proportion of men and women who are 20 to 24 years old with some college education has risen steadily. While this supply side adjustment appears to be working for those pursuing a college education, Murphy noted it is not working as well at the elementary and secondary levels. The cost of being poorly educated is higher today, but this has not necessarily translated into increased participation levels or lower dropout rates (particularly in inner city areas).

During the discussion period, Murphy was asked what percentage of the growth in wage inequality could be attributed to education. He replied that 30% to 40% of the wage inequality growth was education related. Tim Bartik, senior economist at the Upjohn Institute, asked what policies, if any, should be pursued to assist members of the existing adult work force who have experienced declines in living standards due to job dislocations and wage drop-offs. Murphy reiterated that the amount of training needed for many such workers is too high and the payoff too low, in terms of shorter work life and demonstrated returns to adult training programs, to justify such public policies. For this reason, any intervention should probably be focused toward student and young adult populations. Bill Testa asked whether this supply side response might help with the productivity slowdown in the economy that has been so noticeable. Murphy said that assuming that the average number of years of schooling could be increased by roughly 0.6 years over a decade and that the return to four years of college education was roughly 75%, output could expand by an extra 5% to 6% over the decade.

Work Force Preparation in a Changing Environment

The afternoon sessions began with a description of the changing relationship among the federal, state, and local governments in providing training services and how business is approaching training in the current environment. Randall Eberts, executive director of the Upjohn Institute, noted the following three trends. First is the trend toward less direct federal involvement, with the states becoming increasingly responsible for designing their own training strategies and programs. This should make surviving programs more effective by allowing states to customize initiatives, according to differences in regional economies and labor markets. Moreover, the freedom to customize programs may result in innovations that can benefit many work force programs and initiatives. However, this trend will have a price, since fewer federal dollars are likely to be available for training. The second trend cited by Eberts is toward having fewer recognized national standards. While more training experiments are likely to occur, it will become harder to compare their effectiveness since the programs are likely to be geared toward local, not national standards. Finally, Eberts noted the trend toward increased private sector provision of training. Both private and public providers can learn from a greater understanding of the impetus and outcomes of these initiatives.

Devolution of Welfare/Training Responsibilities to State/Local Government

Martin Simon, director of training and employment programs for the National Governors Association, observed how the states are adapting to the new training environment. Simon suggested that the primary change coming out of Congress would be the use

of block grants for training purposes. States would receive lump sums for training and would largely use their own discretion as to how best to use the funds. While the states may welcome the flexibility associated with a block grant structure, they will probably receive les money under block grants than through current programs. Simon also cautioned that, relative to the total amount spent on education and training by states and the private sector, even current federal expenditures in this area are not large.

Do the states have the necessary infrastructure to handle this devolution of responsibility? Simon suggested that many states, including those in the Midwest, have already taken aggressive measures to pursue new training structures. As with health care, some states have decided to establish their own training strategy without waiting for guidance from Washington. Thirty-three states, including most of the Midwest states, have adopted "one-stop" facilities for employment services, such as job postings and training opportunities. Similarly, 29 states have placed time limits on how long welfare benefits can be collected and have begun some form of welfare-to-work reform. Wisconsin has been a national leader in this field. Many states have added benchmarks to their training programs to improve accountability.

While the states may welcome the flexibility associated with a block grant structure, they will probably receive less money under block grants than through current programs.

Addressing some remaining problems, Simon suggested that the states could develop more coherence among their education and training programs. The state government infrastructure is still fragmented in this area and there is a tendency not to coordinate programs across departments. Making training an integrated part of the state's development strategy would be helpful. Second, the states often wrestle with the question of whether training programs are geared toward economic development or welfare goals. While the two are not always mutually exclusive in their outcomes, channeling training dollars to disadvantaged populations may take longer to show a payoff and the question remains how patient will the states be. A faster, more visible political payoff may come from providing training that upgrades the skills of the existing work force. Third, measuring the results of state training programs could be a difficult and lengthy process, since the devolution of responsibility may create 50 different training systems.

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Finally, Simon said that a key element in the success of state-based programs will be their interaction with the private sector. Particularly in the area of post-placement training, it is important that the states are aware of the needs of employers and are willing to support the upgrading of the skills of the existing work force.

How the Federal Government Sees its Role in Work Force Development

James Aaron, director of employment training for the U.S. Department of Labor/Employment Training Administration, described the federal government's role in work force preparation. Current legislation favors the consolidation of federal training activities, making it difficult to assess the extent to which the Employment and Training Administration (ETA) will continue its current functions. Aaron said there are five areas that the department aims to emphasize. The first is capacity building in the delivery of training programs. Aaron noted that the federal government is in a good position to help identify which state programs work best and what elements in those programs contribute to their success. To promote these "best practice" programs, an award program based on the Baldridge Quality Award criteria has been developed for training programs.

The ETA's second area of emphasis is to help develop tools for states' and localities' self-assessment of their programs. The "simply better" program establishes measures for program outcomes. Related to this is the ETA's third area of emphasis—conducting research that will allow careful analysis of existing programs and help determine whether they can be replicated across state lines. For example, Aaron said that Department of Labor research

had shown that one-stop career information centers could be replicated with positive results throughout the nation. Unfortunately, funding for future research may be sharply curtailed under the pending consolidation legislation.

A fourth area of interest for the ETA is in using new technologies, in particular, the Internet, to improve communication between job seekers and employers. The department has already established "America's Job Bank," which posts 400,000 job openings throughout the nation. Finally, the department aims to develop accountability standards, including standardized performance measures that permit states to benchmark their training efforts against other states'.

Following Aaron's presentation, Tim Bartik of the Upjohn Institute discussed two justifications for the federal government's involvement in the training business. First, he said that in a federal system, the government has a responsibility to insure an adequate safety net for the poor. As such, ensuring that disadvantaged segments of society have access to federal training resources can be viewed as an appropriate role.

Standards need to be clear and meaningful measures established for evaluating the success of these programs, beyond simply shrinking the welfare rolls.

Second, the federal government has an interest in promoting the efficient use of resources throughout the economy. In line with this objective, the government can encourage states to provide training programs that have positive spillovers and it can serve as an information clearinghouse, helping states to learn which programs work best. What is less clear is whether the federal government should play a role in training programs that are specifically designed to promote state economic development. Bartik suggested that perhaps a limited federal role could be supported, given disparities in development levels between states. Training efforts directed toward economic development in poorer states probably are more deserving of federal assistance.

Bartik also raised some concerns about the new training environment. He noted that it does not make sense for the federal government to provide the states with training funds without overseeing how well states contribute to national goals. Bartik was also concerned that without adequate federal oversight, states will shift their training emphasis to economic development and redirect support away from disadvantaged population segments. For example, Bartik noted that one welfare-to-work "reform" strategy could be simply to make many current welfare recipients ineligible for welfare benefits. Standards need to be clear and meaningful measures established for evaluating the success of these programs, beyond simply shrinking the welfare rolls. In conclusion, Bartik said he is not certain this will occur under a system that devolves responsibility to 50 states.

A Business Perspective on Today's Work Force

The old model of a labor market—with a worker spending a lifetime in a single occupation at a single company—no longer exists. Accordingly, for employees to feel secure in the labor market, they will increasingly need portable and certified skills.

In the next session, Robert Jones, president and chief executive officer of the National Alliance for Business, discussed how business is responding to the changing environment for work force development. Jones noted that the labor market is changing faster than public policymakers can respond; as a result, many federal solutions to labor market issues are already out of date. He said that, in particular, the federal response has been mistakenly fashioned toward developing structures and programs that are based on an anachronistic understanding of how the labor market functions. The old model of a labor market—with a worker spending a lifetime in a single occupation at a single company—no longer exists. Company structures have become significantly more flexible to adjust to changing economic demands. Accordingly, for employees to feel secure in the labor market, they will increasingly need portable and certified skills. This also requires reducing barriers to labor mobility by assuring that employees can take their benefits—namely, health care and pensions—with them when they change jobs.

Business has stepped up its involvement in lobbying for additional funding for public education and training.

Business is increasingly demanding contextual learning, which sets the curriculum against the backdrop of how it will be applied in the workplace.

Companies that fail to adopt many of these features will find that their recruitment activities are not highly successful, said Jones. In response to the changes occurring in the labor market, he noted the following trends in training from the business perspective. First, business has stepped up its involvement in lobbying for additional funding for public education and training. Particularly for elementary education, businesses have been vocal in seeking increased spending. A coalition of business organizations, including the National Alliance for Business, the National Association of Manufacturers, and the U.S. Chamber of Commerce, is calling for an increase in education funding, particularly at the earliest elementary grade levels. Jones sees this as part of an effort to make education an economic rather than a political issue. In the past, education and training programs were often a political response to interest groups and, in his view, this led to the proliferation of the poorly coordinated programs that we have today. Second, business is increasingly demanding contextual learning, which sets the curriculum against the backdrop of how it will be applied in the workplace.

Jones emphasized that the development of industry-based skill standards and recognized credentials is at the top of the business training agenda. Individual industries and trade groups are best able to define the standards that are most relevant for workers in their field, and by developing appropriate credentials, workers will be employable at other firms in the industry if they lose their current job. Jones suggested that these standards and credentials need to be developed in "smaller bites," so that workers can upgrade specific skills as workplace requirements change. Similarly, companies are moving toward establishing training as a life-long process that represents a real investment in the firm and the worker, rather than training as a gratuitous employee benefit. The key to successful and valuable training is to insure that it is provided on a continuous basis and that it is user friendly and accessible. Using these criteria, Jones suggested that government funding should be harmonized with industry certified training, which is clearly demanded by the labor market.

Jones concluded that the private education sector has already begun to provide training along these lines. Private proprietary schools, customized course work, and corporate universities are all efforts to recast training based on the demands of the labor market.

Where Does the Region Go from Here?

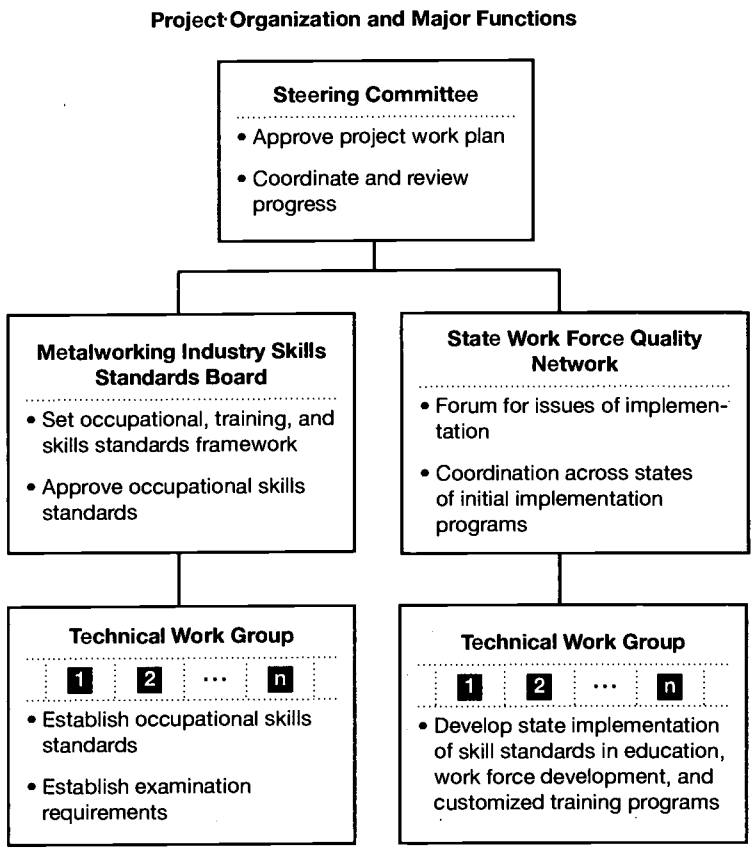
In the final session, a panel discussed work force training programs in the Midwest. The presenters agreed that most Midwest states are already adapting to the new environment for providing training and experimenting with innovative programs to address many of the issues raised throughout the workshop sessions.

Jeff Edstrom, senior policy director at the Council of Great Lakes Governors, described the partnership the governors created with the National Tooling and Machining Association to develop a skills and credentials program for workers in the metalworking industry. Edstrom noted that this industry is fundamental to the region's economic strength. Over 50% of the U.S. metalworking industry and over 50% of metalworkers can be found in the eight Great Lakes states. Additionally, metalworking is becoming a significantly more complex field. New technologies and career paths make it increasingly important that workers receive training and that such training reflect the changes within the industry.

The metalworking project follows two tracks (see figure 9). One track, driven by the industry, is designed to identify occupational, training, and skill standards within the industry. The other track, driven by the states, coordinates the implementation of the new skill standards into education, work force development, and customized training programs.

Labor market needs are sufficiently different from place to place that training needs are often best identified at the local level.

Figure 9 Metalworking Skill Standards Project



Source: Jeff Edstrom, "Certification and Standards in the Metalworking Industry," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

This model holds significant promise, because it recognizes the training needs of an important regional industry and insures the quality of the work force is sufficient to keep the industry productive and prosperous. It can also help identify a potentially attractive career path for students still in high school and provide information to students on what course work is necessary in the field.

The next set of presentations focused on work force development in the five states in the Seventh Federal Reserve District (Illinois, Indiana, Iowa, Michigan, and Wisconsin). Bob Edwards of the state of Michigan suggested that the biggest change in Michigan has been a shift to a community focus in training programs. Michigan is trying to make training programs responsive to the needs of individual communities, rather than providing "one-size-fits-all" programs. The feeling is that labor market needs are sufficiently different from place to place that training needs are often best identified at the local level. However, identifying who should deliver training services is a difficult process.

Michigan's statewide programs include the America's Labor Market Information System (ALMIS) talent bank project—a U.S. Department of Labor effort to make use of advances in computer-interactive technology to create a nationwide electronic résumé system. Michigan and Missouri are joint leaders of a state consortium that is working to develop the system. The system is intended to serve as a qualifications database on which job seekers can post their résumés for screening by potential employers. This should reduce costs for both employers and job seekers.

Gretchen Tegeler, director of the Iowa Department of Management, emphasized that Iowa is concentrating on service delivery in its work force development programs. To increase accountability in measuring results, Iowa is setting benchmarks for training efforts. In addition, the state is studying the training experiences of organizations it has designated as "high performance." Tegeler noted that one of the state's goals is to insure that training resources generate the highest return. Finally, she said that competitive bidding for contracts for training providers is a key factor in Iowa's approach to work force development.

Graham Toft, president of the Indiana Economic Development Council, discussed Indiana's approach to work force training, which is geared toward the state's economic development objectives. A recent problem for the Indiana economy has been a mismatch between jobs and workers. In Toft's view, employers need to improve communication with educational institutions regarding the skills they require.

Toft said that the market for providing education and training needs to be reinvented. Under the current funding structure, providers of training services do not have to meet the needs of the labor market. For example, Indiana has an outstanding educational infrastructure for producing college graduates; however, the demand in the labor market is for technical workers. Toft suggested that the current system is mistakenly geared toward funding the producer of education and training rather than the consumer. He proposed that employers should be given incentives to provide training to create a better match between labor market supply and demand.

The education-to-careers (in some states, "school-to-work") effort aims to make school curricula more responsive to local labor market needs by matching course work more closely with the actual requirements of employers.

Training initiatives in Illinois were described by Herb Dennis from the Illinois Department of Commerce and Community Affairs. Dennis works with the state employment agency to coordinate the state's training strategy. He said Illinois is in the process of developing a work force development strategy guided by the recently created 33-member Human Resource Council. The council has five goals: 1) to develop a guiding framework for human resource development in the state; 2) identify and define barriers to effective work force development; 3) examine how training programs should best be structured; 4) determine how federal and state resources should best be deployed; and 5) establish appropriate accountability standards for evaluating programs. The council aims to integrate these goals into a coherent work force strategy for the state by 1997.

While this process is underway, Illinois continues to pursue several other promising programs, such as the education-to-careers effort and one-stop career centers. The education-to-careers (in some states, "school-to-work") effort aims to make school curricula more responsive to local labor market needs by matching course work more closely with the actual requirements of employers. One-stop career centers attempt to provide better information for both job seekers and employers. Illinois was one of 17 states to receive federal funding to create these centers and the state is developing 55 full-fledged centers, along with 95 satellite centers. The centers are to be customer driven, to provide accessible, user friendly information, and to target the information needs of specific segments of the population. In addition, the operation of the centers will be overseen by the private sector to insure that career information is appropriate.

James Buchen, vice president of Wisconsin Manufacturers and Commerce, provided an overview of Wisconsin's labor force development efforts. Buchen commented that Wisconsin's experience generally parallels that of the other Midwest states. He indicated that the state has three particular areas of emphasis. First, school-to-work transition programs, aimed at insuring that the state's high school population is properly prepared for the work force. This involves making the educational system more responsive to labor market needs and making the delivery of services less fragmented. A second issue for Wisconsin is federal program requirements in the training area. Buchen hopes that the trend toward devolution of federal responsibility for training will increase the state's flexibility, so that programs can be consolidated and administrative costs reduced.

In many cases, getting welfare recipients a job first and then providing training, along with support services, was found to be more effective than using a model where training is used as the first step in the process.

Finally, Buchen noted that Wisconsin has received national attention for its work in the welfare-to-work area. He said that the state has learned a great deal about the process of moving people off the welfare rolls and that the experience has been similar to what Toby Herr from Project Match reported in an earlier workshop session. In many cases, getting welfare recipients a job first and then providing training, along with support services, was found to be more effective than using a model where training is used as the first step in the process. Clearly, Wisconsin's progress in this area will be watched by other states devising welfare reform strategies.

The final three workshop presentations focused on specific experiences with different types of work force programs. Kevin Hollenbeck of the Upjohn Institute presented his research on whether firms are providing basic training to their workers and what barriers might exist that lead to an underprovision of basic literacy training within companies. Hollenbeck noted that an estimated 25% to 30% of the work force has some deficiency in basic skills. From the firm's perspective, this portion of the work force represents less than fully productive human capital, which the firm can choose to 1) do nothing about; 2) get rid of and replace with more productive workers; or 3) invest in, in order to improve their skills.

Although studies have shown that work force literacy programs provide a societal return on investment of between 10% and 14%, neither employees nor employers seem very anxious to invest in these programs. To explain what the barriers might be, Hollenbeck presented a matrix (see table 5) of the benefits and costs of workplace literacy training for employees, firms, society, and the education and training establishment. The matrix suggests that the net benefits are positive for every group other than employers. For the net benefit to be positive for employers, the productivity gain from the newly trained worker must offset both the wage gain to the employee and the cost of providing the training. Because this does not happen in many cases, firms are unlikely to provide literacy training.

Table 5 A Benefit/Cost Analysis Framework for Workplace Literacy Training

	Perspective			
Benefit or Cost	**Workers**	**Employers**	**Rest of Society**	**Education/ Training Establishment**
Training Costs	0/-	-	0/-	+
(Higher) Productivity	0	+	+	0
Nonwage Compensation (Pensions, health Insurance, etc.)	+	-	+	0
(Less) Worker Turnover	+	+/-	+	0
Safer Workplace	+	+	+	0
(Higher) Taxes	-	0/-	+	0/+
(Improved) Self-Esteem	+	0	0/+	0
Net Benefits	+	-/+	+	+

Source: Kevin Hollenbeck, "A Benefit/Cost Framework for Assessing the Economic Payoffs to Workplace Literacy Training," Kalamazoo, MI: W.E. Upjohn Institute, mimeo, 1996.

Hollenbeck concluded that three public policy responses need to be considered. First, for literacy and basic skills training to occur on a widespread basis, training costs must be shifted to workers or society in general. It is unrealistic to assume that firms will absorb these costs. Second, to be relevant and successful, basic skills training needs to closely reflect experience in the workplace. Finally, given the large number of workers in the work force who lack basic skills, a second-chance system is essential to remedy skill deficiencies.

Next, Davis Jenkins of the Great Cities Institute at the University of Illinois at Chicago presented what has been learned about the "best practices" in programs to move disadvantaged segments of the population into employment that provides a living wage. In general, the programs that work best for these population segments emphasize two features. First, they are customer focused. Jenkins explained that this means that the programs recognize the needs of both employers and clients and attempt to customize their services to address these needs. The best programs do not attempt to use a single model for training, supporting, and finding work for their clients.

Best-practice programs provide long-term support for clients who need it and seek to develop long-term relationships with employers who hire their clients.

A second feature of best-practice programs is that they provide long-term support for clients who need it and seek to develop long-term relationships with employers who hire their clients. Too often, programs designed to help the disadvantaged focus on placing clients in their first job and then consider the process complete. The best programs recognize that clients may require a wide-ranging support system after they are in the work force. These programs often need to work with clients to develop good work habits, since high turnover is often a problem in placing disadvantaged workers. The best programs also recognize that they must play an active role in finding employment for their clients, who may not know how to conduct a job search. This might involve placing a client in several jobs before the right fit is found. Chicago's City/Suburban Job/Link program not only identifies suburban jobs for city residents and provides transportation to and from these jobs, but offers clients assistance in developing employable skills and a consistent record of employment. Finally, the best programs work with employers to identify and develop the training workers need to succeed in the workplace. Programs should also be designed to give disadvantaged clients the confidence that they can learn what they need to play a productive role in the workplace.

Chicago's City/Suburban Job/Link program not only identifies suburban jobs for city residents and provides transportation to and from these jobs, but offers clients assistance in developing employable skills and a consistent record of employment.

In conclusion, Jenkins noted that perhaps the biggest drawbacks to the best-practice programs are that they are expensive and can serve very few clients at one time. However, these approaches are clearly more effective than programs that emphasize classroom training and end with clients getting their first job.

In the final presentation of the workshop, Philip Israilevich, senior economist and research officer of the Federal Reserve Bank of Chicago, discussed a project he is working on with the Regional Economics Applications Laboratory at the University of Illinois to provide local labor market information to the Chicago Community College system. The project is motivated by the need to effectively match occupation and skill trends with school curricula. Israilevich explained that a Chicago-specific labor market forecast has been integrated into user friendly software that allows the user to examine and predict occupational growth rates, wage information, and skill requirements for various careers in the Chicago labor market. The product will eventually relate these data to the course offerings of the community college system, allowing students to see what course work is needed to work in specific professions. This will help students to make relevant course selections and to understand the changes in the labor market, while employers can be assured that students will acquire the skills they need in new employees. This should significantly improve the matching process in the local labor market, which is currently costly and time consuming.

The skills required of the new "knowledge worker" include both technical skills, related to computers and automated machinery, and interpersonal skills, such as the ability to communicate well and to work in cooperative situations.

With roughly two-thirds of all poor families having one or more members in the work force, the problem seems to relate less to willingness to work and more to the declining quality of jobs available.

Concluding Remarks

The application of labor to production continues to be the most fundamental relationship in every economy. In the context of Midwest economic growth and development, public and private policymakers must address three issues affecting the region s labor force.

First, the U.S. and Midwest economies are becoming increasingly centered on the flow of information and knowledge creation. Accordingly, workers who are able to perform in this new environment are being rewarded and a deficit or surplus of such workers will determine the region s growth and welfare. By historical standards, the portion of the work force having low skills has declined. However, rising skill levels have not matched the pace of rising skill demands. Widening gaps in wages and income between those with skills and those without testify to the emerging economy s willingness to reward investment in skills and ownership of knowledge. Surveys of new jobs being created by business suggest that new skill demands are higher than those of previous and existing jobs. The skills required of the new knowledge worker include both technical skills, related to computers and automated machinery, and interpersonal skills, such as the ability to communicate well and to work in cooperative situations.

New skill demands on the work force have resulted in several identifiable challenges. In many inner cities, the labor force does not have the skills needed for the jobs being created. Similarly, the lack of skills and credentials presents clear barriers to many poor and minority communities. Much of the educational infrastructure is not geared to meet the below-college skill needs of the rapidly evolving business sector. For this reason, both public and private efforts are being stepped up or created. Some Midwest states, for example, Wisconsin and Illinois, are embracing school-to-work programs, which directly link school curricula with either business guidance or actual work-site learning. Public vocational schools in some states, such as Iowa, may provide a customized curriculum or training program to meet the needs of a particular industry or large company.

The highly visible rise of in-house training programs and corporate universities, such as those of McDonald s and Motorola, further demonstrates the need for enhanced skills among the adult work force, as well as the efficacy of work-based, business-guided training. Nonetheless, because the economic returns to basic skills accrue to workers rather than to firms (or at least are perceived to accrue to workers), the private sector shows an apparent lack of ability or resolve to shore up the basic skills deficit of the adult work force.

A second work force issue is the persistent problem of bringing disadvantaged workers into the work force. It is generally accepted that greater work force participation among low-income and disadvantaged people can increase levels of economic well being, improve self-esteem, and lessen social ills. With roughly two-thirds of all poor families having one or more members in the work force, the problem seems to relate less to willingness to work and more to the declining quality of jobs available. Worsening job prospects mean that adults lacking labor force experience may not acquire the fundamental skills needed to find and keep a job. At the same time, motivation for training and education can be dampened and poverty-related social problems acquired which, in turn, become further obstacles to permanent labor force participation.

Both newly fashioned government policies and innovative prototype work force programs appear to be recognizing this vicious cycle of poverty and nonparticipation in the work force. Currently, the most widely used structure for integrating disadvantaged workers into the work force emphasizes a strong dose of training, followed by introduction of the client to a (permanent) job setting. However, new and somewhat-more-successful programs try to move prospective workers quickly into job situations. These programs may offer clients minimal training prior to joining the work force, but instead provide ongoing support services, which might include child care, family or substance abuse counseling, repeated job placement assistance, and more extensive training. More public policies, such as Wisconsin s

welfare-to-work initiative, are now taking a similar approach. The twin tenets of such programs are that 1) a quick introduction to the work force for many disadvantaged people can help them gain elementary job skills and 2) supplemental family support services may be more helpful than formal and structured upfront training.

Pending legislation before the U.S. Congress proposes folding numerous federally assisted job training programs into block grants, whereby states would have greater freedom to match their own ideas and needs with federal dollars. Philosophically and practically, this approach meshes with emerging state welfare-to-work initiatives. However, some critics question whether the new-found freedoms associated with pending federal and fledgling state initiatives will effectively serve the disadvantaged segments of the population. Concerns center on whether sufficient funding will be available for the follow-up training and support services that are needed and on whether, once freed from federal program restrictions, states will steer funds away from disadvantaged population segments.

Changing work assignments imply that employees will demand that jobs provide opportunities to acquire salable skills. In order to be salable, the skills must be transparent, transferable, and certifiable to future employers.

The third major issue affecting today's work force is the increasingly transitory and fluid nature of the employer-employee relationship. In the U.S. and other industrialized nations, firms are increasingly acquiring their labor through contingent, contractual, or temporary arrangements. In some countries, firms may be motivated by more protective labor laws and regulations, which may penalize them for laying off regular employees. Others view the trend toward contingent arrangements as an innovative way for firms to gain better information about workers they may ultimately hire. The nature of work and the skills required have also become more fluid and firms may be motivated to acquire workers with a variety of skills, who can be switched quickly from one area of operations to another as the firm's needs change.

From the employee's perspective, these changes have lessened the expectation that a given job will remain available throughout much of one's working lifetime. Aside from the more contingent relationships employers may demand, an increasingly competitive environment may make job losses inevitable for some firms.

The implications of the more transitory nature of work assignments are broad-based for both the public and private sectors. First, labor provisions and programs should adapt to the increased mobility being required of workers. Health care should be portable, so that workers are not discouraged from seeking better working opportunities. Similarly, pension contributions should be portable; the idea of offering generous pensions in return for longevity and loyalty has probably outlived its usefulness. Greater portability of these benefits would encourage movement and well being among workers.

More appropriate matching of employment opportunities with workers is being facilitated by advances in information technology and innovative prototype programs, such as one-stop job centers and networking employment assistance.

Changing work assignments also imply that employees will demand that jobs provide opportunities to acquire salable skills. Presumably, those firms that provide low-cost, salable training will be able to attract high-quality workers at lower cost. In order to be salable, the skills must be transparent, transferable, and certifiable to future employers.

Finally, contingency and turnover in labor markets suggest there are greater benefits to more efficient labor markets than ever before. More appropriate matching of employment opportunities with workers is being facilitated by advances in information technology and innovative prototype programs, such as one-stop job centers and networking employment assistance. These advances in job-matching efficiency may be somewhat offset by the expansion of specialized skill sets for new jobs in the economy, which require more time and effort in the matching process.

It is too early to assess the Midwest's response to the work force issues outlined above or how well it will adapt to labor force changes in the future. However, private and public sector policymakers are responding to the changing environment with great energy, and the results of current innovations will have important implications for the Midwest's economic future.

About the Workshop

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Workshop Agenda

The workshop "Work Force Developments: Issues for the Midwest Economy" was held on May 15, 1996, at the Federal Reserve Bank of Chicago, 230 S. LaSalle St., Chicago, IL 60604.

I. Welcome and Opening Remarks

Presenter: *Michael Moskow,* Federal Reserve Bank of Chicago

II. Current Issues in Labor and Training

Session 1: What Does Business Need?

The Midwest High-Performance/Informational Service Economy—What Are the New Skills?
Presenter: *Don Smith,* Carnegie Mellon University

Evidence of Labor Demand from Business—Firm Survey Results
Presenter: *Harry Holzer,* Michigan State University

A Corporate Perspective
Presenter: *Hal Theis,* McDonald's Corporation

Session 2: Problems of Poverty and the Underclass—Is This an Untapped Labor Pool and How Do We Access It?

The National Perspective
Presenter: *Rebecca Blank,* Northwestern University

Evidence from Chicago
Presenter: *Toby Herr,* Erikson Institute/Project Match

Session 3: The Wage/Income Gap: Regional Evidence and Causes

Presenter: *Mark Partridge,* St. Cloud State University

Session 4: Displaced Workers: The New Contingent Work Force

Work Force Contingency in the U.S. and Japan
Presenter: *Susan Houseman,* Upjohn Institute

The Wage Experience of Older Dislocated Workers and Related Evidence
Presenter: *Dan Sullivan,* Federal Reserve Bank of Chicago

III. Luncheon

Wage and Income Disparity Trends: Policy Issues, Theory, and Evidence
Speaker: *Kevin M. Murphy,* University of Chicago

IV. Work Force Preparation in a Changing Environment

Opening Remarks
Moderator: *Randall Eberts,* Upjohn Institute

Devolution of Welfare/Training Responsibilities to State/Local Government
Presenter: *Martin Simon,* National Governors Association

How the Federal Government Sees Its New Role in Work Force Development
Presenter: *James Aaron,* U.S. Department of Labor/Employment Training Administration
Reactor: *Tim Bartik,* Upjohn Institute

V. A Business Perspective on Today's Work Force

Presenter: *Bob Jones,* National Alliance for Business

VI. Panel Discussion

Looking Forward: Where Does the Region Go from Here?

Certification and Standards
Presenter: *Jeff Edstrom,* Council of Great Lakes Governors

State Programs and Perspectives
Presenters:
Bob Edwards, State of Michigan
Gretchen Tegeler, State of Iowa
Graham Toft, Indiana Business Development Council
Herb Dennis, State of Illinois
James Bucher, Wisconsin Manufacturers and Commerce

Organization of Delivery for the Less Skilled and Disadvantaged Populations
Presenter: *Davis Jenkins,* University of Illinois at Chicago

Classroom in the Workplace Survey
Presenter: Kevin Hollenbeck, Upjohn Institute

Matching Local Labor Demand—The Chicago Community College Experience
Presenter: *Philip Israilevich,* Federal Reserve Bank of Chicago

About the Project

The Federal Reserve Bank of Chicago is undertaking an extensive analysis of the Midwest economy. The goal of the project is to understand the Midwest's turnaround in economic performance since the early 1980s. In the Seventh Federal Reserve District—which includes Iowa and large portions of Illinois, Indiana, Michigan, and Wisconsin—unemployment rates are, at the time of this writing, lower than at any time since the 1977–78 period, as well as being below the national average.

The Midwest project will involve a series of workshops and research studies which will be carried out by Federal Reserve analysts and other researchers from the region. An advisory board representing a cross-section of Midwest leaders will provide guidance for the project (see back page). Workshops scheduled for 1996 will consider (1) the economic performance of the broad Midwest economy and the transformation of its manufacturing industries; (2) the rural economy of the Midwest; (3) labor force training and education; (4) global linkages with the region's economy; and (5) tax, spending, and regulatory influences on regional performance. The findings of the workshops will be communicated through a series of publications and broad public forums. The project will conclude with a conference and publication toward the end of 1996.

At the Bank, the "Assessing the Midwest Economy" project is being conducted through a cooperative effort of the Office of the President, Michael H. Moskow, president; Research Department, William C. Hunter, senior vice president and director of research; and Community and Information Services, Nancy M. Goodman, senior vice president.

Inquiries should be directed to William A. Testa, senior economist and assistant vice president, Research Department, or James Holland, public affairs officer.

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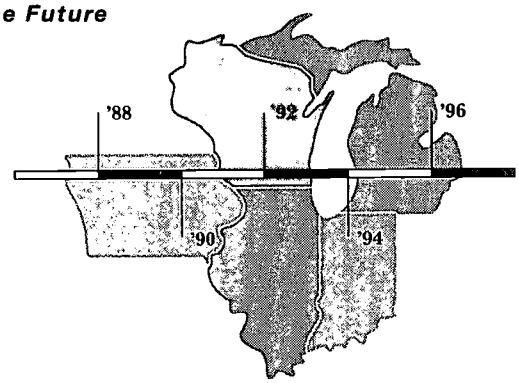


Designing State–Local Fiscal Policy for Growth and Development

Fifth in a series of workshops to be held at the Federal Reserve Bank of Chicago.

The impact of state and local fiscal policy on the performance and prospects of the Midwest economy was the focus of the fifth workshop in the Bank's year-long assessment of the Midwest economy. The workshop, held July 17, 1996, highlighted key tax and spending issues facing state and local governments in their attempts to foster economic growth.

The morning sessions reviewed the current condition of state and local governments in the Midwest and examined how much state policies matter in influencing economic growth and business location decisions, particularly relating to the use of tax policy to promote growth in the economy. The luncheon address turned to the broader issue of how policymakers should assess the success of an economic development policy. Traditionally, job gains or losses have been the favorite measure, but luncheon speaker Paul Courant, chairman of the economics department of the University of Michigan, questioned whether this was the best approach available.

The afternoon sessions began with a debate on the use of selective tax abatements to attract economic development. Should states be prohibited from offering selective tax breaks or can these incentives produce economic and social benefits that would not occur without the incentives? The final session addressed proposals to restructure state–local tax systems more broadly for growth and development—in particular, aligning business taxation with benefits received by business from government. A concluding presentation expanded on the benefits or expenditure side of fiscal policy by examining the condition and level of investment in highways, one key aspect of the region's infrastructure.

Federal Reserve Bank
of Chicago

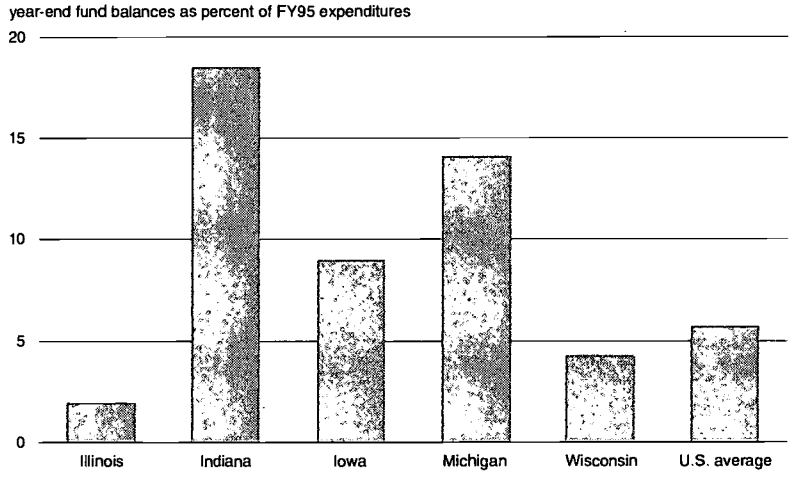
Introduction

In his opening remarks, William Testa, assistant vice president at the Federal Reserve Bank of Chicago and director of the Assessing the Midwest Economy project, noted that th 1990s have seen a remarkable turnaround in the economic fortunes of the region's economy. This relative prosperity is evident in the state and local sector; Midwestern state and local governments have, in general, rebuilt their budget balances and improved their fiscal position. Part of the reason for examining this sector of the economy is to suggest ways in which the region's governments can capitalize on their advantages. The Midwest's strong fiscal position can be used to promote measures that enhance growth and to correct policy problems. In today's environment of federal devolution of responsibility to the states, the role of state and local governments has become all the more important. As the numerous policy experiments underway throughout the District attest, success does not appear to have made the region's governments complacent.

The fiscal experience of the District states shows the same break with the past that has characterized the economic performance of the region overall.

The first presentation of the workshop was by Richard Mattoon, senior economist at the Federal Reserve Bank of Chicago. Mattoon provided evidence as to the recovery of the state and local government sector in the five states of the Seventh Federal Reserve District—Illinois, Indiana, Iowa, Michigan, and Wisconsin. Mattoon highlighted two themes in the behavior of the state and local sector. First, the fiscal experience of the District states shows the same break with the past that has characterized the economic performance of the region overall. Unlike previous recessions, the national recession of 1990-91 had a relatively shallow impact on the Midwest's economy and fiscal condition. The District's governments managed to weather the recession by making small tax adjustments and expenditure corrections. Previous recessions had usually forced dramatic tax increases and program cutbacks by District governments. Additionally, recovery for the District states has been somewhat more robust than for the U.S. as a whole; this is reflected in the FY 1995 budget balances for the District states (figure 1). Michigan's performance has been particularly impressive—beginning the decade with a budget deficit of more than $1 billion, the state now has a surplus of nearly $2 billion.

Figure 1 1995 Budget Balances



Source: Richard Mattoon, "An Overview of Midwest Tax Climate and Fiscal Position," presentation prepared for the workshop "Designing State–Local Fiscal Policy for Growth and Development," held at the Federal Reserve Bank of Chicago, July 17, 1996.

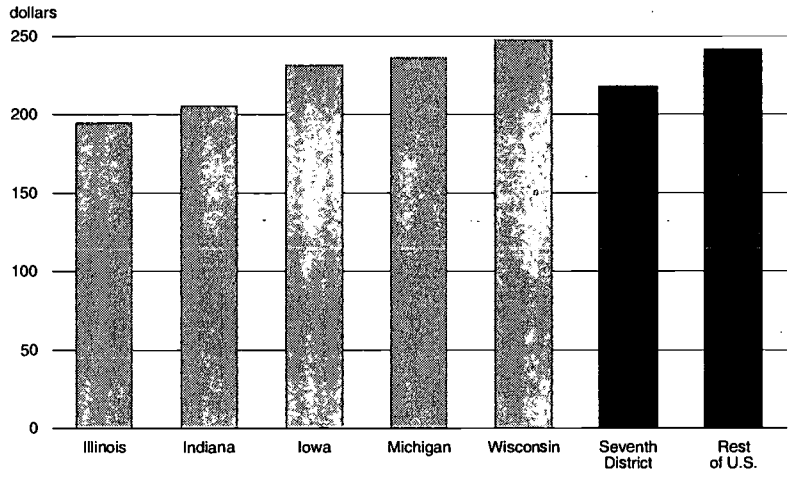
Many District states have been at the forefront of policy experiments that have received national attention—for example, Wisconsin's proposed welfare reform measures and Michigan's dramatic restructuring of its state and local tax structure related to reform of school funding.

Current fiscal conditions in the state and local sector in the District states range from among the best in the country, in the cases of Michigan and Indiana, to stable and improving, in the case of Illinois.

The second theme suggested by Mattoon was the innovative behavior of the District governments. Rather than becoming complacent during this period of relative fiscal health, many District states have been at the forefront of policy experiments that have received national attention—for example, Wisconsin's proposed welfare reform measures and Michigan's dramatic restructuring of its state and local tax structure related to reform of school funding.

In addition to strong revenue growth, Mattoon attributed the fiscal good health of the District states to their relative thrift. District governments' spending is below the average for the rest of the U.S. across a number of categories—for example, total spending (figure 2), corrections spending, administrative spending, and state and local debt costs. District expenditure levels tend to be above the average for the rest of the U.S. in areas often viewed as beneficial to state economies, such as education and highway expenditures. District states tend to have tax rates that are about average, although reliance on the property tax as a revenue source has historically been above average.

Figure 2 Spending per $1,000 Personal Income, 1992
(Total State–Local Spending)



Source: See figure 1.

Furthermore, Mattoon noted that the flow of federal funds indicates that Washington provides less help to District states than to other regions. In 1995, per capita federal expenditures in the region as a percentage of the U.S. national average ranged from a high of just over 90% in Iowa to under 80% in Wisconsin. Mattoon concluded by suggesting that current fiscal conditions in the state and local sector in the District states range from among the best in the country, in the cases of Michigan and Indiana, to stable and improving, in the case of Illinois.

William F. Fox of the economics department at the University of Tennessee presented an overview of regional fiscal policies and issues. He noted that states and possibly localities can act in two policy arenas: (1) stabilization policy to offset short-term episodes of excess state unemployment and (2) growth policy to influence long-term output and employment.

Beginning with stabilization policy, Fox noted that analysts continue to debate how states respond to business downturns. The *perversity* hypothesis, which suggested that state tax and spending behavior acted to magnify cyclical swings in the economy, held sway for a while. More recently, several studies have arrived at conflicting conclusions, raising the question whether state and local governments should use stabilization policies.

States and possibly localities can act in two policy arenas: (1) stabilization policy to offset short-term episodes of excess state unemployment and (2) growth policy to influence long-term output and employment.

First, Fox presented some evidence that state economic trends are sufficiently diverse to suggest that states could sometimes benefit from varying economic stimulus. According to one measure, employment growth between 1982 and 1989 ranged from a low of -1.7% in Wyoming to a high of 5.1% in Arizona. The range was nearly as wide between 1990 and 1994. Correlations in employment growth rates in individual states across time also vary widely.

Next, Fox discussed the long-accepted view of Wallace Oates and Richard Musgrave that state-initiated fiscal policy is ineffective and undesirable, because there may be coordination problems among states; stabilizing actions by individual states may be contradictory or over-stimulative; and stabilizing policies may conflict with national policies, such as those relating to inflation and trade. Fox added that *multipliers* are low, that is, efforts to boost any particular state's income during a downturn would quickly become ineffectual as income leaked into neighboring states. Similarly, factor flows such as migration of workers could offset stabilization policy or make necessary adjustments to the economy before the state government could implement an appropriate stabilizing measure. Furthermore, at the state level, debt issuance imposes an offsetting burden on residents because such debt must be financed externally, thereby reducing the permanent income of those state residents being asked to bolster state spending.

Citing recent statistical studies, Fox made the case that, contrary to the traditional view described above, state or regional fiscal policy may be useful. For example, a recent study by Ed Gramlich of the University of Michigan finds that state multipliers are larger than previously thought. With regard to the external debt question, the counter-argument is that national debt may *also* tend to be externally financed, thereby making state fiscal policies as powerful as national ones.

In the ensuing discussion, conference participants took issue with several strands of Fox's reconsideration of state fiscal policy. The main objection centered on the most appropriate mechanism through which regions should adjust to economic shocks. Migration of factors of production, especially workers, may be preferable in terms of timing; state governments might respond too slowly and, thereby, erroneously to transitory economic shocks. More importantly, the question was raised as to how a state government could correctly distinguish, for example, a temporary downturn from a change in a region's long-run trend? Courant noted that the last business cycle looked very different in the Midwest than in the rest of the country, and it looked very different in the Midwest from the downturn that preceded it. If the state government guesses incorrectly, debt issuance in response to a downturn could further erode the region's prospects and further burden immobile residents who are experiencing loss of income.

Among the practical problems that state and local governments face in trying to use stabilization policies are their own requirements to balance budgets annually, although many governments avoid these rules by delaying or accelerating payments and receipts and building up positive fund balances. Similarly, state unemployment insurance contributions can be delayed or explicit borrowing can take place. In addition, state and local governments can adopt tax and revenue structures that are more or less sensitive to economic conditions. Rainy day funds are another tool that state governments can use, although such funds are relatively small and have been largely used to smooth out state budgets and government spending rather than state economic conditions. Workshop participants argued that current state tax, spending, and debt behavior are nowhere close to the levels that would be required for state intervention to exert a significant economic impact.

Difficult questions remain about the overall efficacy of state–local growth programs and policies. Do the benefits of such programs justify the overall costs?

Turning to growth policy, Fox noted that there exists a vast breadth of state policies aimed at boosting economic growth trends. Growth-enhancing policies can include the provision of staple government services, such as education, roads, libraries, and amenities. More explicit growth policies include tax structure, productivity-enhancing programs such as technology transfer and small business assistance programs, and selective tax abatements and infrastructure improvements targeted toward specific firms or industries. Fox noted that research findings suggest that state policies measurably affect economic and social activities, such as small business start-ups, income growth, job growth, and business location decisions. Quite often, however, the effects of state–local activities tend to be small and highly uncertain. Thus, difficult questions remain about the overall efficacy of state–local growth programs and policies. Do the benefits of such programs justify the overall costs? How much do such policies distort or diminish the economic growth which would have otherwise taken place? Are the effects short-lived? Do these policies have offsetting effects that prevent us from drawing any conclusions about local or national welfare gains? Some politically motivated local growth policies may ultimately be self-defeating or destructive.

To begin to answer these important questions, we might first determine whether state policies matter to the location of economic activity.

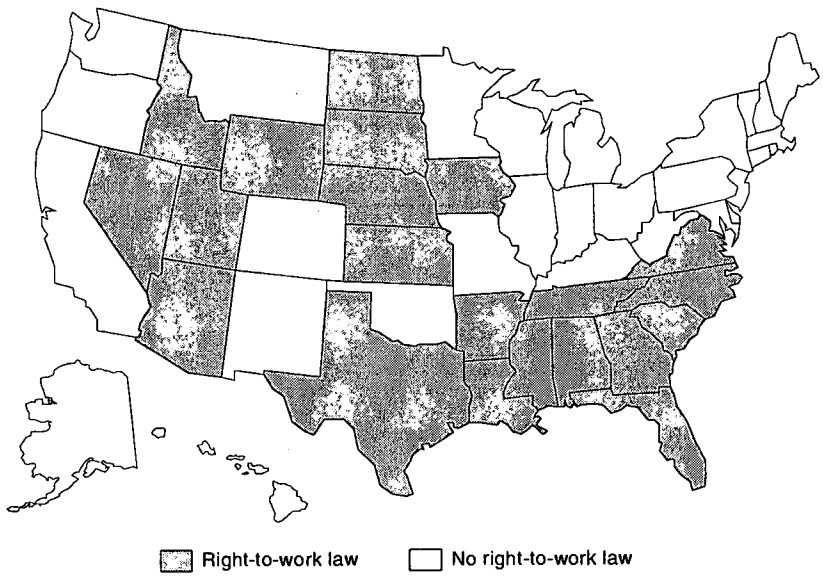
To begin to answer these important questions, we might first determine whether state policies matter to the location of economic activity. If not, other questions may be moot. The remainder of this workshop session examined statistical approaches that shed more light on this issue. It is difficult for even the most careful statistical studies to discern the influence of state policies on growth and development. State policies differ in various and subtle ways, while there are a multitude of confounding factors, such as work force characteristics, wages, transportation access, access to markets, climate, public infrastructure, and previous development.

Thomas Holmes of the University of Minnesota addressed this problem by examining the density and growth of manufacturing activity along state borders.

Thomas Holmes of the University of Minnesota addressed this problem by examining the density and growth of manufacturing activity along state borders. If a large and representative sample of border locales can be compared, all other variable locational factors should become neutralized, bringing any effects of state policies to the fore. State tax differences were rejected by Holmes as a subject for study because states may allow statewide taxes to be abated near their borders to avoid deleterious effects on business activity. Instead, Holmes examined state borders that differ according to whether the state has passed a *right-to-work* law. These laws make it illegal for someone to be forced to join a union as a condition of employment by a firm and are clearly interpreted as pro-business.

Some have argued that the dramatic shift in manufacturing activity to states in the Southeast and other regions outside the traditional manufacturing belt since the 1950s has been partly driven by anti-union sentiment. From 1947 to 1992, manufacturing employment increased by 148% in states that currently have right-to-work laws and was virtually flat elsewhere. As the map shows (figure 3), there has been a clear regional tendency to eschew right-to-work laws in the Northeast and Great Lakes states, while states in the Rocky Mountains, Plains, and South have tended to adopt such laws.

Figure 3 Geography of Right-to-Work Laws



Source: Thomas J. Holmes, "The Effects of State Policies on the Location of Industry: Evidence from State Borders," FRB Minneapolis, research department staff report, No. 205, December 1995, appendix, figure 1.

In designing his experiment, Holmes examined a stretch of state borders over 4,000 miles long, with 17 pairs of combinations of adjacent states. The study area runs south from the Minnesota border, down and around Oklahoma, and eastward to the Atlantic ocean between those states with and those states without right-to-work laws. Counties were the units of analysis, and the analysis ran four county layers deep along the experimental border areas. This allowed Holmes to examine discontinuities in economic activity as distance from the border varies.

The most dramatic and statistically significant differences were found across state borders (table 1). To account for differing size of counties, manufacturing employment was measured against size of population and size of total employment. The results for 1992 indicate dramatic differences in manufacturing employment intensity along the border. Less conclusive evidence lies in the pattern in counties running away from the border. On the *anti-business* (no right-to-work law) side, manufacturing employment tends to tail off nearer the border where, presumably, a short movement across the state border would improve business conditions. On the pro-business side, there is some tendency for the state's manufacturing employment to cluster near the border.

Increasingly footloose, the retail industry might be among the first to move across state borders to a friendlier tax environment.

Next, Bill Lilley presented his joint work with Laurence DeFranco, both of InContext Inc., on the impact of retail taxes on the Illinois–Indiana border. Retail and excise tax differences are particularly acute along this border in favor of the Indiana side (table 2). Surveys conducted by the authors in five Midwestern states suggest that excise tax-sensitive retail establishments are especially labor intensive. They have done similar work using data from the New England states, the New York metropolitan area, the Oregon area, and others.

In places with a large price differential caused by differing excise tax rates across borders, the authors found large differences in employment and job creation. Initially, there is a clustering of smaller retail sales firms that are sensitive to the excise tax differentials across state borders. These include small firms that specialize in retail sales of tobacco, alcohol, food, and gasoline. Once the momentum has been started by these smaller firms, larger retail firms, such as WalMart, follow. Increasingly footloose, the retail industry might be among the first to move across state borders to a friendlier tax environment. The areas

Table 1 Normalized Manufacturing Employment—Unweighted Means across Counties by Distance from Border and Side of Border

Side of border	Miles from border	1992 (% of total employment)	1992 (% of population)	1947 (% of population)	1947-92 growth rate (weighted mean)
Anti-Business	75 - 100	25.9	6.5	5.3	42
	50 - 75	23.1	5.9	4.4	28
	25 - 50	23.1	5.6	3.0	16
	0 - 25	21.0	5.1	2.9	54
Pro-Business	0 - 25	28.6	7.5	3.2	170
	25 - 50	26.7	7.1	3.3	128
	50 - 75	26.7	7.4	3.7	133
	75 - 100	25.4	6.7	3.2	139

Source: Thomas J. Holmes, "The Effects of State Policies on the Location of Industry: Evidence from State Borders," FRB Minneapolis, research department staff report, No. 205, December 1995, appendix, table 2.

Table 2 Indiana vs. Illinois General Sales Taxes and Special Excise Taxes

	General Sales tax	Cigarettes (per pack)	Gas (per gallon)	Alcohol (per gallon)	Beer (per gallon)	Wine (per gallon)
Indiana	5%	15.5¢	15¢	$2.68	11.5¢	47¢
Illinois	6.75	4	19	2.50	7	23
Cook/Chicago	2.5	26	20.5		6	
Illinois near Border	9.25	70	39.5	2.50	13	23

Source: William Lilley, "Impacts of Retail Taxes on the Illinois-Indiana Border," presentation prepared for the workshop "Designing State–Local Fiscal Policy for Growth and Development," held at the Federal Reserve Bank of Chicago, July 17, 1996.

State policymakers have come to believe that retail tax differences can influence economic activity along their borders. High-tax states have established buffer strips of low tax rates along their borders to mitigate any potential loss of business.

of sensitivity typically found by the authors were a three mile zone in the lower excise tax state and a 12 mile zone in the higher excise tax state. (In Illinois, the authors reported a larger, 15 mile, zone of sensitivity.)

One question that this raises is whether the response of retail firms spills over and attracts other types of firms and whether there is a discernible effect on personal wealth in affected areas.

Typically, areas with a higher concentration of retail sales firms are thought to be more poorly situated than other areas. Lilley and DeFranco believe that this is contradicted by the higher household income found inside the Indiana border with Illinois, where the excise tax differential is significant.

The authors displayed their analysis using detailed maps of employment density by industry for zip code areas on both sides of state borders. They believe that this type of presentation is effective in communicating their findings to state and local policymakers. Apparently, state policymakers have come to believe that retail tax differences can influence economic activity along their borders. High-tax states have established buffer strips of low tax rates—or are considering such buffer strips—along their borders to mitigate any potential loss of business. Examples include the Vermont and Massachusetts borders along New Hampshire, the New Jersey border along Delaware, and the Texas/Arkansas border.

What are the appropriate components of business tax costs; how do taxes influence location; and what would be the effect on subnational government finances and the taxation of capital income of a replacement federal consumption-based flat tax?

A second criticism of statistical studies purporting to show that taxation influences the level and location of business activity has been that individual businesses differ widely in their sensitivity to state and local taxation. Moreover, the general indicators of subnational tax differentials that are often used to characterize a state's business tax climate, such as average tax rates and average tax collections per capita or as a percentage of personal income, are virtually useless in understanding the firm's investment location decisions. For these reason, James Papke of Purdue University has developed a computerized microanalytic model, called AFTAX, to simulate the investment decision process for representative or actual firms at specific locations. The underlying rationale of the model is that capital investment is attracted to activities and locations where it earns the highest after-tax returns. The simulation results are applied to empirical studies testing for positive correlations between investment levels and after-tax returns. Papke presented work based on two studies that he recently undertook for the U.S. Small Business Administration (SBA). The first examines the interstate comparative tax burdens on an incremental capital investment and the quantitative impact of investment tax incentives on post-tax rates of return in the six Great Lakes States that comprise the fifth District of the SBA—Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. The study focused on the implications for state and local tax policy of tax-induced interstate competition for capital investment. In terms of tax levels and investment tax incentives, the study addressed how to measure interstate tax-cost differentials and tax impact and how these tax burdens compared, state by state. The issue of intergovernmental tax-cost differentials raised the following questions: What are the appropriate components of business tax costs; how do taxes influence location; and what would be the effect on subnational government finances and the taxation of capital income of a replacement federal consumption-based *flat* tax?

Papke indicated that commonly used measures of comparative business tax burdens provide few relevant insights for policy purposes because the tax burdens of individual firms vary by capital asset composition, operating characteristics, and organizational type and because of the complex and interdependent web of multilevel government tax provisions that apply to firms at different locations. Given firm-specific characteristics and site-specific tax parameters, a meaningful measure of comparative business tax burden based on the after-tax profits on an incremental investment is calculated. The AFTAX model examines the specific impact of subnational business taxation on firms and industries by applying the federal and relevant state–local tax structures to the firm's unique operating characteristics. The output of the model is an estimate of how the profitability of a new investment is affected by the state–local tax system. Whether business taxes influence investment levels and location depends on the relative magnitude of the tax-cost differentials for specific types of firms, especially those in *footloose* businesses. With the AFTAX model, industries and firms that are particularly sensitive to tax-level differentials and specific tax provisions can be identified. Another advantage of the AFTAX model over the use of the general measures of comparative taxation is that it allows the user to calculate site-specific property taxes, rather than employing statewide average tax rates. Given the large magnitude of the property tax relative to other state and local taxes paid by businesses and the wide intrastate variations in property tax rates, site-specific property tax liabilities are particularly important in evaluating relative tax burdens within a state. The AFTAX model also converts after-tax returns into effective marginal tax rates on incremental investment. The effective marginal tax rate is the percentage by which taxation reduces the rate of return on investment; other things being equal, the higher the effective marginal tax rate, the worse the investment climate.

The states that tax one type of firm heavily tend to tax all sectors heavily. Indiana consistently has the lowest rate of return on new capital investment, while Michigan and Minnesota have the highest.

Papke's studies suggest that the difference in the after-tax rate of return in the Great Lakes states is relatively small, amounting to at most 7% (see table 3). This implies a comparatively level tax playing field among the different types of industries in these states. The states that tax one type of firm heavily tend to tax all sectors heavily. Indiana consistently has the lowest rate of return on new capital investment, while Michigan and Minnesota have the highest, even though they are commonly perceived as being high tax states. Papke found little evidence for the perception that general subnational business tax burdens differed significantly within and among the six states. With the after-tax profits roughly equal across the six states, taxation can be considered effectively neutralized in investment location and business development decisions.

Table 3 Comparative After-Tax Rates of Return (ATRR) on New Investment by State and Industry

Industry	SIC Code	Illinois (1)	Indiana (2)	Michigan (3)	Minnesota (4)	Ohio (5)	Wisconsin (6)	Region Mean (7)	Stdv (8)
Manufacturing									
• Food and kindred products	20	12.150	11.925	12.551	12.452	12.301	12.026	12.234	0.244
• Apparel and other textile products	23	12.136	11.644	12.502	12.483	12.012	12.013	12.132	0.325
• Lumber and wood products	24	12.216	11.900	12.395	12.257	12.242	12.034	12.174	0.177
• Furniture and fixtures	25	12.218	11.785	12.513	12.407	12.146	12.063	12.189	0.258
• Printing and publishing	27	12.155	11.976	12.555	12.437	12.357	12.028	12.251	0.233
• Chemicals and allied products	28	12.160	11.933	12.571	12.492	12.305	12.047	12.251	0.251
• Fabricated metal products	34	12.188	11.904	12.425	12.493	12.277	12.064	12.225	0.221
• Machinery, except electrical	35	12.189	11.905	12.413	12.514	12.268	12.071	12.227	0.223
• Electrical and electronic equipment	36	12.310	11.964	12.492	12.797	12.306	12.228	12.349	0.278
• Motor vehicles and equipment	37	12.355	11.856	12.501	12.649	12.177	12.224	12.294	0.277
• Instruments and related products	38	12.136	11.847	12.549	12.441	12.221	12.010	12.200	0.263
Transportation, Communication, & Public Utilities									
• Communication	48	12.283	12.067	12.490	12.354	12.399	12.116	12.285	0.165
Retail									
• General Merchandise Stores	53	12.173	11.660	12.687	12.461	12.015	12.043	12.173	0.361
Services									
• Business services	73	12.299	12.084	12.669	12.759	12.450	12.214	12.413	0.264
Mean		12.256	11.895	12.556	12.528	12.249	12.123	12.268	
Standard Deviation		0.090	0.147	0.091	0.163	0.142	0.098		

Note: New investment undertaken at homesite. For detailed description of the sites, tax systems, and firm sizes included in the baseline simulations, see Papke (1995).

Source: James Papke, "Interjurisdictional Business Tax-Cost Differentials: Convergence, Divergence and Significance," reprint series, No. 915, Center for Tax Policy Studies, Purdue University, 1995, p. 1703.

The federal tax replacement would create a potential boom in plant and equipment expenditures.

Papke finds that differentials in tax burdens are largely determined by firm-specific operating characteristics, such as the composition of capital assets (machinery, equipment, structures, inventories, and the like), the location of plant facilities, and the spatial distribution of product sales. Accordingly, nontargeted general tax incentives are likely to have little impact on the after-tax rates of return on prospective investments. Moreover, the effect that a lower after-tax rate of return might have on economic activity is not obvious. As table 4 shows, while Indiana ranked last in terms of after-tax profits among the Great Lakes states, it ranked first in all three measures of economic growth. Targeted incentives that are tailored to firm-specific operating requirements can, however, influence investment location decisions.

Table 4 Comparative After-Tax Rates of Return (ATRR) with Alternative Measures of Economy Growth Rates (in percent)

	Illinois	Indiana	Michigan	Minnesota	Ohio	Wisconsin
Average Annual Growth of Per Capita GSP in constant dollars (1982-1992)	6.06 (3)	6.33 (1)	6.00 (4)	6.24 (2)	5.81 (5)	5.78 (6)
Average Annual Growth of Nonfarm Employment (1982-1992)	1.73 (6)	2.68 (1)	2.46 (4)	2.68 (2)	1.93 (5)	2.66 (3)
Average annual Growth of Per Capita Personal Income in current dollars (1982-1992)	5.85 (4)	6.00 (1)	5.93 (2)	5.92 (3)	5.67 (5)	5.61 (6)
All-Industry After-Tax Rate of Return (1995)	12.26 (3)	11.90 (6)	12.56 (1)	12.53 (2)	12.25 (4)	12.12 (5)

Note: Rank order appears in parentheses.
GSP data from U.S. Department of Commerce, Bureau of Economic Analysis, 1982-1992. Employment data from U.S. Department of Commerce, Bureau of the Census, *County Business Patterns*, selected years.

Source: James Papke, "Interjurisdictional Business Tax-Cost Differentials: Convergence, Divergence and Significance," reprint series, No. 915, Center for Tax Policy Studies, Purdue University, 1995, p. 1710.

The elimination of the leveling effect of the current federal tax offset (deductibility) provision would result in significant increases in the cross-state differentials in effective marginal tax rates.

The second study Papke conducted for the SBA focused on the effects of a replacement federal consumption-based tax on comparative business tax burdens in the same states. Under several current proposals for replacement consumption-based taxation, state and local business taxes are not allowable deductions from the federal tax base and all capital investment expenditures are treated as current outlays. Full and immediate deduction of capital expenditures means that capital income and the normal return to new investment would effectively be taxed at a zero tax rate. The federal tax replacement would create a potential boom in plant and equipment expenditures by reducing the estimated total effective marginal tax rate (federal, state, and local) on corporations from 38% to 8%. The ultimate result would depend on savings, productivity, and production capacity. (Small businesses would be lesser beneficiaries under the replacement tax since they are favored under the current system of progressive tax rates and expensing of the first $17,5000 of equipment purchases.) The heterogeneity of subnational business tax structures and the elimination of the leveling effect of the current federal tax offset (deductibility) provision result in significant increases in the cross-state differentials in effective marginal tax rates on new investment. According to Papke, this would heat up the tax-bidding war between the states and drive subnational taxation of capital investment to the lowest common denominator, possibly zero. Allocating capital resources in response to geographical tax-cost differentials

instead of to real differences in profitability would also generate general welfare (i.e., efficiency) losses. It would also force significant revisions in the revenue mix and requirements of state and local governments. A consumption-based federal tax would effectively end state and local taxation as we know it.

Papke concluded that there appears to be implicit coordination among the Great Lakes states in business tax policy; the forces of competition or copycat behavior have tended to equalize levels of taxation. Similar data from states in other regions are being explored to see if this equalization phenomenon is national in scope. Papke suggested that, given the relative convergence in tax burden among the Great Lakes states, there is currently little need for federal intervention to correct abusive and tax-induced competition for investment. Policymakers should be aware, however, that in the presence of capital-mobility interdependencies, cooperative strategies are efficient and improved results can be achieved for all parties through coordination of business tax policies.

Bob Ady of PHH Fantus presented a view from industry. PHH Fantus has been helping firms in their location decisions for approximately 70 years. According to Ady, actual site location decisions are made by a process of elimination. There are three key issues that firms focus on when making a location decision: operating costs, operating conditions, and living conditions. These factors are related to the cost structure of the firm and reflect the relative importance of different categories of costs. For example, in manufacturing, taxes account for at most 4% of operating costs; labor costs account for 36%; occupancy, 8%; transportation, 35%; and utilities, 17%. In the service sector, on average, taxes account for approximately 5% of operating costs; labor accounts for 72%; occupancy, 15%; and utilities, 8%.

Firms do want a tax structure that is competitive with those of other states but, given the trend toward competitive convergence in state tax rates, it is harder for states to offer significantly more attractive tax structures than their peers.

This cost breakdown makes it clear that taxes are a less significant factor in location decisions. Firms do want a tax structure that is competitive with those of other states but, given the trend toward competitive convergence in state tax rates, it is harder for states to offer significantly more attractive tax structures than their peers. Ady also suggested that when it comes to the perception of a state's tax system, the relative tax burden on existing capital and businesses also matters. If existing firms in the state are content with the tax structure, the state will find it easier to attract new firms. Existing firms are very important in establishing and spreading the reputation of the business climate to potential investors.

Operating conditions that are factors in the location decision include the availability of a competent workforce and right-to-work laws. In the living conditions category, Ady noted that costs are becoming more important than the quality of life in an area; in the past, the opposite was true. According to Ady, however, the most important factor in location choice is a qualified work force. The importance of an available skilled work force has continued to increase as changes in firm production have made labor force issues paramount. Firms increasingly use skilled labor and, at the same time, the market for such workers has tightened considerably.

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Ady also stressed the importance of incentives in a firm's location decision, singling out training as the most important incentive. Schools do not consistently do a good job of preparing students for skilled and semi-skilled vocational jobs. Furthermore, firms want employees with strong interpersonal skills and the ability to learn, and they are reluctant to pay for this type of training because it is costly and because workers can carry away the value of such training to their next job. The second most important incentive is infrastructure development—especially development that is targeted and provides customized improvements. This accounts for 30% of the incentives offered by state–local governments nationwide and includes sewers and airports. An advantage for government in providing general infrastructure improvements is that the benefits often extend beyond individual firms to other residents and businesses in the area. An additional advantage is that the infrastructure improvements will remain behind even if the firm they were designed to benefit leaves the area. Ady noted that the broad-benefit nature of many infrastructure incentives should

Infrastructure improvements will remain behind even if the firm they were designed to benefit leaves the area.

be taken into account in popularly reported figures on the *dollar cost of incentive per job* for facilities such as the recent BMW auto plant in South Carolina. The third form of incentive is firm-specific tax abatements. This type accounts for 10% of the incentives offered by governments. However, the reluctance of state and local governments to abate property taxes associated with running local schools makes business tax abatements less valuable. The property tax is normally the largest state and local tax faced by businesses, and schools are typically the largest draw on the local property tax base. Ady suggested that this and the *clawbacks* often included in abatement agreements (which may require that abated taxes be repaid if firms fail to create promised jobs) may reduce the importance of tax incentives as a business attraction tool in the future.

Do Politicians Structure Taxes to Encourage Growth?

Alan Peters discussed his joint work with Peter Fisher, both of the University of Iowa, on industrial incentives and the pattern of competition among U.S. states and cities. The purpose of their work is to see whether evidence is available to suggest that the spatial pattern of industrial incentives and competition among cities and states leads to a redistribution of jobs to distressed areas. If the competition to offer the best incentives can create new opportunities for local residents with low reservation wages in high unemployment areas, this should support the contention that the practice of incentives may be a positive-sum game.

Peters and Fisher determined the preferred location for firms from a tax liability perspective based on a tax and incentive model (TAIM). Their methodological framework is similar in construction to that developed by Papke, but it extends that framework to include the use of selective tax abatements and other incentives by state and local governments. Peters and Fisher looked at eight different industry sectors, which included mostly footloose industries divided among small and large firm sizes. Firms are modeled as operating in 24 states and 112 cities and selling to the greater U.S. market. The model features a broad range of incentives, including tax and infrastructure incentives, job training assistance, and loan and grant programs. The only types of incentives excluded as being too general are so-called new wave or demand-side incentives designed to stimulate entrepreneurship, research and development, technology transfer, venture capital, and exports or foster the growth of small businesses. The model also excludes any federal discretionary incentives.

After at least a decade and a half of intense competition for investment and jobs, the state and local system of taxes and incentives has provided no clear inducement for firms to invest in higher unemployment areas.

Peters and Fisher measured the change in the hypothetical firms' return based on different incentive packages. Comparing a project increment to cash flow across U.S. cities, they found that there was a large range in the rate of return. However, locales were mostly clustered, thereby suggesting that the rate of return was reasonably uniform for most cities. Peters and Fisher also compared the project increment to cash flow after tax and other incentives across states and cities. They found that these can change the project increment to cash flow significantly. (See table 5.) While high unemployment areas typically provide good tax incentives, they often negate some of this beneficial effect by failing to offer other valuable incentives, such as infrastructure improvements. Mostly, places with high unemployment also have high basic taxes. Peters noted that after at least a decade and a half of intense competition for investment and jobs, the state and local system of taxes and incentives has provided no clear inducement for firms to invest in higher unemployment areas.

Therese McGuire of the University of Illinois Institute of Government and Public Affairs discussed two state tax commission studies, one of which she directed, in which attempts were made to determine whether taxes were an important factor in promoting economic development. In a study for the Minnesota commission in 1984, McGuire and Michael Wasylenko found that taxes had a significant, albeit small, effect on economic development. However, when Wasylenko attempted to update and replicate the study in

Table 5 Project Returns for Selected Firms: Average and Standard Deviation Across States and Cities

Multi-state Firm	After Basic Taxes Only			After All Taxes & Incentives			Value of Incentive Package	
	Mean	St. Dev.	SD/Mean	Mean	St. Dev.	SD/Mean	Mean	% of Return*
States:								
State Taxes and Incentives								
#5: Soaps & Cleaners	8,580,693	327,237	0.04	9,152,528	411,847	0.04	571,835	6.2%
#7: Misc. Plastics	328,819	51,548	0.16	629,656	204,814	0.33	300,837	47.8%
#12: Electronics	12,592,373	2,125,141	0.17	14,526,660	2,828,459	0.19	1,934,288	13.3%
#14: Automobiles	24,090,255	5,869,814	0.24	27,295,432	7,205,526	0.26	3,205,177	11.7%
#16: Instruments	62,760,898	2,250,306	0.04	64,480,585	2,759,552	0.04	1,719,687	2.7%
Cities:								
State and Local Taxes & Incentives								
#5: Soaps & Cleaners	7,897,374	369,066	0.05	8,657,364	454,925	0.05	759,990	8.8%
#7: Misc. Plastics	106,773	100,372	0.94	457,198	204,170	0.45	350,426	76.6%
#12: Electronics	4,562,124	3,739,239	0.82	7,605,776	3,954,114	0.52	3,043,653	40.0%
#14: Automobiles	1,500,313	12,909,393	8.60	7,843,902	12,565,551	1.60	6,343,589	80.9%
#16: Instruments	56,522,017	2,738,309	0.05	59,181,802	2,999,244	0.05	2,659,785	4.5%

*Mean incentive package value divided by mean project return after all taxes and incentives.

Source: Alan H. Peters, "Industrial Incentives: The Pattern of Competition among U.S. States and Cities," presentation prepared for the workshop "Designing State–Local Fiscal Policy for Growth and Development," held at the Federal Reserve Bank of Chicago, July 17, 1996.

conjunction with the Arizona Tax Commission's work in 1989, he found that tax levels were not significant in promoting economic growth. This suggests to McGuire that predictability of the tax structure may be a more important factor.

McGuire said that one of the important lessons from these studies is that there may be a tendency to focus too much on taxes as they affect economic growth. The impact of taxes is small as evidenced by statistical work where tax variables rarely generate large coefficients. To have a large effect on development, taxes must be reduced dramatically, and it is unclear what the net effect would be on economic development given the concomitant reductions required in state spending, much of which supports development. Low taxes alone are not adequate to support economic growth. Thus, states should emphasize development of stable and certain tax systems that are in line with practices in other states. In the long run, this could be the most beneficial strategy for achieving development goals.

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Bob Tannenwald of the Federal Reserve Bank of Boston discussed his experience with state tax commission studies; he observed that policymakers believe that taxes matter, regardless of the evidence. In assessing Massachusetts's tax climate, Tannenwald has applied Papke's methodology. He discussed some of the studies Raytheon presented to the Massachusetts legislature to justify the use of the single weighted sales factor in the apportionment factor. He concluded that recent policies in Massachusetts may look somewhat bipolar to national observers. Although, on the one hand, there is a latent anti-business culture in Boston, on the other hand, there is a significant number of attractive tax incentives that are being passed in the Massachusetts legislature. This divergence might reflect the intense competition among bordering states in the New England region in response to the region's faltering economy. Assessing future directions for research, Tannenwald argued that more work should be done on the tax burdens of households; behavioral studies could well show that, because of the increasing importance of attracting a high-quality skilled work force, high burdens on high-income households are a significant factor in firms' location decisions.

In the discussion that followed, Mark Haas of the Michigan Treasurer's office noted that the age of the data used in several of the studies might call into question the validity of the findings. Many in the Michigan legislature would consider the results useless since the economic experience of the last five years in the Midwest has been so different from the past. Several of the presenters noted that it is difficult to get comparable newer data due to the four year lag with which the U.S. State and Local Government Finance data are produced. Lee Munich of the Humphrey Institute at the University of Minnesota noted that there seems to be a higher level of significance on the predictability of taxes and their effects on development rather than on the level of taxes themselves. This relates to the perceptions of business investors, in which state reputations can exert long-lasting influence. Papke argued that it would be an improvement if all agencies agreed on one standard way to look at business tax differentials. The current tendency is to pick and choose among a series of tax burden measures to select those that best make the case of the researcher or advocate. This can mislead policymakers. A single measure, such as his AFTAX model, would make it easier to determine the effects of a state's business tax structure. Tom Pogue of the University of Iowa expressed the view that no single measure could adequately capture all of the information policymakers might want. Haas pointed out that the use of a single metric could also be misleading since different measures are used to look at different issues. William Oakland, economics professor at Tulane University, agreed with Pogue and noted that while the AFTAX approach is useful, it has its weaknesses. For instance, not all firms are footloose or taxable. Furthermore, public services provided to business also need to be considered (see final session).

Evaluating Economic Development Policies

Luncheon speaker Paul Courant of the University of Michigan presented his perspective on how economic development policies and tax incentive programs should be evaluated. Courant argued that the proper measure of the effectiveness of an economic development program should be its contribution to enhancing economic welfare, rather than simply the program's ability to create jobs or attract new investment. Too often, he said, it is assumed that economic welfare will be enhanced through investment and job creation without really examining the relationship between the two, particularly in cases where government subsidies are used to spur development. Courant argued that economists can provide better guidance to policymakers by spending more time evaluating ways in which economic welfare can be enhanced, rather than concentrating on statistical studies that examine the raw effects of development programs.

Economists can provide better guidance to policymakers by spending more time evaluating ways in which economic welfare can be enhanced, rather than concentrating on statistical studies that examine the raw effects of development programs.

Many of the studies to date document a wide array of growth consequences as measured by gross employment growth, branch plant openings, small business startups, foreign direct investment, and other economic variables. However, it is far from clear how these are related to either individual or community well-being, and economists have done little to relate these raw effects to useful policy recommendations. Furthermore, studies have yielded such a wide range of impact estimates as to be largely irrelevant. Owing to the wide geographic dispersion of places studied, these impact estimates often reflect only the *average* effect of a given policy among a wide range of potential effects. Tax and spending patterns can be very heterogeneous, as well as the quality and nature of the public sector services provided, which might influence economic growth. Knowing the average impact of a specific abatement policy may not be of much assistance to local decisionmakers, who are trying to figure out whether a particular policy will work in their community. According to economic theory, for an economic development policy to succeed, it must cause an outwar

shift in the demand curve, thereby increasing equilibrium output by improving the productivity of labor and capital. However, Courant noted that most policies simply provide subsidies that create movement along the demand curve without increasing equilibrium output. Essentially the *marginal product* or productivity relation that is specific to the locale stays put.

A good example of such a misguided approach is the common practice of governments trying to provide subsidies for capital.

A good example of such a misguided approach, in Courant's view, is the common practice of governments trying to provide subsidies for capital. While the subsidies may generate additional employment and output, they do not really enhance economic welfare because the cost of the subsidy exceeds the job and output gain. Courant offered an analogy of a locale trying to improve its fortunes by creating a gold rush. One way to create a gold rush would be to go out and buy some gold, bring it back to your community, and bury it in the ground. You could then announce that you found gold and people would come to dig it up but, in the end, all that would be left would be the value of the gold. The costs of buying the gold, transporting it, and digging it up might be ignored. Courant suggested that this is one reason communities pursue subsidies; they create the illusion that employment and output have grown. The jobs and new investment are easy to identify, while the costs of the subsidy are widely dispersed across the local economy.

A related reason may be that growth policies benefit special interest groups, such as land owners and owners of fixed or in-place capital facilities. In some instances, workers may not recognize that wages are bid up only temporarily by economic growth, pending the arrival of in-migrating laborers. For this reason, winning political coalitions are formed, which subsidize new capital investments from taxes paid by all residents.

Given these inefficiencies, why do policymakers pursue strategies geared toward increasing the aggregate number of jobs? Courant suggested that because jobs hold special significance in society, people are willing to subsidize the creation and maintenance of jobs even if it is economically inefficient. If workers become dislocated, the costs of moving to another community may be very high. Not only do workers have to sell their homes, but they also lose location-specific knowledge that is of both social and economic benefit. Additionally, the psychology literature identifies the health and social benefits of being employed. Having a good job and social status in the community appear to be highly valued by individuals. Courant suggested that given the importance of having employment here and now, many individuals would probably be willing to insure themselves against being unemployed. We should perhaps not dismiss the possibility that government acts as an efficient provider of such insurance. To examine this issue, Courant argued that analysis incorporating such *insurance value* should be part of an assessment of the overall net welfare improvements (if any) that result from local development policy. In many cases, government may not be capable of playing the role of insurer; the costs of doing so may be cumulative and prohibitive for locales hosting declining industries.

What should governments do? First provide local public services at the lowest possible unit cost; and second develop tax structures that tax mobile factors based on a benefits principle.

If the current approach to economic development strategy is inadequate, what should governments do? If governments begin to use enhanced net economic welfare as the measure for evaluating their economic development efforts, Courant said they need to focus on two broad policies. The first is providing local public services at the lowest possible unit cost; and the second is developing tax structures that tax mobile factors based on a benefits principle. Additionally, it is important that the evaluation of the mix of services and how mobile factors are taxed is on a case-specific basis. *Average* information about behavioral responses to a policy, drawn from a heterogeneous population of state and local economies, cannot convey much relevant information to a local decisionmaker trying to determine whether a policy is worth pursuing.

Courant concluded by suggesting some potential research avenues that might help policymakers improve their assessment of development policy options. These include:

- Undertaking careful measurement of the benefits received by mobile factors and the costs to local governments of providing government services.
- Calculating on a case by case basis the local cost of providing incentives.
- Studying who receives the jobs and income from new investment when using incentives to influence the distribution of benefits through economic development.
- Looking for potential agglomeration economies (i.e., winning opportunities to encourage business clusters) and ways to exploit them, while maintaining a healthy skepticism about the presence of such agglomeration economies (or other types of market failure).
- Identifying how important local jobs are and how much, on average, local residents are willing to pay for the existence of a local job based on various characteristics.

In the ensuing discussion, Charles Bonser of Indiana University said that the public availability and transparency of the information concerning the incentives might be a key factor in improving economic development programs. Voters find it hard to evaluate whether offering incentives is a good idea because they are not provided with information about the costs. Bonser asked whether legislation to make known the particulars of development policies could improve the decisions and policies being made by local governments. Mike Peddle of Northern Illinois University suggested that one way to test whether voters favor development through incentives or tax breaks (as well as their willingness to pay for it) would be to put economic development agreements and deals to a voter referendum.

Art Rolnick of the Federal Reserve Bank of Minneapolis said that *sunshine* legislation that would provide more information to the public was not an altogether helpful proposal. He argued that Courant's analysis is based on a model that (mistakenly) assumes that government officials act irrationally when they rely on traditional economic development strategies. Rolnick added that the pursuit of jobs and new investment did reflect the desires of their constituencies, but that the local perspective on development policies—however well-conceived with regard to local self-interest—often leads to ruinous outcomes. Therefore, an improved method among economists in conducting welfare analyses from the local perspective or providing better information to voters would not improve public policies at all.

Is There a Role for Regional Tax Policy?

The first afternoon session took up the issue of whether the common state and local government practice of using selective tax abatements to attract businesses should continue or whether such abatements should be prohibited by the federal government. The debate focused on the possible economic properties of incentives and the practical and legal issues of regulating selective incentives.

Rolnick and Mel Burstein, also of the Federal Reserve Bank of Minneapolis, presented their joint work on delimiting selective abatements. First, Rolnick discussed the economic issues, citing the Minnesota case of Northwest Airlines. The state in 1992 provided an $800 million loan package to the airline to construct a large maintenance facility in Duluth (to date, it has not been built). Rolnick noted that such cases, in which jobs are not created but just relocated, provide evidence that selective abatement competition misallocates private resources and, due to revenue losses, causes state and local governments to provide too few of those public goods that are vital to growth and welfare. Subnational governments cannot refrain from participating in the incentives bidding process; failure to participate (while others do so) would result in the loss of local jobs and investments. However, from the national perspective, this behavior results in lost economic output as firms shift investments away from their optimal locations in response to tax incentives. For example, it makes little economic sense for Northwest Airlines to build a maintenance facility in a remote, cold climate city.

Subnational governments cannot refrain from participating in the incentives bidding process; failure to participate (while others do so) would result in the loss of local jobs and investments.

Rolnick noted that it may be surprising to some to hear an economist suggest that competition among states is bad. But this is not competition among private entities, but competition among government entities. There is a difference, Rolnick argued, between general even-handed competition among state and local governments in keeping taxes low and services high and selectively targeting firms for special treatment. Rolnick suggested that equal treatment of equals within a state or locality should guide policy in this area.

There is a difference between general even-handed competition among state and local governments in keeping taxes low and services high and selectively targeting firms for special treatment.

Next, Burstein addressed the legal issues, noting that the only way to stop this futile bidding process is for Congress to invoke its powers under the Commerce Clause of the Constitution to delimit the use of selective incentives. Congress must act, he said, because the states cannot stop this competition on their own. The political costs of not participating in the incentive game are too high and as long as one state chooses to offer incentives, others will feel they have to follow. Burstein suggested that federal penalties could be devised, which would make such competition costly if states ignore federal prohibitions. These enforcement mechanisms might include taxing explicit and imputed income accruing from public subsidies; denying tax exempt status for public debt used to compete for business; and impounding federal funds to states that engage in such competition. Without federal prohibition, Burstein argued, the difficulty of accounting for the use of public money and of assessing the real costs of these abatements will allow the abatements to continue.

Federal penalties could be devised, which would make such competition costly if states ignore federal prohibitions.

Tim Bartik of the Upjohn Institute and Graham Toft of the Indiana Economic Development Council presented an opposing view. Bartik suggested that a broad prohibition of these types of incentives could end a number of interesting experiments by the states that are designed to improve local conditions and welfare. He argued that the claim of inefficiency was a weak one, particularly if abatements are targeted to distressed areas. Nonetheless, subnational governments should be judicious in their use of incentives. He cited three factors that could allow incentives to pass a benefit–cost test. First, the incentives should be targeted to an area where unemployment is high, thereby creating jobs in a community where they otherwise would not exist. Second, the jobs created should pay higher wages than is the norm for the community. Third, the jobs should go to local residents. If these criteria are met, the benefits from the incentive program could outweigh the costs.

Addressing the issue of equal treatment, Bartik noted that since different types of firms may impose different social costs and benefits on society, it may not be a good idea for state governments to treat all firms equally. For example, it may be beneficial to use targeted incentives to attract firms that will create greater social benefits, such as providing high wages or hiring local residents. Similarly, selective incentives that work efficiently in distressed communities may lower transfer payments to the poor.

It may be beneficial to use targeted incentives to attract firms that will create greater social benefits, such as providing high wages or hiring local residents.

Bartik also pointed out that while, in some extreme cases, huge incentive packages have been used to lure or assist specific firms (such as the Northwest Airlines case cited earlier), for the most part incentives are used in important but less visible projects. For instance, all downtown redevelopment projects depend on incentives. Outlawing these types of incentives could end programs that help businesses with overseas exports or minorities and women to open new businesses. Customized training programs, which are of increasing importance to firms, would also be eliminated by a federal prohibition on selective incentives.

Bartik then asked how the federal government would be able to implement such a ban on incentives. This would require the federal government to check each state and local government incentive to determine which ones would be legal. This policing of state and local incentives would be a very difficult administrative task. Instead, Bartik suggests that the correct federal role might be to encourage more rational competition between the states when it comes to offering incentives, by encouraging the use of those incentives that provide greater national benefits.

General state tax structures are suboptimal and capricious in their impact on particular firms or industries. States then use incentives and abatements to improve the outcomes for important industries.

Markets are much better than governments at determining which investments should take place.

Finally, Bartik suggested that there are many more moderate ways to alleviate the problems that state tax competition causes. For example, he would like to see more rules on how and how much money states could dole out to businesses. Similarly, accountability for using incentives could be improved by making incentives more short term and focusing on training and infrastructure improvements. Long-term incentives such as 50-year property tax abatements are rarely much of an inducement to relocating firms and they reduce accountability by making it harder to examine whether the cost of the long-term abatement is negated by the benefits received from the new investment. In addition, states are better off when they focus on infrastructure and training incentives, since these benefits often remain in the state even if the firm that received the incentives leaves. Finally, Bartik recommended that states recover their subsidies though the use of clawback agreements if the benefits promised by the firm fail to materialize.

Toft talked about the practical use of tax abatements based on his experience in Indiana. He explained that many of Indiana's abatement programs reflect the state's desire to maintain its manufacturing base. States like Kentucky have been very aggressive in pursuing manufacturing firms and Indiana has tried to respond to this competition. Global competition has also been a significant factor, given that incentives offered in developing nations far exceed those offered anywhere in the U.S.

Toft also argued that general state tax structures are suboptimal and capricious in their impact on particular firms or industries. States then use incentives and abatements to improve the outcomes for important industries. Toft agreed that creating different tax treatments for firms with differing structures may be rational. For example, Indiana depends on manufacturing, so it has made a strategic choice to focus tax abatements on that industry. Manufacturers perceive incentives as helping to level the playing field. Nonetheless, Toft said that many abatements are used too broadly and are poorly managed. Toft agreed with Bartik that the benefits of incentives can be improved if the majority of incentive funds go to distressed and designated economic development areas. Finally, Toft argued that federal noncompetition laws would be counterproductive by discouraging adjustments to state tax climates.

Rolnick responded to Bartik's presentation by stating that the primary rationale for government intervention in a market economy is to prevent or ameliorate market failure. He suggested that the government should intervene only if there is a proven market failure and government could fix it. The use of selective incentives fails as such a tool, Rolnick said, because many incentives address perceived rather than actual market failures. An example of this that drew federal government action was the state–local use of Industrial Revenue Bonds (IRBs). States were using these to fund private activities, many of which were wasteful and should never have taken place. IRBs were also being used as unnecessary subsidies to private firms that could have received financing through traditional market mechanisms. The federal government prohibited these practices as part of the 1986 tax reform legislation. Finally, Rolnick said that if overall business taxes could be lowered by eliminating tax abatements, this would be beneficial to everyone in an evenhanded fashion. Moreover, markets are much better than governments at determining which investments should take place.

Courant suggested that some firms that might not be able to receive funding from traditional market sources could still produce goods or services that would enhance social welfare. For example, a firm that reprocessed waste into fertilizer might not have great appeal for private funding sources, but the social benefits could make it worth funding. Burstein replied that such instances could be taken care of by means other than selective incentives. For example, waste-producing firms should be charged appropriate disposal fees, thereby giving them a market signal to reprocess their waste or deliver it to another firm for reprocessing.

The point is not to acquire a particular firm or investment, but to improve the appropriate industry cluster. Moreover, the federal government cannot discern, in practice, which incentives to prohibit and which to allow.

Toft said the impact multipliers are the real issue in evaluating any economic development strategy. The point is not to acquire a particular firm or investment, but to improve the set of synergies or multipliers by fostering the appropriate industry cluster. Moreover, Toft does not believe that the federal government can discern, in practice, which incentives to prohibit and which to allow. Success stories like Indianapolis' rebirth as a center for sports, retail, and other industry clusters would have been stifled by federal limits on selective incentive tools.

A final issue raised by David Merriman of Loyola University and Bonser concerned the relative neutrality of federal actions when it comes to economic development. Both argued that federal actions do not treat equal firms equally, because certain public goods are given on a preferential basis to specific firms. Defense contracts and the like are not distributed on an equal basis and these certainly are examples of economic development incentives. Why should the federal government be allowed to offer such preferential treatment, while prohibiting the states from doing so. Burstein replied that rules and regulations on preferential treatment can be developed for the federal government. At the state level, preferential treatment is the product of intense competition, with one state trying to match incentive packages offered by another state without considering whether the overall *game is* rational. In the past, fledgling efforts among groups of states, including the Great Lakes states, to form compacts to prohibit or delimit bidding for business have not been successful. Burstein concluded by reiterating that all states would be better off if they were prohibited from offering incentives.

The Expenditure Side of Policy

The benefit principle of taxation suggests that taxes should be imposed in strict relation to benefits received by the taxpayer.

The final workshop session addressed general tax and fiscal structure. How should state and local governments fashion their tax structures with regard to business development and growth? Oakland and Testa advanced the proposition that the only defensible principle on which state and local governments could tax the business sector is the *benefit* principle, whereby taxes paid by an individual or organization exactly cover the cost of services provided by government. Thus, the tax system becomes one of user charges paid to government for services rendered. The competing principle is *ability to pay,* which implies that wealthy individuals pay more according to widely accepted notions of equity and fairness. However, the ability to pay principle cannot be relied upon in structuring taxes imposed on the business sector. There are major uncertainties about how the burdens of business taxes are ultimately shifted to individuals in various income classes. Given these uncertainties, business taxes are clumsy instruments for achieving equity among individuals. This defect cannot be overcome by using firm profitability as an indicator of ability to pay. Shares in large, prosperous corporations are widely held by pension funds and by charitable foundations, while many small, closely held firms are owned by wealthy individuals.

Public services become an additional factor of production, much like labor or capital, whose cost is appropriately embedded into the final prices of goods produced.

The benefit principle of taxation suggests that taxes should be imposed in strict relation to benefits received by the taxpayer. Thus, business taxes should cover the costs of public services provided to the business sector. By following this principle, the prices of goods and services produced by business will accurately reflect the real costs of those public services inherent in the value of the product; public services become an additional factor of production, much like labor or capital, whose cost is appropriately embedded into the final prices of goods produced. Consumers can then make intelligent choices based on those prices. Moreover, benefit taxation will encourage wise choices by the voting public on the types and levels of services state and local governments should provide. On the other hand, failure to tax business for services rendered might encourage voters to stop funding vital business services, such as roads and bridges, while the mistaken belief that businesses could bear the tax burden of household services, such as health services and parks, could result in

overprovision of these services. Furthermore, the inordinate taxation of mobile factors of business production, such as capital investment, can lead firms to flee the taxing state or jurisdiction to avoid the tax burden.

Any restructuring of the tax system in accord with the benefit principle would therefore require lower taxes or greater business-related public services.

Do existing tax practices of state–local governments approximate the benefit principle? To answer this question, Oakland and Testa examined tax-financed state–local expenditures nationwide, paying particular attention to the Midwest, on public services benefiting households versus those benefiting business entities. Comparing each state's dollars of business taxes paid against dollars of public services received, it is clear that taxes far outweigh business services (see table 6). In midwestern states and in other regions, the ratio of state–local business taxes to tax-financed business services ranges from 1.5 to 2.0. Any restructuring of the tax system in accord with the benefit principle would therefore require lower taxes or greater business-related public services.

Table 6 State and Local Business Taxes and Expenditures, 1992

Region	Business expenditures	Taxes	Ratio of taxes to expenditures
	(———millions of dollars———)		
U.S.	$94,136	$160,514	1.71
New England	5,076	9,022	1.78
Mid-Atlantic	16,762	29,899	1.78
East North Central	15,077	27,781	1.84
West North Central	6,228	9,843	1.58
South Atlantic	15,735	22,837	1.45
East South Central	4,290	6,768	1.58
West South Central	8,589	17,909	2.08
Mountain	5,471	8,169	1.49
Pacific	16,906	28,285	1.67
Seventh District	12,760	23,816	1.87

Source: Staff calculations based on data reported by the U.S. Department of Commerce, Bureau of the Census, Governments Division and individual state fiscal agencies.

Oakland and Testa proposed a single business tax which would be levied at a uniform rate on the value added *by origin* of businesses. Such a tax would have several advantages. First, if businesses were taxed in proportion to their value added, the taxes paid would closely vary according to the size of the firm and its attendant public services consumed. Second, taxing by origin would mean that taxes were levied in proportion to the geographic location of business activity (i.e., production). Since public services are presumably consumed by locally producing firms, this system would accord with the benefit principle. Lastly, a tax on value added is neutral with respect to each firm's choice of method of production. Unlike the current hodge-podge of state–local business taxes, a uniform tax on value added would neither discriminate against capital-intensive firms nor favor the ever-growing service sector.

A uniform tax on value added would neither discriminate against capital-intensive firms nor favor the ever-growing service sector.

Looking at the competitive *tax climate* features of current state–local systems, Oakland and Testa compared current business taxes by state in relation to each state's value added. They found that business taxes as a percent of value added would result in much more modest tax rates—in the range of 2.5% to 3.5%. If business taxes were brought down to levels commensurate with costs of public services provided, these rates would be even more modest—in the range of 1.5% to 2.5% of value added. In assessing the current tax climate, the presenters look at the dollar difference between taxes paid and benefits received by state, and they

Table 7 Comparison of Tax Burden Measures—Business Taxes Only vs. Business Taxes in Excess of Benefits Received

Region/State	Tax measure	(rank)	Excess Taxes	(rank)
U.S.	3.1%	—	1.3%	—
New England	2.9	(6)	1.3	(6)
Mid Atlantic	3.4	(1)	1.5	(4)
E. North Central	3.2	(3)	1.5	(4)
W. North Central	2.8	(7)	2.0	(1)
South Atlantic	2.7	(8)	1.8	(2)
E. South Central	2.5	(9)	.9	(9)
W. South Central	3.3	(2)	1.7	(3)
Mountain	3.1	(4)	1.0	(8)
Pacific	3.1	(4)	1.2	(7)
Seventh District				
Illinois	3.5	(2)	1.7	(1)
Indiana	2.9	(5)	1.6	(2)
Iowa	3.4	(3)	1.2	(5)
Michigan	3.2	(4)	1.4	(4)
Wisconsin	3.9	(1)	1.6	(2)

Source: William H. Oakland and William A. Testa, "State-local business taxation and the benefits principle," *Economic Perspectives*, Federal Reserve Bank of Chicago, January/February 1996.

do so, again, in relation to value added. Consideration of benefits received can make a significant difference in rankings among states and regions and relative to national averages (see table 7). Oakland and Testa believe that such benefit-principle measures of tax climate present a favorable alternative to the cost of capital measures presented by Papke earlier. Benefit-principle measures are easily understood and easily calculated. Most importantly, adoption of such measures would promote good government and a neutral tax structure with respect to business development. Any remaining differences among states in tax levels would reflect conscious choices to provide different levels and mixes of public services. Accordingly, one could expect constructive dialog between the business sector and its government in fashioning and financing critical government services.

Tax reductions of 50% to 60% would be required to bring Canada's nonresidential tax system back into line with the benefit principle.

Harry M. Kitchen discussed joint work with Enid Slack, both of Trent University, Ontario, Canada, which took a similar approach to appraising the existing tax system. Businesses in Canada face two major business-related taxes: the corporate income tax and the nonresidential property tax, the latter being imposed by municipal governments. Considerable variation exists across provinces in municipal property tax rate structures, but all systems favor residential property over nonresidential property.

Many contend that Canadian property taxes are too high, citing lower property tax rates in the U.S. However, Kitchen argued that taxes paid in relation to benefits received is the most appropriate basis in evaluating the nonresidential tax system, both with regard to competitive comparisons across municipalities and to the favorable features inherent in benefit-principle tax structures. Kitchen compared nonresidential tax collections in eight Ontario cities to the dollar cost of public expenditures on business-related services. Using a methodology based on existing studies that examine business versus residential consumption of public services including water, sewer, waste disposal, and transportation, Kitchen reported similar results to those of Oakland and Testa above. He concluded that tax reductions of 50% to 60% would be required to bring Canada's nonresidential tax system back into line with the benefit principle (see table 8).

Table 8 Nonresidential Property Taxes and Tax Rates

	Nonresidential (NR) proportion of taxes	Nonresidential proportion of municipal and education expenditures	Percentage change in NR property taxes
Cornwall	50	21	-59
London	37	16	-56
Niagra Falls	46	21	-55
Oakville	30	13	-57
Peterborough	41	18	-56
Thunder Bay	51	20	-61
Whitby	28	14	-51
Windsor	46	20	-56

Source: Presentation by Harry M. Kitchen at the "Designing State–Local Fiscal Policy for Growth and Development" workshop, Federal Reserve Bank of Chicago, July 17, 1996.

During the ensuing discussion, Courant commented on the Oakland/Testa approach to measuring tax climate as the excess of business tax payments over benefits received. Courant cautioned that the portion of business taxes lying above benefits could not easily be construed as the tax *burden*. Similar to the competing approach, which treats all business taxes as punitive, such burdens would be shifted away from the business entities, owners, or participants through changes in their behavior. Accordingly, a burden measure of this sort would require separate *incidence analysis* for each type of business tax. Oakland and Testa responded that, while this held true, other competing business climate studies suffered from the same defect. Moreover, the presenters did not claim to be measuring tax burden per se, but rather were displaying the extent to which states would need to lower business taxes to come into alignment with the benefit principle.

Signs of business support for education reflect the general view of business and other citizens that the public sector should provide efficient and adequate levels of services (such as parks and public health) that are necessary to maintain general living conditions.

Several participants challenged the allocation of public spending on education between the household sector and the business sector. Both the Oakland/Testa and Kitchen presentations allocated 100% of such spending to the household sector, while several participants felt that education benefits the business sector and should be allocated as such. The presenters responded that labor markets generally operate such that laborers receive the value of their product to the firm. Signs of business support for education reflect the general view of business and other citizens that the public sector should provide efficient and adequate levels of services (such as parks and public health) that are necessary to maintain general living conditions. Conference participants agreed, but argued that at least a small part of government spending on education may be tailored to provide the type of training that specific firms, rather than their workers, would benefit from.

The final presentation of the workshop was by Randy Eberts, executive director of the Upjohn Institute. Eberts presentation focused on the expenditure side of the state–local fiscal equation. While much of the workshop emphasized the effect of taxes on local economic development, Eberts addressed the services that these taxes support and the benefits they provide to businesses. Assessing the effects of services on firm location and economic development is more difficult than assessing the effects of taxes on the cost of doing business in an area. First, services are much more difficult to measure. Most studies have simply equated the amount of spending by local governments with the amount of services provided. However, the efficiency with which tax dollars are spent and the effectiveness of the delivery of services are major factors in how beneficial these services are to businesses. Some measures other than expenditures are available. For example, studies have examined the effect of student test scores as measures of workforce quality on firm location. Others have correlated physical attributes of various infrastructure facilities with economic growth measures.

Second, benefits are typically more widespread than costs. It is relatively easy to determine the tax liability of representative firms through straightforward accounting methods. However, benefits may accrue to parties that do not directly pay taxes. For example, education benefits not only those who attend school but also society at large, by enhancing the quality of the workforce and the citizenry. While highways obviously benefit those who drive on them, an efficient highway network can also affect the price and variety of products and the competitive advantages of regions. Accurately recording the externalities associated with these services is often difficult.

Eberts focused the remainder of his presentation on one major function of state and local governments that is potentially important for economic development: the construction and maintenance of roads and highways. Considerable research has been conducted in recent years to estimate the contribution of highway investment to economic development. Measures of the stock of highway capital and physical attributes are available. Eberts discussed the condition of highways in the Midwest relative to the U.S., trends in highway investment at the regional and national levels, and the empirical research linking highways to economic development.

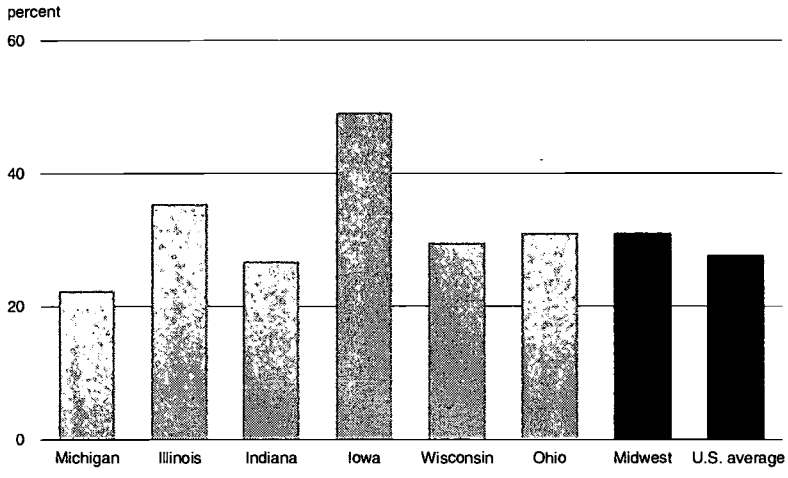
Highways

Eberts noted that state and local governments put in place most of the nation's highway system. Although the federal government provides significant funding through the federal gas tax and the highway trust fund, state and local governments are responsible for construction, maintenance, and much of the planning. Highways comprise a significant part of the nation's fixed nonresidential capital stock. Highway capital stock exceeds $600 billion, valued in 1987 dollars, which is about two-thirds of the nation's manufacturing capital stock and a little over one-tenth of all private nonresidential capital.

Among the Midwest states, Iowa devotes the largest share of its capital budget to highways, at 49%, and Michigan the smallest share, at 22% (based on 1992 figures).

Highway expenditure is the largest single capital outlay of state and local governments. At the national level, 27% of state–local governments' capital outlay budget goes to highways, with education (both k12 and higher education) a close second at 23%. Eberts reported that the Midwest (defined here as Illinois, Indiana, Iowa, Wisconsin, Michigan, and Ohio) follows the national pattern fairly closely, with 31% of the region's capital outlay budget going to highways and 26% to education. Among the Midwest states, Iowa devotes the largest share of its capital budget to highways, at 49%, and Michigan the smallest share, at 22% (based on 1992 figures). (See figure 4.)

Figure 4 Highways' Share of Total Outlays



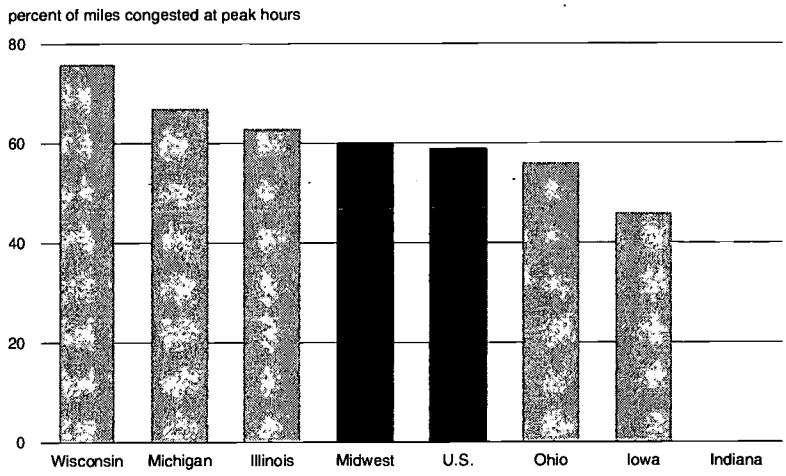
Source: Randy Eberts, "Infrastructure's Role in Economic Development," presentation prepared for the workshop "Designing State–Local Fiscal Policy for Growth and Development," held at the Federal Reserve Bank of Chicago, July 17, 1996.

From 1980 to 1992, highway capital outlays per capita increased 51%, having declined during the previous two decades. Highway capital outlays per capita in the Midwest grew 65%.

Eberts said that in recent years, capital outlays for highways (on a per capita basis and adjusted for inflation) have increased considerably for the U.S. and the Midwest. From 1980 to 1992, highway capital outlays per capita increased 51%, having declined during the previous two decades. Highway capital outlays per capita in the Midwest grew 65% during this period. Some of this faster growth in per capita outlays in the Midwest is associated with a faster increase in the use of highways. Vehicle miles per person rose 35% in the Midwest, compared with 31% nationwide. The result is a 22% increase in highway outlays per vehicle miles for the Midwest versus a 15% increase for the U.S.

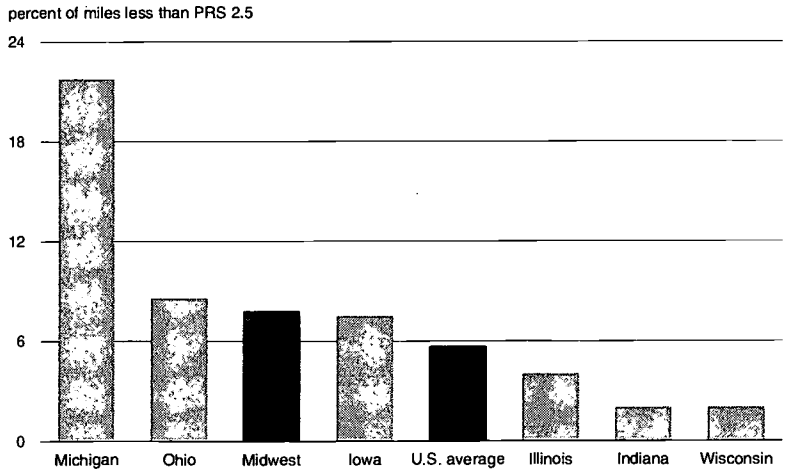
There is considerable variation in the quality of Midwest highways and the level of highway congestion (see figures 5 and 6). According to 1992 interstate highway assessments, Midwest states had some of the worst and some of the best stretches of interstate highways. Among all states, Michigan had the highest percentage of its interstate highways in poor condition; about 25% of its interstate system was rated as needing attention immediately or within the next few years. Wisconsin had the lowest percentage of interstate that needed immediate attention. Wisconsin had the highest percentage of miles of congested urban interstates at peak hours, while Indiana had the lowest among Midwest states, according to recent Federal Highway Administration statistics.

Figure 5 Congestion on Urban Interstates



Source: See figure 4.

Figure 6 Interstate Pavement Condition



Source: See figure 4.

Highways and Economic Development

There is little doubt that highways are essential for economic development. Highways are the primary means by which businesses transport their products and markets are linked together. More than 70% of goods manufactured in the U.S. are transported by trucks along the nation's highways. Well maintained highways are critical for cities and states to attract and retain business. CEOs list access to major highways as a key factor in location decisions.

Well maintained highways are critical for cities and states to attract and retain business. CEOs list access to major highways as a key factor in location decisions.

In addition to providing direct services to businesses and households, Eberts noted that highways affect economic performance by enhancing the productivity of other factors of production, such as labor or private capital, and by creating an attractive economic climate. In addition, highway construction stimulates local economies.

Research in recent years has focused on the impact of an additional dollar of highway investment on economic development. Some initial estimates found extraordinary returns to public capital investment, which indicated significant under-funding of public capital stock, particularly highways. These estimates also promised almost immediate payback in terms of higher output growth from investment in public capital. Eberts suggested that recent refinements to these estimates show a much more modest overall impact of additional highway investment on economic productivity. While consensus has yet to be reached, recent studies indicate that a 1% increase in highway capital stock reduces business costs by 0.06% to 0.08%. These estimates vary by industry. For industries such as primary metals and motor vehicles, which are concentrated in the Midwest, a 1% increase in highway capital stock reduces costs 0.22% and 0.19%, respectively (see table 9). Infrastructure investment alone may not be sufficient to stimulate growth. However, for regions that experience bottlenecks and congestion, additional investment to make the highway transportation system more efficient could enhance regional productivity and competitiveness.

In examining the role of state and local governments in economic development, it is important to consider the benefits businesses and households receive as well as the costs they incur. Presenting a balanced view of the fiscal package can help local governments allocate resources in a way that best serves the needs of businesses and households, thereby creating an environment for growth.

Table 9 Public Capital Elasticities

Industry	
Primary metals	-0.22
Printing & publishing	-0.20
Instruments	-0.19
Motor vehicles	-0.19
Stone, clay, and glass	-0.18
Petroleum refining	-0.17
Fabricated metals	-0.17
Rubber and plastics	-0.16
Machinery, ex electrical	-0.16
Chemicals	-0.16
Electrical machinery	-0.15
US total economy	-0.04
Transportation & warehousing	0.03
Construction	0.07

Source: Randy Eberts, "Infrastructure's Role in Economic Development," presentation prepared for the workshop "Designing State–Local Fiscal Policy for Growth and Development," held at the Federal Reserve Bank of Chicago, July 17, 1996.

Conclusion

The fiscal condition of Midwest state and local governments has surely been bolstered by the region's economic resurgence. On average, state–local fund balances are solid and debt levels are far removed from danger zones. What role did the region's fiscal behavior exert on its economic turnaround? While there is no definitive answer, most accounts suggest that state–local governments responded to economic misfortunes with a successful blend of measured prudence and bold innovation. Excessive debt, which might have impeded recovery, was largely avoided. Governments were sufficiently aggressive in cushioning personal hardships and maintaining investment in education and infrastructure, while designing programs to regenerate growth and development.

Most accounts suggest that state–local governments responded to the Midwest's economic misfortunes with a successful blend of measured prudence and bold innovation.

The relatively healthy fiscal condition of the Midwest's governments has allowed them some room to reconsider their tax and spending policies. Such reconsideration seems all the more appropriate, given the federal government's efforts to devolve responsibility to the states in many service areas, such as labor training and social welfare. Midwest state governments have been at the forefront in crafting new forms for delivering social services and in nudging the federal government to transfer authority for such services to the states. In some cases, the transfer requires that state–local revenues grow sufficiently to meet added service provision responsibilities, thereby putting a premium on the efficiency and equity of state revenue structures. Accordingly, state–local governments continue to examine their tax structures and policies, with an eye to the implications for continued growth and development.

There are two types of tax policies being used by state and local governments to boost or maintain growth, development, or economic well-being. The first is selective tax abatements and special services, awarded to industries and, more commonly, to individual firms, which have been proliferating over the past 30–40 years. The second is a general tax structure that will encourage and not unduly inhibit development.

Evidence from state boundary communities, where taxes and regulations differ while other factors are the same, suggests that fiscal policies can play a significant role in the location of employment and investment.

There are not many analysts or observers who believe that subnational tax and spending policies exert a great deal of influence on investment location decisions. Both site-relocation firms and academic analysts point to other issues, such as quality of life and quality of labor force, as paramount to new firms and expanding businesses. Nonetheless, subnational governments continue to search for and experiment with tax and spending policies that they hope will boost growth and well-being in their communities. While it is true that land, labor, and access to markets overwhelm tax considerations, subnational governments have a lot more control over their own fiscal policies than over these other investment considerations. Furthermore, evidence from state boundary communities, where taxes and regulations differ while other factors are the same, suggests that fiscal policies can play a significant role in the location of employment and investment.

The public is often misled into viewing the rewards of development programs in terms of often-reported jobs created.

Many of the points of contention arise when subnational governments appear to become *too* mindful of the development implications of their actions. While analysts and experts may have a measured idea of the influence of taxes on development, policymakers and elected officials may instead act on the *perceptions* of the voting public who, in turn, tend to overstate the efficacy of tax policy. As a result, subnational governments are often accused of being overzealous in bidding down general taxes on business or, more commonly, in granting selective abatements to individual, and perhaps highly visible, companies. Observers such as Courant believe that the public is often misled into viewing the rewards of development programs in terms of often-reported jobs *created.* Because immediate job effects associated with development programs are often illusory or offset by attendant job losses, Courant recommended that a more general measure, such as the general welfare used in cost-benefit analysis, be used to evaluate development programs. Some workshop participants argued that sunshine laws requiring states to disclose better information would allow more credible program evaluations of selective abatement-type tax policies.

Over the past 40 to 50 years, state–local spending has shifted away from basic infrastructure toward health, education, and welfare.

Other observers, including Burstein and Rolnick, believe that subnational governments are overzealous because, despite the costs and risks, the competitive nature of the economic development game prevents them from exercising unilateral restraint; to do so invites economic decay. Mutual compacts among states to forego the use of selective abatements have not worked. Burstein and Rolnick proposed that subnational governments should be restricted in their ability to use selective abatements. Otherwise, abatements that are effective in influencing investment decisions are likely to damage national economic productivity by relocating firms to locales to which they are not physically suited.

Defenders of selective abatement policy argue that the very *selectiveness* of such tax incentives can be a virtue. For example, Bartik argued that those communities experiencing intransigent unemployment (or underemployment) can use tax abatements to employ local residents. Toft pointed out that selective abatements can be used, not to create distortions favoring selected firms and industries, but to overcome existing distortions and deficiencies in the tax code which stifle particular industry sectors. The alternative—correcting the existing tax code—is often politically unworkable. Toft suggested that selective abatements can also be used to foster industry clusters—groups of related firms in close geographic proximity that can benefit states by creating higher multiplier effects in the local economy. However, further research is needed to establish whether industry clusters offer the benefits often ascribed to them and whether abatements are necessary to encourage their development.

Preliminary evidence from research by Peters and Fisher suggests that states and localities experiencing soft labor markets in the recent past have not shown any greater tendency to use tax incentives. Further study is needed to corroborate their results and further refine measures of local labor market conditions and terms of employment. Similarly, it may be premature to propose the use of tax incentives as a *second-best policy* tool to correct a distorted tax code. What particular features of the political landscape would prevent a *first-best* solution—an evenhanded and neutral tax climate?

Addressing the need for a general tax code that is neutral and even handed, Oakland and Testa and Kitchen proposed a state–local tax system in accord with the benefit principle. Business taxation should be imposed in a neutral way on business investment, and government spending for business services should be thought of as a *fifth factor of production.* Business should be taxed in proportion to state–local spending on services provided to business, such as transportation, public safety, and fire protection. A general tax on the value added of the business sector by place of origin is one approach. In this way, goods produced by the business sector would be priced to include the cost of government services. More importantly, there would be a dialog between the electorate and the government on delivery of services valued by business, allowing government to play its proper and vital role in state–local growth.

Further research is needed to evaluate these recommendations. As Eberts noted, the benefits accruing to individual firms and industries are not so easily discerned as their tax liability. Accurately recording the externalities associated with many state–local government services is often a difficult task. In the meantime, state–local governments will need to look beyond tax policy to the composition of their spending. Over the past 40 to 50 years, state–local spending has shifted away from basic infrastructure toward health, education, and welfare. At the same time, studies of the relationship between infrastructure spending and regional growth initially suggested very significant stimulative effects. Recent studies have shown more modest, yet still significant, contributions from infrastructure spending to business cost reductions and productivity. One such study suggests that highway spending may be particularly important to industries concentrated in the Midwest, such as steel and motor vehicles. Still, the wide range of results to date implies the need for additional research if accurate policy recommendations are to be made.

About the Workshop

Correspondence related to the July 17 workshop should be directed to conference coordinator, Richard Mattoon, senior economist in the Research Department at the Federal Reserve Bank of Chicago. Participants in the workshop included the following:

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Workshop Agenda

The workshop "Designing State–Local Fiscal Policy for Growth and Development" was held on July 17, 1996, at the Federal Reserve Bank of Chicago, 230 S. LaSalle St., Chicago, IL 60604.

I. Welcoming Remarks

William C. Conrad, Federal Reserve Bank of Chicago

II. An Overview of Midwest Tax Climate and Fiscal Position

Richard H. Mattoon, Federal Reserve Bank of Chicago

III. Do State Policies Matter?

Regional Fiscal Policies: Overview and Issues
William F. Fox, University of Tennessee

Interjurisdictional Business Tax-Cost Differentials in the Midwest
James Papke, Purdue University

Impacts of Retail Taxes on the Illinois–Indiana Border
Lawrence DeFranco and William Lilley, InContext Inc.

The Effects of State Policies on the Location of Industry: Evidence from State Borders
Thomas J. Holmes, Federal Reserve Bank of Minneapolis and University of Minnesota

A View from Business
Bob Ady, PHH Fantus

IV. Do Politicians Structure Taxes to Encourage Growth?

Industrial Incentives: The Pattern of Competition Among U.S. States and Cities
Peter S. Fisher and Alan H. Peters, University of Iowa

Observations from State Tax Commission Studies
1. *Bob Tannenwald,* Federal Reserve Bank of Boston
2. *Therese McGuire,* University of Illinois Institute of Government and Public Affairs

V. How Would You Know a Good Economic Development Policy If You Tripped Over One?

Paul N. Courant, University of Michigan

VI. Is There a Role for Regional Tax Policy?

A Proposal to Prohibit Selective Abatements
Art Rolnick and Mel Burstein, Federal Reserve Bank of Minneapolis

Prescriptions for Incentive Policy
Tim Bartik, UpJohn University

Indiana's Use of Abatements
Graham Toft, Indiana Economic Development Council

Open Discussion

VII. Business Services and Infrastructure

State-Local Taxation and the Benefits Principle
William H. Oakland, Tulane University
William A. Testa, Federal Reserve Bank of Chicago

Subnational Business Taxation and Business Services in Canada
Harry M. Kitchen and Enid Slack, Trent University

An Update on Growth-Infrastructure Studies, and Preliminary Data on the Stock of Midwest Infrastructure
Randy Eberts, Upjohn Institute

Open Discussion

About the Project

The Federal Reserve Bank of Chicago is undertaking an extensive analysis of the Midwest economy. The goal of the project is to understand the Midwest's turnaround in economic performance since the early 1980s. In the Seventh Federal Reserve District—which includes Iowa and large portions of Illinois, Indiana, Michigan, and Wisconsin—unemployment rates are, at the time of this writing, lower than at any time since the 1977–78 period, as well as being below the national average.

The Midwest project will involve a series of workshops and research studies which will be carried out by Federal Reserve analysts and other researchers from the region. An advisory board representing a cross-section of Midwest leaders will provide guidance for the project (see back page). Workshops scheduled for 1996 will consider (1) the economic performance of the broad Midwest economy and the transformation of its manufacturing industries; (2) the rural economy of the Midwest; (3) labor force training and education; (4) global linkages with the region's economy; and (5) tax, spending, and regulatory influences on regional performance. The findings of the workshops will be communicated through a series of publications and broad public forums. The project will conclude with a conference and publication toward the end of 1996.

At the Bank, the "Assessing the Midwest Economy" project is being conducted through a cooperative effort of the Office of the President, Michael H. Moskow, president; Research Department, William C. Hunter, senior vice president and director of research; and Community and Information Services, Nancy M. Goodman, senior vice president.

Inquiries should be directed to William A. Testa, senior economist and assistant vice president, Research Department, or James Holland, public affairs officer.

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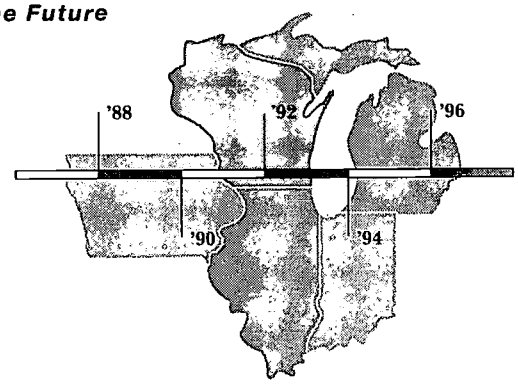
Number 6

ASSESSING THE MIDWEST ECONOMY

Looking Back for the Future



Global Linkages to the Midwest Economy

Sixth in a series of workshops held at the Federal Reserve Bank of Chicago.

An examination of the global linkages between an expanding world economy and the midwestern United States economy was the focal point of a September 18, 1996, workshop held at the Federal Reserve Bank of Chicago. This was the sixth in a series of workshops held during the past year in conjunction with the economic research department's Assessing the Midwest Economy project.

The workshop addressed a broad range of topics. The morning sessions focused primarily on issues related to international trade flows, exchange rate developments, and the impact of regional trade agreements. The afternoon sessions examined the importance and impact of foreign investment in the Midwest. The workshop concluded with a panel discussion on issues facing policymakers charged with the responsibility of facilitating and promoting international sector growth in a regional context.

Federal Reserve Bank
of Chicago

Introduction

The workshop was opened by William (Curt) Hunter, senior vice president and research director at the Federal Reserve Bank of Chicago. Hunter noted that the research department project, Assessing the Midwest Economy, aims to increase our understanding of the dramatic economic turnaround in the region. The Federal Reserve Bank of Chicago, in cooperation with other institutions, embarked on this project to identify public policy directions that will enable the region to sustain its recent run of good economic fortune and provide a sound footing for the region's businesses in shaping their investment and work force decisions.

While most observers are coming to appreciate the fact that global trade and investment have grown, Hunter posed the question: Just how important is global trading to the Midwest's economic welfare, especially within a large market such as the U.S. where industry can achieve a high degree of specialization based solely on internal trade? Are there other reasons, aside from growing trade volume per se, that the Midwest needs to become more fully integrated in world markets? Some observers suggest that the flow of ideas and technology is really what's at stake, said Hunter, while others maintain that participation in global markets has a beneficial competitive effect that keeps home industries on the right technological path of growing productivity.

Just how important is global trading to the Midwest's economic welfare, especially within a large market such as the U.S. where industry can achieve a high degree of specialization based solely on internal trade?

Hunter observed that earlier workshops in the series had addressed the lowering of trade, investment, and factor flow barriers in markets *within* the U.S., for example, between states and regions. If wealth creation and specialization have been achieved through low barriers and open internal markets, doesn't it make sense to continue to focus regional policies on the elimination of explicit or implicit tariffs and nontariff barriers to trade and the promotion of labor mobility and a well-crafted transportation system? After all, such policies are being pursued by many of our foreign trading partners, such as the European Union.

Hunter stated that bringing the policy implications of the workshop findings back to the regional and local level presented the greatest but most important challenge. The workshop's concluding panel discussion would showcase the Chicago area as a case study as to how local areas might respond to the trends of globalization. Hunter recalled that the Atlanta area, where he previously resided, paralleled the Chicago area in many ways, especially in aspiring to be an international business and cultural center. While the Chicago area's ambitions have not yet included the Olympic Games, other Atlanta highlights, such as having one of the world's busiest airports and serving as a major convention destination and a center of international business, are already part of the Chicago environment. Atlanta's success as an international center, Hunter said, involved many years of continuous cooperation among leaders throughout the metropolitan area, the state of Georgia, and the business community. Finally, Hunter said that he looked forward to his own involvement in Chicago's efforts and that the Chicago area held much promise in this regard; Chicago is well on its way to being an *international* city.

International Trade—Importance to the Midwest

Foreign Exports, Domestic Exports, and the Illinois Economy

In the first presentation of the workshop, Illinois was offered as a case study of how the recent boom in manufactured exports is transforming the Midwest economy. Philip Israilevich, a senior regional economist and research officer at the Federal Reserve Bank of Chicago, and Geoffrey Hewings, director of the Regional Economics Applications Laboratory (REAL) and professor of geography at the University of Illinois at Urbana–Champaign, have constructed unique models of the structure and behavior of Midwest states over time. Most recently, they addressed how Illinois exports are shifting the composition of employment and output by industry and how exports are influencing the composition of labor force occupations.

From 1987 to 1994, manufactured exports from Illinois to foreign countries (measured in dollars of constant purchasing power) increased by almost $8 billion dollars, or 92%.

In his presentation, Israilevich observed that from 1987 to 1994, manufactured exports from Illinois to foreign countries (measured in dollars of constant purchasing power) increased by almost $8 billion dollars, or 92%. As a result, exports now comprise a more significant share of the state's total output (see table 1)—10.5% in 1994, compared with 6.4% in 1987. Rates of growth varied markedly by industry. However, in terms of sheer volume and value of exports, much of these gains were realized in the state's mainstay industrial sectors: processed food products, industrial machinery and equipment, electronic equipment, transportation equipment, and instruments and related products.

Each dollar of foreign exports from Illinois was calculated to induce more than an additional dollar of output growth in the state. However, these export "output multipliers" appear to have edged downward over the period 1987–94. Israilevich and Hewings attribute this trend to changing relationships among industries in Illinois. Over time, Illinois industries have been relying less on each other for intermediate parts, products, and equipment purchases. For this reason, according to Israilevich, an additional dollar's sale of foreign exports no longer induces the same high volume of intermediate or forward-linked purchases in Illinois. Exports induce relatively more employment than output (see figure 1). Manufactured products are being produced using more service activities within manufacturing companies and also as manufacturers purchase service inputs from business service providers within the state. For this reason, an incremental dollar increase to foreign export sales by Illinois manufacturing industries tends to boost service employment to a greater extent today than it did in 1987.

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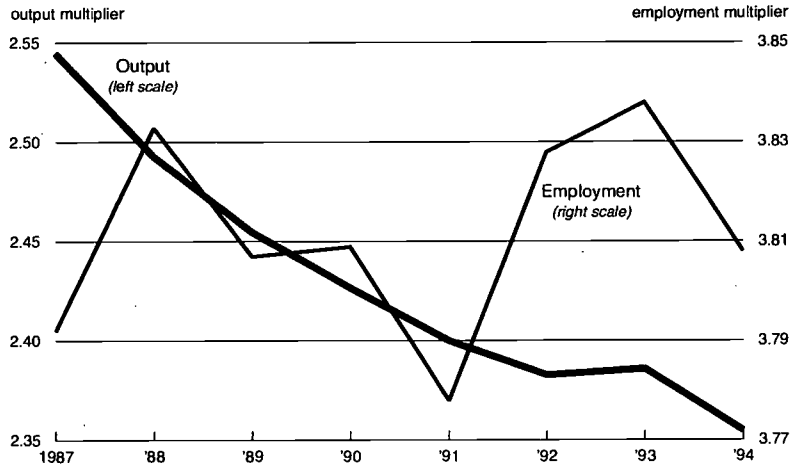
Table 1 Illinois Exports by SIC, 1987 and 1994, in Millions of 1987 Dollars

Sector	1987	1994	Percent Change
Food and Kindred Products (20)	462.9	741.5	60.2
Tobacco Products (21)	1.5	0.6	–61.4
Apparel and Textile Products (22, 23)	32.9	83.6	154.1
Lumber and Wood Products (24)	5.4	45.6	748.4
Furniture and Fixtures (25)	22.3	84.0	276.1
Paper and Allied Products (26)	51.2	241.7	371.8
Printing and Publishing (27)	294.9	273.6	–7.2
Chemicals and Allied Products (28)	957.7	1,990.6	107.8
Petroleum and Coal Products (30)	101.2	48.5	–52.1
Rubber and Misc. Plastics Products (30)	216.2	418.2	93.4
Leather and Leather Products (31)	14.8	26.2	77.6
Stone, Clay, and Glass Products (32)	77.8	139.6	79.5
Primary Metals Industries (33)	169.4	371.3	119.2
Fabricated Metal Products (34)	373.5	617.1	65.2
Industrial Machinery and Equipment (35)	3,370.4	4,520.2	34.1
Electronic and Other Electric Equipment (36)	1,113.7	3,850.1	245.7
Transportation Equipment (37)	636.3	1,682.0	164.3
Instruments and Related Products (38)	350.4	766.8	118.8
Miscellaneous Manufacturing Industries (39)	218.8	373.9	70.9
Total	**8,471.5**	**16,275.3**	
Rates of Change		**13.7%**	**92.1%**

Source: Philip R. Israilevich and Geoffrey J. D. Hewings, "Foreign Exports, Domestic Exports, and the Illinois Economy," presentation prepared for the workshop, "Global Linkages to the Midwest," Chicago, IL, September 18, 1996.

Figure 1 Output and Employment, Export-Induced Multipliers



Source: Philip R. Israilevich and Geoffrey J. D. Hewings, "Foreign Exports, Domestic Exports, and the Illinois Economy," presentation prepared for the workshop, "Global Linkages to the Midwest," Chicago, IL, September 18, 1996.

Although the employment effects from sales of manufactured exports have helped to forestall the trend, the share of manufacturing payroll jobs in Illinois declined from 16.1% in 1987 to 14.4% in 1994.

Although the employment effects from sales of manufactured exports have helped to forestall the trend, the share of manufacturing payroll jobs in Illinois declined from 16.1% in 1987 to 14.4% in 1994. This change is consistent with the fact that U.S. (and Midwest) productivity gains continue to be characterized by labor saving in the manufacturing sector. Similarly, export growth is helping to reshape the distribution of occupations in the Illinois labor force. In sum, according to Israilevich, manufactured export growth has tended to preserve production, craft, and repair occupations, along with occupations classified as operators, fabricators, and laborers.

Taking a different tack on the importance of growing export markets and their impact on the region, Carlos Barbera, director of the international trade division of the state of Indiana, reported on efforts by Indiana's state development agency to respond to the increasingly global business environment. Recognizing the growing importance of foreign markets for Indiana's businesses, the agency is redefining its approach to economic development. According to Barbera's experience, the reactions of business to the growing internationalization range from welcoming a chance to increase sales by entering new markets to anxiety about the potential threats posed by competition from abroad. However, a recent study by Indiana University shows that 88% of the new jobs created in Indiana between 1992 and 1995 were related to exports; in addition, wages for export-related jobs were 5.5% higher than for non-export-related jobs.

Eighty-eight percent of the new jobs created in Indiana between 1992 and 1995 were related to exports; in addition, wages for export-related jobs were 5.5% higher than for non-export-related jobs.

Indiana's state development agency aims to encourage Indiana businesses to enter foreign markets, thereby reducing their exposure to the business cycle in the domestic economy. The agency's strategy of providing critical information to businesses entering export markets includes the following goals:

- To create a greater awareness of opportunities to export products to foreign markets through publication of a newsletter, hosting round tables, and sponsoring export-showcasing conferences.
- To become better acquainted with the business clientele in order to better provide focused export tools, especially for small and medium-sized businesses.
- To work hand in hand with businesses in order to help them gain entry into foreign markets. This effort is substantially furthered by a number of export promotion offices that the state of Indiana operates in Europe, Asia, and Latin America.

The strong growth we have observed in the last few years in U.S. exports to developing countries is the result of a growth phenomenon and not an exchange rate effect.

Commenting on Barbera's presentation, Brad Jensen, an economist at the U.S. Bureau of the Census, said the Census Bureau's research indicates that while plants that engage in export activity tend to perform better than other plants, with higher sales growth, productivity growth, and wage growth, the differences among plants tended to precede the initialization of export activities. In addition, he observed that, over time, there seems to be a large movement into and out of the category, "engaged in exports."

Gary Scott, deputy consul general and senior trade commissioner at the Canadian Consulate General of Chicago, said that the Canadian government has made the development of exporters a national goal; it intends to double the number of exporters through a series of programs.

Discussing the rise in U.S. exports, David Walters, chief economist and assistant U.S. trade representative for economic affairs at the Office of the U.S. Trade Representative, said that a foreign country's demand for imports is a function of the demand conditions in that country, as well as the exchange rate influence. He suggested that the strong growth we have observed in the last few years in U.S. exports to developing countries is the result of a growth phenomenon and not an exchange rate effect.

Doug Roberts, treasurer of the state of Michigan, related Michigan's perspective on recent developments in exports and foreign direct investment (FDI). While the U.S. is less reliant on trade than some of its trading partners (see figure 2), the importance of trade has grown steadily over the last several decades. For example, in 1970, exports represented 6.8% (and imports 5.9%) of U.S. gross domestic product (GDP); by 1995 exports' share had grown to 13.4% (and imports' share to 14.9%).

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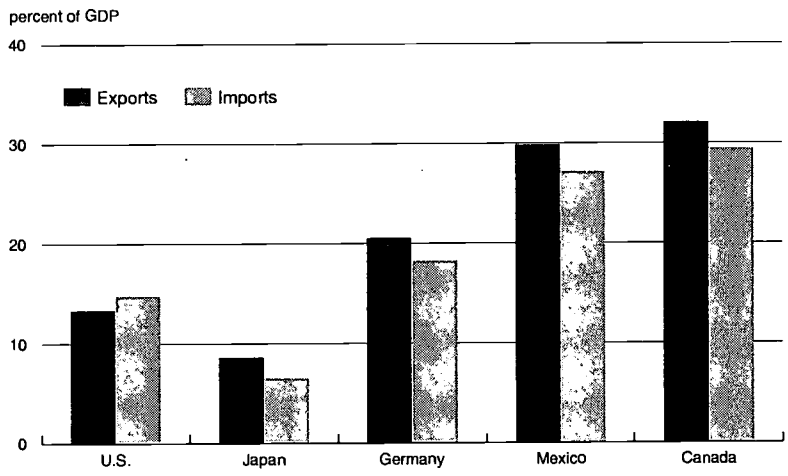
Figure 2 U.S. Reliance on Trade, Merchandise Imports and Exports, 1995



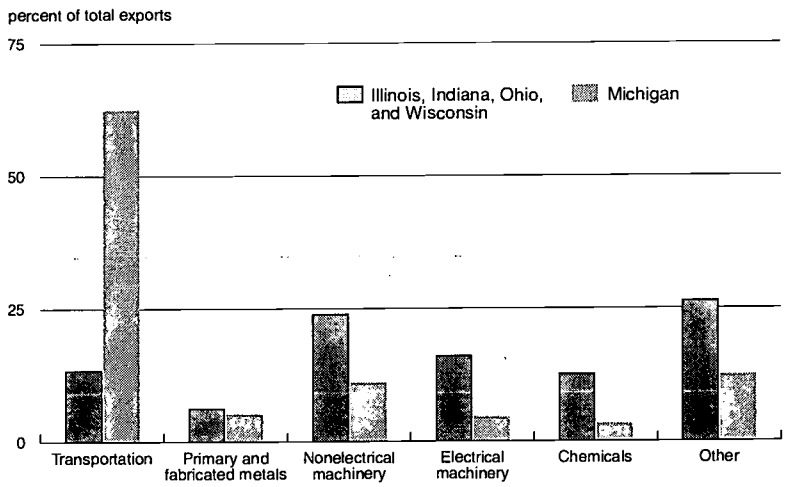
Source: Doug Roberts, reactor comments prepared from data obtained from U.S. Department of State, *Country Reports on Economic Policy and Trade Practices*, for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

Any change in the value of the dollar relative to the yen has fundamental effects on the automobile sector, because it affects the cost difference of producing U.S.-made versus imported vehicles.

Roberts noted that Canada is Michigan's largest export market. Not surprisingly then, Michigan was also the largest North American Free Trade Agreement (NAFTA) trader among the 50 states in 1995. What distinguishes Michigan from the other midwestern state is the fact that transportation equipment is its dominant export sector (see figure 3). In terms of the sensitivity of the state's industry to exchange rate movements, Roberts pointed out that the relationship between the U.S. and Japanese currencies swamps other exchange rate effects. Any change in the value of the dollar relative to the yen has fundamental effects on the automobile sector, because it affects the cost difference of producing U.S.-made versus imported vehicles. Recently, the depreciation of the dollar against the yen has helped the U.S. auto industry reestablish market share relative to imports.

Roberts concluded that as state treasurer he not only watches the state's economy from an international trade point of view, but as he holds fiduciary responsibility for the state's pension funds, he must increasingly take an investment perspective on international issues.

Figure 3 Composition of Michigan and Great Lakes Exports, 1995



Source: Doug Roberts, reactor comments prepared from data obtained from U.S. Department of Commerce for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

Exchange Rates Changes Look Different When Viewed from the Midwest

Jack Hervey, a senior economist at the Federal Reserve Bank of Chicago, observed that he was pleased to hear Roberts' comments on the importance of exchange rates, for he felt strongly about the necessity of closely identifying the issues when talking about exchange rate changes. Hervey emphasized the importance of that rigor when interpreting the results of the study he presented. The work, done jointly with William Strauss, also a senior economist at the Federal Reserve Bank of Chicago, examined changes in the dollar exchange rate from a regional perspective. A common view, espoused during the past decade, is that the resurgence of Midwest manufacturing since the mid-1980s has been importantly dependent on manufacturing's increased competitiveness in export markets. Proponents maintain that this increased competitiveness was strongly supported by the sharp depreciation of the dollar during 1985–87 and the more gradual depreciation since then. Hervey and Strauss disagree; they put forward the unorthodox view that except for the "aberration" in exchange rate markets during 1980–87, Midwest manufactured goods exports (especially durable goods exports) have faced an appreciating dollar exchange rate since 1974.

In 1993–94, the Midwest exported 43% of its manufactured exports to Canada and 13% to Mexico markets in which the U.S. dollar appreciated.

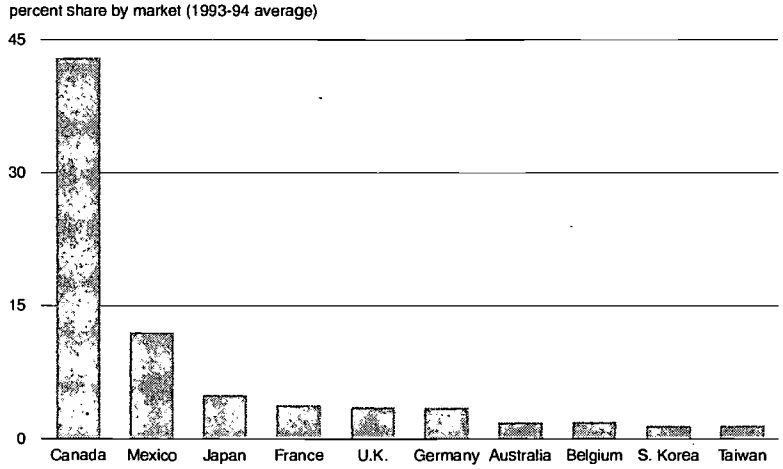
By comparison, the U.S. shipped 23% of manufactured exports to Canada and about 10% to Mexico.

In setting the stage, Hervey presented a historical perspective of exchange rate movements, highlighting two common aggregate dollar indexes—the Federal Reserve Board's *Trade-Weighted Dollar Index* (FRB-TWD) and the J.P. Morgan *Real Broad Effective Foreign Exchange Index* for the dollar (JPMr). Hervey indicated that both of these indexes support the contention that the dollar has depreciated over the period 1970 to mid-1996. He also noted, however, that the JPMr index remained virtually flat during the period 1988–96.

Why should we be interested in a regional U.S. exchange rate? All states or aggregations of states (regions) face a common U.S. monetary policy, a common currency, and a common international border. Hervey noted, however, that different regions have different industrial mixes and foreign markets. In 1993–94, for example, the Midwest (Illinois, Indiana, Michigan, Ohio, and Wisconsin) exported 43% of its manufactured exports to Canada and 13% to Mexico—markets in which the U.S. dollar appreciated (see figure 4). A little over 5% of Midwest manufactured exports went to Japan and 13% went to Europe—markets in which the U.S. dollar depreciated. By comparison, the U.S. shipped 23% of manufactured exports to Canada and about 10% to Mexico (see figure 5). About 10% of U.S. manufactured exports went to Japan and 17% went to European markets. In short, markets in which the dollar was appreciating were considerably more important for the Midwest than for the U.S. overall.

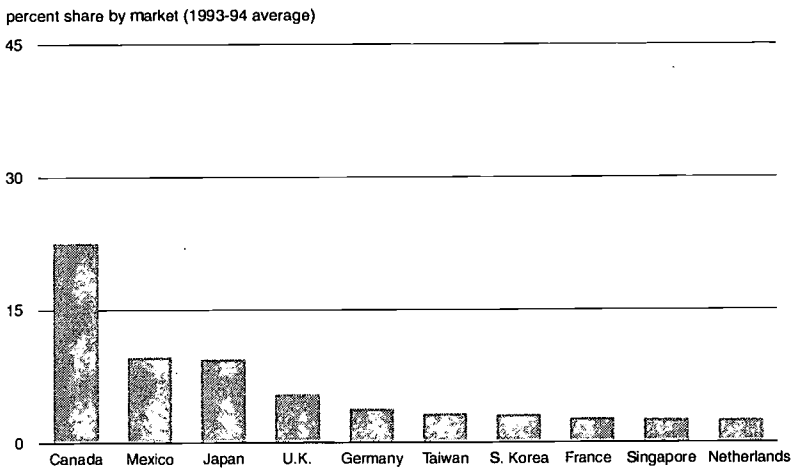
Hervey and Strauss explored this issue by constructing an aggregate export-weighted dollar exchange rate index for eight geographical regions of the U.S., plus an aggregate export-weighted index for the U.S. overall. They contend that a dollar index of this type facilitates the examination of exchange rate movements in an environment where, over time, the dollar is observed to depreciate against some currencies (such as the Japanese yen or the German mark), appreciate against some currencies (such as the Canadian dollar or Mexican peso), and remain virtually unchanged against others (a number of developing country currencies). At this stage, interpretation of their work must be strictly limited to *exports* of manufactured goods, because data that would allow them to make broader statements about regional exchange rates relative to domestic markets are not readily available. Hervey and Strauss indicated that they are working on an extension of the study that will permit the addition of an import competitiveness measure.

Figure 4 Midwest Exports—Total Manufactured Goods



Source: Jack L. Hervey and William A. Strauss, "A Regional Export-Weighted Dollar: A Different Way of Looking at Exchange Rate Change," data compiled from Massachusetts Institute for Social and Economic Research, "MISER," *State of Exporter Location Data*, Series 2, 1993 and 1994, for a presentation prepared for the workshop, "Global Linkages to the Midwest," Chicago, IL, September 18, 1996.

Figure 5 U.S. Exports—Total Manufactured Goods



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Except for the 1980–88 blip in the dollar exchange rate, Midwest exporters, on average, have faced an appreciating trend in the dollar since early 1974.

Midwest manufacturing exporters have become more competitive in export markets during the past ten to 15 years.

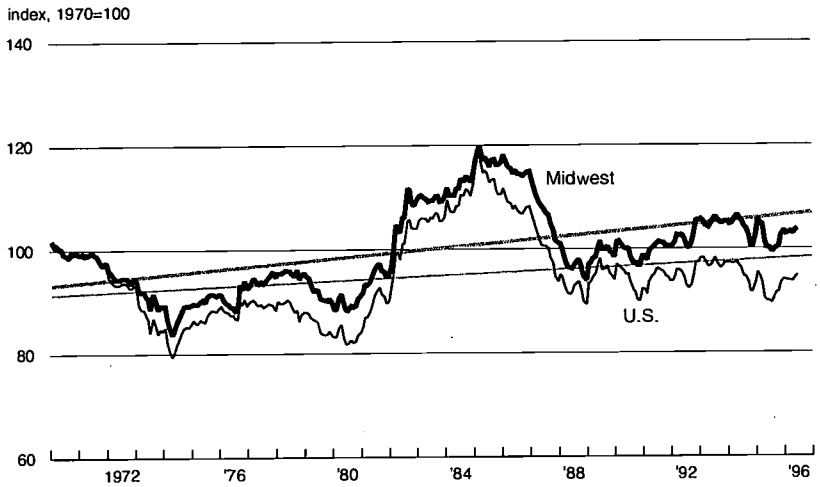
In addition to the nine exchange rate indexes, Hervey and Strauss aggregated manufacturing industries (by two-digit SIC codes) into three groupings—durable goods, nondurable goods, and total manufactured goods. Finally, the indexes are adjusted for relative wholesale price level changes between the U.S. and the 44 countries included in the indexes.

The indexes show marked differences across regions in terms of the aggregate exchange rate faced by manufactured goods exporters. Hervey and Strauss suggest that, contrary to popular perception, in the aggregate Midwest manufactured goods exporters (due to the composition of the foreign markets they serve and their heavy concentration in durable goods industries) have faced an appreciating dollar since the late 1980s. Furthermore, they maintain that except for the 1980–88 blip in the dollar exchange rate, Midwest exporters, on average, have faced an appreciating trend in the dollar since early 1974. This is most apparent for durable goods exports; as of June 1996, the aggregate real dollar exchange rate faced by Midwest durable goods manufacturers stood 4% higher than in 1970 (well before the initial formal devaluation of the dollar), 17% higher than in 1974 (following two formal dollar devaluations and the subsequent *floating* of the dollar), and nearly 7% higher than the average for 1988 (see figure 6).

Summing up, Hervey acknowledged that Midwest manufacturing exporters have become more competitive in export markets during the past ten to 15 years. Export growth has been an important part of the resurgence of Midwest manufacturing. Hervey also suggested that restructuring may have been more effective than is commonly thought. Given the foreign markets served by Midwest manufacturing, it appears that the region's increased competitiveness in export markets has been accomplished without the help of a depreciating dollar. Indeed, Midwest manufacturing has become more competitive in export markets in the face of an appreciating real dollar.

Responding to Hervey's presentation, Thomas Klier, a senior economist at the Federal Reserve Bank of Chicago, said the findings seem to suggest that the productivity effects of implementing advanced manufacturing technologies and restructuring productic relations within and between plants may have been much more prevalent and effective than

Figure 6 Regional Exchange Rate Indexes, Midwest and U.S., durables



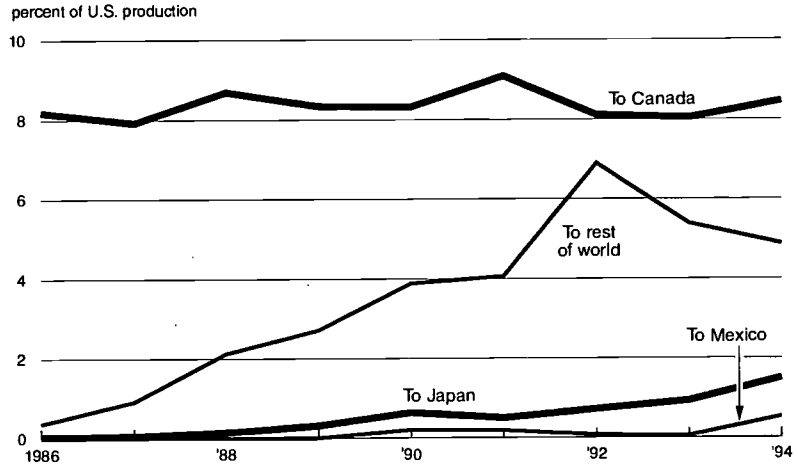
Source: Jack L. Hervey and William A. Strauss, "A Regional Export-Weighted Dollar: A Different Way of Looking at Exchange Rate Change," presentation prepared for the workshop, "Global Linkages to the Midwest," Chicago, IL, September 18, 1996.

The U.S. automobile industry, concentrated in the Midwest, is essentially dominated by competition from imports and not exports.

previously thought. Klier offered two caveats to interpreting the numbers presented by Hervey. First, in carving up the country into separate regions, one ignores economic linkages that exist across these regions. To the extent that, say, products produced in the Midwest are used as inputs by plants located in other regions and shipped abroad from there, the exchange rate index for the Midwest misrepresents this region's exposure to exchange rate fluctuations. Second, as information on import weights is currently not available to the authors, their index cannot capture important elements of the Midwest's story. For example, the U.S. automobile industry, concentrated in the Midwest, is essentially dominated by competition from imports and not exports (as discussed earlier by Roberts). In 1986 only 32,000 units of U.S. auto production were exported (excluding shipments to Canada and Mexico). Even by 1995 only about 500,000 units were exported. (See figures 7 and 8.) Changes in the competitiveness of the domestic auto industry have been associated with import- rather than export-related factors, like the adoption of *voluntary export restraints* by Japanese producers in the late 1970s and the arrival of the so-called transplant assembly plants, starting with Honda's first plant in Ohio in 1982. The current index needs to be complemented by an import-weighted index, which in all likelihood would portray a different picture.

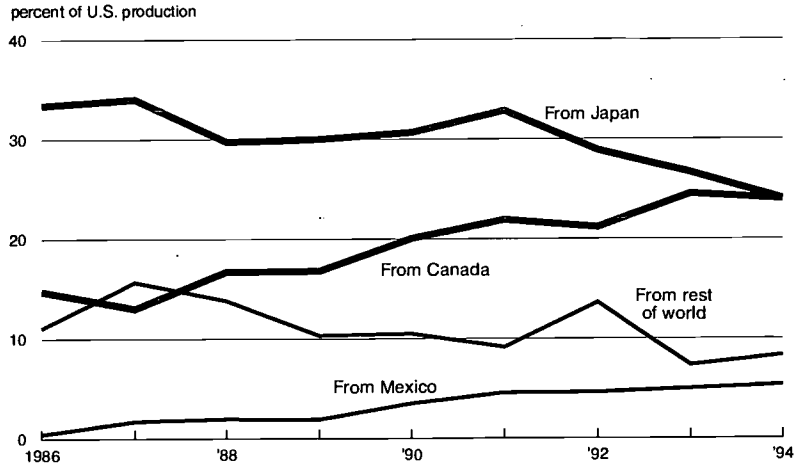
Cletus Coughlin, a vice president at the Federal Reserve Bank of St. Louis, noted the index numbers problem that haunts the various aggregate exchange rate index constructions, including the regional indexes. This is of particular concern the further in time the index moves from the base period, in this case 1993–94. The constant base period assumes that the relative importance of the various markets stays the same over time. This, of course, has not been the case over the period 1970–96. Hervey acknowledged this problem, but noted that the lack of consistent data series for exports by state, by SIC, and by country of destination limited the authors' use of data prior to 1993.

Figure 7 Exports of Passenger Cars



Source: Thomas Klier, reactor comments prepared from data obtained from the American Automobile Manufacturers Association, *World Motor Vehicle Data*, various years, for the workshop, "Global Linkages to the Midwest," Chicago, IL, September 18, 1996.

Figure 8 Imports of Passenger Cars



Source: Thomas Klier, reactor comments prepared from data obtained from the American Automobile Manufacturers Association, *World Motor Vehicle Data*, various years, for the workshop, "Global Linkages to the Midwest," Chicago, IL, September 18, 1996.

As the center of feed grain and oil seed production in the U.S. and an important producer of livestock products and processed food products, the Midwest is an important link in the chain that ties the U.S. economy to its foreign trading partners.

U.S. Agricultural Trade and Its Impact on the Midwest Rural Economy

Agricultural exports currently account for nearly 10% of U.S. goods exports. As the center of feed grain and oil seed production in the U.S. and an important producer of livestock products and processed food products, the Midwest is an important link in the chain that ties the U.S. economy to its foreign trading partners. An examination of the Midwest's ties to the world economy, without reference to the agricultural industry, would be incomplete.

Agricultural exports account for 895,000 jobs nationally, with about one-third of these jobs located in rural areas.

The number of nonfarm jobs supported by agricultural exports substantially exceeds the number of farm jobs.

The impact of agricultural exports on both farm and nonfarm employment in the Midwest was examined by William Edmondson, an economist at the Economic Research Service of the U.S. Department of Agriculture, who reported on a study conducted with Gerald Schluter, Chinkook Lee, and Lowell Dyson, also of the Economic Research Service. Edmondson pointed out that U.S. agricultural exports have risen sharply during the current decade, reaching a record level of $55.8 billion in 1995, an increase of $20 billion since 1988. In general, foreign sales were stimulated by rising overseas demand, a weaker dollar, and trade agreements that further opened international markets to U.S. products. But in contrast to the export boom of the 1970s, which was spurred largely by increased shipments of bulk commodities, such as wheat, corn, and soybeans, the more recent gains were driven by both bulk commodities *and* high-value or processed products, such as red meat, poultry, fruit, and vegetables. Edmondson noted that this development—the change in commodity composition of agricultural exports—presents a special challenge to regions involved in agriculture, since the shift toward high-value agricultural exports implies that the economic benefits associated with foreign sales will move to those states that produce and/or process high-value food products. This has implications for the Seventh Federal Reserve District, he said, since the region is not as well represented in food processing as in the production of bulk commodities.

To gain further insight into the employment effects of agricultural trade in the Seventh District states (Illinois, Indiana, Iowa, Michigan, and Wisconsin), Edmondson and his fellow researchers employed an input–output model. This allowed them not only to estimate the aggregate level of trade-related employment, but also to allocate employment across seven broad economic sectors in rural and metropolitan areas. The seven sectors were livestock, grains and oilseeds, other crops, food processing, manufacturing, transportation and trade, and a residual category for all other sectors. The results indicated that agricultural exports account for 895,000 jobs nationally, with about one-third of these jobs located in rural areas. The impact on rural areas is relatively greater in Seventh District states, with about 40% of the export-related jobs in rural communities. Among the five District states, Illinois reported the most jobs generated by agricultural exports. However, Iowa was more dependent on trade, with a larger ratio of export-supported jobs to total employment. Edmondson emphasized that "the effects of agricultural exports on the economy are not limited to the farm sector, but also affect upstream and downstream sectors linked to agriculture by supplying its inputs and handling its products." The number of nonfarm jobs supported by agricultural exports substantially exceeds the number of farm jobs.

Edmondson concluded by noting that trade liberalization will continue to promote growth in agricultural trade, and that rural areas will probably benefit because they possess a significant share of the industries tied to production and shipping activities. However, metro areas are expected to reap the greater reward, given their overall strength in food processing and the shift in agricultural exports toward high-value products.

In responding to Edmondson's presentation, Mike Singer, an agricultural economist at the Federal Reserve Bank of Chicago, noted that the growth in processed food exports was also influenced by increased demand for convenience by customers, which often accompanies income growth, and improved transportation technology. He suggested that the Midwest will continue to benefit from agricultural exports, not only as producer of grain and livestock products, but also because the region plays an important role in the food manufacturing industries associated with its production strengths.

Singer suggested three extensions to Edmondson's research. First, he suggested that the broad livestock sector of the input–output model be disaggregated into smaller divisions to evaluate the employment impact on the Midwest of recent gains in pork exports. Quantifying the local economic benefits of pork exports would be valuable to policymakers and other participants involved in the debate regarding the desirability of locating *mega* hog farms in the region. Second, a comparison across years could identify industries that exhibit a relatively greater employment response to a change in total agricultural exports or a shift in the composition of agricultural exports. An interesting comparison would be 1981, a year in which agricultural exports reached a cyclical low, versus the record year of 1995. Finally, he suggested the model be used to evaluate the impact of a change in agricultural export policy on Midwest employment. As an example, the current low level of grain stocks and the potential for a poor harvest have led some observers to raise the specter of an embargo on exports of U.S. grain. An evaluation of the consequences of such an action in advance would play an important role in policy discussions.

Regional Perspectives on Trade Agreements

NAFTA's Potential Impact by U.S. Region

During the second morning session, the focus shifted to international agreements and their influence on the economies and trade of the parties involved.

Leading the discussion of this very current and sensitive issue, Michael Kouparitsas, an economist at the Federal Reserve Bank of Chicago, presented the preliminary results of his research on the international and domestic implications of NAFTA. Kouparitsas noted that "although NAFTA has been in place since 1994, it is too early to gauge the long-run impact of its far-reaching trade liberalization program." He added that "it is also difficult to measure the short-run impact of NAFTA because observed short-term fluctuations in North American activity are quite possibly driven by factors other than NAFTA. At this time the only guide to the short- and long-run impact of NAFTA is analysis involving quantitative theoretical models of international trade." Kouparitsas briefly described the current state of this research and the improvements that his approach offered.

At the time of the initial signing of the NAFTA agreement in December 1992, the effective levels of protection from non-tariff barriers (NTBs) were significantly higher than those associated with explicit ad valorem tariffs.

Kouparitsas' approach differs from existing analysis along one important dimension. He works within the framework of a dynamic general equilibrium model, whereas the current research typically employs static models. According to Kouparitsas, his approach provides three improvements over traditional static analyses. First, a dynamic model allows for the endogenous accumulation of physical capital, while static models limit the world supply of capital to that available in the pre-liberalized period. This is important because liberalization is expected to lead to greater capital accumulation and ultimately higher output and consumption. Second, static analysis is limited by the fact that it rules out trade in foreign assets and thereby provides no role for foreign capital inflows. Access to capital markets allows relatively smaller economies, such as those of Canada and Mexico, to maintain smooth consumption paths during the period of adjustment to the liberalized environment. Finally, the greatest advantage of a dynamic model is that it allows the researcher to speculate on the path of adjustment following the implementation of NAFTA and provides a means by which to measure the costs of adjusting to the liberalized environment.

Kouparitsas then described the level of protection and trade patterns that existed at the time of the initial signing of the NAFTA agreement in December 1992. He argued that the effective levels of protection from nontariff barriers (NTBs) were significantly higher than those associated with explicit *ad valorem* tariffs. In most cases the tariff-equivalent NTB rates exceeded their tariff-equivalent counterparts by more than 20 percentage points.

Kouparitsas' discussion of trade flows focused on the low volume of bilateral trade between Canada and Mexico. Using 1992 IMF *Direction of Trade Statistics,* he observed that less than 2% of Mexican and Canadian exports/imports were devoted to trade with each other. These statistics show the importance of U.S.–Canadian and U.S.–Mexican trade to Canada and Mexico. At the same time, they suggest that North American trade is relatively less important to the much larger U.S. economy.

Kouparitsas concluded his presentation by reporting on simulations of his quantitative model of the North American economy. His findings are summarized in table 2. Kouparitsas' model suggests that all three North American economies gain from NAFTA. In fact, he estimates the welfare gain to Mexico to be almost 1% of its pre-liberalization consumption level (i.e, NAFTA is expected to permanently raise Mexico's consumption level by 1%). He noted that the gains in terms of percentage changes are smaller for Canada and the U.S., but quite large in absolute terms. The sectoral analysis predicts that NAFTA will lead to an expansion of all non-primary sectors in Canada and the U.S., whereas the U.S. and Canadian primary commodity sectors are expected to remain at their pre-NAFTA levels. By contrast, all Mexican sectors are predicted to expand under NAFTA. Based on these results, Kouparitsas conjectured that NAFTA would likely have a positive impact on the Midwest region through an expansion of durable goods manufacturing activity.

NAFTA is expected to permanently raise Mexico's consumption level by 1%. The gains in terms of percentage changes are smaller for Canada and the U.S., but quite large in absolute terms.

Commenting on Kouparitsas' presentation, Randy Eberts, executive director of the Upjohn Institute, wondered why the results of Kouparitsas' model show larger effects than those of earlier static models. Kouparitsas said this is because, unlike the static models, his model allows for capital stock accumulation.

Walters suggested Kouparitsas might be better able to gauge the welfare effects of NAFTA through further disaggregation of his model. He remarked that a highly aggregated general equilibrium model cannot measure specialization gains within sectors. Walters maintained that even though a large share of international trade is in fact intra-industry trade, the welfare effects it generates are sensitive to the level of aggregation used in the model.

NAFTA is likely to have a positive impact on the Midwest region through an expansion of durable goods manufacturing activity.

Table 2 Long-Run Effects of NAFTA, Percentage Deviation from Pre-Liberalization Path

	Canada	Mexico	U.S.	Rest of World
Welfare	0.02	0.92	0.11	0.01
Real GDP	0.11	3.26	0.24	0.01
Real Consumption	0.08	2.52	0.25	0.01
Labor Hours	0.07	1.99	0.14	0.00
Real Wage	0.09	2.12	0.25	–0.01
Capital Investment	0.16	5.05	0.37	0.01
Total Imports	0.29	12.47	1.39	0.14
Total Exports	0.37	13.87	1.46	0.02
Foreign Assets/GDP*	1.29	–8.09	–0.14	0.25
Terms of Trade	–0.15	–0.72	–0.04	0.27

**Deviation from pre-liberalization path.*

Source: Michael Kouparitsas, "NAFTA's Potential Impacts by U.S. Region," presentation prepared for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

The NAFTA agreement has received a great deal of attention, pro and con, during the last four years. However, its implementation less than three years ago marked the second phase in a concerted drive to open North American borders. The first phase, involving the U.S. and Canada, began nearly 30 years ago with the U.S.–Canada auto pact (which had significant implications for the Midwest) and continued with the signing of the U.S.–Canada Free Trade Agreement (FTA) in 1989. Two discussions that closed out the morning session dealt with the U.S.–Canada experience.

"Canada is this nation's and the Midwest's largest single export market ... [in 1993 accounting] for over one-fifth of the country's and over 40% of the Midwest's merchandise exports." With that comment, Jane Sneddon Little, assistant vice president and economist at the Federal Reserve Bank of Boston, set the stage for an examination of the FTA.

During the 1989–93 period, Canada was the one part of the industrial world to absorb a growing share of U.S. exports.

A major trade liberalization between two countries holds several potential outcomes, according to Little. Falling trade barriers might encourage the consolidation of production, in one country or the other, as firms attempt to benefit from economies of scale and specialization. Firms may also want to minimize transportation costs and delivery times, which may counter moves to consolidate. But there are tensions between these goals. How has the FTA affected the nature of bilateral trade and investment flows, Little asked, and has the FTA resulted in more trade or more cross-border investment?

Little posed some related questions: How did trade expand following the move to free trade? Was growth based on comparative resource endowments (comparative advantage), or was it through increased intra-industry trade (IIT)? The distinction is important, Little said, because "growing IIT brings efficiency gains to producers in both countries and is thought to be less disruptive." There are fewer *losers* than is the case where the expansion in trade is based on comparative advantage.

The FTA, the first stages of which went into effect January 1, 1989, ends tariffs and removes or reduces many nontariff barriers to trade in goods, services, and capital. The conditions of the agreement are to be implemented over ten years. Little noted that, at the outset, analysts believed that because of its smaller economy and higher tariffs, Canada would gain more (and risk more) than the U.S. Early effects are somewhat masked by the fact that both economies went into recession in 1990. Furthermore, Canada's recession was more serious and its recovery was slower. Meanwhile, the Canadian dollar was depreciating against the U.S. dollar. All of these developments tended to discourage U.S. export growth to Canada. Nonetheless, Little observed that during the 1989–93 period, "Canada was the one part of the industrial world to absorb a growing share of U.S. exports."

Because of the long-standing auto pact and the cyclical influence of the recession on the auto industry, a robust rate of trade growth between Canada and the Midwest during the early stages of the FTA probably should not have been expected.

During the 1989–93 period, several geographical regions of the U.S. showed relatively fast bilateral export growth with Canada—East South Central, West South Central, and New England. Little explained that large differences across regions in the export product mix may account for part of the regional variation in growth rates, as different industries vary in their sensitivity to cyclical developments. In addition, tariff rate reductions across industries were phased in at different times and were more significant for some industries than others. For example, the transportation industry accounts for over 40% of merchandise exports to Canada from the East North Central (Midwest) region and only 3% from the New England region. But the FTA had little effect on this industry and, thus, a minimal impact on a large segment of the Midwest's exports to Canada, because the auto pact had established essentially free trade in autos between the U.S. and Canada beginning in 1965. Little observed that because of the long-standing auto pact and the cyclical influence of the recession on the auto industry, a robust rate of trade growth between Canada and the Midwest during the early stages of the FTA probably should not have been expected.

Because firms can now serve a single market, investment location decisions are not dictated by tariff-jumping needs, but by economic considerations.

Little suggested that the increased integration of the U.S.–Canadian market brought about by the FTA has changed the role of their cross-border foreign investment and of their respective foreign affiliate firms. Because firms can now serve a single market, investment location decisions are not dictated by *tariff-jumping* needs, but by economic considerations, such as minimizing transportation costs and product delivery times. Little pointed out that the evidence suggests that U.S. and Canadian firms are "choosing to stress plant scale economies and, thus, trade." The growth in the number of affiliates, on both sides of the border, has been slow, which suggests that U.S. and Canadian firms are shifting the focus of their bilateral activities from direct investment to trade.

Little said that the verdict is not yet in on whether this trade is based on comparative advantage or IIT. However, national trade balance data suggest that U.S.–Canada trade has generally expanded as comparative advantage would suggest. For example, industries in which the U.S. recorded a net trade surplus against Canada in 1988 generally recorded an even larger net trade surplus in 1993 (see table 3). The same pattern generally emerged for Canadian industries that recorded a net trade surplus with the U.S. in 1988. The national pattern broke down, however, when Little examined regional trade balances, in particular New England and the Midwest. Intra-industry trade, at the national level, fell slightly between 1988 and 1993. Adjusting this measure to exclude the auto industry, which already enjoyed free trade, the IIT measures increased—nationally and for those regions where transportation is an important industry (see figure 9).

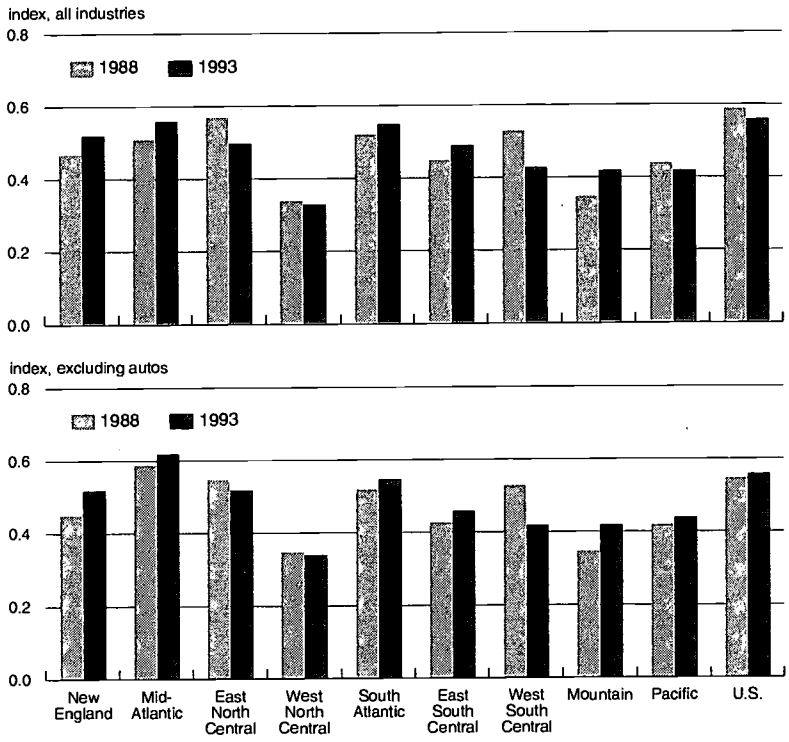
Table 3 U.S. Trade Balance by Industry Category, 1988 and 1993
(Millions of Canadian Dollars)

Code	Description	1988	1993
1–5	Animal Products	–1,826.1	–2,585.0
6–14	Vegetable Products	1,279.3	1,223.4
15	Fats, Oils, and Waxes	–15.5	–141.3
16–24	Prep. Foodstuffs, Beverages, Tobacco	–129.1	–626.8
25–27	Minerals	–9,009.5	–16,098.2
28–38	Chemicals and Allied Products	109.8	1,862.9
39–40	Plastic and Rubber	1,110.7	1,141.7
41–43	Hides, Skins, Leather, etc.	–35.4	–68.1
44–46	Wood and Articles	–3,605.3	–7,098.5
47–49	Pulp and Paper	–7,948.2	–6,568.2
50–63	Textiles	816.0	1,033.9
64–67	Footwear	–14.5	–38.1
68–70	Stone, Ceramics, Glass	350.8	582.5
71	Pearls, Stones, Jewelry	–102.4	–1,134.4
72–83	Base Metals and Articles	–4,224.5	–3,195.8
84	Industrial Machinery	8,475.7	9,296.1
85	Electric and Electrical Machinery	4,408.1	5,458.1
86–89	Transportation	–6,823.7	–18,026.9
90	Instruments, Scientific and Measuring	1,610.8	2,451.0
91–92	Instruments, Photographic and Musical	54.6	41.6
93	Arms	125.0	212.5
Total*		**–14,830.2**	**–36,669.1**

**Including industries not shown.*

Source: Jane Sneddon Little, "U.S. Regional Trade with Canada in the First Five Years of Free Trade," presentation prepared from data from *Statistics Canada* for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

Figure 9 Index of U.S.–Canada Intra-Industry Trade



Note: Averages of indexes calculated at the two- or four-digit levels, weighted by each industry's share of total trade between the United States and Canada. Calculations for industries in harmonized code 84 through 90 were based on the four-digit data. All other calculations were based on two-digit data.

Source: Jane Sneddon Little, "U.S. Regional Trade with Canada in the First Five Years of Free Trade," presentation prepared from data from *Statistics Canada* for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

The physical proximity of the Midwest to the Canadian market and the presence of a key metropolitan area in the region appear to bode well for the Chicago area as a focal point for Midwest–Canada trade.

Finally, using a measure of changes in the industrial composition of exports and imports, Little observed that structural change is much greater at the regional level than the national level. The data indicate that regions with a relatively large gain in IIT often experienced a relatively large structural change in exports and imports. In short, it is not clear that increasing two-way trade necessarily smooths the transition to free trade.

Implications for the Midwest economy that can be drawn from this work are based on early regression analysis. Little suggested that to the degree that domestic U.S. economic activity shifts to other regions of the country, the Midwest may face slower export growth to Canada than otherwise would be the case. On the plus side, the analysis suggests that the physical proximity of the Midwest to the Canadian market and the presence of a key metropolitan area in the region appear to bode well for the Chicago area as a focal point for Midwest–Canada trade.

A Canadian View of the FTA and NAFTA

Gary Scott, deputy consul general and senior trade commissioner from the Canadian Consulate General of Chicago, concluded the morning session with a discussion of the FTA from a Canadian perspective. He said that foreign investors have viewed the Canadian economy more favorably since Canada signed NAFTA. The increased openness of the North American market means that foreign investors can choose the best overall location in North America to satisfy their needs and still have access to the entire market. According to Scott,

The recent economic recovery of the Canadian economy was export led and U.S. demand was an important part of that development.

Industries that have recorded losses in market share in the Canadian market have recorded gains in the U.S. market.

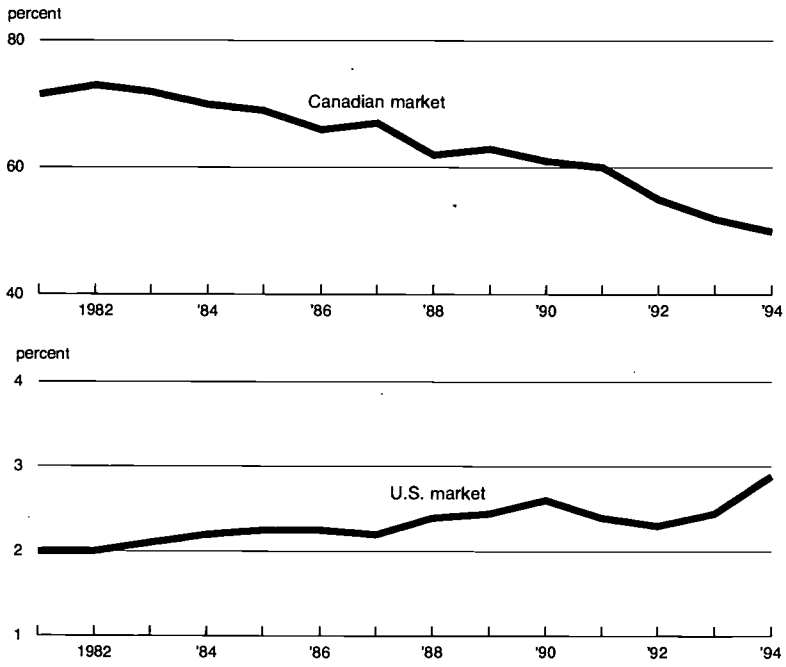
foreign direct investment from all sources has increased significantly since NAFTA was implemented in 1994. Growth in Canadian exports has also been impressive, he said, with gains dating back to the implementation of the FTA. The recent economic recovery of the Canadian economy was export led and U.S. demand was an important part of that development.

Scott noted that the more open North American economy is promoting increased productivity and regional specialization in industries. Nonetheless, he observed that there is still much work to be done to fully achieve the objective of a free trade area. Over 30 working groups and committees have been set up to insure effective implementation and administration of NAFTA rules. Important areas of continuing discussion include: rules of origin, customs, agricultural trade and subsidies, standards, government procurement, temporary entry, and trade remedies.

According to *Statistics Canada* data, the U.S. and Canada trade more than $1 billion per day in goods and services. To put this in perspective, Scott said, the province of Ontario buys more U.S. products than Japan. One of the results of the FTA has been an increase in the cross-border dependence of the two countries. One of the characteristics of a free trade agreement, a characteristic that suggests the FTA is doing what it is supposed to do, is the increased specialization of trade. This goes along with the increased interdependence of the two economies. If jobs and growth increasingly depend on the cross-border relationship, it would seem that the focus of policy should be on ensuring that the relationship is strengthened.

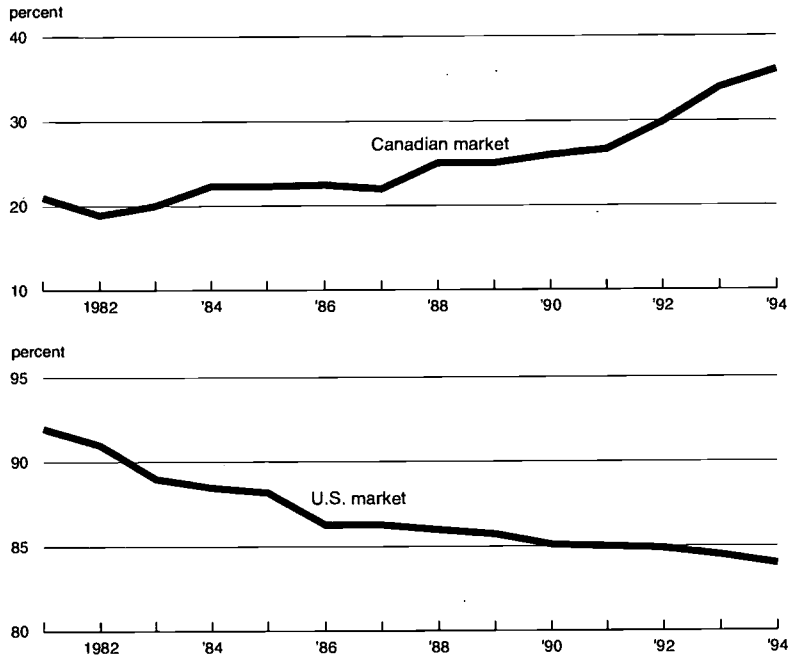
The FTA has, of course, produced winners and losers. Based on the combined markets of the two countries, Canadian manufacturers have lost market share since 1989. However, Scott observed that industries that have recorded losses in market share in the Canadian market have recorded gains in the U.S. market (see figure 10). Similarly, "U.S. manufactures have experienced a gentle decline in their share of the U.S. market, while gaining steadily in Canada," said Scott (see figure 11).

Figure 10 Canadian Share of Market



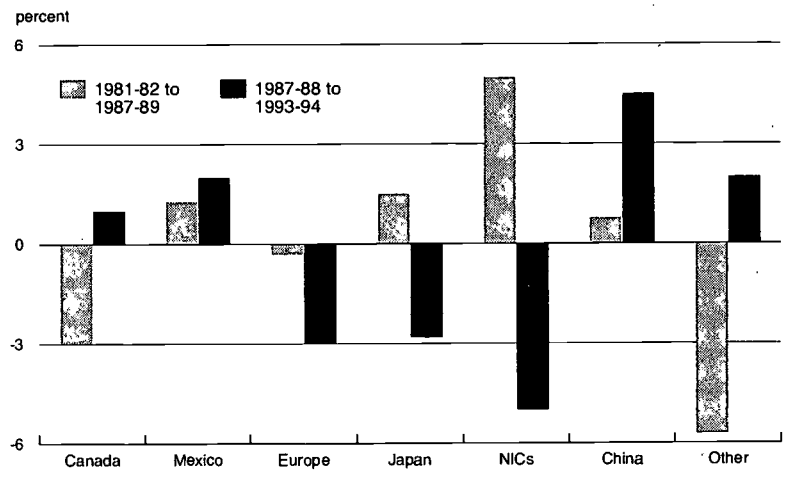
Source: Gary Scott, reactor comments prepared from data obtained from the Government of Canada, *Proceedings of the Standing Committee on Foreign Affairs*, various years, for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

Figure 11 U.S. Share of Market



Source: Gary Scott, reactor comments prepared from data obtained from the Government of Canada, *Proceedings of the Standing Committee on Foreign Affairs*, various years, for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

Figure 12 Change in U.S. Import Market, Percent Change in Market Share by Trading Partner



Source: Gary Scott, reactor comments prepared from data obtained from the Government of Canada, *Proceedings of the Standing Committee on Foreign Affairs*, various years, for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

Scott also looked at gains and losses among other major suppliers of imports to the U.S. market over two periods, 1981–82 to 1987–89 and 1987–88 to 1993–94 (see figure 12). During the earlier period, the major gainers in U.S. market share were the newly industrialized countries (NICs) of Asia, Japan, and Mexico. The more recent period showed gains in U.S. import market share by Canada, Mexico, China, and other (primarily Asia), with substantial losses in market share by the NICs, Japan, and Europe.

Scott noted that some difficult issues remain to be resolved between the U.S. and Canada, issues that "reflect political and protectionist pressures that run counter to our mutual long-term economic well-being." He cited *trade remedies* that continue to adversely affect the relationship between the two countries. Antidumping and countervailing duty actions are economic distortions that are especially serious irritants from the Canadian perspective. Scott emphasized that "these kinds of actions weaken not only the agreement (FTA) itself, but the willingness of the spirit necessary to have such agreements in the first place." In conclusion, Scott said that, despite these issues, "95 percent of our bilateral trade continues to move successfully across the border."

Trade and the Economy: International Linkages in an Open Market

Luncheon speaker David Walters, chief economist and assistant U.S. trade representative for economic affairs at the Office of the U.S. Trade Representative, provided his perspective on the growing importance of trade to the economy and the effect that trade policy can have on expanding trade opportunities. Walters discussed the growing recognition that international trade and economic opportunity are inexorably linked and that the promotion of trade benefits all participants whether they be developing or industrialized nations.

Before examining potential trade opportunities and trends, Walters first addressed his concern that the econometric tools for modeling and measuring the benefits from trade are inadequate and may even be getting worse. First, most trade models are static and, therefore, fail to accommodate dynamic effects. Dynamic modeling is significantly more difficult, but it produces results that are more accurate given the rapid structural change in the economy. (In this context, he commended Kouparitsas for his efforts at examining the NAFTA experience in a dynamic framework.) Second, more industrial sectors need to be added to trade models. Because of data limitations, significantly less is known about the effects of trade in the service industries than in the manufacturing sector. Given the prominence of the service sector in the U.S. economy in particular, understanding the effects of trade on service firms is critical. Third, too many of the current models have been designed primarily to evaluate the effects of tariff reduction while, increasingly, the more important issues in trade negotiations have to do with internal, nontariff barriers to entering markets. Walters indicated that working to correct these flaws is important so that we might better understand the gains that can occur through freer trade. For example, Walters noted that current estimates indicate that gains from the Uruguay round of the General Agreement on Tariffs and Trade (GATT) negotiations will add 3% to U.S. gross domestic product over ten years.

Too many of the current models have been designed primarily to evaluate the effects of tariff reduction while, increasingly, the more important issues in trade negotiations have to do with internal, nontariff barriers to entering markets.

Turning to the forces that are currently expanding trade opportunities, Walters highlighted the following four factors:

- Technology, which makes trade and what can be traded easier;
- The shrinking physical size of many products;
- The rapid growth of emerging markets; and
- Improvement in trade agreements.

All of these factors have led to strong growth in the value of goods and services exported from and imported into the U.S. economy. The total value of exports and imports of goods and services (including return on investment) rose from 13% of GDP in 1970 to almost 30% in 1995. The dollar value of this trade increased from $1.6 trillion in 1992 to $2.1 trillion in 1995. In turn, the benefits from trade spill over to the firms that export. Workers with export-related jobs earn 17% more than the U.S. average and the industries in which they work have higher rates of growth and productivity. Walters also noted that, according to academic studies, average wages in import-competing industries have fallen below the U.S. average. Trade affects the direction of resources by shifting the composition of job growth to export jobs.

Workers with export-related jobs earn 17% more than the U.S. average and the industries in which they work have higher rates of growth and productivity.

Three-fourths of the future growth in export opportunities will come from low- and middle-income nations rather than from the already developed economies.

Walters stressed that the big gains from future trade will come from emerging markets, especially China. This development brings policy challenges. Since China is not a participant in the World Trade Organization, a great deal of attention will have to be paid to how a nation with one-fourth of the world's population is included in the trend toward liberalizing trade. What is clear, Walters said, is that the movement to market-driven economies and structures (as a model for participating in the benefits from trade) is occurring in virtually all emerging markets. Understanding these markets is critical since three-fourths of the future growth in export opportunities will come from low- and middle-income nations rather than from the already developed economies. The good news is that the structure of U.S. trade favors serving low- and middle-income nations. The U.S. has traditionally had a comparative advantage in capital goods trade, which will be in demand among these low- and middle-income nations. Consumer goods have never been a particular comparative trade strength for the U.S. economy. In fact since 1760, the U.S. has only run a surplus in consumer goods trade in the post World War II years of 1947 and 1948.

Addressing trade prospects for the Midwest, Walters asserted that prospects appear favorable. The region already captures nearly one-fourth of U.S. goods exports and its 30% growth in exports between 1993 and 1995 was higher than the U.S. average. Perhaps even more important, growth rates for Midwest exports to the emerging markets of Latin America and Asia are relatively robust.

Walters concluded by observing that the health of the U.S. economy and its ability to compete and trade in world markets must be seen as interconnected.

Foreign Investment and the Midwest Economy

There is a tendency when examining interactions in international markets to concentrate on developments that are directly associated with the export and import of goods This is probably because, among all international transactions, goods transactions are the most easily defined. Trade in services has only recently received greater attention in the analysis of international transactions. Foreign investment is another component of the broader international trade assembly that has dramatically increased in importance within the U.S. economy during the past 20 years. As the U.S. trade deficit has grown since the early 1970s, it has had to be financed through the importation of foreign capital. An important part of that capital inflow has been in the form of foreign direct investment (FDI). The first afternoon session addressed this important and growing component, which is contributing to the internationalization of the U.S. and Midwest economies.

Within manufacturing, FDIUS employment in the five-state district of the Federal Reserve Bank of Chicago is substantial; the 353,200 workers employed in 1994 by foreign-owned firms in the region represented one-sixth of the U.S. total, with Illinois being the fourth leading state nationwide and Indiana the eighth.

FDI in Manufacturing in the Southeast and Midwest

Cletus Coughlin, vice president and associate director of research at the Federal Reserve Bank of St. Louis, presented his recent analysis of the location of new foreign-owned manufacturing plants in the U.S. Coughlin noted that the share of output attributable to foreign-owned firms in the U.S. rose from 2.3% in 1977 to 6.2% in 1994. Coinciding with that development has been a rise in the percentage of U.S. workers employed by foreign-owned firms. Between 1977 and 1994, employment at nonbank foreign affiliates rose from 1.7% to 5.0% of all U.S. nonbank employment. Among sectors of the economy, manufacturing attracts the largest share of foreign direct investment in the U.S. (FDIUS), representing 38% of the stock of FDIUS in 1995. Within manufacturing, FDIUS employment in the five-state district of the Federal Reserve Bank of Chicago is substantial; the 353,200 workers employed in 1994 by foreign-owned firms in the region represented one-sixth of the U.S. total, with Illinois being the fourth leading state nationwide and Indiana the eighth.

In his current research, Coughlin focuses on one aspect of manufacturing FDIUS, the spatial distribution of FDI in new plants throughout the U.S. His empirical work analyzes 316 new manufacturing plants that were planned to be built between 1989 and 1993.

A new foreign plant is more likely to choose a county that can provide a labor force with a relatively high education level, relatively large manufacturing employment, access to an interstate highway, and a large regional market.

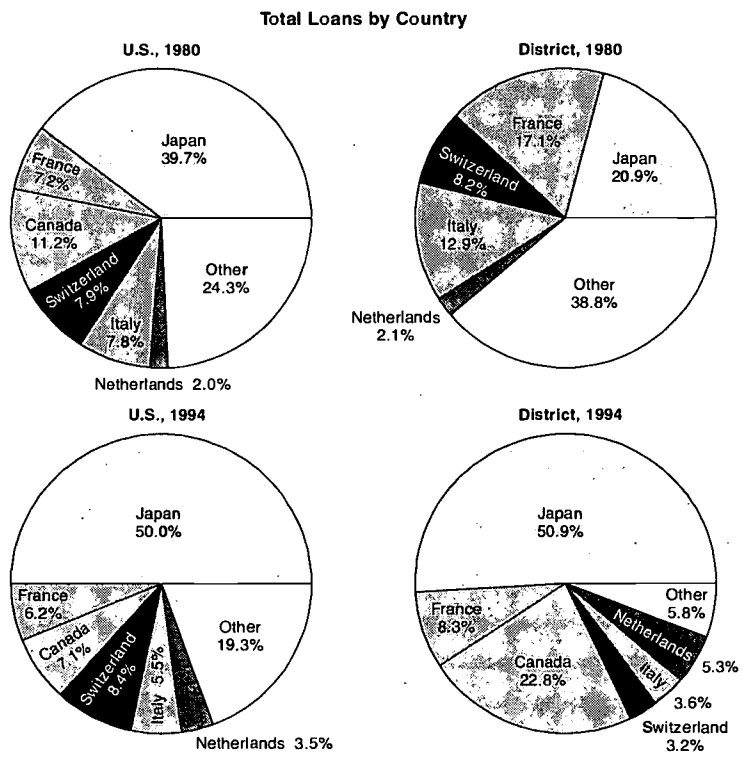
Econometric analysis is employed to explain the observed spatial distribution of these plant locations at the county level. The underlying assumption of the model is that a foreign firm will choose to invest in a particular county only if doing so will maximize its profit. The modeling of the location decision includes various categories of potential determinants: cost factors, such as wage rates, unionization rate, and local taxes; revenue factors, such as regional personal income; work force characteristics, such as education levels; and transportation accessibility of the area. Consistent with previous studies, Coughlin's preliminary modeling results indicate that a new foreign plant is more likely to choose a county that can provide a labor force with a relatively high education level, relatively large manufacturing employment, access to an interstate highway, and a large regional market (as measured by the area's personal income and its population density). Preliminary analysis using only the Midwest observations reveals similar results.

Foreign-Owned Banks in the Midwest

Tim O'Neill, executive vice president and chief economist of the Bank of Montreal addressed a number of issues associated with the emergence and role of foreign banking operations in the U.S. and Midwest.

O'Neill observed that more than 650 banking offices (including agencies, branches, commercial banks, Edge Act banks, and New York state investment companies), representing 61 countries, operate in the U.S. In mid-1995 foreign banks accounted for 33.3% of all commercial and industrial (C&I) loans, compared with a 21% share in 1983. Foreign bank assets of about $1 trillion make up 22.6% of total U.S. bank assets. Japanese banks maintain the largest foreign presence, in terms of loans, in the U.S. market, followed by Canadian and French banks (see figure 13).

Figure 13 Major Countries' Loans, U.S. and District

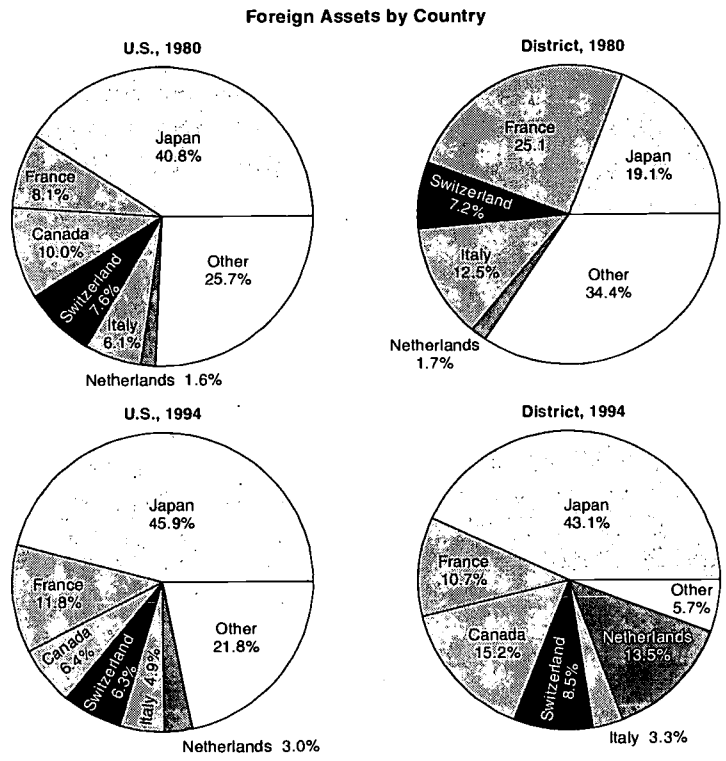


Source: Tim O'Neill, reactor comments (chart prepared from an article by Linda Aguilar, "A Current Look at Foreign Banking in the U.S. and Seventh District," *Economic Perspectives*, Federal Reserve Bank of Chicago, January/February 1995, pp. 20–28) from the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

In the Midwest, foreign banks account for about the same share of C&I loans, 32%, as in the U.S. Foreign banks' regional share of assets, however, is somewhat smaller, at 17%. Japanese banks also represent the largest foreign presence by asset size in the Midwest. Canadian and Dutch banks follow, heavily influenced by the acquisition of two major Chicago banks during the first half of the 1980s (see figure 14.)

Measured by asset growth, foreign banks located in the Midwest expanded tenfold during the 1980s, compared with an increase just shy of fourfold for foreign banks in the nation.

Figure 14 Major Countries' Assets, U.S. and District



Source: Tim O'Neill, reactor comments (chart prepared from an article by Linda Aguilar, "A Current Look at Foreign Banking in the U.S. and Seventh District," *Economic Perspectives*, Federal Reserve Bank of Chicago, January/February 1995, pp. 20–28) from the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

O'Neill observed that foreign banks grew dramatically in the Midwest during the 1980s. Measured by asset growth, foreign banks located in the Midwest expanded tenfold during the decade, compared with an increase just shy of fourfold for foreign banks in the nation. Over the same period, domestic banks' assets increased only 1.7% in the Midwest and 2.1% nationally. O'Neill also noted that foreign banks maintain a somewhat different customer base than domestic banks, concentrating primarily on wholesale lending to corporations. This leads to somewhat different loan portfolios, with the national and Midwest experience being roughly comparable in this regard. Foreign banks' C&I loans make up 51% of their total U.S. loans, while real estate loans account for 22%. Domestic banks hold only 23% of their total in C&I loans and 43% in real estate (see table 4). This reflects the fact that domestic banks are more active in retail banking and may also have a knowledge-base advantage in real estate lending.

Table 4 Real Estate and Commercial Loans, Percent of Total Loans

	U.S.-Owned Commercial Banks		Total Foreign Banking Offices	
	Real Estate	C&I	Real Estate	C&I
Total U.S.				
1985	27.1%	31.3%	10.8%	43.4%
1990	39.9	26.3	20.5	48.7
1994	42.7	23.3	22.1	51.0
Seventh District				
1985	27.3	31.4	7.2	49.5
1990	39.0	29.5	19.3	58.0
1994	42.9	26.6	16.5	61.9

Note: 1994 figures are for the second quarter.

Source: Tim O'Neill, reactor comments prepared from an article by Linda Aguilar, "A Current Look at Foreign Banking in the U.S. and Seventh District," *Economic Perspectives*, Federal Reserve Bank of Chicago, January/February 1995, pp. 20–28, for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

The turbulence in U.S. financial markets during the mid-1980s to early 1990s provided an opportunity for foreign banks to increase market share, especially among the more competitive commercial and industrial customers.

A number of factors have been cited as being influential in contributing to the rapid growth in foreign banking in the U.S. during the 1980s. They include an expansion in banking in support of increases in foreign direct investment (FDI), the reduction in regulatory barriers, technological changes, and the unbundling of banking functions into separable product lines, or *commoditization*. O'Neill said that these factors might explain why foreign banks would move beyond their domestic borders, but not necessarily why they would locate in the U.S. or the Midwest. Indeed, he added that FDI growth was faster in other industrial countries during the 1980s than in the U.S. and that banking deregulation came later in the U.S. Why did foreign banking in the U.S. grow relatively rapidly during the mid-1980s to early 1990s?

O'Neill suggested that the turbulence in U.S. financial markets during that period—including problems with loans to less developed countries, the savings and loan crisis, and purported credit crunch problems—provided an opportunity for foreign banks to increase market share, especially among the more competitive commercial and industrial customers. Many foreign banks also enjoyed a favorable cost of capital advantage relative to U.S. banks during this period—in part an exchange rate phenomenon. Foreign banks that initially came to the U.S. in order to service their home-based FDI were able to extend these banking relationships to include U.S.-based firms. Finally, the sheer size and dynamics of the U.S. market serves as an important drawing point for foreign institutions. In some cases, firm-specific conditions influenced foreign banks' entry into the U.S. market, especially regional markets like the Midwest. O'Neill suggested, for example, that increased openness to branch banking in the Midwest was a factor in Bank of Montreal's (BoM) recent expansion in the retail banking market; BoM's experience with branching in the Canadian market was viewed as a plus on entering this portion of the Midwest market. Physical proximity was also considered a positive factor.

In the Midwest, foreign banks have brought expertise in branching, have strengthened global links to an increasingly international market, and have increased the number of credit facilities available for local borrowers.

The slowdown in foreign bank growth in recent years may be, in part, a result of a decline in their efficiency relative to domestic banks as the regulation of domestic banks has become less onerous.

Growth in foreign banking has slowed since 1992. O'Neill observed that market shares of foreign banks operating in the U.S. have plateaued and, in some cases, declined. He cited several possible reasons for this development, including a slowdown in economic growth in the banks' home countries and a deterioration in the relative cost advantages enjoyed by the foreign banks when they first entered the U.S. market. For example, foreign banks' cost of capital relative to U.S. competitors has increased from the levels of the 1970s and 1980s. In addition, U.S. banks became more efficient and competitive during the 1980s, making it more difficult for foreign banks to expand market share through their existing facilities and more expensive to acquire market share through the purchase of existing U.S. institutions.

Has the expansion of foreign banking in the U.S. been beneficial? O'Neill observed that to the extent that "public interest is increased (or, at minimum not diminished) by foreign banks entry, then it should be applauded." Overall, he said, efficiency in the industry has been enhanced by foreign bank entry. Foreign banks have also contributed to the industry's innovativeness, bringing in new products and services in response to the changing needs of the U.S. economy. In the Midwest, foreign banks have brought expertise in branching, have strengthened global links to an increasingly international market, and have increased the number of credit facilities available for local borrowers.

Responding to O'Neill's presentation, Hunter noted that initially foreign banks were able to enter the U.S. market and compete effectively because they were more efficient. In addition, there was a tendency among foreign banks to increase their loan portfolios through the purchase of existing loans rather than *growing loans* through more aggressive lending activity. The slowdown in foreign bank growth in recent years may be, in part, a result of a decline in their efficiency relative to domestic banks as the regulation of domestic banks has become less onerous.

R&D Activities and Innovativeness of Foreign-Owned Firms in Ohio

Asim Erdilek, professor and chairman of the department of economics at Case Western Reserve University, presented recent work on the research and development activities of foreign-owned firms in Ohio. He discussed the relative importance of foreign-owned firms to the region's economy (see table 5) and introduced recent U.S. Department of Commerce

Table 5 Share of Manufacturing Employment at Foreign-Owned Firms

	1988	1989	1990	1991	1992	1993	1994
Illinois	9.5	10.9	11.8	12.6	12.8	12.6	12.3
Indiana	8.4	10.0	13.7	13.0	13.6	13.4	13.3
Michigan	7.0	7.2	7.6	7.8	8.3	8.8	8.6
Ohio	7.9	10.1	11.2	11.9	12.3	12.3	12.2
Wisconsin	7.2	7.6	8.3	8.5	8.2	7.6	7.5
U.S.	8.2	9.5	10.4	11.0	11.2	11.3	11.4

Source: Asim Erdilek and Milton A. Wolf, "R&D Activities and Innovativeness of Foreign-Owned Firms in Ohio," presentation prepared for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

data regarding the extent of research and development (R&D) activity of foreign-owned firms. While in 1992 the U.S. affiliates of foreign-owned companies accounted for 6% of U.S. GDP, their R&D activity represented 17% of the privately funded R&D performed by U.S. businesses. However, about two-thirds of all foreign-funded R&D in the U.S. is concentrated in a few high-technology sectors in which foreign-owned firms have established strong export positions. Erdilek's study addressed the following questions:

- Do foreign-owned firms transfer technologies to their U.S. subsidiaries or do they rely primarily on U.S. technologies in establishing a presence in the U.S. market?
- To what extent does R&D activity performed by foreign subsidiaries spill over to the host economy?

About two-thirds of all foreign-funded R&D in the U.S. is concentrated in a few high-technology sectors in which foreign-owned firms have established strong export positions.

Examples from the Midwest, such as the arrival of Japanese auto assembly plants and the restructuring of the U.S. steel industry under foreign influence, suggest that inward direct foreign investment can play a significant role in developing the host country's technological capabilities.

Erdilek and his coauthor Milton Wolf, Ph.D., analyzed the activities of firms with at least 10% foreign ownership, operating in Ohio. Their analysis is based on 180 returned questionnaires, 86% of which are from firms engaged in manufacturing. The data show that more than half the firms in the sample did not engage in R&D. In addressing the technology transfer issue, the authors looked at foreign-owned firms' payments for technology to either U.S. companies or home country companies, as well as technology-related receipts by the foreign-owned company. It appears that the vast majority of firms do not make or receive technology payments. For the ones that do, however, the U.S. is the most important source of both technology and technology receipts. This result suggests that the technology transfer flows in both directions. Finally, in terms of technology spillover, the authors report that Ohio's economy benefited mostly through the opening of the new business, which sometimes represented the first manufacturing activity in a new industry. According to information provided by the foreign-owned firms in Ohio, major beneficiaries of the companies' innovations are their customers. However, Erdilek and Wolf were unable to distinguish the ownership/nationality of these suppliers. In conclusion, Erdilek cited Honda's assembly operations in Ohio as an example of successful technology transfer with spillover to the regional economy.

Ed Malecki, professor of geography at the University of Florida, responded to Erdilek's presentation by putting the analysis of the Ohio-specific data in a broader context. He distinguished four primary types of foreign investment of transnational corporations: 1) *listening posts* for technology acquisition or technology capture; 2) *world product mandate operations*, from which local linkages and backward spillover effects tend to be relatively large; 3) production and assembly only for the North American market, using designs from elsewhere and often using low levels of local content; and 4) product design and development for local (and possibly global) markets, which tends to have higher levels of local linkage and benefit, such as backward spillovers. Malecki said that, apart from the third type, all of these investment categories involve some degree of R&D activity.

Table 6 Largest Foreign Sources of R&D Investment in the U.S., 1993

Country	Expenditures ($ Billions)	R&D Employees	Number of Companies	Number of R&D Facilities	Average Number of R&D Employees per Company Location
Switzerland	2.524	14,700	16	45	919
Germany	2.321	19,200	32	95	600
United Kingdom	2.295	20,000	61	109	328
Canada	2.190				
Japan	1.781	11,800	107	219	110
France	1.204	9,300	22	52	423

Note: Detailed data on Canada not included in source information.

Source: Ed Malecki, reactor comments prepared from *Science*, 1995; National Science Board, 1996, 4-47–4-48; and calculations by the author for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

Table 7 U.S. R&D Facilities of Foreign Companies, by Country and Industry, 1994

Industry	Total	Japan	U.K.	Germany	France	Switzerland	South Korea	Netherlands	Sweden	Other
Total	635	219	109	95	52	45	26	26	22	41
Computers	39	22	0	4	0	0	7	3	0	3
Software	41	25	6	4	3	0	1	1	0	1
Semiconductors	35	19	0	3	0	0	10	3	0	0
Telecommunications	29	14	2	4	2	1	1	0	2	3
Opto-Electronics	20	11	2	3	0	0	0	0	1	3
HDTV, Other Electronics	71	33	10	9	4	5	3	4	0	3
Drugs, Biotechnology	111	22	23	18	11	17	1	5	5	9
Chemicals, Rubber, Materials	109	23	19	28	17	10	0	4	0	8
Metals	15	5	3	1	4	1	0	0	1	0
Automotive	53	34	1	11	2	0	3	0	2	0
Machinery	22	7	4	2	3	0	0	0	6	0
Instrumentation, Controls	40	1	23	3	5	4	0	3	1	0
Foods, Consumer Goods, Misc.	53	7	19	6	2	6	0	5	1	7

Note: Categories in columns may not sum to total because facilities may be included in more than one category, e.g., computers and semiconductors, or "other" categories that are not included.

Source: Ed Malecki, reactor comments prepared from National Science Board, *Science and Engineering Indicators 1996*, p. 4-47, Table 4-11, for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

Foreign plants in the U.S. have been found to be more capital intensive, more productive, and to pay higher wages than their domestic counterparts, but plants owned by U.S. multinational companies appear to be more productive than FDI plants.

Malecki suggested a breakdown of the Ohio data by nationality and investment sector for several reasons. First, some recent data on foreign R&D in the U.S. (see table 6) suggest that the nationality of the firm makes a difference. For example, Japanese firms have twice as many R&D facilities in the U.S. as any other foreign group, yet the Japanese facilities are by far the smallest in terms of number of employees per R&D facility. This indicates their facilities operate largely as *listening posts* for technology acquisition or capture. Second, in addressing technology transfer and spillover questions, the data in table 7 suggest it might be necessary to conduct sector-specific analyses. While Japanese firms are represented heavily in the automotive and software sectors, European firms tend to concentrate in chemicals, especially pharmaceuticals.

During the ensuing discussion, Jensen mentioned interesting findings from research using U.S. Bureau of the Census data. Foreign plants in the U.S. have been found to be more capital intensive, more productive, and to pay higher wages than their domestic counterparts, Jensen said, but plants owned by U.S. multinational companies appear to be more productive than FDI plants.

Clearly, cities see the benefits of promoting trade, but the question is do they have effective strategies for accomplishing this goal?

Cities' role as economic actors has grown during an era in which globalization and international trade agreements have lessened the independent sovereignty of nation states in the trade process.

There are identifiable economic regions within the nation, as well as across the international borders of neighboring countries, which might be well served by promoting inter-city cooperation.

Shaping Local Policy for the Global Economy

The final session of the day was devoted to a panel discussion on the policy implications of an increasingly international-oriented regional economy. How should state and local governments respond to this changing economic environment?

Moderator Donald Haider, professor of the Kellogg School at Northwestern University, opened the discussion by noting that individual cities are increasingly trying to improve their image as potential centers of global commerce. Clearly, cities see the benefits of promoting trade, but the question is do they have effective strategies for accomplishing this goal?

Peter Kresl, a professor of economics at Bucknell University, suggested that a primary reason for cities to be interested in improving their trade opportunities is that their role as economic actors has grown during an era in which globalization and international trade agreements have lessened the independent sovereignty of *nation states* in the trade process. Sweeping efforts to reduce trade barriers across regions, such as in the European Union, have reduced the role of national governments, which have ceded some of their economic, and thus political, authority to regional multinational governments. That has made it increasingly important for cities to establish an independent reputation in order to attract global investment. Kresl suggested that in these new regional economic spaces, cities will serve as the center and that doing this effectively will require cooperation with other cities.

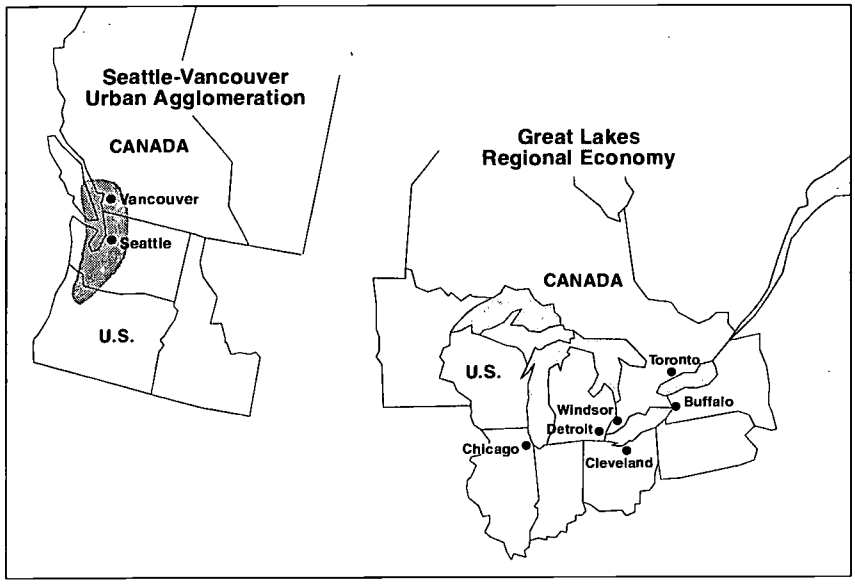
In this vein, European cities appear to have a head start on their American counterparts. For example, the cities of Lyon, France, Barcelona, Spain, and Turin, Italy, have worked together to develop better transit connections between the three cities and in doing so ease the movement of goods. This cooperation takes advantage of each city's economic specialization and provides benefits to all three participants. Kresl suggested that the roots of such cooperative, city-based ventures date back to the Hanseatic League. This type of historical precedence does not exist among U.S. cities.

Turning to strategies for U.S. cities, Kresl noted that there are identifiable economic regions within the nation, as well as across the international borders of neighboring countries, which might be well served by promoting inter-city cooperation. Two such regions are the I-5 corridor which runs from Portland, Oregon, to Vancouver, British Columbia, and the much larger Great Lakes regional economy (see figure 15). Still, neither of these regions has built structures that promote cooperation among their respective cities.

In conclusion, Kresl proposed a strategy to create the type of cooperation that is benefiting some European cities. First, a city government needs to be clear about its aspirations. What is the city's vision for the future? Second, it must define its strategic strengths and weaknesses. Third, it must develop a set of realistic outcomes. Once it has developed its strategic plan from such a process, it will be in a position to become an effective partner with another city or cities. This in turn will enhance the city's potential global advantages.

The next panelist was Arnold Weber, chairman of the civic committee of the Commercial Club of Chicago. Paraphrasing former U.S. House Speaker Tip O'Neill, Weber suggested that "if all politics are local, then all economic development is local in a global economy." He went on to propose a variety of strategies that Chicago could employ to improve its image and effectiveness as an international city. At the top of this list is the need for Chicago to develop a marketing strategy for itself. The city has numerous advantages, yet it does not communicate these advantages very well to the outside world. For example, several rankings of U.S. cities have placed Chicago first in terms of its transportation resources (in fact, the preponderant factor for selecting Chicago as a location is its transportation access). Weber argued that this advantage is not properly communicated in a marketing strategy.

Figure 15 Cross-Border Regional Economies



Source: Peter Kresl, *Urban Economy and Regional Trade Liberalization*, New York: Praeger, 1992.

Chicago is the city most associated with the financial services industry throughout the world.

The Chicago metropolitan area does not have in place a structure for encouraging cooperation among local governments.

Next, Chicago occupies an excellent central location. It is in close proximity to a substantial portion of the nation's population and represents an excellent market. In addition, it has the infrastructure to support international business, particularly when it comes to providing critical service personnel, such as lawyers, consultants, and bankers, who are familiar with international operations. The city is also home to a significant number of foreign consulates.

Another advantage is the availability of high-quality human capital, particularly for highly skilled positions. The local college and university environment is of very high quality and attracts students from around the world. For example, 25% of graduates from the business schools at Northwestern University and the University of Chicago are from foreign countries. Similarly, Chicago's ethnic mix contributes to its flavor as an international city. For example, Weber noted that the city has a larger Polish population than any city other than Warsaw. It has attracted significant numbers of Mexicans and Asians, which has broadened the city's cultural base.

Chicago also benefits from being a major financial center with an international reputation in commodities trading. The importance of this niche in the financial services industry continues to grow, and Chicago is the city most associated with this business throughout the world.

A further advantage that the city has is its cultural institutions. From museums, to the symphony, to the opera, Chicago has exceptional cultural amenities. These are complimented by major league sports and an excellent park system, which enhances Chicago's image as a good place to live and do business.

Weber cautioned, however, that the city must address its negative attributes as well. Chicago has high taxes on business, and wage levels for workers are also well above the U.S. average. In addition, the city is perceived as having high crime rates and significant poverty. Finally, the Chicago metropolitan area does not have in place a structure for encouraging cooperation among local governments. With 1,200 governments in the Chicago metro area, developing a metropolitan-wide strategy for promoting Chicago will be a challenge.

Weber concluded by suggesting several strategies to improve the city's prospects as an international city. First, a structural entity should be created to reduce fragmentation of resources in the metro area and to help leverage the advantages that the city offers. Weber noted, for example, that Miami and Houston have been very effective in this regard; they have created images and cooperative structures that enhance their respective economies. Chicago needs to clearly promote its relative advantages as a business location. It also needs to develop specific strategies for promoting key segments of the region's economy, including capital goods, financial services, and high technology products. This also means having a strategy for cultivating and promoting intermediaries, such as educational institutions and consultant organizations with a strong international orientation, such as those serving the legal, accounting, and financial services sectors.

The provision of outstanding infrastructure and job training will enhance Chicago's international image more than bidding for new business.

Chicago needs to strengthen its overseas presence through strategically located export offices. Finally, Weber said, the city needs to focus its resources to provide the critical goods and services that businesses need to grow, rather than providing incentives and tax abatements to lure new business. The provision of outstanding infrastructure and job training will enhance Chicago's international image more than bidding for new business.

The next panelist, Clark Heston, executive director of the Risk Management Center, addressed Chicago's reputation as a financial center. To begin with, Chicago's financial industry has gone through significant changes, even during the last decade. Chicago is not a financial center like New York or Los Angeles where money management, commercial banking, and stock trading dominate continental activity in these areas. Chicago started out as a commodities trading center and has since developed this financial market into a world center for controlling all types of financial risk.

Chicago started out as a commodities trading center and has since developed this financial market into a world center for controlling all types of financial risk.

Heston observed that Chicago's financial services culture is somewhat unique because it is grounded in trading. This being the case, much of the focus of Chicago's financial services is on activity at the major exchanges—the Board of Trade and the Mercantile Exchange. Trading volume at the exchanges has grown impressively, from 664 million trades in 1987 to 1.7 billion in 1994. However, increased global competition has eaten into the Chicago exchanges' market share, which fell from 59% to 36% during this period. At the same time, the number of exchanges worldwide grew from 32 to 107. Clearly, the growth of foreign competition poses a threat to Chicago's dominant position in trading in financial futures and options and commodities. A second threat is presented by the growth in over-the-counter trading, which has also cut into the volume of trading at the Chicago exchanges.

The growth of foreign competition poses a threat to Chicago's dominant position in trading in financial futures and options and commodities.

Heston identified three issues that are increasing competition for Chicago. First, there appears to be some interest on the part of traders in trading in local markets. Because of time differences and because local products are tailored to local needs, local markets appeal to some traders, and this erodes interest in trading exclusively in a large centralized market. Second, technology is making it easier to participate in markets throughout the world, again eroding the competitive position of a large central market. Third, the cost of regulatory compliance is higher in the U.S. than in other markets. Heston asserted that developing the most cost-effective and efficient regulatory structures that still protect the security of these markets will need to be a top priority, if the U.S. is to maintain a dominant presence in financial markets. He observed that the Chicago exchanges' primary competition will be Tokyo and London.

Finally, Heston suggested that the Chicago markets also need to explore ways in which they can deliver their services in the most effective manner throughout the world. For example, the GLOBEX system was an attempt to extend the trading hours on the Chicago exchanges to relate better to foreign markets. (GLOBEX was initially set up as a cooperative effort between Reuters, the Chicago Board of Trade, and the Chicago Mercantile Exchange. The CBOT has since withdrawn from the system.) Such innovations need to be tried.

A final perspective on global trade was provided by Hewings of REAL and the University of Illinois at Urbana–Champaign. Hewings challenged the perception that *international* trade is critical to the well-being of the Midwest economy. He presented evidence from a joint University of Illinois–REAL study that modeled the Chicago metropolitan economy and found that of an estimated $140 billion in goods exported from the Chicago metro area, $119 billion was traded to other parts of the U.S., particularly the East and West coasts. Canada accounted for $11 billion in trade and Mexico for only about $1 billion. Hewings suggested that this reflects the role of the Midwest as an intermediary in trade. In some cases, the Midwest produces products that are incorporated into other products, which are then sent abroad.

It is important for regions to analyze and recognize trends in the economies of their trading partners, located domestically or abroad.

Hewings said that this result should not surprise people. Regions are becoming more dependent on other regions. The important issue is to identify the interconnections that differing production structures encourage. It is important for regions to analyze and recognize trends in the economies of their trading partners, located domestically or abroad. In addition, the fostering of trade tends to promote a more open economy, which in turn leads to a convergence in the industrial structure across regions. As regions progressively differ less from each other, comparative advantages will increasingly rest on differences in the quality of the work force. Hewings suggested that *occupational capital,* defined as having the skilled labor force available to meet the growing occupational demands of a region's economy, could become the most important regional comparative advantage.

As regions progressively differ less from each other, comparative advantages will increasingly rest on differences in the quality of the work force.

Finally, Hewings suggested that, given that Chicago's key trading partners are in the domestic U.S. economy, perhaps the city should stop trying to establish *sister city* relationships with foreign cities, such as Paris, and concentrate on developing its relationships with East Lansing, Michigan, Indianapolis, Indiana, or Madison, Wisconsin.

During the closing discussion, Haider asked whether there was any evidence that trade promotion programs really helped export volume. He noted that such economic development programs were often the first to go when state economies slowed and that few studies had shown that these programs were cost effective. Coughlin noted that work done at the Federal Reserve Bank of St. Louis suggests that export promotion programs do contribute to exports. On the other hand, Jensen observed that Census Bureau research suggests that public export promotion programs are not effective. Other participants observed that while there may be certain forms or structures of export promotion that are ineffective, there certainly are structures that are effective. If that were not the case, exporting firms would not be *paying* for private consulting services that involve export promotion activities.

Participants also highlighted the importance of the regulatory environment and its impact on the ability of industries and firms to compete in international as well as domestic markets. National, state, and local regulations (the latter primarily in the form of taxes) can easily place an industry or location at a competitive disadvantage. Financial markets, which rely heavily on electronic transactions, are seen as particularly vulnerable to an adverse regulatory environment, with the bulk of electronic transactions likely to go to the lowest cost market, whether it be Chicago, London, or Singapore.

Summing Up

An Increasingly Interdependent World Market

An examination of the global linkages to the Midwest economy seems a fitting conclusion to the Chicago Federal Reserve Bank's year-long assessment of the Midwest economy. This workshop delved into issues that only during the last couple of decades have been recognized as important to the region's economic well-being and growth. Increased international trade in goods and services, a surge in foreign investment in the goods and services sectors and the financial sector, and political initiatives that seek to facilitate or exploit the greater interaction and interdependence of the international economy have left an indelible mark on the Midwest economy.

Although it is clear that the domestic market remains the dominant influence on the Midwest's economic condition, the fabric of the Midwest economy has become intricately interwoven with that of the international economy. For continued growth, regional industries look not only to the domestic market, but also to new or expanding markets abroad. This is especially evident when a slowing in domestic demand occurs; at such times in recent years, industry observers, policymakers, and economists have anxiously looked to foreign demand to pick up the slack. Moreover, while it has not been an easy transformation, Midwest industry owes much to the structural modifications in the economy that were forced, in part, by import competition *and* the competitive nature of foreign-owned entities that have become an integral part of the domestic market.

Manufacturing industries (be they producers of intermediate products or final goods), especially those associated with capital goods production, have dominated the Midwest's recent economic revival and expansion in exports. Production agriculture, long the region's most important primary goods producing industry, has also recorded dramatic increases in exports in recent years.

The economic revival that has occurred in the Midwest during the past decade has important underpinnings in the increasingly worldwide scope of markets. Expanded international trade in goods and services, made easier by the reduction of tariff and nontariff barriers under agreements such as the U.S.–Canada FTA and NAFTA, has contributed to Midwest economic growth. At the same time, the region has benefited from rapid economic expansion in emerging markets and continued moderate to strong demand from developed markets around the world.

The international market can no longer be thought of as the foreign market only; for an industry to be competitive in foreign markets, it must also be competitive in its domestic market.

Arguably the most important development contributing to the Midwest's economic revival has been the critical restructuring of its industrial base during the past ten to 15 years, a restructuring that has enhanced Midwest (and U.S.) industrial competitiveness in international markets, i.e., foreign *and* domestic markets. This characterization of the market is important to understanding the progress made by industry in its drive toward competitiveness. The *international* market can no longer be thought of as the *foreign* market only; for an industry to be competitive in foreign markets, it must also be competitive in its domestic market. Midwest industry's improved competitiveness in international markets owes much to the competitive impact of imports from abroad, technology transfers and competition from foreign direct investment in major Midwest industries, and increased interregional competition within U.S. borders.

International trade is considered a national activity. A country's borders define whether a trade or investment activity is international or domestic. Within the U.S., international agreements and, therefore, the degree of openness of borders, are within the purview of the federal government. Since the late 1940s, the U.S. has engaged in numerous trade agreements

that have dramatically opened the country's borders to trade. Movement toward such policies has surged in recent years. The U.S.–Canada Automotive Trade Agreement was negotiated in the mid-1960s, the U.S.–Canada FTA in 1989, and NAFTA in 1994. Even more important are the eight post World War II multilateral trade agreements, seven of which were negotiated under the auspices of GATT (the first established GATT), the most recent being the Uruguay Round which established the World Trade Organization in 1995.

National policy also influences the rate of domestic inflation, the exchange rate of the dollar relative to other currencies, financial market regulations, agricultural production decisions, and environmental, safety, and health controls. While such national policy actions may be aimed at the domestic economy, they inevitably affect the interaction of the domestic economy with the international economy. The more open the national borders are to trade and financial flows, the more important is the influence of these non-trade-specific national policies on the economy's international involvement.

National policy actions, whether related to trade or aimed primarily toward influencing the domestic economy, can also be expected to have different effects on the various regions of the U.S. As noted during the workshop, the Midwest economy has typically responded well, though not without difficult and comprehensive industrial restructuring, to the relaxation of international trade barriers. The recovery of the Midwest economy during the past ten years and its recent success in international markets are due importantly to the composition of the region's industrial mix, which is heavily oriented toward automotive and capital equipment manufacturing and agricultural production. The appreciation of the dollar exchange rate during the early 1980s and the progress toward lowering trade barriers throughout the 1960s, 1970s, and 1980s encouraged a rapid influx of imports, leading to increased competition for local industries nationwide.

National policy actions, whether related to trade or aimed primarily toward influencing the domestic economy, can be expected to have different effects on the various regions of the U.S.

Midwest industry, in particular, responded with a comparatively successful restructuring, which was clearly identified as having an international scope. Foreign direct investment in existing U.S. firms was an important factor contributing to the retention of some midwestern industries, for example, consumer electronics. Foreign financial institutions entered the region's banking market and provided new sources of competitively priced funds.

The automotive industry, heavily concentrated in the Midwest, was profoundly influenced by developments in the international sector. First was the *single market* effect of the 1965 U.S.–Canada auto pact, which promoted harmonization of the industry across the national border. Arguably the most important impact from the international sphere came as a result of international competition in the domestic market, initially from imports and more recently from the transplanting of foreign production (that is, foreign investment) to U.S. locations, in many cases the Midwest. To the domestic industry's credit, it was able to adjust to meet the competition.

Midwest industrial restructuring contributed importantly to a rapid growth in shipments to foreign markets during the late 1980s and early 1990s, a development that occurred despite the fact that the primary markets to which Midwest industry exports (the Americas) faced a dollar exchange rate that was appreciating (not depreciating as is typically thought to be the case).

Agricultural exports, both primary products and processed foods, have also surged in recent years. The Midwest is the heart of feed grain and oil seed production in the U.S.; it is also an important center for the food processing industry. Processed foods are among the fastest growing agricultural exports.

Much of the expansion in U.S. exports has occurred in response to growth in emerging markets. Indeed, some estimates suggest that nearly three-quarters of future growth in world trade is expected to arise from such markets. High on the list of import demand by emerging markets are capital goods, machinery and equipment, and the Midwest is well positioned to respond. Recent evidence of NAFTA's impact on market expansion to Mexico suggests that Midwest gains have accrued through an expansion in durable goods manufacturing activity.

Open borders to direct investments have assisted the Midwest in several ways, including the adoption of world-class technologies and modes of business operation. In some cases, technology transfer has occurred through information/communication channels as multinational and midwestern companies that sell worldwide have adopted new standards and processes. In other cases, foreign domiciled firms—both manufacturers and service firms—have relocated operational skills directly to the Midwest. Joint ventures between domestic and foreign firms have also helped domestic firms to invest in cutting edge technologies (e.g., integrated steel mills). Open borders at the national level made this transformation possible; regional amenities and infrastructure may also have contributed.

While the federal government determines the nation's international trade and investment policy, individual state and metropolitan areas also have an important role to play in the internationalization of the economy. In the process of a nation becoming more interdependent with the rest of the world through the reduction of trade and investment barriers, national governments cede some of their economic and, thus, political authority to multinational authorities. Some observers suggest that as a result of this process, the economic role of subnational political jurisdictions, such as states and metropolitan areas, is likely to grow. Indeed, states and metro areas in the Midwest have moved toward becoming hosts and centers for foreign investment and the export of services worldwide—business services, financial services, business travel, and tourism. However, the current model of participating in the expanding international marketplace by states and metro areas is that of interstate or intercity competition. Some observers suggest that the European model of intercity cooperation to promote cities' relative advantages would be a more productive approach, and would in turn help U.S. cities to attract global investment.

While the federal government determines the nation's international trade and investment policy, individual state and metropolitan areas also have an important role to play in the internationalization of the economy.

There is much more to be understood about the pattern of interregional (domestic and international) linkages and how they are evolving. Clearly, there are many questions left unanswered. However, asking the appropriate questions is more than half the battle. In this spirit, the reasonable questions that need to be addressed include: Are there significant unmeasured interstate and international flows in services as well as manufactured goods? What are the implications of policies that promote distortionary regulations, taxes, and fiscal issues that may be limiting international trade, investment, and labor flows—policies such as different weight and length limits on trucks; different state and local tax regimes; barriers and impediments to skilled labor migration; prohibitions against foreign ownership of property; and trade distortions among states or across international borders, arising from selective tax abatements and restrictions on imports?

It is clear that *international as well as intranational* economic linkages are complex, and becoming more so. The papers and discussions presented at this workshop have shed some light on these linkages. Nonetheless, what clearly emerges from this endeavor is a pattern found all too often. The search for understanding answers some pressing questions and provides some guidance for policy, but it also raises more questions.

About the Workshop

Correspondence related to the September 18 workshop should be directed to conference coordinators, Linda Aguilar, regional economist, and Jack Hervey and Thomas Klier, senior economists, of the Research Department at the Federal Reserve Bank of Chicago. Jack Hervey was the chief author and coordinator of this publication. Participants in the workshop included the following:

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Paul Conley
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Suzanne Cosgrove
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David Crane
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Commercial Club of Chicago

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Bridge News

**Presenter, discussant, or moderator*

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Workshop Agenda

The workshop, "Global Linkages to the Midwest Economy," was held on September 18, 1996 at the Federal Reserve Bank of Chicago, 230 S. LaSalle Street, Chicago, IL 60604.

I. Welcome and Opening Remarks

William C. Hunter, Federal Reserve Bank of Chicago

II. International Trade—Importance to the Midwest

Moderator: *William A. Testa*, Federal Bank of Chicago

A. Foreign Exports, Domestic Exports, and the Illinois Economy
Presenter: *Philip Israilevich*, Federal Reserve Bank of Chicago
Reactors: *Carlos Barbera*, State of Indiana
Doug Roberts, Michigan Department of Treasury

B. Exchange Rate Changes Look Different When Viewed from the Midwest
Presenter: *Jack Hervey*, Federal Reserve Bank of Chicago
Reactor: *Thomas Klier*, Federal Reserve Bank of Chicago

C. U.S. Agricultural Trade and Its Impact on the Midwest Rural Economy
Presenter: *Bill Edmondson*, U.S. Department of Agriculture
Reactor: *Michael Singer*, Federal Reserve Bank of Chicago

III. Regional Perspectives on Trade Agreements

A. NAFTA's Potential Impact by U.S. Region
Presenter: *Michael Kouparitsas*, Federal Reserve Bank of Chicago

B. A Regional Assessment of the Canada–U.S. FTA (Five Years After)
Presenter: *Jane Sneddon Little*, Federal Reserve Bank of Boston
Reactor: *Gary Scott*, Canadian Consulate General, Chicago

IV. Luncheon

Introduction: *Michael Moskow*, Federal Reserve Bank of Chicago

Trade and the Economy: International Linkages in an Open Market
Speaker: *David Walters*, Office of the U.S. Trade Representative

V. Foreign Investment and the Midwest Economy

A. FDI in Manufacturing in the Southeast and Midwest
Presenter: *Cletus Coughlin*, Federal Reserve Bank of St. Louis

B. Foreign-Owned Banks in the Midwest
Presenter: *Tim O'Neill*, Bank of Montreal

C. R&D Activities and Innovativeness of Foreign-owned Firms in Ohio
Presenter: *Asim Erdilek*, Case Western Reserve University
Reactor: *Ed Malecki*, University of Florida

VI. Panel Discussion: Shaping Local Policy for the Global Economy

Moderator: *Don Haider*, Northwestern University

A. Urban Policies for the Global Economy
Presenter: *Peter Kresl*, Bucknell University

B. Chicago as an International City
Presenter: *Arnold Weber*, Northwestern University

C. The Globalization of Midwest Financial Markets
Presenter: *Clark Heston*, Risk Management Center

D. A Regional Perspective
Presenter: *Geoffrey Hewings*, REAL and the University of Illinois at Urbana–Champaign

About the Project

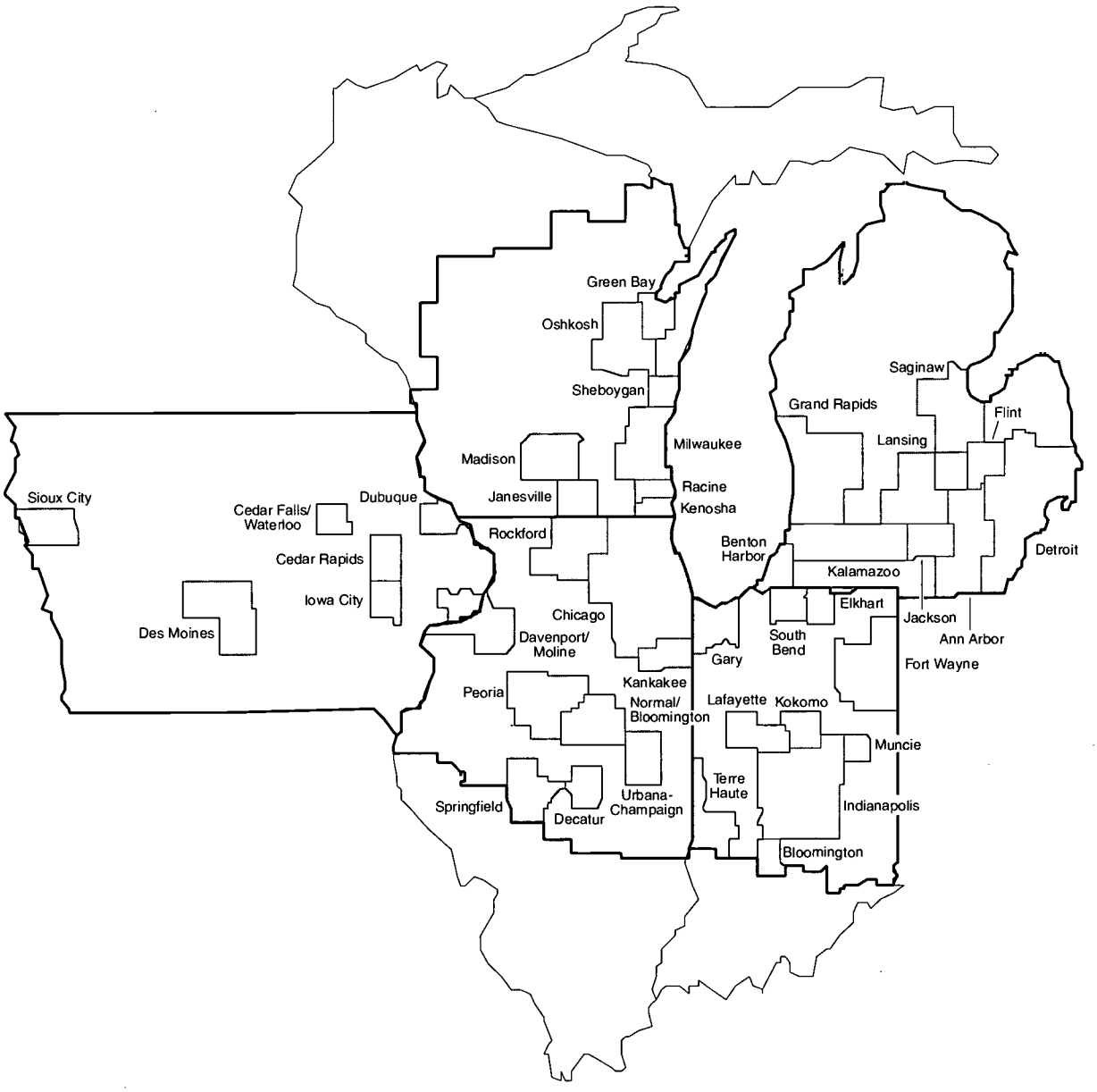
The Federal Reserve Bank of Chicago is undertaking an extensive analysis of the Midwest economy. The goal of the project is to understand the Midwest's turnaround in economic performance since the early 1980s. In the Seventh Federal Reserve District—which includes Iowa and large portions of Illinois, Indiana, Michigan, and Wisconsin—unemployment rates are, at the time of this writing, lower than at any time since the 1977–78 period, as well as being below the national average.

The Midwest project will involve a series of workshops and research studies which will be carried out by Federal Reserve analysts and other researchers from the region. An advisory board representing a cross-section of Midwest leaders will provide guidance for the project (see back page). Workshops scheduled for 1996 will consider (1) the economic performance of the broad Midwest economy and the transformation of its manufacturing industries; (2) the rural economy of the Midwest; (3) labor force training and education; (4) global linkages with the region's economy; and (5) tax, spending, and regulatory influences on regional performance. The findings of the workshops will be communicated through a series of publications and broad public forums. The project will conclude with a conference and publication toward the end of 1996.

At the Bank, the "Assessing the Midwest Economy" project is being conducted through a cooperative effort of the Office of the President, Michael H. Moskow, president; Research Department, William C. Hunter, senior vice president and director of research; and Community and Information Services, Nancy M. Goodman, senior vice president.

Inquiries should be directed to William A. Testa, senior economist and assistant vice president, Research Department, or James Holland, public affairs officer.

Figure 1 Geography of Metro Areas, Seventh Federal Reserve District



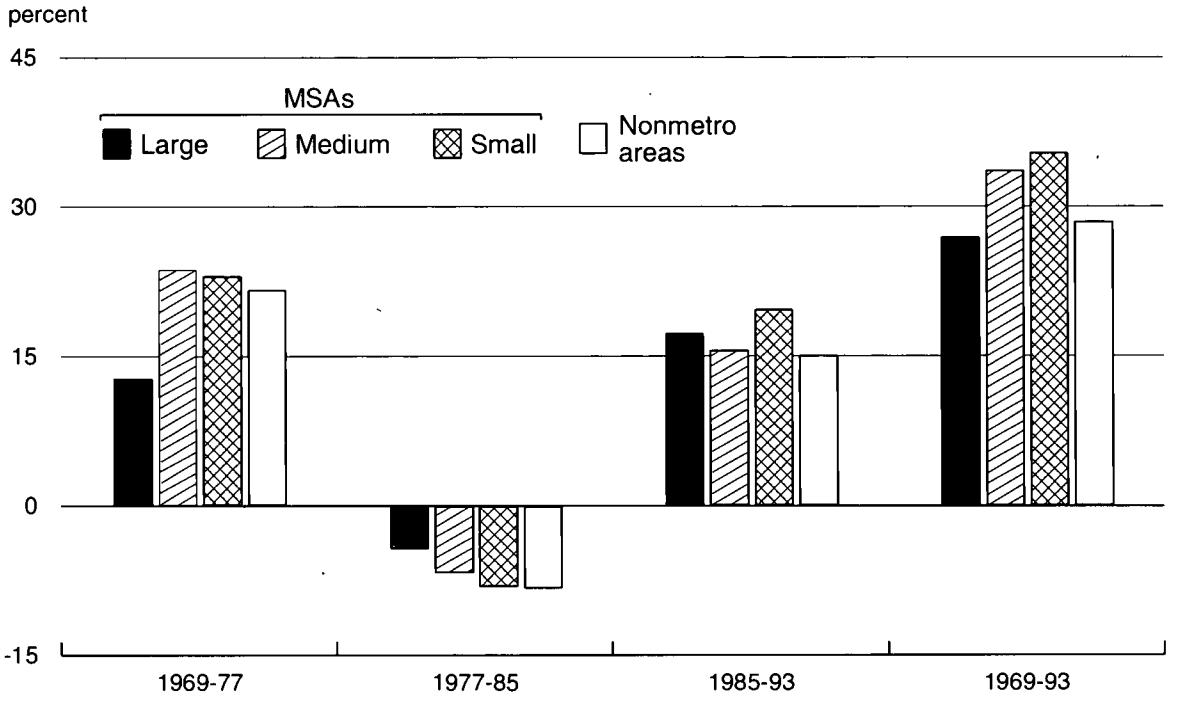
Note: Heavy black line indicates border of the Seventh District.
Source: U.S. Office of Management and Budget.

Table 1 Metro/Nonmetro Population, 1993 (000s)

	Metro	Non-metro	% Metro	% Non-metro
U.S.	205,489.0	52,294.0	79.7	20.3
Illinois	9,817.6	1,868.3	84.0	16.0
Indiana	4,088.0	1,617.5	71.7	28.3
Iowa	1,238.5	1,582.8	43.9	56.1
Michigan	7,813.3	1,646.4	82.6	17.4
Wisconsin	3,431.2	1,312.8	72.3	27.7
Seventh District	26,388.6	8,027.8	76.7	23.3

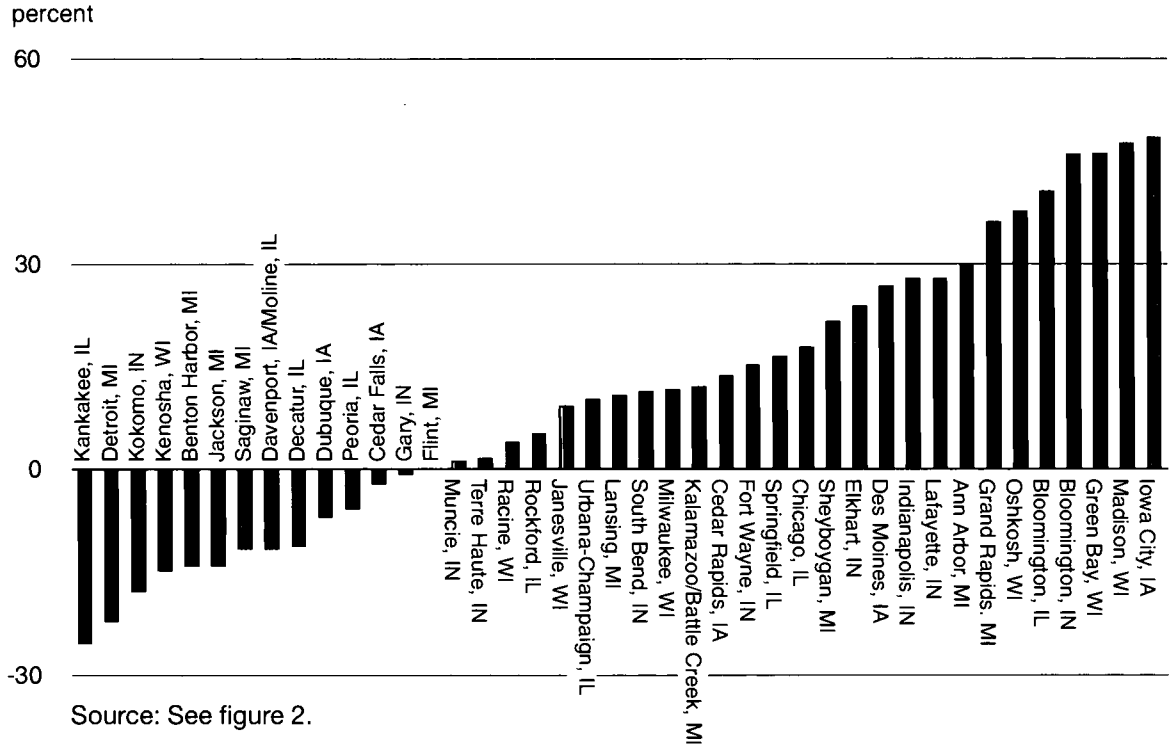
Source: U.S. Department of Commerce, Bureau of Economic Analysis (BEA), Regional Economic Information System (REIS).

Figure 2 Change in Real Personal Income by MSA Size, 1977–93



Source: U.S. Department of Commerce, Bureau of Economic Analysis (BEA), Regional Economic Information System (REIS).

Figure 3 Change in Real Personal Income by MSA, 1977–93



Source: See figure 2.

Table 2 Number of Governments

	Municipal		Special Districts	
Metropolitan Area*	**1957**	**1992**	**1957**	**1992**
Chicago	248	315	333	605
Des Moines	42	41	21	38
Detroit	106	120	23	46
Indianapolis	70	62	28	136
Milwaukee	59	65	15	39

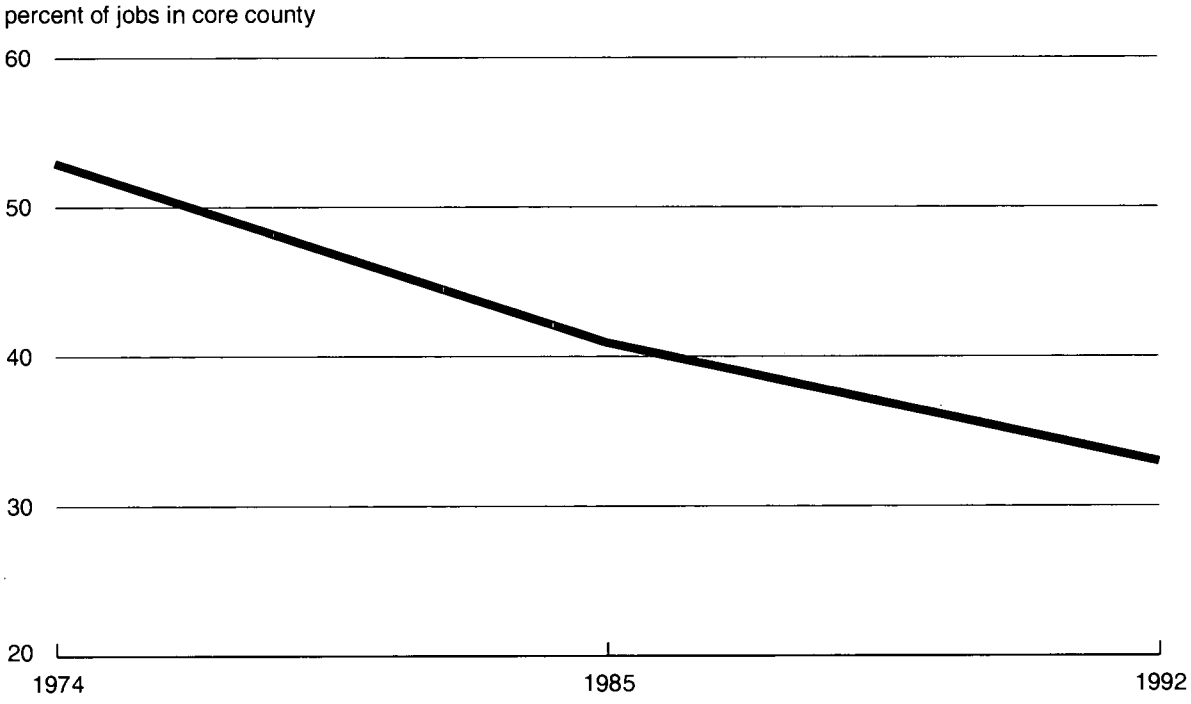
*Defined identically for 1957 and 1992.
Source: U.S. Department of Commerce, Bureau of the Census, *Census of Governments* (various years).

Table 3 Real Personal Income (Indexes of Concentration)

	Versus the U.S.				Versus the Seventh District			
	1969	1977	1985	1993	1969	1977	1985	1993
Manufacturing								
Large MSAs	1.31	1.35	1.29	1.27	0.99	0.98	0.92	0.89
Core counties	1.28	1.34	1.22	1.18	0.97	0.96	0.88	0.82
Med. MSAs	1.52	1.63	1.70	1.67	1.15	1.18	1.22	1.16
Small MSAs	1.41	1.48	1.55	1.66	1.07	1.07	1.11	1.16
Nonmetro	1.10	1.19	1.34	1.59	0.83	0.86	0.96	1.11
FIRE								
Large MSAs	1.00	1.09	1.14	1.14	1.19	1.22	1.27	1.27
Core counties	1.12	1.22	1.37	1.30	1.32	1.37	1.53	1.45
Med. MSAs	0.70	0.71	0.70	0.77	0.83	0.80	0.79	0.86
Small MSAs	0.71	0.73	0.71	0.69	0.84	0.82	0.79	0.77
Nonmetro	0.60	0.62	0.51	0.46	0.71	0.70	0.57	0.51
Business services								
Large MSAs	1.06	1.07	1.16	1.14	1.34	1.32	1.34	1.30
Core counties	1.13	1.02	1.01	1.00	1.43	1.26	1.17	1.14
Med. MSAs	0.52	0.58	0.63	0.74	0.66	0.71	0.73	0.84
Small MSAs	0.43	0.51	0.54	0.62	0.55	0.63	0.63	0.71
Nonmetro	0.49	0.53	0.44	0.40	0.62	0.65	0.51	0.46

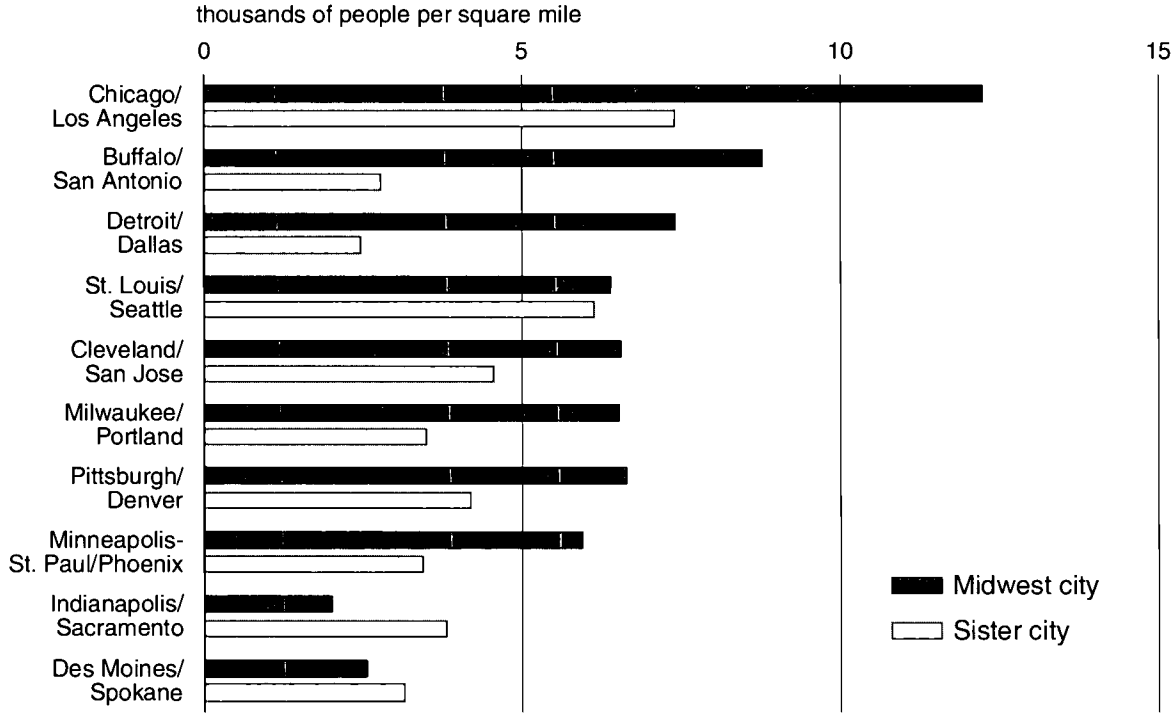
Note: Index value is the ratio of industry share in the MSA to the share in the U.S. (or Seventh District).
Source: See table 1.

Figure 4 Core County Employment in Data Processing within Metro Areas



Source: U.S. Office of Technology Assessment, *The Technology Shaping of Metropolitan America,* September 1995, p. 84.

Figure 5 Population Density in the Midwest and Sister Cities,* 1990



*Cities were paired that had similar census population in 1990. Densities are for the city proper, not the metropolitan area.

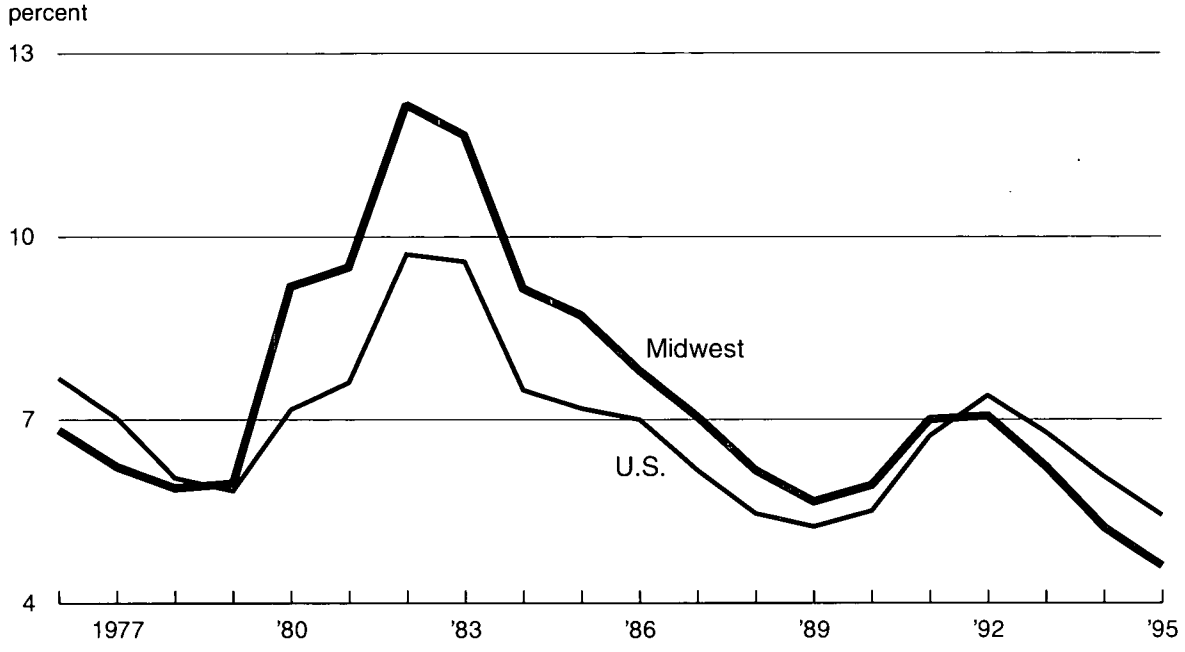
Source: U.S. Department of Commerce, Bureau of the Census, *Urban Areas of the United States and Puerto Rico,* December 1993.

Table 4 Seventh District State Brownfield Initiatives

State	Program Description	Liability Provision	Participant Requirements	State Assurances Provided
Illinois	Pre-Notice Site Cleanup Program	State liability is strict, joint, and several for potentially responsible parties (PRPs).	$5,000 initial fee for oversight costs.	"Clean" letters issued for successful cleanups. Re-openers apply in the case of changes in land use.
Indiana	Voluntary Cleanup Program	Liability is strict, joint, and several.	$1,000 fee for application submittal including site history and description.	Certificate of completion issued by the Indiana Department of Environmental Management. Governor's office then issues a "covenant not to sue."
Iowa	None at this time.			
Michigan	Natural Resources Environmental Protection Act	Strict retroactive liability still applies to potentially responsible parties, although new law exempts owners from liability at current sites if they did not cause the release.	"Affirmative obligations" now exist for owners and operators of sites suspected or known to be contaminated to remediate and restore the site.	Covenant not to sue available for redevelopers of industrial sites. Letter of determination provided to anyone purchasing property. Letter protects purchaser from liability pending approved baseline assessment of site.
Wisconsin	Land Recycling Act	Prospective purchasers and innocent landowners may participate; responsible parties are pursued for cleanup costs in the event voluntary agreements fail. Municipalities and lenders are generally exempt from liability for properties obtained through foreclosure.	Currently no fee is required.	Release from liability offered under the state's Hazardous Substance Discharge Law. Release is transferrable to future owners.

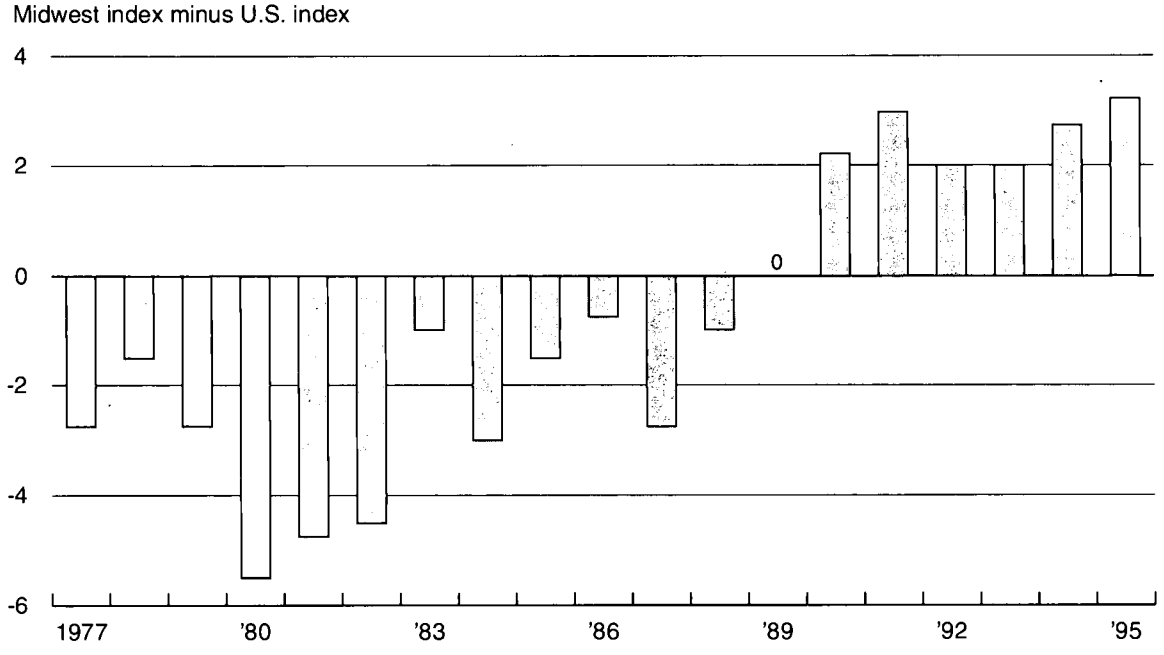
Source: Adapted from Charles Bartsch, "Brownfield Policies in the Midwest," working draft, Northeast-Midwest Institute, Washington, DC, November 15, 1995.

Figure 1 Unemployment Rates



Sources: Bureau of Labor Statistics and state employment agencies.

Figure 2 Midwest Hiring Plans, Relative Strength

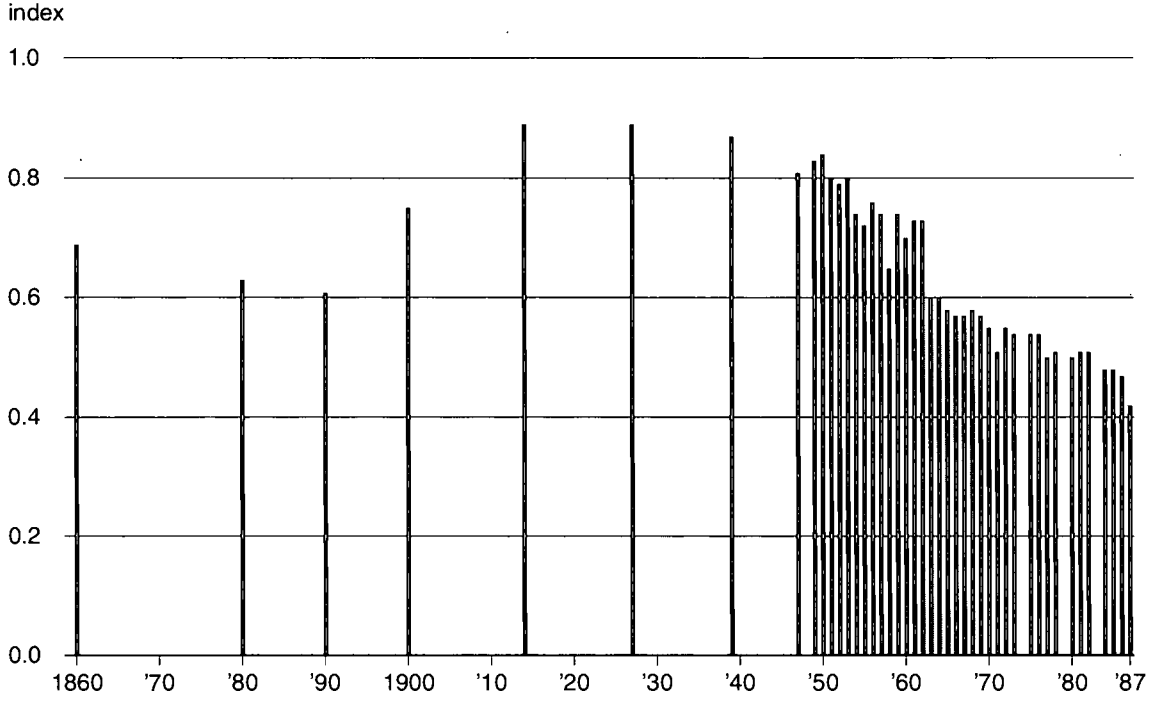


Source: Manpower, Inc., hiring survey.

Figure 3 Relative Strength in Midwest Industrial Production

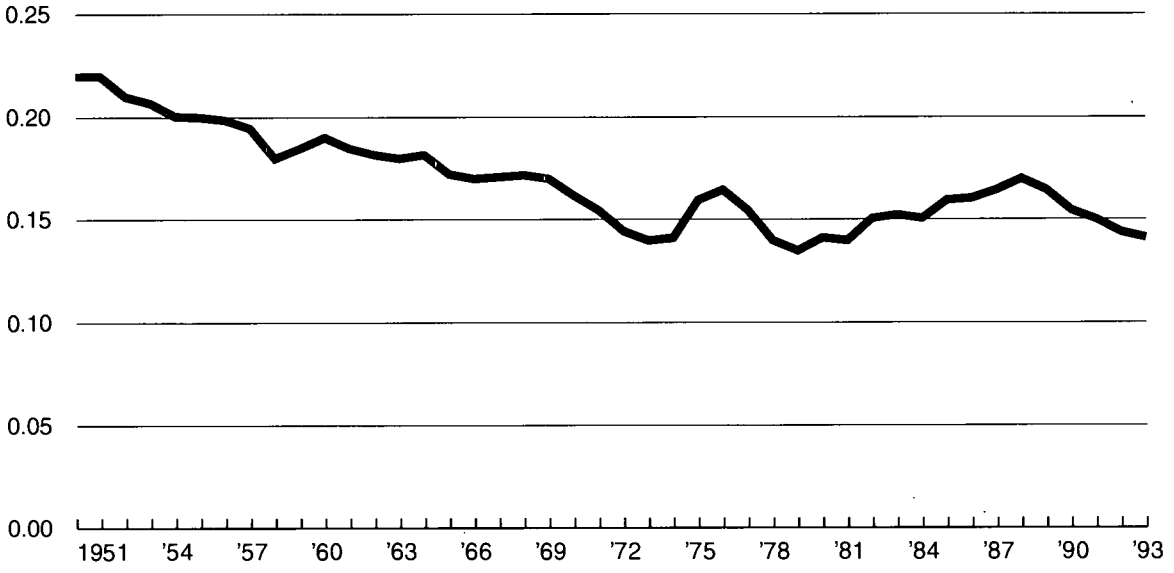
Source: Board of Governors of the Federal Reserve System and Federal Reserve Bank of Chicago.

Figure 4 Index of Regional Specialization for Manufacturing, 1860–1987



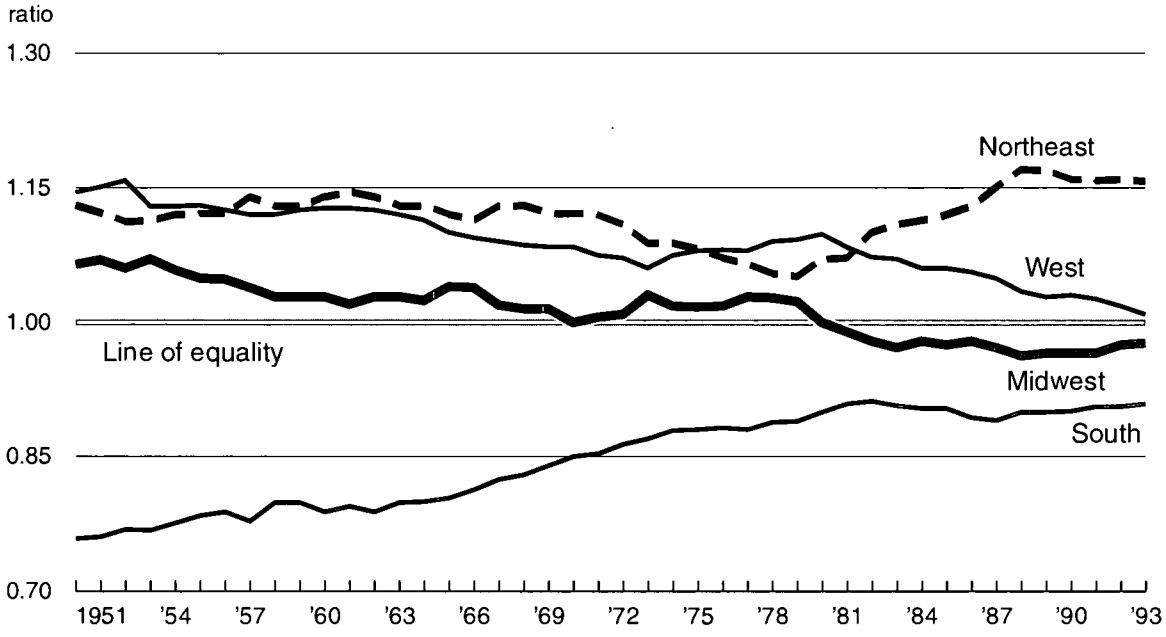
Source: Sukkoo Kim, "Changing Structure of U.S. Regions: A Historical Perspective," paper prepared for the workshop *Structure and Performance, 1996.*

Figure 5 Dispersion of Per Capita Income among States (Gini Coefficient), 1950–93



Source: Fred Giertz, "Regional Income Trends and Convergence," paper prepared for the workshop *Structure and Performance, 1996.*

Figure 6 Ratios of Regional Per Capita Income to U.S. Average, 1950–93



Source: Fred Giertz, "Regional Income Trends and Convergence," paper prepared for the workshop *Structure and Performance, 1996*.

Table 1 Classification of Cities

High Productivity	Low Productivity	High Amenity	Low Amenity
New York, NY	Tampa, FL	Boston, MA	Cleveland, OH
Newark, NJ	San Antonio, TX	San Diego, CA	Cincinnati, OH
Los Angeles, CA	Salt Lake City, UT	Milwaukee, WI	Pittsburgh, PA
Seattle, WA	New Orleans, LA	Denver, CO	Philadelphia, PA
San Francisco, CA	Columbus, OH	Riverside, CA	Baltimore, MD
Minneapolis, MN	Sacramento, CA	Portland, OR	St. Louis, MO
Anaheim, CA	Phoenix, AZ	Ft. Lauderdale, FL	Indianapolis, IN
Nassau-Suffolk, NY	Kansas City, MO	Miami, FL	Dallas, TX
Chicago, IL			Atlanta, GA
Washington, DC			
San Jose, CA			
Houston, TX			
Detroit, MI			

Productivity cities are listed from most amenable to least amenable, amenity cities are listed from most productive to least productive.

Source: Eberts and Beeson, "Identifying Amenity and Productivity Cities Using Wage and Rent Differentials," Federal Reserve Bank of Cleveland, *Economic Review,* Quarter 3, 1987, pp. 16–25.

Table 2 Foreign Destination Shares of Regional Industrial Production, 1987

U.S. region of production	Foreign Destination Area							
	North America	Central America	South America	Europe	Asia	Oceania*	Africa	All**
Midwest	52.6	5.1	3.0	20.1	15.3	2.3	1.6	100
Mid-Atlantic	25.7	5.5	6.7	31.4	25.5	2.6	2.7	100
New England	23.7	2.9	2.3	39.6	25.6	4.9	1.0	100
Plains	38.8	3.8	2.6	25.9	24.2	3.1	1.6	100
Rocky Mtn.	22.1	4.0	1.3	32.3	36.2	3.4	0.8	100
South Atlantic	15.1	13.8	12.0	30.7	23.7	2.4	2.3	100
South Central	23.2	9.7	6.7	31.8	22.2	2.6	3.9	100
Southwest	11.8	24.3	7.4	23.4	27.1	2.1	3.9	100
West	11.3	5.5	3.4	30.3	44.1	4.0	1.4	100
U.S.	27.3	8.0	5.1	28.0	26.5	3.0	2.1	100

**Islands in the Pacific, including New Zealand, Australia, and the Malay Archipelago.*
***Totals may not add to 100% due to rounding.*

Source: U.S. Bureau of the Census, unpublished data.

Table 3 Application of Flexible Manufacturing Cells (FMCs) by Employment Size and Age of Plant

Plant Employment	% of Plants Using FMCs	Age of Plant	% of Plants Using FMCs
20–99	7.6	< 5 yrs.	13.4
100–499	21.4	5–15	13.3
500+	40.4	16–30	13.4
		> 30	15.2

Percentages do not add up to 100% as "% of plants using FMCs" is only one of the categories per plant size and plant age, respectively.

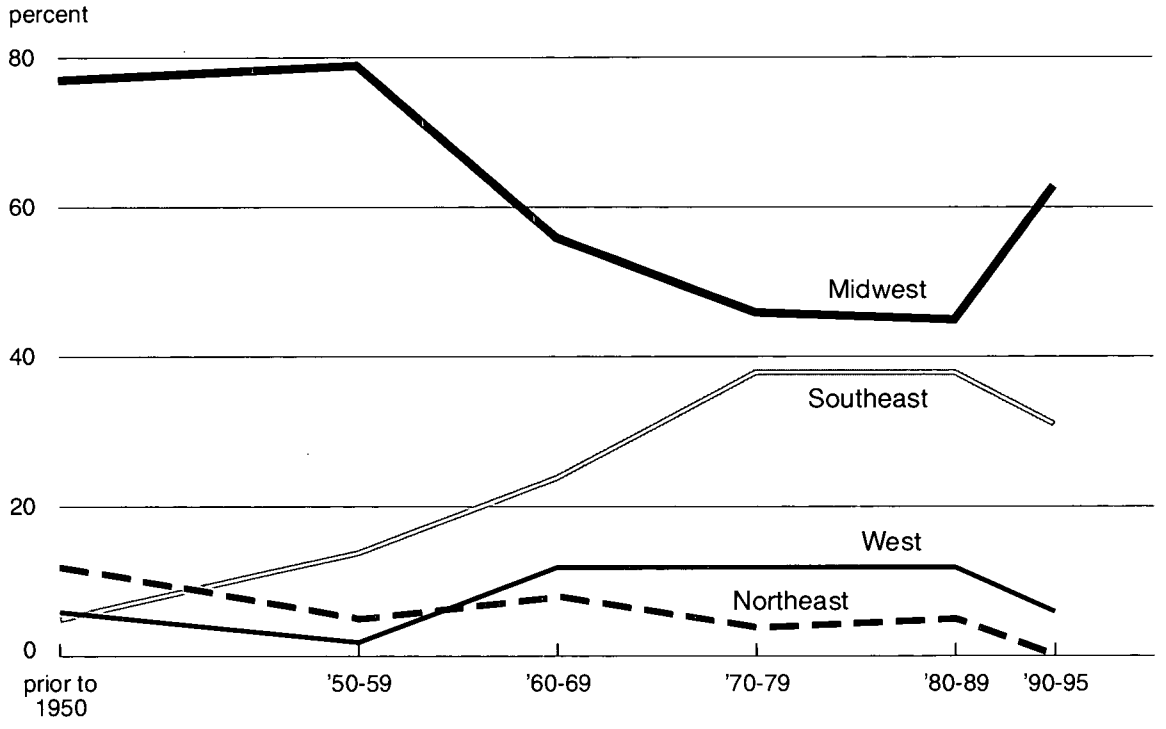
Source: U.S. Department of Commerce, Bureau of the Census, "Current Industrial Reports," *Manufacturing Technology: Prevalence and Plans for Use,* 1993, tables 4D and 4E.

Table 4 Distribution of Auto Assembly Plants over Time, by Region

Region	Status of Plant: Open in 1979	Closed 1979–96	Open 1979–96	Open in '96
Midwest	27	9	13	31
Southeast	6	1	8	13
West	15	6	1	10
Northeast	9	5	0	4
Total	**57**	**21**	**22**	**58**
I-65/I-75 corridor	27	8	20	39
Other	30	13	2	19

Source: Adapted from James Rubenstein, "The Evolving Geography of Production: Is Manufacturing Activity Moving Out of the Midwest? Evidence from the Auto Industry," paper prepared for the workshop *Structure and Performance, 1996.*

Figure 7 Auto Supplier Plants by Region and Start-Up Date



Source: Adapted from James Rubenstein, "The Evolving Geography of Production: Is Manufacturing Activity Moving Out of the Midwest? Evidence from the Auto Industry," paper prepared for the workshop *Structure and Performance, 1996.*

Table 5 Auto Supplier Plants by Region and Ownership

Region	Ownership status: Big 3 subsidiary	Independent U.S.-owned	Foreign-owned	All
Midwest	80%	54%	41%	56%
Southeast	9	27	40	27
West	4	12	9	10
Northeast	7	7	9	7
Number of plants in sample	129	603	149	881

Source: Adapted from James Rubenstein, "The Evolving Geography of Production: Is Manufacturing Activity Moving Out of the Midwest? Evidence from the Auto Industry," paper prepared for the workshop *Structure and Performance, 1996.*

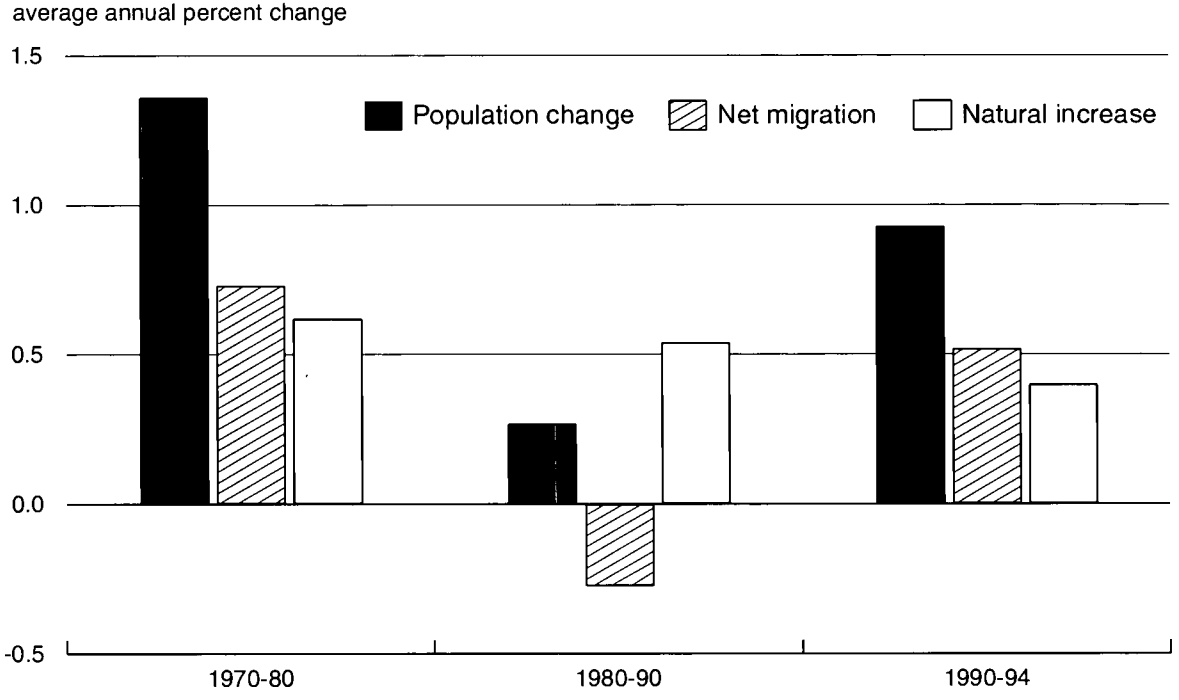
Table 1 Population Growth Has Rebounded in Rural Areas

	% Change in Population			% of Counties with Population Gains	
	Rural	Urban	Total	Rural	Urban
United States					
1980-90	2.7	11.8	9.8	45	81
1990-94	3.9	4.9	4.7	74	91
Midwest[a]					
1980-90	-2.2	1.3	0.4	30	67
1990-94	2.4	3.0	2.9	74	92

[a]Illinois, Indiana, Iowa, Michigan, and Wisconsin.

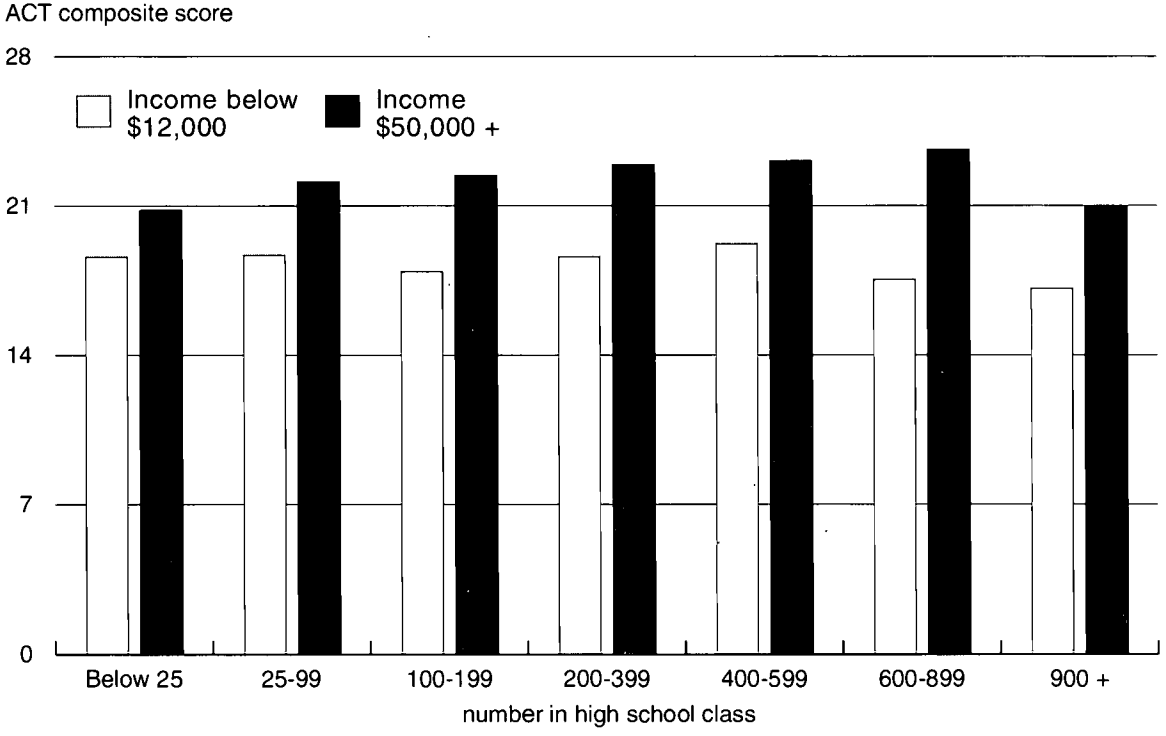
Source: Kenneth M. Johnson, "Recent Nonmetropolitan Demographic Trends in the Midwest," paper presented at the workshop "The Changing Rural Economy of the Midwest," held at the Federal Reserve Bank of Chicago, March 8, 1996.

Figure 1 Recent Population Gains in Rural Areas Parallel the Pattern of the 1970s Boom



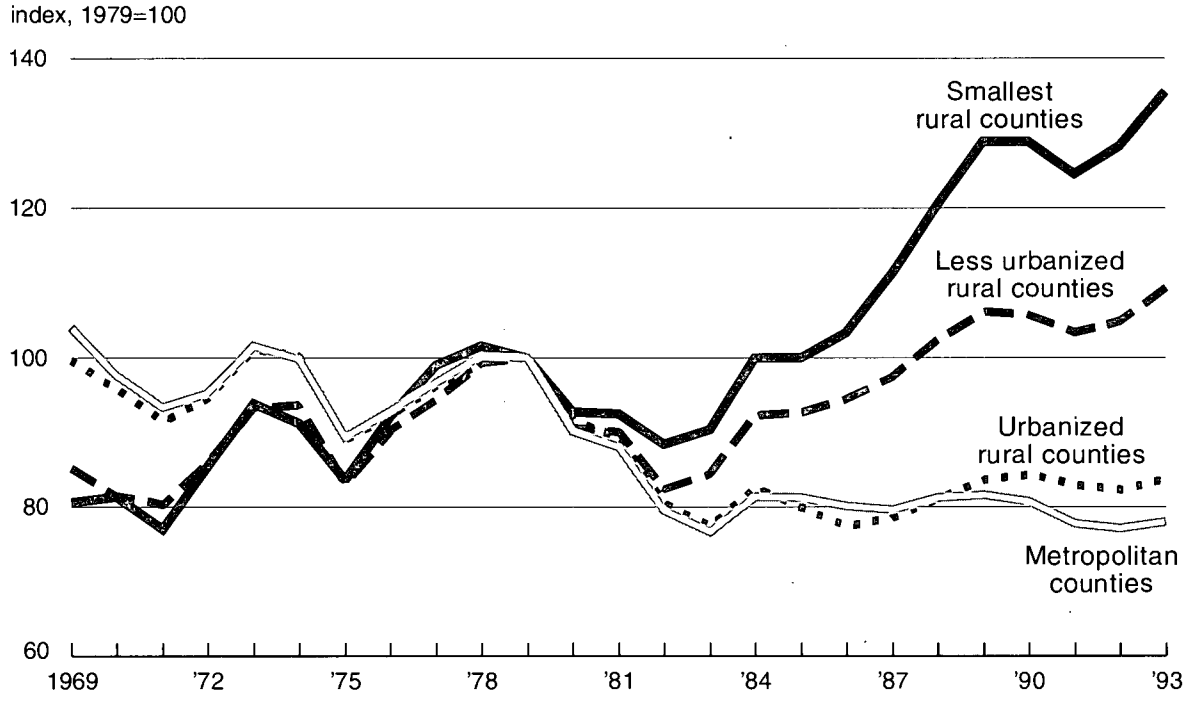
Source: Kenneth M. Johnson, "Recent Nonmetropolitan Demographic Trends in the Midwest," paper presented at the workshop "The Changing Rural Economy of the Midwest," held at the Federal Reserve Bank of Chicago, March 8, 1996.

Figure 2 ACT Composite Scores of 1995 Graduates in Midwestern States, by Income Level and High School Class Size



Source: Thomas F. Pogue, "The Quality of Rural Education in the Midwest," paper presented at the workshop "The Changing Rural Economy of the Midwest," held at the Federal Reserve Bank of Chicago, March 8, 1996.

Figure 3 Smaller Rural Counties Have Witnessed Most of the Growth in Rural Manufacturing Jobs in the Midwest



Note: Rural counties broken down by population: < 2,500 = the smallest rural counties, 2,500 to 19,999 = less urbanized rural counties, > 20,000 = urbanized rural counties.

Source: G. Andrew Bernat, "Manufacturing and the Midwest Rural Economy: Recent Trends and Implications for the Future," paper presented at the workshop "The Changing Rural Economy of the Midwest," held at the Federal Reserve Bank of Chicago, March 8, 1996.

Table 2 The Top 15 Food Processing Industries in the Midwest

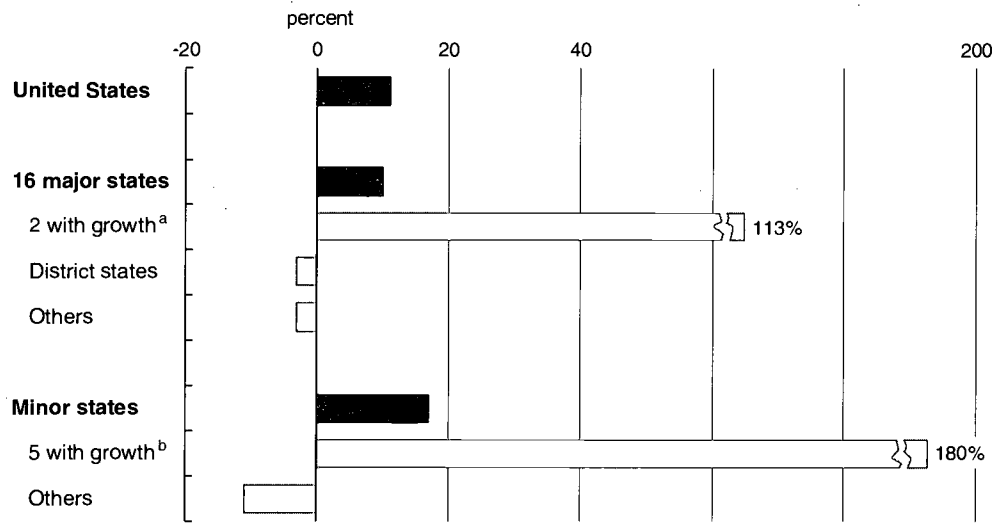
	Rank 1992	Rank 1982	Value Added 1992	Value Added 1982	% of all Midwest Food Processing 1992	% of all Midwest Food Processing 1982
			(--million dollars--)			
Breakfast Foods	1	3	3,470	1,264	10.6	6.9
Confectionery	2	2	2,489	1,472	7.6	8.0
Wet Corn Milling	3	5	2,386	902	7.3	4.9
Cheese	4	8	2,191	788	6.7	4.3
Meat Processing	5	7	1,849	799	5.7	4.4
Meat Packing	6	1	1,743	1,564	5.3	8.5
Processed Milk	7	9	1,687	783	5.2	4.3
Soft Drinks	8	6	1,654	845	5.1	4.6
Bread	9	4	1,482	1,113	4.5	6.1
Cookies and Crackers	10	15	1,210	521	3.7	2.8
Canned Fruits & Veg.	11	17	937	499	2.9	2.7
Flavorings	12	16	902	521	2.8	2.8
Fluid Milk	13	14	885	545	2.7	3.0
Frozen Specialties	14	18	859	393	2.6	2.1
Animal Feeds	15	13	738	575	2.3	3.1
Top 15			24,482	12,584	74.9	68.7
All Food Processing						
Midwest States			32,687	18,308	100	100
United States			156,843	88,419		

Note: Midwest states are Illinois, Indiana, Iowa, Michigan, and Wisconsin.

Source: Mike Singer and Chris Barfels, "The Food Processing Industry in the Midwest," paper presented at the workshop "The Changing Rural Economy of the Midwest," held at the Federal Reserve Bank of Chicago, March 8, 1996.

Figure 4 The Mega Hog Farms Are Mostly Apparent in a Few "Rapid Growth" States Which Now Account for Nearly One-Fourth of All Hogs

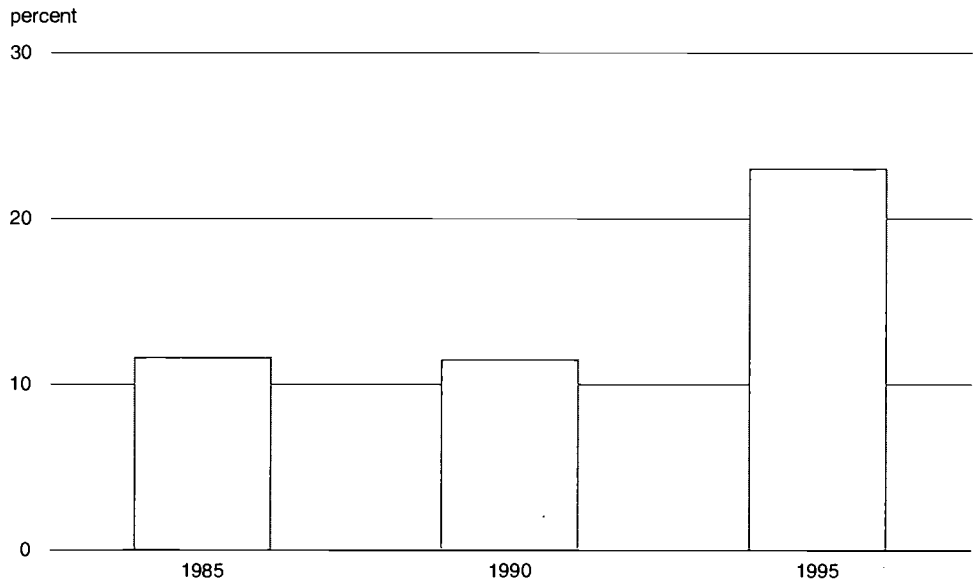
Change in Hog Inventories, 1990–95



[a]Missouri and North Carolina.
[b]Colorado, Mississippi, Oklahoma, Utah, and Wyoming.

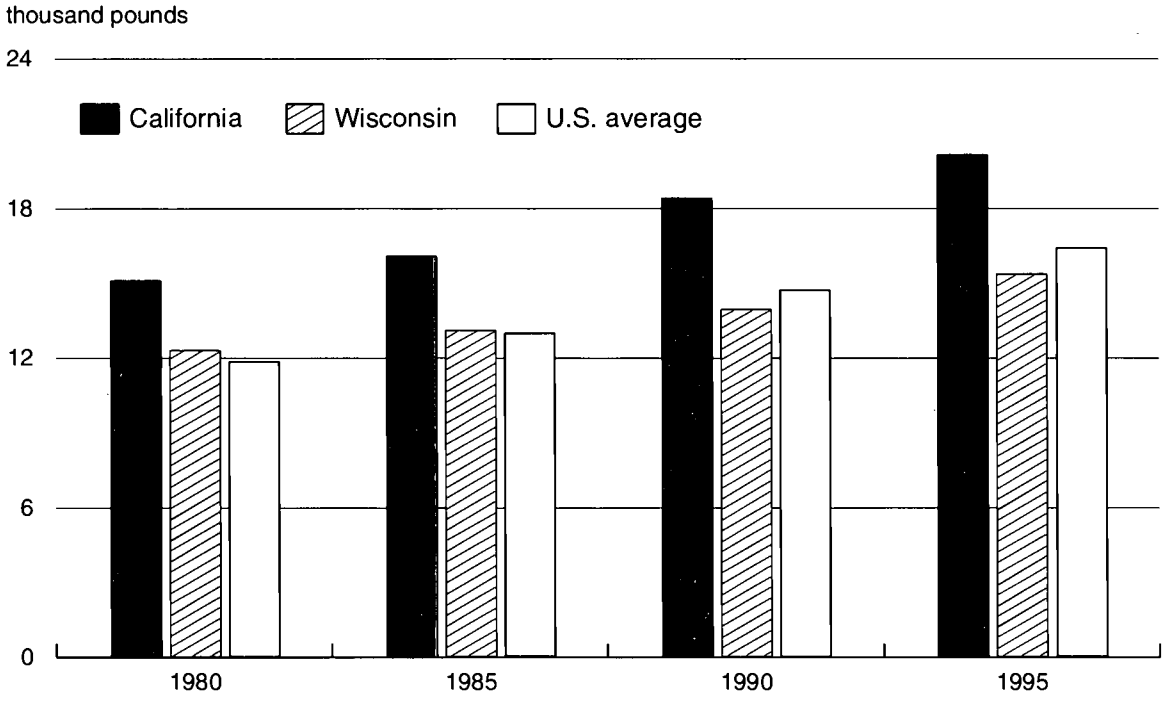
Note: District states are Illinois, Indiana, Iowa, Michigan, and Wisconsin.

The "Growth" States' Share of Hogs



Source: Gary L. Benjamin, "The Industrialization in Hog Production," paper presented at the workshop "The Changing Rural Economy of the Midwest," held at the Federal Reserve Bank of Chicago, March 8, 1996.

Figure 5 Annual Milk Output per Cow Tends to Be Lower in Midwest States Where Dairy Farms Are Smaller



Source: Mary Keough Ledman, "The Changing Dairy Sector," paper presented at the workshop "The Changing Rural Economy of the Midwest," held at the Federal Reserve Bank of Chicago, March 8, 1996.

Table 1 Skills and Credentials Required for New Jobs

	All Jobs	College Required	No College Required	
			White-Collar	Blue-Collar/Service
Daily Task Performance				
Customer Contact	.73	.82	.82	.51
Reading or Writing Paragraphs	.68	.91	.67	.51
Arithmetic	.68	.77	.70	.56
Computer	.56	.74	.70	.20
Required Credentials				
High School Diploma	.78	1.00	.82	.54
GED Accepted	—	—	.66	.44
GED Not Accepted	—	—	.16	.10
General Work Experience	.70	.75	.72	.62
Specific Work Experience	.64	.74	.64	.56
Previous Training or Certification	.43	.56	.39	.37

Notes: All results are sample weighted. A dash indicates information not available.

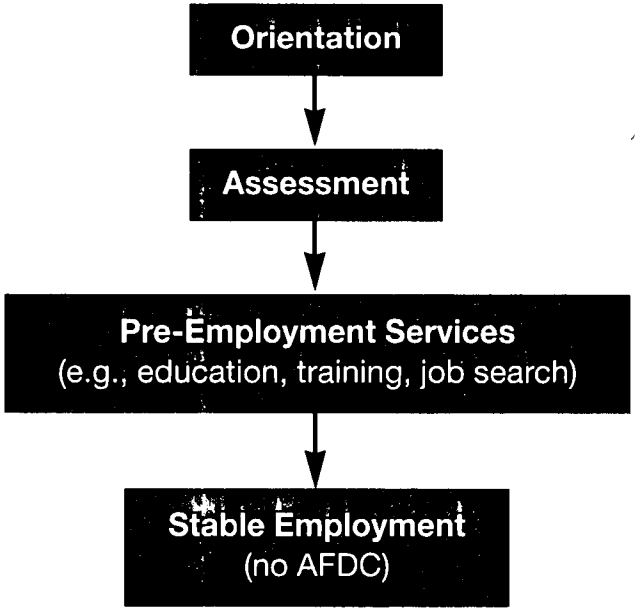
Source: Harry Holzer, "Employer Skill Needs and Hiring Procedures," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

Table 2 Change in Average Full-Time Weekly Wages, 1979–93

Education Level	Men	Women
H.S. dropout	–22.5%	–6.3%
H.S. graduate	–11.9	5.7
H.S. graduate (+)	–5.3	11.0
College graduate	9.8	27.1

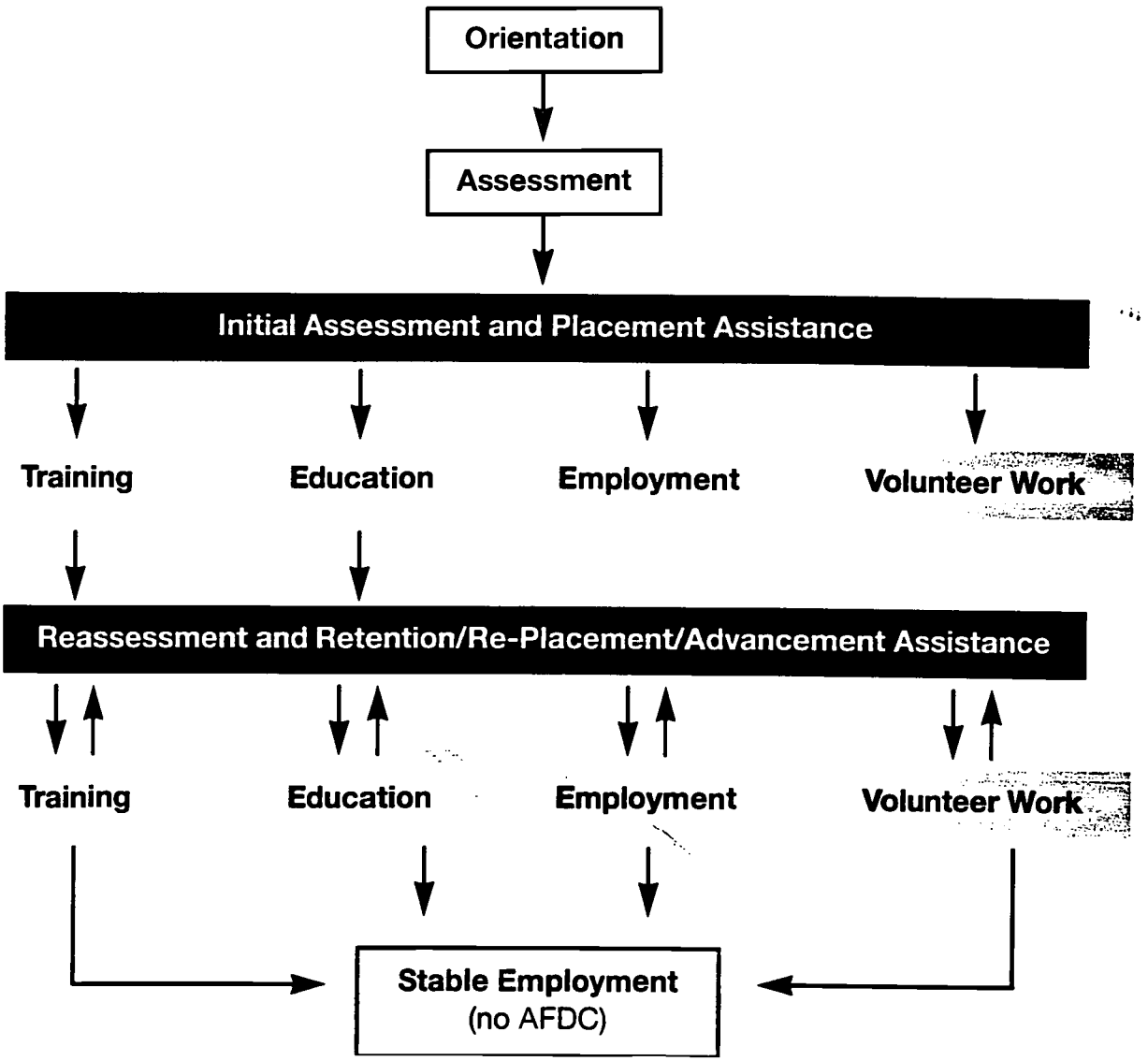
Source: Rebecca Blank, "The National Perspective," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

Figure 1 The Typical Welfare-to-Work Program Model: Pre-Employment Services Only



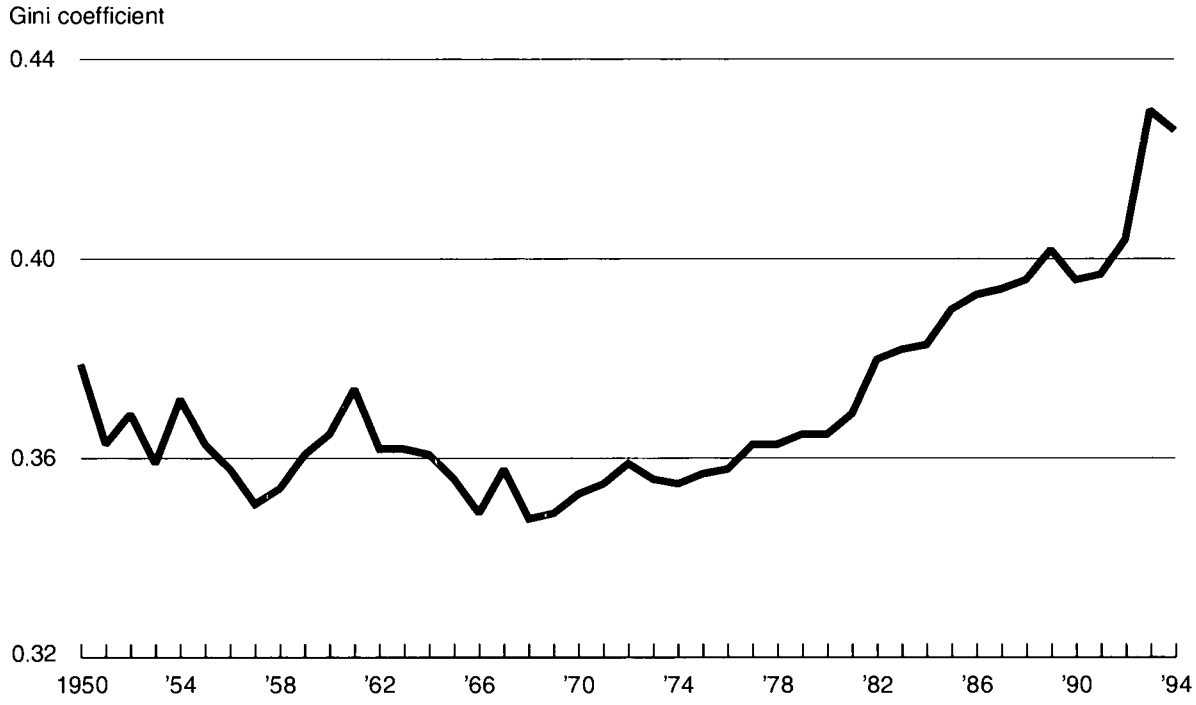
Source: Toby Herr, "Evidence from Chicago—Project Match Materials," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

Figure 2. An Alternative Model: Pre-Employment and Post-Employment Services



Source: Toby Herr, "Evidence from Chicago—Project Match Materials," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

Figure 3 Family Income Inequality, 1950–94, Gini Coefficients



Source: U.S. Department of Commerce, Bureau of the Census, *Current Population Reports*, Series P60, various years.

Table 3 North Central Region Family Income Inequality Trends, Gini Coefficients

Region	1990 Gini	1990 Gini rank[a]	1960 Gini rank[b]	1970-1990 change in Gini[c]	1970-1990 change in Gini rank[d]	1980-1990 change in Gini[e]	1980-1990 change in Gini rank[f]
East North Central							
Ohio	.3939	26	43	.0809	1	.0587	3
Indiana	.3767	39	33	.0547	12	.0467	16
Illinois	.4094	16	27	.0647	4	.0596	1
Michigan	.3993	21	38	.0703	2	.0534	10
Wisconsin	.3675	46	35	.0415	22	.0365	36
West North Central							
Minnesota	.3804	36	23	.0344	33	.0390	29
Iowa	.3728	43	19	.0258	41	.0110	48
Missouri	.4035	17	16	.0265	40	.0448	17
North Dakota	.3756	42	18	.0066	47	.0304	43
South Dakota	.3842	34	15	−.0018	48	.0265	44
Nebraska	.3774	38	20	.0164	45	.0338	39
Kansas	.3894	30	24	.0394	24	0387	31
U.S. Average	.3984	na	na	.0414	na	.0421	na

Notes: The Gini coefficient is a measure of income equality.
na indicates information is not applicable.

[a] The 1990 Gini rank for the 48 contiguous states. A low rank is associated with relatively *more* family income inequality.

[b] The 1960 Gini rank for the 48 contiguous states. A low rank is associated with relatively *more* family income inequality.

[c] The 1970–90 change in the Gini coefficient. A greater change is associated with a larger increase in inequality.

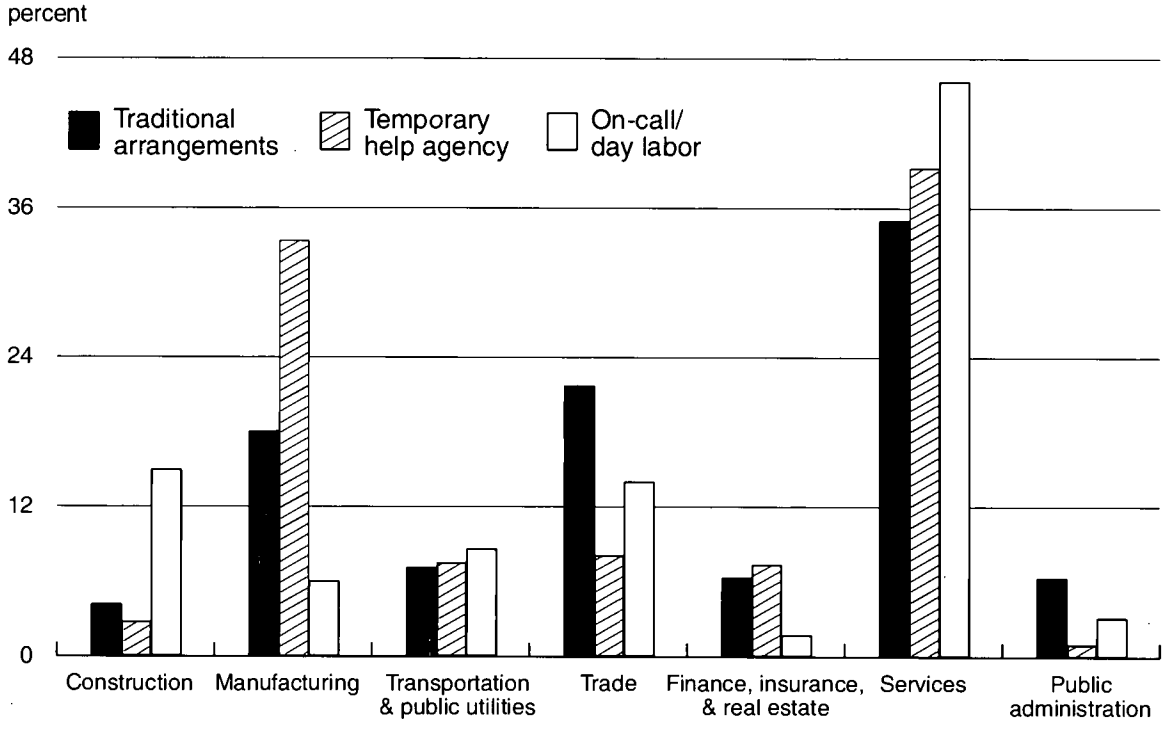
[d] The rank ordering of the 1970 to 1990 change in the Gini coefficient for the 48 contiguous states.

[e] The 1980–90 change in the Gini coefficient. A greater rank is associated with a larger increase in inequality.

[f] The rank ordering of the 1980 to 1990 change in the Gini coefficient for the 48 contiguous states.

Source: W. Levernier, M. Partridge, and D. Rickman, "Variation in State Income Inequality, 1960–90," *International Regional Science Review,* No. 3, 1996. The data were based on the 1960, 1970, 1980, and 1990 decennial census, where the actual family income was from the preceding year (i.e., 1959, 1969, 1979, and 1989).

Figure 4 Percent of U.S. Workers in Alternative Employment Arrangements, by Industry



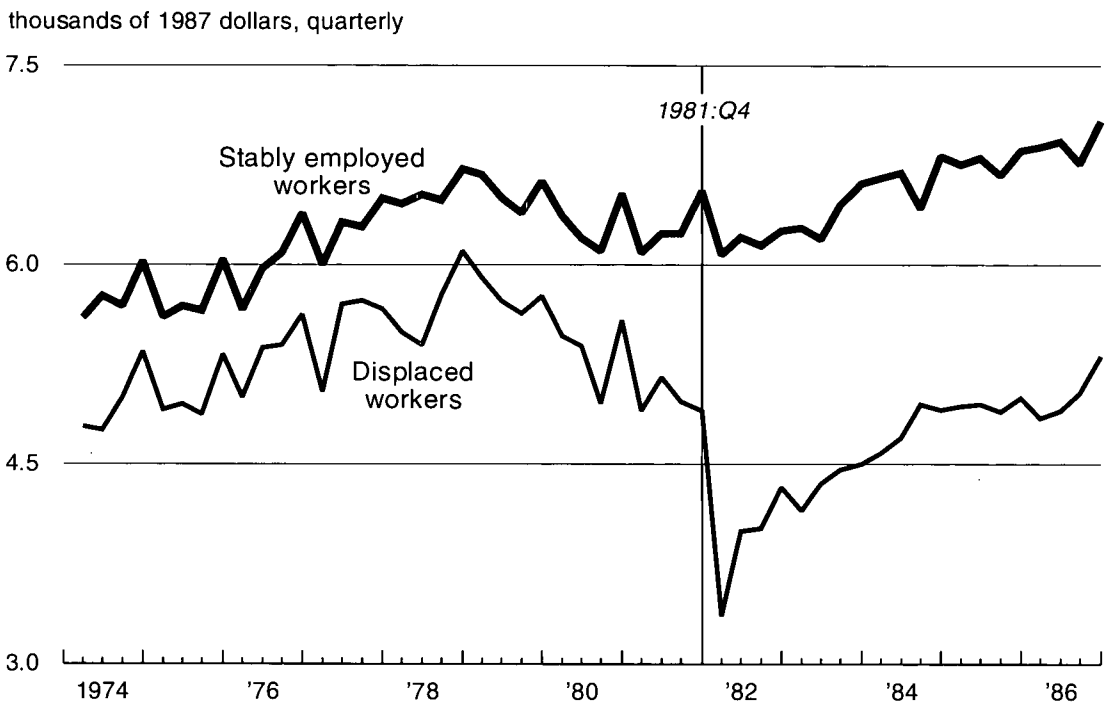
Source: U.S. Department of Labor, *Report on the American Work Force,* 1995.

Table 4 Contingent Workers by Class as Percent of Japanese Work Force

Year	Part-Time	Temp/Day Labor	Temp Agency
1982	11.0	11.5	4.8
1987	14.2	12.0	4.2
1992	16.1	11.2	3.9

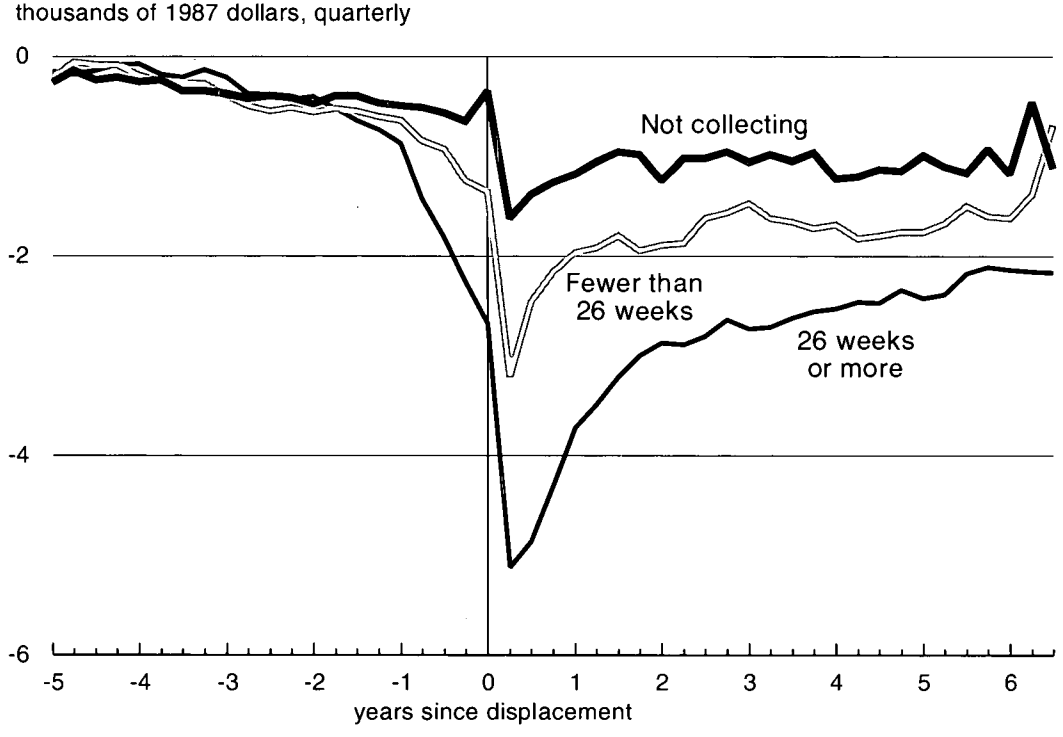
Source: Susan Houseman, "Work Force Contingency in the U.S. and Japan," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

Figure 5 Earnings Histories of Workers Displaced in 1981:Q4 and Workers Stably Employed through 1986



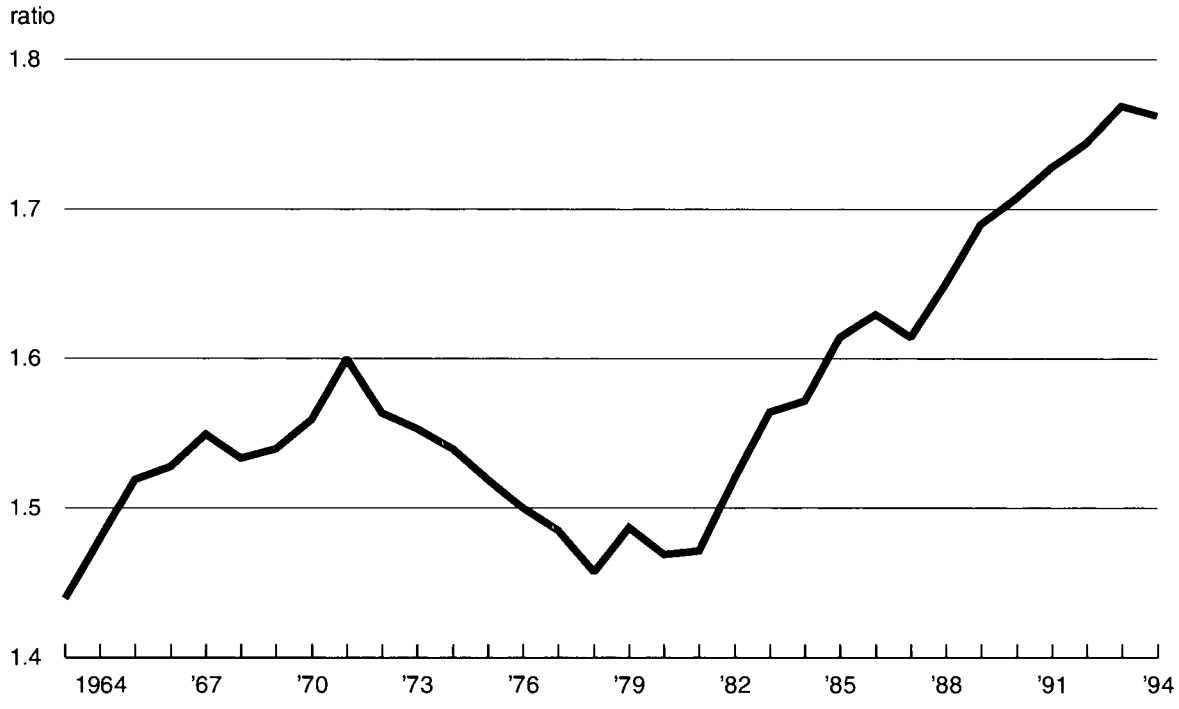
Source: Daniel Sullivan, "The Earnings Experience of High-Seniority Displaced Workers," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

Figure 6 Earnings Losses for Workers Not Collecting Unemployment Insurance, Collecting Fewer than 26 Weeks, and Collecting 26 Weeks or More



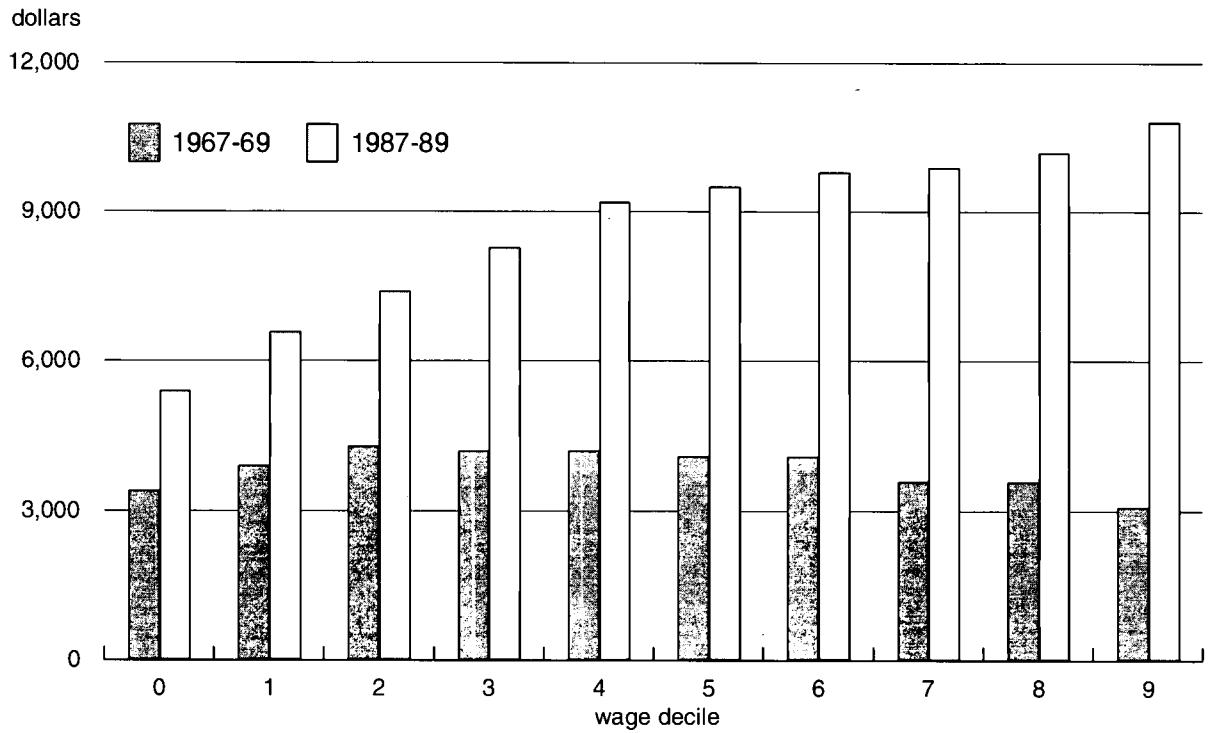
Source: Daniel Sullivan, "The Earnings Experience of High-Seniority Displaced Workers," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

Figure 7 Wage Premium, College Educated versus High School Educated



Source: Kevin Murphy, "Wage and Income Disparity Trends," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

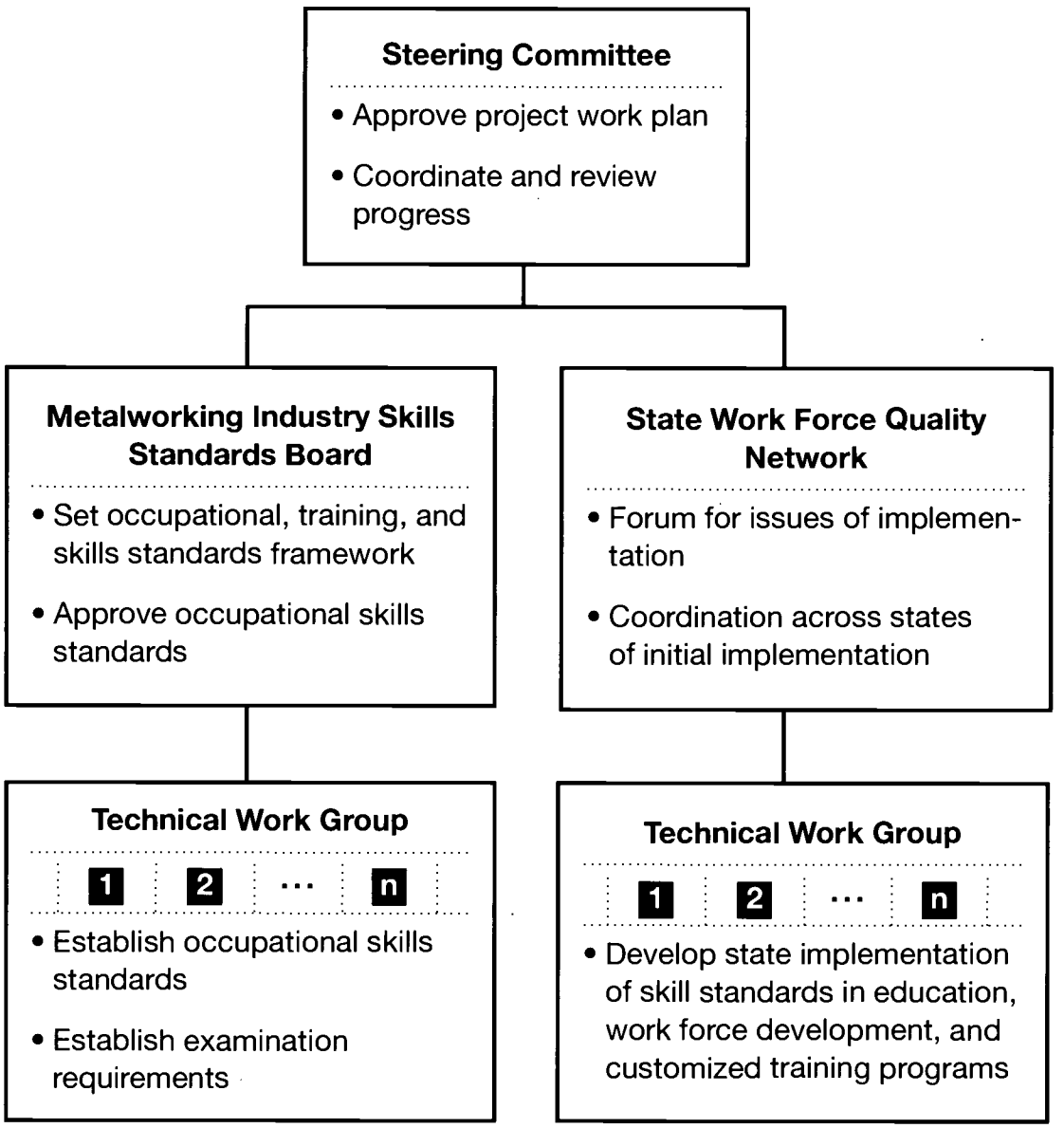
Figure 8 Wife's Annual Earnings by Husband's Wage Decile



Source: Kevin Murphy, "Wage and Income Disparity Trends," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

Figure 9 Metalworking Skill Standards Project

Project Organization and Major Functions



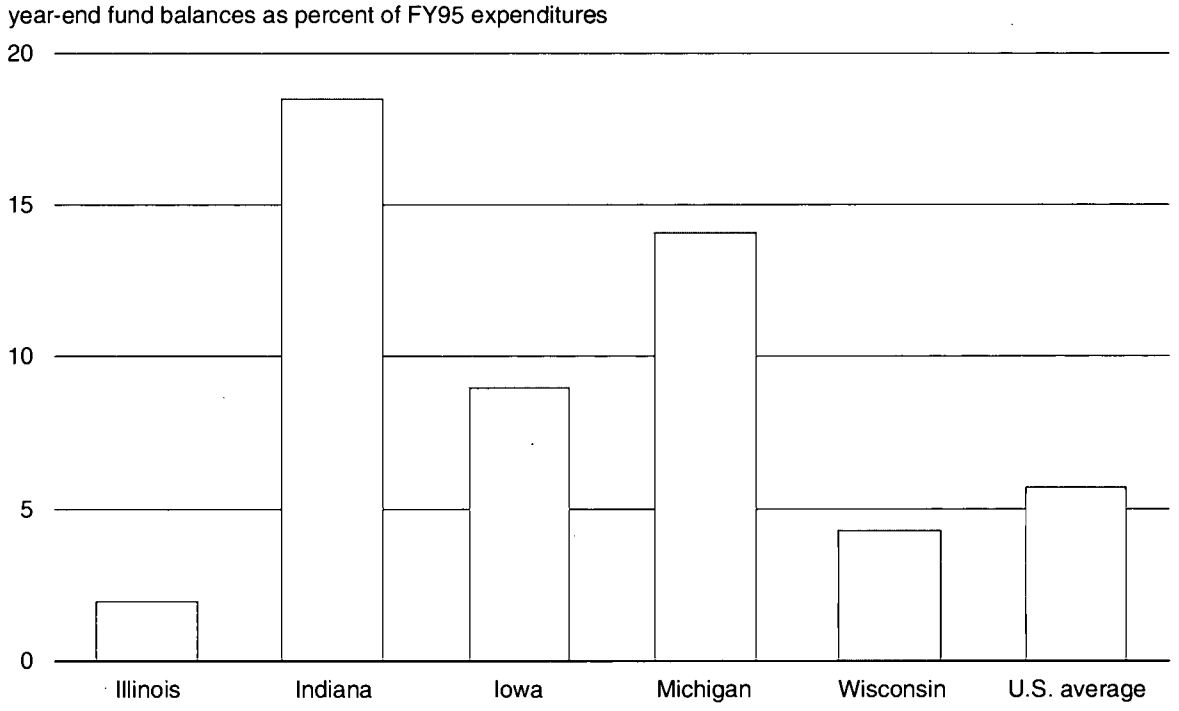
Source: Jeff Edstrom, "Certification and Standards in the Metalworking Industry," presentation prepared for the workshop "Work Force Developments," Chicago, IL, May 15, 1996.

Table 5 A Benefit/Cost Analysis Framework for Workplace Literacy Training

	Perspective			
Benefit or Cost	**Workers**	**Employers**	**Rest of Society**	**Education/ Training Establishment**
Training Costs	0/-	-	0/-	+
(Higher) Productivity	0	+	+	0
Nonwage Compensation (Pensions, health Insurance, etc.)	+	-	+	0
(Less) Worker Turnover	+	+/-	+	0
Safer Workplace	+	+	+	0
(Higher) Taxes	-	0/-	+	0/+
(Improved) Self-Esteem	+	0	0/+	0
Net Benefits	+	-/+	+	+

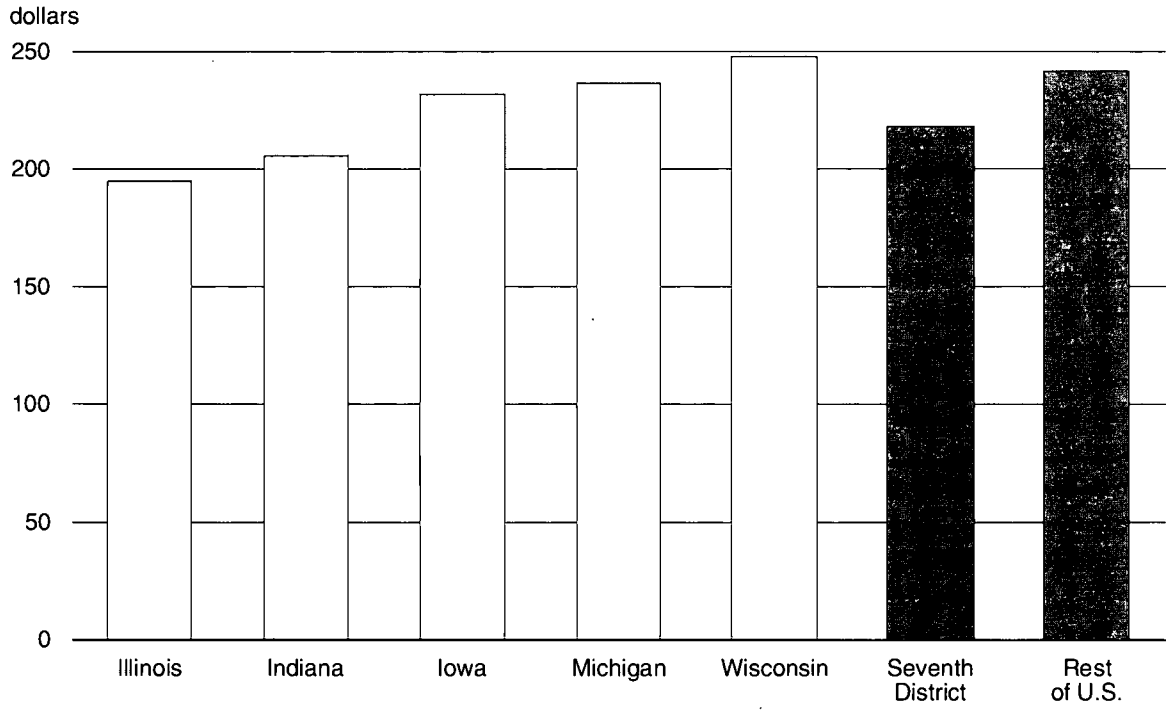
Source: Kevin Hollenbeck, "A Benefit/Cost Framework for Assessing the Economic Payoffs to Workplace Literacy Training," Kalamazoo, MI: W.E. Upjohn Institute, mimeo, 1996.

Figure 1 1995 Budget Balances



Source: Richard Mattoon, "An Overview of Midwest Tax Climate and Fiscal Position," presentation prepared for the workshop "Designing State–Local Fiscal Policy for Growth and Development," held at the Federal Reserve Bank of Chicago, July 17, 1996.

Figure 2 Spending per $1,000 Personal Income, 1992
(Total State–Local Spending)



Source: See figure 1.

Figure 3 Geography of Right-to-Work Laws

Source: Thomas J. Holmes, "The Effects of State Policies on the Location of Industry: Evidence from State Borders," FRB Minneapolis, research department staff report, No. 205, December 1995, appendix, figure 1.

Table 1 Normalized Manufacturing Employment—Unweighted Means across Counties by Distance from Border and Side of Border

Side of border	Miles from border	1992 (% of total employment)	1992 (% of population)	1947 (% of population)	1947-92 growth rate (weighted mean)
Anti-Business	75 - 100	25.9	6.5	5.3	42
	50 - 75	23.1	5.9	4.4	28
	25 - 50	23.1	5.6	3.0	16
	0 - 25	21.0	5.1	2.9	54
Pro-Business	0 - 25	28.6	7.5	3.2	170
	25 - 50	26.7	7.1	3.3	128
	50 - 75	26.7	7.4	3.7	133
	75 - 100	25.4	6.7	3.2	139

Source: Thomas J. Holmes, "The Effects of State Policies on the Location of Industry: Evidence from State Borders," FRB Minneapolis, research department staff report, No. 205, December 1995, appendix, table 2.

Table 2 Indiana vs. Illinois General Sales Taxes and Special Excise Taxes

	General Sales tax	Cigarettes (per pack)	Gas (per gallon)	Alcohol (per gallon)	Beer (per gallon)	Wine (per gallon)
Indiana	5%	15.5¢	15¢	$2.68	11.5¢	47¢
Illinois	6.75	4	19	2.50	7	23
Cook/Chicago	2.5	26	20.5		6	
Illinois near Border	9.25	70	39.5	2.50	13	23

Source: William Lilley, "Impacts of Retail Taxes on the Illinois-Indiana Border," presentation prepared for the workshop "Designing State–Local Fiscal Policy for Growth and Development," held at the Federal Reserve Bank of Chicago, July 17, 1996.

Table 3 Comparative After-Tax Rates of Return (ATRR) on New Investment by State and Industry

Industry	SIC Code	Illinois (1)	Indiana (2)	Michigan (3)	Minnesota (4)	Ohio (5)	Wisconsin (6)	Region Mean (7)	Stdv (8)
Manufacturing									
• Food and kindred products	20	12.150	11.925	12.551	12.452	12.301	12.026	12.234	0.244
• Apparel and other textile products	23	12.136	11.644	12.502	12.483	12.012	12.013	12.132	0.325
• Lumber and wood products	24	12.216	11.900	12.395	12.257	12.242	12.034	12.174	0.177
• Furniture and fixtures	25	12.218	11.785	12.513	12.407	12.146	12.063	12.189	0.258
• Printing and publishing	27	12.155	11.976	12.555	12.437	12.357	12.028	12.251	0.233
• Chemicals and allied products	28	12.160	11.933	12.571	12.492	12.305	12.047	12.251	0.251
• Fabricated metal products	34	12.188	11.904	12.425	12.493	12.277	12.064	12.225	0.221
• Machinery, except electrical	35	12.189	11.905	12.413	12.514	12.268	12.071	12.227	0.223
• Electrical and electronic equipment	36	12.310	11.964	12.492	12.797	12.306	12.228	12.349	0.278
• Motor vehicles and equipment	37	12.355	11.856	12.501	12.649	12.177	12.224	12.294	0.277
• Instruments and related products	38	12.136	11.847	12.549	12.441	12.221	12.010	12.200	0.263
Transportation, Communication, & Public Utilities									
• Communication	48	12.283	12.067	12.490	12.354	12.399	12.116	12.285	0.165
Retail									
• General Merchandise Stores	53	12.173	11.660	12.687	12.461	12.015	12.043	12.173	0.361
Services									
• Business services	73	12.299	12.084	12.669	12.759	12.450	12.214	12.413	0.264
Mean		12.256	11.895	12.556	12.528	12.249	12.123	12.268	
Standard Deviation		0.090	0.147	0.091	0.163	0.142	0.098		

Note: New investment undertaken at homesite. For detailed description of the sites, tax systems, and firm sizes included in the baseline simulations, see Papke (1995).

Source: James Papke, "Interjurisdictional Business Tax-Cost Differentials: Convergence, Divergence and Significance," reprint series, No. 915, Center for Tax Policy Studies, Purdue University, 1995, p. 1703.

Table 4 Comparative After-Tax Rates of Return (ATRR) with Alternative Measures of Economy Growth Rates (in percent)

	Illinois	Indiana	Michigan	Minnesota	Ohio	Wisconsin
Average Annual Growth of Per Capita GSP in constant dollars (1982-1992)	6.06 (3)	6.33 (1)	6.00 (4)	6.24 (2)	5.81 (5)	5.78 (6)
Average Annual Growth of Nonfarm Employment (1982-1992)	1.73 (6)	2.68 (1)	2.46 (4)	2.68 (2)	1.93 (5)	2.66 (3)
Average annual Growth of Per Capita Personal Income in current dollars (1982-1992)	5.85 (4)	6.00 (1)	5.93 (2)	5.92 (3)	5.67 (5)	5.61 (6)
All-Industry After-Tax Rate of Return (1995)	12.26 (3)	11.90 (6)	12.56 (1)	12.53 (2)	12.25 (4)	12.12 (5)

Note: Rank order appears in parentheses.
GSP data from U.S. Department of Commerce, Bureau of Economic Analysis, 1982-1992. Employment data from U.S. Department of Commerce, Bureau of the Census, *County Business Patterns,* selected years.

Source: James Papke, "Interjurisdictional Business Tax-Cost Differentials: Convergence, Divergence and Significance," reprint series, No. 915, Center for Tax Policy Studies, Purdue University, 1995, p. 1710.

Table 5 Project Returns for Selected Firms: Average and Standard Deviation Across States and Cities

	After Basic Taxes Only			After All Taxes & Incentives			Value of Incentive Package	
Multi-state Firm	**Mean**	**St. Dev.**	**SD/Mean**	**Mean**	**St. Dev.**	**SD/Mean**	**Mean**	**% of Return***
States:								
State Taxes and Incentives								
#5: Soaps & Cleaners	8,580,693	327,237	0.04	9,152,528	411,847	0.04	571,835	6.2%
#7: Misc. Plastics	328,819	51,548	0.16	629,656	204,814	0.33	300,837	47.8%
#12: Electronics	12,592,373	2,125,141	0.17	14,526,660	2,828,459	0.19	1,934,288	13.3%
#14: Automobiles	24,090,255	5,869,814	0.24	27,295,432	7,205,526	0.26	3,205,177	11.7%
#16: Instruments	62,760,898	2,250,306	0.04	64,480,585	2,759,552	0.04	1,719,687	2.7%
Cities:								
State and Local Taxes & Incentives								
#5: Soaps & Cleaners	7,897,374	369,066	0.05	8,657,364	454,925	0.05	759,990	8.8%
#7: Misc. Plastics	106,773	100,372	0.94	457,198	204,170	0.45	350,426	76.6%
#12: Electronics	4,562,124	3,739,239	0.82	7,605,776	3,954,114	0.52	3,043,653	40.0%
#14: Automobiles	1,500,313	12,909,393	8.60	7,843,902	12,565,551	1.60	6,343,589	80.9%
#16: Instruments	56,522,017	2,738,309	0.05	59,181,802	2,999,244	0.05	2,659,785	4.5%

*Mean incentive package value divided by mean project return after all taxes and incentives.

Source: Alan H. Peters, "Industrial Incentives: The Pattern of Competition among U.S. States and Cities," presentation prepared for the workshop "Designing State–Local Fiscal Policy for Growth and Development," held at the Federal Reserve Bank of Chicago, July 17, 1996.

Table 6 State and Local Business Taxes and Expenditures, 1992

Region	Business expenditures	Taxes	Ratio of taxes to expenditures
	(———millions of dollars———)		
U.S.	$94,136	$160,514	1.71
New England	5,076	9,022	1.78
Mid-Atlantic	16,762	29,899	1.78
East North Central	15,077	27,781	1.84
West North Central	6,228	9,843	1.58
South Atlantic	15,735	22,837	1.45
East South Central	4,290	6,768	1.58
West South Central	8,589	17,909	2.08
Mountain	5,471	8,169	1.49
Pacific	16,906	28,285	1.67
Seventh District	12,760	23,816	1.87

Source: Staff calculations based on data reported by the U.S. Department of Commerce, Bureau of the Census, Governments Division and individual state fiscal agencies.

Table 7 Comparison of Tax Burden Measures—Business Taxes Only vs. Business Taxes in Excess of Benefits Received

Region/State	Tax measure	(rank)	Excess Taxes	(rank)
U.S.	3.1%	—	1.3%	—
New England	2.9	(6)	1.3	(6)
Mid Atlantic	3.4	(1)	1.5	(4)
E. North Central	3.2	(3)	1.5	(4)
W. North Central	2.8	(7)	2.0	(1)
South Atlantic	2.7	(8)	1.8	(2)
E. South Central	2.5	(9)	.9	(9)
W. South Central	3.3	(2)	1.7	(3)
Mountain	3.1	(4)	1.0	(8)
Pacific	3.1	(4)	1.2	(7)
Seventh District				
Illinois	3.5	(2)	1.7	(1)
Indiana	2.9	(5)	1.6	(2)
Iowa	3.4	(3)	1.2	(5)
Michigan	3.2	(4)	1.4	(4)
Wisconsin	3.9	(1)	1.6	(2)

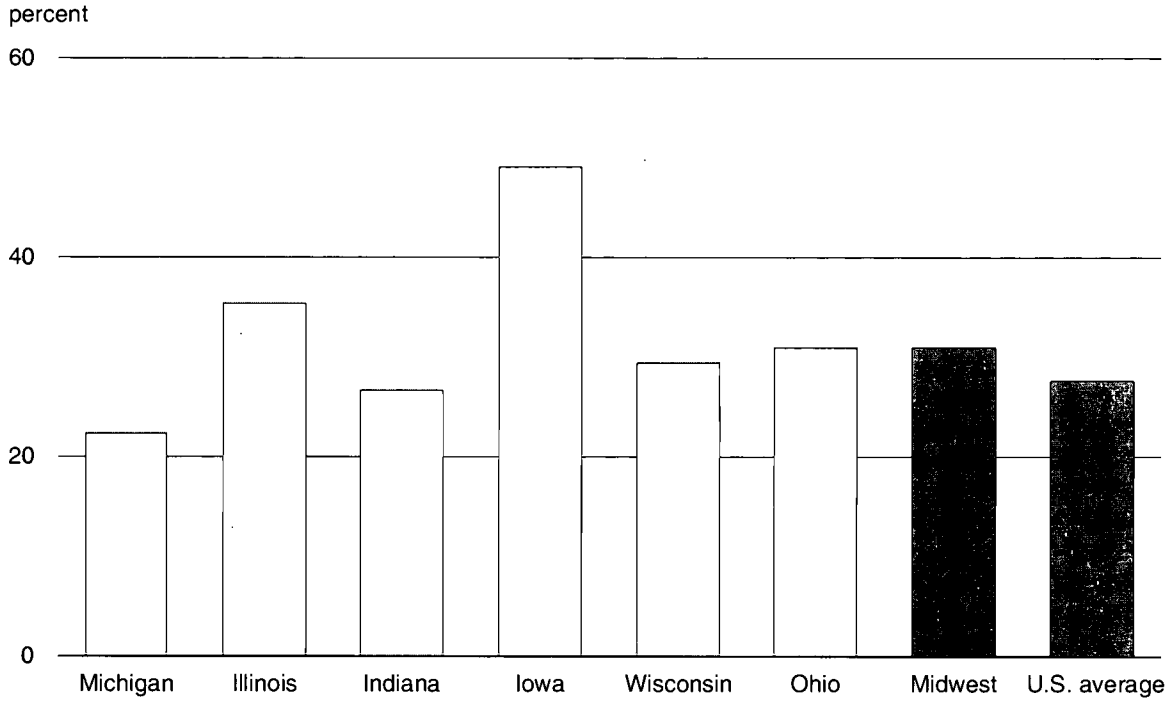
Source: William H. Oakland and William A. Testa, "State-local business taxation and the benefits principle," *Economic Perspectives,* Federal Reserve Bank of Chicago, January/February 1996.

Table 8 Nonresidential Property Taxes and Tax Rates

	Nonresidential (NR) proportion of taxes	Nonresidential proportion of municipal and education expenditures	Percentage change in NR property taxes
Cornwall	50	21	-59
London	37	16	-56
Niagra Falls	46	21	-55
Oakville	30	13	-57
Peterborough	41	18	-56
Thunder Bay	51	20	-61
Whitby	28	14	-51
Windsor	46	20	-56

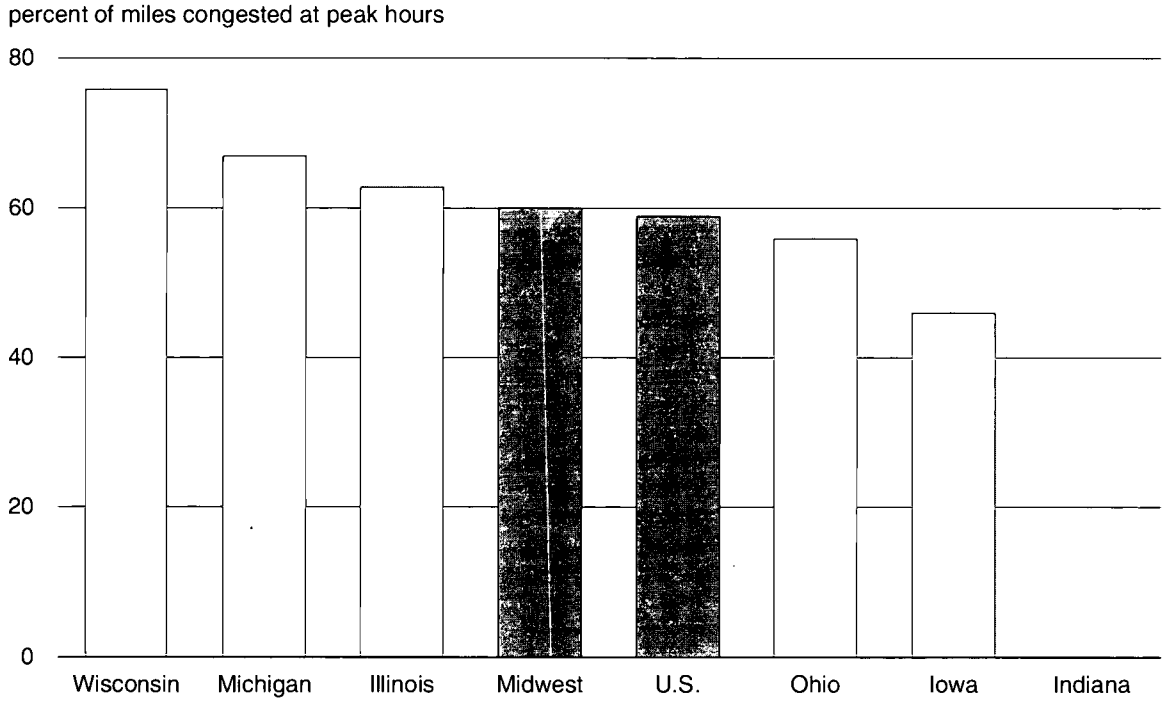
Source: Presentation by Harry M. Kitchen at the "Designing State–Local Fiscal Policy for Growth and Development" workshop, Federal Reserve Bank of Chicago, July 17, 1996.

Figure 4 Highways' Share of Total Outlays



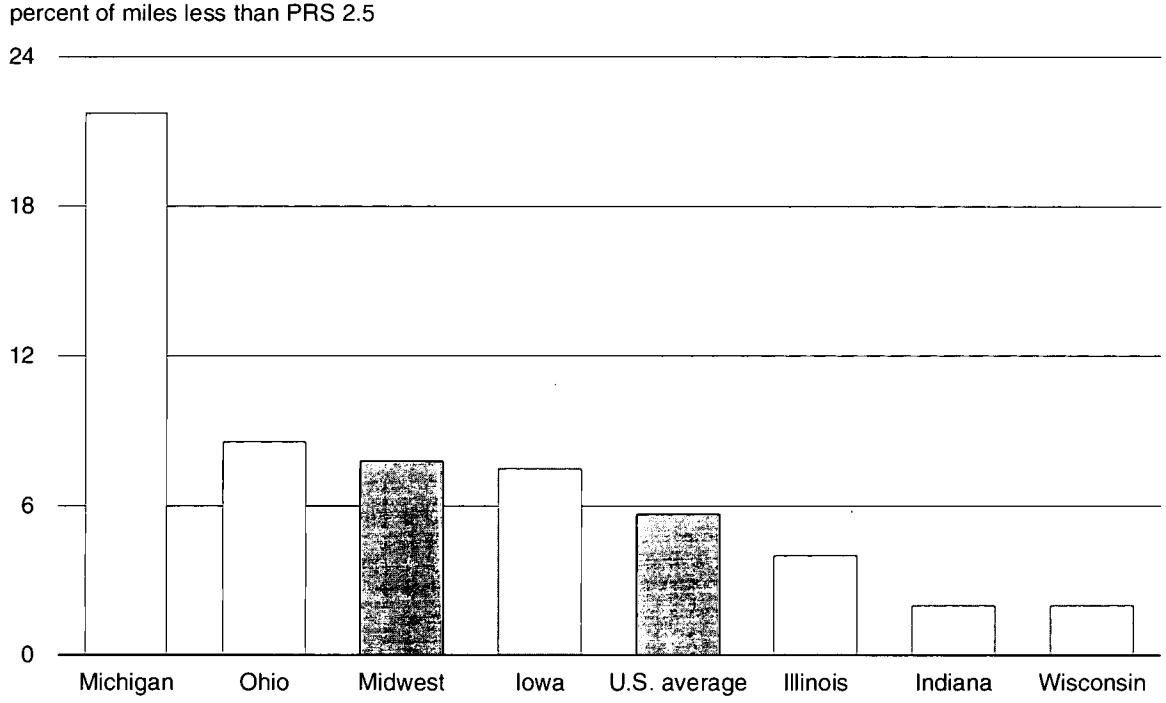
Source: Randy Eberts, "Infrastructure's Role in Economic Development," presentation prepared for the workshop "Designing State–Local Fiscal Policy for Growth and Development," held at the Federal Reserve Bank of Chicago, July 17, 1996.

Figure 5 Congestion on Urban Interstates



Source: See figure 4.

Figure 6 Interstate Pavement Condition



Source: See figure 4.

Table 9 Public Capital Elasticities

Industry	
Primary metals	-0.22
Printing & publishing	-0.20
Instruments	-0.19
Motor vehicles	-0.19
Stone, clay, and glass	-0.18
Petroleum refining	-0.17
Fabricated metals	-0.17
Rubber and plastics	-0.16
Machinery, ex electrical	-0.16
Chemicals	-0.16
Electrical machinery	-0.15
US total economy	-0.04
Transportation & warehousing	0.03
Construction	0.07

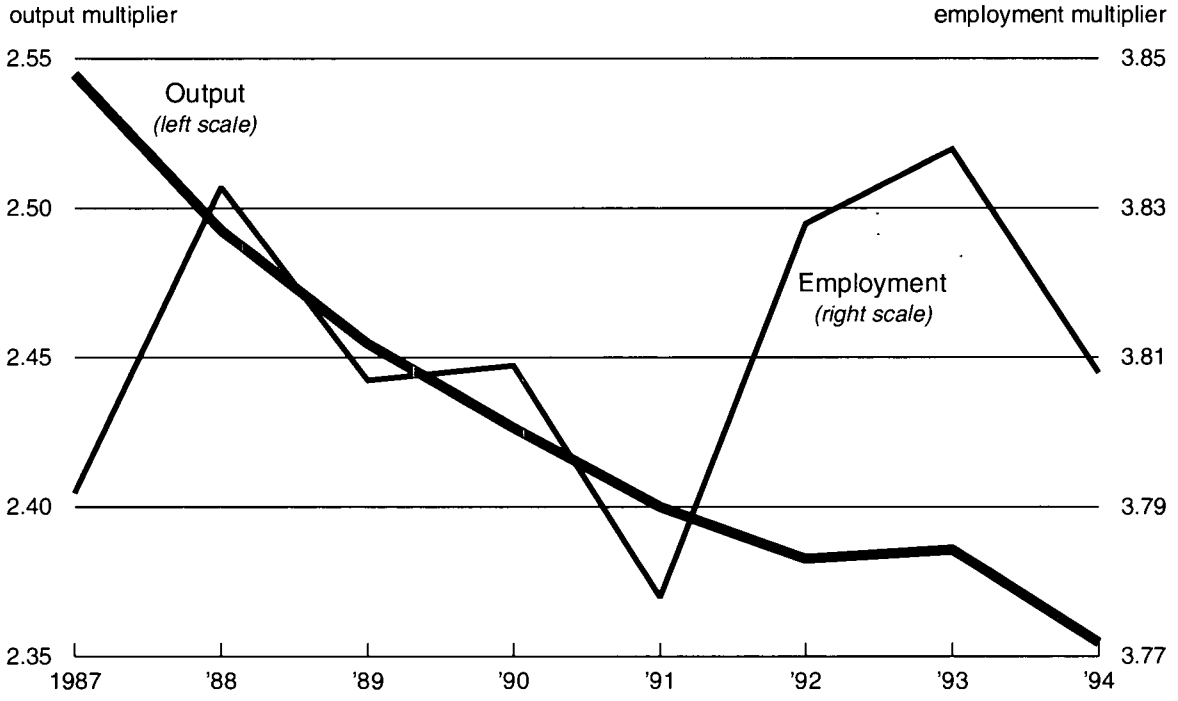
Source: Randy Eberts, "Infrastructure's Role in Economic Development," presentation prepared for the workshop "Designing State–Local Fiscal Policy for Growth and Development," held at the Federal Reserve Bank of Chicago, July 17, 1996.

Table 1 Illinois Exports by SIC, 1987 and 1994, in Millions of 1987 Dollars

Sector	1987	1994	Percent Change
Food and Kindred Products (20)	462.9	741.5	60.2
Tobacco Products (21)	1.5	0.6	–61.4
Apparel and Textile Products (22, 23)	32.9	83.6	154.1
Lumber and Wood Products (24)	5.4	45.6	748.4
Furniture and Fixtures (25)	22.3	84.0	276.1
Paper and Allied Products (26)	51.2	241.7	371.8
Printing and Publishing (27)	294.9	273.6	–7.2
Chemicals and Allied Products (28)	957.7	1,990.6	107.8
Petroleum and Coal Products (30)	101.2	48.5	–52.1
Rubber and Misc. Plastics Products (30)	216.2	418.2	93.4
Leather and Leather Products (31)	14.8	26.2	77.6
Stone, Clay, and Glass Products (32)	77.8	139.6	79.5
Primary Metals Industries (33)	169.4	371.3	119.2
Fabricated Metal Products (34)	373.5	617.1	65.2
Industrial Machinery and Equipment (35)	3,370.4	4,520.2	34.1
Electronic and Other Electric Equipment (36)	1,113.7	3,850.1	245.7
Transportation Equipment (37)	636.3	1,682.0	164.3
Instruments and Related Products (38)	350.4	766.8	118.8
Miscellaneous Manufacturing Industries (39)	218.8	373.9	70.9
Total	**8,471.5**	**16,275.3**	
Rates of Change		**13.7%**	**92.1%**

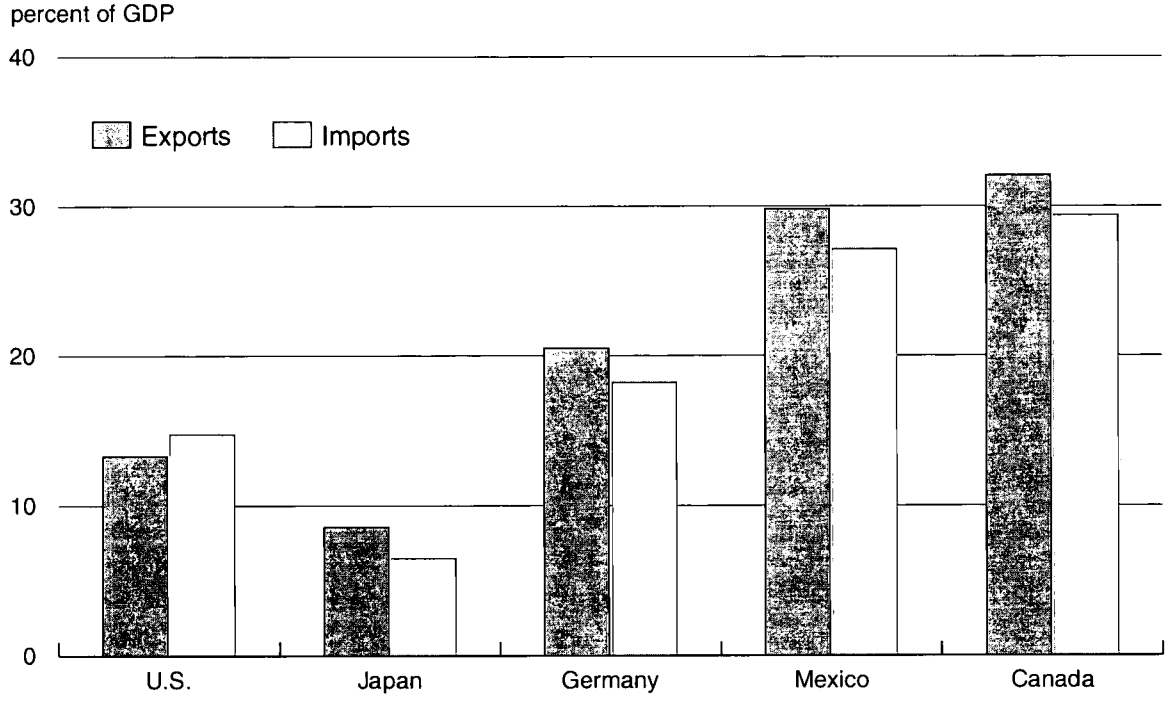
Source: Philip R. Israilevich and Geoffrey J. D. Hewings, "Foreign Exports, Domestic Exports, and the Illinois Economy," presentation prepared for the workshop, "Global Linkages to the Midwest," Chicago, IL, September 18, 1996.

Figure 1 Output and Employment, Export-Induced Multipliers



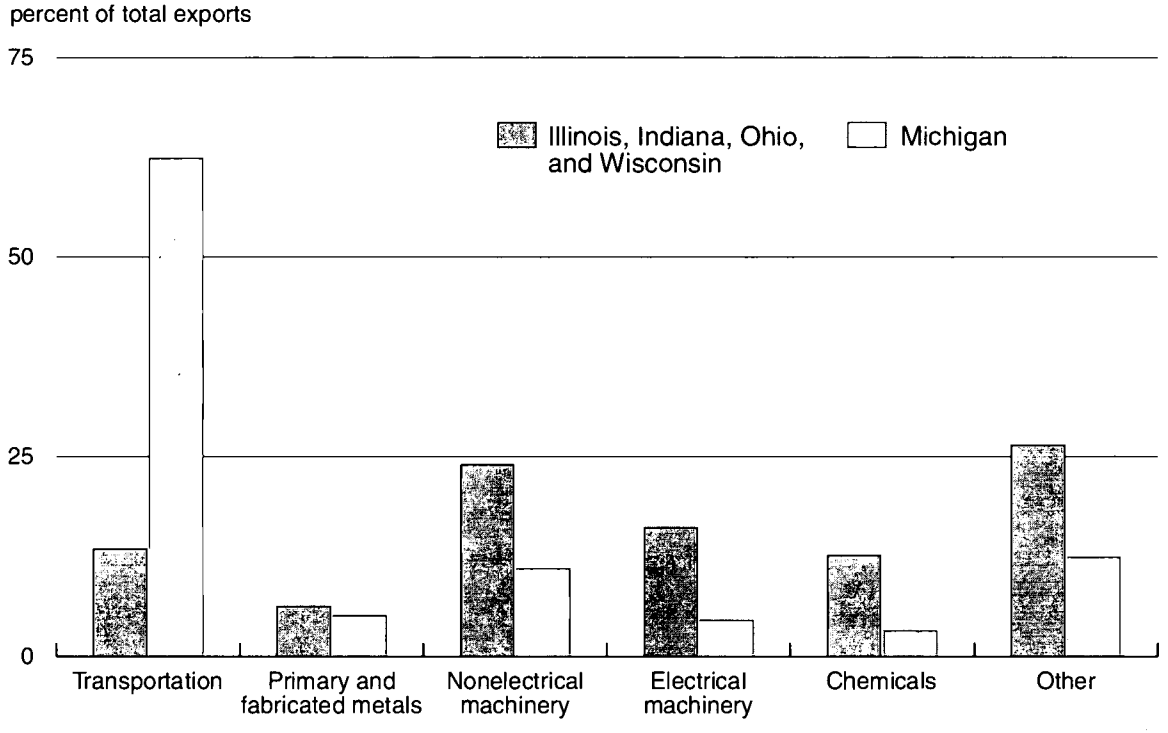
Source: Philip R. Israilevich and Geoffrey J. D. Hewings, "Foreign Exports, Domestic Exports, and the Illinois Economy," presentation prepared for the workshop, "Global Linkages to the Midwest," Chicago, IL, September 18, 1996.

Figure 2 U.S. Reliance on Trade, Merchandise Imports and Exports, 1995



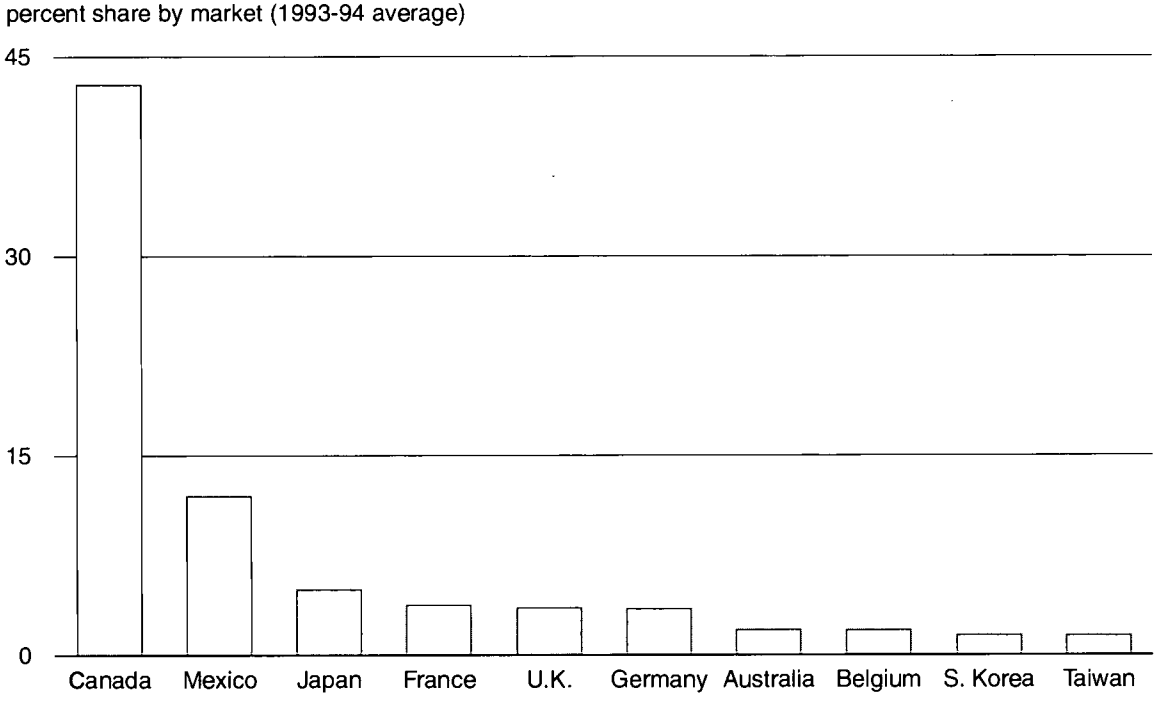
Source: Doug Roberts, reactor comments prepared from data obtained from U.S. Department of State, *Country Reports on Economic Policy and Trade Practices*, for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

Figure 3 Composition of Michigan and Great Lakes Exports, 1995



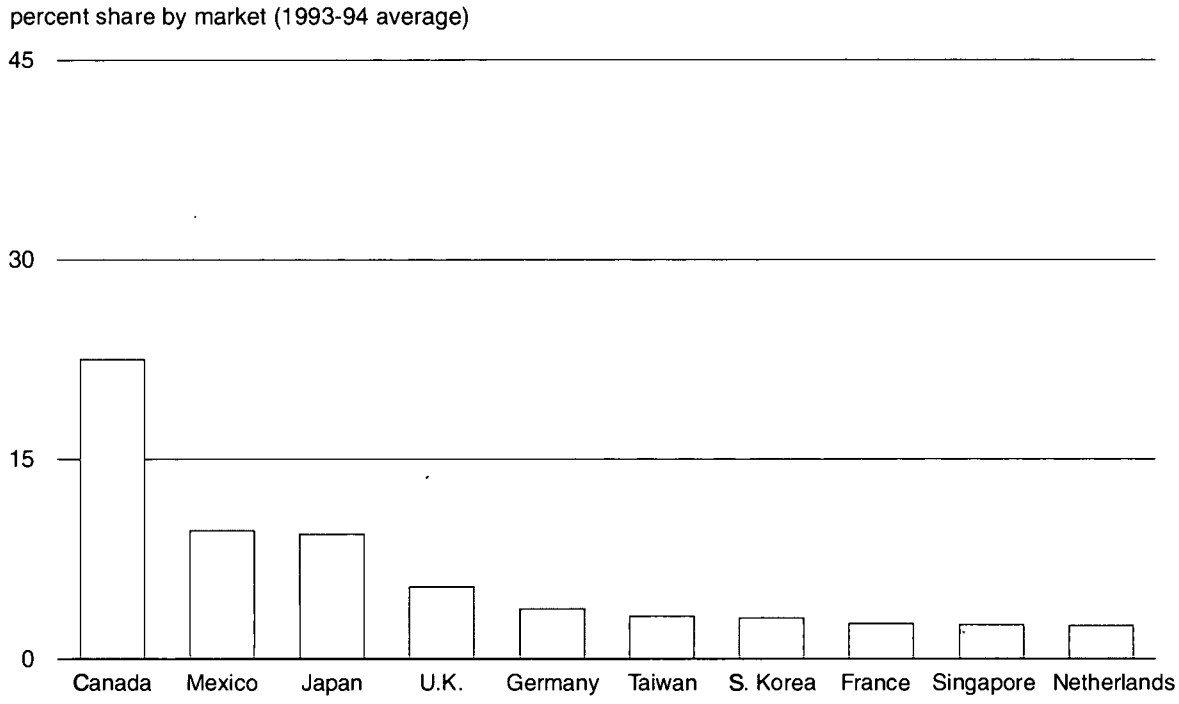
Source: Doug Roberts, reactor comments prepared from data obtained from U.S. Department of Commerce for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

Figure 4 Midwest Exports—Total Manufactured Goods



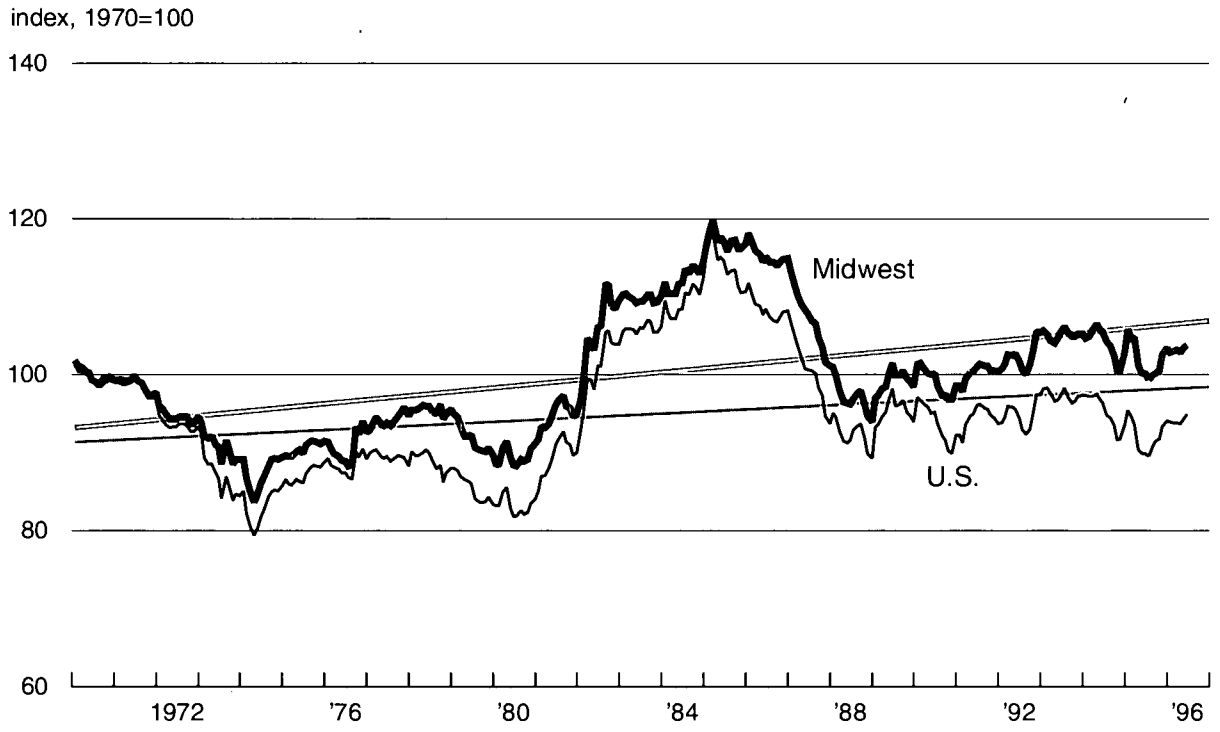
Source: Jack L. Hervey and William A. Strauss, "A Regional Export-Weighted Dollar: A Different Way of Looking at Exchange Rate Change," data compiled from Massachusetts Institute for Social and Economic Research, "MISER," *State of Exporter Location Data*, Series 2, 1993 and 1994, for a presentation prepared for the workshop, "Global Linkages to the Midwest," Chicago, IL, September 18, 1996.

Figure 5 U.S. Exports—Total Manufactured Goods



Source: Jack L. Hervey and William A. Strauss, "A Regional Export-Weighted Dollar: A Different Way of Looking at Exchange Rate Change," data compiled from U.S. Department of Commerce, FT-900, Annual Revisions, 1993 and 1994, for a presentation prepared for the workshop, "Global Linkages to the Midwest," Chicago, IL, September 18, 1996.

Figure 6 Regional Exchange Rate Indexes, Midwest and U.S., durables



Source: Jack L. Hervey and William A. Strauss, "A Regional Export-Weighted Dollar: A Different Way of Looking at Exchange Rate Change," presentation prepared for the workshop, "Global Linkages to the Midwest," Chicago, IL, September 18, 1996.

Table 2 Long-Run Effects of NAFTA, Percentage Deviation from Pre-Liberalization Path

	Canada	Mexico	U.S.	Rest of World
Welfare	0.02	0.92	0.11	0.01
Real GDP	0.11	3.26	0.24	0.01
Real Consumption	0.08	2.52	0.25	0.01
Labor Hours	0.07	1.99	0.14	0.00
Real Wage	0.09	2.12	0.25	–0.01
Capital Investment	0.16	5.05	0.37	0.01
Total Imports	0.29	12.47	1.39	0.14
Total Exports	0.37	13.87	1.46	0.02
Foreign Assets/GDP*	1.29	–8.09	–0.14	0.25
Terms of Trade	–0.15	–0.72	–0.04	0.27

**Deviation from pre-liberalization path.*

Source: Michael Kouparitsas, "NAFTA's Potential Impacts by U.S. Region," presentation prepared for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

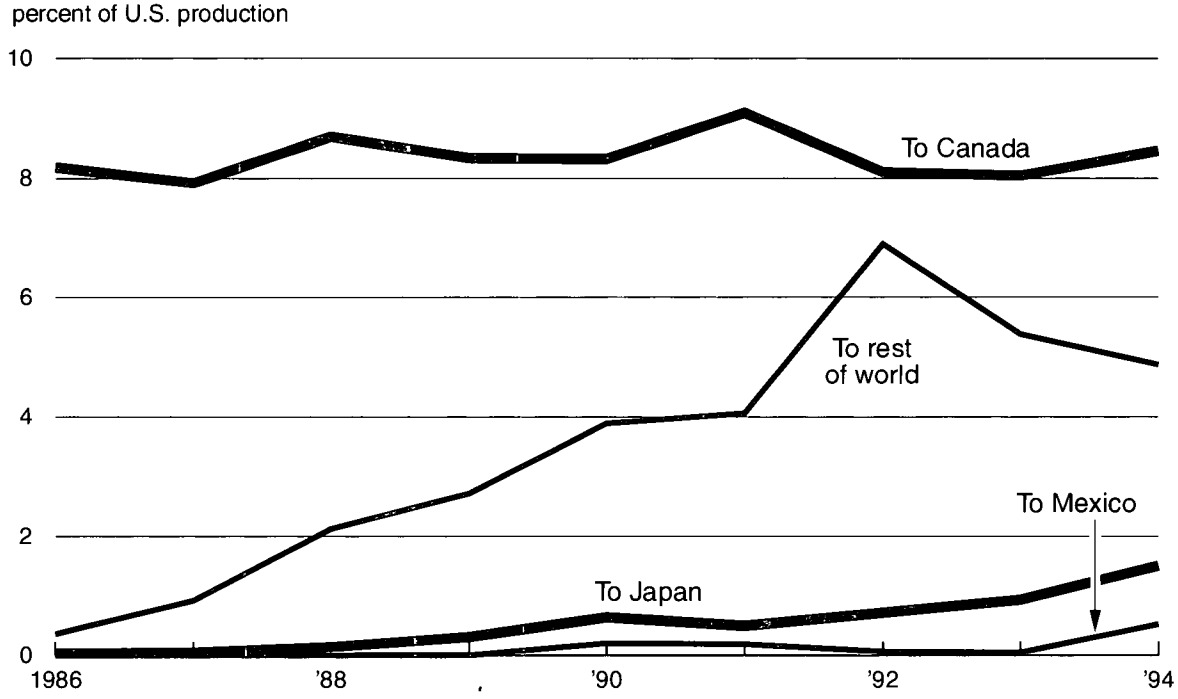
Table 3 U.S. Trade Balance by Industry Category, 1988 and 1993
(Millions of Canadian Dollars)

Code	Description	1988	1993
1–5	Animal Products	–1,826.1	–2,585.0
6–14	Vegetable Products	1,279.3	1,223.4
15	Fats, Oils, and Waxes	–15.5	–141.3
16–24	Prep. Foodstuffs, Beverages, Tobacco	–129.1	–626.8
25–27	Minerals	–9,009.5	–16,098.2
28–38	Chemicals and Allied Products	109.8	1,862.9
39–40	Plastic and Rubber	1,110.7	1,141.7
41–43	Hides, Skins, Leather, etc.	–35.4	–68.1
44–46	Wood and Articles	–3,605.3	–7,098.5
47–49	Pulp and Paper	–7,948.2	–6,568.2
50–63	Textiles	816.0	1,033.9
64–67	Footwear	–14.5	–38.1
68–70	Stone, Ceramics, Glass	350.8	582.5
71	Pearls, Stones, Jewelry	–102.4	–1,134.4
72–83	Base Metals and Articles	–4,224.5	–3,195.8
84	Industrial Machinery	8,475.7	9,296.1
85	Electric and Electrical Machinery	4,408.1	5,458.1
86–89	Transportation	–6,823.7	–18,026.9
90	Instruments, Scientific and Measuring	1,610.8	2,451.0
91–92	Instruments, Photographic and Musical	54.6	41.6
93	Arms	125.0	212.5
Total*		**–14,830.2**	**–36,669.1**

**Including industries not shown.*

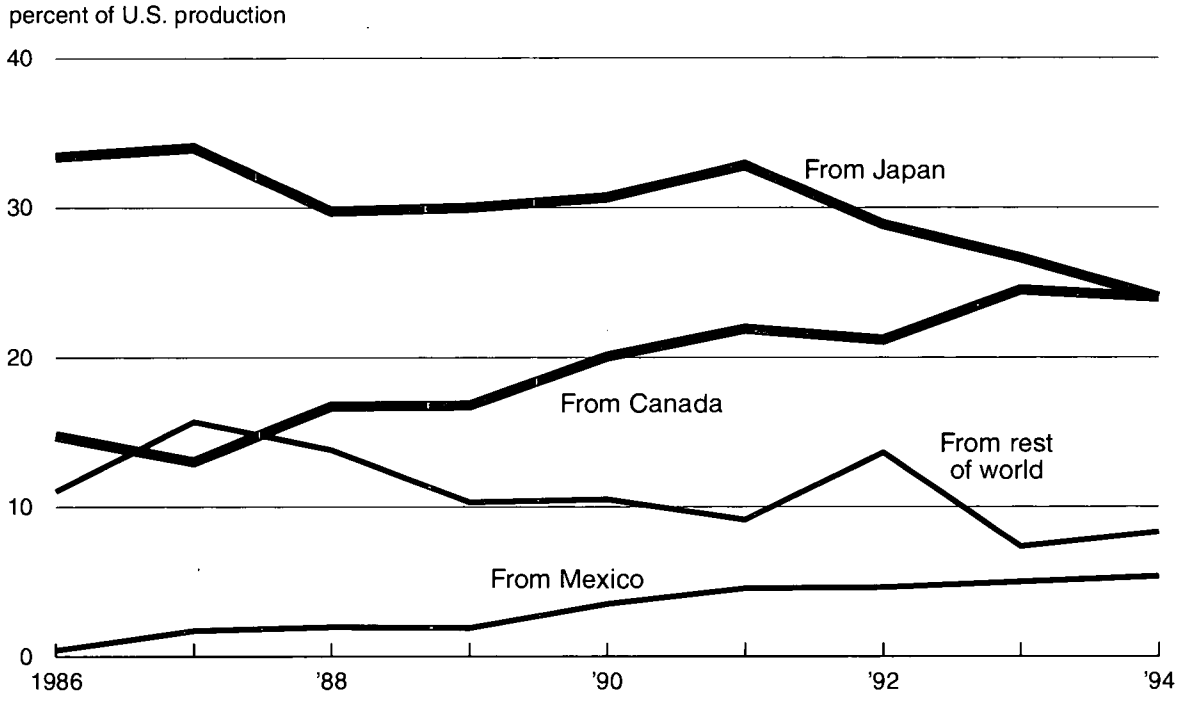
Source: Jane Sneddon Little, "U.S. Regional Trade with Canada in the First Five Years of Free Trade," presentation prepared from data from *Statistics Canada* for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

Figure 7 Exports of Passenger Cars



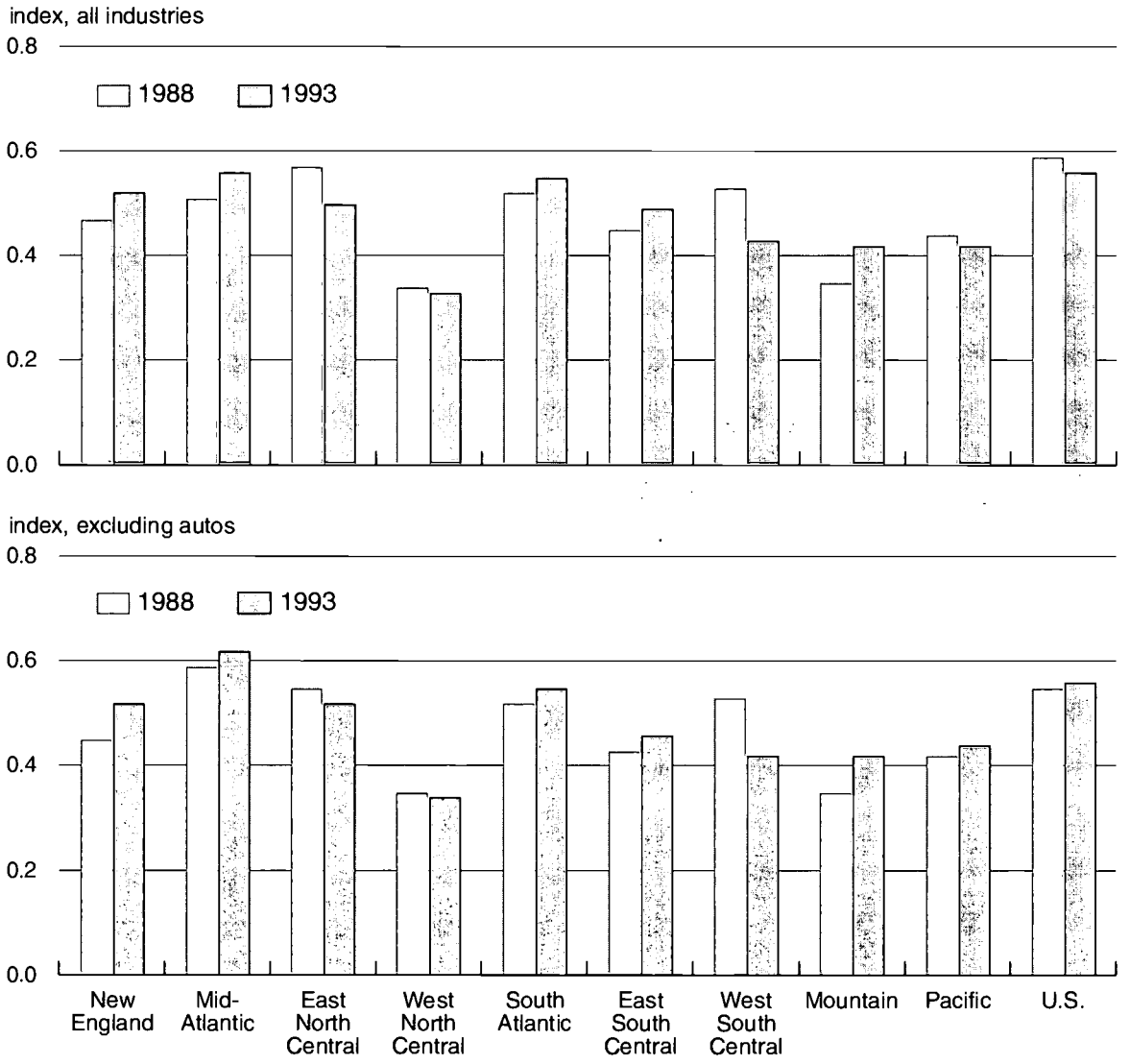
Source: Thomas Klier, reactor comments prepared from data obtained from the American Automobile Manufacturers Association, *World Motor Vehicle Data*, various years, for the workshop, "Global Linkages to the Midwest," Chicago, IL, September 18, 1996.

Figure 8 Imports of Passenger Cars



Source: Thomas Klier, reactor comments prepared from data obtained from the American Automobile Manufacturers Association, *World Motor Vehicle Data*, various years, for the workshop, "Global Linkages to the Midwest," Chicago, IL, September 18, 1996.

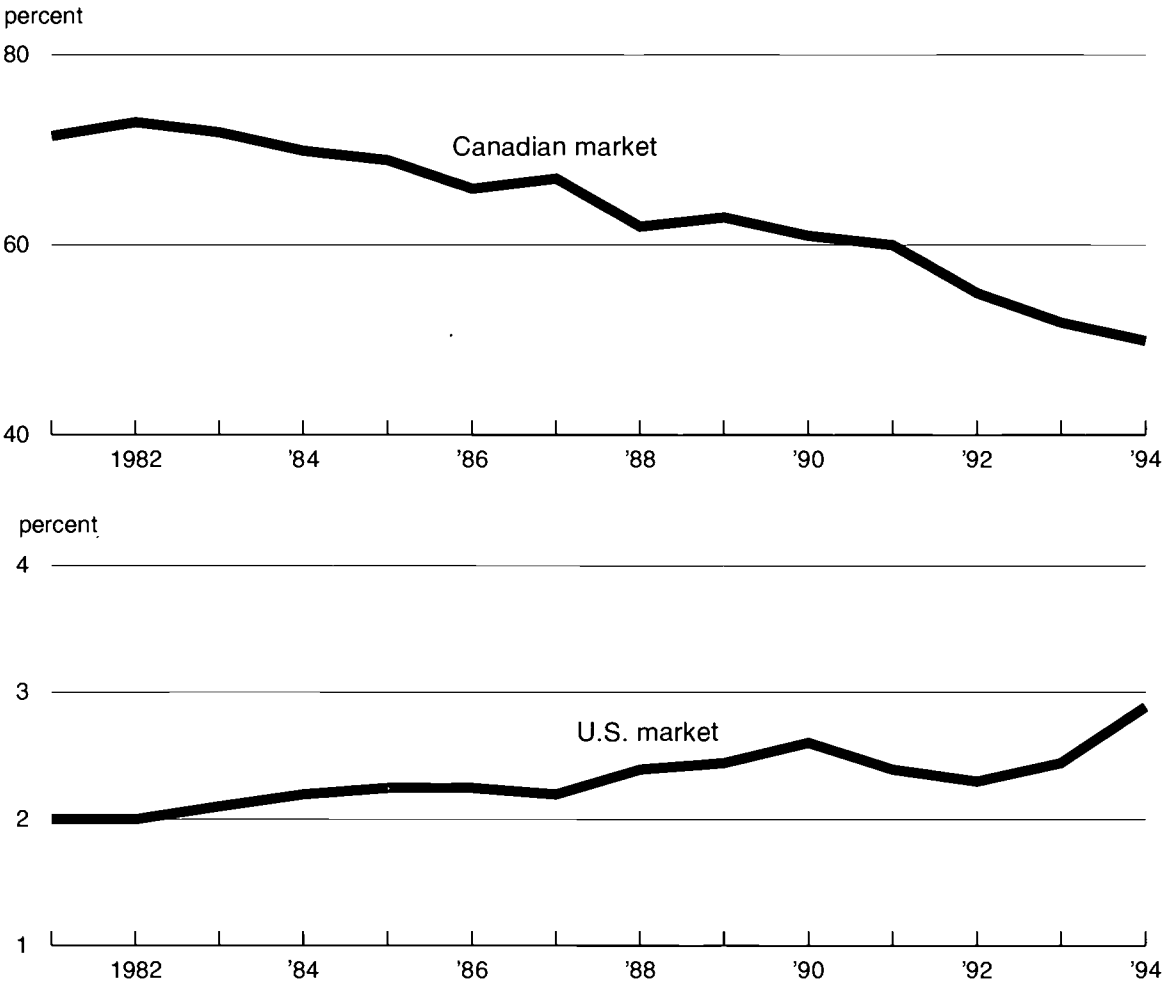
Figure 9 Index of U.S.–Canada Intra-Industry Trade



Note: Averages of indexes calculated at the two- or four-digit levels, weighted by each industry's share of total trade between the United States and Canada. Calculations for industries in harmonized code 84 through 90 were based on the four-digit data. All other calculations were based on two-digit data.

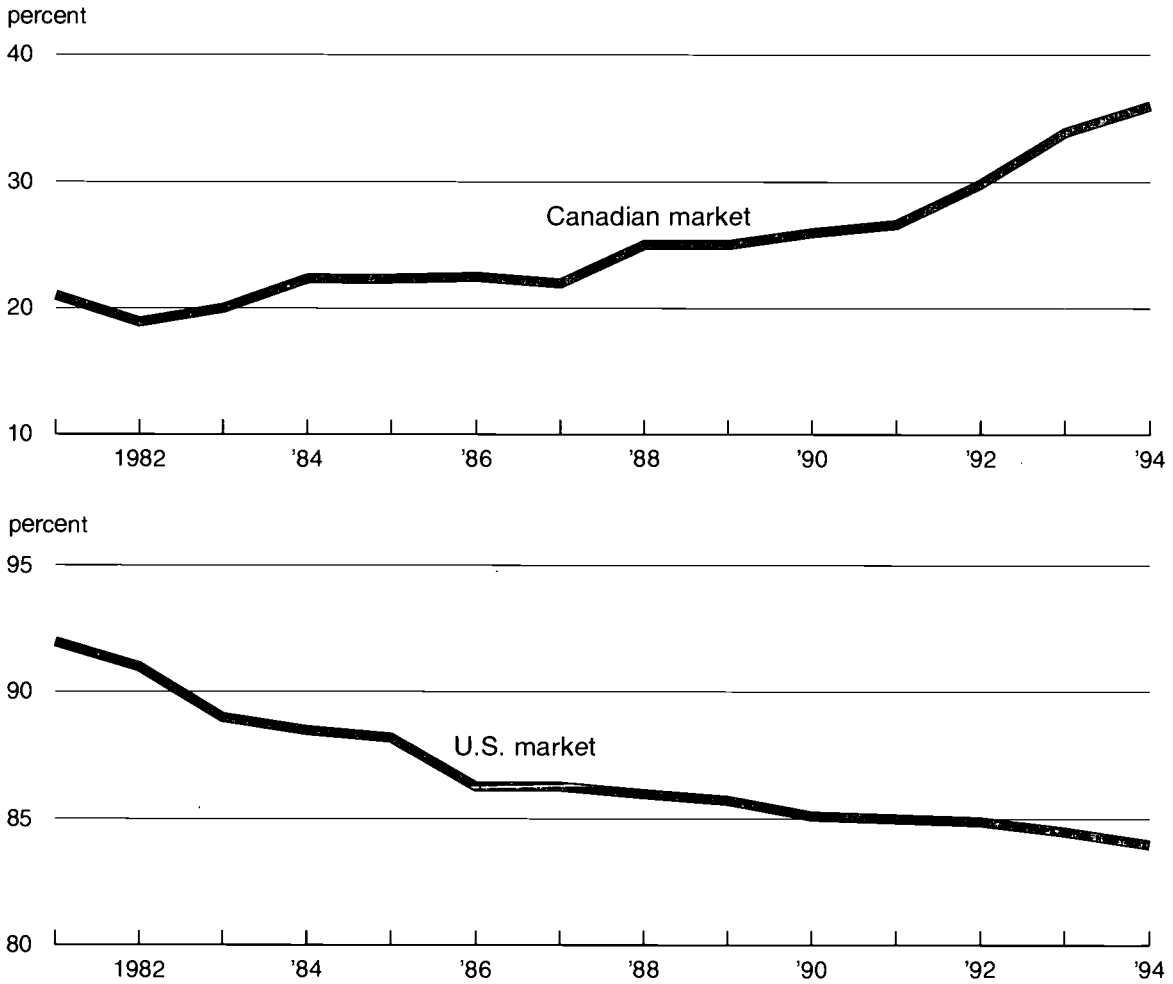
Source: Jane Sneddon Little, "U.S. Regional Trade with Canada in the First Five Years of Free Trade," presentation prepared from data from *Statistics Canada* for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

Figure 10 Canadian Share of Market



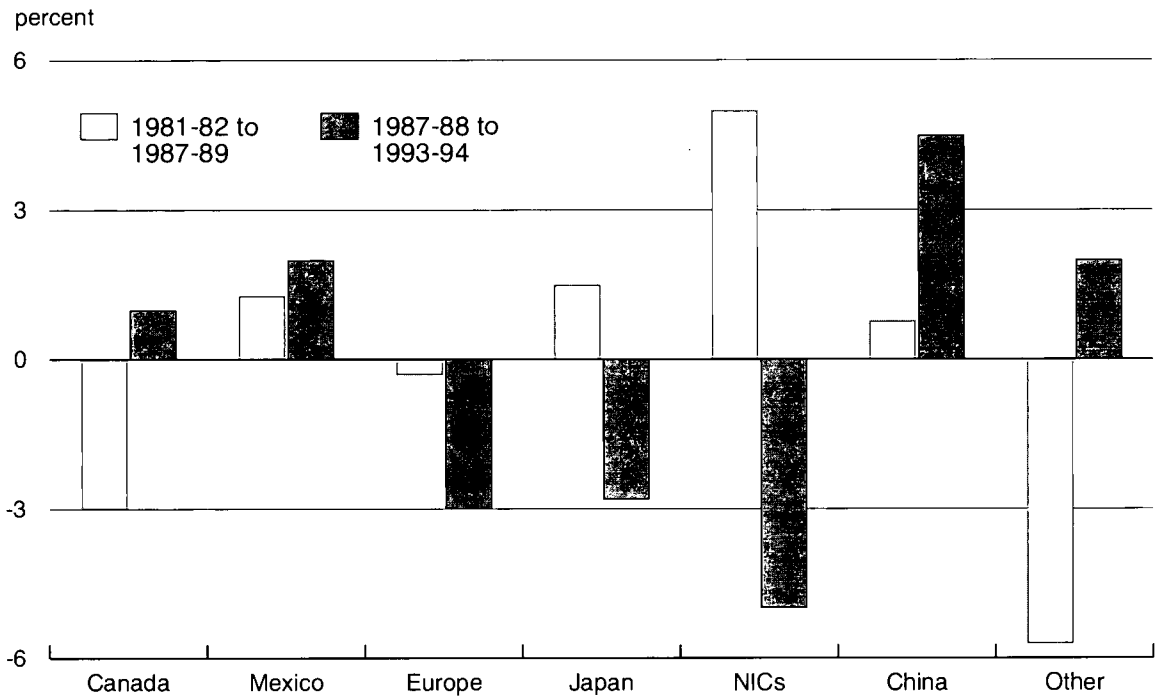
Source: Gary Scott, reactor comments prepared from data obtained from the Government of Canada, *Proceedings of the Standing Committee on Foreign Affairs*, various years, for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

Figure 11 U.S. Share of Market



Source: Gary Scott, reactor comments prepared from data obtained from the Government of Canada, *Proceedings of the Standing Committee on Foreign Affairs*, various years, for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

Figure 12 Change in U.S. Import Market, Percent Change in Market Share by Trading Partner



Source: Gary Scott, reactor comments prepared from data obtained from the Government of Canada, *Proceedings of the Standing Committee on Foreign Affairs*, various years, for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

Table 4 Real Estate and Commercial Loans, Percent of Total Loans

	U.S.-Owned Commercial Banks		Total Foreign Banking Offices	
	Real Estate	**C&I**	**Real Estate**	**C&I**
Total U.S.				
1985	27.1%	31.3%	10.8%	43.4%
1990	39.9	26.3	20.5	48.7
1994	42.7	23.3	22.1	51.0
Seventh District				
1985	27.3	31.4	7.2	49.5
1990	39.0	29.5	19.3	58.0
1994	42.9	26.6	16.5	61.9

Note: 1994 figures are for the second quarter.

Source: Tim O'Neill, reactor comments prepared from an article by Linda Aguilar, "A Current Look at Foreign Banking in the U.S. and Seventh District," *Economic Perspectives*, Federal Reserve Bank of Chicago, January/February 1995, pp. 20–28, for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

Table 5 Share of Manufacturing Employment at Foreign-Owned Firms

	1988	1989	1990	1991	1992	1993	1994
Illinois	9.5	10.9	11.8	12.6	12.8	12.6	12.3
Indiana	8.4	10.0	13.7	13.0	13.6	13.4	13.3
Michigan	7.0	7.2	7.6	7.8	8.3	8.8	8.6
Ohio	7.9	10.1	11.2	11.9	12.3	12.3	12.2
Wisconsin	7.2	7.6	8.3	8.5	8.2	7.6	7.5
U.S.	8.2	9.5	10.4	11.0	11.2	11.3	11.4

Source: Asim Erdilek and Milton A. Wolf, "R&D Activities and Innovativeness of Foreign-Owned Firms in Ohio," presentation prepared for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

Table 6 Largest Foreign Sources of R&D Investment in the U.S., 1993

Country	Expenditures ($ Billions)	R&D Employees	Number of Companies	Number of R&D Facilities	Average Number of R&D Employees per Company Location
Switzerland	2.524	14,700	16	45	919
Germany	2.321	19,200	32	95	600
United Kingdom	2.295	20,000	61	109	328
Canada	2.190				
Japan	1.781	11,800	107	219	110
France	1.204	9,300	22	52	423

Note: Detailed data on Canada not included in source information.

Source: Ed Malecki, reactor comments prepared from *Science*, 1995; National Science Board, 1996, 4-47–4-48; and calculations by the author for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

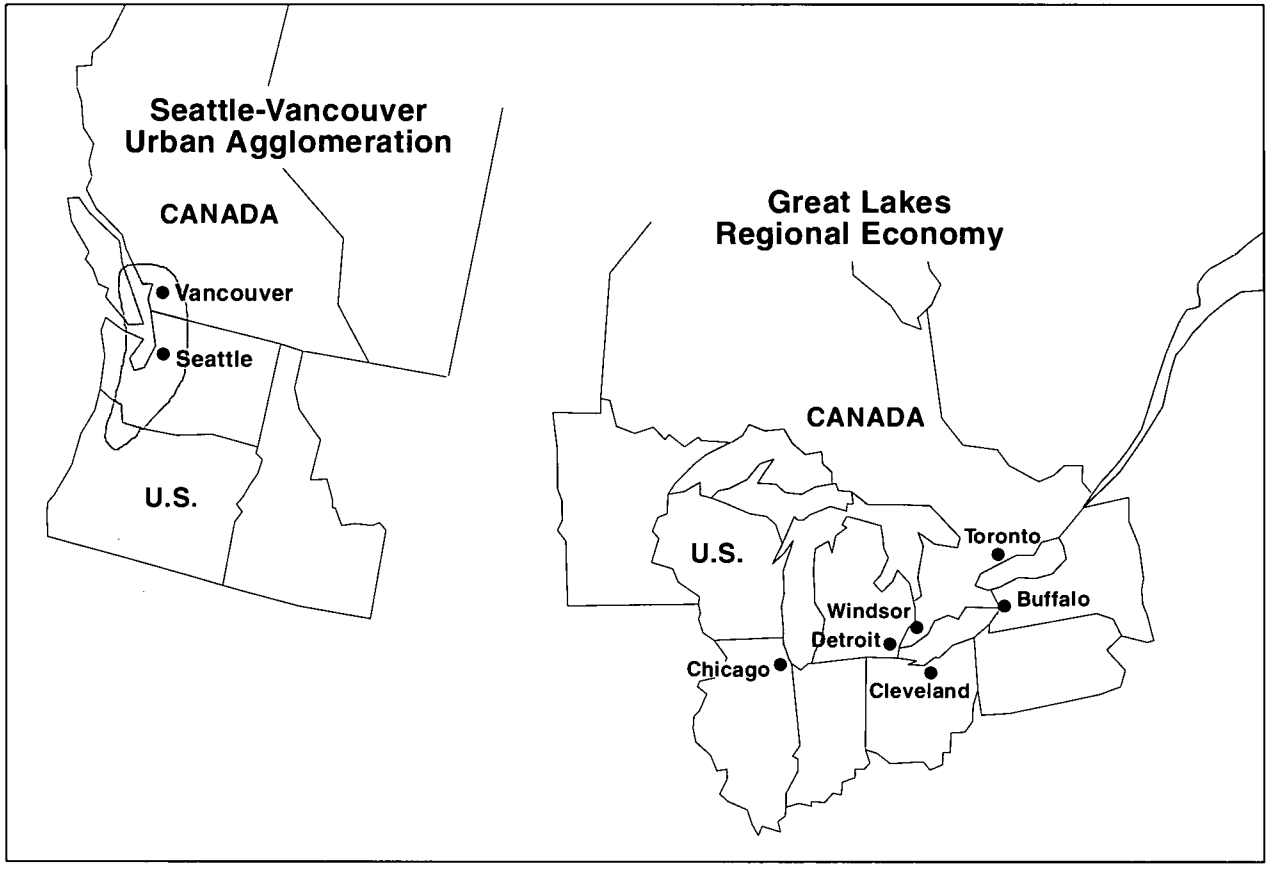
Table 7 U.S. R&D Facilities of Foreign Companies, by Country and Industry, 1994

Industry	Total	Japan	U.K.	Germany	France	Switzerland	South Korea	Netherlands	Sweden	Other
Total	635	219	109	95	52	45	26	26	22	41
Computers	39	22	0	4	0	0	7	3	0	3
Software	41	25	6	4	3	0	1	1	0	1
Semiconductors	35	19	0	3	0	0	10	3	0	0
Telecommunications	29	14	2	4	2	1	1	0	2	3
Opto-Electronics	20	11	2	3	0	0	0	0	1	3
HDTV, Other Electronics	71	33	10	9	4	5	3	4	0	3
Drugs, Biotechnology	111	22	23	18	11	17	1	5	5	9
Chemicals, Rubber, Materials	109	23	19	28	17	10	0	4	0	8
Metals	15	5	3	1	4	1	0	0	1	0
Automotive	53	34	1	11	2	0	3	0	2	0
Machinery	22	7	4	2	3	0	0	0	6	0
Instrumentation, Controls	40	1	23	3	5	4	0	3	1	0
Foods, Consumer Goods, Misc.	53	7	19	6	2	6	0	5	1	7

Note: Categories in columns may not sum to total because facilities may be included in more than one category, e.g., computers and semiconductors, or "other" categories that are not included.

Source: Ed Malecki, reactor comments prepared from National Science Board, *Science and Engineering Indicators 1996*, p. 4-47, Table 4-11, for the workshop, "Global Linkages to the Midwest Economy," Chicago, IL, September 18, 1996.

Figure 15 Cross-Border Regional Economies



Source: Peter Kresl, *Urban Economy and Regional Trade Liberalization*, New York: Praeger, 1992.

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