The Causes of State Differences in Per Capita Income: How Does Indiana Fare?

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Introduction

Over the last two decades, per capita personal income has become an increasingly common measure of the effectiveness of economic development policy. Many states throughout the nation now include some measure of income in their formal performance measures. The use of income measures in benchmarking economic development policy is attractive for a number of reasons. Economic theory suggests that wages are closely linked to individual productivity, and, hence, are a potential measure of accumulated economic development efforts of all types. Likewise, higher personal income leads to an increased demand for goods and services, resulting, in part, in greater employment, investment, and production within a region. So, for policymakers who wish to monitor and assess public policy, personal income is an attractive choice for informative, yet low-cost, data to collect and observe. However, there are several important caveats to using personal income as a measure of economic development. These demand a more detailed analysis of the issue to fully inform policy choices.

Personal income on a per capita basis may vary dramatically at the state and county levels, due to factors such as the degree of urbanization, family composition, share of farming in a region, tax rates, human capital, and factors that are often labeled as socioeconomic, such as the share of immigrants or single-parent households.

The use of personal income measures for tracking and monitoring economic development efforts then suffers some weaknesses. Of the matters outlined above, some factors readily lend themselves to short-run public policy. Other factors can only be influenced in the longer run, while some factors may require several generations to adjust through policy efforts. Further, some of these factors might be entirely insensitive to policy efforts, while some other factors that depress incomes (such as high rates of agricultural production) are an economic development chimera. Farms hold great wealth but also garner low incomes as a consequence of ownership arrangements. Understanding these dimensions is critical in apprehending the role and scope of policy on personal income.

To that end, this study is designed to better explain personal income dynamics for Indiana within a national context. To perform this, we explore how personal income has changed over time, relative to the nation and surrounding states. We also provide a detailed discussion of the elements of personal income and how these have changed over time, and what these changes mean to overall Hoosier incomes. We also offer a section in which we examine those factors that lead to differences in personal income in the state. Here we provide estimates of various contributing factors to differences in personal income and why they matter for Indiana. In a subsequent section, we explore the role of causation of human capital to differences in income, and then provide a discussion of the role of income inequality and migration with respect to Indiana’s per capita income. We end with a discussion of policy considerations.

1. See, for example, Texas Ahead at http://www.texasahead.org/economy/sb275/edefexp.html.
Personal Income in Indiana

On a per capita basis, Indiana ranks 40th across the states in 2010, with the average resident receiving $34,042 in income from all sources. This is a decline from 1980, when Indiana ranked 30th, which itself is a decline from 1950, when we ranked 21st in the nation. The 1950 figure was a relative increase from 1930, in which we were 26th in the nation. Earlier data does not provide a reliable comparison. However, the relative decline in per capita income for Hoosiers when compared to Americans as a whole has been occurring since the middle of the last century and presents a troubling picture of economic development in our state. Before moving to a fuller analysis of personal incomes, a few clarifying points must be made.

To be clear, standards of living in Indiana have been growing, and have doubled in roughly the past fifty years. The standard of living of Hoosiers is twice what our parents enjoyed in the early 1960s. That rate of growth is tepid, hovering, on average, at 2.2 percent in inflation-adjusted terms over the past fifty years. As Figure 1 so clearly displays, there has been a steady divergence of incomes between Indiana and the nation as a whole over the past 50 years. Indeed, the last time Indiana and the nation as a whole had identical incomes was in 1964.

Further, we wish to emphasize that the concerns discussed here do not have a short-term policy dimension to them, but this does not mean policies do not matter. Efforts by one administration, or even several successive legislatures engaged in similar policy changes, will have a slow, but potentially critical, effect. For example, if we compare the relative per capita income share between Indiana and the U.S. each year from 1929 through 2010, we find no statistical difference between outcomes when Republican and Democratic governors were in office. Again, this does not mean that policy does not matter, simply that the impacts of policies that ultimately influence per capita income differences have long and variable lags.

Also, we wish to make clear that Indiana is not a poor place. Even with a long period of divergence between Hoosier and American incomes, from a worldwide perspective we remain an affluent place. To illustrate this, we provide a small sample of personal income on a per capita basis with which to compare ourselves. Table 1 illustrates the average relative income of Americans as a whole, Hoosiers, and a select number of example countries. Indiana’s income problems are solely a problem of economic performance relative to the nation as a whole.

The problem of declining relative income is among the chief sources of worry by policymakers in Indiana because lower per capita personal income may point to lower standards of living (a full accounting study would have to account for overall costs of living also). So, even while income grows, the income gap could be growing. The per capita income in Indiana from 1929 to 2010 in inflation-adjusted dollars clearly illustrates both the growth and divergence of incomes between Indiana and the nation as a whole.

It should also be apparent from Figure 1 that despite a trend of growth, it is not a constant process. Periods of rapid national income growth, such as during World War II, the late 1980s, and the late 1990s, also saw much faster relative growth in Indiana. Likewise, economic downturns such as the Great Depression, the 1981-1982 downturn, and the Great Recession of 2007-2009 saw declining growth rates in personal income.

Table 1. Relative Personal Incomes and Poverty

<table>
<thead>
<tr>
<th>Selected Places</th>
<th>Daily Income Per Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>$109.01</td>
</tr>
<tr>
<td>Indiana</td>
<td>$93.75</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>$84.81</td>
</tr>
<tr>
<td>Japan</td>
<td>$80.66</td>
</tr>
<tr>
<td>U.S. free/reduced lunch threshold</td>
<td>$57.50</td>
</tr>
<tr>
<td>Argentina</td>
<td>$35.12</td>
</tr>
<tr>
<td>Mexico</td>
<td>$34.80</td>
</tr>
<tr>
<td>U.S. poverty threshold</td>
<td>$31.08</td>
</tr>
<tr>
<td>Pakistan</td>
<td>$6.45</td>
</tr>
<tr>
<td>Haiti</td>
<td>$2.55</td>
</tr>
<tr>
<td>World poverty line</td>
<td>$1.25</td>
</tr>
<tr>
<td>Liberia</td>
<td>$0.77</td>
</tr>
</tbody>
</table>

Note: World poverty line from UN definition, U.S. from threshold for single adult
Source: World Bank (purchasing power parity) and author calculations

2. We compared income changes by individual party, not governor from 1929 through 2010, and compared the mean between the two samples using the well-known t-tests. The results unambiguously suggest that party affiliation has nothing to do with income differences in the short run.
Changes in Personal Income

Volatility in year-to-year changes in personal income has also dampened in recent decades. Economists refer to this as the Great Moderation. As Figure 2 illustrates, annualized percentage changes in personal income have grown remarkably steadier over time. With the exception of the post-9/11 recovery and the Great Recession, annual changes have virtually disappeared. This has been caused by a number of factors, including growth in transfer payments as a share of income (which we will discuss in more detail in later sections) as well as fundamental changes in economic performance, which are not fully understood. For some time, analysts have argued that the absence of broad economic shocks, or ‘luck’, has led to this moderation in income volatility. Much recent research suggests that better-informed monetary policy (which was a hallmark of the post-1981 recession) explain most of this moderation, along with fundamentally less-rapid adjustment of labor forces by firms. The slower adjustment of labor forces may be due to greater costs of rehiring, which might signal a growing skills mismatch over the same period. (3)

For the purposes of considering the effect of volatility on personal income, moderations in annual changes should be welcomed if they are not accompanied by a slowdown in trend growth or structural problems within labor markets. Sadly, there is at least some evidence that both slower income growth and higher rehiring costs have accompanied the lessened volatility of income growth in the United States. In addition to lessened volatility, we have observed some convergence of proximal states. While per capita incomes in Indiana have diverged from the nation as a whole, we are becoming more like our neighboring states. Figure 3 illustrates the incomes of Indiana and adjacent states relative to the nation as a whole. As is clear from this illustration, convergence of these regional economies is occurring.

Indeed, across the nation as a whole, state economies are less different from the national economy than they were a half-century ago. Still, some states have experienced periods of divergence from the national economy, and Indiana is among those states. (4)

Convergence of state economies has been analyzed periodically throughout the past half-century. Economic theory suggests that access to productivity capital and technology are sufficiently uniform to erase other regional differences (such as levels of human capital). Virtually all of these studies largely find that overall convergence is occurring. However, this convergence may be conditional on factors that limit availability of investment, or ‘club convergence,’ to a regional average. A fuller explanation of these factors is outside the scope of this analysis, but divergent tax policy, persistent gaps in human capital development, differentials in state regulatory climate, and other such policy-sensitive matters clearly may play a role in slowing convergence of incomes. We note, however, that in tax and regulatory policy, Indiana would possess significant advantages relative to all but a few states nationwide. In human capital acquisition and retention, we are at a relative disadvantage, given the levels of educational attainment of our residents. This matter should, therefore, be the focus of additional policy-focused analysis. Regional differences in cost of living also play a role in determining how the differences in income translate into a real standard of living measurement.

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4. See Hicks 2010 for a discussion and estimate of midwestern convergence.
Differences in Cost of Living, Family Size, and Per Capita Income

A comparison of urban consumer price indices (CPI), compiled by the Bureau of Labor Statistics, provides evidence of the degree of difference between selected larger regions and the nation as a whole. See Figure 4.

These indices clearly point to very small cost of living differentials between urban areas around the nation, but it is not static. Figure 5 shows the cost of living gap between the Midwest and the nation as a whole. In the most recent data available (mid 2012), the Midwest urban areas experienced cost of living differences roughly 2.9 percent lower than the nation as a whole, while the Northeast was 5.2 percent higher than the nation as a whole. The West was 2.5 percent higher than the nation as a whole, and the South was less than 1.5 percent lower than the nation as a whole. However, we would not be surprised to see smaller differences between urban consumers, solely due to land and rental price differences. Growth in the CPI gap between the Midwest and the nation as a whole has persistently favored the Midwest, albeit modestly.

A second data series contains information on some household products. The regional cost of living indices compiled by the Center for Community and Economic Research (C2ER) compiles regional cost data in 57 categories of consumer products and estimates differences based on these data. Table 2 illustrates recent estimates for Indiana.

The C2ER estimates from 2012 suggest a larger divergence between area living costs than does the CPI regional estimates. However, the CPI surveys 400 products and includes a broader set of expenditure categories that would better weight the differing types of consumption. Indeed, some potential distortion elements of this are plainly evident from the data. Health care, for example, is reported as only accounting for 4.4 percent of income by C2ER, while overall health care spending in the U.S. is almost 18 percent of GDP. Moreover, the variance of costs across regions is very large, with only utility costs exceeding it. While useful for comparison of what might be termed as living costs for a household constructing a budget, the C2ER data is neither as comprehensive nor comparable over time as the CPI data. So we must conclude that while individual variations in cost of living exist, they are most clearly not the cause of the large per capita income differences between Indiana and the nation as a whole.

The size of families might also contribute to regional variations in per capita income. For example, if households in two regions have the same earnings, but one region had even modestly smaller families, the region with the smaller family would have higher per capita income. To examine this, we calculated the average (mean) household size from 2005 to 2009 in the United States, which was 2.33 persons with a standard deviation of 0.15 persons. Over this period, Indiana has a mean household size that is slightly lower than the nation as a whole (2.30 persons), which is not statistically different from the national...
average. Moreover, the lower household size suggests that Indiana households, being smaller than the nation as a whole, would have higher per capita incomes if household earnings were held constant.

We will explore these and related differences in a later section, but from what we observe here, it is clear that household size and regional cost of living differences are not meaningfully contributing to per capita income differences between Indiana and the nation as a whole. Personal income, however, consists not simply of wages but also of all payments to individuals. It is that issue to which we now turn our attention.

Composition of Personal Income

Personal income is not simply wages, but it also consists of transfer payments, retirement payments, payments for factors of production (such as land and capital), and all types of wage and income disbursements. Figure 6 provides the change in shares of wage-related and work-related income, returns to investments (land and capital), and government transfer payments (Welfare, Social Security, Temporary Assistance to Needy Families, etc.).

To clarify these dynamics for Indiana, we construct three graphics that portray the per capita share of each type of personal income flow along with their subcomponents into Indiana relative to the nation as a whole. So, if Indiana has the same per capita payment of each component of personal income, we would expect a flat line, creating a value of 1.0 (100 percent). Any amount greater than 1.0 represents a greater than average per capita share of that component of personal income for Hoosiers, while a value less than 1.0 represents a lower per capita level of that component. We begin with transfer payments, entitlement, and retirement income.

Figure 7 portrays Indiana’s relative contribution of transfer payments (the total of the three components), per capita income maintenance (primarily Social Security payments to non-retirees and Temporary Assistance to Needy Families), and unemployment compensation. As is clear from this graph, with the exception of unemployment compensation, which is both small and subject to very large recessionary swings, Indiana is becoming more like the U.S. over time. While modestly lower, these factors contribute to our similarity, not difference, to the U.S. as a whole.

Data on payments to owners of land and capital in Indiana paint a clear picture of recent divergence from the national level of incomes. Figure 8 displays the relative per capita income from dividends to stockholders, interest rates for holders of financial instruments and rent to landowners and property owners. Over the past 55 years, we have observed only seven years where the per capita payments of any of these components of income have reached or exceeded the national average. Moreover, from the late 1990s to the Great Recession, the relative decline of these payments has been profound, with a roughly 20 percent decline. The sole good news in these data is that the rapid decline in these payments relative to the nation as a whole stabilized during the Great Recession.
Dividend and interest payments are those components of income associated with previous earnings. Interest payments accrue on saved income held in such financial instruments as bonds, money market accounts, and savings accounts. Dividends are payments made to capital gains through investments. These include traditional invested income and retirement plans such as 401(k) accounts. The average dividend of an Indiana resident peaked above the national level in 2001 and 2002, suggesting that the composition of holdings during that business cycle played a part in relatively good performance in Indiana. Since then, a steady drop in dividends and interest has occurred.

What is most worrisome in the amount of change in these data is the sharp decline in rents from the mid-1970s through early 1980s. Among the components of personal income in Indiana, none show a more marked change than this. This suggests that a greater focus on rents as a source of income divergence for Indiana and the nation is warranted. The national profile of rents as an important source of income is shown in Figure 9.

With Indiana’s sharp decline in rents during the late 1970s, it is important to understand what economic factors could have contributed to this divergence. Rents, as reported by the Bureau of Economic Analysis, will include agricultural rental agreements, or royalties for natural resource extraction. While there are clearly other components to this element of personal income, a sharp change in the share of personal income suggests that agricultural conditions played a role in this large drop. To investigate this, we examine commodity price during this period. We begin by examining the real price of corn, as depicted in Figure 10. As is clear from this graphic, the real price of corn (which is highly correlated with other agricultural commodities) rose quickly in the early 1970s. It then dropped precipitously from the mid-decade through the mid-1980s, a period in which rents also declined.

The statistical relationship between commodity prices (real corn price per bushel) and per capita rents in Indiana were confirmed through an empirical test known as cointegration. In this test, variables are said to be cointegrated if the observed variables change over time in a related and consistent way. Rent payments on a per capita basis and real corn prices move together (or are cointegrated) to a high degree of statistical certainty.

The rapid decline in commodity prices would appear to argue that rents would decline, but other cost declines might also play a role.

5. See Bureau of Economic Analysis, Regional Economic Information Systems

While there are clearly other components to personal income, a sharp change in the share of personal income suggests that agricultural conditions played a role in this large drop.
However, the U.S. Department of Agriculture also maintains models of farming costs, productivity, and returns. Using the department’s model from 1975 to 1995, we obtain the annual return to management (and risk payments) associated with corn farming. These data provide strong evidence that the value of land rents associated with farming would almost certainly experience the deep and persistent change observed in Figure 9. Indeed, the rate of return on farming from the late 1970s throughout the ensuing decade was actually negative (Figure 11). This strongly suggests that the unusual decline in the rent component of personal income in Indiana was associated with declines in the returns on farming.

Overall, Hoosiers have seen very sharp declines and a decade of very poor performance in income earned from dividends, interest, and rents. This is a source of real concern because these elements comprise about one-fifth of all income earned. Moreover, the movement from defined benefit retirement plans to defined contributions suggests this will increase with time. However, the relative per capita earnings in dividends and interest ultimately derive from income, since savings and purchases of financial investments are largely tied to wage levels.

Wages, salaries, and proprietor’s income comprise the largest portion of income sources. The data on these is not as lengthy as on other income components, but we see that, relative to the nation as a whole, Hoosier personal incomes have been declining for almost four decades (Figure 12). This trend is the source of the remarkable divergence in per capita personal income and therefore deserves special attention.

Figure 12. Wage-Based Incomes, 1969-2010

About one-fifth of all income earned by Hoosiers is earned from dividends, interest, and rents, which all have seen very sharp declines and a decade of very poor performance.
What Causes Differences in Per Capita Income?

For purposes of policy development, a central question regarding per capita income differences concerns the measurements of factors that contribute to differences across regions. There is a long history of examining these issues. A 1950 study (Fulmer) estimated cross state differences in earnings in a statistical model, in which the share of labor force in agriculture, the labor force participation rate, demographic data, and median years of schooling explained per capita earnings. His study found all four variables statistically significant, with the largest effects in labor force participation, followed by agricultural share, then human capital and, finally, racial composition.

Hanna (1951) published a study in which differences in industrial composition of then all 48 states were compared. He found that there were industry specific causes to per capita income differences, which is to be expected given relative skill differences across occupation mixes. He also concluded that linkages to lower or higher wages across all sectors occurred across regions, and that there were supply side effects to wages (places with lower wages in one sector tended to have lower wages in other industrial sectors as well).

Industrial diversity in states has been examined as a source of stability in states across the business cycle (Israeli and Murphy 2003). In this study, the authors find that more diverse economies (those with more even shares in a particular sector) lead to increased employment. There is weak evidence that states with higher concentrations in one industry have higher per capita incomes when controlling for other factors.

Connaughton and Madsen (2004) reexamined some of the hypotheses tested in the studies from the 1950s. When comparing census data from 1950 through 2000, they found that racial composition could no longer explain differences in state personal incomes. Instead, urbanization, share of population with a four-year college degree, and the share of service sector employment all positively correlated with higher levels of per capita income in a state.

These studies provide representative samples of analyses of personal income studies, and motivate some further analysis that may illuminate statewide differences in personal income. One extension of this work is to estimate the responsiveness of personal income across the 50 states, to relative differences in factors mentioned above or factors appearing elsewhere in the literature. To do so, we prepared the most basic of economic models, accounting for the responsiveness of relative personal income in the 50 states, based on factors such as educational attainment, labor force and dependency rates, industry structure, costs, exports, and population variability.

The response of personal income to a 1.0 percent change in each of these factors is displayed in Figure 13.

This approach to estimating the relative importance of each factor is useful in highlighting how individual elements of economics and governance play a role in changing personal income.

Of course, this sort of model does not provide convincing evidence of causation, but even a casual observer of economic research should by now be aware that human capital plays a dominant role in personal income. These results say that human capital plays almost all the role because college education, the dependency ratio's labor force participation, population variance, and urban agglomerations are all related to human capital for a region. These variables describe either the level of education, or the ability of a region to attract educated adults. Once these factors are accounted for, there is almost nothing with which a policymaker can influence per capita income. Still, exploring causation between incomes and regional inputs remains an important part of explaining personal income.
The Long-Term Role of Human Capital

A number of studies have attempted to discern the effect of human capital on regional growth. These types of studies are important in their ability to isolate specific characteristics of human capital (such as health, literacy, educational attainment, and social capital) on regional differences in economic performance. These studies also measure the overall role of proxy measurements of human capital. This research provides deep insight into the most effective human capital investments for both regions and individuals. In order to illustrate the role of human capital in growth, we have tested two families of economic growth models. The first of these is a model in which regional economic growth is a function of human capital, physical capital, and employment. This is the canonical approach, which appears as:

\[ Y = f(H, K, N) = a(t) \left( H^\alpha, K^\beta, N^\theta \right) \]

Where \( Y \) is state GDP, \( a \) is a common technology coefficient, \( H \) is human capital (bachelor’s and associate degree completion rates), \( K \) is physical capital (the sum of investment, rents, and profits in each state over the previous decade), and \( N \) is employment in each state. The goal of these models is to show how human capital, physical capital, and employment impact economic growth.

The second model we test is explicitly derived from Mankiw, Romer, and Weil (1992), which is perhaps the most influential model of the past quarter century. This model crafted an empirical strategy for explaining economic growth as an internal function of high savings rates and previous investments in human and physical capital. This model tests the role of the share of investments and past levels of investment. It is:

\[ \Delta \log Y = f(H, K, N) = a(t) + \delta \log Y - \log Y_{-1} + \alpha(H/Y)_{-1} + \beta(K/Y)_{-1} + \theta \Delta \log N - \log N_{-1} \]

Table 3. Estimation Results and Comparison

<table>
<thead>
<tr>
<th></th>
<th>( \alpha ) (Human Capital)</th>
<th>( \beta ) (Physical Capital)</th>
<th>( \theta ) (Employment)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Equation 1</strong></td>
<td>0.16</td>
<td>0.47</td>
<td>0.73</td>
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<td>Basic form</td>
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<tr>
<td>Basic form with fixed effects</td>
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<td>0.50</td>
<td>0.81</td>
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<tr>
<td>Basic form with state varying parameter</td>
<td>0.22</td>
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<td>0.79</td>
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<td>Per worker model</td>
<td>0.017</td>
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<tr>
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<td><strong>Comparisons to Equation 1: Other studies of human capital</strong></td>
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<tr>
<td>Judson 1995</td>
<td>0.098</td>
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<td>-</td>
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<td><strong>Equation 2</strong></td>
<td>0.28</td>
<td>1.99</td>
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<tr>
<td>Basic form</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Basic form with fixed effects</td>
<td>0.28</td>
<td>1.99</td>
<td>n/a</td>
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<tr>
<td>Comparisons to Equation 2: Other studies on human capital</td>
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<tr>
<td>Mankiw, Romer, and Weil 1992; international data</td>
<td>0.28</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Romer 1990</td>
<td>0.25</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Note: All coefficients are statistically meaningful at commonly reported levels.

Source: Author calculations and research

We test both models on the United States in 1990, 2000, and 2010. These data include levels of educational attainment of adults (bachelor’s and associate degrees), employment, the gross domestic product for each state, and a proxy for physical capital (investment, rents, and profits in each state accumulated over the previous decade). All nominal variables are adjusted for inflation.

**Equation 2** requires only the addition of an error term to produce an empirically testable model. **Equation 1** requires some adjustment prior to estimation. We perform a logarithmic transformation of **Equation 1** above, and differentiate with respect to time. This places all the variables in a common format so that coefficients may be compared, in order to assess relative magnitudes. For both models, we are interested in the level of \( \alpha \). In addition to the specification of **Equation 1**, we conduct several small modifications – transforming the data into a per worker model, allowing the coefficients to vary by state, and adjusting assumptions regarding the ordinary least squares estimate. Results appear in **Table 3**.

These models show strong parameter stability, and are remarkably similar to earlier studies. What they tell us is that a simple factor like educational attainment explains a significant share of overall economic growth (and hence personal income) within a state. For example, a 1.0 percent increase in human capital, as measured by educational attainment, would boost overall statewide economic activity by almost a quarter of a percentage point. This is the source of long-standing interest in human capital as a source of regional growth.

Ultimately, these models build the relationships of causation: strong theory and empirical testing. The conclusions surrounding this estimate and those to which it is compared is simply that human capital determines income levels within a region.
Migration, Earnings, Income Distribution, and State Personal Income

Among the contributions to per capita income is migration between states and regions. As our elasticity estimate above suggests, population variance might contribute modestly to per capita income differences. It is also important to better understand who is moving to and from Indiana. The questions of importance are “How big is migration?” and “What are the incomes of those who migrate to and from Indiana?” To answer these, we use Internal Revenue Service data on federal tax filers each year. These data are aggregated and reported in differing income levels, along with total adjusted gross income (which should be very strongly correlated with per capita income).

We first examine the amount of migration. Over the time range of 2004 to 2010, we find that 14.7 percent of the state’s population (non-leaver base) in-migrated to Indiana, while 15.22 percent out-migrated. The total was a decline of 0.52 percent of the state’s stable (or non-leaver) population over this period. See Table 4.

These data are not available for a long time series, and fall across the Great Recession, when national migration slowed dramatically. However, the household incomes of in-migrants and out-migrants are of great interest (Figure 14). In the first years of our data (2004 to 2005 migration) we see a large gap in household earnings ($3,416) between those who leave the state and those who move to the state. This suggests Indiana is doing poorly in terms of attracting and retaining high-income households, a trend that persisted until the end of the Great Recession, when the incomes of in-migrants exceeded those of out-migrants for the first time in our data series (a $1,075 gap). This gap was almost wholly due to lessened out-migration by more affluent Hoosier households. If this is a permanent trend, it argues that Indiana will see some convergence in earnings, driven by in-migration to the state from international and U.S. residents. However, given the continued net out-migration, a trend at this level will not be sufficient to close the income gap. Many more high-income Hoosiers will have to remain in the state, and many more affluent households will have to migrate to Indiana. The composition of migrating households is also important. Table 5 illustrates the number, family size, and household earnings of migrants and non-migrants annualized between 2004 and 2010.

To reduce the income gap between the state and the nation, Indiana must focus on both retaining many more high-income Hoosiers and attracting many more affluent households.

### Table 4. Migration in Indiana, 2004-2010

<table>
<thead>
<tr>
<th>Year of Migration</th>
<th>In-Migration</th>
<th>Out-Migration</th>
<th>Net Migration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004 to 2005</td>
<td>2.54%</td>
<td>2.58%</td>
<td>-0.04%</td>
</tr>
<tr>
<td>2005 to 2006</td>
<td>2.64%</td>
<td>2.65%</td>
<td>-0.02%</td>
</tr>
<tr>
<td>2006 to 2007</td>
<td>2.55%</td>
<td>2.63%</td>
<td>-0.08%</td>
</tr>
<tr>
<td>2007 to 2008</td>
<td>2.52%</td>
<td>2.58%</td>
<td>-0.06%</td>
</tr>
<tr>
<td>2008 to 2009</td>
<td>2.34%</td>
<td>2.46%</td>
<td>-0.13%</td>
</tr>
<tr>
<td>2009 to 2010</td>
<td>2.11%</td>
<td>2.31%</td>
<td>-0.20%</td>
</tr>
<tr>
<td>Total 2004 to 2010</td>
<td>14.70%</td>
<td>15.22%</td>
<td>-0.52%</td>
</tr>
</tbody>
</table>

Source: Internal Revenue Service
**Income Distribution and Inequality**

The role of income inequality and regional growth has also seen a small body of research. Partridge (2004) formulates the most complete test of state-level income inequality and growth. He found short-run effects highly uncertain, but determined a strong long-run relationship between growth and a larger middle class, as well as growth and higher income inequality. These are not necessarily incompatible findings, since a large middle class may not dampen, for example, large income gaps between the rich and poor. In particular, Partridge noted that much additional research on the causes and consequences of income inequality and growth were needed. For example, are income differences motivated by changes in labor markets and worker migration, or is it due to changes in capital payments? One favors workers, the other favors holders of wealth, and so the source of growth could motivate income inequality while raising all incomes at different levels.

The evidence in Indiana over the long run is not clear. *Figure 15* illustrates Indiana’s relative per capita income (U.S. = 1.0) graphed against the log of the income ratio between the top 10 percent earners and the median household income. These data show a declining income share, with a rising income gap from 1963 to 2004 (income data are from the Sage Foundation 2007). Caution should be exercised when using this data to determine the relationship between income and state growth; a far more detailed analysis would be required to conclude that income inequality within Indiana is causing slower growth in the state or vice-versa.

When comparing changes to income inequality and Indiana’s personal income relative to the nation, more obvious linkages appear. *Figure 16* illustrates the change in the five-year moving average of Indiana’s relative per capita income and a widely used measure of income inequality, the Gini index. These data clearly show long procyclical movements between Indiana’s relative income and income inequality. The trends appear to confirm earlier research (Partridge 2004), and suggest that the very strong divergence that occurred in the late 1970s was a period of less proximal linkage between these two variables. As with *Figure 15*, this figure suggests some long-term relationship between income inequality and Indiana’s relative per capita income. The full causes of this are well outside the scope of this study.

We now turn our attention to county-level income differences.

**County-Level Differences in Personal Income**

Within Indiana, there are stark differences in per capita personal income. The causes of these differences are many, as we will later discuss. But in this section, we illustrate how different Indiana regions have changed over time. *Figure 17* illustrates a very simple analysis, highlighting relative per capita income differences within Indiana’s counties. In this analysis, we date the current per capita income in each Indiana county to the most recent year in which that value was equal to the U.S. per capita income. We place all values in 2010 inflation-adjusted numbers. This figure then provides the year in which the current standard of living in each Indiana county was equal to the standard of living in the nation as a whole.

For example, residents in Marion County had an average personal income in 2010 equivalent to the national average in 1999. The bulk of counties in Indiana experienced personal income levels that were 20 years to 30 years behind the national average. Three counties earned at 2010 national levels (Hancock, Porter, and Warrick counties) and two counties earned more than the national average (Boone and Hamilton counties). Interestingly enough, because of Indiana’s population distribution, the state average is at the 1996 national average. For a geographic map of personal income by county, see *Figure 18*.

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6. Also, the link between income inequality and growth (positively correlated) has a fairly long history as embodied in the Kuznets curve, a full review of which is outside the scope of this study (see Kuznets 1955).
Conclusions and Policy Considerations

This study examined the dynamics of Indiana’s per capita income over time, and compared this to national and regional changes. We first examined the components of personal income, and then reviewed and estimated how various factors, such as education and urbanization, were related to income differences. We examined the link of causation between human capital and economic growth, and we provided evidence in the migration data that Hoosier migration is likely causing a per capita income drain (though the most recent year is a sign of good news). Finally, we discussed individual and regional income inequality, providing a very stark comparison of standards of living in Hoosier counties. This research has resulted in two main conclusions and several policy recommendations for Hoosiers over the coming decade.

We begin by cautiously applauding the goal of boosting per capita incomes adopted by public and private sector organizations. Per capita income is a strong measure of standard of living, and its increase will have laudable effects on the states’ citizens. However, changes to policies and programs have long and variable lags. It is nearly certain that no policy, no matter how ambitious, effective, or wide reaching, will achieve measurable income goals over the term limit of a governor.

The first conclusion is that it is very clear that the per capita income gap in Indiana has a very strong human capital dimension. The largest difference between regions is associated most robustly with educational attainment at the bachelor’s degree and beyond. However, educational attainment at the high school level is directly associated with labor force participation. So, efforts to boost labor force participation or reduce the dependency rates (both of which have significant effects on per capita income) will likely occur at the K-12 level. While there is some proof that exposure to some college or the acquisition of an associate degree confers some wage or benefit, this effect varies dramatically by occupation and age (see review by Kane and Rouse 1999 and Day and Newberger 2002). Therefore, policies that focus on educational credentials without

Figure 17. Standard of Living Year for Indiana’s Counties as Compared to the U.S.*

* The average personal income for each county in 2010 was calculated and then graphed with the corresponding year of the national average personal income (inflation-adjusted for 2010)

Source: Author calculations
attention to the type of learning will exhibit highly variable and uncertain benefits.

Second, it is clear that place-based differences play a very large role in per capita income. While it is more difficult to measure this at the county and state level, it is clear that regional attractiveness to residents plays a major role in per capita income differences across states and counties. This study reports the results of analysis of migration patterns to describe the exodus of higher-income earners with lower-income replacements. The matter has been examined in greater detail in other settings. A recent study, which constructed an amenity-based assessment of Indiana’s counties (Devaraj, Heupel, and Hicks 2012), provides more detailed evidence of this relationship. To better illustrate this, we plot the average community rankings at the county level in Indiana against the standard of living year computed previously. This offers a more complete picture of quality of place and human capital dimensions, compared to differences in per capita income (reflected by the standard of living year). That result appears in Figure 19.

This very strong relationship, along with the results outlined above, suggests more comprehensive ‘place-based’ policies in Indiana, designed to attract and retain high-income households. Such policies at the state level should be designed to create conditions in which communities can develop residential attraction policies that suit their particular suite of amenities, local preferences, and budget constraints. State-level policies designed to help communities better plan investments and consolidate resource intensive activities will occur across a wide spectrum of public and private activities, which support residential investment.

Finally, this work has not evaluated the role of top-down economic development incentives and efforts. It is clear that matters such as tax policy play a role in differential regional development, but the subsequent link to per capita income growth is extremely tenuous. Our decision to exclude these and other matters was made through a deliberate reading of economic literature on the matter. The issues explored in this study are not exhaustive, but they do represent the bulk of evidence regarding differences in levels and rates of growth in state per capita income in the United States over the past half-century.

Figure 18. Average Personal Income by County, 2010

Source: Data from Bureau of Economic Analysis and base map from U.S. Geological Survey

Figure 19. Community Asset Ranking and Standard of Living Year for Indiana’s Counties

Source: Author calculations for standard of living year (X axis) and Community Asset Inventory and Rankings (Y axis)
References


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