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A publication of the Indiana Business Research Center at IU's

Broadband Adoption in Indiana

The link between high-speed Internet connections and economic development has become more pronounced in recent years. The Brookings Institution has gone so far as to estimate that for every 1 percentage point increase in broadband penetration in a state, nonfarm private employment is projected to increase by 0.2 to 0.3 percent.[1] While the rate of broadband adoption has slowed in recent years (partly due to the recession), two-thirds of American adults now use a high-speed Internet connection at home,[2] and Congress has tasked the Federal Communications Commission (FCC) with developing a plan to ensure that every American has access to high-speed capability.[3]

As part of that national broadband plan, the Indiana Geographic Information Office is in the midst of a multi-year, multi-agency effort to map where broadband coverage exists across the state (down to the census block level).[4] While the vast majority of the state has access to broadband capability, how many Hoosier households are actually adopting this technology?

In the past two years, the FCC began tracking residential broadband adoption at the census tract and county level.[5] The agency looks at two definitions of broadband:

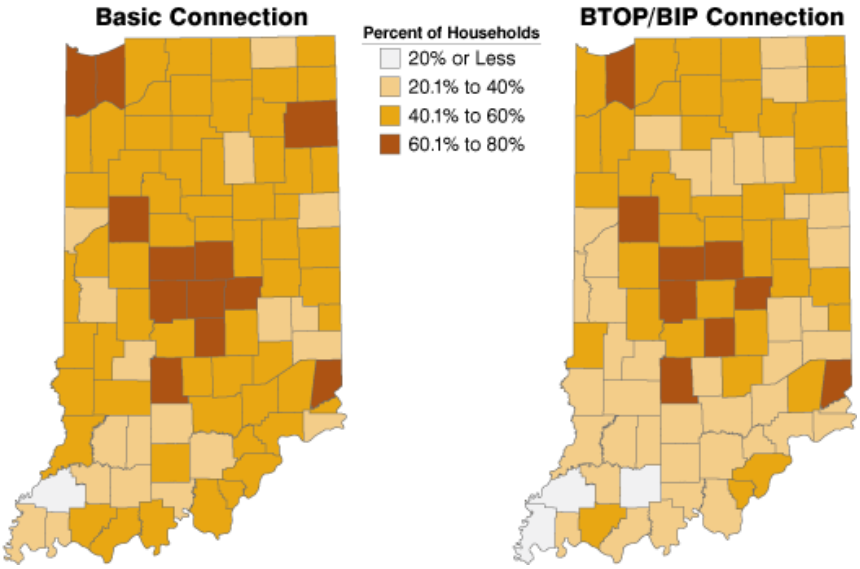
- Basic broadband: Residential fixed connections with a minimum of 200 kilobits per second (Kbps) in at least one direction. This is an old standard adopted by the FCC back in 1999.
- The BTOP/BIP definition: Residential fixed connections with at least 768 Kbps downstream (i.e., downloading files from the Internet to your computer) and greater than 200 Kbps upstream (i.e., uploading files from your computer to the Internet). This is the definition used by the National Telecommunications and Information Administration.

To provide some context for the non-technical among us, even though the BTOP/BIP definition is faster than the bare minimum, it is still encompassing the slower end of broadband since the U.S. average broadband speed is 5 megabits per second (Mbps) as of the third quarter of 2010. (As an aside, South Korea leads the world with an average connection speed of 14 Mbps.)[6] So even though the high-speed Internet access definitions used by the FCC are rather broad, this data set enables us to look at broadband adoption rates for specific geographies across the state and nation.

How Do Indiana Counties Fare?

Figure 1 shows adoption rates for both broadband definitions by Indiana county as of December 2009. Looking at basic broadband service, 12 of Indiana's 92 counties have between 60 and 80 percent of households with high-speed Internet access. Using the BTOP/BIP definition, that number drops to 9 Indiana counties.

Figure 1: Broadband Adoption by Indiana County, December 2009



Source: IBRC, using FCC data

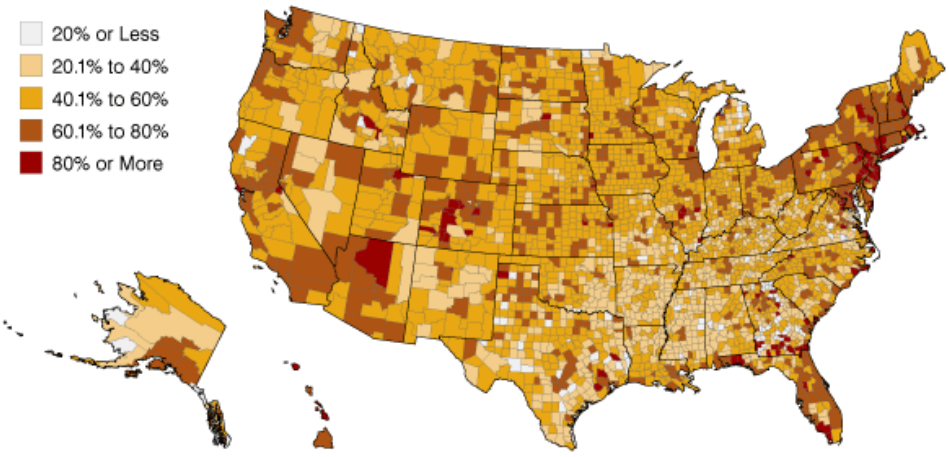
When one looks at southwest Indiana, Evansville is notable among the state's metros for its low rates of broadband adoption. According to the FCC, Gibson County is the only county in the state where 20 percent or less of its households have basic broadband access. When looking at the faster BTOP/BIP definition, Gibson and Posey counties have adoption rates of 20 percent or less, while Vanderburgh County has adoption rates of 40 percent or less.

The ability to look at change between December 2008 and December 2009 is limited: the FCC only reports data in ranges rather than an actual number of connections in each county. Using the BTOP/BIP definition, four Indiana counties (Gibson, Dubois, Posey and Vanderburgh) saw their percentage of households with broadband decline by a category, while 35 counties increased by a category.

Leaders in Broadband Adoption Nationally

Figure 2 shows 2009 basic broadband adoption across the nation. In 120 counties (none of which were in Indiana), more than 80 percent of households had a broadband connection.

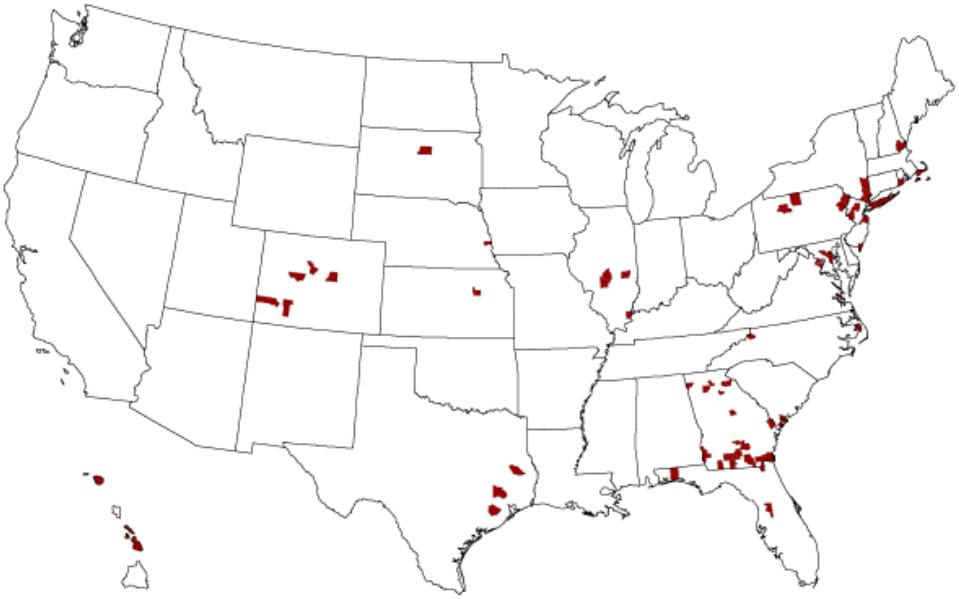
Figure 2: Basic Broadband Adoption by U.S. County, December 2009



Source: IBRC, using FCC data

When looking at the BTOP/BIP definition of broadband nationwide, 66 counties had adoption rates exceeding 80 percent of households (see Figure 3).

Figure 3: Counties Where More than 80 Percent of Households Have a BTOP/BIP Broadband Connection, December 2009



Source: IBRC, using FCC data

Summary

While in past decades access to interstates and railroads played a crucial role in economic development, the knowledge-based economy is experiencing a similar reliance on broadband connectivity. These data from the FCC show that broadband adoption rates tend to be lower in southern Indiana relative to the rest of the state, making this an indicator for economic developers to watch as time goes on.

To learn more about the National Broadband Plan, visit www.broadband.gov.

Notes

1. Robert W. Crandall, Robert E. Litan and William Lehr, "The Effects of Broadband Deployment on Output and Employment: A Cross-Sectional Analysis of U.S. Data," *Issues in Economic Policy*, no. 6, July 2007, www.brookings.edu/papers/2007/06labor_crandall.aspx.
2. Aaron Smith, "Home Broadband 2010," Pew Internet & American Life Project, August 11, 2010, www.pewinternet.org/Reports/2010/Home-Broadband-2010.aspx.
3. "National Broadband Plan Executive Summary," Broadband.gov, www.broadband.gov/plan/executive-summary/.
4. For more information about this initiative and broadband availability maps, visit www.in.gov/iot/BroadbandQuestionnaire.htm.
5. This data set, "Census tract information mapped for Internet access services faster than 200 kbps in at least one direction," is available at www.fcc.gov/wcb/iatd/comp.html.
6. Akamai Technologies, "The State of the Internet 3rd Quarter, 2010 Report," www.akamai.com/stateoftheinternet/.

Rachel Justis
Geodemographic Analyst, Indiana Business Research Center, Indiana University Kelley School of Business

Next: Roller Coaster Employment: A Look at Before, During and After the Recession

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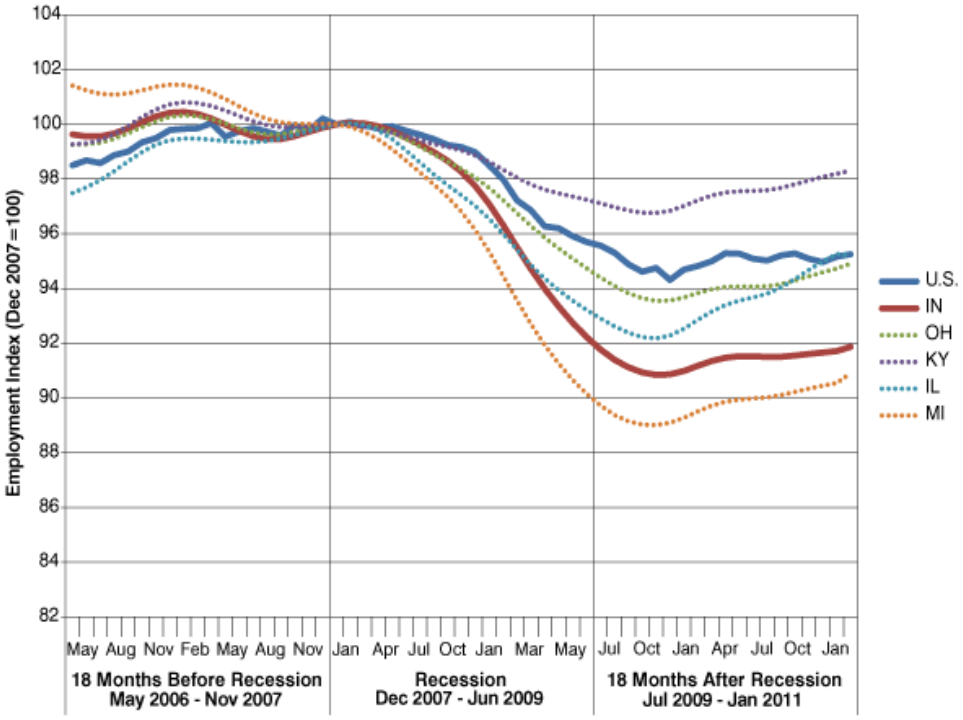
Roller Coaster Employment: A Look at Before, During and After the Recession

It is approaching two years since the official end of the recession in June 2009. The Great Recession, as it is commonly known, lasted 18 months from December 2007 to June 2009. It has been described as the deepest and longest recession of the past half century and one which will be remembered for many years to come. This article explores how employment in Indiana and its neighbors changed in the 18 months before, during and after the recession.[1]

Employment

Employment in Indiana and among most states declined steadily during the recession and bottomed out at 2.803 million in November 2009. Employment has increased since then, reaching nearly 2.835 million as of January 2011. Among Indiana's neighbors, Michigan surpassed Indiana in terms of relative employment losses since the recession began; meanwhile, Kentucky was the only neighboring state to perform better than the U.S. average (see Figure 1).

Figure 1: An Employment Index, May 2006 to January 2011



Source: IBRC, using Bureau of Labor Statistics data

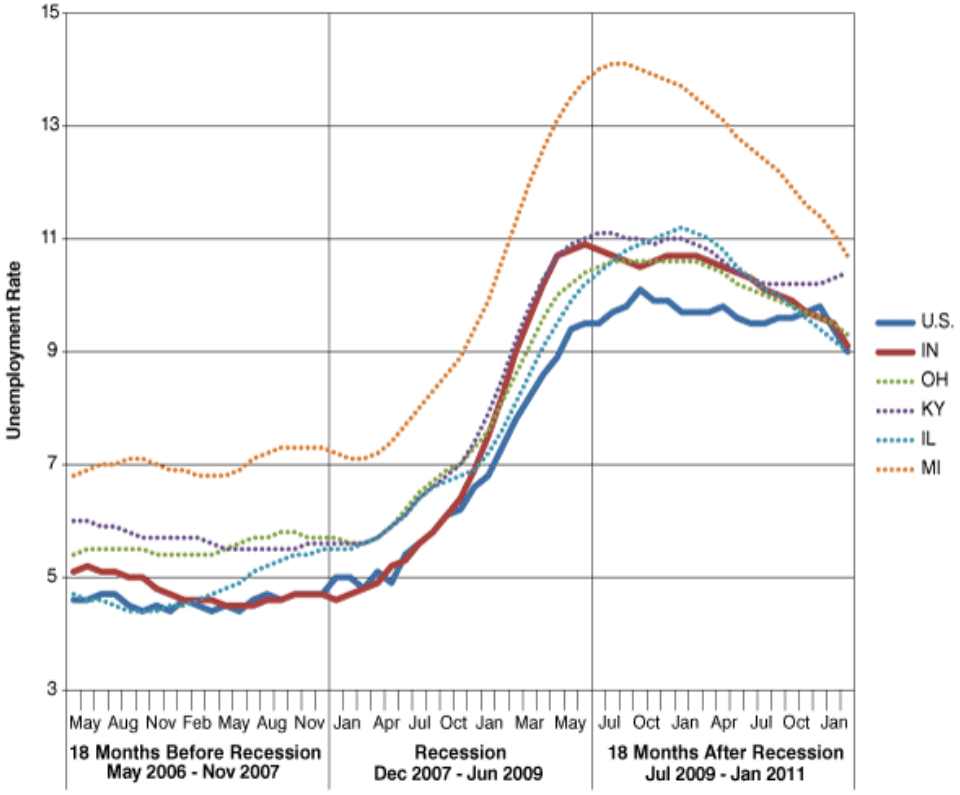
Unemployment

a real roller coaster ride

Here's a point-of-view video from Indiana's own Holiday World.

Employment (and unemployment) is a lagging indicator, which means it takes several months to see changes in the indicator once the economy has changed. Figure 2 illustrates this, with unemployment rates staying low for the first part of the recession and only later beginning to climb. Indiana began the recession with low unemployment rates, comparable to the U.S. average, but rose during the recession to levels more consistent with its neighbors.

Figure 2: Unemployment Rates, May 2006 to January 2011



Source: IBRC, using Bureau of Labor Statistics data

The number of unemployed Hoosiers peaked in May 2009 at 347,098 (that's 132 percent higher than in December 2007) and has since been trending downward. As of January 2011, the number of unemployed Hoosiers (285,396) was still 91 percent higher than at the beginning of the recession. Looking across the nation and the Midwest, even through things have been improving, there is still a ways to go before we reach the unemployment levels seen prior to the recession (see Table 1).

Table 1: Average Unemployment Rates Before and After the Recession

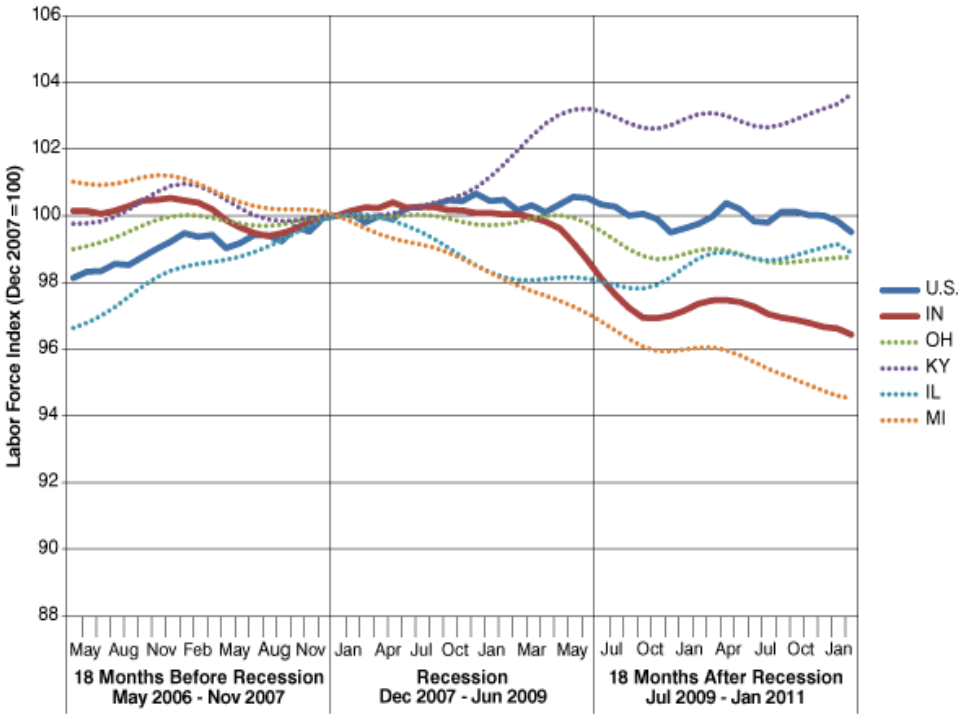
Time Frame	U.S.	IN	OH	KY	IL	MI
18 Months Before Recession May 2006 - Nov 2007	4.6%	4.8%	5.6%	5.7%	4.8%	7.0%
18 Months After Recession Jul 2009 - Jan 2011	9.7%	10.3%	10.2%	10.6%	10.4%	12.8%

Source: IBRC, using Bureau of Labor Statistics data

Labor Force

The labor force includes all those who are employed or who are unemployed but looking for work. In Indiana, the labor force really didn't start declining until the very end of the recession, but in Michigan it was declining even before the recession began (see Figure 3). Meanwhile, Kentucky is unique among Indiana's neighbors in that the size of its labor force actually increased during the recession and now surpasses pre-recession levels.

Figure 3: Labor Force Index, May 2006 to January 2011



Source: IBRC, using Bureau of Labor Statistics data

Summary

This article provided a quick glimpse of employment in our region during the last five years. The recession hit workers in Indiana and its neighbors hard. While employment is beginning to rise, it's only the beginning of a long recovery.

Notes

1. All data in this article are seasonally adjusted Local Area Unemployment Statistics available from www.hoosierdata.in.gov or www.stats.indiana.edu/topic/laus.asp

Rachel Justis
Geodemographic Analyst, Indiana Business Research Center, Indiana University Kelley School of Business

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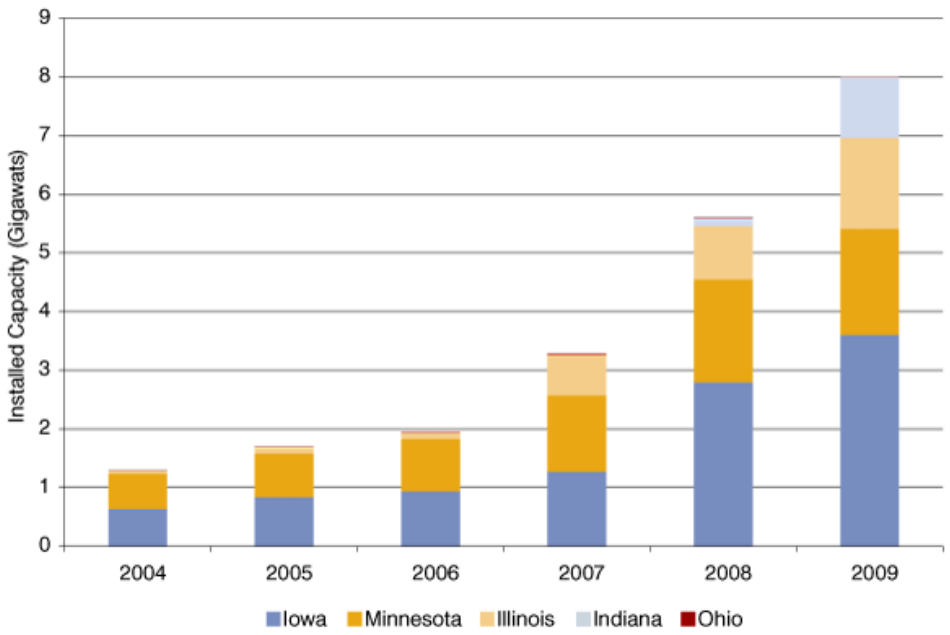
Who Builds Those Windmills?

The windmill has become a symbol of Indiana's move into the clean energy future. Many Hoosiers have gazed in awe at the expansive wind farms off of I-65 just north of Lafayette. But how much do we really know about wind energy in Indiana?

In the last several decades, wind energy has come a long way from the heavily subsidized Carter-era energy projects that eventually fizzled. Recently, thanks to technological developments making turbines more efficient, wind energy has taken off in the United States. Installed capacity for wind energy in the U.S. has increased at an average rate of 22 percent over the past five years.

The Midwest has experienced similar growth in wind energy capacity. Iowa and Minnesota have led the expansion in the Midwest over the last five years, complemented more recently by Indiana (see Figure 1). As Figure 2 shows, Iowa and Minnesota are two of the top five wind-producing states across the nation as a whole due largely to their favorable wind conditions.

Figure 1: Installed Capacity for Select Midwest States, 2004-2009



Source: U.S. Department of Energy

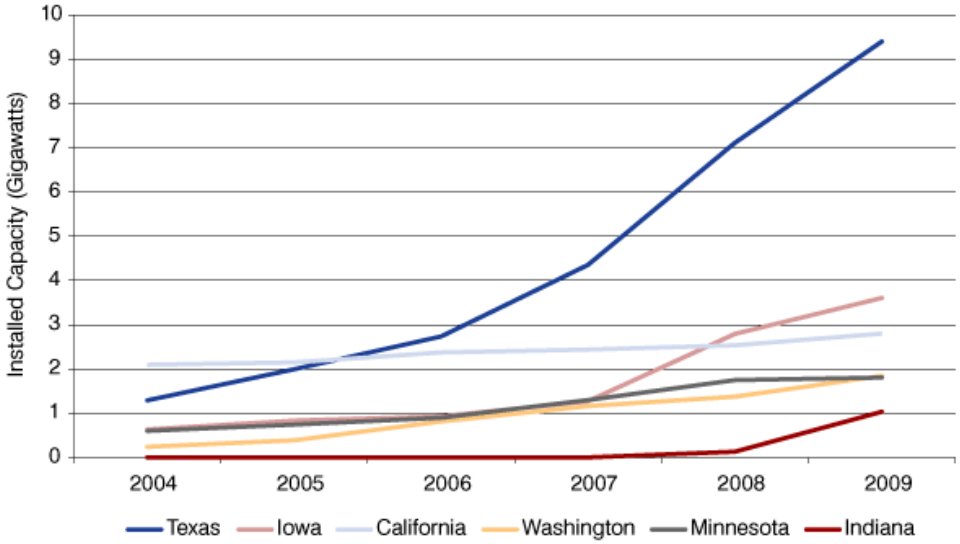
Figure 2: Wind Energy Production: Five Largest States and Indiana, 2004-2009

A look at some Indiana companies manufacturing windmill parts:

Electric Motor Services (Hammond) offers repair and maintenance services to the wind energy industry, as well as custom rebuilding. The firm has over 30 years of experience in the field and manufactures generators and industrial motors.

Bedford Machine and Tool (Bedford) has 70 employees and sales exceeding $4 million. As well as providing components to the wind turbine industry, it also supplies parts to the Department of Defense.

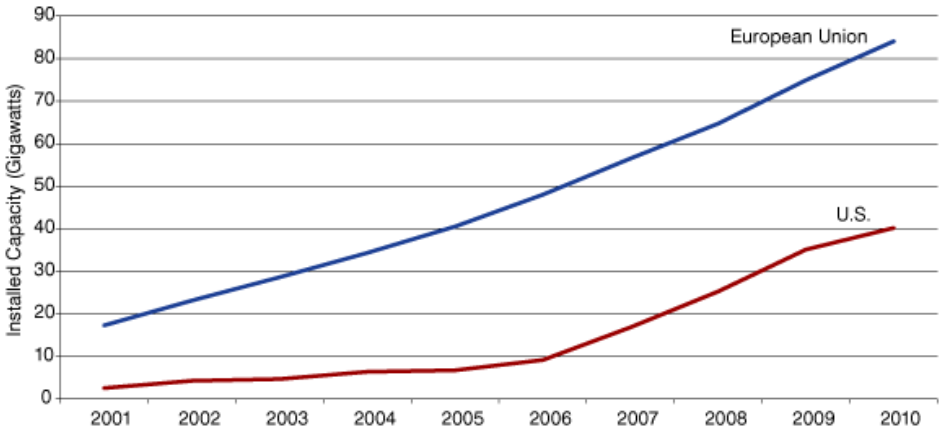
ATI Casting (LaPorte) incorporated in Pennsylvania in 1901 and is now headquartered in Albany, Oregon. ATI produces rolled steel for use in the construction of wind turbines and other products. The company's Indiana location had sales in excess of $35 million in 2010.



Source: U.S. Department of Energy

The U.S. has put up some impressive growth numbers, but it has a long way to go to equal the wind energy produced in the European Union (EU). As Figure 3 shows, U.S. installed capacity is about half that of the EU. The EU derives about 3.5 percent of its energy from wind, compared to the U.S. at less than 1.5 percent. Considering that wind power is such a small share of electricity generation, the U.S. Department of Energy's goal to produce 20 percent of all America's electricity from renewable sources by 2030 is a daunting target. With that said, the U.S. wind energy sector is expanding rapidly, and Indiana and the greater Midwest not only stand to gain from wind as a source of energy, but also from windmill manufacturing as a source of economic growth.

Figure 3: Power Generation from Wind, 2001-2010



Source: Global Wind Energy Council

Indiana Wind Farms

Indiana is currently home to four industrial wind farms in Benton and White counties. Three are entirely European owned, while the Fowler Ridge wind farm is a joint venture between a West Virginian company and BP (see Table 1).

Table 1: Indiana's Wind Farms, November 2010

Wind Farm	Power Generating Capacity (Megawatts)	Number of Wind Turbines	Owner
Fowler Ridge	600	355	BP Alternative Energy (U.K.) and Dominion (West Virginia)

Hoosier Wind Project	106	53	Électricité de France
Meadow Lake Wind I,II & III	501.2	303	Energías de Portugal
Goodland Wind Plant I	131	87	BP Alternative Energy (U.K.)

Source: Indiana Office of Energy Development

The Department of Energy estimates that the construction of Indiana's wind farms employed around 2,000 people. Once operational, however, the employment figure declines to about 85 maintenance and repair workers.[1] Wind power generation is not going to create many jobs in the long term. However, wind turbine manufacturing does offer great potential for employment growth.

Turbine Manufacturing

Wind turbines consist of five components: the blades, the tower, the gearbox, the generator and the nacelle (which is the housing that surrounds the generator, gearbox and other electronic systems).

The blades and the towers do not travel well due to their size, and bridge clearances limit transportation options. As a result, blade and tower manufacturers prioritize the proximity of intended wind farms on the availability of transportation links when locating a plant.[2] However, occasionally the larger components will be imported. For example, 75 wind turbine blades (at lengths of nearly 54 yards a piece) were recently imported from Denmark via the Port of Indiana at Burns Harbor for Horizon Wind's new Timber Road wind farm in Payne, Ohio.[3]

Manufacturing other windmill components also offers potential for economic growth and job creation in the Midwest if the predominantly European manufacturers shift production from Europe and Asia. There is already evidence that this is occurring: the past six years have seen European wind energy firms announce a total of $1.7 billion of foreign direct investment in the United States. The largest investor is Vestas Wind Systems, committing to spend over $1.3 billion, or more than 80 percent of total wind investment from European firms. Investments have primarily been in manufacturing (see Table 2).

Table 2: Manufacturing Investments over $50 Million by European Wind Energy Firms in the United States, 2004-2010

Company	Total Investment	Total Jobs	Origin Country	Destination	Year Announced
Vestas Wind Systems	$498,600,000	1,600	Denmark	Colorado	2010
Vestas Wind Systems	$240,000,000	550	Denmark	Colorado	2008
Siemens	$200,000,000	300	Germany	North Carolina	2004
Vestas Wind Systems	$180,000,000	650	Denmark	Colorado	2008
Vestas Wind Systems	$111,700,000	255	Denmark	Colorado	2008
Nordex	$100,000,000	700	Germany	Arkansas	2008
Vestas Wind Systems	$72,700,000	240	Denmark	Colorado	2010
Vestas Wind Systems	$61,500,000	400	Denmark	Colorado	2007

Source: FDI Markets

Many smaller windmill components are manufactured within the European Union and then exported to the United States. Brevini—one the largest manufacturers of speed changers, drivers and gears, all of which are regularly used in the construction of windmills—is bucking this trend with their investment in Indiana. In 2008, Brevini, an Italian company with U.S. operations headquartered in Indiana, announced that it intended to invest $86 million at its existing site just outside of Muncie. The construction funded by this investment is still ongoing and is expected to produce over 400 jobs

when complete.

Researchers at Illinois State University have identified a variety of industries that contribute to wind turbine manufacturing, including machine shops, rolled steel manufacturers and electronics manufacturers. The Midwest, and Indiana in particular, has a particularly high concentration of iron and steel mills and other engine manufacturing firms, both of which are vital to the production of wind turbines. Figure 4 demonstrates that there are high concentrations of employment in ductile iron castings and gearing and bearing manufacturing compared to the national average. (In this figure, a score of one represents an equal concentration to the national average.) As Figure 4 indicates, the concentration of employment in iron and steel mills, as well as other engine manufacturers, in Indiana is more than 10 times the U.S. concentration. If recent trends continue and the U.S. makes progress toward the goal of deriving 20 percent of its power from renewable energy by 2030, the demand for wind turbines and the workers who build them is sure to increase in the next two decades.

Figure 4: Location Quotients for Select Indiana Manufacturing Industries, 2010

Source: Bureau of Labor Statistics

There is also an opportunity for homegrown wind energy start-ups to enter this market. Firms like Vela Gear Systems, located in Carmel, Ind., or Renewegy in Oshkosh, Wis., have both successfully established themselves as manufacturers of components specific to the wind power industry. Vela is expecting rapid expansion over the next three years and, thanks in large part to tax credits from the Department of Energy, may grow from one full-time and six part-time employees to more than 160 by 2014. These new firms are not in direct competition with the European manufacturers and instead tend to focus on installations for individual firms or smaller scale wind generation. Nevertheless, start-ups in the Midwest are emerging and finding their niche in this expanding sector.

Wind Turbine Occupations

The wind turbine industries that are relatively concentrated in Indiana employ a variety of production occupations. The iron and steel milling industry, for example, employs many assemblers and fabricators as well as installation, maintenance and repair workers. The turbine and power transmission and other engine manufacturing industries hire assemblers, fabricators, metal and plastic workers in addition to mechanical and electrical engineers, engineering technicians, and drafters. Based on just the top three industries that both supply windmill components and in which Indiana (and the Midwest) have relative strengths, it appears that the industries supplying windmill components hire across a wide range of educational and skill requirements.

Conclusion

Wind generates just a sliver of the power consumed by Americans, but it is expected to grow rapidly over the next 20 years. The EU is the world leader in wind energy, boasting some of the world's largest wind power companies, including Siemens, Nordex and Vestas. Midwestern firms entering the windmill or component market will face stiff competition from these companies. Nevertheless, as these EU firms seek to improve the proximity of their operations to the point of installation, Midwestern firms will likely see growing opportunities to carve out their slice of America's wind power industry.

Notes

1. National Renewable Energy Laboratory, *NREL's Wind Powering America Team Helps Indiana Develop Wind Resources* (Golde, CO: NREL, 2010).
2. Andrew S. David, *Wind Turbines Industry and Trade Summary* (Washington D.C.: United States International Trade Commission, 2009).
3. Diane Krieger Spivak, "First Ship en Route to Burns Harbor Port with 75 Wind Turbine Blades, "*Post-Tribune,* www.indianaeconomicdigest.net/main.asp?SectionID=31&SubSectionID=306&ArticleID=59106.

By Indiana Business Research Center Analysts
Indiana University Kelley School of Business

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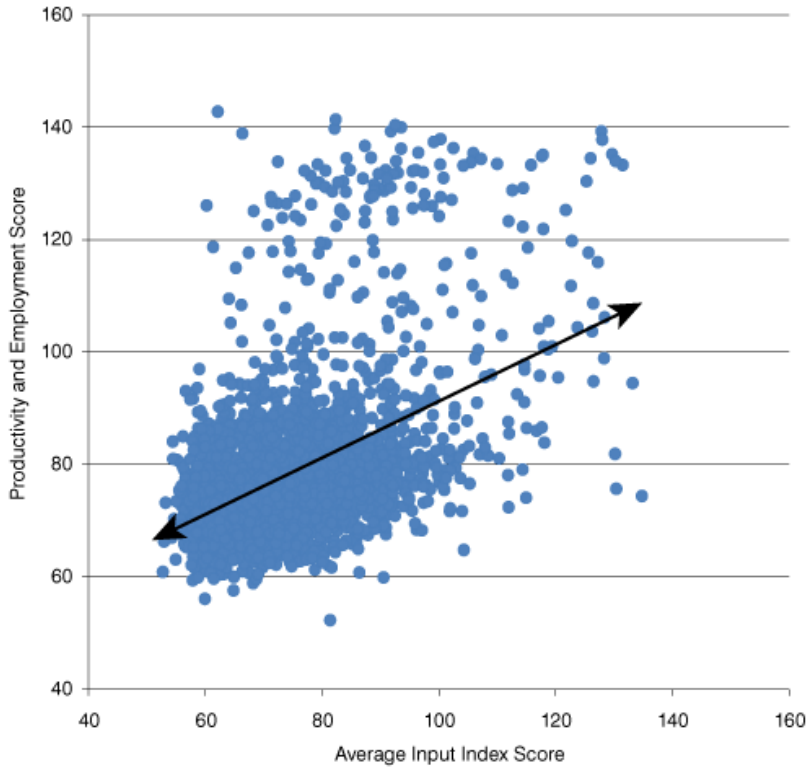
Digging Deeper into the Innovation Index

Recently updated, the Innovation Index is a metric of regional capacity for innovation.[1] The present analysis digs a little deeper and examines the relationships between the index's innovation input components and innovation performance (or output) measures for both U.S. counties and Indiana metro areas.

Innovation Sub-indexes

The Innovation Index, available at www.statsamerica.org/innovation/, is composed of four sub-indexes covering different facets of innovation, each warranting analysis in their own right. The Human Capital and Economic Dynamics sub-indexes were designed as "inputs" to innovation. The Productivity and Employment index and the Economic Well-Being index were designed as "outputs" of innovation. It seems natural, then to examine how well the inputs predict the outputs. Figure 1 plots the Productivity and Employment scores of every county in the United States against the average of the two input scores for the same counties, showing that this output measure is correlated with both input measures. The average of the two input measures explain more than 21 percent of the variance in U.S. counties' Productivity and Employment scores. Separately, the correlations between Human Capital and Productivity and Employment, and between Economic Dynamics and Productivity and Employment, are even higher, 41 percent and 30 percent respectively.

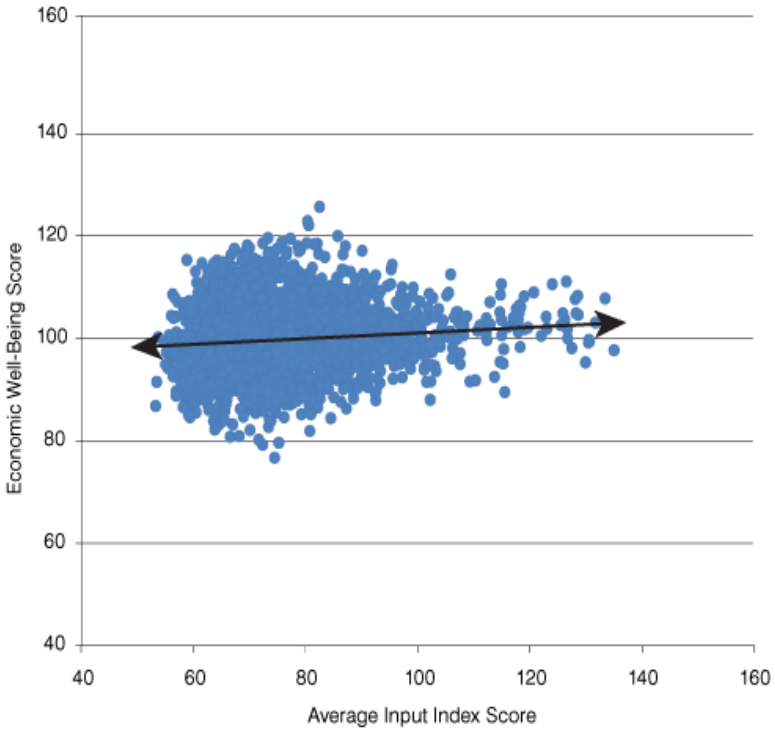
Figure 1: Relationship between Input and Output Indexes—Productivity and Employment



Source: Indiana Business Research Center

Figure 2 plots the Economic Well-Being scores against the average input index scores. The results are markedly different. There is essentially no relationship between the average input score and Economic Well-Being at the county level. The average Economic Well-Being score sits at about 100 regardless of the input scores and the innovation input measures explains a mere 1 percent of the variance in Economic Well-Being. Breaking apart the input sub-indexes, we can see part of why this is. Economic Well-Being has a predictable positive correlation with Human Capital (19 percent). It's correlation with Economic Dynamics, however, is negative at -5 percent. While these correlations are statistically significant, they pale in comparison to those between the input sub-indexes and Productivity and Employment.

Figure 2: Relationship between Input and Output Indexes—Economic Well-Being



Source: Indiana Business Research Center

These weak relationships are not necessarily bad, however. For one thing, there is just considerably less variance in Economic Well-Being scores than there is in the scores of the other sub-indexes. That makes finding correlations more difficult. At a more substantive level, it is important when constructing an index of something like innovative capacity to use components that account for as much of the phenomenon as possible. Even though it may not be so strongly correlated with the other sub-indexes, Economic Well-Being likely describes aspects of innovation that the others exclude. Conversely, innovation may not have a strong and direct influence on the concepts and measures that make up Economic Well-Being—like per capita personal income, unemployment or poverty rates. Regardless, the weak statistical relationships reported here seem to justify the lower weight given to Economic Well-Being in calculating the overall Innovation Index score. Economic Well-Being contributes 10 percent to the overall score, whereas the other three sub-indexes each contributed 30 percent.

Innovation Index for MSAs

While digging deeper into the Innovation Index, it is also important to examine the index at different levels of geography. Though the index can provide an innovation "score" at the county level, the county probably is not the best geographic unit of measure to evaluate innovation. Counties that are economically interdependent, typically as a result of commuting patterns and transportation linkages —make up a region. One off-the-shelf definition of a region is a Metropolitan Statistical Area (MSA). The index can also be more useful to researchers trying to find relationships with other macro-economic or demographic variables when computed at the MSA level because more types of data are available. Finally, the MSA level of analysis solves one problem with using county-level data to measure innovation—some measures (such as educational attainment) are based upon one's place of residence, while other measures (such as GDP per worker) are based on place of work. Often, workers work in one county and live in another.

The following analysis uses Indiana's MSAs to show how the innovation index is applicable on a regional level and how a region, in contrast to a county, acts as the appropriate geographic unit of analysis.

Table 1 lists the 16 Indiana MSAs and their innovation scores. Compared with the wide-ranging

county scores, the MSA scores gravitate to the mean. There are no MSAs in Indiana with overall Innovation Index scores above 100, the national average. The closest is Columbus, with a score of 98.9.

For MSAs made up of several counties, there can be many similarities with the county-level data, depending on how much one county in an MSA dominates the other counties. Monroe County ranked highest in human capital among Indiana counties, and the Bloomington MSA maintains that status, above the national average at 108.9. Note, though, that the Bloomington MSA consists of three counties, and the 108.9 figure is well below the score for Monroe County alone, an impressive 117.9. A similar pull to the mean can be found in the Lafayette MSA. The Human Capital score for Tippecanoe County is above the national average at 103.5, but the aggregate score for the Lafayette MSA is only 97.3.

Table 1: Indiana MSA Innovation Index Scores

Indiana MSA	Innovation Index	Human Capital	Economic Dynamics	Productivity and Employment	Economic Well-Being
Columbus	98.9	88.0	86.6	123.1	96.0
Chicago-Joliet-Naperville	98.5	102.9	82.3	111.5	95.4
Lafayette	95.3	97.3	88.2	100.6	94.9
Cincinnati-Middletown	94.3	93.8	80.0	108.4	96.3
Bloomington	90.7	108.9	72.3	89.6	94.2
Indianapolis-Carmel	88.4	105.3	80.7	76.0	98.4
Fort Wayne	86.4	94.9	81.7	80.9	91.6
Kokomo	85.1	80.7	76.8	97.1	87.3
Evansville	85.0	94.2	77.1	79.2	99.0
Louisville/Jefferson County	83.8	86.3	78.5	81.2	100.4
South Bend-Mishawaka	83.8	90.4	77.2	78.6	99.1
Elkhart-Goshen	82.9	70.8	82.1	92.4	92.8
Muncie	80.6	86.8	74.8	78.1	87.2
Terre Haute	79.6	79.0	76.8	77.2	96.9
Anderson	77.7	76.0	78.0	74.3	91.9
Michigan City-La Porte	75.3	72.3	75.4	73.2	90.6

Source: Indiana Business Research Center

The fact that the innovation scores gravitate to the mean is not a bad outcome. In fact, it probably shows that the counties that make up the region are, for want of a better term, collaborating. There is something of a geographical tradeoff within MSAs. Consider the example of the Indianapolis-Carmel MSA, which consists of Hamilton County and Marion County (among others). In terms of innovation inputs, Hamilton County has the edge. Hamilton County's Human Capital and Economic Dynamics scores are 120.5 and 109.4, respectively; both exceed the MSA scores by far. Marion County's Human Capital and Economic Dynamics scores are 108.2 and 82.0, respectively.

The output measures tell a different story, however. Hamilton County's Productivity and Employment score is 74.1, and its Economic Well-Being score is 95.1; both are below the MSA scores. Marion County, on the other hand, has scores of 78.1 and 97.8, respectively. The reasons for this flip can be found in the measures that make up these sub-indexes, some of which are shown in Table 2. The percentage of the adult population in Hamilton County with a bachelor's degree or higher is almost twice the national average, whereas Marion County's percentage sits just above the national average. The population of younger workers in Hamilton County has also grown considerably: 3.4 percent between 1997 and 2009, compared with a 0.6 percent drop in Marion County.

Table 2: Select Residence — and Employment-Based Measures

	Educational Attainment		Productivity		High-Tech Employment	
County	Adults with Some College or Associate's Degree*	Adults with Bachelor's Degree*	GDP per Worker	Average Annual Change in GDP per Worker, 1997-2008	Average High-Tech Employment Share, 1997-2009	Tech-Based Knowledge Occupations
Hamilton	26.2%	52.0%	$64,486	2.4%	5.3%	8.7%
Marion	28.2%	27.5%	$86,053	4.3%	6.2%	9.9%
U.S. Average	29.6%	26.5%	$79,057	3.5%	4.8%	8.4%

* Ages 25-64
Source: Indiana Business Research Center

When we shift the focus to employment, however, the advantage swings to Marion County. As mentioned above, population statistics are based on place of residence, whereas employment statistics are based on place of work. Technology-based knowledge occupations in Marion County outstripped those in Hamilton County. Another measure based on place of work, GDP per worker, was more than 33 percent higher in Marion County than in Hamilton County.

A look at Table 2 can make one wonder whether it is Hamilton or Marion County that is the innovation powerhouse. If the decision is based on where brains create rather than where brains sleep, Marion County is the winner.

This is one example of regional patterns. Human capital—a key driver of innovation—congregates in certain geographic corners and travels to other locations in the region to produce the fruits of innovation. In this sense, even though MSA scores on the Innovation Index and sub-indexes obscure some of the differences between counties, the scores are useful in that they can point us to the larger geographic regions that constitute a type of innovation eco-system. The inputs and outputs of innovation may be localized, but they exist in a larger geographic context.

Conclusion

The evidence appears to show that the original design and performance of the index to measure innovation is still valid. There are some weaknesses to the Economic Well-Being sub-index, but its inclusion likely adds more value than it subtracts. Geographically speaking, analyzing innovation at the MSA-level may dull the ability to find an innovation hot spot, but it enhances the knowledge one can gain by illuminating the way that counties interact to innovate and reap the rewards of innovation.

Notes

1. Timothy Slaper and Rachel Justis, “Measuring Regional Capacity for Innovation,” *InContext*, January-February 2010, www.incontext.indiana.edu/2010/jan-feb/article1.asp.

Ryan Krause
Research Assistant, Indiana Business Research Center, Indiana University Kelley School of Business

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