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# Measuring Regional Capacity for Innovation

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Innovation is a key ingredient in an economy's ability to increase the standard of living for a region's residents. Building on other national and European research, a newly released Innovation Index (www.statsamerica.org/innovation) provides policymakers and economic development practitioners with a unique web-based tool for exploring regional innovation performance and comparing that with the United States, a state or other regions.[1]

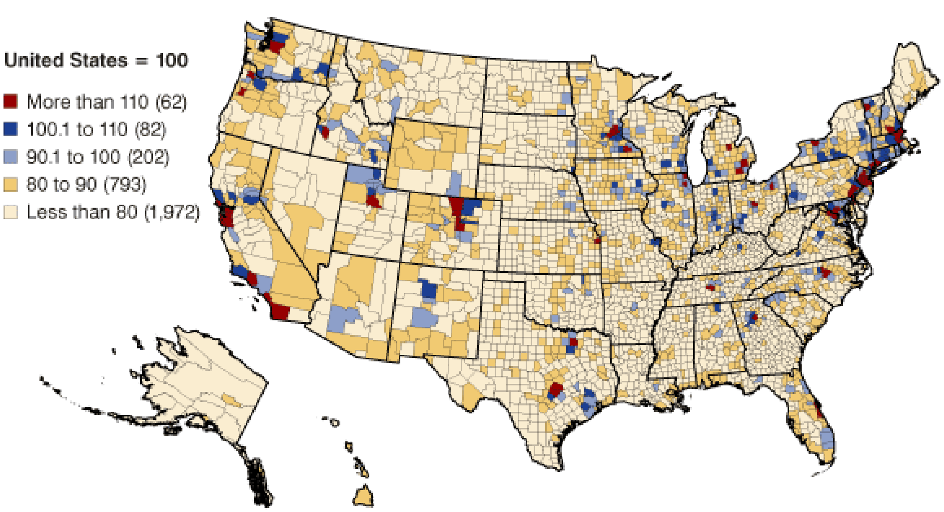
## First Things First: What Is Innovation?

Our research focused on this definition: Innovation puts ideas into action with the result of increasing firms' compensation and profits.[2] Innovation can result in the introduction of new or better goods and services and is manifest in adopting new technologies and processes that increase productivity or lower costs. Adopting a new technology makes production more efficient. Adopting new business models and organizational structures improve how firms meet consumer needs, process information or make decisions. As a result, innovation reduces costs and increases profitability. Innovation can be incremental (e.g., reducing breakage during shipping) or radical (e.g., using computers for business applications). On a more macro-level, innovation is evident in an economy that is adaptable and that can readily move resources from lower value-added activities to higher value-added activities.

## Creating the Index

Combining multiple variables into a composite index provides a single, high-level snapshot to evaluate innovative capacity, innovation outcomes and economic progress (see Figure 1).[3] The indicators in the Innovation Index are derived from both official government statistical agencies and several private, proprietary sources, including Economic Modeling Specialists, Inc., Innovation Economy 360 and Moody's economy.com.

**Figure 1: The County-Level Innovation Index for the United States**



Source: Indiana Business Research Center

The index includes both inputs and outputs together as a composite indicator of innovation capacity and output potential. Inputs are those factors, influences or conditions that promote innovation. Inputs are divided into two sub-indexes: human capital and economic dynamics.

- Human Capital: These variables suggest the extent to which a county's population and labor force are able to engage in innovative activities. Counties with high levels of human capital are those with enhanced knowledge that can be measured by high educational attainment, growth in younger age brackets of the workforce (signifying attractiveness to younger generations of workers), and a sizeable number of innovation-related occupations and jobs relative to the overall labor force.
- Economic Dynamics: These variables measure local business conditions and resources available to entrepreneurs and businesses. Targeted resources such as research and development funds are input flows that encourage innovation close to home, or that, if not present, can limit innovative activity.

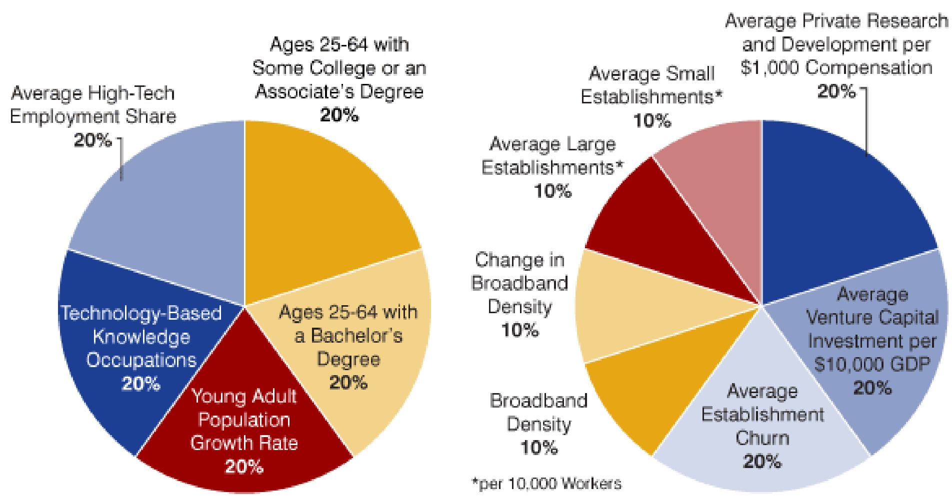
Outputs are the direct outcomes and economic improvements that result from inputs. These are divided into two sub-indices: productivity and employment, and economic well-being.

- Productivity and Employment: These variables describe economic growth, regional desirability or direct outcomes of innovative activity. Variables in this index suggest the extent to which local and regional economies are thriving and attracting workers seeking particular jobs.
- Economic Well-Being: Innovative economies improve economic well-being because residents earn more and have a higher standard of living. Decreasing poverty rates, increasing employment, in-migration of new residents and improvements in personal income signal a more desirable location to live and point to an increase in economic well-being.

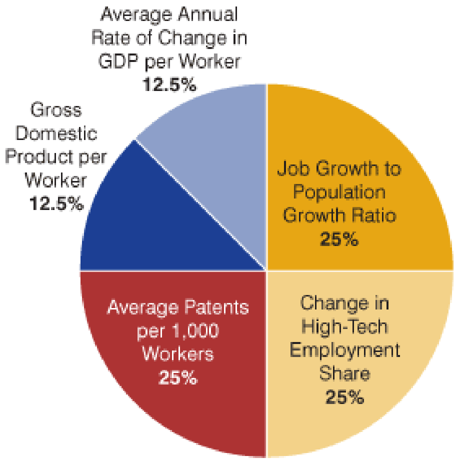
Figure 2 shows the individual indicators in each sub-index, along with how each sub-index is weighted in the calculation of the overall index.[4]

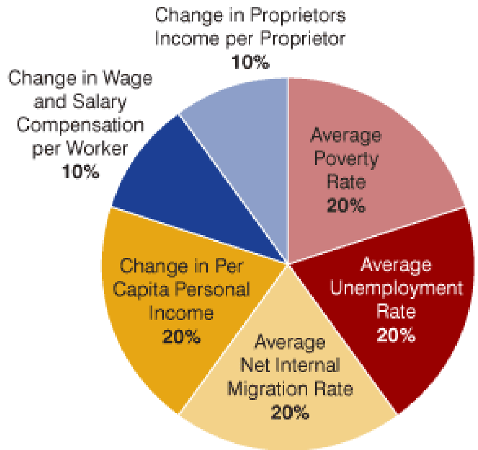
**Figure 2: Indicators and Weights Used to Calculate the Innovation Index**

Human Capital: 30% Economic Dynamics: 30%




Productivity and Employment: 30% Economic Well-Being: 10%




Source: Indiana Business Research Center

A fifth sub-index, state context, seeks to capture data that are theoretically important but available only at the state level (therefore, it is not used for the index calculation). It is composed of science and engineering graduates from state institutions per 1,000 residents of the state and research and development spending per capita.

## So What Does This Mean? Interpreting the Index

Each region of the country has a different mix of qualities that can boost its overall innovation score. No two counties or regions will be exactly alike and there is no single path toward an innovative and growing economy.

Interpretation of this index should be done with some caution. While the collection of multiple data points into a single composite estimate provides an efficient way of visualizing and comparing innovation capacity, it can obscure information that could help explain a particular region's underlying innovative capacity and performance.

To illustrate that point, within Indiana, four counties (out of 92) exceed the U.S. average on the overall index (see Table 1). Kosciusko and Hamilton counties both scored quite highly on the productivity and employment sub-index but for different reasons.

**Table 1: Indiana Counties Scoring above 100 on the Innovation Index**

| County | Innovation Index | Productivity and Employment Sub-Index | Economic Well-Being Sub-Index | Human Capital Sub-Index | Economic Dynamics Sub-Index |
|---|---|---|---|---|---|
| Kosciusko | 107.8 | 122.5 | 99.7 | 102.1 | 101.6 |
| Hamilton | 103.5 | 122.8 | 97.6 | 113.0 | 76.7 |
| Marion | 101.9 | 94.3 | 101.6 | 104.1 | 107.4 |
| Bartholomew | 100.2 | 109.4 | 98.0 | 83.4 | 108.4 |

Source: Indiana Business Research Center

Those reasons can be seen in Table 2, which compares the productivity and employment indicators for Kosciusko and Hamilton counties. Kosciusko's high value on this sub-index is driven by change in high-tech employment, change in GDP per worker, and patents per worker (because they all exceed the U.S. average). Conversely, Hamilton County's high value is due only to a very high value for patents per worker.

**Table 2: Productivity and Employment Indicators**

| Indicator | United States | Kosciusko County | Hamilton County |
|---|---|---|---|
| Rate of Change in High-Tech Employment Share, 1997-2006 | -0.7% | 3.9% | -2.0% |

| | | | |
|---|---|---|---|
| Job Growth-to-Population Growth Ratio, 1997-2006 | 0.73 | 0.72 | 0.65 |
| Gross Domestic Product per Worker, 2006 | $73,783 | $72,121 | $60,213 |
| Average Rate of Change in GDP per Worker, 1997-2006 | 3.7% | 4.4% | 2.6% |
| Average Patents per 1,000 Workers, 1997-2006 | 0.94 | 1.55 | 2.62 |

Source: Indiana Business Research Center

There is no perfect combination of factors that define an innovative region, but an innovative county could be expected to perform at or better than the nation in at least one category. In Indiana, 28 counties (30 percent) score greater than 100 in at least one input or output sub-index (see Table 3).

**Table 3: Indiana Counties Scoring above 100 on at Least One Sub-Index**

| County | Innovation Index | Human Capital | Economic Dynamics | Productivity and Employment | Economic Well Being |
|---|---|---|---|---|---|
| Kosciusko | 107.8 | 102.1 | 101.6 | 122.5 | 99.7 |
| Hamilton | 103.5 | 113 | 76.7 | 122.8 | 97.6 |
| Marion | 101.9 | 104.1 | 107.4 | 94.3 | 101.6 |
| Bartholomew | 100.2 | 83.4 | 108.4 | 109.4 | 98 |
| Tippecanoe | 97.2 | 101 | 82.2 | 108.7 | 96.5 |
| Posey | 96.3 | 96.9 | 71.1 | 120.9 | 96.4 |
| Monroe | 94.6 | 122.6 | 71.1 | 90.2 | 94.8 |
| Boone | 94.4 | 84.9 | 69.6 | 123.3 | 110.4 |
| Hancock | 94.4 | 98.2 | 78.9 | 104 | 100.6 |
| Ripley | 93 | 73.3 | 79.4 | 125.2 | 96.1 |
| Morgan | 91.4 | 80.2 | 84.7 | 106.6 | 98.9 |
| Tipton | 90.7 | 70.4 | 71.6 | 129.4 | 92.4 |
| Franklin | 90.6 | 68 | 97.2 | 105.1 | 95.3 |
| Johnson | 90.1 | 90 | 76.4 | 101.4 | 97.6 |
| Dearborn | 89.7 | 72.9 | 82.8 | 110.7 | 97.5 |
| Howard | 88.8 | 79.6 | 77.1 | 108.7 | 91.6 |
| Owen | 88.6 | 74.4 | 79.9 | 108.4 | 98.2 |
| Warrick | 88.4 | 83.8 | 76.5 | 100.6 | 101.2 |
| Gibson | 88.3 | 103.1 | 67.5 | 90 | 100.6 |
| Floyd | 87.4 | 84.8 | 80.9 | 92 | 101 |
| St. Joseph | 86.1 | 92.3 | 73.2 | 87.4 | 102 |
| Vanderburgh | 85.6 | 92.1 | 75.7 | 83.4 | 102.2 |
| Hendricks | 84.7 | 82.6 | 71.1 | 94.8 | 101.8 |
| Putnam | 82.5 | 75.2 | 84.4 | 81.9 | 100.7 |
| Dubois | 82.5 | 72.7 | 89.7 | 78.3 | 102.5 |
| Jackson | 81.9 | 76.7 | 82.7 | 79.7 | 101.9 |
| Spencer | 78.9 | 67.9 | 69.8 | 91.3 | 101.8 |
| Union | 78.4 | 71.4 | 49.1 | 107.5 | 99.6 |
| Total above 100 | 4 | 6 | 3 | 17 | 13 |

Note: Shaded cells indicate values above the U.S. average (i.e., greater than 100).
Source: Indiana Business Research Center

## Conclusion

The Innovation Index can serve as a valuable tool for policymakers and practitioners to quickly evaluate innovative capacity and potential. As with all indices, however, the overall estimate is not as important as the sum of its parts. Economic development practitioners not only get a quick snapshot of how their region is doing in terms of innovation with the portfolio index, but they also have the ability to drill down into the highly granular data to gain a better understanding about their region's strengths and weaknesses.

Upcoming articles will discuss innovation in Indiana's regions, as well as ongoing empirical research. In the meantime, visit www.statsamerica.org/innovation/ to begin using the Innovation Index.

## Notes

1. This research was supported by a generous grant from the U.S. Economic Development Administration and done in collaboration with Purdue Center for Regional Development, Strategic Development Group,Inc., the Rural Policy Research Institute, and Economic Modeling Specialists, Inc.
2. The vast majority of value added is comprised of compensation and profits. In economics, value added refers to the returns on the factors of production—primarily labor and capital—that increase the value of a product and corresponds to the incomes received by labor and the owners of capital.
3. This approach is similar to the annual European Innovation Scorecard: www.proinno-europe.eu/index.cfm?fuseaction=page.display&topicID=5&parentID=51.
4. A discussion of the rationale behind the variable selection is at www.statsamerica.org/innovation/innovation_index/methodology.html.

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Next Article: Do Teachers Have Education Degrees? Matching Fields of Study to Popular Occupations of Bachelor's Degree Graduates



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# Do Teachers Have Education Degrees? Matching Fields of Study to Popular Occupations of Bachelor's Degree Graduates

The current debate on the training needs of our nation's teachers reminds us that it is often challenging to match fields of study to occupations and vice-versa. Economic developers and educators are constantly anticipating the training needs of a changing workforce. Unfortunately, many career pathway resources fail to identify the relative number of workers in a particular occupation that completed degrees in various disciplines.

This article makes use of ongoing research by the Indiana Business Research Center to develop a comprehensive "Workforce Futures" information tool that matches current and projected employment in a wide range of occupations to the fields of study that corresponding workers complete at all postsecondary levels—from certificates through doctoral degrees. Here, we will look at the bachelor's degree fields of a wide range of workers with a focus on teachers. This article will also look at the reverse—the occupations of bachelor's degree graduates from particular fields of study, particularly those in education programs.

While education remains popular among workers with bachelor's degrees, business-related occupations and fields of study are the most popular among this group of graduates—particularly among men—likely due to their high lifetime earnings potential.[1] Table 1 displays the 10 most popular occupations among U.S. workers with a bachelor's degree as their highest degree (i.e., their terminal degree). We see accountants, auditors and financial specialists accounting for almost 8 percent of this sector of workers.

**Table 1 : Popular Occupations of U.S. Workers with Bachelor's Degrees as their Highest Degree**

| Rank | Occupation | Percent |
|---|---|---|
| 1 | Accountants, Auditors, Financial Specialists | 7.9 |
| 2 | Registered Nurses, Pharmacists, Dieticians, Therapists, Physicians Assistants | 5.6 |
| 3 | Other Administrative Services (e.g., Record Clerks, Telephone Operators) | 4.9 |
| 4 | Other Management Related Occupations | 4.9 |
| 5 | Other Marketing and Sales Occupations | 4.9 |
| 6 | Insurance, Securities, Real Estate and Business Services | 4.1 |
| 7 | Artists, Broadcasters, Editors, Entertainers, Public Relations Specialists | 4.1 |
| 8 | Elementary School Teacher | 4.0 |
| 9 | Top-level Managers, Executives, Administrators | 3.5 |
| 10 | Sales Occupations - Retail | 3.1 |

Note: This chart uses data for full-time, year-round workers divided into 125 occupations adapted from the Scientists and Engineers Statistical Data (SESTAT) System and the U.S. Department of Labor's Standard Occupational Classification (SOC) System.

Source: IBRC, using data from the National Survey of College Graduates, 2003

Table 2 shows that business administration and management, accounting and other business services majors account for three of the top four degree fields among all U.S. workers with terminal bachelor's degrees. However, high numbers of particular majors do not necessarily mean that these graduates will pursue careers directly associated to their fields of study, making the link between Table 1 and Table 2, tenuous at best.

**Table 2 : Popular Fields of Study of U.S. Workers with Bachelor's Degrees as their Highest Degree**

| Rank | Field of Study | Percent |
|---|---|---|
| 1 | Business Administration and Management | 9.3 |
| 2 | Accounting | 6.5 |
| 3 | Elementary Teacher Education | 5.1 |
| 4 | Other Business or Administrative Services | 5.0 |
| 5 | Nursing | 3.7 |
| 6 | Sales and Marketing Fields | 3.5 |
| 7 | Psychology | 3.5 |
| 8 | Biological Sciences | 3.3 |
| 9 | Communications | 2.9 |
| 10 | Computer and Information Sciences | 2.9 |

Note: This chart uses data for full-time, year-round workers whose college degree majors have been divided into 76 fields adapted from the Scientists and Engineers Statistical Data (SESTAT) System.
Source: IBRC, using data from the National Survey of College Graduates, 2003

## Current Workforce Debates and Research Needs

This article examines the link between the fields of study pursued by undergraduates and their occupations. College students typically choose a major with particular careers in mind, but may actually end up in a completely different occupation as a result of being under-qualified, over-qualified or otherwise unable to gain entry to their career of choice. According to research by John Robst, the highest levels of education-to-career mismatch occurred among those who had bachelor's degrees in English and foreign languages, social sciences, and liberal arts. Degrees with the lowest amount of mismatch included computer science, engineering and business management.[2] While many workers facing the prospect of a mismatched occupation after their bachelor's degree may pursue a graduate degree, this article focuses on workers who do not complete any additional degrees.

While this research cannot determine the appropriate training for teachers, it can inform the discussion by assessing what college degree fields were completed by different types of teachers nationwide. In Indiana, considerable debate surrounds the major changes proposed by the state superintendent of public instruction, notably that secondary-school teachers (grades 5 to 12) should receive a bachelor's degree in an applicable content-area major and a minor in education.[3] Opponents meanwhile insist that a major in education is preferable since it already contains sufficient content-area study requirements.[4] Not only can the Workforce Futures tool of this research determine the relative percentage of teachers across the country who completed education versus content-area college majors, but it can also assess the relative number of education degree graduates who are currently in teaching careers.

## Moving Beyond Current School-to-Work Resources

This research transcends currently available resources by matching U.S. workers by occupation to the fields of study they completed at the college level. Typically, publically available education-to-occupation crosswalks match occupations to fields of study through simple "one-to-many" matches that list all the relevant fields of study for a particular occupation or vice-versa. For example, the widely-used O*NET crosswalk matches occupations by Standard Occupational Classification (SOC) code to relevant fields of study by Classification of Instructional Programs (CIP) code.[5] However, such crosswalks do not assess the relative incidence of each match, making it near impossible to determine which matched occupations are the more prevalent outcomes for recipients of a particular degree or alternatively, which degree fields are really more popular among workers in a particular occupation.

By adapting the education and work histories of a representative sample of 100,402 U.S. workers surveyed by the 2003 National Survey of College Graduates (NSCG), this research makes the elusive link between fields of study and occupations that accounts for the relative proportions of each link. To do this, first the NSCG occupations and fields of study were re-classified so that occupations more closely resembled the widely-used SOC system and listed fields of study were less science-focused. [6] In the end, the detailed crosswalk produced was able to match a total of 125 occupations with 76 fields of study. For the purpose of this article, these occupations and fields of study were further summarized into nine broad occupational groups and nine broad fields of study (see Table 3).

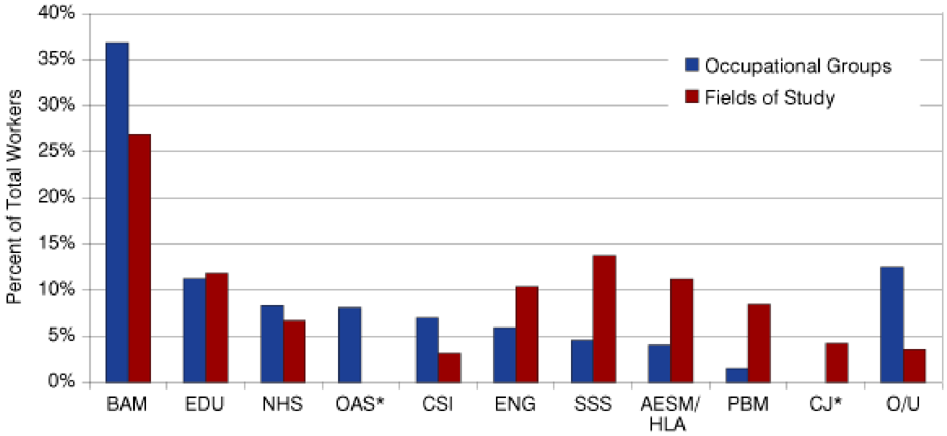
**Table 3 : Legend of Abbreviations for Occupational Groups and Broad Fields of Study**

| Code | Occupation | Field of Study |
|---|---|---|
| PBM | Physical, Biological Sciences and Mathematics | Physical, Biological Sciences and Mathematics |
| SSS | Social Sciences and Service | Social Sciences and Service |
| BAM | Business, Administration, Management, Financial Services, Marketing, and Sales | Business, Administration, Sales and Marketing |
| NHS | Nursing and Allied Health | Nursing and Allied Health |
| AESM / HLA | Art, Design, Entertainment, Sports and Media | Humanities, Liberal Arts and Fine Arts |
| EDU | Education (Pre-K to 12), Training | Education, except Administration |
| ENG | Engineering, Technologies and Architecture | Engineering, Technologies and Architecture |
| CSI | Computer Science and Information Science | Computer Science and Information Science |
| CJ | *Not Applicable* | Communications and Journalism |
| OAS | Office and Administrative Support | *Not Applicable* |
| O/U | Other / Unknown | Other / Unknown |

Note: The above occupational categories have been adapted and modified from the U.S. Department of Labor's Standard Occupational Classification (SOC) System. Fields of study are in categories that have been adapted and modified from the Scientists and Engineers Statistical Data (SESTAT) System. The other/unknown category includes occupations or fields that were not statistically significant within other categories. "Not Applicable" for CJ occupations indicates that a separate category for communications and/or journalism occupations was not possible so these occupations are largely contained within the broad "Art, Design, Entertainment, Sports and Media" (AESM) category. "Not Applicable" for OAS degree indicates the absence of a known bachelor's degree that is directly related to Office and Administrative Support occupations.
Source: Indiana Business Research Center

Education-to-occupation and occupation-to-education matches were produced for a subsample of full-time, year-round workers who received a bachelor's degree for their highest educational attainment. Estimated percentages were produced whenever a statistically significant percentage of workers in a particular occupation received a degree in a particular major field.[7] Figure 1 summarizes the proportion of workers in each of the broad groups of matched occupations and fields of study.

**Figure 1: Popular Occupational Groups and Fields of Study for U.S. Workers with a Bachelor's Degree as their Highest Degree**




*There is no category for Office and Administrative Support (OAS) for fields of study nor a category for Communications and Journalism (CJ) for occupational groups. Please see Table 3 for details on category abbreviations.
Source: IBRC, using data from the National Survey of College Graduates, 2003

## Matching Popular Occupations by Field of Study

Table 4 summarizes the broad fields of study completed by workers in a range of popular occupations. As expected, business-related occupations have high percentages of workers who received their bachelor's degrees in business-oriented BAM fields of study, most notably the fact that 73 percent of accountants, auditors and financial specialists with terminal bachelor's degrees completed business-oriented majors. Other occupations that seemed to have specialized college graduates include nurses and other allied health professionals of which over 84 percent completed nursing and allied health (NHS) fields of study, and electrical engineers, almost 90 percent of which completed engineering degrees. It is also not surprising that almost two-thirds of social workers had degrees in social science and service (SSS).

**Table 4: Broad Fields of Study for Selected Occupations (excluding Teaching) among U.S. Workers with Bachelor's Degrees as Highest Degree**

| Occupation | Percent of Occupation by Broad Fields of Study* | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PBM | SSS | BAM | NHS | HLA | EDU | ENG | CSI | CJ | O/U |
| Accountants, Auditors, Financial Specialists | 3.7 | 8.6 | 73.1 | 0.0 | 5.1 | 2.5 | 1.5 | 0.9 | 2.1 | 2.4 |
| Management-Related Occupations | 7.1 | 16.6 | 39.9 | 1.3 | 10.8 | 5.7 | 9.0 | 1.7 | 4.8 | 3.2 |
| Personnel, Training, Labor Relations Specialists | 2.8 | 18.9 | 42.3 | 1.8 | 13.9 | 7.2 | 0.9 | 0.6 | 4.6 | 7.0 |
| Sales Occupations - Retail | 5.0 | 14.4 | 34.4 | 2.4 | 18.2 | 10.8 | 3.4 | 0.5 | 4.1 | 7.0 |
| Health Technologists and Technicians | 27.3 | 8.2 | 7.3 | 19.8 | 4.5 | 3.5 | 23.4 | 0.0 | 0.9 | 5.2 |
| Registered Nurses, Pharmacists, Dieticians, Therapists, Physician's Assistants | 3.8 | 3.0 | 2.6 | 84.3 | 1.5 | 1.6 | 0.0 | 0.0 | 0.4 | 2.9 |
| Accounting Clerks and Bookkeepers | 4.3 | 12.1 | 42.8 | 1.9 | 11.6 | 10.5 | 0.0 | 4.3 | 3.7 | 8.8 |
| General Administrative Occupations, except Secretaries, Receptionists, Typists | 6.4 | 17.4 | 33.1 | 1.9 | 16.7 | 10.5 | 2.7 | 2.1 | 5.1 | 4.2 |
| Secretaries, | 3.6 | 20.4 | 26.6 | 0.8 | 15.3 | 15.7 | 0.8 | 0.0 | 5.1 | 11.7 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Receptionists, Typists | | | | | | | | | | |
| Artists, Media, Entertainers, and Public Relations Occupations | 1.9 | 10.3 | 6.2 | 1.0 | 46.1 | 4.6 | 1.6 | 1.0 | 23.5 | 3.8 |
| General Service Occupations, Non-Health | 6.1 | 28.6 | 23.5 | 1.6 | 10.6 | 13.9 | 1.5 | 0.4 | 4.9 | 8.8 |
| Social Workers | 1.4 | 65.6 | 8.1 | 0.6 | 7.1 | 6.7 | 0.0 | 1.5 | 2.2 | 6.7 |
| Precision/Production Occupations | 14.9 | 11.2 | 23.3 | 0.5 | 19.5 | 7.9 | 11.0 | 0.0 | 3.1 | 8.5 |
| Protective Services Occupations | 9.0 | 46.6 | 17.9 | 0.0 | 9.1 | 4.8 | 3.8 | 1.2 | 0.9 | 6.7 |
| Computer Engineers - Software | 9.6 | 3.7 | 6.5 | 0.2 | 4.0 | 1.0 | 31.7 | 40.6 | 0.8 | 1.9 |
| Computer System Analysts | 9.8 | 7.0 | 20.0 | 0.4 | 6.1 | 1.8 | 11.5 | 40.2 | 1.3 | 2.0 |
| Electrical and Electronics Engineers | 2.8 | 0.0 | 2.3 | 0.4 | 0.0 | 0.2 | 89.6 | 1.3 | 0.0 | 3.4 |

*Hover cursor over category abbreviations on any table in this article to see their full names
Note: This table uses data for full-time, year-round workers. Please see Table 3 for details on category abbreviations.
Source: IBRC, using data from the National Survey of College Graduates, 2003

However, many occupations have workers who completed a much wider range of college degrees. Most notably we see that over 10 percent of graduates working in precision/production occupations completed majors in each of five different fields: physical and biological sciences (14.9 percent), social sciences and service (11.2 percent), business (23.3 percent), the humanities (19.5 percent) and engineering (11 percent).

Looking specifically at teachers, we see that nearly 72 percent of elementary education teachers received their degree in an education field (see Table 5). However, the dominance of the education degree drops among middle and high school teachers (grades 5 through 12).

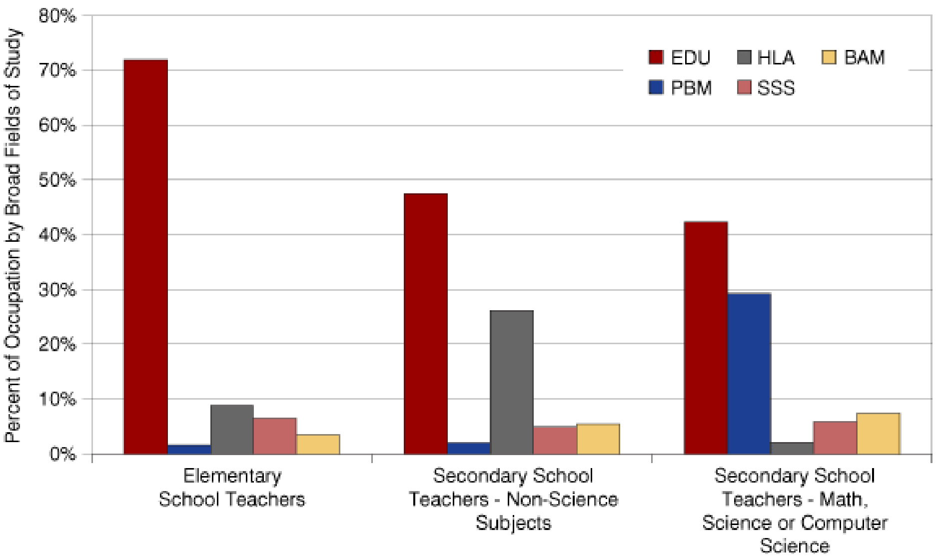
**Table 5 : Broad Fields of Study for Teaching Occupations among U.S. Workers with Bachelor's Degrees as Highest Degree**

| Occupation | Percent of Occupation by Broad Fields of Study | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PBM | SSS | BAM | NHS | HLA | EDU | ENG | CSI | CJ | O/U |
| Pre-Kindergarten and Kindergarten Teachers | 4.0 | 9.5 | 4.9 | 2.0 | 7.7 | 61.3 | 1.2 | 0.0 | 0.0 | 9.6 |
| Elementary School Teachers | 1.6 | 6.5 | 3.6 | 0.6 | 8.8 | 71.9 | 0.0 | 0.3 | 1.7 | 5.0 |
| Secondary School Teachers - Math, Science or Computer Science | 29.3 | 5.9 | 7.4 | 0.0 | 2.1 | 42.3 | 2.1 | 1.8 | 1.0 | 8.0 |
| Secondary School Teachers - Social Sciences | 0.0 | 11.3 | 2.3 | 0.0 | 20.9 | 54.9 | 0.0 | 0.0 | 0.0 | 10.6 |
| Secondary School Teachers - Non-Science Subjects | 2.0 | 4.9 | 5.5 | 1.7 | 26.1 | 47.5 | 0.0 | 0.0 | 3.4 | 8.9 |
| Special Education Teachers - Primary and Secondary | 1.2 | 5.2 | 4.3 | 2.6 | 7.9 | 70.2 | 0.0 | 0.0 | 0.0 | 8.6 |

Note: This table uses data for full-time, year-round workers. Please see Table 3 for details on category abbreviations.
Source: IBRC, using data from the National Survey of College Graduates, 2003

As highlighted in Figure 2, only 42 percent of secondary school teachers in mathematics, science and computer science have an education degree while nearly 30 percent have a degree in the physical and biological sciences or mathematics. Also diverse are the degrees of non-science secondary school teachers since over one-quarter of them have degrees in the humanities and liberal arts.

**Figure 2: Popular Fields of Study for Different Types of Teachers Who Completed Bachelor's Degrees as Their Highest Degree**




Note: This chart uses data for full-time, year-round workers. Please see Table 3 for details on category abbreviations.
Source: IBRC, using data from the National Survey of College Graduates, 2003

## Matching Popular Fields of Study by Occupation

Interesting results also emerge when we look at the occupations of graduates from a range of popular college degree fields (see Table 6). As expected, nursing graduates are overwhelmingly in health-related occupations (NHS). Similarly, over 60 percent of economics, computer and information science and civil and architectural engineering graduates are in business (BAM), computer and information science (CSI), and engineering (ENG) occupations, respectively.

**Table 6: Occupational Groups for Selected Fields of Study (excluding Education) among U.S. Workers with Bachelor's Degrees as Highest Degree**

| Fields of Study | Percent of Field by Occupational Group | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PBM | SSS | BAM | NHS | AESM | EDU | ENG | CSI | OAS | O/U |
| Accounting | 0.0 | 0.7 | 77.9 | 0.7 | 0.3 | 0.9 | 0.0 | 2.9 | 9.4 | 7.4 |
| Business Administration and Management | 0.1 | 3.9 | 59.1 | 1.5 | 1.1 | 2.9 | 1.5 | 5.5 | 11.7 | 12.8 |
| Nursing | 0.0 | 0.6 | 4.4 | 88.8 | 0.0 | 0.7 | 0.0 | 0.0 | 0.6 | 5.0 |
| Criminal Justice/Protective Services | 0.0 | 17.2 | 21.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.0 | 55.8 |
| Economics | 0.0 | 2.7 | 62.6 | 0.0 | 1.6 | 0.4 | 0.0 | 6.5 | 7.2 | 19.1 |
| Psychology | 0.2 | 16.3 | 35.5 | 6.1 | 2.0 | 9.0 | 0.6 | 4.6 | 12.6 | 13.1 |
| Sociology | 0.0 | 17.2 | 31.4 | 5.2 | 4.3 | 9.6 | 0.0 | 3.3 | 12.0 | 17.2 |
| Biological sciences | 12.4 | 2.4 | 23.3 | 21.5 | 1.7 | 7.5 | 4.5 | 4.3 | 5.7 | 16.7 |
| Mathematics and Statistics | 6.0 | 1.0 | 26.9 | 0.7 | 0.7 | 13.5 | 2.9 | 27.1 | 6.9 | 14.5 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Computer and Information Sciences | 0.5 | 1.3 | 16.4 | 0.4 | 0.9 | 2.0 | 2.3 | 64.8 | 5.6 | 5.7 |
| Communications | 0.0 | 4.5 | 46.2 | 1.8 | 17.7 | 5.5 | 0.0 | 3.2 | 9.3 | 11.9 |
| Journalism | 0.0 | 4.4 | 34.1 | 0.8 | 34.1 | 2.7 | 0.0 | 1.1 | 9.3 | 13.7 |
| English Language, Literature and Letters | 0.0 | 3.3 | 34.1 | 1.7 | 15.6 | 13.3 | 0.0 | 4.8 | 13.5 | 13.5 |
| Fine Arts, All Fields | 0.0 | 4.1 | 22.6 | 3.0 | 25.7 | 12.5 | 2.7 | 2.2 | 7.8 | 19.4 |
| History, Other | 0.0 | 3.1 | 39.4 | 0.5 | 4.9 | 10.8 | 0.0 | 6.4 | 9.8 | 25.3 |
| Film, Dance, Graphics and Other Visual/Performance Arts | 0.0 | 0.8 | 24.8 | 1.9 | 40.3 | 2.1 | 1.3 | 2.4 | 4.8 | 21.6 |
| Civil and Architectural Engineering | 0.0 | 0.4 | 22.2 | 0.4 | 0.2 | 0.3 | 60.6 | 2.2 | 1.6 | 12.1 |
| Electrical/Electronics/ Communications Engineering | 0.2 | 0.5 | 20.5 | 0.5 | 0.6 | 0.8 | 46.2 | 20.5 | 1.5 | 8.6 |

Note: This table uses data for full-time, year-round workers. Please see Table 3 for details on category abbreviations.
Source: IBRC, using data from the National Survey of College Graduates, 2003

However, the career outcomes of bachelor's degree graduates by field are generally quite diverse. This is particularly the case for non-vocational fields such as English whose graduates were likely to find employment in occupations as diverse as business (34.1 percent), arts, sports and media (15.6 percent), office and administrative support (13.5 percent) and teaching (13.3 percent). Surprisingly, less than half of electrical/electronics/communications engineering majors have engineering jobs with over 20 percent gaining employment in business, as well as computer and information science occupations.

**Table 7: Occupational Groups for Popular Fields of Study in Education among U.S. Workers with Bachelor's Degrees as Highest Degree**

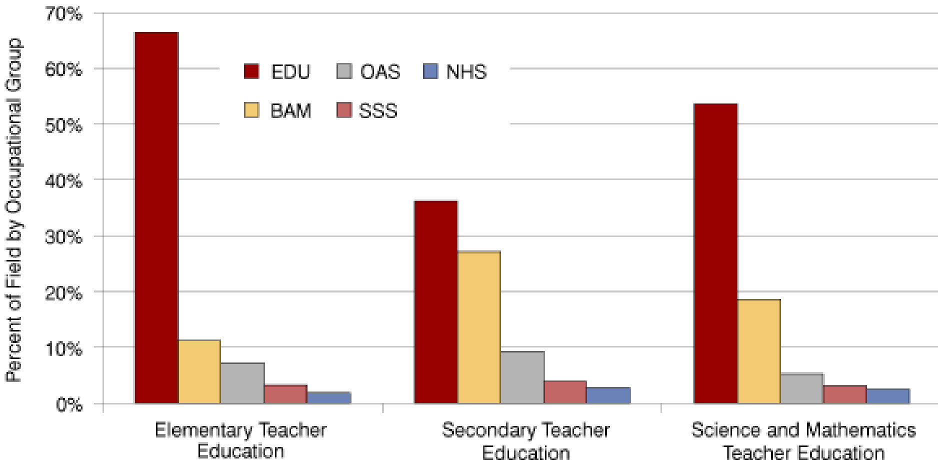
| Fields of Study | Percent of Field by Occupational Group | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PBM | SSS | BAM | NHS | AESM | EDU | ENG | CSI | OAS | O/U |
| Special Education | 0.0 | 3.8 | 3.4 | 0.0 | 4.8 | 69.9 | 0.0 | 0.0 | 6.8 | 11.4 |
| Elementary Teacher Education | 0.0 | 3.3 | 11.3 | 1.9 | 1.1 | 66.4 | 0.0 | 1.4 | 7.3 | 7.3 |
| Science and Mathematics Teacher Education | 0.0 | 3.2 | 18.7 | 2.6 | 0.8 | 53.6 | 0.0 | 0.0 | 5.3 | 15.9 |
| Education (General) | 0.0 | 5.1 | 19.7 | 1.9 | 3.1 | 42.4 | 0.0 | 1.0 | 11.0 | 15.8 |
| Physical Education and Coaching | 0.0 | 3.2 | 26.9 | 2.3 | 1.3 | 39.2 | 0.0 | 0.0 | 5.9 | 21.2 |
| Secondary Teacher Education | 0.0 | 4.0 | 27.2 | 2.8 | 1.5 | 36.2 | 0.6 | 1.4 | 9.3 | 17.0 |

Note: This table uses data for full-time, year-round workers. Please see Table 3 for details on category abbreviations.
Source: IBRC, using data from the National Survey of College Graduates, 2003

When looking at education majors in Table 7, we see that two-thirds of elementary education degree graduates are in an education or training occupations with business occupations a distant second at 11 percent. Notably though, only 36 percent of those who majored in secondary education remained in the education field with a full quarter of these graduates moving on to business-related occupations (see Figure 3).

**Figure 3 : Popular Occupational Groups for Education Fields of Study among Workers**

**Who Completed Bachelor's Degrees as Their Highest Degree**




Note: This chart uses data for full-time, year-round workers. Please see Table 3 for details on category abbreviations Source: IBRC, using data from the National Survey of College Graduates, 2003

## Understanding Diverse Education-to-Occupation Linkages

While the results presented here show that "yes"—teachers largely do have education degrees—the results also show the tremendous diversity of fields of study completed by teachers and other workers in completing their bachelor's degrees. Both economic developers and educators can benefit from the Workforce Futures tool under development by the Indiana Business Research Center, in conjunction with the Indiana Department of Workforce Development. As Indiana and other states promote initiatives in emerging industries such as the life sciences, it is important that economic developers understand the education needs for desired professions. Alternatively, college educators and students can benefit from this tool as educators can enhance their curricula to prepare students for a variety of potential post-graduation career options.

The ultimate goal of this tool is to provide approximately 9,500 matches and corresponding percentage estimates between each of 126 occupations and 75 degree fields, not only for bachelor's degree graduates but at all post-secondary levels. Particularly useful would be to match associate's degree and postsecondary certificate fields to corresponding occupations since over 26 percent of the U.S. residents have some postsecondary education below the bachelor's degree level.[8] but few detailed education-to-occupation crosswalk resources exist for these graduates.

## Notes

1. For more information on broad fields of study popular among women and men and their associated lifetime earnings, please see: Michael F. Thompson, "Earnings of a Lifetime: Comparing Women and Men with College and Graduate Degrees," *InContext*, March-April 2009, www.incontext.indiana.edu/2009/mar-apr/article1.asp.
2. John Robst, "Education and Job Match: The Relatedness of College Major and Work," *Economics of Education Review* 26 (2006): 397-407.
3. More information is available on the website of the Indiana Department of Education. Specifically: "Proposed Rule Revisions for Educator Preparation and Accountability (REPA)," www.doe.in.gov/news/2009/07-July/REPA.html.
4. A concise summary of this debate is available in the following article: J. K. Wall, "Overhaul of Indiana public school teacher training threatens college budgets." *Indianapolis Business Journal*, October 3, 2009, www.ibj.com/article?articleId=7378.
5. O*NET (Occupational Information Network) is supported by the U.S. Department of Labor and makes its education-to-occupation crosswalk available online at: http://online.onetcenter.org/crosswalk/.
6. The National Survey of College Graduates categorizes occupational and education groups according to the Scientists and Engineers Statistical Data (SESTAT) System. Crucial information used to re-classify the SESTAT system into SOC and CIP system was kindly provided by Kelly H. Kang at the National Science Foundation.

7. The final sample contained 43,722 workers who worked for at least 35 hours per week and 50 weeks per year and weights were applied to ensure that this sample was representative of the larger U.S. population. Averages for each occupation or field that were not statistically significant at the $p<0.1$ level were re-categorized as "Unknown."
8. U.S. Census Bureau, Current Population Survey, 2008 Annual Social and Economic Supplement.

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Previous Article: Measuring Regional Capacity for Innovation    Next Article: Occupation Clusters

# Occupation Clusters

Jan-Feb 2010, Vol. 11, No. 1

Occupation cluster analysis is a relatively new approach in regional development. In contrast to industry clusters that focus on what businesses produce, occupation clusters focus on the knowledge, skills and abilities of the individuals who work for those businesses. Occupation cluster analysis offers insights into the talent base of the regional workforce that go beyond the relatively simple measure of educational attainment (such as highest degree earned). As part of a recent study conducted for the U.S. Economic Development Administration, the Purdue Center for Regional Development developed a set of 15 knowledge-based occupation clusters. National county-level data for the clusters are available online at www.statsamerica.org/innovation/.[1]

## Defining Occupation Clusters

The Occupational Information Network (O*Net) divides occupations into five job zones, based on the education and experience a person needs to do the work.[2] This study used a clustering algorithm with some subsequent fine-tuning to construct 15 knowledge-based occupation clusters containing all occupations within the three highest O*Net job zones (see Table 1)—thus excluding occupations that require limited preparation, such as taxi drivers or customer service representatives.

**Table 1: Occupation Clusters Defined in This Study**

| Occupation Cluster Name |
|---|
| Agribusiness and Food Technology |
| Arts, Entertainment, Publishing and Broadcasting |
| Building, Landscape and Construction Design |
| Engineering and Related Sciences |
| Health Care and Medical Science (Aggregate) |
| *Health Care and Medical Science (Medical Practitioners and Scientists)* |
| *Health Care and Medical Science (Medical Technicians)* |
| *Health Care and Medical Science (Therapy, Counseling, Nursing and Rehabilitation)* |
| Information Technology |
| Legal and Financial Services, and Real Estate |
| Managerial, Sales, Marketing and HR |
| Mathematics, Statistics, Data and Accounting |
| Natural Sciences and Environmental Management |
| Personal Services |
| Postsecondary Education and Knowledge Creation |
| Primary/Secondary and Vocational Education, Remediation and Social Services |
| Public Safety and Domestic Security |
| Skilled Production Workers: Technicians, Operators, Trades, Installers and Repairers |

Source: Purdue Center for Regional Development

## inside this issue

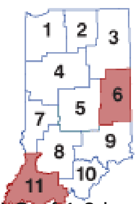
## Why Occupation Clusters Are Useful

The swift transformation taking place in the global economy makes occupation cluster analysis particularly valuable. The global integration of markets has eliminated many regional competitive advantages. Low-cost land with transportation and communications infrastructure in place is no longer scarce. Technology quickly jumps national borders. Costs for reliable labor are lower in many places across the globe. In this low-cost competitive environment, a region's best chance to differentiate itself is with its brainpower: the education, knowledge, skills, and abilities of its workforce. From this perspective, every region has the potential to be competitive.

In addition to globalization, the retirement of the Baby Boom generation and the move of businesses toward more innovative, knowledge-based markets have combined to make the skills of the workforce central to economic development. The extensive array of labor force data compiled by the U.S. Department of Labor is giving regional leaders a greater understanding of this economic development asset.

Exploring occupation clusters within one's region represents a first step. Occupation cluster analysis can help identify which clusters of occupations provide the best opportunities for investment to build different types of skills, supporting existing or emerging industry clusters, and which occupation clusters show a competitive skills advantage in the region.

## Identifying Clusters of Opportunity




The following examples, using two designated economic growth regions (EGRs, shown in map to the left) in Indiana, illustrate how the tool can be used to identify "clusters of opportunity."

The analysis includes location quotients (LQs)—ratios describing the concentration of clusters in a region compared to the United States. When using location quotients, an LQ of 1.2 is usually considered the base point for determining whether an occupation cluster or an industry cluster has a "concentration" in the region. If it does, then the region may have a competitive advantage in that particular industry cluster or occupation cluster.

### Economic Growth Region 6

EGR 6 consists of nine counties in east-central Indiana. In this region, job growth occurred in eight of the 15 occupation clusters between 2001 and 2007, with health care and medical science having the highest growth rate (see Table 2). This cluster is also the second largest in the region (tied with legal and financial services and real estate) and its location quotient is approaching 1.2, suggesting that a regional specialization is developing in these occupations. One of the cluster's components (medical technicians) is already specialized (LQ=1.22). The largest group of occupations in the health care and medical science cluster is comprised of registered nurses, licensed practical and licensed vocational nurses, followed by physicians and surgeons, and medical assistants.

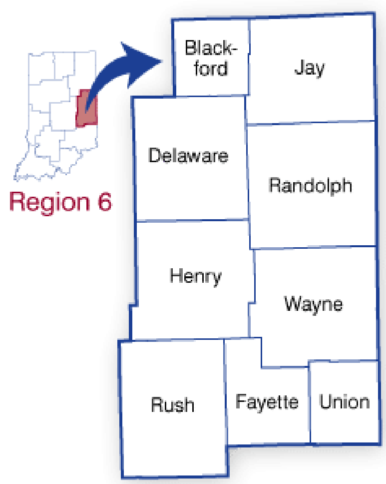



**Table 2: Occupation Clusters of Opportunity in EGR 6**

| Cluster | Employment Growth (%), 2001-2007 | 2007 LQ | % Growth of LQ |
|---|---|---|---|
| Health Care and Medical Science | 7.2% | 1.11 | 4.7% |
| Primary/Secondary and Vocational Education, Remediation and Social Services | 7.0% | 0.93 | 8.1% |
| Information Technology | 6.9% | 0.41 | 17.1% |

| | | | |
|---|---|---|---|
| Arts, Entertainment, Publishing and Broadcasting | 5.9% | 0.72 | 7.5% |
| Public Safety and Domestic Security | 5.3% | 0.94 | 6.8% |
| Legal and Financial Services, and Real Estate | 4.9% | 0.73 | 2.8% |
| Postsecondary Education and Knowledge Creation | 4.6% | 1.33 | 0.0% |
| Managerial, Sales, Marketing and HR | 1.0% | 0.67 | 1.5% |

Source: EMSI Complete Employment 2008 Spring Release v. 2

When making the comparison between occupation clusters and industry clusters, it is noteworthy that the biomedical/biotechnical industry cluster in EGR 6 shows a clear concentration compared with the nation, with a location quotient of 3.7 in 2007. With this kind of a concentration in both medical skills and establishments, the region could, for example, seek opportunities to grow its medical research capacities or to aim for a specialization in geriatrics and nursing homes, or other specialized nursing facilities—leveraging its own biomedical industry, as well as the large biomedical industry cluster in the nearby Indianapolis metropolitan area.

Alternatively, the region could try to develop a capacity for physical therapy and the kind of skilled nursing required in rehabilitating patients who need prosthetics. Such potential strategies should obviously be worked out by the economic development stakeholders in tandem with medical and related professionals in the region—in other words, those who would be in the front lines of moving such strategies forward.

A surprising finding is that the information technology occupation cluster (IT) has the third highest employment growth rate in EGR 6. Even more strikingly, the location quotient (while well below 1.2 in 2007) has grown by over 17 percent during the period. Further inspection into the occupational structure of this cluster reveals that the major occupations within the cluster are largely composed of computer software engineers, systems and data communications analysts, network and computer systems administrators, and support specialists.

It is possible that this emerging occupation cluster is related to the presence of Ball State University (postsecondary education and knowledge creation cluster) in the region. Research of these clusters at the national level indicates that the information technology cluster tends to co-locate with the engineering cluster and the mathematics, statistics, data analysis and accounting occupation clusters. However, these two clusters are both smaller, unspecialized and declining in the region, while the IT cluster, though currently small, is growing and increasing in degree of specialization compared to the nation. Clearly, given this kind of information, economic development stakeholders in EGR 6 will want to explore ways to support the further expansion of this important cluster.

Not all of the higher-growth clusters provide direct regional opportunities for 21st century global or even national competitiveness. For example, the 7 percent job growth in primary/secondary and vocational education and social services occupations and an increasing level of concentration of such jobs is beneficial inasmuch as good professional jobs are provided, and the region's education resources are increased; however, this cluster is more of a "pipeline" for *future* competitiveness.

## Economic Growth Region 11

EGR 11 consists of nine counties in southwestern Indiana. In this region, all of the occupation clusters grew between 2001 and 2007 except for three: engineering; mathematics, statistics, data analysis and accounting; and agribusiness and food processing. Moreover, six clusters showed job growth of 5 percent or more (see Table 3). As in EGR 6, the health care and medical science cluster showed the largest percentage gain in jobs, with a concomitant rise in the size of the location quotient, and a similar internal occupational structure to the


EGR 6 cluster (concentration of physicians and surgeons, nurses, and medical assistants). However, the next two highest growth rates occur in very different occupation clusters—building, landscape and construction design followed by arts, entertainment, publishing and broadcasting.

**Table 3 : Occupation Clusters of Opportunity in EGR 11**

| Occupation Cluster | Employment Growth (%), 2001-2007 | 2007 LQ | Percent Change in LQ |
|---|---|---|---|
| Health Care and Medical Science | 14.6 | 1.04 | 6.1 |
| Building, Landscape and Construction Design | 10.9 | 0.72 | 7.5 |
| Arts, Entertainment, Publishing and Broadcasting | 8.2 | 0.63 | 3.3 |
| Public Safety and Domestic Security | 6.4 | 0.69 | 3.0 |
| Postsecondary Education and Knowledge Creation | 6.3 | 0.64 | -3.0 |
| Natural Sciences and Environmental Management | 5.0 | 0.78 | 1.3 |
| Skilled Production Workers: Technicians, Operators, Trades, Installers and Repairers | 4.6 | 1.38 | 1.5 |
| Primary/Secondary and Vocational Education, Remediation and Social Services | 4.0 | 0.84 | 0.0 |
| Managerial, Sales, Marketing and HR | 3.4 | 0.72 | -1.4 |
| Legal and Financial Services, and Real Estate | 2.0 | 0.78 | -6.0 |
| Information Technology | 1.4 | 0.48 | 2.1 |
| Personal Services | 0.2 | 0.84 | -8.7 |

Source: EMSI Complete Employment 2008 Spring Release v. 2

The building, landscape and construction design occupation cluster in EGR 11 is not a large cluster (960 jobs in 2007), nor is it the type of cluster that focuses on exportable products. However, it is an important cluster from the point of view of maintaining and increasing “quality of life” factors for the region and can increase the value of the arts, entertainment, visitor industries and recreation industry cluster if the region becomes known for exceptional design and physical attractiveness.

The third fastest growing occupation cluster in EGR 11 is the arts, entertainment, publishing and broadcasting cluster. While southwestern Indiana provides many opportunities for outdoor recreation and tourism, the fastest growing occupations in the arts and entertainment cluster in EGR 11 appear to be concentrated around casino-style entertainment, photography, graphic design and publishing. It might be worthwhile for regional planners and economic developers to explore the potential synergies of outdoor recreational opportunities with this cluster.

## Summary

Since working with occupational data can quickly become overwhelming for users, this research focused on 15 knowledge-based occupation clusters that can simplify analysis and aid in understanding. The occupation cluster tool provides fast insights into the talent base that drives a local or regional economy. With this tool, economic development professionals can begin to structure effective collaborations with business managers, educators, and workforce development professionals. To begin using these data or to learn more about the cluster research, visit www.statsamerica.org/innovation/.

## Notes

1. Research was conducted by the Purdue Center for Regional Development, the Indiana Business Research Center at Indiana University's Kelley School of Business, Strategic Development Group, Inc., the Rural Policy Research Institute, and Economic Modeling Specialists, Inc.
2. O*Net is developed under the sponsorship of the U.S. Department of Labor/Employment and Training Administration (www.onetcenter.org/overview.html).

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Previous Article:Do Teachers Have Education Degrees? Matching Fields of Study to Popular Occupations of Bachelor's Degree Graduates

Next Article: The Fort Wayne Metro Story: Told by STATS Indiana

# The Fort Wayne Metro Story: Told by STATS Indiana

Jan-Feb 2010, Vol. 11, No. 1

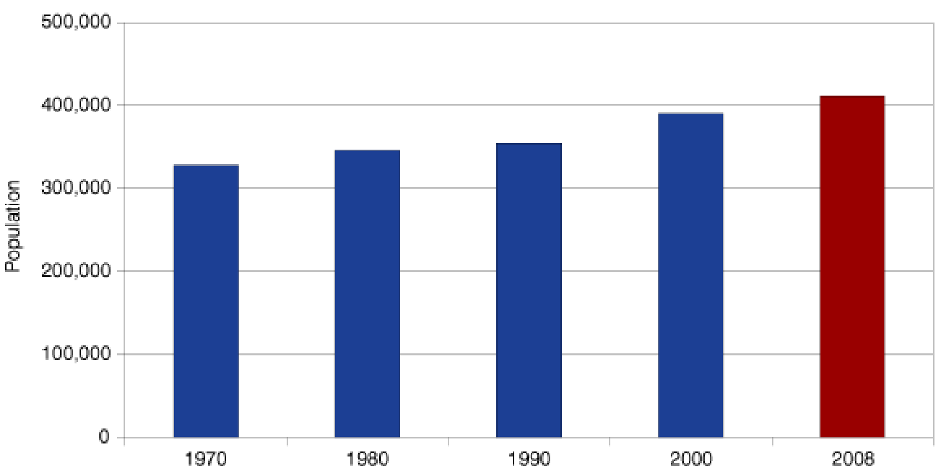


This is the 16th and final article in a series about Indiana's metropolitan statistical areas (metros). All of the data used in this article can be found using the USA Counties and Metros Side-by-Side feature on STATS Indiana (www.stats.indiana.edu). Because we are using annual data for this series, the information will not reflect some of the recent impacts of the recession.

## The Area

The Fort Wayne Metropolitan Statistical Area consists of three counties in northeast Indiana: Allen, Wells and Whitley counties. The Fort Wayne metro had a population exceeding 411,000 in 2008, making up 6.4 percent of Indiana's total population. Figure 1 shows the Fort Wayne metro's population since 1970. The metro's change in population since the turn of the century (5.4 percent) was higher than Indiana's 4.9 percent growth, but not as fast as the nation's 8 percent growth from 2000 to 2008.

**Figure 1: Fort Wayne Metro Population, 1970 to 2008**




Source: IBRC, using U.S. Census Bureau data

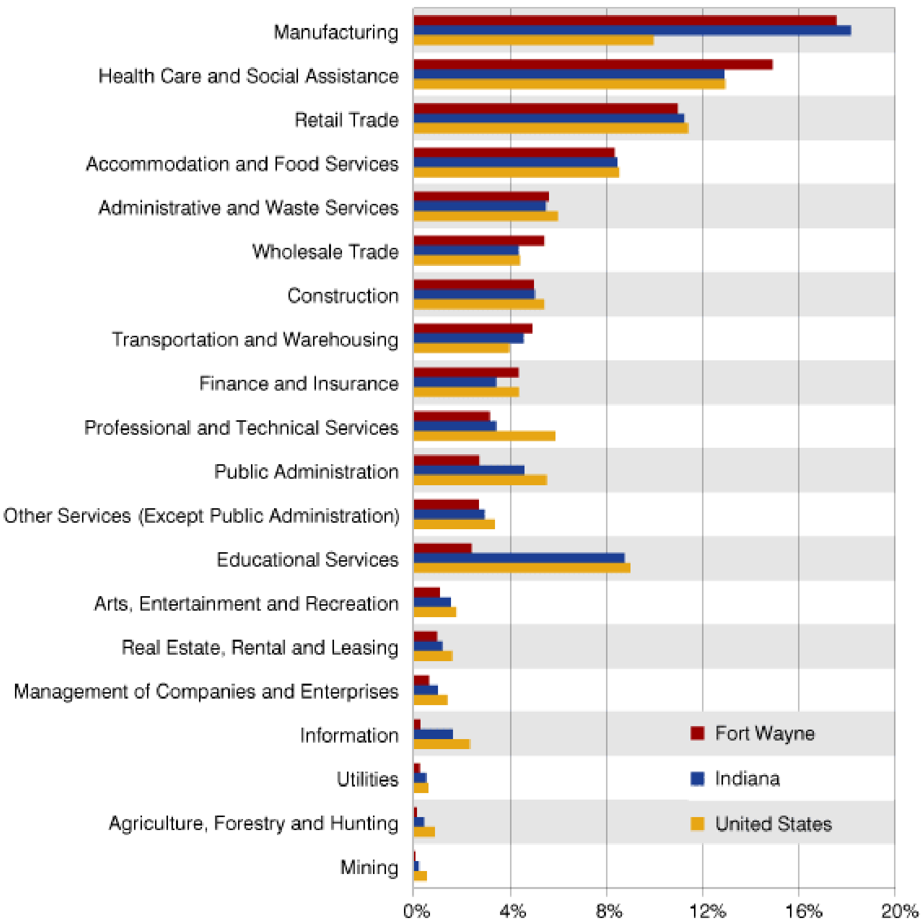
The Fort Wayne metro can attribute its population growth to two things in 2008: international migration and natural increase (more births than deaths). Similar to Indiana's trend, domestic migration was negative, meaning more people moved out of the Fort Wayne metro and to other parts of the United States than moved into the metro. In fact, the metro saw a net domestic migration of -1,761, compared to Indiana's -1,979.

## Jobs and Wages

There were five industries in which the Fort Wayne metro had a higher proportion of workers than the state of Indiana in 2008 and four industries where Fort Wayne had a higher percentage of workers than the nation. Also, there were three industries in which the Fort Wayne metro had a higher proportion of jobs than both the state and nation. They included health care and social assistance (with 14.9 percent of jobs in the metro), wholesale trade (5.4 percent of jobs), and transportation and warehousing (with 4.9 percent of jobs).

Manufacturing had the highest proportion of jobs in the metro at 17.5 percent—lower than Indiana's 18.2 percent, but still higher than the nation's 10 percent (see Figure 2). Manufacturing in Fort Wayne had nearly 5,400 more workers than the second place health care and social services industry. Retail trade, the third largest industry in the metro, accounted for 22,330 jobs in 2008, more than 13,000 jobs less than from manufacturing jobs.

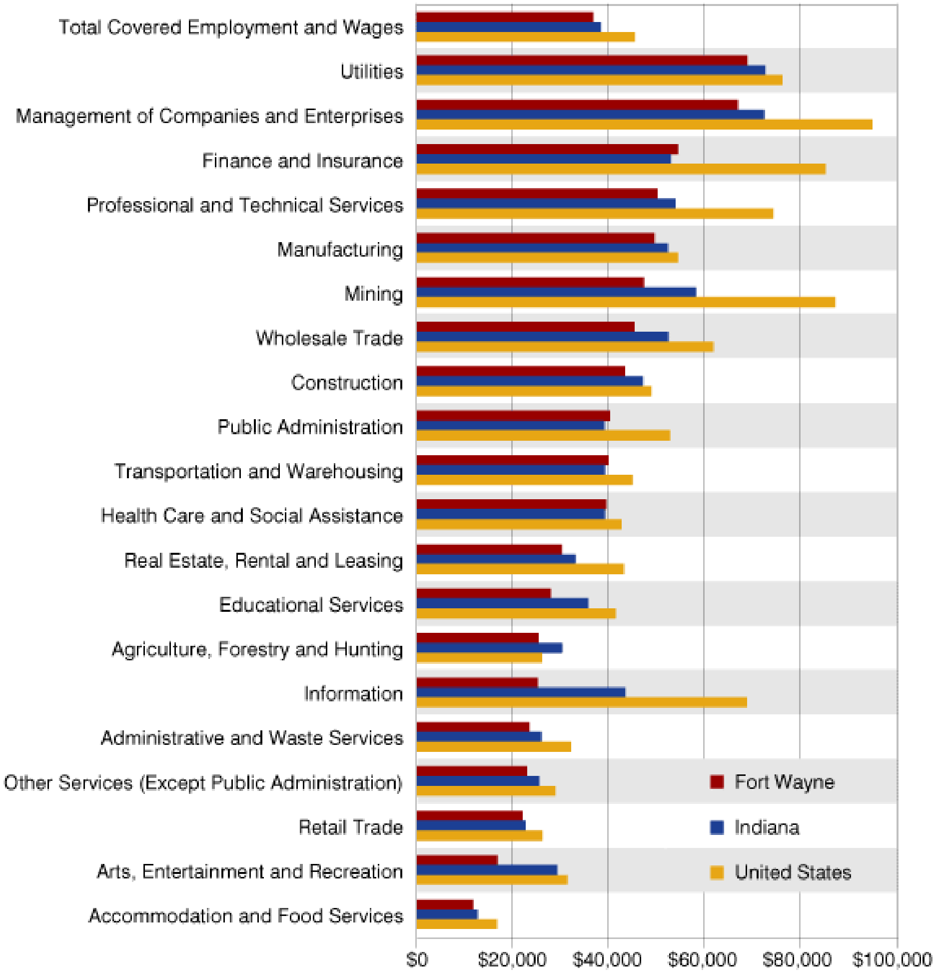
**Figure 2: Industry Jobs as a Percent of Total Covered Employment, 2008**




Source: IBRC, using Bureau of Labor Statistics data

There were no industries in the Fort Wayne metro that paid wages as high as the nation (see Figure 3). The closest industry to achieving the national pay was agriculture, forestry and hunting, paying an average $25,419 per job in 2008 (97.4 percent of the U.S. wage). There were four industries where the Fort Wayne metro paid higher average wages than the state of Indiana: finance and insurance (Fort Wayne paid an average $1,576 more per job than the state), public administration ($1,200 more than the state), transportation and warehousing ($800 more than the state) and health care and social assistance ($213 more than the state).

**Figure 3: Average Wage per Job in the Fort Wayne Metro, Indiana and the United States, 2008**

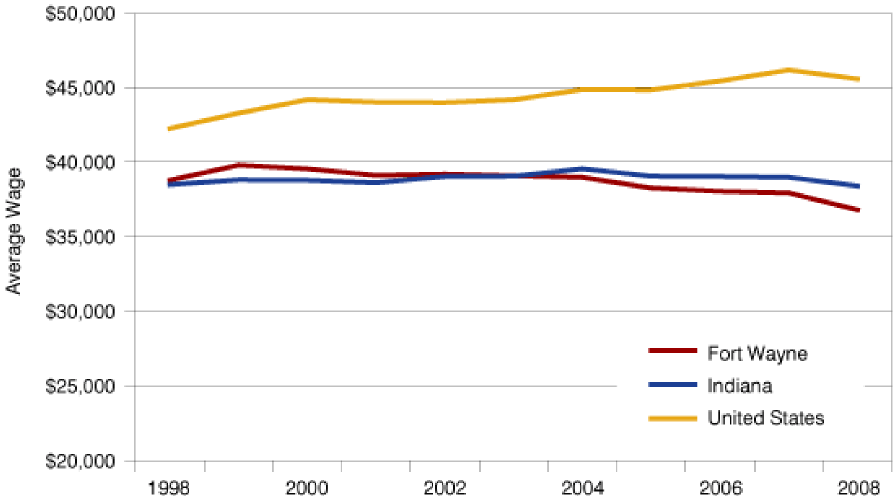



Source: IBRC, using Bureau of Labor Statistics data

Of the three industries with the most jobs in the region (manufacturing, health care and social services and retail trade), only manufacturing (in fifth place) ranked among the top five highest average paying sectors in the metro. Health care ranked 11th and retail trade ranked 19th out of the 21 major industry sectors.

Looking at the 10-year change in average wage per job, it appears as though the Fort Wayne metro never fully recovered wages since the last recession (in 2001). In 1999, the Fort Wayne metro annual average wage was $975 higher than Indiana's. That margin began to shrink[1] and by 2004, the state's annual average wages were higher than Fort Wayne's and have remained higher since (see Figure 4).

**Figure 4: Annual Average Wage per Job in 2008 Dollars, 1998 to 2008**




Source: IBRC, using Bureau of Labor Statistics data

## Conclusion

The Fort Wayne metro continues to grow, in population at least. Jobs and wages have declined and continue to show an adjustment from a manufacturing-intense economy to a more diverse array of jobs. According to the *Indiana Business Review*'s 2010 outlook, the Fort Wayne area has been undergoing an economic transformation for years and its ability to recover from the current recession depends on the area's ability to adapt.[2]

## Notes

1. Wages adjusted for inflation to 2008 dollars.
2. John Stafford, "Fort Wayne Forecast 2010," *Indiana Business Review,* Winter 2009, www.ibrc.indiana.edu/ibr/2009/outlook/fortwayne.html.

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Previous Article: Occupation Clusters