

Steel: Challenges, Opportunities, and Change



Steel remains one of the most important manufacturing industries in Indiana, and the dominant manufacturing industry in Northwest Indiana. The Chicago region continues to lead the U.S. in steel production, accounting for as much as 28% of the total output of steel in the country.¹ Currently, steel mill employment accounts for nearly 10% of total employment in Northwest Indiana,² compared with 0.3% of total U.S. employment.³ However, the importance of the steel industry locally and nationally as a source of employment has declined both locally and nationally. In addition, a more complex domestic industry and more aggressive international competition have made the performance of the steel industry, particularly in Northwest Indiana, more volatile, and its future more difficult to project.

In this report, we discuss four aspects of the steel industry that are important for understanding both its past and its future. In the first section, we examine changes in the structure of the domestic steel industry, in particular the emergence of mini-mills and their impact on integrated producers. Next, we turn to an examination of long-term industry output and productivity trends. Finally, we consider some short-term issues involving international competition and domestic labor relations.

Industry Structure

Six years ago, one of the authors of this report (with two co-authors) published an analysis of the integrated steel industry, with particular reference to Northwest Indiana, which suggested that integrated steel-making firms were in serious difficulty, facing possible extinction (with the possible survival of finishing mills) as a consequence of the rise of mini-mills.⁴ Indeed, current data from the Iron and Steel Institute suggest that mini-mill output has approached half of total industry output⁵ in the U.S.

Not all of the predictions of decay, decline, or collapse of integrated steel have come true. Partly, the relatively good news has come from integrated steel having worked and continuing to work very hard on its survival. The long-term results are as yet uncertain, and integrated steel currently faces continued competitive threats from mini-mills and from foreign competition.

Until the rise of mini-mills, economists tended to classify the steel industry as a classic "oligopoly" industry. An oligopoly industry is characterized by a small number of competitors, generally from 2 to 10 firms, with substantial barriers to entry of new competition. These barriers occur primarily because of what is known as "economies of scale." Economies of scale exist through the sheer size of the firm and its ability to produce at very low costs of production. Others lack the financial ability to build a firm large enough to compete

with these industrial giants. Names such as United States Steel and Bethlehem Steel were commonly used to illustrate real-world examples of oligopoly firms.

The advent of mini-mills changed the conventional wisdom regarding the steel industry as an oligopoly. Relatively small firms whose investment and capital requirements were significantly smaller than big steel challenged integrated steel. The "Dinosaurs" article mentioned above forecast the demise of formerly oligopolistic large firms in favor of smaller mini-technology firms. It is important to note that the rise of the mini-mills was, in fact, a response to new technologies that allowed for smaller producers to compete cost-effectively. These technological changes in some ways have reversed a centuries-long trend of changes that have favored large-scale enterprise at the expense of smaller firms. It was, in part, the unexpected nature and implications of the new technologies that made adjustments by integrated producers difficult.⁶ To survive, the integrated producers faced changing how they did business.

The rise of the mini-mills was...a response to new technologies

Today the evidence is not so clear that mini-mills will drive integrated producers out of the steel industry; there appear to be "niches" for both large and small producers in steel. It appears that economies of scale do exist for integrated steel in some areas, primarily at the finishing end. Some mini-mills, such as Nucor, have achieved a size that qualifies them as "big" producers and the question arises about where they should be placed in the order of things. It is no longer a certainty that a mini-mill will necessarily survive if not properly managed. A case in point is Qualitech Steel, an Indiana mini-mill that filed for bankruptcy protection in March 1999.

In spite of a number of local and state incentives, Qualitech did not succeed. According to an article by Bill Koenig in the *Indianapolis Star* (May 1, 1999), "Qualitech had wanted to get production up to 40,000 tons a month. The best the Pittsboro plant did was in March, when it hit 10,000 tons. The factory needed 21,000 tons a month just to break even."

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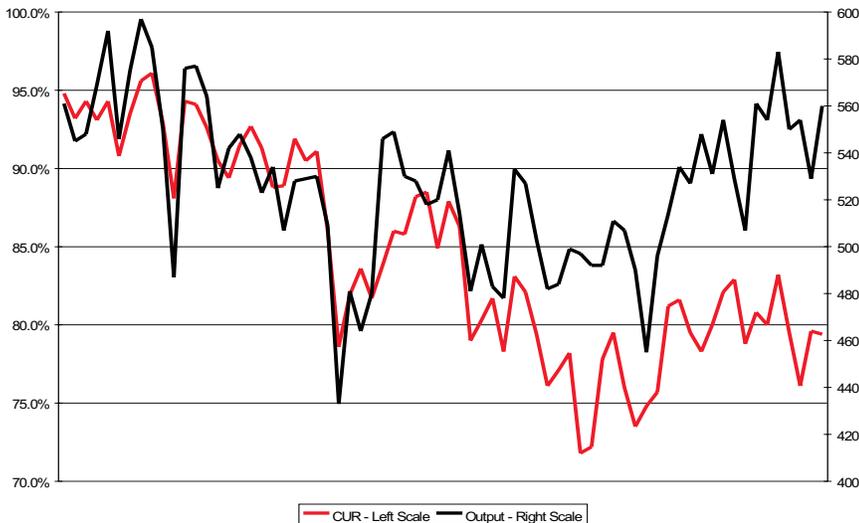
As the case of Qualitech indicates, mini-mills have also faced the necessity to adapt to an accelerated rate of change.

The survival of any business is based on a Darwinian survival of the fittest. Those firms who are most successful in producing a quality competitive product at low price and low costs will survive, while others will not. The survival of domestic steel, both integrated and mini-mill, depends on its ability to respond to competitive pressures, most pronounced at present from foreign sources. It is no longer the case that the survival of a domestic mini-mill is a "given" simply due to an advanced technology. The management of that technology is equally as important as the technology itself. What is clear is that a return to dominance of the domestic steel industry by a small number of extremely large integrated producers will not happen. The structure of the industry appears to have changed, permanently, and in the direction of increased domestic competition. For users of steel, this can only be a benefit.

Output and Productivity Growth

The change in the structure of the steel industry toward increased domestic competition has had implications for the performance of firms in the industry and, by extension, for workers in the industry. The increased competitive pressures in steel have placed a large premium on continued innovation in process and organization. These innovations will be accompanied by rising productivity in the industry. A second implication is a growing need to control costs. Since steel-making firms are, if anything, less likely to be vertically-integrated than in the past, this means controlling the direct costs of the steel-making process. One arena in which this can be done is to control labor costs.

Figure 1
U.S. Weekly Steel Output and Capacity Utilization Rates (CUR), 1998-1999



Productivity in the steel industry has increased at a dramatic rate. The Iron and Steel Institute estimates that worldwide steel output has increased by about 30% over the past 25 years, while employment has dropped by half.⁷ These numbers suggest an increase in productivity-output per worker-of about 4.06% per year for the past quarter century. By contrast, overall productivity growth in the U.S. economy has averaged only about 1.1% per year in the non-farm business sector and about 2.8% per year in manufacturing.⁸ However, steel output grew at a rate of only 1.05% per year. The consequence is clear: employment has to fall in the steel industry. If these output and productivity trends continue, worldwide steel employment will fall at an annual rate of about 3% per year for the foreseeable future.

But the rapidly rising productivity is, for the U.S. economy and for the world economy, an almost unalloyed good. It allows our overall standard of living to rise. It allows us to use resources that would have been devoted to producing steel to be used to produce other goods and services.

However, the second implication of the increasingly competitive steel industry worldwide is a greater need to control costs. This drive to control costs will become even greater as worldwide over-capacity continues to mount. Within the U.S., it is likely to take the form of increasing resistance to unionization by steel-making firms and less willingness by management to acquiesce in substantial pay and benefit increases. Efforts by unions to win employment guarantees are also likely to be increasingly resisted. The alternative, for any individual producer, is to lose market share and profits to firms that do a better job of controlling costs.

As a consequence, the position of the steel workers as an industrial elite, earning wages substantially above the average everywhere in the world, is likely to erode. Wages in steel will continue to be high. Workers in steel are highly productive, and their pay will continue to reflect that. Work in steel will continue to be difficult and dangerous, and worker pay will reflect that. But 100% or more premia over average wages in manufacturing are likely to become a thing of the past.

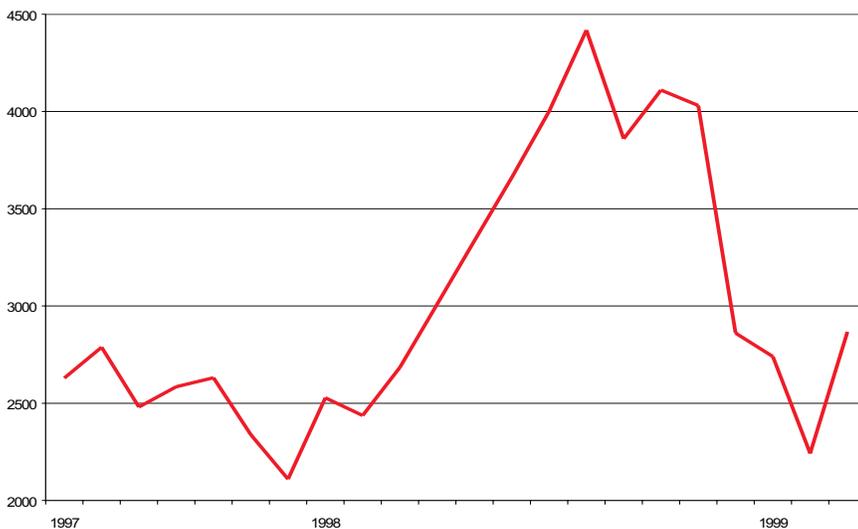
Short-Term Competitive Pressures

The factors discussed above reflect long-term adjustments for steel producers and for steel workers. But the industry also faces some short-term competitive pressures which have led to calls for short-term actions. The wisdom of some of these actions may be questionable.

Over the past year, steel output in the U.S. has fluctuated widely. Figure 1 shows, for the U.S. industry as a whole, the degree of capacity utilization (left scale). From a high of about 95% in early 1998, capacity utilization fell to about 72% near the end of 1998. Since then, capacity utilization has recovered somewhat, to about 80%, still below its level of a year and a half ago.⁹

Figure 1 also shows weekly steel output for the Chicago area, in thousands of tons. Locally, output fell from about 570,000 tons per week early in 1998 to a low of about 460,000 tons in early 1999. Since then, local output has recovered to about 560,000 tons per week. The Chicago area's share of total steel output in the U.S. has, as a consequence, increased from 25% at the beginning of 1998 to nearly 29% most recently.

Figure 2
U.S. Monthly Steel Imports, 1997-1999 (Thousands of Net Tons)



The major cause of the declines in steel output and capacity utilization during 1998 was increased international competition. The Asian currency crises, beginning in Malaysia and spreading throughout Asia (and, indeed, to Brazil and Russia) had two consequences.

First, those economies went into recessions, ranging from moderate (Singapore) to severe (Malaysia, Indonesia, Korea). The depressed economic conditions in those countries reduced their domestic demands for steel, inducing their domestic steel producers to look elsewhere for markets. In addition, demand for certain U.S.-produced goods, such as heavy construction and agricultural equipment, declined as those countries cut back their imports in response to lower income and output levels. These forces led to reduced demand for U.S.-produced steel directly (as some U.S. manufacturers reduced their orders) and indirectly (as foreign producers turned increasingly to U.S. markets).

Second, the currency crises led to declines in the value of certain foreign currencies (conversely, one can think of this as increases in the international value of the dollar). As foreign currencies become cheaper, U.S. businesses and consumers have an increased incentive to purchase imported goods and services, including steel. And they did. Directly, as steel imports, and indirectly as imports of products made with steel. As the

dollar becomes more expensive, businesses and people outside the U.S. have an increased incentive not to buy U.S.-produced goods, including those made with steel. And, again, they did what we would expect; they bought less from the U.S.

U.S. Steel producing firms have also argued that foreign steel producers have "dumped" steel in the U.S. (sold it below the cost of production). While judging whether this is true is difficult, we should note that firms can find it **profitable** on many occasions to sell a product at below its **average** cost of production. Suppose for example that the average cost of producing a certain grade of steel is \$400 per ton. But suppose that additional tons of that grade of steel can be produced at an additional (marginal) cost of \$300 per ton. It will be profitable to sell that **additional** steel at any price in excess of \$300 per ton, particularly if your choice is not to sell it at all.¹⁰

Politically, one response to the allegations of dumping has been to place some restrictions on steel imports. It appears, in fact, that much of the recovery in steel production has resulted from these import restrictions. (See **figure 2** for the changes in monthly imports during the 1997 to 1999 period.) Note that the consequence of this, however, is higher prices for steel sold to U.S. manufacturers, and thus higher costs of producing their products. This has consequences for their ability to compete in an increasingly competitive global marketplace as well.

The Labor Situation

Finally, the steel industry faces a complex labor situation. Following optimism early in the year about the prospects for a quick and amicable settlement in this year's negotiations, it now appears that a settlement is not imminent.¹¹ Negotiators for USSteel are seeking ways to control their labor costs more closely, as we noted above in our discussion of the long-term consequences of an increasingly competitive world. While the United Steelworkers are seeking enhanced employment guarantees (for workers with 2+ years of seniority), USSteel seeks to reduce employment guarantees. Management is also seeking greater cost controls by shifting overtime pay calculations from a daily basis to a weekly basis and by increasing the amount of cross-training (especially by training workers in maintenance skills for the equipment they operate).

With contracts expiring this summer at USSteel, ISPAT, LTV, and Bethlehem, even a brief work stoppage will undermine the domestic industry's competitive position. This has historically been a problem for the steel industry, as periods of prosperity followed by periods of increased competition have undermined industrial peace.¹² With an August 1 deadline, there is still time for negotiations to conclude successfully, but, increasingly, there may be less room for optimism.

Conclusions

The steel industry faces long-term structural problems, as it adapts to an increasing pace of technological change and an increasingly competitive market. For workers, there is the reality of on-going reductions in employment as productivity growth continues to outpace output growth. For individual firms, finding ways to cope with these changes represents their major strategic challenge for the future.

In the shorter term, economic fluctuations around the world and the continued strength of the dollar will confront the industry with increased international competition. In the absence of a labor agreement-if not labor peace-the domestic steel industry will be badly placed to respond to these short-term competitive challenges. How steel company management deals with these challenges will surely test their tactical skills at least as much as the structural changes test their strategic visions.

It's Raw, It's Rolled (hot or cold), It's Pickled and It's Made in Indiana

The following list of steel plants in Indiana is not all-inclusive and does not include steel fabricators and processors. Where available, we have included the web addresses of these companies, as many have very good location information and some have photographs of the plants.

- AK Steel
Rockport [under construction] (www.aksteel.com)
- American Steel Foundries
Hammond
- Bethlehem Steel
Portage (www.bethsteel.com)
- Gary Steel Products
Gary
- Inland-ISPAT
Hammond (www.inland.com)
- LaSalle Steel
Hammond
- LTV Steel
East Chicago (www.ltvsteel.com)
- National Steel
Portage
- Ottawa River Steel
Hammond
- Republic Engineered Steel
Gary
- Symco Industrial Fabricators
Hammond
- US Steel
Gary (www.usx.com/ussteel)

Curious as to how steel is made? Check out this diagram on the web: www.ltvsteel.com/htmlfiles/diagram2.htm

Notes

¹ American Iron and Steel Institute, "1999 Weekly Production by Geographic District," press release, May 15 1999. The Chicago area's share of total output cited in the text is for the week ended May 1, 1999.

² Indiana Department of Workforce Development, "Labor Market Letter: Gary-Hammond PMSA." Data are for March 1999. Total employment was 267,800; steel mill employment was 27,300.

³ Bureau of Labor Statistics Data Home Page. Total establishment employment in March 1999 was 127,813,000; employment in steel mills and iron and steel foundries was 350,500.

⁴ John Holowaty, Gary Lynch, and Leslie Singer, "Dinosaurs on the Lake: Steel in the Next Decade," *Indiana Business Review*, Spring 1993, 1-13.

⁵ Iron and Steel Institute, "March 1999 Selected Steel Industry Data," press release. Mills using typical mini-mill technology apparently produced about 45% of total steel output in the first quarter of 1999.

⁶ Similar technological changes have affected local telecommunications (the wireless revolution), business consulting (the power of personal computers), airlines (nimble, regional carriers and the "hub-and-spoke" organization strategy), among others.

⁷ Iron and Steel Institute, "Steel: Basic Facts and Figures about the Steel Industry," www.worldsteel.org/steelmaking/intro/index.html.

⁸ *Economic Report of the President 1999*, Table B-47.

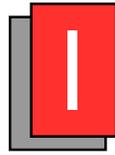
⁹ Iron and Steel Institute, "1998 and 1999 Weekly Raw Steel Production by Geographic District," www.steel.org/stats98weekly.html and www.steel.org/stats99weekly.html

¹⁰ Airlines often do this; hence the phenomenon of multiple prices being charged for "identical" seats on a flight.

¹¹ Much of the following discussion is based on articles in *The Times*, most recently on June 8, 1999, A-1 to A-5.

¹² John Hoerr's *...And The Wolf Finally Came*, remains the definitive study of labor relations in the steel industry.

Break Away Growth: Economic Development for the 21st Century



Imagine living in a state with the fastest growing economy in the Midwest:

- A state that fully capitalizes on its competitive and comparative advantages in manufacturing, value-added agriculture and advanced services to lead in the continuing industrial renaissance of the heartland.
- A state with a proliferation of home-grown businesses, many of them market leaders in the United States and abroad, both in mainstream manufacturing and emergent industries.
- A magnet for high growth clusters of frontier industries, e.g., biomedical and business software companies.
- An educational system that prepares young people for high skill jobs and helps retrain adults for better and better opportunities.
- A place world renowned for its livable, vital communities, and smart government.

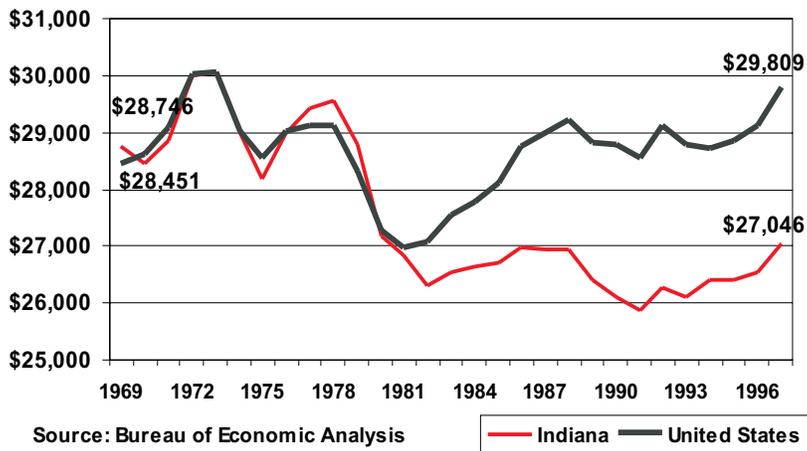
In short, the state just described could well be Indiana as it celebrates its bicentennial in 2016. *Break Away Growth* details how Indiana can break away from competitor states by focusing on quality economic growth and performing government functions exceptionally well. The aim of the plan is to make Indiana the best location in the Midwest for businesses and families.

Why Should We Change Now?

Indiana has fully participated in the Midwest's economic revitalization. New plants have come to the state. Employment is at an all-time high. Exports continue to break records and outpace the U.S. rate of growth. Investment from overseas firms has increased. Why, then, should the state change its strategies?

While Indiana's cost of living and cost of doing business are well below most states, the average wage per job is below the national average (see figure 1).

Figure 1
Average Wage Per Job, 1969-1997 (1997 CPI adjusted dollars)



Wages that were once at the national average have grown 0.8% since 1981. During the same time span, national wages increased 10.5%.

Employment growth data are convincing: Indiana's economic development strategies have served us well for creating jobs. Now, the state must enhance those strategies to move ahead in improving its standard of living.

Global competition will continue to put pressure on prices. Manufacturing and agricultural production around the world have increased, meaning that more of what Indiana produces can be also made elsewhere. As a result, Hoosier companies must specialize in high value-added products and services that command a premium in the marketplace.

Mainstay industries such as manufacturing, agriculture, insurance, trade and distribution, and higher education will continue to be a cornerstone of Indiana's economy. Manufacturing, which represents nearly one-third of Indiana's Gross State Product, continues to outpace the nation in production wages and productivity (see figure 2). Over-reliance on these industries, however, makes us vulnerable to recessions. By expanding cutting edge growth companies in traditional and frontier industries, Indiana can increase incomes and opportunities for job advancement.

Higher-paying jobs reward skill and innovation. Many production and service jobs do not necessarily require a four-year college degree. They do, however, require increased levels of skill in technology, problem solving, teamwork and communication.

The state's economic development system must be geared to meet demands for flexibility and responsiveness. The pace of the 21st Century will be even faster than that of today. State programs need the tools and customer-service focus necessary to respond quickly and in a coordinated fashion.

What is Break Away Growth?

Break Away Growth is...

A Vision for Superior Performance

Indiana aspires to be the best place in the Midwest to...

- earn
- work
- play
- learn
- raise a family
- enjoy the environment
- build community

And to be globally renowned for its...

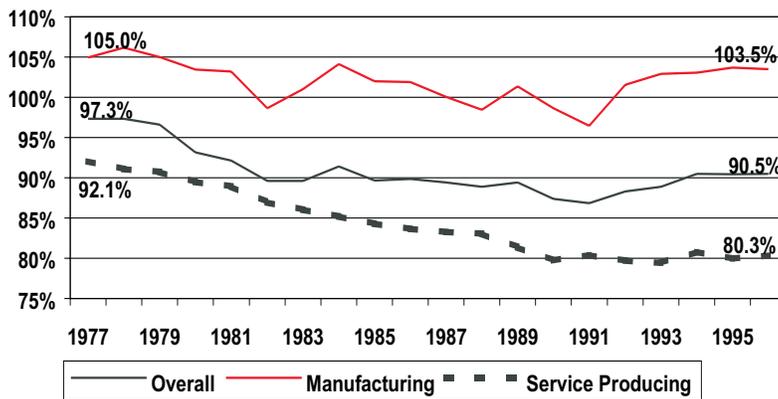
- free enterprise
- smart government

Goals that Raise the Bar

By 2016, Indiana will achieve Quality Economic Growth if it meets six goals:

1. Raise per capita income and average annual wages above the U.S. average.
2. Attain the best purchasing power of any state in the nation.

Figure 2
Productivity by Major Sectors
 (GSP per worker, Indiana as a Percent of the U.S., 1977-1996)



Source: Bureau of Economic Analysis

3. Secure the lowest poverty rate in the Midwest.
4. Bring productivity above the U.S. average and rank as the best in the Midwest.
5. Earn the highest livable places rating in the Midwest.
6. Create the highest rate of growth in the number of high skill, high paying jobs in the Midwest.

A Mantra of Innovation and High Performance

The bulk of U.S. economic gains are coming from advances in technology, improved productivity and increased worker skills and knowledge. Indiana is in a highly competitive world market. Only by synchronizing public and private efforts to focus on innovation and high performance can we create a higher standard of living and higher quality of life.

The Tenacity to Stay the Course

No strategic plan is complete without consideration of downside possibilities. Regardless of short-term economic contractions, Indiana must continue to focus on the long-term: innovation-led, high performance growth.

How Will We Break Away?

This plan charts a course for break away growth through three primary strategies:

Improve and Enhance the Performance of Mainstay Industries

Strong mainstay industries such as manufacturing are our economic powerhouse, and the employers of most Hoosiers. They will be the focus of continued efforts to improve performance and competitiveness.

Speed Development of Frontier Industries and Growth Companies

Agile, high growth, high paying companies in traditional and frontier industries offer opportunities to increase Hoosiers' standard of living through high skill, high paying jobs. Indiana will look for ways to speed development of these firms.

Create a Climate for Growth

State government and its partners can make a series of investments to create a climate conducive to quality economic growth by :

#1: Making Workforce Skills a Priority

In the highly competitive global economy, businesses compete on price, value and responsiveness. One option is for firms to focus on offering the lowest price by utilizing a low skill, low cost workforce and "dumbing down" operations. A second option is to command a premium price but offer the highest overall value. Finally, one could choose a hybrid option which combines price competitiveness and higher value. Both the second and third options require skilled workers and investments in technology.

The second and third courses of action, while more demanding, are the paths *Break Away Growth* advocates. High value added, innovative products strengthen companies' financial performance, increase job security for skilled workers and improve workers' wages and incomes. Consequently, education and training of the workforce has become the primary competitive issue in economic development.

Indicators of skill levels of current and future workforces present a mixed picture. Currently, only 16.8% of Indiana's jobs require a bachelor's degree or higher, compared with 20.7% of all U.S. jobs. Many of Indiana's good paying jobs require training other than a four-year degree, such as apprenticeship programs, vocational certificates and short course college "packages." It is important to recognize, however, that an increasing number of jobs will require post-secondary training of some sort.

One of the most important steps the state could take to prepare for the future is to ensure that Indiana can respond quickly as industries' needs change. That effort would require high response, on-the-job training adequate to address the skills of large and small numbers of people.

There is concern that as job tasks become more technically complex and require more problem solving and people skills, Indiana workers may not yet have the full set of matching skills. A recent Indiana Economic Development Council study estimates that for every 100 high skill job openings, only 65 job applicants had the mix of skills required. While 76% of the jobs do not require a formal post-secondary degree, they do require continual training, much of it on the job.

Formal education rates are lower than the national average. Currently, Indiana's public high school graduation rate is 70.1%— 30th in the nation. Only 17.7% of adults have completed a four-year degree or higher — 47th in the nation. Conversely, Indiana is the 14th largest producer of college graduates in the nation. These graduates represent a steady supply of workers that possess the knowledge and technical expertise needed to attract and retain high growth, high skill companies.

Four Growth Challenges

Indiana faces

four core challenges:

1. Indiana must catch up in per capita income and real wages per worker
2. Growth must be sustainable and less susceptible to business cycles. Reaching a level of productivity and industrial diversity that reduces the impact of recessions is an important safeguard.
3. The working poor must develop skills to ensure continued family wages. Increasing skills through work-based training, short courses and distance learning will be an essential means of stability and upward mobility for many Hoosiers well into the next century.
4. Communities must deal with the impact of migration to non-metropolitan areas. Among the negative consequences of the migration are loss of farmland, decline in the core of cities, and increased demands on schools, municipal services and water, sewer and drainage infrastructure.

#2: Accelerating Development of Growth Companies

On average, growth companies pay better, employ more highly skilled workers, export greater amounts, spend more on research and development, and provide better worker benefits and job satisfaction. These companies are the engines of Quality Economic Growth.

Generally, a firm is considered a high growth company if its sales and earnings grow at a rate of 15% per year, or better. The firms come in all sizes and cross all industries. What they share is a focus on innovative, cutting edge products and services. Indiana already has several concentrations of high growth, high pay companies in Elkhart, Warsaw and Indianapolis. The state's future vitality and wage and income growth, however, depend on having many more of these clusters.

Diversifying Indiana's industrial base to include high growth niches is a logical step. Promising industries include biotechnology, healthcare, information technology, advanced business services, environmental technology and services, advanced logistics, and education and training. They are also logical extensions of Indiana's existing economic base.

Our college and university research capabilities and the state's ability to produce skilled workers will impact efforts to have growth companies locate and expand in Indiana. Likewise, "smarter" government efforts to encourage networking among firms and regional high technology strategies can encourage business development. Equally important are efforts to improve Indiana's quality of life and retain highly skilled residents.

#3: Taking Advantage of Our Crossroads Location

Indiana has an enviable geographic location. It is the Crossroads of America, the center of the world's most powerful industrial nation. The state has a powerful asset with its advanced transportation system of railroads, highways, ports and airports, and its strong telecommunications system. Indiana can position itself as a global gateway by investing in superior transportation and logistics systems.

#4: Leading the Way with Smarter Government

Indiana is in an excellent position to pursue "smarter" government. It already follows the tenets of limited government, a moderate tax rate, low debt and local initiative. "Smarter" government will require three innovations:

1. Find ways to perform exceptionally well.
2. Implement performance-based designs for public services with high standards of accountability.
3. Find solutions that minimize or eliminate the role of public bureaucracies.

This effort to maximize both the efficiency and effectiveness of government calls for greater flexibility and a greater range of options to solve problems. For example, more of what the federal government funded in the past has shifted to local areas. Consequently, communities must cope with addressing more demands with fewer resources.

Likewise, to be truly effective in economic development, communities must look at issues such as transportation, infrastructure, worker skills, the environment and a host of items from a regional perspective. Sub-state solutions are required to achieve economies of scale, efficient financing and coordinated solutions to issues that cut across boundaries. Yet, coping with multi-jurisdictional issues can be challenging.

#5: Creating Livable and Healthy Communities

Increasingly, families and employers will pay premiums to live in places that are safe, clean and in harmony with nature. People will seek out communities that enhance the natural landscape, prevent pollution and are designed with convenience in mind.

The well-being of residents relates directly to environmental conditions and healthy lifestyles. Indiana communities rank high on many quality of life factors, but fall behind their peers in attaining environmental and health standards.

This plan focuses on policies that address the concept of sustainable economic development: maintaining or improving Indiana's standard of living, agricultural yields and industrial productivity without compromising the support systems that make those results possible.

Break Away Growth is the fourth in Indiana's series of strategic plans for economic development prepared since 1983. The Indiana Economic Development Council, Inc. is a public-private partnership that brings business, government, labor, and education to the table to reach consensus and develop commitment to creating a long-term strategic advantage for the state.

For more information, contact the Indiana Economic Development Council, or visit the Council's Website at www.iedc.org

Where are They Coming From? Where Do They Go? A Study of Migration For 1997-1998

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The IRS develops county-to-county migration flow data for a state by matching the social security numbers of primary taxpayers from one year to the next. Information on taxpayers' social security numbers is drawn from the IRS Individual Master File, which contains a record for each IRS Form 1040, 1040A, and 1040EZ individual tax return filed by citizens and resident aliens. The most recent migration flow data for Indiana and other states from the Internal Revenue Service have been obtained by matching the social security numbers from federal tax returns filed in 1997 (for the year 1996) with those on tax returns filed in 1998 (for the year 1997). When a social security number match is found, the counties of residence for 1997 and 1998 are compared to determine if they are the same. If the county addresses match, then the taxpayer's number of personal exemptions are counted as non-migrants. If the county addresses do not match, then the taxpayer's number of personal exemptions are counted as out-migrants from the county listed on the return filed in 1997 and as in-migrants into the county listed on the return filed in 1998. Conclusions about county migration flow can then be drawn.

Nevertheless, actual migration flow may be understated, since tax returns that did not match based on social security number are not included. And there are other possible migrants not represented in the data set, including those not required to file tax returns because their income was below the required minimum for filing, persons whose only income was from social security payments, persons whose income was primarily from a vested interest in a retirement plan, and immigrants.

Movement Between Indiana and Other States

Between 1997 and 1998, in-migration to Indiana was estimated at 115,500; out-migration was estimated at 116,600. The resulting net-migration figure for Indiana for the period was negative, with an estimated 1,100 more people leaving the state than entering it. The estimated negative net-migration figure represents a reverse from previous years in the decade when Indiana experienced positive net-migration. Specifically, net-migration was estimated at 13,400 from 1994 to 1995, 10,200 from 1995 to 1996 and 3,400 from 1996 to 1997.

The largest number of in-migrants to Indiana were from neighboring states: Illinois (18,800), Ohio (11,400), Kentucky (9,700) and Michigan (9,200). Almost 44% of the domestic in-migration to the Hoosier State was from one of these four neighboring states. Indiana attracted large numbers of new residents from Florida (7,400), California (5,800), Texas (5,400), Tennessee (3,500), foreign countries (3,500)

and North Carolina (2,700). Hoosiers moving to other states tended to move to neighboring states or to states in the South or West: Illinois (13,200), Florida (11,300), Ohio (10,400), Kentucky (9,200), Michigan (9,100), Texas (6,800), California (5,100), Tennessee (4,700), Georgia (3,700) and North Carolina (3,400). Almost 37% of the domestic out-migration from Indiana was to one of the state's four immediate neighbors.

Indiana experienced positive net-migration (with more people entering Indiana than leaving Indiana to/from other areas) with each of its neighboring states between 1997 and 1998, particularly in the case of Illinois (5,600), Ohio (1,000), Kentucky (500) and Michigan (where in-migration and out-migration are running about equal). Non-neighboring states that accounted for large numbers of net in-migrants to Indiana were foreign countries (1,600), California (700), New York (500), Pennsylvania (400) and Virginia (400). States that accounted for the largest number of net out-migrants from Indiana were Florida (3,900), Texas (1,400), Arizona (1,400), Tennessee (1,200) and Georgia (1,200).

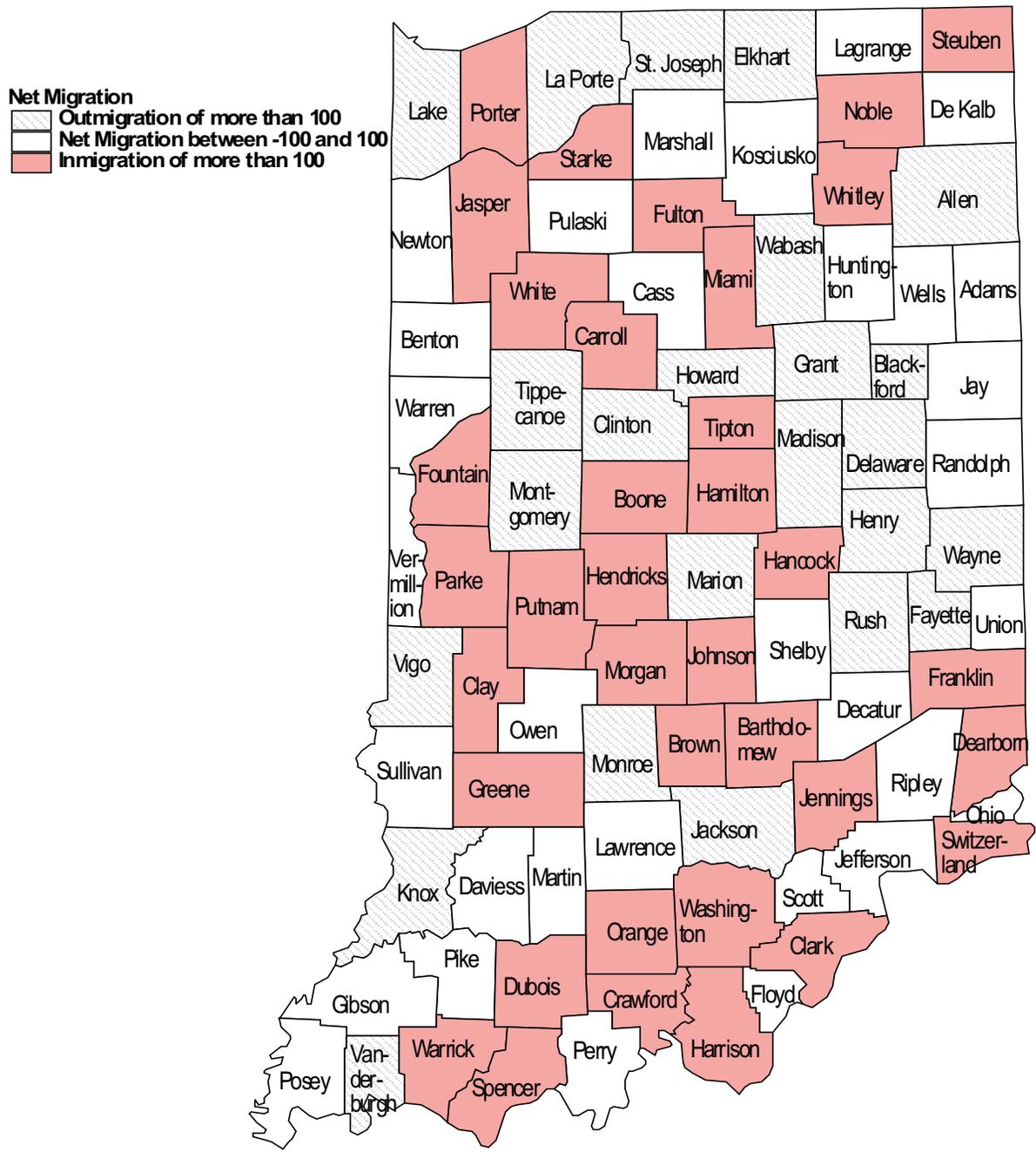
Indiana County-to-County Migration

Indiana counties experiencing the largest amount of net in-migration included Hamilton (5,400), Hendricks (2,500), Johnson (1,800), and Hancock (1,000). Counties with positive net-migration between 500 and 700 were Porter, Boone, Dearborn and Washington. Counties with the largest number of net out-migrants were Marion (5,600), Lake (2,300), St. Joseph (1,300) and Madison (1,100). (Net migration between 1997 and 1998 can be seen in **figure 1**)

•Hamilton County

Hamilton has been the fastest-growing county in Indiana in the 1990s. Between 1997 and 1998, Hamilton county experienced in-migration of 16,300 and out-migration of 10,900 for a net in-migration estimate of 5,400 persons. About 61% of the people moving into Hamilton county were from other Hoosier counties, with 39% of the total in-migrants from neighboring Marion county. About 51% of the people moving out of Hamilton county moved to other Indiana counties, with 27% of the out-migrants moving to Marion county. With 6,400 in-migrants from Marion county and 2,900 out-migrants to Marion county, a net in-migration figure of over 3,500 persons from Marion to Hamilton counties accounted for 65% of Hamilton county's total net in-migration estimate. The largest number of in-migrants to Hamilton county from other states were from Ohio (690), Illinois (430), Michigan (320), California (270), Missouri (180), Texas (170) and Kentucky (150). The largest number of out-migrants moving to other states went to Ohio

Figure 1
 Indiana County Net Migration, 1997-1998



(340), Florida (280), Illinois (280), Texas (220), Michigan (200), California (180) and Arizona (170). States that accounted for the largest number of net in-migrants (after accounting for outflow) to Hamilton county included Ohio (250), Illinois (160), Michigan (120), Wisconsin (110), Kentucky (100) and California (100). States that accounted for the largest number of net out-migrants from Hamilton county included Florida (190), Arizona (80) and Georgia (70).

•Marion County

Marion county has experienced population decline in the last three years. Despite positive natural increase for the county (births exceeding deaths), recently the county's increasing level of net out-migration has resulted in net out-migration exceeding natural increase. Between 1997 and 1998, Marion county was estimated to have an in-migration figure of 36,000 persons, and an out-migration figure of 44,000 persons for a net out-migration estimate of 8,000 persons. About 55% of the persons moving into Marion county were from other Hoosier counties, with 33% of the county's total in-migrants from the eight counties surrounding Marion. About 61% of the persons moving out of Marion county moved to other Indiana counties, with 46% of the county's total out-migrants moving to one of Marion county's eight neighboring counties. Of the 20,400 persons moving from Marion county to a neighboring county, the largest numbers of persons moved to Hamilton county (6,400), Johnson county (4,300) and Hendricks county (4,200). Marion county's in-migration from other states was estimated to be 15,800 and its estimated out-migration to other states was 16,800, for a net out-migration figure of 1,000 persons between 1997 and 1998. The largest number of in-migrants from other states were from Illinois (1,600), Florida (1,200), Ohio (1,200), California (1,100) and Michigan (700). The largest number of out-migrants from Marion county moved to Florida (1,700), Ohio (1,300), Illinois (1,200), Texas (900) and California (800). States that accounted for the largest number of in-migrants to Marion county included Illinois (400), California (300), foreign countries (200) and New York (200). States that accounted for the largest number of out-migrants from Marion county were Florida (500), Texas (300), Georgia (300) and Arizona (200).

•Lake County

Like Marion county, Lake county has experienced population loss in recent years, due to net out-migration exceeding natural increase. The county experienced in-migration of 14,500 persons between 1997 and 1998 and out-migration of 16,800 persons, for a net out-migration estimate of 2,300 persons. Lake county experienced net out-migration to other Hoo-

sier counties and net in-migration from other states due to a large amount of net in-migration from neighboring Illinois. About 3,500 persons moved from other Indiana counties to Lake county, while 6,400 persons moved from Lake county to other Hoosier counties, for a net out-migration of 2,900 persons. The largest number of Hoosiers that moved between Lake county and other Indiana counties moved to or from Porter county, Lake county's neighbor to the east. 1,900 persons or 53% of the Hoosiers who moved into Lake county were from Porter county, while 3,100 persons or 48% of the Lake county residents who moved to other Indiana counties moved to Porter county. The result was a net-migration from Lake county to Porter county of about 1,200 persons. 6,400 persons moved from Illinois to Lake county between 1997 and 1998, while 3,600 persons moved from Lake county to Illinois, resulting in a net in-migration estimate of 2,800 persons. With net out-migration of 2,900 persons to other Indiana counties, and with net in-migration of 2,800 persons from Illinois, the overall migration picture for Lake county is completed by looking at migration estimates between the county and states other than Illinois. Lake county experienced net out-migration with other states, with an in-migration estimate of 4,500 persons and an out-migration estimate of 6,700 persons for a net out-migration figure of 2,200 persons. The largest numbers of net out-migrants from Lake county were accounted for by the states of Florida (400), Arizona (300) and Texas (200).

County Changes in Per Capita Personal Income



Recently, the U.S. Bureau of Economic Analysis released data on the personal income of each county in the nation. Three simple numbers tell a story that deserves attention by Hoosiers:

1. **Total personal income (TPI)**¹ includes wages, salaries, employer-paid benefits, self-employment income, dividends, interest, rent, and transfer payments (social security, welfare, federal employee and military retirement) adjusted for commuting patterns; it represents the income of persons living in the county regardless of where they work.
2. **Total population (POP)** is a residence-based number of all persons whether or not employed, and does include workers who reside in other counties; and
3. **Per capita personal income (PCPI)**¹ is simply personal income (1) divided by total population (2).

Per capita personal income (PCPI) is often accepted as the best available measure of economic well-being. But as a number derived from two other numbers,

PCPI is difficult to evaluate. For example, when income remains constant while population falls, per capita income rises. Is this an indication of improved economic health? When children leave because they can not find jobs locally, income can be stable as their parents continue to work. PCPI will rise but the community may be in decline.

If population rises faster than total personal income, PCPI falls. Yet, a thriving county may have an influx of families with children. Thus, the movements of PCPI are ambiguous and require careful examination. Before we look into the county level detail, let's consider Indiana in a national perspective.

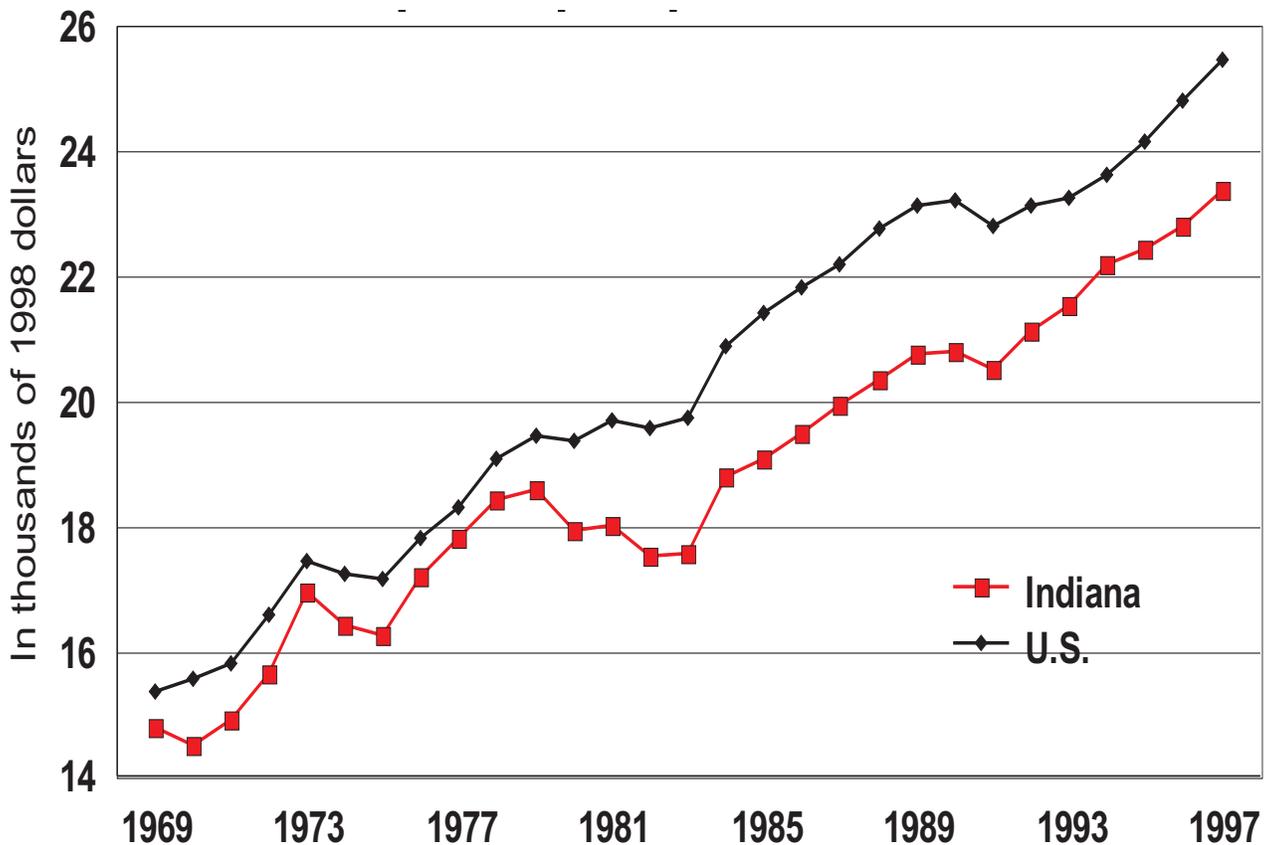
Indiana and the U.S.

Since 1969, PCPI for Indiana has been below the national level. As **figure 1** shows, Indiana has seen steeper downturns than the nation. In 1969, the Hoosier state had a per capita personal income of \$14,815 (in 1998 dollars) which grew to \$23,388 by 1997. Our compound annual growth rate was 1.64% over these 28 years, compared with the nation's 1.82%. This slower rate of growth increased the spread between Indiana and the nation (left scale). In 1969, Indiana was \$556 below the

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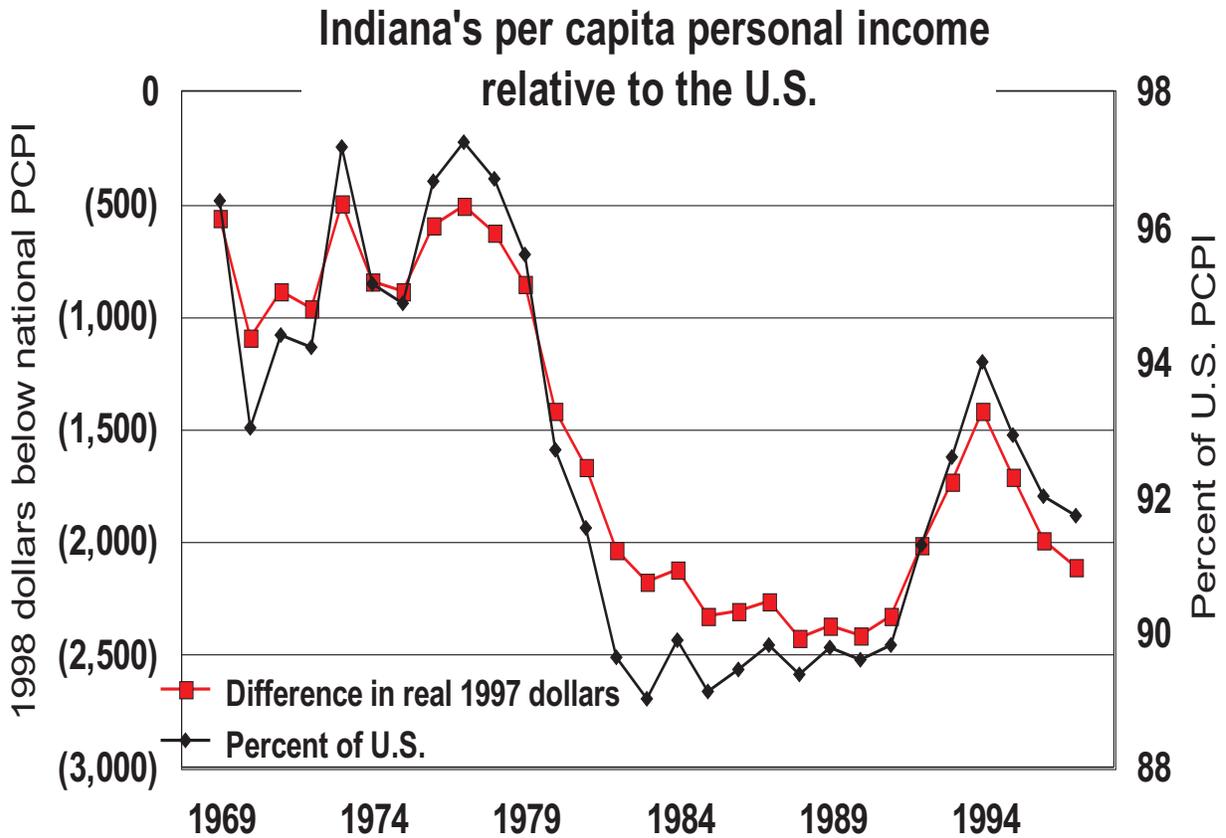
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Figure 1
Real Per Capita Personal Income, 1969-1997 (Indiana vs. U.S.)



nation's PCPI (see figure 2). The gap increased to more than \$2,500 in the mid-1980s and was \$2,103 in 1997. From a position 96.38% of the U.S. (or 3.62% below the nation's PCPI), Indiana fell to 91.75% in 1997.

Figure 2



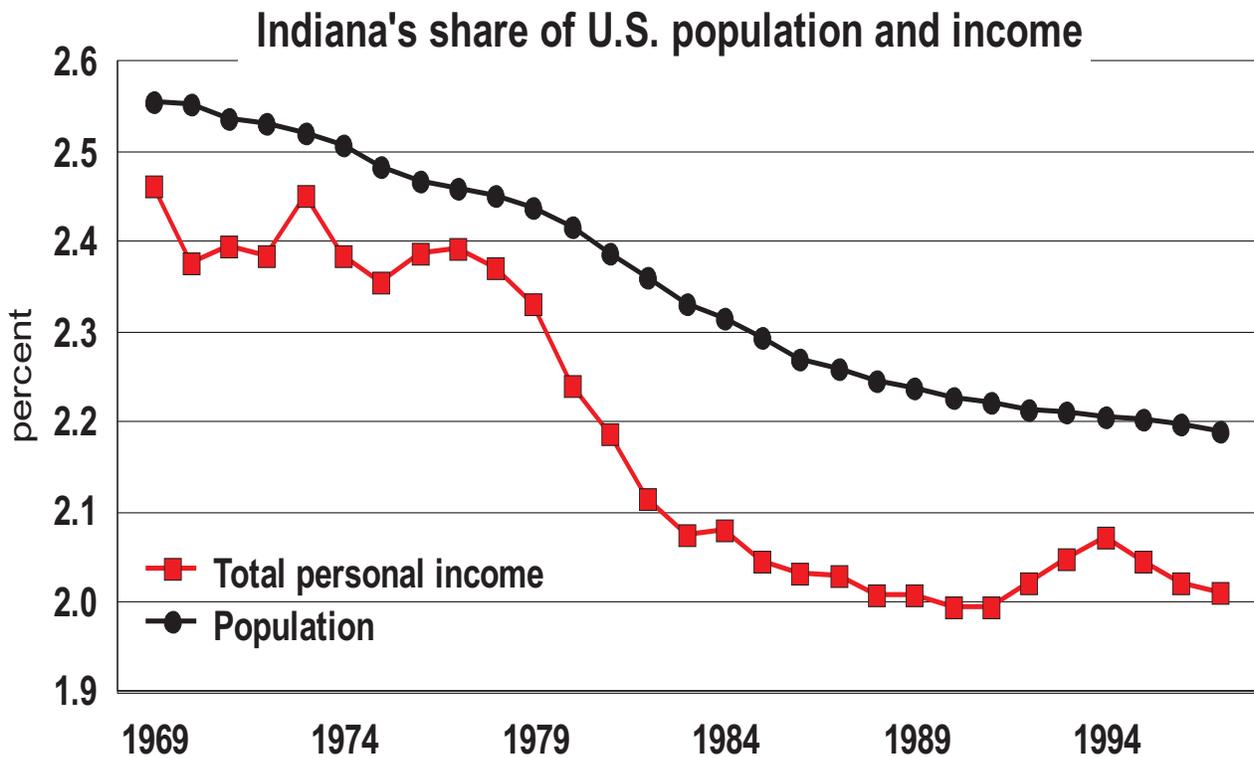
Did Indiana decline in PCPI relative to the nation because of an income deficiency or an excess of population? **Table 1** shows Indiana's compound annual rates of growth in both income and population failed to keep pace with the nation. But we were further behind in the rate of income growth than in population growth (-.75 vs. -.55). Thus, our per capita personal income grew slower than the nation and our PCPI, relative to the nation, fell. In effect, had our population growth kept pace with the nation, and our total personal income not improved, our PCPI would have been \$3,143 (13.4%) lower than the \$23,388 we actually achieved.

Table 1
Compound Annual Growth Rates, 1969-1997

	Total real personal income	Population	Real per capita personal income
United States	2.87	1.02	1.82
Indiana	2.12	0.47	1.64
<i>Difference (IN-U.S.)</i>	<i>-0.75</i>	<i>-0.55</i>	<i>-0.18</i>

As a slow growth state, Indiana's share of both America's population and total personal income declined over the period, as seen in figure 3. In 1969, Indiana had 2.55% of the nation's population and 2.46% of its total personal income. By 1997, we were down to 2.19% of population and 2.01% of income. We realized only 1.09% of the U.S. population growth during those years and 1.63% of the income growth.

Figure 3



County per capita personal income

Level of income Indiana's 92 counties can be compared to the state or to the nation. In 1969 we had 11 counties with PCPI above the national level. We peaked in 1973, that great year for high farm prices, when 24 Indiana counties exceeded the nation's PCPI. In 1997, only eight Hoosier counties were above the national level. **Figure 4** shows those eight counties plus another 11 counties that exceeded the state level in 1997. Of the 73 counties below the state level, 37 had managed to improve their position relative to the state in those 28 years. Another 32 saw their position relative to the state deteriorate; four counties held steady.

There is evidence of growing disparity in the per capita personal income of Indiana counties. Hamilton has reigned as our state's highest income county throughout the period. It was 17% ahead of the state in 1969 and

had surged to 56% over the Indiana PCPI by 1997. In 1969, Owen and Crawford counties tied for last place, 32% below the state. By 1997, Starke county held last place, 39% below the state.

The ratio between the highest and the lowest counties in Indiana is shown on the left axis in **figure 5**. Where Hamilton county residents, on average, had \$1.66 for each dollar held by citizens of Owen and Crawford counties in 1969, that advantage grew to \$2.34 over Starke county in 1997.

In terms of 1998 buying power, the right axis in **figure 5**, the gap between the richest and the poorest counties rose from \$6,849 to \$20,820 over 28 years, an average real increase of 4% per year. Thus in relative and absolute terms, the PCPI disparity among Indiana counties has been increasing.

Growth rates For the entire period, 1969 to 1997, no county declined in PCPI, although Newton achieved only a 0.5% compound annual rate of growth. Hamilton led all counties with a 2.7% rate in PCPI, well ahead of

Figure 4
County Per Capita Personal Income

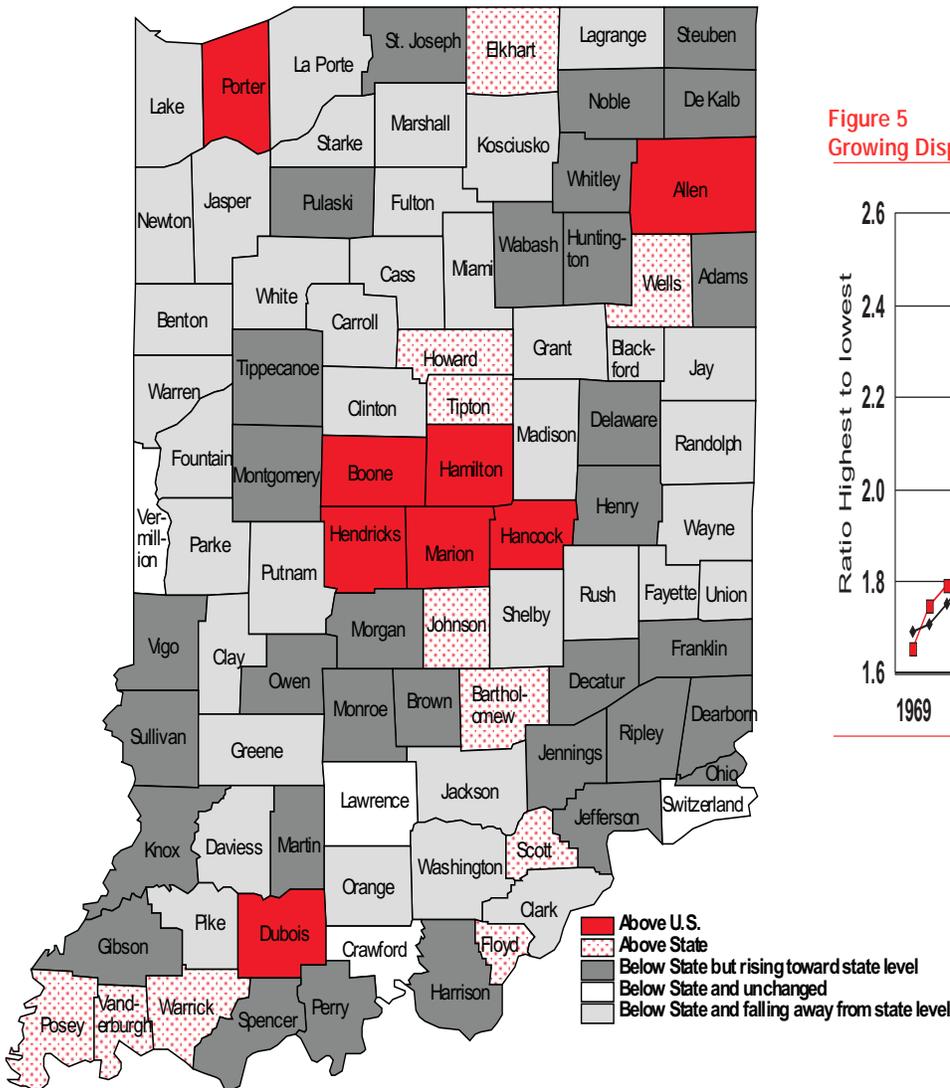
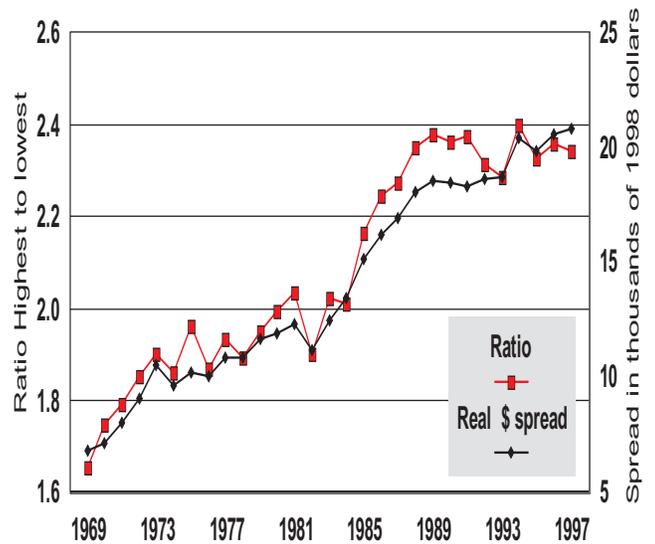


Figure 5
Growing Disparity in Real Per Capita Personal Income



second place Boone county (2.3%) (see figure 6). Not surprisingly, Hamilton enjoyed the highest compound rate of personal income growth (6.7%) which was offset by a state-leading 3.9% rise in population.

Warrick county, which ranked second to Hamilton in both total personal income growth (4.19%) and in population growth (2.21%), managed only 9th place in PCPI growth (1.93%). In 10th place was neighboring Vanderburgh at 1.89%. But, in contrast to Warrick, Vanderburgh had a slight loss in population (-0.03%),

ranked 73rd) to go with a modest growth in total personal income (1.86% ranked 51st). Population decline leads to higher levels of, and a higher growth rate in, per capita personal income (see box 1).

PCPI increased in 22 counties only because their income gains were not overwhelmed by their population losses. To view a positive growth rate in PCPI without looking at the underlying forces leads to misinterpretation. For example, in figure 6, Daviess and Jay counties

Box 1

The Arithmetic of PCPI Growth

- A. If total income grows **faster** than population, per capita personal income will **increase**
- B. If total personal income grows **slower** than population, per capita personal income will **decrease**
- C. If total personal income and population grow at the **same rate**, per capita personal income will be **unchanged**

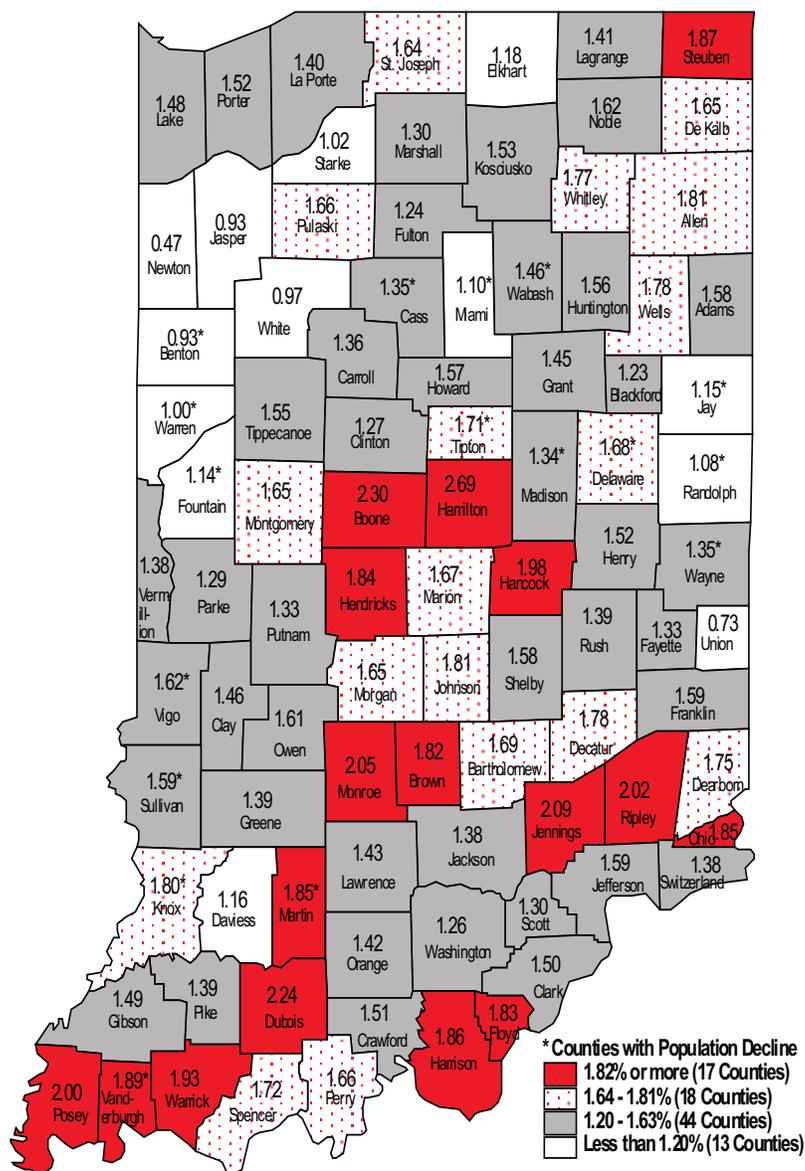
The rate of change in population has a small additional influence on the growth rate of per capita personal income:

$$pcpi = (tpi - pop) / (1 + pop)$$

where

- pcpi= % change in per capita personal income
- tpi= % change in total personal income

Figure 6
Indiana County Growth Rates



have comparable growth rates in PCPI. Daviess was a growing county with an advance of 1.45% in total personal income and 0.29% growth in population, and thus a 1.16% growth rate in PCPI (81st in the state).

Compare that with Jay county where the PCPI growth rate of 1.15% (82nd) was almost identical to Daviess county. Jay county's total income grew by only 0.86%, but the PCPI growth rate was aided by a 0.29% decline in population. Despite the fact that both counties had nearly the same rates of growth in PCPI, it seems reasonable to say that Daviess county outperformed Jay county over the period.

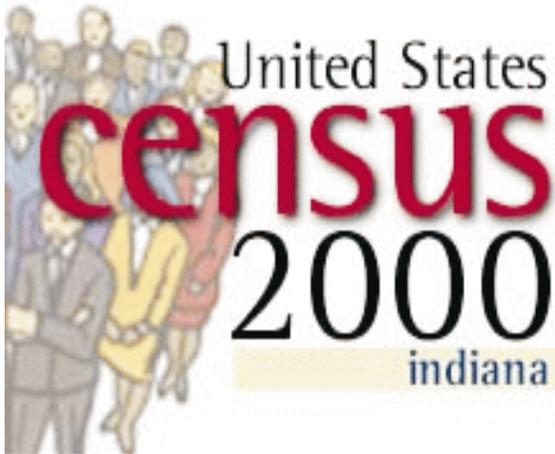
A Final note

There are many questions which these data raise, including:

- Is population attracted to places with high per capita income?
- Does the pattern of population growth (fast, erratic, slow, smooth) have an affect on the rate of growth in income or population?
- What factors contribute to high or low income levels: Interstates? Manufacturing? Services? Retired people? But attempts to answer those questions must wait for future issues.

Notes

¹All dollar figures in this report are in *real* terms, that is, adjusted for price changes and expressed in 1998 dollars.



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Awareness Efforts

The Indiana State Complete Count Committee has been formed by Governor O'Bannon, along with dozens of mayors and town council presidents who have formed local complete count committees throughout Indiana. Just a few of the dozens formed include:

- Akron
- Berne
- Carmel
- DeKalb County
- Edinburgh
- Evansville
- Fort Wayne
- Gary
- Hanover
- Indianapolis
- Jeffersonville
- Knightstown
- La Porte
- Madison
- New Harmony
- Osgood
- Paoli
- Remington
- Seymour
- Terre Haute
- Valparaiso
- Warren

The purpose of these complete count committees, either statewide or local, is two-fold:

- promote awareness of the Census
- encourage response to the Census forms

Come April 1, 2000 we all want every Hoosier household to respond to the questionnaire they will receive.

Recruitment: Thousands of Applicants Will Be Needed in Indiana Alone

Do you have a friend or relative who could use a good-paying, temporary job? The Census Bureau is scouring the nation in order to find good applicants for the nearly half a million jobs it will need to fill between now and Census day. Offices are now opening throughout Indiana: in Gary, Indianapolis, Muncie, Evansville, Ft. Wayne, Logansport, Marion county, New Albany, South Bend, and Terre Haute. Pay for these full time jobs varies from \$14.25 to \$27.00 an hour (dependent on position and location). As the year goes on more jobs will be available for work in the field. The toll free number to call is (888) 325-7733 to request application instructions and test dates.

Local Address Review

The LUCA, or address review program, has wrapped up, with many Indiana communities having participated in this partnership program with the Census Bureau. We do not have information yet on the number of addresses added and accepted from local governments, but the Census Bureau has been very positive about the results. Approximately 50% of Indiana's local governments participated in this program. The majority of those who did not participate were townships (of which we have 1,008).

Census 2000 in Indiana Website

A new website, devoted solely to Census 2000 in Indiana, is now available. One can find informational copies of the census forms, listings of complete count committees in Indiana, Bureau plans, jobs available, materials for teachers to include the census in their curricula this fall (these are great - see the extract on map literacy on the inside back cover) and even a section devoted to news of the Census 100 years ago in Indiana (drawing from papers such as the Terre Haute Gazette and the Hammond Lake County News). The web address is: www.iupui.edu/it/ibrc/2k. Monthly news from the Chicago office of the Census Bureau is also being posted to this site. It is being maintained at the IBRC, but is one of the first initiatives of the Indiana Complete Count Committee, whose goal is to provide a statewide portal to Census information of specific interest to Indiana. An opportunity for feedback and questions is also available through this new website.