

Dual Futures:
Indiana's Economy at a Crossroads



Fiscal Policy Executive Summary

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Executive Summary

A missing part of the debate about the importance of technology to Indiana's future is any analysis of the (a) the magnitude of that task, and (b) the potential benefits that would accrue to all Hoosiers -- both within and outside technology industries -- should it be achieved.

This study addresses the question: what would the year 2005 Indiana economy look like if a rapid development in technology intensive industries were to take hold? The issue is important, because its proponents have offered the diversion of resources into technology-intensive development activities as a means of addressing some of our economy's shortcomings. These include relative declines in personal income, low population growth, and the net out-migration of better-educated young people.

The analysis consists of a comparison of two different scenarios of Indiana's future. The first is a status quo, baseline assessment, which extrapolates from the observable trends to project where the economy will be in 2005. The baseline forecast of the Indiana economy calls for continued technological advancement and improvement in productivity across most industries. This is compared to an alternative vision of growth, in which the state economy deviates from historical trends, and significantly increases the size of its technology sector.

We will use two, alternative, definitions of high tech in this report: those industries considered as part of the information technology (IT) industry by the Battelle (2000) study of the Indiana economy, and those considered to be high technology (HT) sectors by the U.S. Bureau of Labor Statistics. We expect that new high tech activity will produce benefits across a wide spectrum of industries.

How would growth in Indiana's technology sector affect the existing economy? First is the primary spending associated with the new activity itself, in the form of payroll, raw materials, taxes, rents, and other direct expenditures. Second is the secondary spending of those who receive payment from the technology activity, and who, in turn, spend those dollars in the state. Finally, the state would see a new stimulus of spinoffs of new firms and new investments at existing firms whose existence comes about because of the presence of the new technology activity.

The REMI model used in this study breaks the state of Indiana down into two regions: central Indiana, or the Indianapolis MSA, and the rest of the state. This additional disaggregation enables us to track the economic effects of technology-led growth across the geography of the state. We consider two types of technology-growth scenarios for the state economy: an expansion in IT industries in Central Indiana, and a more broadly defined growth across high tech (HT) industries that occurs throughout the state.

Scenario 1: Information Technology (IT) Expansion in Central Indiana

How much would Indianapolis high tech sectors have to grow to match the concentration expected in Chicago in 2005? Only 11 of the 42 high tech industries had a greater concentration in Indianapolis than the U.S. average in 1997. In comparison, the Austin, Texas MSA had 24 such industries, with location quotients as high as 20. Twenty-five industries had location quotients greater than one in Chicago, but the largest ratio was a more modest 5.1. Meeting these targets requires employment growth above and beyond trend growth in the Indianapolis economy, varying between 44 jobs in the semiconductors and related devices industries, to 7,239 net new jobs for computers and data processing firms.

Our basic findings are that:

- Indianapolis, proportionately, is less concentrated in IT industries than Chicago. In 1997 such industries accounted for 2.7 percent of employment in Indianapolis, compared to 4.8 percent in Chicago.
- In order for Indianapolis to have the same concentration in IT industries as Chicago in 2005, it would have to add about 19,500 jobs, representing new sales of approximately \$3.9 billion, in those industries.
- Were such growth to occur, we would expect to see more than 48,000 new jobs created in the state economy in the short run, growing to about 60,000 new jobs over a longer span of time. Seven out of every eight of these jobs would be in central Indiana, but all regions of the state would see an increase.
- This growth would also increase economic output, per capita after-tax income, and spark migration of prime-aged workers and their families into the state. Ultimately the state's population would grow by about 77,000.

What would the Indianapolis and Indiana economies look like if Indianapolis were to realize these growth targets? The effects of this expansion would be far-reaching. Not only would the high tech expansion result in an immediate increase in Indianapolis employment of nearly 43,000 jobs, but it would also produce an additional 5,500 jobs in the remainder of the state. About one in four private sector jobs created in the short run in Indianapolis are in manufacturing, with a similarly defined ratio of one in five for the remainder of the state. The new jobs jointly add more than \$3 billion to the output of the state economy.

High tech expansions directly and indirectly add more than \$2 billion to the earnings of individuals statewide, with about \$1.75 billion of that total accruing to Indianapolis residents. In terms of after-tax income available for spending, central Indiana residents gain about \$1.2 billion, or about \$286 dollars for every man, woman and child. All of these dollar figures are measured in inflation-corrected, 1992 dollars.

The economic expansion expands the population base. Largely as a result of the increase in net migration resulting from improved job opportunities, the high tech scenario produces a population increase of about 39,500 in the short run statewide, growing eventually to more than 76,000 over a longer span of time.

The overall impact of the high tech stimulus over time increasingly favors the nonmanufacturing side of the economy. In particular, construction employment effects actually diminish over time, from 3,300 jobs in the short run to about 2,200 jobs in the long run. Services, trade, government and most other nonmanufacturing categories continue to rise, however. This pattern reflects the fact that the demographic changes caused by increased population in-migration, over time, tend to dominate the shorter lived impacts of the increased economic activity caused by the expansion itself.

As expected, a technology-led expansion adds significantly to the skilled labor force. Workers classified in the Executive and Administrative and the Professional and Specialty occupational categories, taken together, are projected to eventually number 15,800 higher than the baseline forecast.

The high tech expansion also adds significantly to the young and middle-aged portions of the population. In the short run, 9 out of every ten new residents of the state as a result of the high tech expansion are aged 44 or less.

Scenario 2: Above-Trend Technology Growth in the Indiana Economy

If the Indiana economy were to grow in a manner that produced the same concentration in HT in the state economy in year 2005 as that projected for the Illinois economy, we find that:

- (i) The state economy would need to increase its HT employment share by more than two percentage points, or by almost 60,000 jobs, in order to match the concentration of employment in HT industries expected to occur in Illinois in 2005;
- (ii) were such growth to occur, the state's economy would expand in the short run by about 120,000 jobs, one quarter of which would be in the manufacturing sector;
- (iii) in the long run, such growth would bring about an additional \$16 billion in economic output, raise employment in high skill jobs by almost 38,000, and result in a net increase in state population of about 175,000.

To achieve the Illinois industry mix, Indiana must grow to an HT concentration of 4.1 percent by the year 2005, from a share of 1.8 percent in HT jobs in 1997. Most of this job stimulus would come from four industries: Computer and data processing services, electronic computing equipment, radio and TV communications equipment, and research and testing services.

Above trend growth in the Indiana HT sector would produce a sizable stimulus to the overall economy. The 60,000 new primary jobs in high technology industries result in an immediate expansion in the state's payroll of 134,000 jobs, with about one third of that total occurring in the central region of the state. Those jobs produce just short of \$10 billion in additional economic output in the short run, growing to almost twice that figure in the long run.

The manufacturing sector captures nearly one out of every four new jobs created throughout the state. The above-average wages paid for many of the new jobs created, as well as the increase in wages of all industries that accompany the increased economic activity, result in gains in per

capita income. These gains amount to \$290 per person in central Indiana, and \$190 per person elsewhere.

The increased economic opportunity brought about by the economic expansion helps the state retain its population base and attract new residents. The HT expansion would increase population by 105,000 people in the short run, with that figure growing to 194,000 people over a longer time.

Growth in the technology sector of the economy has wide spread benefits. For both Indianapolis and the rest of the state, the industry group which stands to gain the most from HT growth is the services industries category. Construction activity is also pronounced in the short run, spurred by the increases in investment and in population. Local government employment, by contrast, is more stimulated in later years, as in-migration raises the number of school-aged children, leading to increased hiring of teachers.

In a scenario where the state share of HT employment matches that of our more populous neighbor to the west, the number of workers who hold jobs in the Professional and Specialty and the Executive and Administrative occupational categories eventually grows by almost 42,000 workers. However, an HT-led expansion leads to additional jobs in all occupational categories, not just those requiring educational and skill-based credentials.

As was the case in the IT-based Indianapolis growth scenario, a concentration of HT activity in Indiana induces changes to the state's population. Not only is there population growth in both central Indiana and in the rest of the state, but the population increases come primarily due to the in-migration of those of prime working age. More than 70 percent of the population increase that occurs by year 2005 is aged 44 or less. The increases in older aged cohorts in later years are primarily due to the earlier migration of the young.

Conclusion

Substantial expansion in Indiana's technology industries would have to occur in order for us to match the concentration of high tech firms expected to occur in Chicago or in Illinois, but in either case, the required job gains are less than 3 percent of total employment. Were those expansions to take place, there would be considerable benefit to sectors of the economy not commonly associated with high tech. This is the second important discovery of this report.

Finally, a technology-led expansion of the sort envisioned in this report directly addresses some of the longer-term challenges faced by the state economy in recent years. Such an expansion would add significantly to the number of high skilled jobs, would help boost both wages and per capita income for both new and existing jobs, and would increase the net migration of educated young people into the state.