County Income Growth: How Healthy? How Efficient?

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In the Summer issue of the *Indiana Business Review*, we looked at the growth of per capita personal income in Indiana counties since 1969. This growth rate can be a tricky number to interpret. Per capita personal income is the ratio of real personal income to population. Total income may be growing at a phenomenal rate, but if population grows at the same rapid rate, per capita personal income remains unchanged.

On the other hand, an equal increase in per capita personal income (PCPI) may mask very different underlying trends. From 1969 through 1997, for example, PCPI in Jay County grew about 1.15% per year. So did PCPI in Daviess County. Yet in Daviess County, both income and population showed signs of growth. In Jay County, income hardly changed, and population actually fell. But the growth rate in income per capita comes out the same.

How healthy?

So perhaps there are different kinds of growth. Whether healthy growth is occurring depends on which of the two components is growing or declining. One way to think about this is to consider the four possible combinations: income up, population up; income up, population down; income down, population up; and income down, population down. Some combinations may be healthier than others. **Figure 1** shows the relationships, in four quadrants.

All other things being equal, when both income and population are growing in a county, the county is experiencing prosperity. PCPI itself may rise a little or fall a little, depending on which factor is moving faster. But things are looking good. When both income and population are falling (the lower left quadrant), the county faces a general decline. Its economic life is slowly withering.

If total income is growing but the population is not, that may be a sign that older, wealthier residents are staying in a county but younger ones are leaving. Over the long term, this situation (the upper left quadrant) can erode the foundation of a county's economy.

A decline in total income in the face of growing population is another red flag. Shown in the lower right quadrant, these conditions will produce a major slide in per capita personal income. Such a county is attracting more and more people who have less and less money. A likely consequence is the increasing dependence of these relatively poorer residents on the more well-off counties.

For **Figure 2**, we fit a random walk percent change model to each county for the period 1969-1997. This provides an estimate of the "best fit" annual percent change. Each dot represents a county and gives its population and income growth rates. Because of the wide variability in year to year growth in some counties, the best fit annual percent change for one of the factors may be zero: no clear growth or decline pattern was present. These counties are shown at zero growth, and many of these points plotted on top of each other. (The

Figure 1

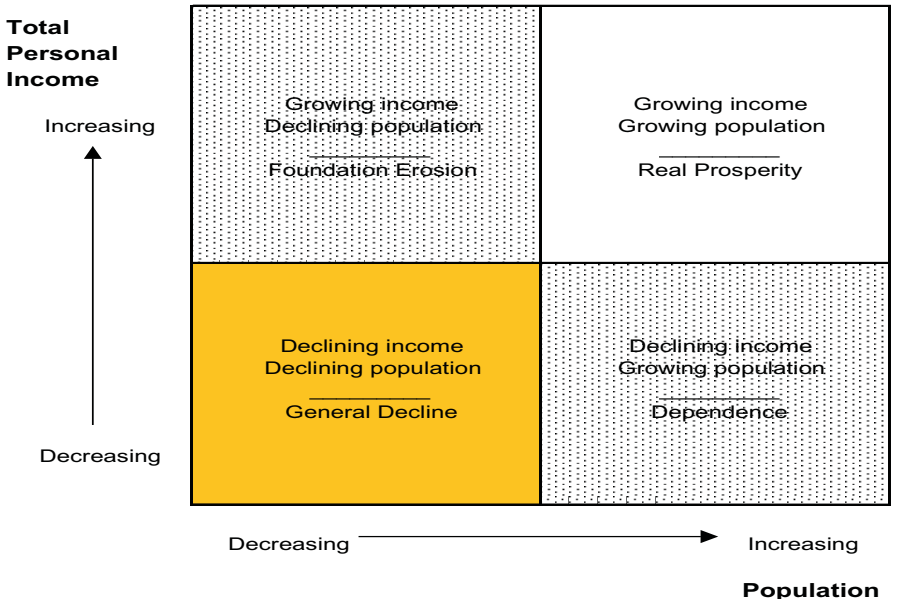
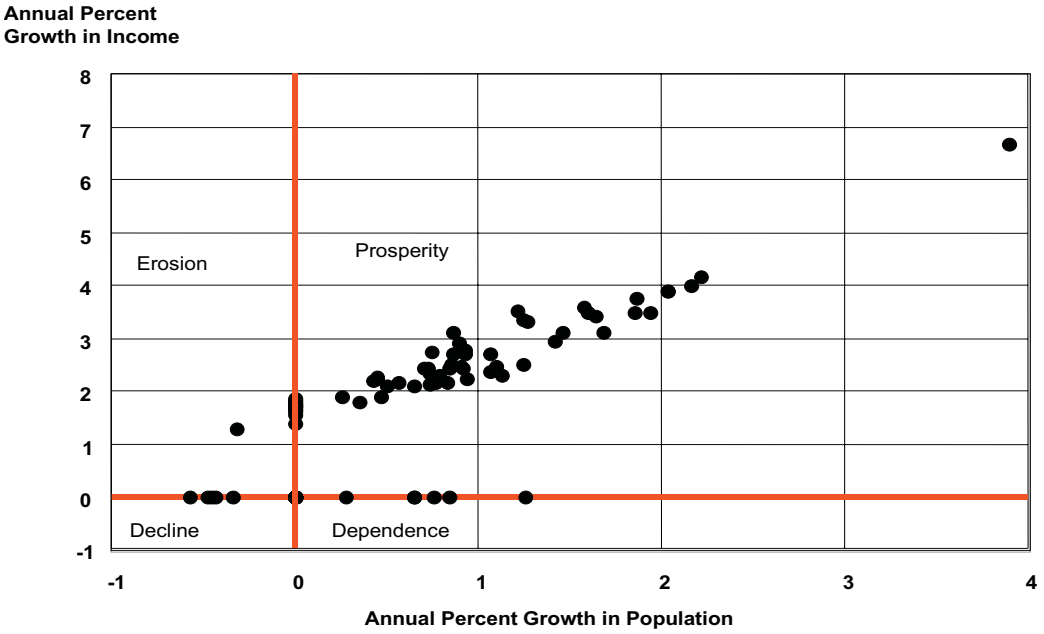


Figure 2



complete spreadsheet showing the annual percent change calculations for each county may be found on the IBR web version at *www.iupui.edu/it/ibrc/ibr*.

Forty-nine counties are firmly in the *Prosperity* quadrant, with significant growth in both population and total income (Hamilton county is the obvious winner in the upper right corner: very high growth in both factors). Another 11 average significant increases in income, while their population growth has been bouncing around zero (the points located on the vertical zero axis). No Indiana counties fall into the either the *Dependence* quadrant or the *Decline* quadrant. Several, however, showed a tendency toward a population increase with zero growth in income, and their data points are found toward the right along the horizontal axis. Jasper county is farthest out, with a 1.26% average population growth and no significant income growth.

A trend toward population decline shows up in six counties. They are represented by those points to the left of the vertical zero axis. In one of these shrinking counties, namely Vigo County, income has been rising, so its data point appears in the upper left quadrant. This combination suggests some long-term erosion of its economic foundation.

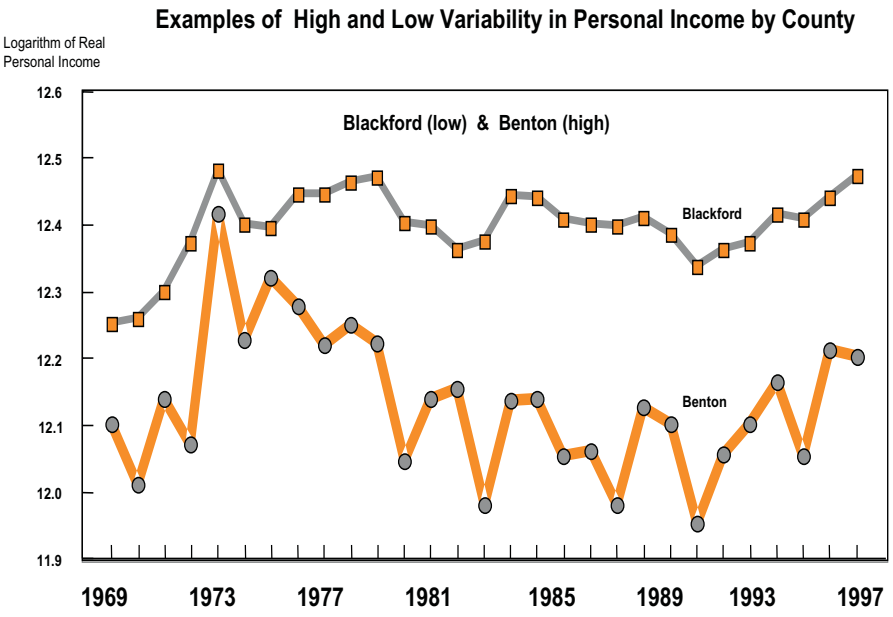
The other five counties losing population were Benton, Blackford, Grant, Lake and Wayne. In each, its total real personal income has been hovering around a zero growth rate.

How Efficient?

Although we have calculated an average percent change for the county growth rates, many counties do not stick to the average very closely. Income levels fluctuate much more widely than county populations. Annual changes in personal income are sometimes small, sometimes large, sometimes close to their average and sometimes far above or below it. Other counties appear to grow more steadily, with less meandering. **Figure 3** shows two examples. The estimate for average annual income growth in the counties of Blackford and Benton is zero. But Blackford's pattern appears much less variable than Benton's. So we may ask whether one kind of growth pattern is better than another. Perhaps there is an efficiency advantage in more stable growth and less extreme fluctuation.

To compare variability among counties, we looked at the typical variability around the average growth rate (technically, the standard deviation of the differences in the logarithms). Using that number we can estimate the average range of variation, expressed as plus or minus a number of percentage points. This range is a gauge of the extent to which a county bounces around above and below its average growth rate.

Figure 3



However, many exceptions can be found. It is not a very strong correlation (the actual correlation coefficient is about –0.4).

Using data from 1969 through 1997, we have arrived at average percent changes in county population and income statistics, the two components of per capita personal income. In about half of Indiana's counties, the annual change in both income and population is up. A few, however, show signs of weakness. This weakness comes about in two ways. Either the population is declining, which pushes these counties into the left quadrants on our diagram, or there is a lack of income growth. Without income growth, counties slide toward the lower quadrants of decline or dependence.

These estimated growth trends, however, are sometimes overshadowed by the large fluctuations in the measures. Still, many counties avoid much of an efficiency penalty. Counties whose income levels fluctuate widely can indeed be high growth counties, a fact that Lagrange county has proven. Over this period, personal income in Lagrange County grew at more than a 3% annual rate despite varying widely between plus or minus 12%.

The next question concerns variability inefficiency. More specifically, do counties with high variability exhibit lower growth rates? To answer that question, each county is plotted on the total income chart (see **figure 4**). Counties with high variability are farther to the right. Counties with high growth rates are closer to the top. (For the complete list of county growth rates and variability calculations, see the IBR website at *www.iupui.edu/it/ibrc/ibr*.

We can detect only a vague hint of a downward sloping pattern. There is a weak tendency for lower growth rates to be associated with higher variability.

Figure 4