The State of the Rural Economy in Indiana

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Ball State University

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TABLE OF CONTENTS

Introduction – Why Study Rural Places?

Indiana's 48 rural counties are home to one in five Hoosiers. Although the share of rural population has been in decline since statehood, the total rural population in the state today is similar to that of the late 1940s *(Figure i)*. Rural businesses produce a large share of state Gross Domestic Product (GDP) across every economic sector, and despite a shrinking workforce, the GDP from rural Indiana has risen by more than $11 billion during the first two decades of this new century. Still, the rural economy of every U.S. state faces many challenges, and these communities and their people are worthy of additional research and policy consideration.

Figure i, Rural Share of Indiana's Population, 1900-2019
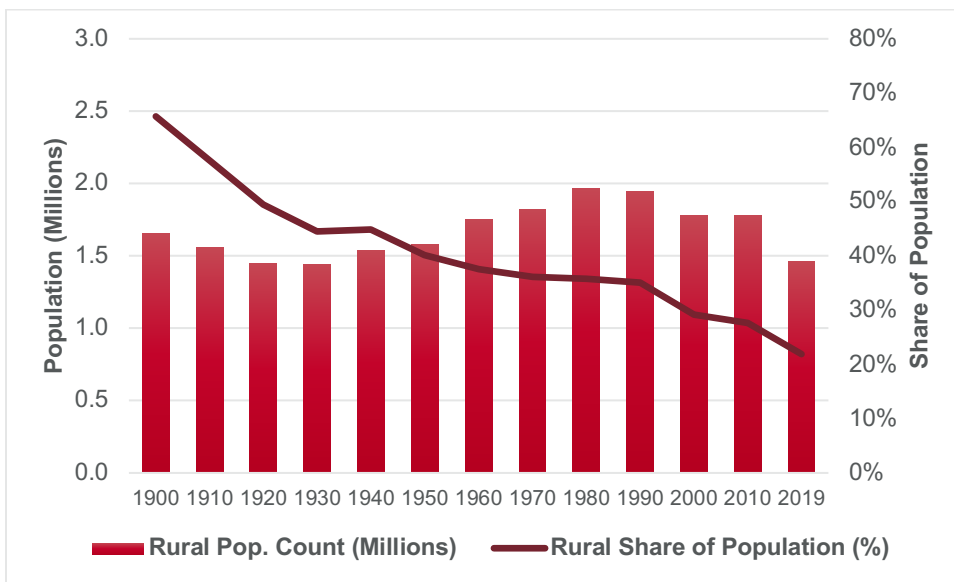
Source: U.S. Census, various years and Iowa Data Center
  https://www.iowadatacenter.org/datatables/UnitedStates/urusstpop19002000.pdf

Few places warrant a detailed rural analysis more than does Indiana. Indiana enjoys a compact urban geography—all locations in the state lie within 45 miles of the center of a metropolitan county. Indeed, less than 1.45 percent of Indiana's population lives farther than 30 miles from a metropolitan area (Hicks, Terrell, and Heupel, 2015). This compactness ties together urban and rural Hoosiers more fully than in most states with a large rural geography—especially those located west of the Mississippi River. Indiana's rural-urban linkages exist across many domains, from labor and goods markets, to logistics, and to leisure and recreational services; and they have some symmetry. Employees freely commute between rural and urban locations for work, and urban and rural residents alike visit the other's domain for recreation. Our goods move across highways and routes that cross the full geography of our state, and the production of even the simplest good or service uses a vast array of inputs from both rural and urban places.

It is worth noting from the very outset that Indiana's rural and urban places are more alike than they are different. The demographics of businesses and families are fairly similar, as are the distribution of businesses and the availability and quality of public services. However, in some of these areas, small differences matter greatly to economic outcomes. While our analysis acknowledges broad similarities, much of our focus is on differences and why they matter.

This study is separated into four sections. First, we provide a series of descriptive statistics about the rural economy. Much of this involves comparing urban and rural places both in Indiana and across the nation as a whole. This first section might be best thought of as a treatment of economic outcomes, and includes discussion about GDP, per capita income, changing economic structures, firm dynamics, and entrepreneurship.

The second section more closely inspects those elements of the rural economy that are considered economic inputs, including demographics, population projections, and health outcomes of rural Hoosiers. We examine employment, the mix of industries, and changes over time, and we make a close study of the human capital and educational differences between rural and urban Indiana. We also report the size and type of capital stock, a detailed treatment of housing markets, and the tax burden and capacity of counties. Finally, we devote significant space to the size, scope, and fragmentation of local governments.

Our third section surveys special issues of importance to the rural economy. Here we look at the components of population change in rural Indiana, including the role of urban reclassification and the movement of people through commuting, migration, and immigration. We spend considerable space discussing quality of life and economic growth in rural Indiana, focusing on a new market-based measurement of quality of life in rural places, and changes to manufacturing, agriculture, logistics, and services in rural places. We discuss both the size and scope of these industries and the potential changes in employment likely to occur in coming years. This section also considers the incredibly timely issues of broadband deployment in rural Indiana, and the potential changes to rural Indiana in a post-COVID world, in which a substantial share of work can be performed remotely.

Our fourth and final section provides a lengthy summary of our findings, tying together these disparate elements into a research-based narrative of rural Indiana. Here we focus on those factors that demonstrate a causal link to economic growth, which challenge many common perceptions about growth in a modern economy.

There are a few issues regarding data, definitions, and time periods we should clarify at the beginning. Most of this study is focused on the 21st century, though we do discuss some matters in a longer historical context. That said, not every section uses the same period for reasons that we explain here. The U.S. changed its method of identifying industries after 2000, and rather than merging two data sets that can introduce error and confusion, we opted to report most of our GDP and employment data starting in 2001 or later. Other data, e.g. population, did
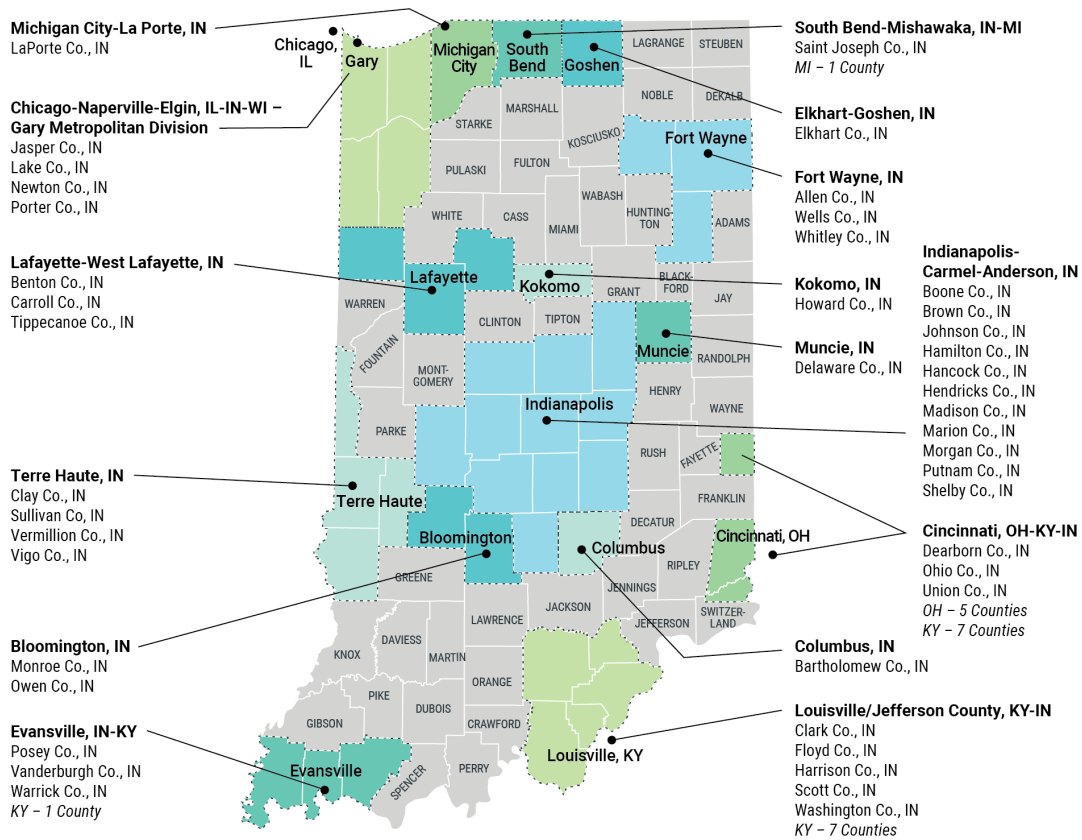
not change definition so we may seamlessly use data from 2000 or earlier. Finally, some of our research focuses on the period following the Great Recession, which constrains the years we report.

Likewise, for most of our analyses we use the most up-to-date data available from federal sources, which are typically lagged by one or two years. This means that many analyses use data through 2019 simply because it is the most recent data available to us. When available, we do use later data as appropriate, most often in a few employment data sets from the Bureau of Labor Statistics. In all of these cases, we have examined earlier and later data. If extending the data by a few months or years materially changes the conclusion, we discuss this in the corresponding section and describe why it matters.

Finally, while there are many ways to define "rural," we use the U.S. Office of Management and Budget definition of "metropolitan" to mean "urban" and "non-metropolitan" to mean "rural." It is an imperfect definition—in fact, the Indiana Office of Community and Rural Affairs (OCRA) uses a more expansive definition—but the OMB's definition is the most commonly used definition in academic research partially because it corresponds quite readily with available data at the county level. In general, any change in definition incurs a very modest difference in the interpretation of findings. We do devote a chapter to the challenge of defining "rural" and "urban" and the strengths and weaknesses of each approach; we acknowledge that every urban county in Indiana has some rural areas, and every rural county has some urban places. The findings we report here are applicable to those places regardless of the formal definition.

Figure ii shows which Indiana counties in 2019 lie within or outside the boundaries of metropolitan statistical areas (MSAs). Those included in an MSA are shaded in blues and considered as urban for our purposes. Those shaded in gray are not a part of an MSA and are considered as rural.

Figure ii, Metropolitan Statistical Areas (MSAs) and Non-Metropolitan Counties in Indiana, 2019

Michigan City-La Porte, IN
LaPorte Co., IN

**Chicago-Naperville-Elgin, IL-IN-WI –
Gary Metropolitan Division**
Jasper Co., IN
Lake Co., IN
Newton Co., IN
Porter Co., IN

Lafayette-West Lafayette, IN
Benton Co., IN
Carroll Co., IN
Tippecanoe Co., IN

Terre Haute, IN
Clay Co., IN
Sullivan Co, IN
Vermillion Co., IN
Vigo Co., IN

Bloomington, IN
Monroe Co., IN
Owen Co., IN

Evansville, IN-KY
Posey Co., IN
Vanderburgh Co., IN
Warrick Co., IN
KY – 1 County

South Bend-Mishawaka, IN-MI
Saint Joseph Co., IN
MI – 1 County

Elkhart-Goshen, IN
Elkhart Co., IN

Fort Wayne, IN
Allen Co., IN
Wells Co., IN
Whitley Co., IN

**Indianapolis-
Carmel-Anderson, IN**
Boone Co., IN
Brown Co., IN
Johnson Co., IN
Hamilton Co., IN
Hancock Co., IN
Hendricks Co., IN
Madison Co., IN
Marion Co., IN
Morgan Co., IN
Putnam Co., IN
Shelby Co., IN

Kokomo, IN
Howard Co., IN

Muncie, IN
Delaware Co., IN

Cincinnati, OH-KY-IN
Dearborn Co., IN
Ohio Co., IN
Union Co., IN
OH – 5 Counties
KY – 7 Counties

Columbus, IN
Bartholomew Co., IN

Louisville/Jefferson County, KY-IN
Clark Co., IN
Floyd Co., IN
Harrison Co., IN
Scott Co., IN
Washington Co., IN
KY – 7 Counties

Source: Data from U.S. Office of Management and Budget; base map from NationalAtlas.gov
Note: Urban counties (part of an MSA) are shaded in blue; rural counties (non-metro) are shaded in gray.
Note 2: The OMB determines which counties are included in each MSA and updates the boundaries periodically. The Cincinnati MSA has included and excluded Franklin County and Union County at various times. In 2019 (most recent date for many data sets), Union County was included in the Cincinnati MSA and Franklin County was excluded. OMB updates are discussed in Chapter 13.

The Rural and Urban Economy

In this section we provide a broad description of the economy in Indiana with a specific focus on the size, scope, and growth differences and similarities between rural and urban. We examine the economy through what are often termed "outputs" to economic activity, such as gross domestic product, per capita incomes, and business dynamics. We also include entrepreneurship in this chapter since the measures we use so closely align to business dynamics metrics. We begin with the size of the rural and urban economies.

Chapter 1. Rural GDP Growth

Understanding Indiana's rural economy begins with definitions. The Gross Domestic Product (GDP) is a broad measure of the dollar value of goods and services produced within a region. It is an imperfect, but useful, measure of the size of an economy. It is useful because GDP measures production from all sources of inputs, such as land, workers, and equipment. It is imperfect because it does not capture informal work or the value of non-traded activities, like home labor, which we know are more common in rural places than in urban. Despite these problems, the relative size and composition of GDP influence public policy in a number of ways, including investments in education, infrastructure, and other issues. For these reasons, it is helpful to understand the size and scope of the rural and urban economy as well as how they change over time. Here we report the growth of GDP since 2001 (the turn of the century) using county-level GDP data.

Figure 1.1, Cumulative GDP Growth in Rural and Urban Indiana, 2001-2019
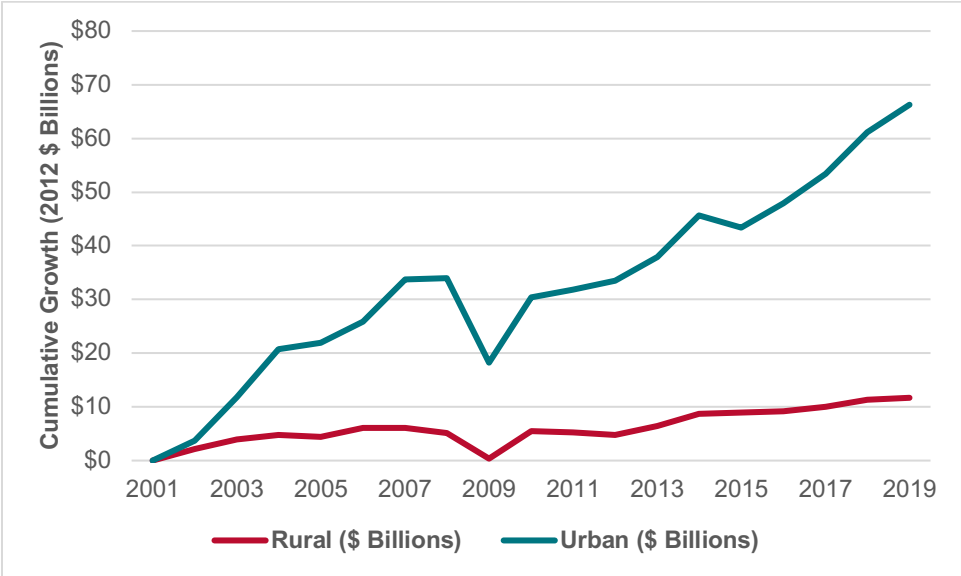
Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information Systems
Note: Data using 2012 inflation-adjusted dollars

Rural Indiana's economy saw cumulative GDP growth of roughly $11.6 billion (in 2012, inflation-adjusted dollars). That was growth of 23.4 percent in real terms. Indiana's urban places grew much faster, experiencing a 30.1 percent cumulative growth in the production of goods and services. Despite the difference in growth rates, rural Indiana continues to provide a reasonably stable share of GDP in the state. In 2001, rural Indiana provided 18.4 percent of the state's GDP; by 2019 that share had declined by only 0.8 percent, to 17.6 percent of total state GDP.

In later chapters we will discuss in detail the sectoral changes in the rural economy with a specific focus on the larger sectors, such as manufacturing and agriculture. One point we will detail later, but that bears foreshadowing here, is that GDP growth does not clearly translate into employment growth. Despite a growth of more than $11 billion in rural GDP, after adjusting for inflation, rural employment overall has declined by 531 workers since 2001. This contradiction is more evident in the manufacturing and agricultural sectors. Rural manufacturing production has risen by $5.7 billion in inflation adjusted terms, but rural manufacturing employment has declined by 25,000 jobs. Likewise, Indiana's rural agricultural economy remains slightly above its 2001 level, but farm employment has declined by more than 7,000 workers over this time-period. Taken together, manufacturing and agriculture, two of the most important production sectors of Indiana's rural economy, have shed more than 32,000 jobs since 2001 while simultaneously experiencing GDP growth.

In *Table 1.1* we offer an approximation of the relative GDP in rural and urban Indiana. This is an approximation because many counties in both rural and urban Indiana have suppressed data on small sectors due to confidentiality issues. We have interpolated these data from earlier unsuppressed data and from available counties. The most likely errors come in the retail, utility, and construction sectors, though we think these are likely in error by less than 0.5 percentage points each.

Table 1.1, Sector Share of GDP in Rural and Urban Indiana, 2019

Sector	Rural Counties	Urban Counties
Agriculture, forestry, fishing and hunting	2.7%	0.6%
Mining, quarrying, and oil and gas extraction	1.1%	0.2%
Utilities	4.2%	1.4%
Construction	2.5%	2.8%
Manufacturing	34.8%	24.6%
Wholesale trade	4.7%	5.8%
Retail trade	6.1%	6.6%
Transportation and warehousing	3.5%	3.6%
Information	1.1%	1.8%
Finance, insurance, real estate, rental, and leasing	12.4%	16.9%
Professional and business services	4.8%	9.5%
Educational services, health care, and social assistance	6.4%	10.3%
Arts, entertainment, recreation, accommodation, and food services	2.7%	4.0%

Sector	Rural Counties	Urban Counties
Other services (excl. government and government enterprises)	2.3%	2.3%
Government and government enterprises	10.4%	9.5%

Source: Bureau of Economic Analysis, and author's calculations

These data should not be surprising. Differences in industrial structure between rural and urban Indiana seem concentrated in those locations with large land use requirements, such as agriculture, mining, utilities, and manufacturing. There are also differences in sectors with strong agglomeration effects, such as professional services or finance. Thus, at first glance the industrial mix of Indiana's rural and urban economy seem largely insensitive to policy interventions and are, rather, the result of natural market forces.

Much of the remainder of this report will explain why that has happened and what it means for federal, state, and local policies for rural areas.

Chapter 2. Per Capita Income Growth

Income per person is a staple measure of economic wellbeing. It consists of earned wages and transfer payments from the government, such as income maintenance benefits (e.g. Earned Income Tax Credits or Temporary Assistance to Needy Children), unemployment benefits, both private and public, and Social Security benefits. This latter category includes several payment categories but is overwhelmingly used by retirees. Per capita income also includes non-labor income such as dividends, interest, and rental income.

Rural places, in Indiana and elsewhere, have lower levels of per capita income than do urban places. Since 2000, rural wages have averaged between 83 and 77 percent of urban wages in Indiana. In 2019, per capita annual income in urban Indiana were $33,009 and $25,627 in rural Indiana, 78 percent of the urban level.

Nearly all of the difference in per capita income between rural and urban places is driven by wages. The per capita earnings from income maintenance and unemployment remained stable, ranging between 7-8 percent in rural counties and around 10 percent in urban ones. The exception to this was during the Great Recession years, which, expectedly, saw increases in both rural and urban use of income maintenance and unemployment benefits. The difference in actual spending was small, in part because Social Security payments, which account for most transfer payments, are substantially higher in rural areas. This is due simply to a higher share of retired workers living in rural counties and is not a source of meaningful income variation.[1]

Wages and proprietor's income can vary on a per capita basis for several reasons. Occupational and industry structure, particularly in a small county, may lead to high variations. For example, Martin County's earnings are the highest in the state due to the dominance of workers from Crane Naval Surface Warfare Center. Another factor influencing per capita earned income in rural places are the presence of capital-intensive industries, such as manufacturing, which have long had higher wage employees. Likewise, family structure, particularly relatively large families with many children or non-wage-earning adults, tend to have lower per capita wages. This affects several rural counties with religious minorities who traditionally have larger families. However, the primary source of variation in earned income between regions comes from the educational attainment of the workforce.

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[1] We discuss population and demographic differences between rural and urban places in a later chapter.

Figure 2.2, Per Capita Earned Income and Educational Attainment (2019)
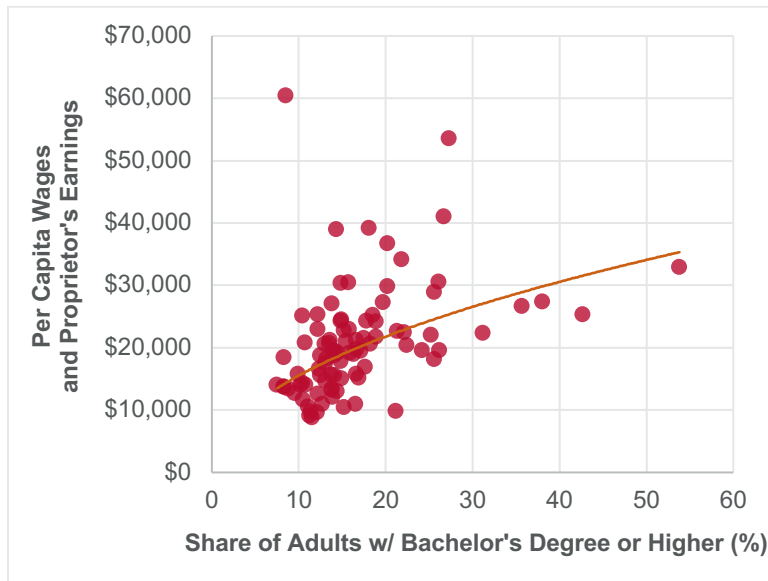
Source: Bureau of Economic Analysis and U.S. Census

Higher levels of educational attainment result in higher earned income as illustrated in *Figure 2.1*. This relationship alone explains about one-fifth of the total variation in earned income per capita. If we removed proprietor's income, which is heavily influenced by farms, and controlled for manufacturing share, educational attainment would explain closer to two-thirds of variation in earnings among Indiana counties.[2]

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[2] We return to this theme often, and recommend Hicks, et al. (2013) for a state level analysis.

Chapter 3. Shift-Share Analysis of Rural and Urban Indiana

Regional economies change composition over time. Some sectors grow, while others shrink. These changes may be linked to the fortunes of the national economy, such as a recession or recovery, while some changes are due to idiosyncratic changes within a particular place. Still other changes are linked to an individual industry that may be over-represented.

Shift-share analysis decomposes these three different effects on a region by comparing changes in national, industrial mix, and local growth. In the following tables we compare the actual employment growth in Indiana's rural and urban counties coming from these three sources of change. The national growth column illustrates the change that would have occurred within the region (urban or rural) if overall employment had grown at the national rate. For example, if the U.S. economy grew by 2.0 percent and the region had one million jobs, we would expect the national shift-share effect to be 20,000 jobs, or 2.0 percent of one million.

The industrial mix column illustrates the overall change in employment connected to each sector of the economy. This column measures how many jobs would be expected from each region due to differences in the industry mix in that region. This is calculated by subtracting the national growth rate from the industry growth rate to estimate how many jobs should have been created. For example, if there were 100,000 manufacturing jobs and nationally manufacturing grew by 3.0 percent while the overall economy rose by 2.0 percent, the industry mix contribution of growth would be 1,000 jobs:

(3.0% − 2.0%) * 100,000 = 1,000

The industrial share of growth tells us how much more or less a region is growing based upon its particular mix of industries.

Finally, the local effect is often termed the 'local competitiveness' effect, and represents how many more or fewer jobs are created in each sector than should be given the national growth rate and industry mix of the region. This calculation is perhaps the most important for the region, because it is a summary of what is happening locally for good or ill to affect employment. Importantly, the shift-share does not provide a causal explanation for local competitiveness, but it does offer insight into how much better or worse a location or industry are performing than is expected, with a focus on idiosyncratic local conditions.

In the following tables we focus on the last decade (2009-2019), which represents the recovery from the Great Recession. We chose this time-period because it illustrates the differential effects of employment growth in rural and urban Indiana during a period of growth.

Table 3.1, Shift-Share Analysis of Indiana's Rural Counties, 2009-2019

Sector	Actual Growth	National Growth	Industry Share Mix	Local Competitiveness
Agriculture, Forestry, Fishing and Hunting	423	1,084	-1,103	442
Mining, Quarrying, and Oil and Gas Extraction	-1,077	178	-946	-309
Utilities	-53	226	-520	241
Construction	1,808	1,206	1,822	-1,220
Manufacturing	9,462	4,498	4,286	678
Wholesale Trade	-570	621	-264	-927
Retail Trade	508	2,093	659	-2,245
Transportation and Warehousing	1,882	1,031	4,287	-3,436
Information	-956	239	-951	-244
Finance and Insurance	-560	468	34	-1,062
Real Estate and Rental and Leasing	85	161	-110	34
Professional, Scientific, and Technical Services	-809	561	816	-2,186
Management of Companies and Enterprises	132	154	344	-365
Admin and Support / Waste Mgmt and Remediation Svcs	-804	795	966	-2,565
Educational Services	-2,843	1,874	-2,221	-2,497
Health Care and Social Assistance	-1,747	2,127	-335	-3,539
Arts, Entertainment, and Recreation	-2,212	499	-2,180	-531
Accommodation and Food Services	-2,017	1,591	-1,143	-2,466
Other Services (except Public Administration)	-111	906	-1,219	201
Public Administration	385	1,395	-439	-571
Unclassified	-2	0	0	-1
Total	924	21,709	1,784	-22,569

Sources: Bureau of Economic Analysis and Chmura Economics

During the historically lengthy recovery from the Great Recession, Indiana's rural counties experienced net employment growth of only 924 jobs.[3] Had Indiana's rural counties grown at the national rate, we would anticipate growth of 21,709 jobs. The structure of Indiana's rural economy is somewhat over-represented by nationally growing industries, so should have expected growth of more than 1,700 jobs due to the mix of rural industries. Finally, the local competitiveness illustrates the number of jobs that were created after accounting for national growth and local industry mix. In Indiana's rural counties, this accounts for the loss of more than 22,000 jobs.

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[3] We use employment data from multiple sources (Bureau of Economic Analysis, the Census County Business Patterns and the Census, Current Population Survey). These elements use different definitions of year to year changes (e.g. March numbers versus an annual average). Thus, there are slight differences in jobs counts between these sources, but these differences are trivial.

Table 3.2 Shift-Share Analysis of Indiana's Urban Counties, 2009-2019

Sector	Actual Growth	National Growth	Industry Share Mix	Local Competitiveness
Agriculture, Forestry, Fishing and Hunting	-105	602	-431	-277
Mining, Quarrying, and Oil and Gas Extraction	-90	111	-78	-123
Utilities	-706	759	-566	-899
Construction	15,201	7,311	11,682	-3,792
Manufacturing	17,260	18,689	4,920	-6,349
Wholesale Trade	2,637	5,831	-428	-2,765
Retail Trade	1,774	15,846	-9,735	-4,337
Transportation and Warehousing	21,694	7,253	29,104	-14,664
Information	-8,225	2,470	-6,943	-3,752
Finance and Insurance	4,489	5,592	1,791	-2,895
Real Estate and Rental and Leasing	1,630	2,329	532	-1,231
Professional, Scientific, and Technical Services	15,687	6,277	10,640	-1,230
Management of Companies and Enterprises	5,717	1,562	3,576	579
Admin and Support / Waste Mgmt and Remediation Svcs	10,027	8,906	5,948	-4,827
Educational Services	-8,838	13,351	-13,788	-8,400
Health Care and Social Assistance	40,784	20,957	17,378	2,448
Arts, Entertainment, and Recreation	-4,167	2,532	-7,430	731
Accommodation and Food Services	349	12,197	-10,124	-1,724
Other Services (except Public Administration)	-367	7,633	-11,614	3,614
Public Administration	-3,468	6,473	-2,720	-7,221
Unclassified	-19	1	-3	-18
Total	111,264	146,683	21,711	-57,130

Sources: Bureau of Economic Analysis and Chmura Economics

In contrast to the slow rural growth of the recovery, urban Indiana created more than 111,000 jobs. For the purposes of this study, it is useful to know that more than 126,000 net new jobs were created in the Indianapolis metropolitan region alone, meaning that it is not simply urban places, but specifically the Indianapolis MSA, that led economic growth during this time. Despite the growth, Indiana's urban counties should have expected 168,000 jobs given the national growth rate (146,000) and the industrial mix (22,000). So a gain of 111,000 jobs actually includes a loss of more than 57,000 jobs due to idiosyncratic local factors, as highlighted by the Local Competitiveness column in *Table 3.2*.

It is not the case that economic conditions in Indiana are primarily a rural-urban issue. Much of Indiana's urban places heavily underperformed the national average. Indeed, the only metropolitan area in total to outperform the national average job growth was the Indianapolis MSA. Again, this analysis is not causal. The shift-share analysis cannot tell us what elements specific to 'local competitiveness' result in these outcomes; we explore the question of "why" through other elements of this study.

Chapter 4. Business Dynamics

Business dynamics potentially play a role in economic prosperity, so it is useful to understand if there are differences between Indiana's rural and urban places in these data. In this section, we examine the business dynamics of metro and rural regions, including the distribution of firms by size, age, and earnings.

We first compare the share of firms by size (the number of employees) across rural and urban regions in Indiana. We find that about 22 percent of firms in rural areas have fewer than 20 employees, while 44 percent of firms have at least 500 employees *(see Figure 4.1)*. The corresponding numbers for urban areas was 20 percent and 49 percent, respectively. Between 2000 and 2019, the share of large employers (500 or more employees) increased by 1.9 percent for rural vs. 4.2 percent for urban areas in Indiana.

**Figure 4.1, Share of Firms by Size in Rural and Urban Counties (2019)**
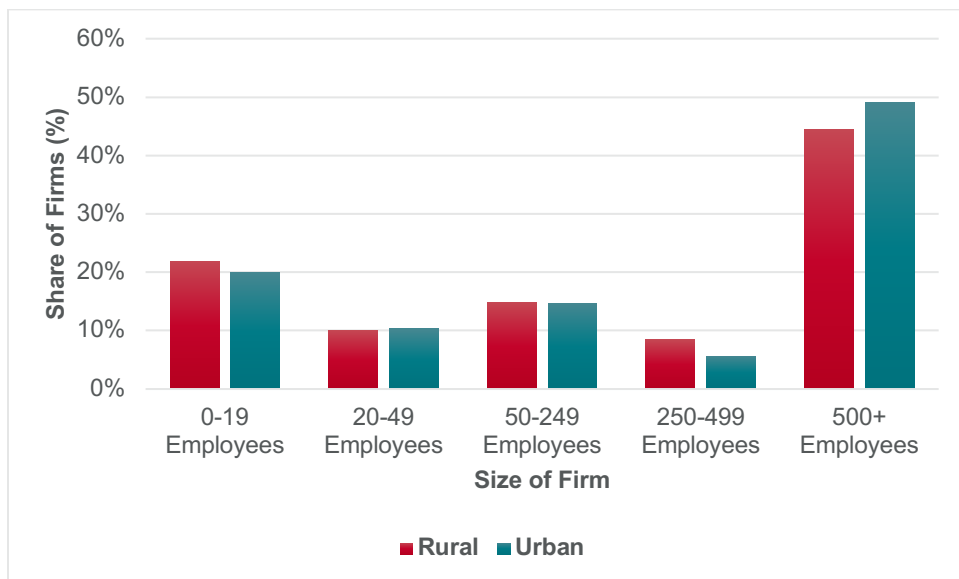
Source: Quarterly Workforce Indicators

Indiana's rural counties have a modestly higher share of smaller firms, while urban places have a higher share of the very largest firms, although some of the urban share may be due to reporting of larger firms from a centralized state headquarters. The economic literature tells us this matters for a couple of reasons. The first is that net job growth is clustered in smaller firms. The second is that there is a wage premium for employment in larger firms, when worker characteristics are held constant.

To look at the second point more closely, we compare the average earnings of employees by region and by firm size. The average monthly earnings of employees in rural areas was $3,630 in 2019, whereas in metro areas the average earnings was $3,904 during the same period *(see Figure 4.2)*. This earnings gap was consistent across all types of firm sizes, suggesting industry differences play a larger role than firm size in wage differences.

Figure 4.2, Employee Earnings Gap by Firm Size in Rural and Urban Counties (2019)
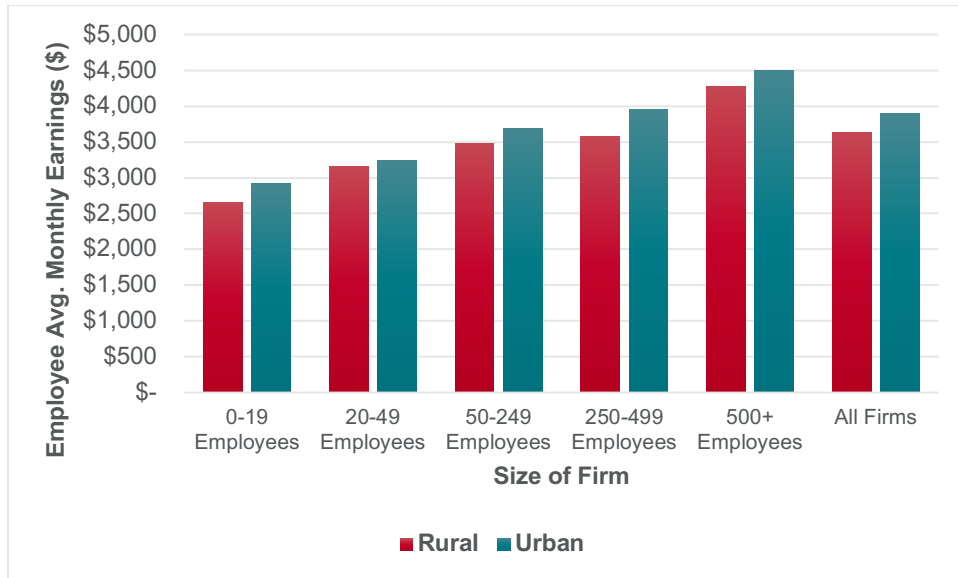
Source: Quarterly Workforce Indicators

We also compared the firm type by their age (not shown) and find that there are no meaningful differences between urban and rural areas by firm age. As of 2019, about 85 percent of firms in both rural and urban areas were established 11 or more years ago.

These business dynamic data suggest little differences between urban and rural places that might be attributed to the size or age differences between firms. The simple reason for this is that there are only modest income differences by firm size between rural and urban places; the near-uniform distribution of these differences suggests industry, not business dynamics, is the most likely contributor to those differences.

Chapter 5. Indiana Entrepreneurship

An often expressed truism is that entrepreneurship is particularly important to rural communities and economies. To assess whether there are important differences between rural and urban areas, we compare the entrepreneurial climate across these geographies in several ways.

First, we estimate annual business applications per capita across both areas. In 2019, urban Indiana had 8.3 business applications per 1,000 population, whereas rural areas had 6.5 business applications per 1,000 population. The gap between rural and urban entrepreneurship has remained largely static over the past decade and a half for which we have county-level data *(Figure 5.1)*.

**Figure 5.1, Business Applications Comparison, 2005-2019**
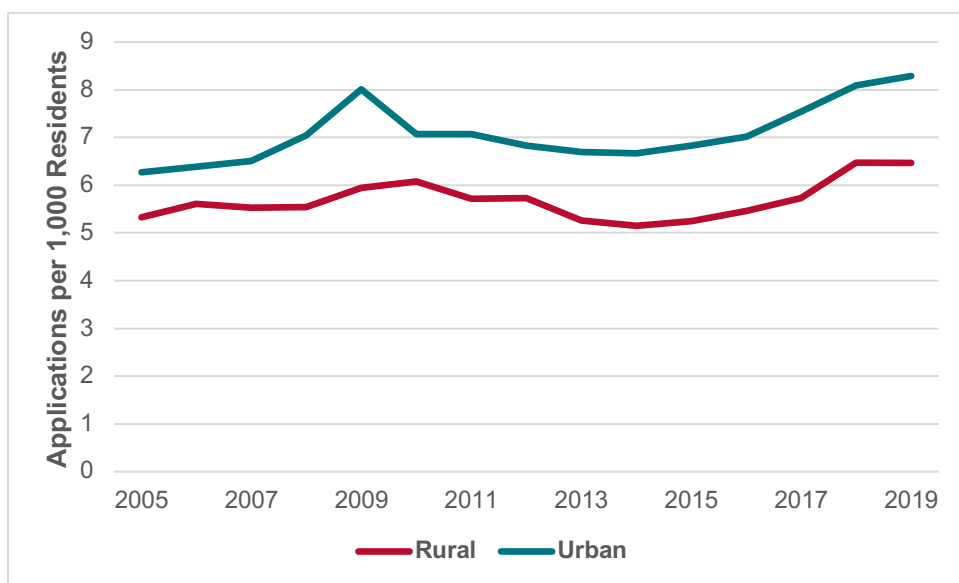
Source: U.S. Census, Business Formation Statistics

Our second approach to measuring entrepreneurial intensity compared the share of proprietary income relative to total personal income. We find that the share of proprietary income relative to the total personal income in rural areas was 7.3 percent in 2019 (15 percent of which comes from farms), whereas it was 10.1 percent in urban areas (only 1.2 percent coming from farms).

Figure 5.2 shows the trends of share of proprietary income. In both rural and urban, the share of proprietary income increased from around 2009 to about 2013, followed by a gradual decrease in urban places and a sharper decline in rural. A portion of this decline is partially attributable to farm income and commodity prices over this time. Global corn prices, which will be correlated with other row crops, peaked in 2012 and declined sharply. These dynamics closely mimic the rise and fall of rural proprietary income. The increase in urban proprietary income from 2007 to 2013 and its subsequent stability are not clearly understood.

Figure 5.2, Proprietary Income as Share of Total Personal Income, 2001-2019
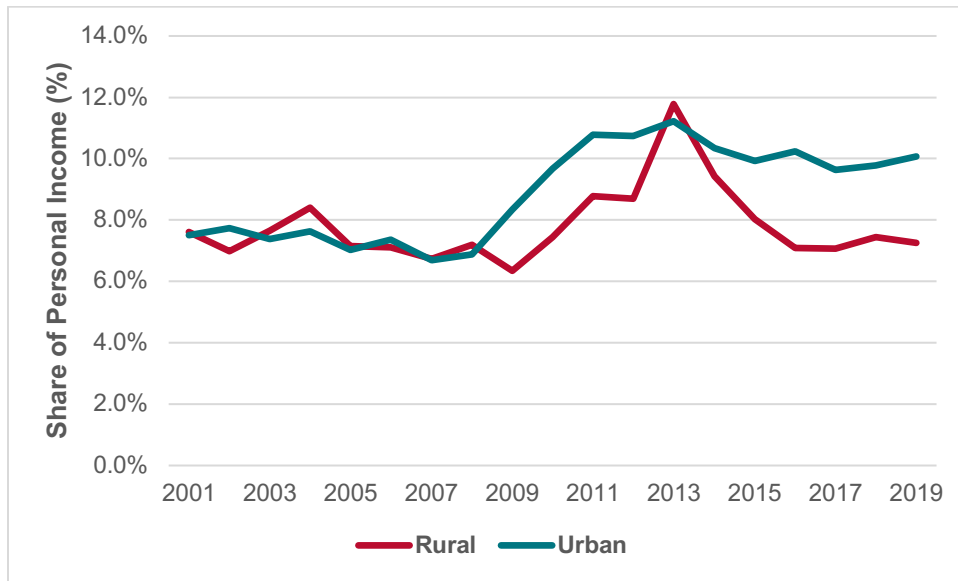
Source: Bureau of Economic Analysis

These data show that there are only modest differences across the level and scope of entrepreneurial income between rural and urban Indiana, suggesting that a very modest share of rural-urban differences in income may be explained by differences in entrepreneurial activity. There have been a few studies of causal differences in entrepreneurship between regions, but for the most part, there is little evidence of meaningful differences resulting from public policy specifically focused on entrepreneurship. Rather, policies that remove barriers to self-employment, along with increased levels of human capital account for the bulk of entrepreneurship differences between regions (see Hicks and Faulk, 2018; Matejovsky, Mohapatra and Steiner, 2014; and Hall and Sobel, 2008).

Inputs to the Rural Economy

In this section we examine inputs to the rural economy: population, employment, education, physical capital, and local government characteristics. These are often viewed as causal factors in the production of goods and services.

Chapter 6. Population

We first examine population and compare population trends over time across rural and urban areas. Between 2000 and 2019, the population in urban places across Indiana increased by 650,000, with 78 percent of Hoosiers living in urban areas by 2019. During this same time period, rural Indiana experienced a population decline of 10,000. *Figure 6.1* shows the cumulative change in population since 2000.

Figure 6.1, Cumulative Population Change in Indiana, 2000-2019
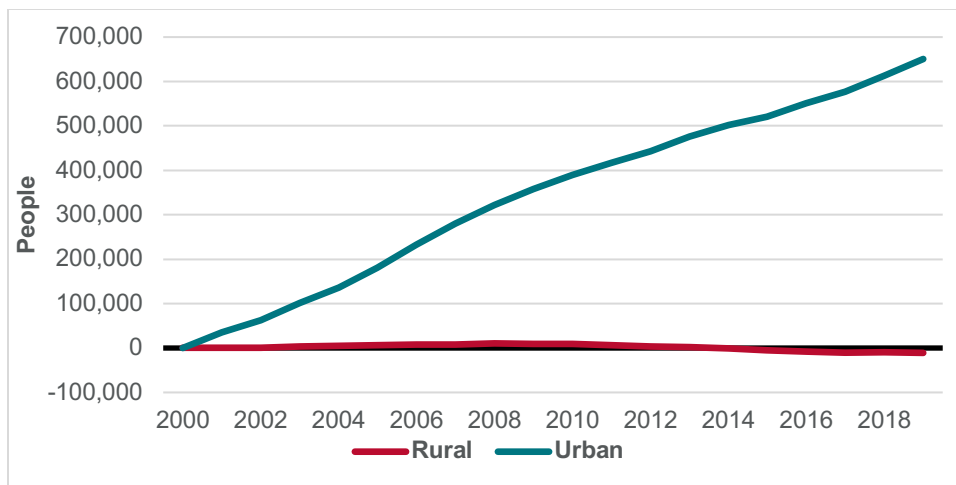
Source: U.S. Census, and author's calculations

This population trend is certainly not unique, as much of rural America is in a protracted period of population decline, nor is it expected to change significantly anytime soon. *Figure 6.2* illustrates the population projection performed by the Indiana Business Research Center through 2050, alongside those prepared by the Center for Business and Economic Research, Ball State University. These two projections were prepared using different methods but provide very similar results. While the specific details of the forecasts are surely wrong, the trends are almost certainly accurate. Through the foreseeable future, Indiana's rural population will experience modest declines, while the urban portion of the state continues to grow.

Figure 6.2, Rural and Urban Cumulative Population Projections, 2020-2050
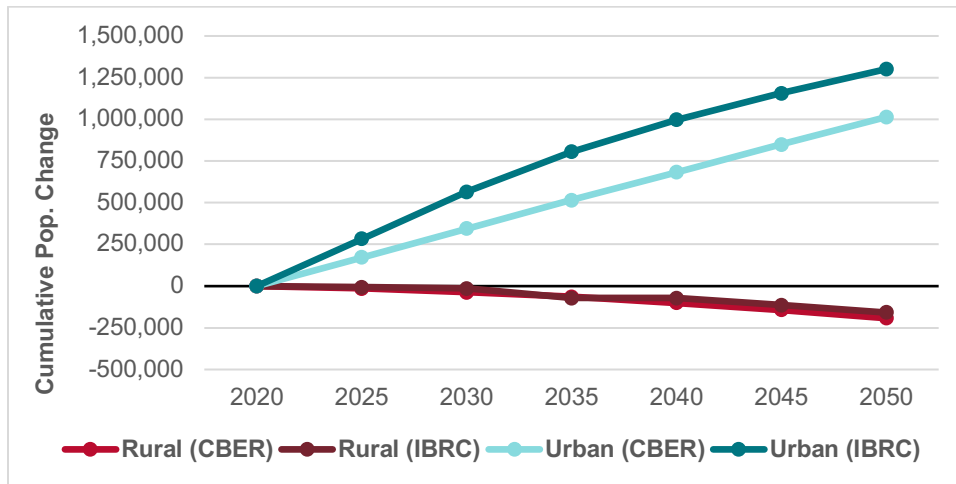
Source: Indiana Business Research Center and Ball State CBER calculations

A simple comparison of population trends only tells us so much, however. To better understand the nuance of population change, we also examine the demographic and health characteristics of urban and rural populations *(Table 6.1)*. As expected, we find that residents of rural areas are slightly older, less well-educated, and whiter than their urban counterparts. The median household income in rural areas was $6,122 lower in 2019 than in urban areas, and the poverty rate is slightly higher (11.3 percent vs. 10.7 percent, respectively). There are some slight differences in family composition, most of which correspond to demographic and health differences. The rural population is less likely to have never been married, for example, which would be expected with an older population. They are also more likely to be widowed, which, as we discuss next, is unsurprising given the mortality rates in rural versus urban Indiana.

Findings about health characteristics are also fairly expected and correspond to national trends. The average life expectancy in rural areas is about 0.6 years lower than metro areas, which is reflect in the premature age-adjusted mortality rate (defined as years of potential life lost before age 75 per 100,000 population), drug overdose mortality rate, and motor vehicle crash mortality rates, all of which are higher in rural Indiana than in urban. Rural areas also have slightly higher share of veterans and non-institutionalized disabled population.

Table 6.1, Demographic and Health Variables, 2019

Variable	Rural Counties	Urban Counties	Source
Total Population	1,460,840	5,212,783	US Census, S0101
By Age and Sex:			
% Under 15	19.3%	19.2%	US Census, S0101
% 15 to 24	12.9%	14.3%	US Census, S0101
% 25 to 64	50.2%	51.8%	US Census, S0101
% 65+	17.6%	14.7%	US Census, S0101
Ratio of Women to Men	100.019	98.6568	US Census, S0101

| Variable	Rural Counties	Urban Counties	Source
By Race and Ethnicity:			
% White	95.8%	80.6%	US Census, DP05
% Black	1.6%	11.6%	US Census, DP05
% American Indian and Alaska Native	0.3%	0.2%	US Census, DP05
% Asian	0.7%	2.7%	US Census, DP05
% Hawaiian and Other Pacific Islander	0.0%	0.0%	US Census, DP05
% Some Other Race	1.4%	2.4%	US Census, DP05
% Hispanic or Latino	4.5%	7.6%	US Census, DP05
% Only English Spoken at Home	92.9%	89.8%	US Census, DP02
% Some Other Language Spoken at Home	6.4%	9.3%	US Census, DP02
% Foreign-Born	2.5%	6.0%	US Census, DP02
By Family Structure:			
Total Population Age 15+	1,190,758	2,535,467	US Census, S0101
% Now Married	53.1%	47.6%	US Census, S1201
% Widowed	6.8%	5.8%	US Census, S1201
% Separated	13.4%	12.1%	US Census, S1201
% Divorced	1.2%	1.4%	US Census, S1201
% Never Married	25.6%	33.1%	US Census, S1201
By Health Outcomes:			
Life Expectancy	76.70 Yrs	77.32 Yrs	County Health Rankings
Average Premature Age-Adjusted Mortality	419.35	398.11	County Health Rankings
Average Drug Overdose Mortality Rate	27.64	25.92	County Health Rankings
Average Motor Vehicle Crash Mortality Rate	17.87	14.60	County Health Rankings
Other Characteristics:			
Poverty Rate	11.3%	10.7%	US Census, SAIPE
Average Median Household Income	$52,939	$59,061	US Census, S1901
% of Population 18+ Veterans	8.4%	7.2%	US Census, DP02
% of Noninstitutionalized Population Disabled	16.0%	13.2%	US Census, DP02

Source: U.S. Census, County Health Rankings

These data show that while there are differences between rural and urban Indiana, these differences are not stark.

Indeed, none of these differences are likely to fully explain economic, income, or other outcome differences.

Chapter 7. Employment Mix

One potential explanation for rural-urban outcome differences is based on the differential employment mix. We focus on non-farm employment; farming is a relatively small share of total employment and heavily seasonal.

We start by comparing the distribution of urban and rural employment by sector *(Figure 7.1)*. Urban employment totaled 2,766,321 jobs (83%) in 2019; rural had 565,997 jobs (17%). Rural Indiana's largest non-farm sector is manufacturing, which accounts for 30.6 percent of jobs, followed by retail trade (13.0%) and accommodation and food services (7.7%). Urban areas have a much narrower distribution, with health care and social assistance taking the highest share of non-farm employment (13.9%), followed closely by manufacturing (13.7%) and retail trade (11.3%).

Figure 7.1, Distribution of Non-Farm Employment by NAICS Sector, 2019
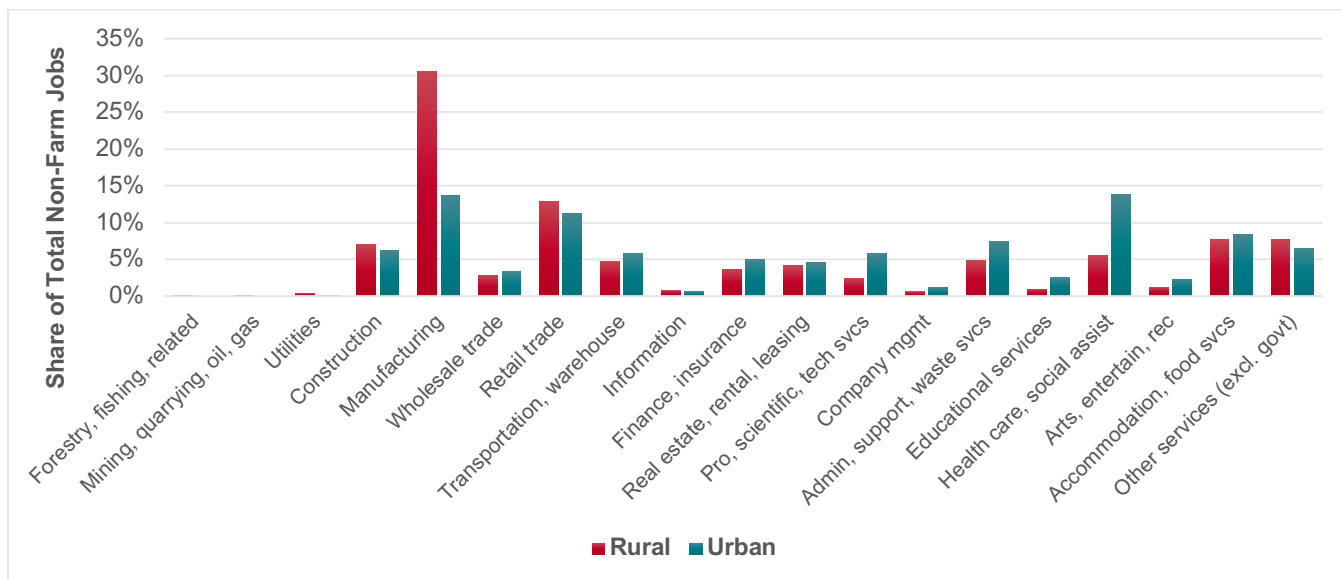
Source: Bureau of Economic Analysis, Regional Economic Information Systems

The sectors that dominate the rural versus urban areas are fundamentally different, and employment in these sectors face fundamentally different futures. Of specific interest to us is the difference between "footloose" jobs (which produce exportable goods/services) and "non-footloose jobs" (which produce locally consumed goods/services).[4]

Manufacturing, the sector that dominates the rural job market, is considered a footloose job. The goods produced are exported across the country and around the world. These products do not rely on a local consumer.

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[4] See Hicks and Terrell (2017) for more detail on footloose and non-footloose jobs: https://rupri.org/wp-content/uploads/FootlooseJobs-20170330.pdf. The footloose category includes all jobs in manufacturing and half of jobs in mining, utilities, construction, transport/warehouse, financial, and real estate/rental sectors. The non-footloose category includes all jobs in forestry/fishing, wholesale and retail trade, info, pro/tech services, company management, admin/support, education, health/social assist, arts/entertain/rec, and accommodation/food service sectors.

Healthcare and retail trade, on the other hand, do depend on local consumers, and these are stronger sectors in urban areas. This distinction between footloose and non-footloose sectors indicates the potential for employment growth as well as the impact each is likely to have on rural and urban economies.

Figure 7.2 shows the cumulative job creation in urban areas across footloose and non-footloose firms between 2001 and 2019. We find that urban areas gained 355,527 non-footloose jobs between 2001 and 2019, but only 14,964 footloose jobs during the same time period.

Figure 7.2, Cumulative Job Creation in Urban Areas, Footloose and Non-Footloose Firms, 2001-2019
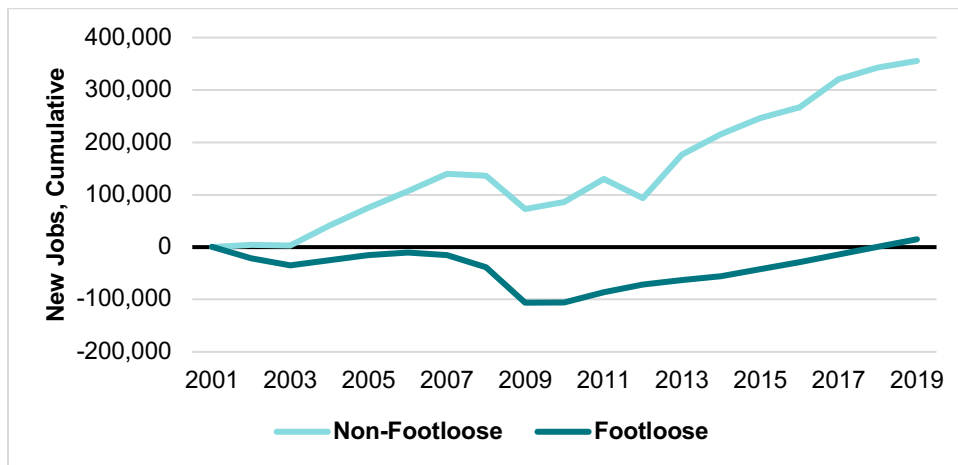
Source: Bureau of Economic Analysis

Figure 7.3, Cumulative Job Creation in Rural Areas, Footloose and Non-Footloose Firms, 2001-2019
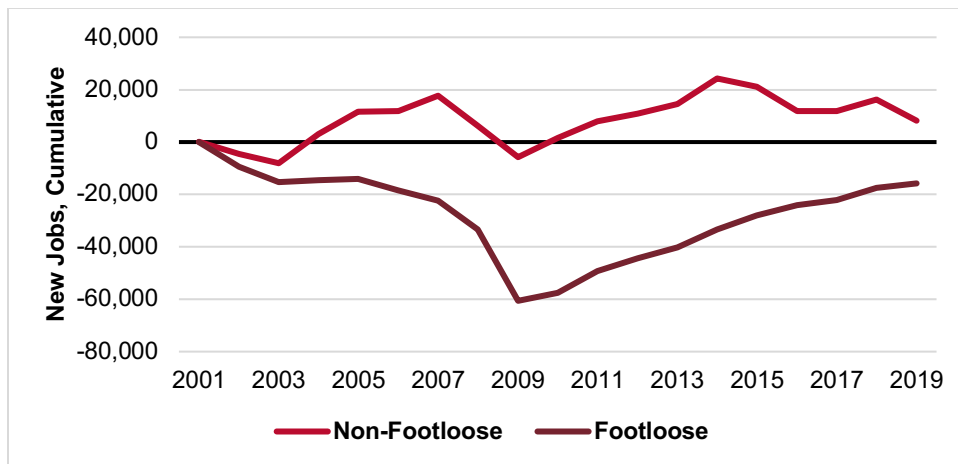

Source: Bureau of Economic Analysis

Figure 7.3 shows the cumulative job creation in rural areas across footloose and non-footloose firms between 2001 and 2019. We find that rural areas gained 8,126 non-footloose jobs over the past two decades but lost 15,741 footloose jobs during the same period.

Beyond the obvious implications for future employment opportunities in rural Indiana, another important implication about job growth in footloose versus non-footloose jobs lies in the application of economic development policies. The suite of economic development policies, from state Economic Development for a Growing Economy (EDGE) tax credits to local property tax abatements and Tax Increment Financing (TIF), focus almost exclusively on attracting footloose jobs. But after two decades of aggressive economic development efforts surrounding these jobs, rural Indiana has fewer, not more.[5]

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[5] For further reading in this area, we recommend our publication "Why Have Local Economic Development Efforts Been So Disappointing," at https://projects.cberdata.org/113/why-have-local-economic-development-efforts-been-so-disappointing.

Chapter 8. Educational Attainment

Another potential explanation of outcome differences, and one closely connected to employment opportunities, is education. *Figure 8.1* shows the comparison of educational attainment between rural and urban Indiana, and between the state and national averages in 2019. Overall, residents in rural Indiana have lower educational attainment than do their urban counterparts. This is not unexpected, as this rural/urban educational differential is common throughout the country. Importantly, urban Indiana is also less educated than the national average, both of which translate into a state on the lower end of educational attainment.

Figure 8.1, Educational Attainment in Indiana and U.S., 2019
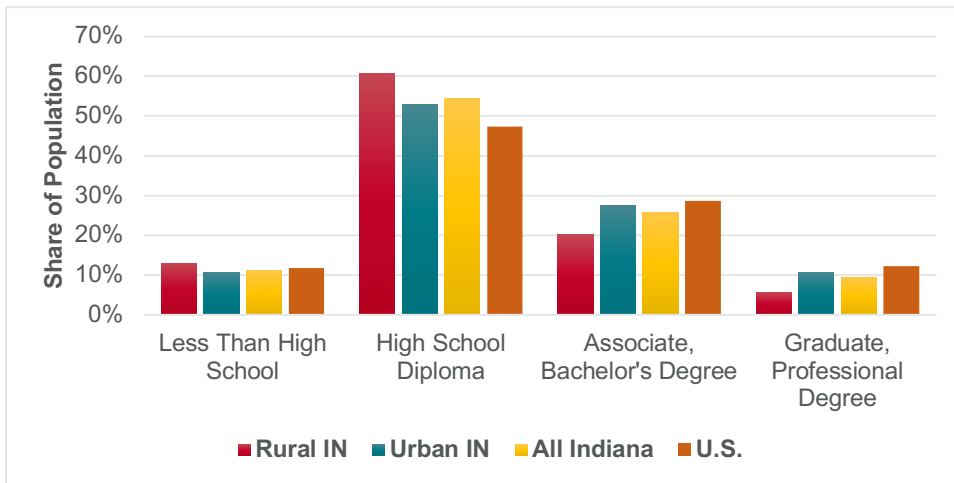
Source: U.S. Census Bureau, American Community Survey 2019 (author calculations from Table S1501)

Figure 8.2, Change in Educational Attainment of Population Age 25 and Older, 2000-2019
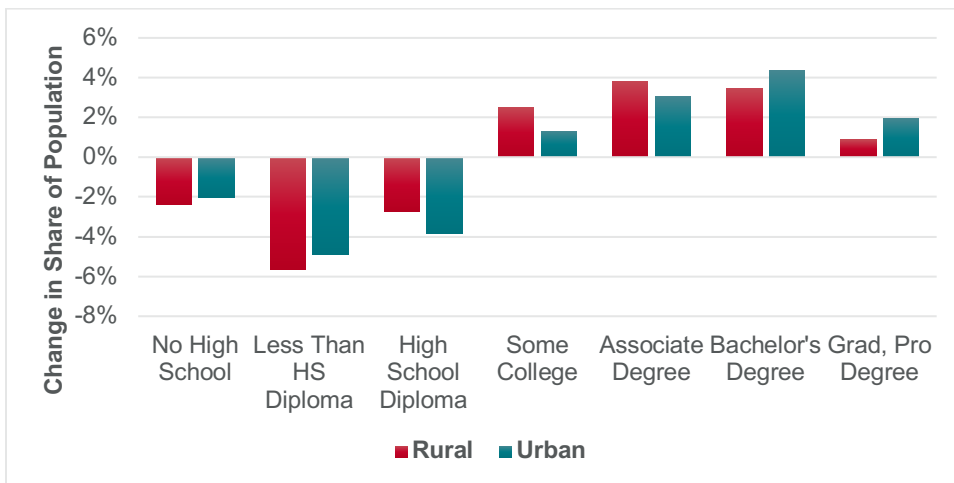
Source: U.S. Census Bureau, American Community Survey 2019 (author calculations from Table S1501)

Educational attainment is the strongest causal factor in economic growth, and our underperforming state averages should concern everyone, from the business community to the Indiana Statehouse. That said, both rural and urban places in the state are making some progress.

Between 2000 and 2019, educational attainment increased in both rural and urban counties *(Figure 8.2)*. The increase was more pronounced in urban places, where residents were more likely to get at least a bachelor's degree, but rural residents who gained at least some college increased by nearly 6.5 percent during that period. Indiana's challenge with educational attainment is that, because of slower-than-average growth and lower-than-average levels of education, the state continues to fall farther behind the nation as a whole during the 21st century (Hicks, 2022). These differences are more pronounced in rural areas of the state.

Chapter 9. Private Capital Stock

In much the same way educational attainment is a stock of human potential, private capital is a stock of economic potential. Private capital is the sum of business and residential plant and equipment in a region, and at the aggregate level is combined with labor to produce goods and services. Capital measures are important both because they are the source of property tax revenue, and because they offer some insight into the structure of economic changes.

Rural Indiana possesses roughly 21.2 percent of all the private capital stock in Indiana, which is roughly unchanged from its 2010 level of 21.8 percent. Between 2010 and 2019, the state's real growth in capital stock has been negative, with rural Indiana losing $3.77 billion in capital stock and urban Indiana gaining only $205 million. While we discuss taxation in another chapter, it is worth noting here that Indiana's rural places have combined tax abatement and deductions of $2.977 billion in capital stock between 2010 and 2019. Over the same period, urban counties had combined abatement and deduction in capital of $3.827 billion. For businesses, the cost of capital during the years after the Great Recession were at near-record lows, with modest interest rates and low tax rates, particularly on new investment.

Thus from 2010 to 2019, there was $6.749 billion less in physical capital to tax in rural counties, and $3.622 billion less in urban ones. Over the same time, Tax Increment Financing (TIF) share of total property rose from 6.3 percent to 11.7 percent in rural counties and from 5.0 percent to 5.9 percent in urban counties, accounting for an additional $12.93 billion in deductions for rural counties and $24 billion in deductions for urban counties. All told, the urban property allocated to traditional property taxes grew by 0.5 percent, while shrinking 6.7 percent in rural Indiana.

Indiana's rural counties are home to more capital-intensive industries, such as manufacturing, agriculture, mining, and utilities, as highlighted in *Figure 9.1*. These industries not only use more capital per worker, but they also use more capital to produce a dollars' worth of goods or services.

Figure 9.1, Capital-to-Labor and Capital-to-GDP Ratios in Rural and Urban Counties, 2010-2019
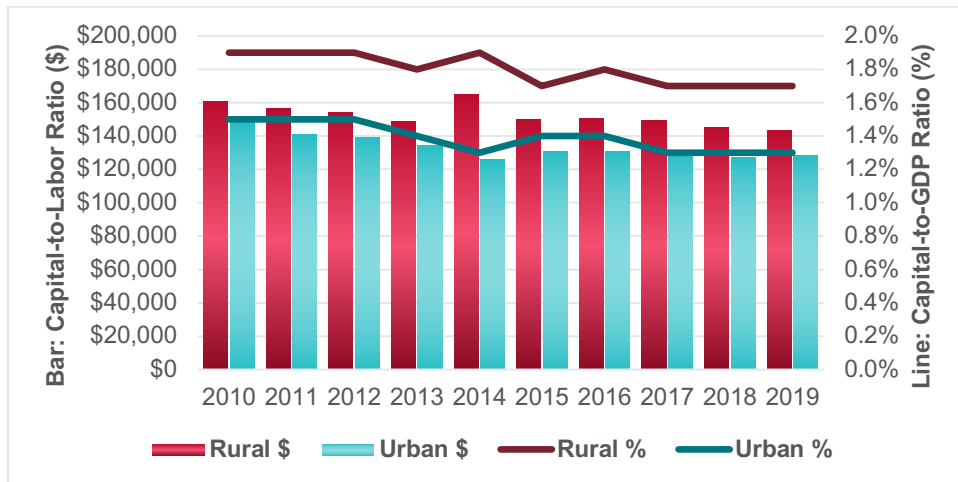
Source: Bureau of Economic Analysis, Indiana Handbook of Taxes, Revenues and Appropriations

Figure 9.1 also shows capital investment levels over time, which have declined as both a share of GDP and on a per-person basis. The likely cause for this is a change in the mix of industries. Our economy produces an increasing share of GDP in less-intensive physical capital industries. In a later chapter, we expand our discussion of private capital, combining it with labor and human capital to explain growth and change in Indiana's rural counties.

Chapter 10. Housing Stock

In examining the housing sector in Indiana's rural and urban counties, our goal is to better understand the size and condition of housing markets across the state. We use data from the U.S. Census Bureau and the Federal Housing Finance Authority. These data are more accurate sources of data on the quantity and price changes of housing than are Multiple Listing Services (MLS), which only includes homes that pass through realty companies for sale, excluding a significant source of housing supply and prices.

The Census Bureau's American Community Survey estimates that there are over 2,886,500 housing units in the state as of 2019. Of these units, just over 316,100 (11 percent) are vacant. See *Table 10.1*. While there is a lot of variation in vacancy rates between Indiana counties, ranging from 4.4 percent in Hendricks County to 31 percent in Crawford County *(Appendix Table A1),* vacancy rates are generally higher in rural areas (13.5 percent) and the housing stock is older, with almost a quarter (24.9 percent) built more than 80 years ago. A larger share of housing units in rural areas are owner-occupied (74.6 percent), and not surprisingly home values in rural areas tend to be lower compared to urban areas, with just under 12 percent having a value less than $50,000 compared to 7.2 percent in urban areas. See *Appendix Tables A1 and A2* for these statistics for each county.

On the flip side, the share of housing that is renter-occupied is lower in rural areas (25.4 percent) compared to urban areas (32.5 percent), and fewer renters pay more than 35 percent of their income on rent in rural versus urban places (31.3 percent vs 39.2 percent, respectively). Across the state, this statistic ranges from 16 percent of renters that pay more than 35 percent of household income in Steuben County to 51.1 percent in Monroe County *(Appendix Table A2).*

Table 10.1, Characteristics of Housing Units, 2019

Category	Rural Counties	Urban Counties	Statewide
Housing Units	659,845	2,226,703	2,886,548
% Occupied	86.5%	89.8%	89.0%
% Vacant	13.5%	10.2%	11.0%
% Built in 1939 or Earlier	24.9%	14.8%	17.1%
Occupied Housing Units	570,523	1,999,896	2,570,419
% Owner-Occupied	74.6%	67.5%	69.1%
% Renter-Occupied	25.4%	32.5%	30.9%
% Owner-Occupied with a Value < $50,000	11.9%	7.2%	8.4%
% Occupied Rental Units Paying Rent ≥ 35% of Income*	31.3%	39.2%	37.8%

Source: U.S. Census Bureau, American Community Survey, 5-year estimates (2015-2019), Table DP04,
  https://api.census.gov/data/2019/acs/acs5/profile
* Excludes units where gross rent as a percentage of household income (GRAPI) could not be computed.

Next, we examine factors affecting the profitability of speculative home construction in rural and urban counties, updating the work of Hicks and Faulk (2019). By "speculative home construction" we mean new homes constructed by a builder before a buyer is found. In *Figures 10.1 and 10.2*, the line in red is a national measure of

construction costs and includes a 17 percent builder profit (Glaser & Gyourko, 2005 & 2018), the line in maroon represents home prices averaged over rural (or urban) counties in the state, and the line in teal represents the average number of building permits issued in rural (or urban) counties for each year between 2000 and 2020.

Figure 10.1 clearly shows that before 2010, the average home price in rural counties was higher than the cost of construction. From 2010 to 2019, construction costs were higher than average home prices although from 2016 to 2018, they were very close. During 2020, average home prices were higher than construction costs, and the number of building permits were low. This matters because builders are generally unwilling to engage in speculative construction unless the price of housing is higher than the construction costs.

The underlying data shows variation in this relationship among rural counties. Several counties (e.g. Adams, Blackford, Cass, Fayette, Grant, Henry, Huntington, Miami, Randolph, Tipton, and Wayne) had not reached profitability by 2020. Crawford, Parke and Greene counties did not have available data to calculate their profitability.

Figure 10.1, Housing Starts and Profitability in Rural Counties, 2000-2020
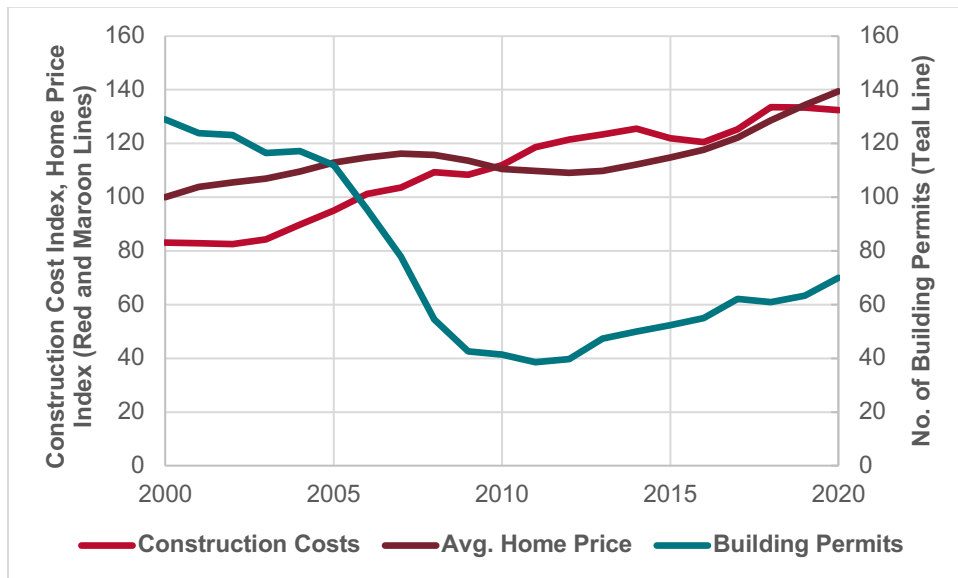
Sources: New Private Housing Structures Authorized by Building Permits for County Data from U.S. Census Bureau via FRED; Producer Price Index by Commodity: Inputs to Industries: Net Inputs to Residential Construction, Goods from U.S. Bureau of Labor Statistics via FRED; HPI for Counties (All-Transactions Index) from the Federal Housing Finance Agency.
Note: Data was not available for Crawford, Green or Parke counties.

Figure 10.2, Housing Starts and Profitability in Urban Counties, 2000-2020
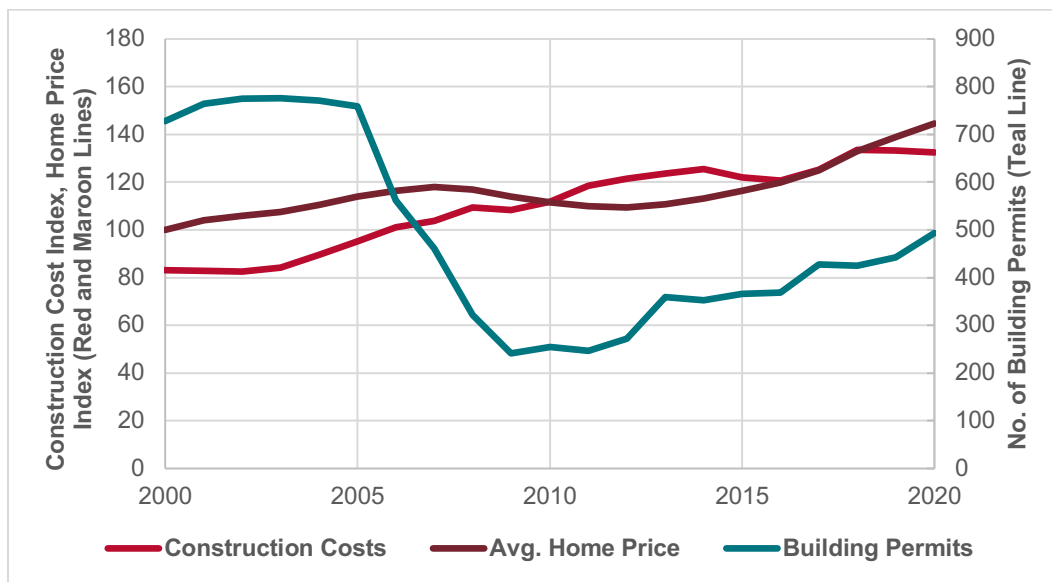
Sources: New Private Housing Structures Authorized by Building Permits for County Data from U.S. Census Bureau via FRED; Producer Price Index by Commodity: Inputs to Industries: Net Inputs to Residential Construction, Goods from U.S. Bureau of Labor Statistics via FRED; HPI for Counties (All-Transactions Index) from the Federal Housing Finance Agency.

Figure 10.2 shows a similar graph for Indiana's urban counties. Average home prices were higher than construction costs before 2010. After 2010 and until 2018, speculative building was unlikely to occur because construction costs were higher than or too close to the average price builders would be able to charge for new housing. After 2018, building was profitable again, and there was a uptick in the number of building permits issued. Five urban counties (Delaware, Howard, Madison, Union, and Vigo) had not reached profitability by 2020.

As in most places, the Great Recession reduced both housing prices and new home construction in Indiana. However, the cost of constructing a new home has continued to rise, making speculative new home construction unprofitable across much of Indiana until very recently. As of 2020, speculative new home construction is clearly profitable in 71 of 92 counties (32 rural and 39 urban). In several of these counties, it only became profitable during 2020. In 18 of 92 counties (13 rural and five urban), it was still not profitable to construct new speculative homes as of 2020. In the remaining three counties (rural), the data was not available make a determination. While price increases during the pandemic has served as an incentive to construct more housing, supply side issues such as labor shortages in the construction industry and higher prices for construction materials are likely to stifle development in many parts of the state.

An important addition to this discussion is the role that population decline plays in the risk of an excess supply of housing stock. Housing is a durable capital stock, as *Table 10.1* illustrates. Statewide, more than one out of every six homes was built before World War II, and in rural places, nearly one in four homes were built before the war. As Glaeser and Gyourko (2006) describe, population decline leaves an excess supply of housing and causes a

strong negative shock to local home prices. The resulting oversupply of vacant homes suppresses home values in counties, regions, and neighborhoods where they are most concentrated. This in turn attracts lower skilled workers to communities with more affordable housing.

Housing markets respond quickly and effectively to changes in supply and demand. Indeed, they are among the most responsive markets for physical goods. Many policymakers in Indiana believe their community faces a housing shortage, which should prompt government intervention. However, this is not typically true. More commonly, home prices and housing supply are dampened by the market forces outlined previously. So, in most places where new housing stock has not been added in recent years, the problem is not a shortage, but an oversupply of homes, which reduces the market value of existing homes and new speculative construction. Subsidizing new housing will simply worsen this problem.

Recent market conditions have improved across much of Indiana, and as we write this, there is a possibility that new home building in the wake of COVID will add higher-quality housing stock to many counties. Still, where speculative building is not occurring, the most common problem is that the community's actual demand for housing is so low relative to supply that building new homes is not profitable. That is not a failure of markets, but the result of housing markets responding to population decline and the resulting blight associated with the homes they vacate.

Chapter 11. Local Income and Property Taxes

Taxation and expenditure policies play an important role in the quality of public services between rural and urban places. This is connected to both how we tax and structure our local governments *(see Chapter 12)*. Discussion of tax differences also play an outsized role in conversations about equity and growth in rural and urban places. These issues naturally lend themselves to a discussion of how local governments tax themselves, how much resources they can and are willing to collect from local taxpayers, and how these compare to similar places. So, in this chapter we discuss these issues in detail, offering more of a historical perspective so readers may better understand how the current tax system matured in Indiana.

Local income taxes and property taxes are the two largest sources of tax revenue for local governments in Indiana, generating 95 percent of local government tax revenue and 46.6 percent of general own source revenue during 2017, the most recent year this data is available (U.S. Census Bureau).[6] The other major source of general own source revenue is "charges and miscellaneous," which generates 50.7 percent of general revenue. We examine each of these taxes in turn, and end with a discussion of rural-urban transfers and tax capacity for each county.

PROPERTY TAXES – RECENT DEVELOPMENTS

Indiana's property tax system has undergone major changes since the late 1990s. In 1998, the Indiana Supreme Court ruled that property should be assessed under a system that incorporates an objective reality to determine the true tax value of a property. Subsequently, the Tax Court required the State Board of Tax Commissioners to implement a new assessment system and specified that the new regulations should be in effect by June 1, 2001, and that the reassessment of real property should occur by March 1, 2002.[7]

In 2005, the Indiana Fiscal Policy Institute published a Property Tax Equalization Study (Brown, 2005) conducted to measure the accuracy of assessments in each of Indiana's 92 counties.[8] The findings of this study exposed fundamental problems with Indiana's property tax system, specifically that the structure of property tax administration in Indiana resulted in a systematic lack of uniformity in assessment practice and assessment results; the data sets collected were not adequate for a market value assessment system; international assessment standards were not being met; and administration and interpretation of assessment were inconsistent among counties.

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[6] U.S. Census Bureau. 2017. Census of Governments: Finance. Table 1. State and Local Government Finances by Level of Government and by State: 2017. https://www.census.gov/data/tables/2017/econ/gov-finances/summary-tables.html.

[7] The previous reassessment took place in 1995 for taxes due in 1996.

[8] Brown, Mark D. 2005. Statewide Property Tax Equalization Study Policy Report. Indiana Fiscal Policy Institute, Indianapolis, IN, IFPI Report No. 24, http://indianafiscal.org/REPORT.pdf.

In addition to the administrative problems listed above, the reassessment had resulted in substantial increases in tax burdens for some property owners, especially residential property taxpayers in older homes. The legislature enacted various short-term measures to provide relief to affected taxpayers, but 2007 saw large increases in tax burdens for many Indiana homeowners brought on by the elimination of the inventory tax, rising local operating and capital levies, and further increases in residential assessments resulting from *trending*.[9]

Trending was authorized to begin in 2002 as a means to bring assessed value closer to the market value of property, but it was not widely implemented for several years as local officials completed the general reassessment. During this period, many counties issued late or provisional property tax bills. Trending was fully implemented in 2007 with assessed value that was based on selling prices in 2005. However, the previous year's assessed values had been based on 1999 sales data, resulting in large increases in assessed value for many homeowners. The ultimate result of these changes to the property tax system was a sudden and rather unexpected property tax increases on a substantial number of homeowners in 2007. This led to calls for numerous property tax reforms, including an organized effort for total property tax repeal.

A variety of proposals to restructure the property tax were considered. The legislation that was ultimately passed by the General Assembly was based substantially on Governor Mitch Daniels' proposal to impose tax rate caps (circuit breakers), which were partially implemented in 2009 and fully implemented for taxes paid in 2010. The caps implemented in 2010 are rate limits that constrain property tax payments to a maximum of 1.0 percent of gross assessed value (AV) on homesteads, 2.0 percent of AV on apartments, other residential, agricultural land, mobile home land, and long-term care facilities, and 3.0 percent of AV on nonresidential (business) real property and personal property.

Figure 11.1 shows how these changes in property tax structure and administration affected net property tax levy per capita in Indiana's urban and rural counties. During 2001, the inflation-adjusted net levy per capita was $965 and $1,262 in rural and urban areas, respectively. During 2019, it was $863 and $1,014.

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[9] In 2002 the Indiana General Assembly approved a measure to remove inventories from the business personal property tax by 2006.

Figure 11.1, Net Property Tax Levy per Capita, Adjusted for Inflation, 2000-2019
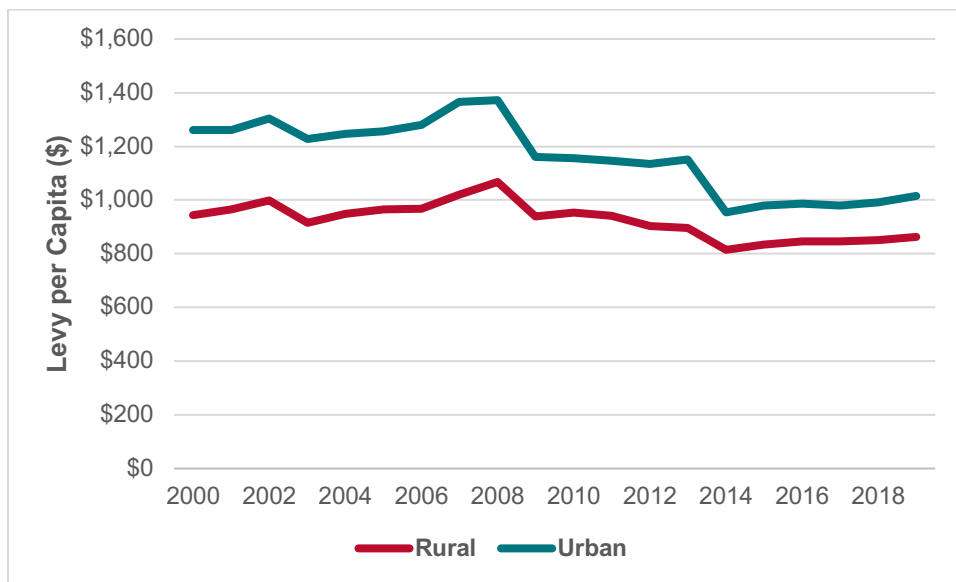
Source: Indiana Handbook of Taxes, Revenues and Appropriations

Because tax caps would substantially decrease local government revenue, the state took over about $3 billion of local spending, including the remaining 15 percent of school operating costs, child welfare levies, juvenile incarceration, indigent health care, state fair and forestry levies, preschool special education levies, and police and fire pensions. The state sales tax increased from 6.0 to 7.0 percent to pay for a portion of these costs. To further limit local spending, the statute required that referenda be held for new school and local government capital projects. This same legislation also included a circuit breaker for senior citizens.

The statute also addressed issues with the accuracy and fairness of property assessment. The number of assessing units was reduced from 1,008 assessing units (mainly in townships) to 105 units—92 county assessors and 13 township assessors (in townships with more than 15,000 parcels).[10] The requirements for assessor certification were also increased.

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[10] Referenda were held in November 2008 for voters to decide whether 43 townships in the state with 15,000 or more parcels should transfer to the county assessor or keep a township assessor. Thirty voted to transfer to county assessment, while 13 voted to keep township assessment. Those counties still with township assessors are Allen, Elkhart, Howard, Lake, LaPorte, Porter, St. Joseph, Vigo, and Wayne counties.

LOCAL OPTION INCOME TAXES

Local Option Income Tax (LOIT) has been available as a revenue source since at least the early 1970s.[11] County-Adjusted Gross Income Tax (CAGIT) was the first local income tax that was authorized. County Economic Development Income Tax (CEDIT) and County Option Income Tax (COIT) were introduced during the 1980s. In some counties, CAGIT could be used to fund construction or operations of jails, detention centers, and justice centers. CEDIT was used for capital projects, and COIT was used to fund public communication systems, public transportation, and economic development project bonds, in addition to property tax relief.

During 2007, the General Assembly also authorized three additional local option income taxes—LOIT to freeze the property tax levy, LOIT for property tax relief, and LOIT for public safety—to provide local governments with additional ways to raise revenue while reducing property tax burdens. During 2000, only eight (six urban and two rural) of Indiana's 92 counties did not have a local income tax. By 2014, all Indiana counties had implemented a local income tax.

During 2017, the General Assembly changed the LOIT categories so that the use of funds was clearer. The new categories are *Expenditure: Certified Shares* (IC 6-3.6-6-10), *Expenditure: Public Safety* (IC 6-3.6-6-8), *Expenditure: Economic Development* (IC 6-3.6-6-9), *Expenditure: LIT Correctional Facility* (IC 6-3.6-6-2.7), *Property Tax Relief* (IC 6-3.6-5), and *Special Purpose* (IC 6-3.6-71). As of 2019, 59 counties (33 rural and 25 urban counties) had implemented the LOIT for property tax relief, which essentially shifts part of local tax revenue from the property tax to the income tax.

Figure 11.2 shows the local income tax certified distribution per capita, adjusted for inflation. There is a two-year lag between the time the revenue is collected and when it is distributed to local governments, so local income tax reductions resulting from the Great Recession actually occurred two years later in 2011 and 2012. Since 2013, the LOIT distribution has increased steadily from an inflation adjusted $280 and $261 per capita in rural and urban counties, respectively, to $369 and $396 during 2019. Over this same period, the average LOIT rate has increased from 1.55 percent to 1.85 percent in rural areas and 1.36 percent to 1.58 percent in urban areas.

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[11] The earliest year that we have been able to find data on local income tax rates was 1973.

Figure 11.2, Local Income Tax Certified Distribution per Capita, Adjusted for Inflation, 2000-2019
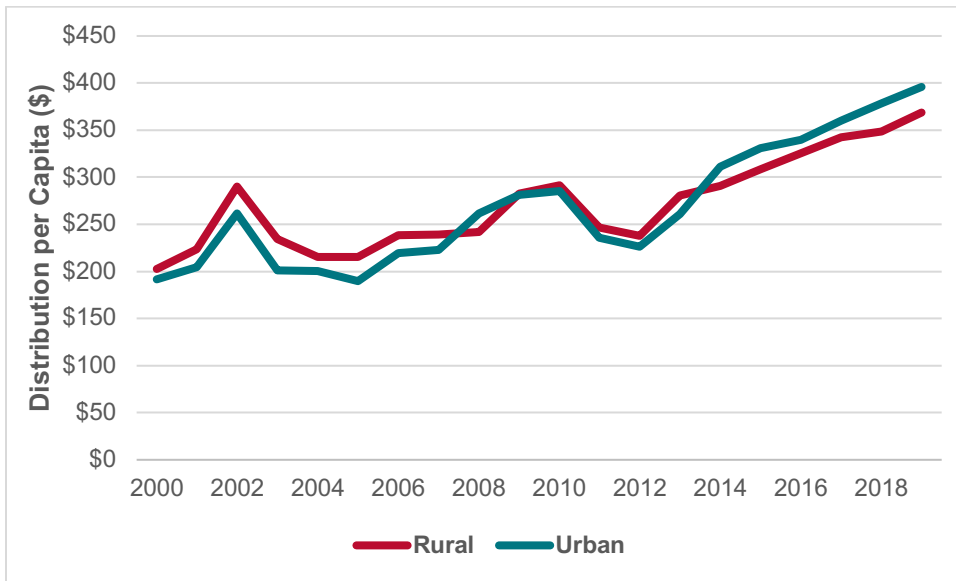
Figure 11.3, Local Income Tax as a Share of Total Local Income and Property Tax Revenue, 2000-2019
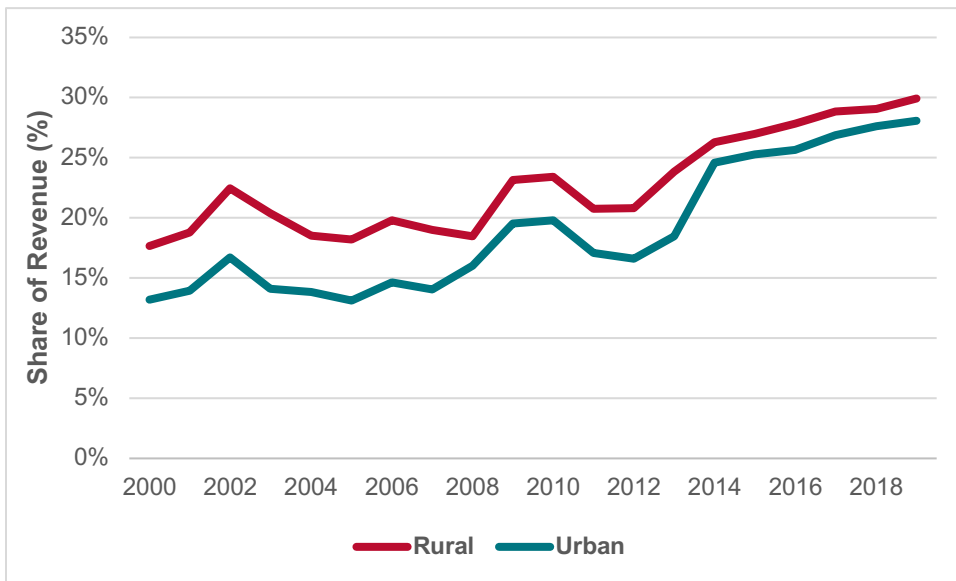
Statewide, the share of local tax revenue generated by local income taxes has dramatically increased from 14.1 percent in 2000 to 28.4 percent in 2019. See *Figure 11.3*. Rural counties generate a larger share of revenue from local income taxes—increasing from 17.7 percent of income and property tax revenue in 2000 to 29.9 percent during 2019. In urban areas, this share increased from 13.2 percent in 2000 to 28.1 percent during 2019, which suggests that the share is converging.

TAX CAPACITY

In this section, we examine a basic measure of local tax capacity in rural and urban areas using data from 2019. We use two regression equations to analyze the relationship between the tax base and the amount of local income tax revenue and property tax revenue accruing to local governments in each county.

$$(\text{Property Tax Net Levy})_i = \beta_0 + \beta_1 (\text{Gross Assessed Value}_i) + \beta_2 (\text{Personal Exemptions}_i) + \varepsilon_i$$

$$(\text{Local Income Tax Distribution})_i = \beta_0 + \beta_1 (\text{Personal Income}_i) + \varepsilon_i$$

We then calculate the residual, ε_i, which is the difference between actual (observed) revenue and predicted revenue from the regression equations given the tax base. A negative residual means that the county's local income or property tax revenue is lower than expected given the level of income and assessed value in the county. A positive residual means that local income or property tax revenue is higher than expected given the level of personal income and assessed value in the county.

Table 11.1 shows the relationship among property taxes, local income taxes, and combined taxes in rural and urban counties. For example, in Switzerland County, the local income tax certified distribution is $52 per capita less than predicted, given the county's level of personal income; and the property tax revenue is $7.50 per capita less than predicted, given the gross assessed value of its tax base and the various exemptions taken by tax payers.

Table 11.1, Difference Between Actual and Predicted Tax Revenue (Regression Residuals), 2019

Rural County	Local Income Tax Residual Per Capita	Property Tax Residual Per Capita	Combined LOIT and Prop. Tax Residual Per Capita	Urban County	Local Income Tax Residual Per Capita	Property Tax Residual Per Capita	Combined LOIT and Prop. Tax Residual Per Capita
Switzerland	-52.1	-7.5	-59.6	Ohio	-43.9	-8.8	-52.7
Jefferson	-47.3	8.1	-39.1	Sullivan	-48.0	16.3	-31.7
Pike	-62.9	26.1	-36.8	Benton	-1.8	-24.3	-26.1
Spencer	-28.4	-1.8	-30.1	Warrick	-15.5	-2.7	-18.2
Crawford	-57.0	28.7	-28.3	Harrison	-11.2	-6.4	-17.6
Gibson	-21.4	2.9	-18.5	Newton	-32.6	19.7	-13.0
Knox	-13.9	-2.2	-16.1	Owen	-16.3	4.6	-11.7
Franklin	-1.8	-7.4	-9.2	Porter	-5.8	0.3	-5.4
Orange	-2.4	-6.3	-8.7	LaPorte	-4.5	1.2	-3.2
Dubois	-7.8	-0.8	-8.5	Posey	-5.5	3.2	-2.2
Kosciusko	-4.1	-2.0	-6.1	Johnson	-2.0	0.2	-1.8
Lagrange	2.8	-7.9	-5.1	Floyd	-0.7	-1.0	-1.8
Ripley	-2.3	-2.4	-4.7	Dearborn	-4.0	2.5	-1.5
Marshall	-2.9	-1.1	-3.9	Tippecanoe	-0.9	-0.4	-1.3
Daviess	-5.0	3.3	-1.7	Monroe	-0.7	-0.5	-1.3

Rural County	Local Income Tax Residual Per Capita	Property Tax Residual Per Capita	Combined LOIT and Prop. Tax Residual Per Capita	Urban County	Local Income Tax Residual Per Capita	Property Tax Residual Per Capita	Combined LOIT and Prop. Tax Residual Per Capita
Martin	7.0	-8.3	-1.3	Whitley	2.9	-3.7	-0.8
Steuben	6.3	-7.2	-0.9	Delaware	-0.7	0.1	-0.6
Wayne	-2.6	1.7	-0.9	Hamilton	-0.6	0.2	-0.4
Henry	-2.6	1.8	-0.8	Putnam	6.3	-6.6	-0.3
Noble	2.2	-0.4	1.8	Vanderburgh	-1.1	0.9	-0.2
Grant	4.7	-2.8	1.8	Allen	0.2	0.2	0.4
Jackson	5.5	-3.0	2.5	Marion	0.2	0.2	0.4
Lawrence	0.1	3.0	3.1	Morgan	8.5	-8.1	0.4
Adams	0.6	2.6	3.2	Shelby	-1.4	1.8	0.4
Huntington	4.6	-1.2	3.4	Lake	0.1	0.5	0.6
Greene	-0.4	4.9	4.4	St. Joseph	0.9	-0.2	0.7
Blackford	-12.5	18.7	6.3	Madison	0.6	0.2	0.8
Decatur	14.0	-6.4	7.6	Hendricks	0.6	0.5	1.1
White	15.5	-7.7	7.8	Jasper	15.3	-13.8	1.5
DeKalb	8.1	-0.3	7.8	Wells	11.7	-9.9	1.7
Montgomery	9.4	-1.3	8.1	Hancock	2.4	-0.3	2.1
Miami	10.9	-2.5	8.4	Boone	2.5	-0.3	2.2
Randolph	8.5	-0.1	8.4	Clark	2.3	0.0	2.3
Perry	6.4	2.9	9.3	Elkhart	2.3	0.9	3.2
Starke	1.1	8.5	9.6	Vigo	2.3	1.3	3.6
Fayette	6.3	3.6	9.9	Bartholomew	2.6	1.1	3.7
Rush	5.5	5.7	11.2	Clay	12.5	-8.3	4.2
Parke	20.7	-7.5	13.2	Howard	1.8	2.7	4.5
Clinton	9.7	5.3	14.9	Vermillion	-1.2	7.1	5.8
Cass	11.0	4.1	15.1	Brown	24.8	-18.9	5.9
Wabash	18.3	-0.4	17.9	Washington	2.0	4.7	6.7
Fountain	12.5	5.5	18.0	Carroll	16.1	-9.1	7.0
Jennings	18.7	0.6	19.3	Scott	7.1	5.2	12.3
Fulton	15.8	3.9	19.7	Union	-1.1	29.2	28.1
Pulaski	44.8	-23.4	21.4				
Warren	27.1	-5.3	21.8				
Jay	13.0	8.9	21.9				
Tipton	31.0	-4.1	26.9				

Source: Authors' calculations using data from the Indiana State Budget Agency, Indiana Legislative Services Agency and the Indiana Department of Local Government Finance.

RURAL-URBAN EQUITY IN TAXATION

In addition to local tax capacity differences between regions, we must also address a lingering concern over the equity of tax collections and spending between rural and urban places. A few studies have address this issue. Coomes and Kornstein (1999 & 2004) find that the more densely populated urban areas in Kentucky subsidize the more sparsely populated rural. Bluestone (2009) reports that the Atlanta metropolitan area generates more state revenue than it receives in expenditures, while the 28-county Atlanta metropolitan area accounted for approximately 61 percent of Georgia's state revenue and received approximately 47 percent of state expenditures in fiscal year 2004.

Hicks, Faulk, and Ketzenberger (2010) found that Indiana's urban counties bore a heavier tax burden than the rural counties, and, tax revenues predominantly flowed from urban to rural places. This analysis was conducted upon every tax instrument and more than 500 expenditure funds in the state. In fact, only 20 counties in Indiana paid more in taxes than they received in state revenue in 2010; 18 of these counties are metropolitan and two are micropolitan. See *Figure 11.4*.

Figure 11.4, Geographic Distribution of per Capita Net Tax Payments in Indiana, 2010
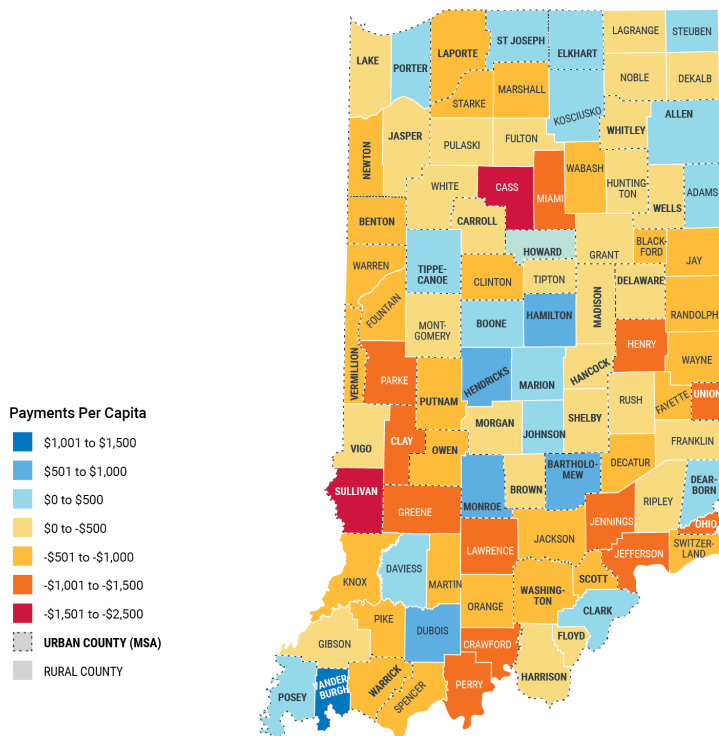
Source: Hicks, Faulk, and Ketzenberger, 2010

The issue of self-taxation (tax capacity and actual collections), along with the intrastate distribution of taxes for each county, should be part of a comprehensive discussion about financing local government and the quality and availability of local public services.

Chapter 12. Government Fragmentation

Local government in Indiana consists of counties, municipalities (cities and towns), townships, school districts, and special districts. Indiana cities are divided into three classes depending on population: first class cities have 600,000 inhabitants or more; second class cities have from 35,000 to 599,999 inhabitants; and third-class cities have fewer than 35,000 inhabitants. Indianapolis, which is consolidated with Marion County, is the only first-class city in Indiana and is governed by a mayor and city-county council. Second- and third-class cities are governed by a mayor and city council. Other municipalities regardless of population are generally classified as towns and are governed by a town council (and in some cases an appointed town manager). Towns with a population of 2,000 or more may become cities through a petition of voters and a referendum; likewise, cities may become towns through a petition of two-thirds of taxpayers to the circuit court.[12]

Table 12.1 shows the number of local governments in Indiana. The number of municipalities has remained stable over the past several decades, increasing from 564 in 1982 to 567 in 2017. Towns make up approximately 80 percent of municipalities in the state.

Table 12.1. Number and Type of Local Governance in Indiana, 1952-2017

Indiana	1952	1962	1972	1982	1992	2002	2007	2012	2017
Counties†	92	92	91	91	91	91	91	91	91
Municipalities*	540	546	546	564	566	567	567	569	567
Townships	1,009	1,009	1,008	1,008	1,008	1,008	1,008	1,006	1,004
School Districts	1,115	884	315	305	294	294	293	291	289
Special Districts‡	293	560	832	897	939	1,125	1,272	752	687
State Total	3,049	3,091	2,792	2,865	2,898	3,085	3,231	2,709	2,638

Source: U.S. Census Bureau, Census of Government.
* Municipalities include cities and towns.
† With the consolidation of Indianapolis and Marion County in 1970, the Census Bureau does not count Marion County as a separate county government.
‡ The reduction in the number of special districts after 2002 is due primarily to "School Building Corporations" being reclassified as a component of school districts rather than special districts.

Another layer of government in Indiana is townships. These are general purpose governments, each led by an elected trustee and township board, offering a limited range of services. Their primary services are overseeing volunteer fire departments and emergency medical services, providing poor relief, maintaining cemeteries, and operating parks.[13] Townships fund services through their property taxing authority, and every county is subdivided into several townships. There were 1,004 townships in 2017, the most recent year we have data.

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[12] U.S. Census Bureau (2019) provides more details about local governments in Indiana.

[13] There have been calls to eliminate townships in Indiana and transfer their functions to county government (Indiana Commission on Local Government Reform 2007, Cline 2014). For a treatment of local government consolidation, see Faulk and Hicks, 2011.

Even though the number of townships has remained basically the same over at least the past 70 years, there have been some changes in the property assessment function that townships traditionally performed. These changes were intended to decrease variability in assessments that became apparent after the 2003 court-ordered mass reappraisal of property. Referenda held in November 2008 transferred the assessment responsibilities of some townships to the county assessor; there are currently 92 county assessors and 13 township assessors in Indiana.

The number of school districts in the state has decreased dramatically since 1952. The number of school districts per county ranges from one school corporation in each of 21 counties to 16 school corporations in Lake County. Hicks and Faulk (2014) provide additional details on the distribution of school corporations in the state.

As in most states the number of special districts has increased dramatically since the 1950s. The decrease in special districts between 2002 and 2017 is due primarily to the reclassification of school building corporations as components of school districts rather than as separate special districts. In Indiana the most common types of special districts are library districts (297), soil and water conservation (94), sewerage (91), solid waste management (71), housing and community development (70), and drainage and flood control (41).

RURAL/URBAN DIFFERENCES

Table 12.2 shows that on average the number of local governments in rural and urban counties is about the same. However, when we scale the number of local governments by population, we find there are many more local governments per person in rural areas. See *Table 12.3*. On average, the number of local governments per 1,000 population in rural areas is 30 to 40 percent higher than in urban areas, depending on the type of local government.

Table 12.2, Average Number of Governments per County, 2017

Per County	Total	Municipalities	Townships	Special Districts	School Districts
State Avg.	28.67	6.16	10.91	7.47	3.14
Rural Avg.	27.58	5.88	10.88	7.10	2.73
Urban Avg.	29.86	6.48	10.95	7.86	3.59

Source: Office of Management and Budget. There are 44 urban counties and 48 rural counties using 2014 OMB metro definition.

Table 12.3, Average Number of Local Governments per Thousand People, 2017

Per 1K People	Total	Municipalities	Townships	Special Districts	School Districts
State Avg.	0.884	0.177	0.355	0.316	0.080
Rural Avg.	1.074	0.217	0.435	0.379	0.098
Urban Avg.	0.677	0.133	0.267	0.247	0.059

Source: Author's calculations from U.S. Census Bureau. 2017. 2017 Government Units Listing. 2017 Public Use Files. Last revised February 2021. https://www.census.gov/data/datasets/2017/econ/gus/public-use-files.html

The implications of this are that fewer taxpayers are available to fund each unit of local government in rural places. Thus, the average costs of local government services are higher and/or the breadth and quality of services is lower in rural locations than urban places. The reason for this is that governments have high fixed costs (overhead), which is spread across far fewer taxpayers in rural counties. For example, each town government has a town council and perhaps a town manager, website, and administrative offices. Likewise, each township, school district, and special district has overhead costs associated with administering these units of government.

These overhead, or fixed, costs are disproportionately paid by rural residents who sustain a far larger number of local governments on a per capita basis than do urban residents. As we make clear in other sections of this report, the ability of local governments to provide high quality public services is a dominant cause of population and employment growth. High overhead costs may reduce the quality of services and/or increase the costs of receiving the same level of service. Typically, they will do some of both, which leaves rural places at a disadvantage in funding higher quality of life improvements for their residents.

An examination of average tax rates *(Table 12.4)* shows that rural counties have higher income tax rates, while urban areas have higher property tax rates. The typical rural county received a LOIT distribution of about $11.2 million compared to $47.4 million in the typical urban county. For property taxes, the average net levy in rural counties was $26.2 million compared to $121.6 million in urban counties.

Table 12.4, Average Tax Rates and Revenue per County, 2019

Per County	LOIT Total Rate (%)	LOIT Certified Distribution ($)	Effective Property Tax Rate (%)	Property Tax Net AV ($)	Property Tax Net Levy ($)
State Avg.	1.7207	28,540,483	1.90	3,371,066,326	71,837,486
Rural Avg.	1.8459	11,209,495	1.85	1,459,221,595	26,251,270
Urban Avg.	1.5841	47,447,016	1.96	5,456,715,123	121,567,904

Source: Author calculations from local income tax data provided by the Indiana Office of Management and Budget and property tax data from the LSA Handbook of Taxes, Revenue and Appropriations.

LOCAL GOVERNMENT CONSOLIDATION

Since the 2006 passage of the Government Modernization Act, there have been attempts to consolidate local government units. Seven local government consolidation efforts occurred between 2008 and 2012, all in metropolitan (urban) areas.[14] Two of these were city-county consolidation referenda, which were held in 2012—Muncie-Delaware County and Evansville-Vanderburgh County, both of which were unsuccessful, and two were

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[14] We identified these consolidation attempts through the media and word of mouth. If there have been other attempts, please contact the authors so that they can be included in future analysis. We are aware that the Town of Middletown and Fall Creek Township in Henry County have begun the consolidation process and that West Clark Community Schools held a referendum to split the school district into two districts, which passed in May 2020.

town-township referenda—Town of Zionsville-Eagle Township-Union Township in 2008 and Town of Yorktown-Mt. Pleasant Township in 2010, both of which were successful. More than 70 percent of voters approved consolidation in each of these successful cases.[15] Conversely, the two city-county mergers were each defeated by a margin of approximately 2:1.

Despite their ultimate fortunes, these four consolidation attempts were similar in at least two key characteristics. All four were conducted using the process specified in the Government Modernization Act, and in each case proponents were recommending the consolidation of a city or town with a geographically larger entity encompassing the local government unit, such as a county or township. However, these consolidation attempts also had significant differences in key aspects.

The communities affected by the township consolidations tended to be more homogeneous with respect to social and economic characteristics than the proposed cities and counties consolidations. Furthermore, the town and township governments, unlike cities and counties, have relatively little overlap in functional responsibilities. For the functions in which overlap existed, most notably fire protection, the towns and townships were already functionally consolidated.

From 2010 to 2012, reorganization committees were formed for three additional municipality-township consolidations—City of Greenwood-White River Township in 2010, Town of Brownsburg-Brown Township-Lincoln Township in 2011, and Town of Avon-Washington Township in 2012. Each of these consolidation attempts failed to reach the referendum stage.

TRADITIONAL PUBLIC SCHOOLS

Two studies have focused on economies of scale in Indiana school corporations. Zimmer, DeBoer, and Hirth (2009) simulated the effects of a proposed school district consolidation in Indiana. The authors employed a traditional cost function, treating the potential endogeneity in cost factors (e.g., teacher salary) using socioeconomic instrumental variables. This study found the minimally optimal school corporation enrollment (in terms of cost) to be between 1,300 and 2,900 students, suggesting the presence of economies of scale in corporations of this size, with diseconomies occurring in schools with larger student bodies. These results suggest that merging school corporations with fewer than 1,300 students with larger corporations will result in lower costs but merging into much larger corporations may experience other disadvantages.

Faulk and Hicks (2010) examined the potential impact of consolidating Indiana school corporations and found that the consolidation of school corporations with enrollment of less than 2,000 students would lower the cost of

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[15] See Taylor, Faulk and Schaal (2017) for a more detailed analysis of these consolidation attempts.

providing school services. As part of this same study, the authors examined the relationship between the number of school corporations in a county and per capita spending on education using data from four Midwestern states. They found that per capita spending on education increases with the number of school corporations in a county, which suggests that consolidating school corporations to reduce the number in a county will lower the cost of providing public education.

We also provide descriptive statistics for school corporations in metro (urban) and non-metro (rural) counties *(Tables 12.5 and 12.6)*. School corporations in rural areas tend to be smaller, as indicated by average enrollment in the data. The average SAT composite score, pass rates for the 4th and 8th grade ISTEP exams, high school AP exams, and the biology end-of-course assessment (ECA) are lower in school corporations located in rural counties.

Table 12.5, School Corporation Educational Outcomes in Rural and Urban Indiana, 2014

School Corps.	Number of Corporations	2014 Avg. Enrollment	2014 Total Enrollment	Avg. SAT Score	Avg. ACT Score	% Students w/ Honors Diploma
Rural	131	1,757	230,137	965.55	22.48	30.77
Urban	158	4,900	774,161	976.51	22.26	32.61
Total	289	3,475	1,004,298	971.56	22.36	31.77

Source: Devaraj, Faulk, and Hicks (2017)

Table 12.6, School Corporation Pass Rates in Rural and Urban Indiana, 2014

School Corps.	% Students Passing 4th Grade ISTEP	% Students Passing 8th Grade ISTEP	% AP Students Passing AP Exam	% HS Grads Passing Algebra ECA	% HS Grads Passing English ECA	% HS Grads Passing Biology ECA
Rural	56.71	44.80	32.44	72.34	80.30	38.54
Urban	58.79	47.39	38.75	72.25	80.94	43.86
Total	57.85	46.22	43.71	72.29	80.65	41.45

Source: Devaraj, Faulk, and Hicks (2017)

Special Issues Affecting the Rural Economy

While the issues we examine in this next section are important to any community, rural or urban, we examine them through a distinctly rural lens. This section includes discussion about: how rural and urban are defined and how that definition influences our understanding of rural places; what quality of life means, how it is measured, and how it affects employment and population growth; industrial mix and its disparate impact on rural communities; broadband, where it exists (and doesn't), and its role as a vital, private service; the movement of people through commuting patterns, migration, and immigration; and, finally, we end with a discussion of Indiana in a post-COVID world.

Chapter 13. Formerly Rural Places, or the Role of Changing Rural Definitions

There is not, of course, any natural designation for what constitutes "rural" or "urban." These definitions, and many of the opportunities and challenges faced by these places, are primarily constituted by policy and rules developed at both the national and state levels. Nor are these designations consistent across programs, agencies, or even within the same department. At the federal level alone, there are 15 different definitions of "rural," 11 of which come from the U.S. Department of Agriculture. There is a significant amount of arbitrariness to how we define both rural and urban, or nonmetropolitan and nonmetropolitan, highlighted by the fact that these definitions are regularly examined and updated or changed. The Office of Management and Budget (OMB) definition, which is commonly used by researchers, was first to define metropolitan and non-metropolitan in 1975. These definitions have undergone review and change in 1990, 1993, 2003, and 2013. Indeed, the definition was changed so dramatically in 2003 (when it included a "micropolitan" definition) that data since then is not comparable to data prior to the change (Cromartie, et. al., 2020).

Currently, the OMB defines metropolitan (often used interchangeably with "urban") as counties with one or more densely populated area of at least 50,000 people plus all outlying counties that are closely tied to the core county through commuting pattern. Non-metropolitan (or "rural") counties are any that do not fit the metro definition. Technically micropolitan counties are simply large non-metropolitans, but they received official recognition in 2003, and are defined as counties with a population cluster of between 10,000-49,999 plus their socially and economically close-tied neighboring counties. Counties that do not fit either of these definitions are classified as "noncore" counties.

The OMB recently proposed to change the metropolitan threshold to 100,000 people, which was expected to change the designation of 144 metropolitan counties into non-metro counties. Five Indiana metropolitan areas, consisting of eight counties, were on the list of those places to change from metropolitan to non-metropolitan
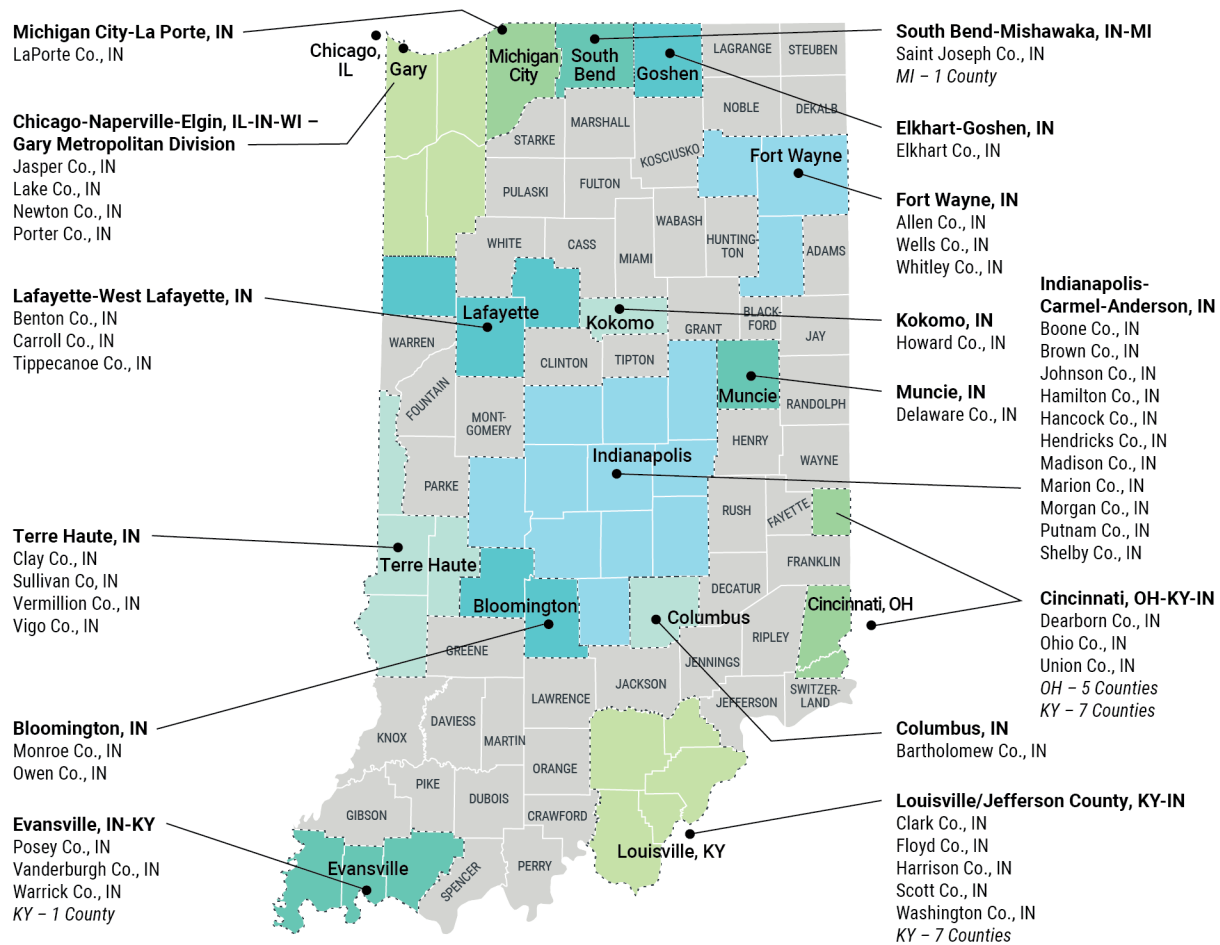
status. Although this plan has been rejected, we expect that another significant definitional change will occur by the end of the decade. However, even without these big changes, counties are updated on a regular basis and move in and out of these designations fairly regularly. Understanding and acknowledging reclassification is important for at least three reasons.

First, rural counties that are reclassified as urban are still incredibly important and potentially successful rural stories. It is possible other rural communities might be able to learn from these success stories, but because of reclassification, they are lost from the rural narrative.

Alternatively, rural counties that are reclassified as urban entirely due to their proximity (and, therefore, economic ties) to other urban counties may experience unique challenges that are obscured within a larger MSA structure. Failing to identify these rural counties as essentially rural within the shadow of larger urban centers may result in mis-targeted funds or misaligned policies, such as exclusion from rural programs.

The counties that remain or become rural are increasingly those with smaller chances of success, reinforcing the common, but incomplete, narrative of rural America as dying and desperate. If we were to acknowledge the incredible rural success of the counties that have tipped into metropolitan status, not only would we have a more coherent and accurate picture of the opportunities that exist in rural places but the remaining rural communities would have more models to follow.

Figure 13.1, Metropolitan Statistical Areas (MSAs) and Non-Metropolitan Counties in Indiana, 2019

Michigan City-La Porte, IN
LaPorte Co., IN

**Chicago-Naperville-Elgin, IL-IN-WI –
Gary Metropolitan Division**
Jasper Co., IN
Lake Co., IN
Newton Co., IN
Porter Co., IN

Lafayette-West Lafayette, IN
Benton Co., IN
Carroll Co., IN
Tippecanoe Co., IN

Terre Haute, IN
Clay Co., IN
Sullivan Co, IN
Vermillion Co., IN
Vigo Co., IN

Bloomington, IN
Monroe Co., IN
Owen Co., IN

Evansville, IN-KY
Posey Co., IN
Vanderburgh Co., IN
Warrick Co., IN
KY – 1 County

South Bend-Mishawaka, IN-MI
Saint Joseph Co., IN
MI – 1 County

Elkhart-Goshen, IN
Elkhart Co., IN

Fort Wayne, IN
Allen Co., IN
Wells Co., IN
Whitley Co., IN

**Indianapolis-
Carmel-Anderson, IN**
Boone Co., IN
Brown Co., IN
Johnson Co., IN
Hamilton Co., IN
Hancock Co., IN
Hendricks Co., IN
Madison Co., IN
Marion Co., IN
Morgan Co., IN
Putnam Co., IN
Shelby Co., IN

Kokomo, IN
Howard Co., IN

Muncie, IN
Delaware Co., IN

Cincinnati, OH-KY-IN
Dearborn Co., IN
Ohio Co., IN
Union Co., IN
OH – 5 Counties
KY – 7 Counties

Columbus, IN
Bartholomew Co., IN

Louisville/Jefferson County, KY-IN
Clark Co., IN
Floyd Co., IN
Harrison Co., IN
Scott Co., IN
Washington Co., IN
KY – 7 Counties

Source: Data from U.S. Office of Management and Budget; base map from NationalAtlas.gov
Note: Urban counties (part of an MSA) are shaded in blue; rural counties (non-metro) are shaded in gray.

Given this backdrop, we believe it is prudent to examine Indiana's rural counties that have been reclassified as urban since the 2003 OMB redefinition. Both of Indiana's counties that have made this leap (Scott County and Union County) retain small populations that have been subsumed by expanding metropolitan areas.

SCOTT COUNTY

With just over 23,000 people in 2003, Scott County was a non-metropolitan county by all standard definitions. However, by 2013, the county was included in the Louisville/Jefferson County, KY-IN MSA (the "Kentuckiana" region) and was reclassified as metropolitan. The 2019 estimated population in Scott County was 23,873, a 3.6 percent increase over the 2000 population but still well below the state and national growth rates of 10.5 percent and 16.3 percent, respectively. However, it is closely connected to the larger metropolitan area through a commuting pattern that is growing in importance to the county. In 2000, 1,571 Scott County residents commuted

into the Louisville metropolitan counties in Indiana and Kentucky. By 2019, the commuting number had risen to 1,817 workers, or 15.6 percent of the working population. The largest commuter growth was into neighboring Clark County, IN.

UNION COUNTY

Union County was redesignated as part of the Cincinnati MSA in the same 2003 OMB circular. This county is much smaller, with only 7,054 residents in 2019, having experienced a loss of 3.9 percent of its population since 2000. As with Scott County, the change in commuting patterns appears to have motivated the designation change. In 2000, 662 Union County residents commuted to Ohio for work, a figure that rose by 44 percent to 956 workers in 2019. Today, 13.5 percent of all Union County workers commute to Ohio for work, while only 35 Ohio workers commute into the county, a number unchanged since 2000. It appears that the decision to alter the OMB's metropolitan status was primarily one of commuting patterns or economic linkages between formerly rural counties and nearby metropolitan counties.

DEFINITIONAL CHANGES

It is also useful to consider those current metropolitan counties that the OMB recently considered changing to non-metropolitan. While this change did not occur, the primary rationale was that some current metropolitan areas are simply too small to be rightfully included as separate places. And, as we stated earlier, we expect some significant change that will likely impact these counties in the fairly immediate future. See *Table 13.1*.

Table 13.1, Counties Proposed to Move to Non-Metropolitan Status, 2019

County	Associated MSA	2019 Population	Pop. Change 2000-2019
Bartholomew	Columbus	83,779	16.7%
Clay	Terre Haute	26,225	-1.3%
Delaware	Muncie	114,135	-3.9%
Howard	Kokomo	82,544	-2.8%
LaPorte	Michigan City-LaPorte	109,888	-0.2%
Sullivan	Terre Haute	20,669	-5.0%
Vermillion	Terre Haute	15,498	-7.6%
Vigo	Terre Haute	107,038	1.2%

Source: Office of Management and Budget; Census Bureau

All but one of these metropolitan areas experienced population decline since 2000, although the cities of Columbus and Kokomo have both experienced organic growth since the Great Recession (Muncie, on the other hand, experienced slight growth due to annexation in 2008). While none of these counties appears poised to experience population decline that would remove them from MSA status in the coming decade under the current definition, it is possible they all could be redefined as micropolitan given future definitional changes. This matters

because while the character of these counties is unlikely to change—as is true for many metro-designated counties, all of these counties have large areas that would traditionally be considered rural, including small towns and agricultural lands—the ways in which they are classified has the potential to drastically impact their qualifications for federal programs.

The OMB definition is used by unknown numbers of public and private programs to determine eligibility for funding, and nonmetro and metro places are often treated quite differently in these programs. Community Development Block Grants, for example, utilize the OMB definitions and while they are open to both rural and urban places, the application process, amount, and restrictions are significantly different for both. Alternatively, this change had the potential to put current nonmetropolitan counties at a disadvantage as well, as they would suddenly be competing for funding with much better resourced, funded, and experienced former metropolitan counties. This is not to say that that a definitional change is not needed; rather, we are highlighting here the challenges of shifting definitions and how they potentially impact our understanding of rural and urban places in our state.

Of course, many of the rural counties that have been redesignated as urban are those that have grown relatively quickly. Were we to extend this analysis back another half century, we would find that Hamilton, St. Joseph, and Elkhart counties—all of which are now booming urban centers—were among the top ten row crop suppliers in the state (Barnhart and Carmony, 1954). With fast growing places losing their rural designation, we are left with a biased view of success in rural communities. It is like noting that all the students in a classroom are short only after removing all the tall children from the room. We do not propose a statistical remedy for this, only a conceptual understanding of this issue.

# Chapter 14. Quality of Life and Growth

Quality of life is a much discussed, but poorly defined component of regional prosperity. Here we attempt to explain how it is measured, which factors contribute most to quality of life, and what impact quality of life can have on employment and population growth. We also explain how a related concept, quality of business environment, does and does not influence population and employment growth.

The most common approach to measuring quality of life (QoL) is the Rosen-Roback model. This approach is based on the understanding that households make trade-offs between the local cost of living and how much money they are likely to make when deciding where to live. But the local cost of living and salary are not the only considerations, and these other considerations are what are termed "amenities." In general, people are willing to pay a higher cost of living and/or take a lower wage to be close to these amenities. While "amenity preference" will be different for every individual and household, the beauty of the Rosen-Roback model is that it relies on observed behavior rather than reported behavior. For example, surveys routinely report that workers dislike long commutes and would like to live near a beach, yet we observe hundreds of millions of Americans living far away from beaches and/or commuting great distances to work. Measuring quality of life depends on the actual trade-offs people make, so it is more useful to deploy observed behavior rather than stated preferences.

How do we observe this behavior? To be clear, we aren't talking about raw home prices or wages, but on prices and wages conditioned on the characteristics of the home and worker. Simply examining wages, home prices, or amenities can tell us nothing important about the QoL trade-off. We must control for differences in homes and workers that are independent of local QoL. Over the past couple of decades, economists have relied on anonymous Census data of individuals and families to measure QoL. This data tells us the level of education, occupation, and wages of an individual worker, along with demographic data such as age, race, and ethnicity. However, due to confidentiality restrictions placed on the important data sources used in this research, researchers have been unable to extend these QoL measurements to geographies smaller than the metropolitan level. That means micropolitan and rural places lack any market-based measurement of QoL to inform their local policy choices. This is a serious omission from the places that one in five Americans live and work. Our research circumvents these data restrictions by using aggregate wage and housing prices prior to the estimation of QoL.

In a recent study (Weinstein, Wornell, and Hicks, 2022) we extended this analysis to the county level nationwide. This permitted us to measure quality of life in American metropolitan, micropolitan, and rural places. See *Figure 14.1*. What does this mean for residents of micropolitan and rural places?

Figure 14.1, Quality of Life in U.S. Counties, 2010
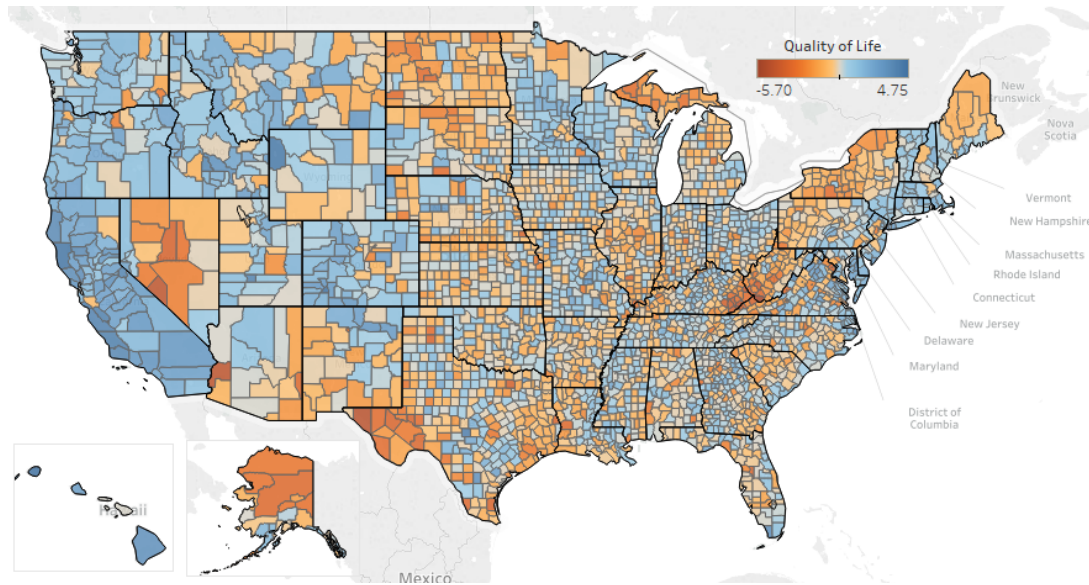
Source: Weinstein, Wornell, and Hicks, 2022

HOW CAN WE USE OUR QUALITY OF LIFE MEASURES?

The study of quality of life has provided urban communities with clear guidance on the development of policy and infrastructure spending for decades. Not so for non-metropolitan places; much of the recent literature on quality of place simply documented the importance of natural amenities for growth in rural areas.[16] While interesting, it is hardly an agenda for local policy or infrastructure spending. From studies like these, we know that there are correlations between natural amenities and population growth; however, the theory and empirical work required to infer causation between quality of life and economic outcomes has been missing for non-metropolitan counties. This omission has significantly limited how we understand amenities in non-metro places. In effect, quality of life researchers have simply assumed that micropolitan and rural residents share amenity preferences with urban dwellers.

There are many reasons to believe that this assumption may be incorrect, and our modeling approach allows us to evaluate the role quality of life plays in population and employment growth, while measuring which amenities matter most to micropolitan and rural residents.

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[16] See Deller et al., 2001; Nzaku and Bukenya, 2005; McGranahan and Wojan, 2007; McGranahan, 2008; Davidsson and Rickman, 2011; Rickman and Rickman, 2011).

In graphing the relationship between QoL and both population and employment growth, we see a strong relationship in both cases. *Figure 14.2* shows our quality of life measurements against population growth in Indiana's 48 rural counties from 2009 to 2019, the recovery period following the Great Recession. The effects are remarkable. Moving from the lowest QoL measure to the average would result in a 3.2 percent population growth.

Figure 14.2, Population Growth and Quality of Life in Indiana's Rural Counties, 2009-2019

Source: Bureau of Economic Analysis; Weinstein, Wornell, and Hicks, 2022

Further, the effect of QoL on employment should be equally interesting. *See Figure 14.3*.

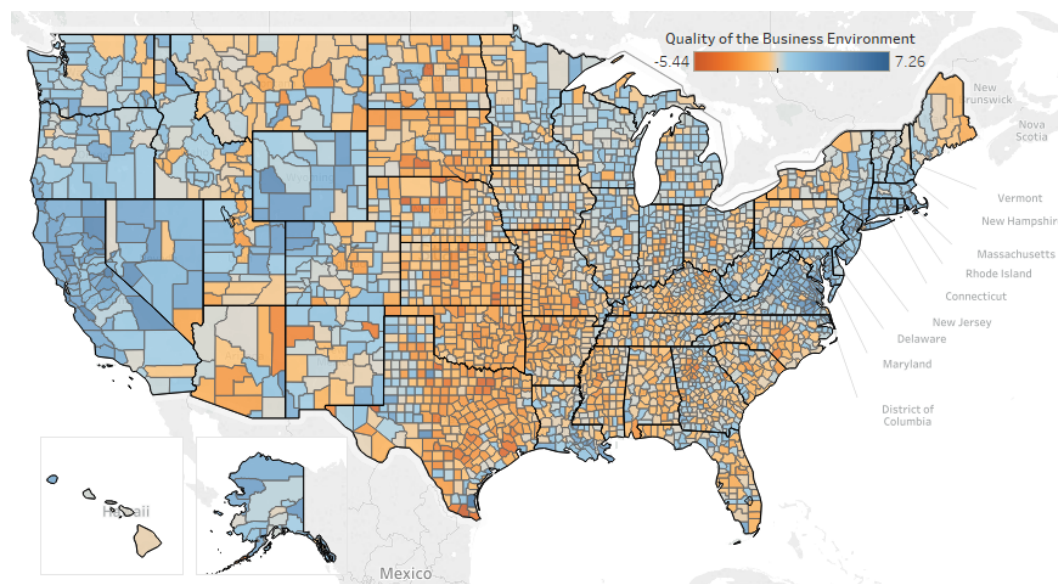**Figure 14.3, Employment Growth and Quality of Life in Indiana's Rural Counties, 2009-2019**

Source: Bureau of Economic Analysis; Weinstein, Wornell, and Hicks, 2022

55

Figure 14.3 illustrates the link between QoL and employment growth in Indiana's rural counties in the wake of the Great Recession. The link is strong and causal. The Rosen-Roback theories make clear that quality of place influences economic activity (population growth and employment). What is most startling about these two graphics is not merely the connection between QoL and population and employment growth, but rather the strength of the connection. Note that the scales differ on both graphs to improve legibility. The actual effect of QoL on employment growth is more than three times stronger than that on population growth over the same period. These findings confirm that improvements in quality of life attract people and jobs, and that the effects matter in rural counties, not solely in large urban centers.

Weinstein, Wornell and Hicks (2022) also explained a related concept, Quality of Business Environment (QoBE). This comes to us from Beeson and Eberts (1989) and Gabriel and Rosenthal (2004) who demonstrate that businesses weigh wages and cost of living considerations differently than do households. In general, businesses are willing to pay both higher wages and a higher cost of living because both indicate more productive locations. The QoBE measure is important because traditional economic development policies focus on being "business friendly" (i.e., having a higher QoBE) as a primary goal for attracting jobs and people. *Figure 14.4* displays the QoBE for every county in the nation.

Figure 14.4, Quality of the Business Environment in Counties Across the U.S., 2010
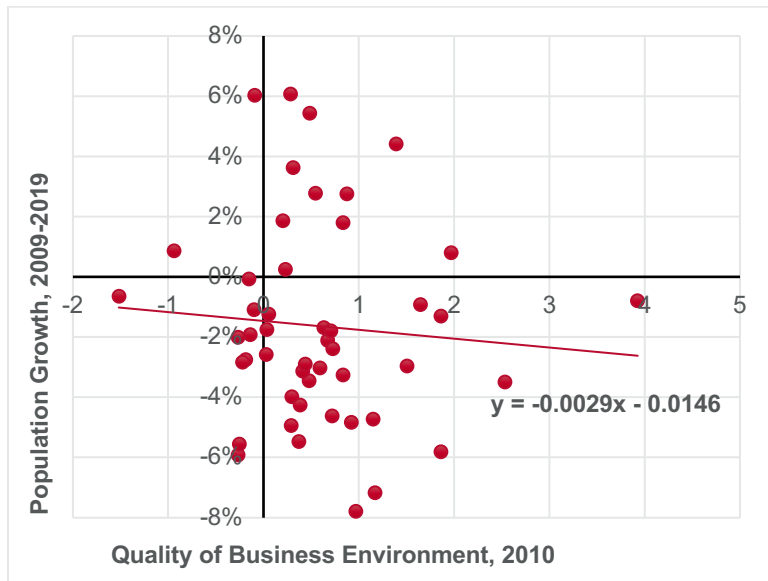

Source: Weinstein, Wornell and Hicks, 2022

We next compare the quality of business environment measures with population and employment growth in Indiana's rural counties. *See Figures 14.5 and 14.6.*
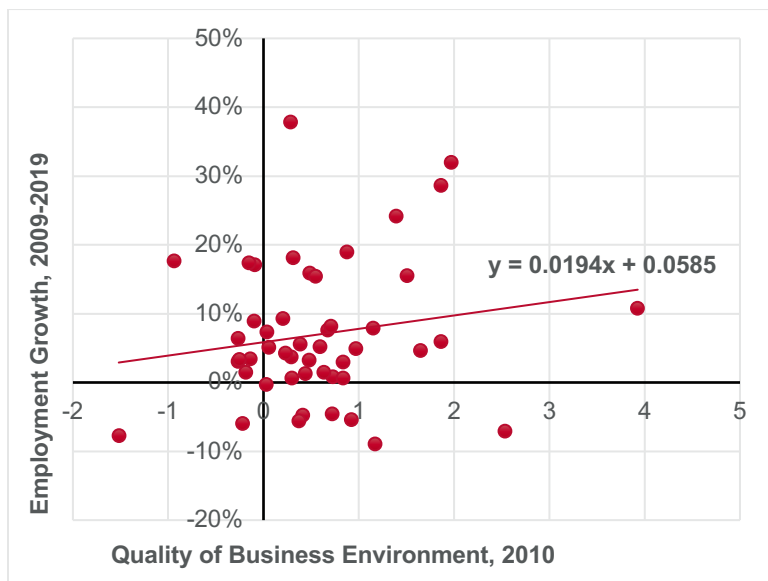
Figure 14.5, Quality of Business Environment and Population Growth in Rural Indiana, 2009-2019

Source: *Bureau of Economic Analysis; Weinstein, Wornell, and Hicks, 2022*

Figure 14.6, Quality of Business Environment and Employment Growth in Rural Indiana, 2009-2019
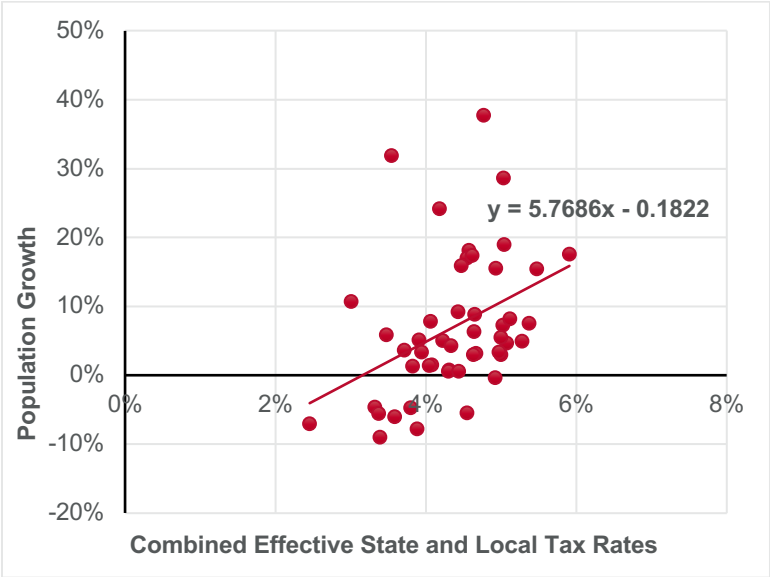

Source: *Bureau of Economic Analysis; Weinstein, Wornell and Hicks, 2022*

Despite the expectation of many traditional economic development proponents, it is quality of life, not quality of business environment, that drives both population and job growth. Moreover, QoBE tends to depress population growth while boosting job growth. These findings strongly suggest that economic development in rural Indiana is likely to be more successful if and when investments are made in QoL. This is particularly true if resources, particularly tax dollars, are diverted to Quality of Life.

In fact, this factor is so robust, it warrants additional analysis. In *Figure 14.7*, we illustrate employment growth and the combined state and local tax rates (from IRS files) from 2009 to 2019 in rural Indiana counties. There appears to be no negative consequences of higher tax rates on employment growth. On the contrary, higher tax rates are strongly correlated with employment growth (as well as population growth, which we do not report here).

Figure 14.7, Employment Growth and Combined State and Local Tax Rates in Rural Indiana, 2009-2019

Source: Bureau of Economic Analysis; Internal Revenue Service; and author's calculations

Our findings remain robust across broad geographic regions, metropolitan, and micropolitan counties. In rural counties, we observe better performance of quality of business environment, though the strength of QoL on population and employment growth remains much stronger than the effect of QoBE. We do not report it here, but we find small business growth is also closely linked to QoL, not QoBE. But, the most powerful use of this research is in identifying alternative policies to improve the prosperity and economic vitality of non-metropolitan places.

Finally, we use the QoL measures to tell us what specific amenities matter to residents. This directly informs policy development and infrastructure spending in micropolitan places. Using our measure on national micropolitan regions, we categorize all amenities into one of three categories—natural, public, and private. These are, as they suggest, those aspects of a community that are naturally occurring, such as mountains or miles of coastline; provided by state or local government, such as public safety and school quality; or provided by the private sector, such as recreational facilities or restaurants. We then use an algorithm (least angle reduction, LAR) to identify the most significant amenities in each of these categories. Of all the variables we included for

consideration, 15 rose to the level of statistical significance. These included variables across all three categories, as highlighted in *Table 14.1*.

Table 14.1, Amenities Correlated with Quality of Life Measures

Natural Amenities	Significance, Coefficient	Public Amenities	Significance, Coefficient	Private Amenities	Significance, Coefficient
January Temperature	0.0254*** -0.0062	School Spending	6.6583*** -1.5855	Food Stores	0.0131** 0.0058
July Temperature	-0.0711*** -0.0138	Violent Crime Rate	-0.0007*** -0.0002	Worship Places	-0.0258*** -0.0099
Land Hilliness	0.0001** 0.0	Physically Unhealthy Days	-0.0724* -0.0399	Food/Beverage Places	0.0039* 0.0021
Forest Coverage	-1.2494*** -0.2225	Distance to Metro	-0.0033** -0.0014	Arts/Culture	0.0431* 0.0254
Federal Land	-0.0001** -0.0001	Work from Home	0.1185*** -0.0173	Recreation	0.0551*** 0.0152

Source: Weinstein, Wornell and Hicks, 2020

These three broad amenities areas—natural, public, and private—offer different levels of influence. Because all these measures are in logarithmic form, the size of the effect, or the coefficient, is comparable across characteristics. Natural amenities are statistically significant but play a modest role in market-based measures of amenities, additionally most of these amenities are not susceptible to policy changes.

Public amenities matter but have a more nuanced interpretation. For example, high school spending as a share of county-level GDP is the most highly valued amenity, but this is really a rough proxy for school quality. Nearly every study of the issue has identified school quality as playing a dominant role in household relocation decisions. Crime is also a major factor, but we suspect that it is likely a proxy for other unobservable factors, e.g., urban decay or blight.

On the private amenity side, we interpret these as factors that respond quickly to consumer demand, with one exception. The data suggests that the number of worship places per capita is negatively correlated with quality of life. We have two hypotheses for this. The first is that a dense number of worship facilities are a proxy for a high degree of religious interest, which may be a less appealing amenity for some households.

The second hypothesis is that this dynamic is a statistical artifact of population change. Newer worship centers are often built larger than older facilities and often locate in growing areas. Worship centers tend to close slowly— only after significant population declines. Because we have only a count variable in our data, growing places with fewer but larger worship centers would rank lower on this variable, while places with a declining population and numerous worship centers would rank higher. Thus, this metric is correlated without causal inference, due to weakness in the data.

Our results here, coupled with our results on the relationship between quality of life and employment growth, are in line with some previous research. These results provide compelling evidence that policymakers in Indiana's rural counties are likely to receive more robust returns by focusing on improving the quality of life in their towns rather than narrowly focusing on improving quality of the business environment. Importantly, the quality of life policies recommended here are not focused on talent attraction; rather, the focus is on improving the quality of life of existing residents, making a rural county naturally attractive to those with similar preferences.

Chapter 15. Manufacturing

In this chapter we examine the manufacturing sector in Indiana's rural areas. As with the other chapters, we define rural areas as those counties that are not part of a metropolitan statistical area. We also compare manufacturing in rural areas to urban areas to frame our discussion about the industry. Using 2001 to 2019 county-level data on employment and GDP, we compare the level and share of manufacturing employment in urban and rural areas along with the growth of manufacturing employment and GDP.

Figure 15.1 shows the relationship between manufacturing GDP and employment in rural areas. Prior to the Great Recession, the manufacturing sector was going through a time of adjustment as manufacturing GDP increased while manufacturing employment decreased. Since 2009, rural manufacturing GDP has made a slow but full recovery, unlike manufacturing employment, which has recently just passed employment numbers from 2008. The substantial increase in real GDP is closely related to the increase in innovative technologies that boost the efficiency of manufacturing processes using more capital and less labor.

**Figure 15.1, Manufacturing Real GDP and Employment in Rural Indiana, 2001-2019**
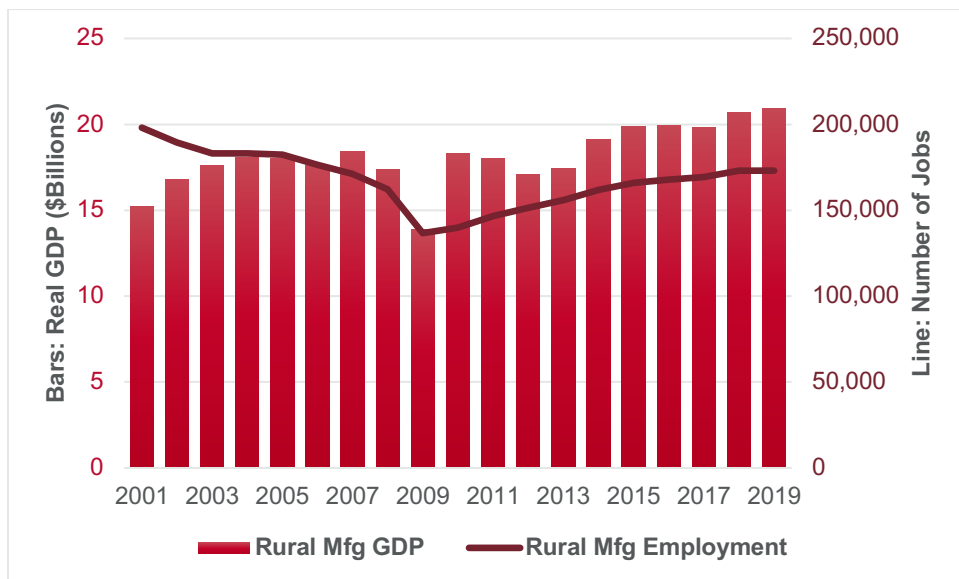
Source: Bureau of Economic Analysis

There is much variation in the growth of the manufacturing sector among the state's counties. In rural Indiana, Ripley County saw the largest decline in manufacturing GDP with a decrease of $148,307,000 (-44.7 percent), whereas Gibson County had GDP growth of $1,192,675,000 (373.7 percent), making it the rural county with the largest gain. It also had the greatest increase in rural manufacturing employment, adding 4,821 jobs (109 percent). Gibson County is home to a Toyota manufacturing facility, which began production in 1999. Conversely, Grant County lost the most rural manufacturing jobs, with a decrease of 3,333 jobs (-41 percent) from 2001 to 2019.

This wide variation is mirrored in urban Indiana. The urban county with the largest gain in manufacturing GDP was Elkhart County, which increased by $4,966,905,000 (155.1 percent) from 2001 to 2019. Elkhart's growth is largely due to the expansion of RV manufacturing in the county. The urban county with the largest decline in manufacturing GDP was Delaware County, decreasing by $432,286,000 (-49.6 percent).

Elkhart County also experienced the most growth in manufacturing employment within urban counties, adding 10,597 jobs (18.7 percent). Marion County suffered the largest decline in manufacturing employment with a decrease of 22,884 jobs (-29.2 percent) from 2001 to 2019.

Figure 15.2, Manufacturing Share of GDP and Employment, 2001-2019
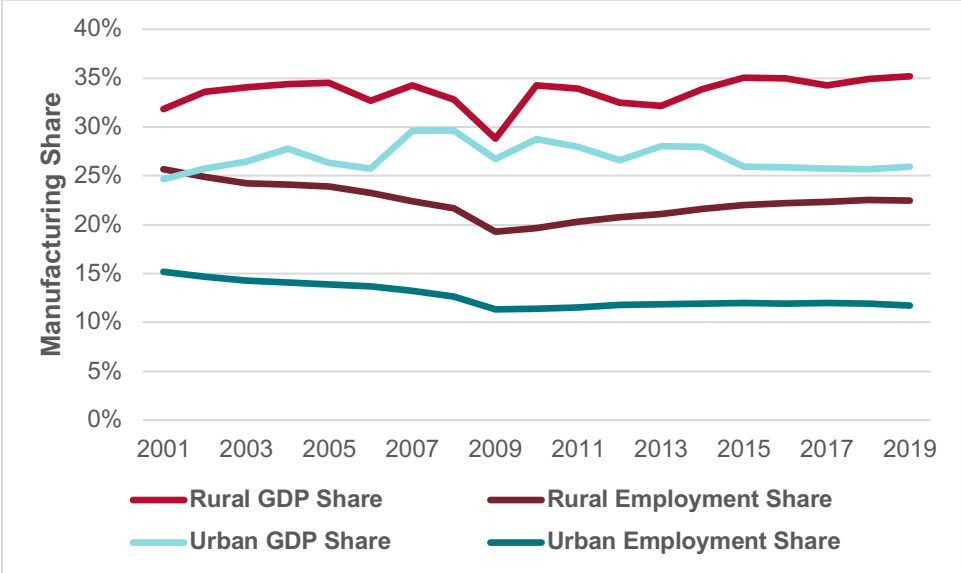
Source: Bureau of Economic Analysis

Figure 15.2 illustrates the manufacturing share of rural and urban GDP from 2001 to 2019. The rural share of manufacturing GDP was 31.8 percent in 2001 and increased to 35.2 percent in 2019. The urban manufacturing share of GDP grew much slower compared to rural areas, increasing from 24.7 percent in 2001 to a share of 25.9 percent in 2019.

Manufacturing is a much larger share of total employment in rural areas than in urban areas. The share of manufacturing employment in rural areas accounted for 25.7 percent of the total employment in 2001, then dropped to 22.4 percent in 2019. Urban manufacturing employment accounted for a 15.2 percent share of total employment in 2001 and decreased to 11.7 percent in 2019. Manufacturing GDP and employment in urban places experienced less volatility than did rural manufacturing during the Great Recession. Because rural counties saw a greater decline in manufacturing during the Great Recession, they also experienced a stronger recovery.

The size of manufacturing establishments is measured by the number of employees working at an establishment,[17] and establishment size has been decreasing across most subsectors.[18] Statewide, the subsector that experienced the most change from 2004 to 2018 was textile mills and products. This subsector no longer has any establishments with 100+ employees, and over half (55 percent) of all the textile mills and products establishments in the state had 1-19 employees in 2018.

The most common change for all other manufacturing sectors is the loss of manufacturing establishments with 250+ employees. The wood product manufacturing subsector, for example, no longer had any establishments with 250+ employees in 2018, and nonmetallic mineral products manufacturing has seen a loss of all the establishments with 500+ employees from 2004 to 2018.

The distribution of jobs in manufacturing has also changed significantly through the first two decades of the 21st century. See *Figure 15.3*. Employment in the durable goods sector dropped by 14 percent, while employment in the non-durable goods sector rose by 3.1 percent. The largest percentage declines came in electrical equipment and computer and electronic parts manufacturing. In raw numbers of jobs lost, primary metal manufacturing and computer and electronics led the losses with 18,266 and 13,387 jobs lost respectively.

Figure 15.3, Percent Change in Durable Goods Employment, 2001-2019
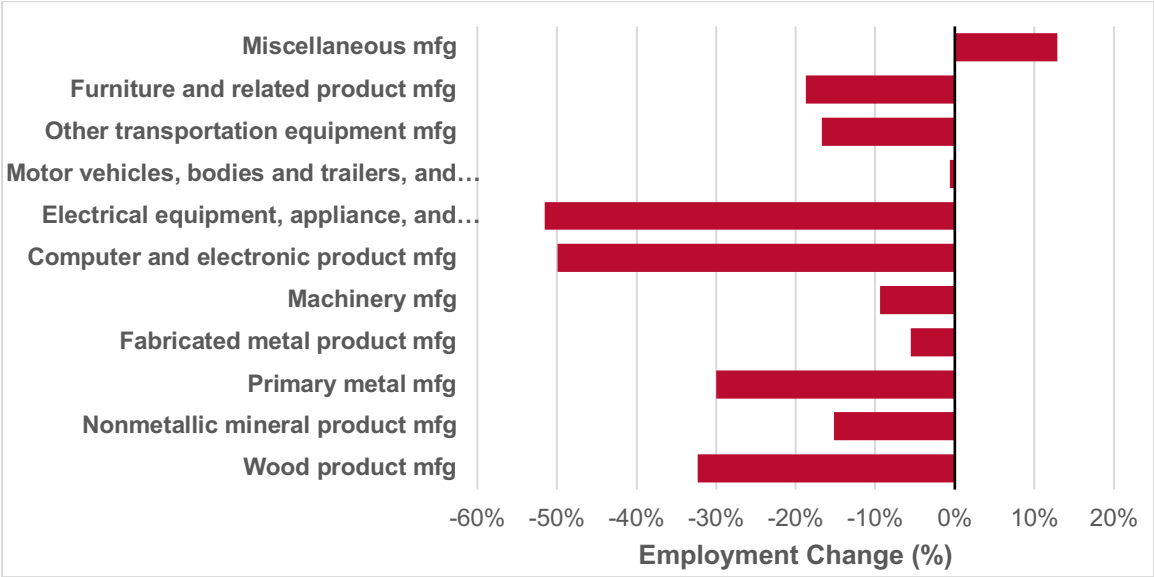
Source: Bureau of Economic Analysis


17 We are not able to do an analysis of the number of firms by establishment size for rural areas due to data suppression at the county level because of the limited number of firms in most counties.

18 The exception is in transportation equipment and fabricated metal products manufacturing, which has had little-to-no change in percent share for the size of manufacturing establishments.

The non-durable goods sector also experienced job losses through the first two decades of the 20th century; both the share and absolute decline in employment were far less than the declines in the durable goods sector. See *Figure 15.4*. Not surprisingly, non-durable goods are less volatile over a business cycle because many of these items comprise food and clothing products.

Figure 15.4, Percent Change in Non-Durable Goods Employment, 2001-2019
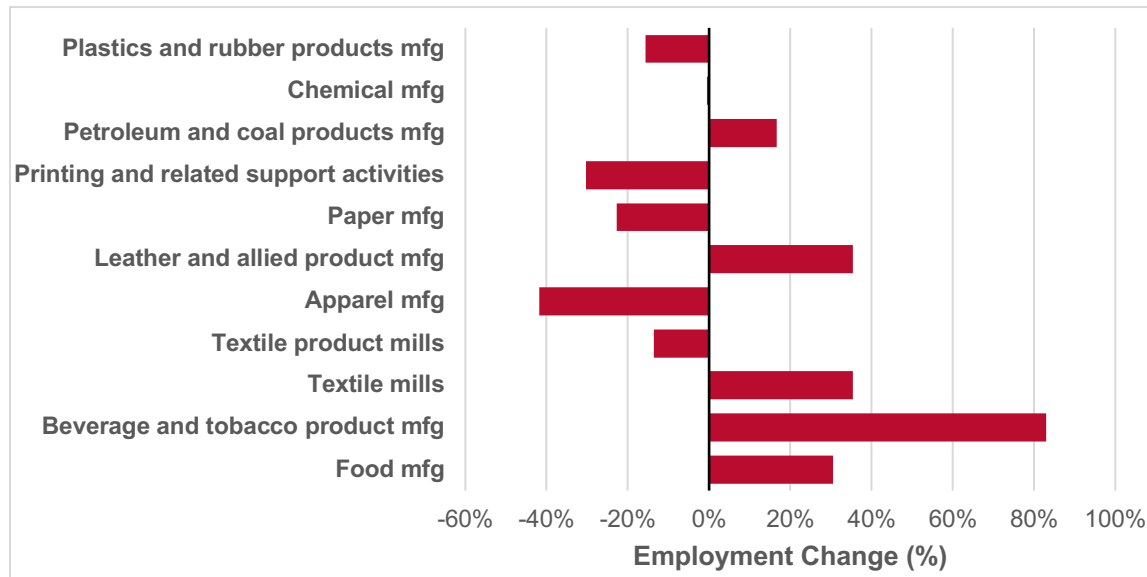
Source: Bureau of Economic Analysis

The largest employment gains in non-durable goods manufacturing were in food and beverage manufacturing (12,794 jobs) and petroleum manufacturing (551 jobs). The shifting composition of manufacturing are not available beyond the state level due to data suppression at the county level, which precludes a direct comparison between rural and urban places. However, the overall composition of employment reveals some concern about the dynamics of manufacturing productivity. With the exception of coal and natural gas production—which is highly productive and saw modest employment gains—the state is exchanging high-productivity jobs for low-productivity jobs.

The most productive durable goods subsector in Indiana, primary metals, had each employee producing $279,000 of GDP per year but experienced a loss of more than 18,000 jobs since 2001. The fastest growing subsector was food and beverage manufacturing, which gained roughly 13,000 jobs, but productivity of workers in this subsector is less than half that of the primary metal workers. The shift from more-productive to less-productive employment is a key feature in the stagnation of manufacturing wages and the rise in employment among workers with less education.

Manufacturing GDP in Indiana reached new, inflation-adjusted records in 2019. However, due to advances in technology that improves efficiency, the sector needs fewer workers. The state has seen a loss of 70,248

manufacturing jobs from 2001 to 2019, with more than a third of that loss (24,850 jobs) coming from rural manufacturing. This trend is expected to continue beyond the COVID era, with preliminary numbers suggesting nearly 50,000 additional jobs lost.

Chapter 16. Agriculture

Indiana has long boasted a large agricultural sector, with much of the early settlement occurring through land claims from early Revolutionary War veterans. In 1900, Indiana had roughly 21 million acres, or 91 percent of its total land, in agricultural use. By 2020, that had fallen to 14.8 million acres, or 64 percent (U.S. Census). Over the same period, the inflation-adjusted value of farmland rose from $1,283 per acre to $6,600 per acre (U.S. Department of Agriculture). In 1900, four out of 10 Americans worked on farms, with Indiana enjoying a somewhat larger share; by 2020, the national figure had dropped to fewer than 2.0 percent nationwide and 2.9 percent in Indiana. Over the past half century, the employment share of agriculture in Indiana declined from 221,000 to 108,000 workers (Bureau of Economic Analysis).

The changes to farm employment and GDP largely follow the path of productivity growth in farming. The technological revolution in farming following the First World War and the green revolution of the 1960s saw considerable growth in agricultural productivity and growth in farmland values. Farm productivity also varies with commodity prices, such as corn, soybeans, etc. *Figure 16.1* clearly illustrates both phenomenon occurring in a series that dates back to 1860.

Figure 16.1, Land Price per Acre in Indiana, 1860-2020
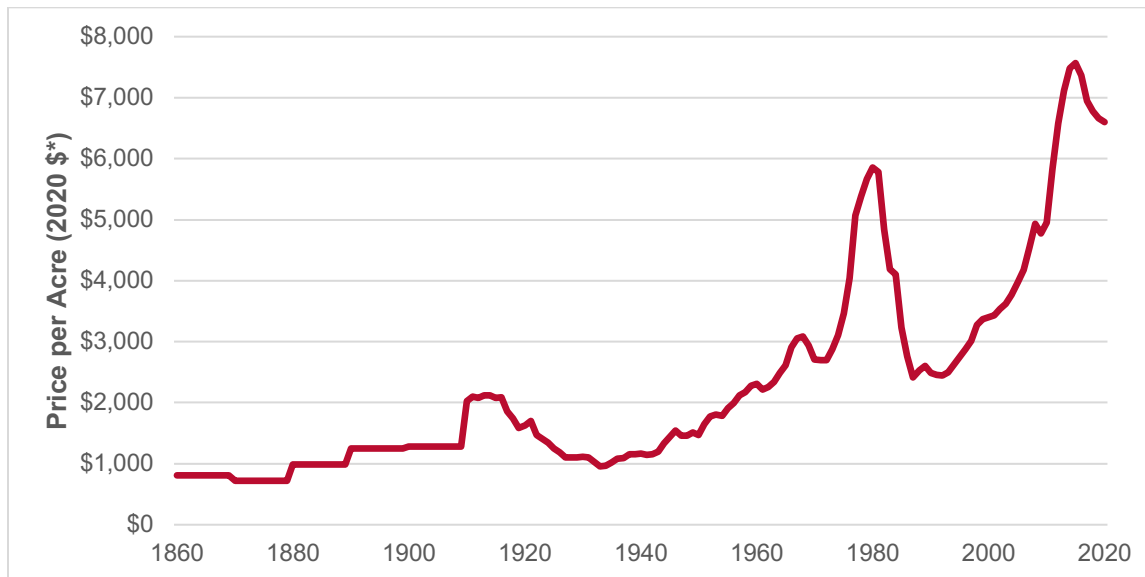
Source: USDA land prices (decennial, 1860-1900), Bureau of Labor Statistics (various price indices bridged by the author)
* Data are inflation-adjusted to 2020 price levels

Agricultural productivity in terms of output remains near an all-time high, but the value of agriculture GDP has not kept pace. The value of agriculture produced in Indiana peaked in 1973, with a near peak again in 2012 due to high commodity prices. In contrast, manufacturing GDP peaked in 2017, and peaked again in 2022. But to keep this in perspective, manufacturing in 2019 was 25.3 percent of Indiana's GDP, while agriculture was 1.0 percent.

Even in Indiana's rural counties, where agriculture is a stronger player, it accounts for only 3.8 percent of GDP and one in 25 jobs, while manufacturing contributes 30.5 percent and one in five jobs.

The Indiana counties job-dependent on farming are Warren at 10.9 percent jobs (19.9 percent manufacturing jobs), and Crawford and Switzerland counties with 9.2 percent farm jobs. Both Crawford and Switzerland have suppressed data on manufacturing, but secondary sources report Crawford County's manufacturing employment at 12.6 percent. The counties with the fewest farm employees include Blackford (220), Martin (243), Pike (268), Tipton (291) Fayette (293) Crawford (299) and Switzerland (328).

However, farm employment may be partially undercounted. Farm proprietors have been stable at roughly eight for every 10 farm employees, so actual farm work is likely higher than reported here. Also, there are large seasonal variations in farm employment that may not be clearly captured. Likewise, we do not know what amount of farm work is provided by proprietor families and, therefore, is not captured by these data. It is worth noting that these are common measurement problems within industries with a number of small businesses and seasonal demand for labor.

Figure 16.2, Cumulative Employment Change in Farm Subsectors, 2000-2019
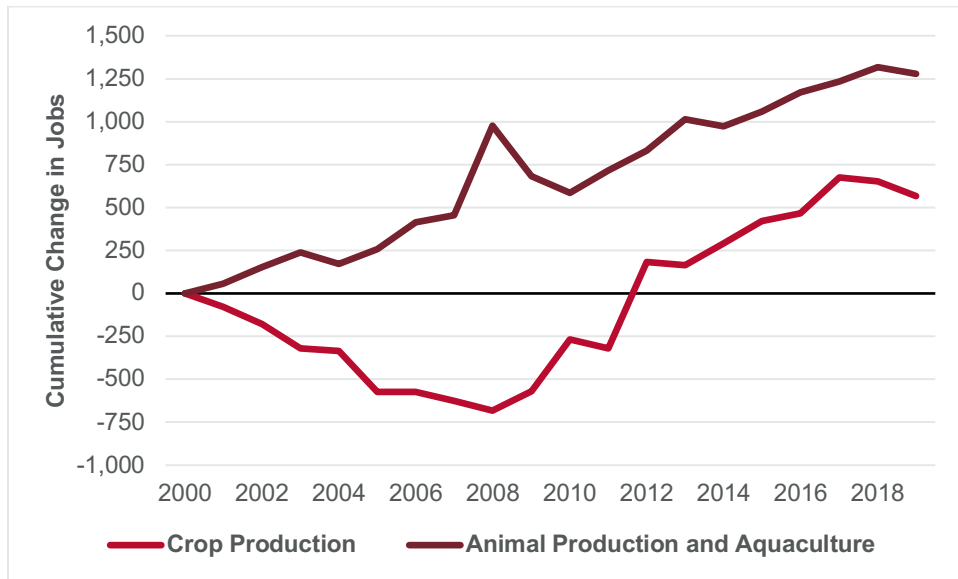
Source: Quarterly Workforce Indicators

We note wages have risen recently in the farm subsectors of crop production and animal production/aquaculture. Their hourly wages averaged between $19.97 and $20.13 in 2019, the most recent period for which we have data.

Figure 16.3, Average Monthly Earnings in Farm Subsectors, 2000-2019
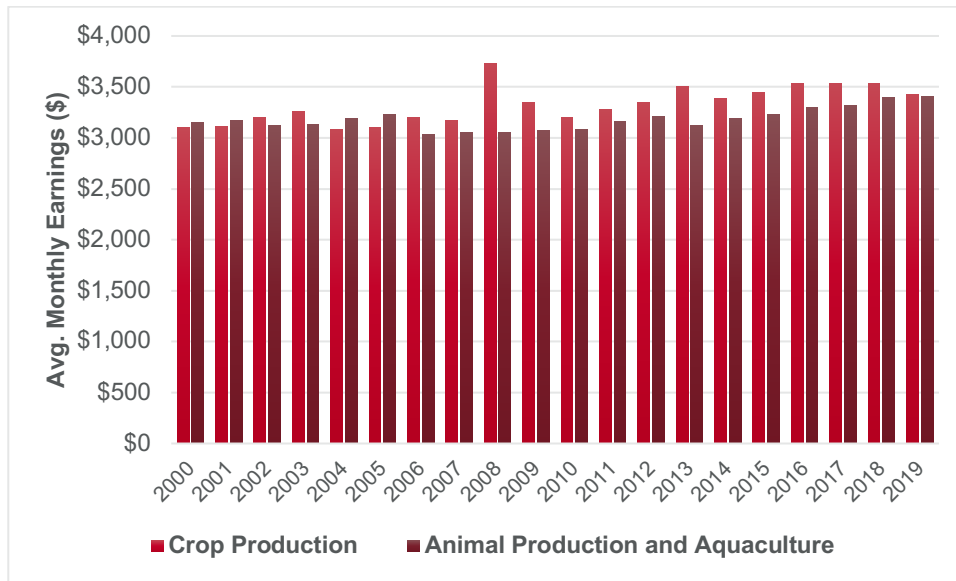
Source: Quarterly Workforce Indicators

Agriculture in Indiana continues to evolve, but remains a shrinking share of rural employment and GDP in the state. It is an important industrial sector but plays a much more modest economic role than other sectors in rural Indiana, particularly manufacturing. Perhaps the best way to consider the current and future role of agriculture in the rural context comes from testimony by Charles Fluharty, former director of the Rural Policy Research Institute:

> "Today, while agriculture plays an important role in the economic vitality of many rural regions, it is no longer the centerpiece of rural economic growth. In fact, it is now becoming clear to policymakers that the broader rural economy plays a direct and significant role in the economic health of farm families, many of whom depend upon these rural economies to sustain their agricultural enterprises." —Fluharty, 2011

Chapter 17. Transportation and Logistics

The movement of goods (i.e., logistics) is an increasing source of employment in both rural and urban places in Indiana. Since the year 2000, rural counties have seen more than 14,000 new jobs in this sector, and urban counties have seen growth of almost 44,000 transportation and warehousing jobs. The employment share has risen from 2.8 percent of all jobs to 5.2 percent in rural counties, and from 3.4 percent to 5.3 percent in urban counties, as shown in *Figure 17.1*.

Figure 17.1, Cumulative Job Growth and Employment Share for Logistics Sector in Indiana, 2000-2020
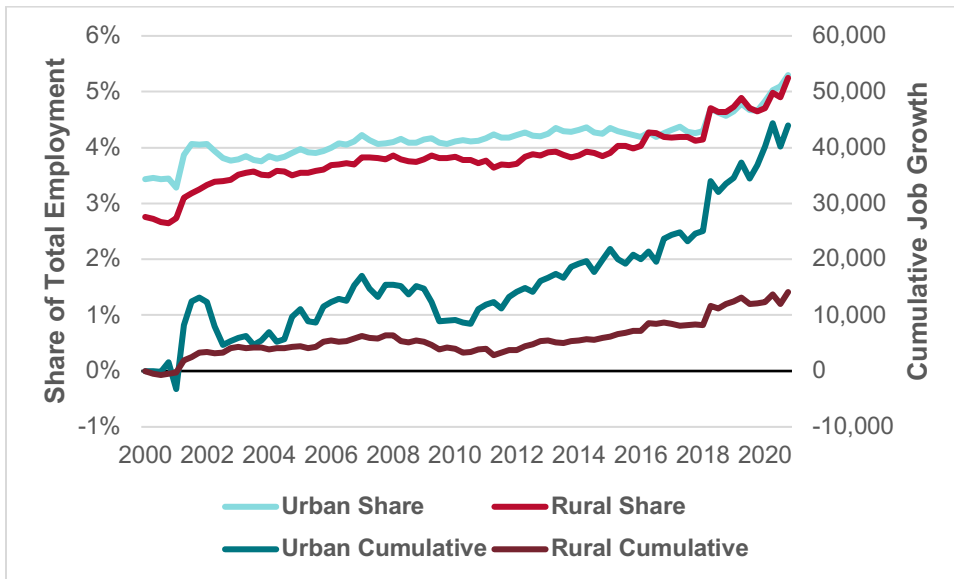
Source: Quarterly Workforce Indicators

This employment growth represents a significant share of total job growth in Indiana over the 21st century, and it is more than all the job growth in rural places. However, this growth is not reflected in the inflation-adjusted wages for logistics workers, which have risen less than the state average for all sectors. See *Figure 17.2*. This is most likely due to the composition of jobs, with a large share of employment growth in the lower-wage occupations within the transportation and warehousing sector.

Figure 17.2, Wage Comparison for Logistics and All Sectors in Indiana, 2000-2020
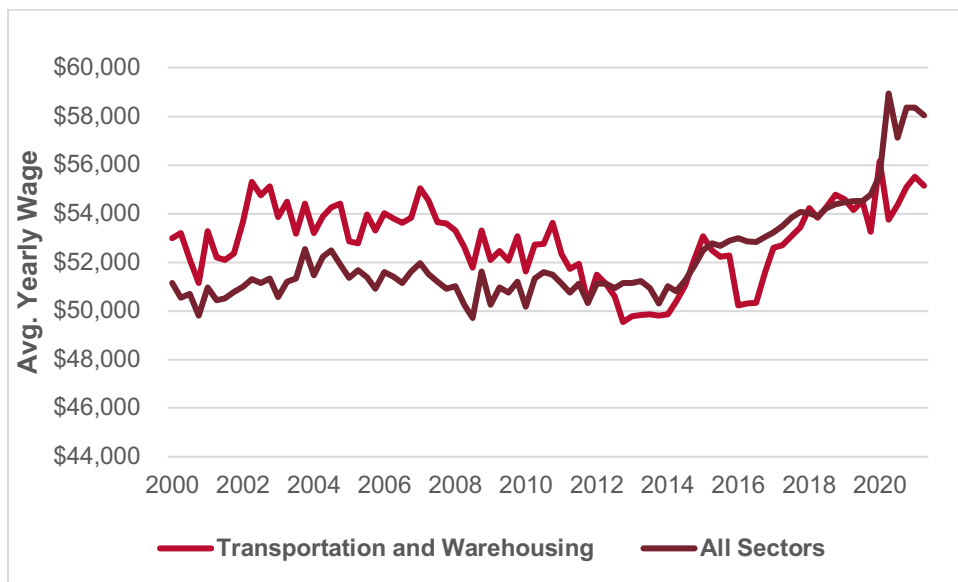
Source: Current Employment Survey, via Federal Reserve Economic Data

The expansion of logistics firms (i.e., transportation and warehousing) has been especially pronounced in recent years, at least partially due to the growth of global trade and the expansion of online shopping, which have increased demand for shipping services. At the same time, warehousing sizes have expanded significantly. In a survey of existing facilities, the Energy Information Administration reports that existing warehouse facilities built since 2010 are one-third larger than those build in the 1980s, expanding to an average of 20.8 million square feet. This increase in warehouse size has shifted the geographic focus of many logistic facilities towards rural places, where land is more abundant and less expensive.

Nationwide, transportation and warehousing employment growth has largely compensated for loss of manufacturing jobs since peak employment in 1979. However, wages in logistics firms did not replace manufacturing wages. Ironically, the same forces that largely caused manufacturing job losses also put job gains in logistics at risk. It is estimated that eight out of 10 jobs losses in manufacturing were due to automation or productivity growth. The remaining losses were due to offshoring of production and changing demand for goods (see Hicks and Devaraj, 2015). Logistics firms are similarly at high risk of automation related job losses.

In *Table 17.1*, we illustrate the occupational profile of Indiana's logistics industry, listing the largest occupations. We use recent wages (2019) and offshorability risk from Blinder (2009) and automation risk from Frey and Osborne (2013). As is apparent in these data, total employment has a large cluster in the low wage range, most of which are at very high risk of automation. Several sectors also have a high offshorability, but a full two-thirds of

these occupations are among the very highest risk of automation across the nearly 1,000 occupations examined in these studies.[19]

Table 17.1 Largest Occupations in Transportation and Warehousing in Indiana, 2019

Transportation and Warehousing Jobs	Employment Share	Avg. Annual Wages	Offshorability Risk	Automation Risk
Stockers and Order Fillers	5.8%	$27,000	34%	64%
Laborers and Freight, Stock, and Material Movers, Hand	13.3%	$31,000	15%	85%
Passenger Vehicle Drivers, Excl. Bus, Transit and Intercity	2.3%	$32,200	15%	89%
Office Clerks, General	2.1%	$32,700	53%	96%
Industrial Truck and Tractor Operators	5.4%	$35,200	15%	93%
Light Truck Drivers	3.1%	$40,100	15%	69%
Bus and Truck Mechanics and Diesel Engine Specialists	2.2%	$41,800	15%	73%
Heavy and Tractor-Trailer Truck Drivers	28.9%	$45,800	15%	79%
Postal Service Mail Carriers	5.7%	$49,700	15%	68%
First-Line Supervisors	2.6%	$52,100	68%	2%
Remainder of Occupations	28.5%	$52,600	–	–

Source: BLS, via Chmura Economics, Blinder (2009), Osborne and Frey (2013) with author's calculations.

Due to Indiana's geographic location, transportation and warehousing always have and will play a critical role in the state's economy. The sector has been an important source of job growth across much of Indiana—especially in rural places—and its facilities provide tax revenue to many local governments. However, the composition of these jobs has shifted during the 21st century towards lower-paying occupations, which also carry significant automation risk. While the sector will surely expand, its geographic footprint and labor demand remain important unknowns for the coming decades.

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[19] The specific risks to counties was covered in some detail in Devaraj, et. al., 2017, which provides detailed mitigation policy recommendations.

Chapter 18. Services

Using county-level data on employment and GDP for 2001 to 2019, we examine the service sectors in rural and urban Indiana by comparing the levels and share of employment and the growth of employment and GDP. The service sector is incredibly broad, including the production of non-tangible goods. This can mean anything from high-wage jobs requiring specialized training, like doctors and dentists, to minimum-wage jobs in waste collection or fast food restaurants, and everything in between. The 11 service sectors in the NAICS (North American Industry Classification System) are listed in *Table 18.1*, along with their share of total employment and average annual wages (2019).

Table 18.1, Service Sector Employment and Wages in Indiana, 2019

NAICS Service Sectors	Rural Counties		Urban Counties	
	Employment Share	Avg. Annual Wages ($)	Employment Share	Avg. Annual Wages ($)
Information	0.7%	39,676	1.1%	62,608
Finance and Insurance	1.9%	58,158	3.8%	86,154
Real Estate and Rental and Leasing	0.8%	35,802	1.6%	55,583
Professional, Scientific, and Technical Svcs	2.3%	49,306	4.9%	75,805
Management of Companies and Enterprises	0.7%	94,476	1.3%	117,956
Administrative and Support and Waste Management and Remediation Services	3.4%	31,422	6.3%	37,602
Educational Services	7.5%	36,673	8.0%	48,463
Health Care and Social Assistance	9.0%	39,861	15.4%	57,853
Arts, Entertainment, and Recreation	1.5%	26,455	1.5%	42,230
Accommodation and Food Services	6.7%	16,185	7.8%	19,042
Other Services (excl. Public Admin)	4.2%	24,683	4.9%	32,705
All Industries Average	–	$44,034	–	$54,168

Source: Bureau of Economic Analysis

Rural service wages are lower than that of urban places, and the gap is greater than in total employment. With a few exceptions (namely healthcare and social assistance, professional services, and finance and insurance), rural places had a reasonably similar share of employment in services when compared to urban counties in Indiana, but during 2019, the share of service employment in rural areas (30 percent) was lower than that of urban areas (50 percent). Overall, however, the service employment share of total employment in the state has increased over time (with the exception of 2012), which is clearly seen in *Figure 18.1*. Indeed, the only sector that experienced steady employment decline during this time was the information service sector. Unsurprisingly, GDP in almost all the sectors has also increased during this period, with the exception of "educational services" and "other services" (e.g., automotive repair, personal care, religious groups, and social advocacy organizations).

Figure 18.1, Service Sectors Share of Total Employment in Indiana, 2001-2019
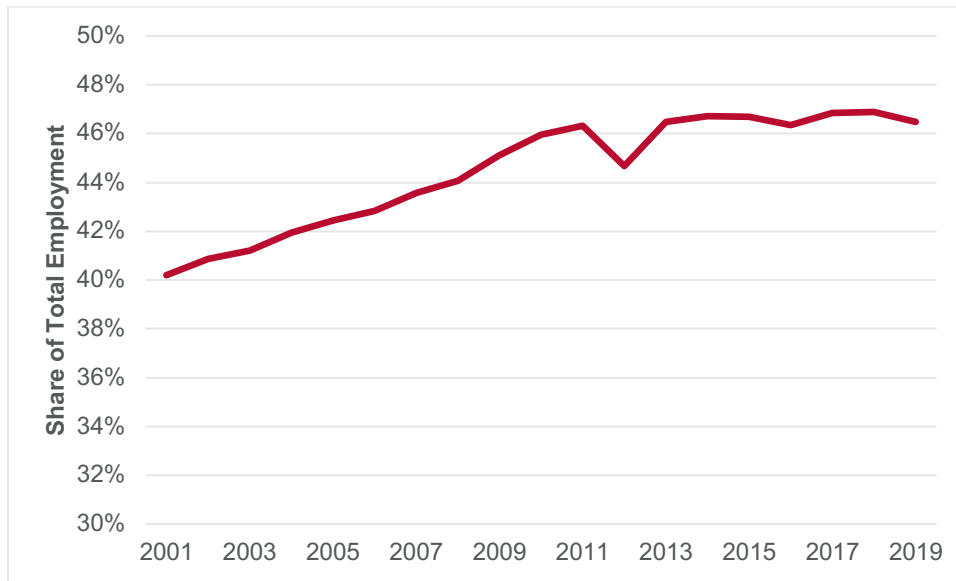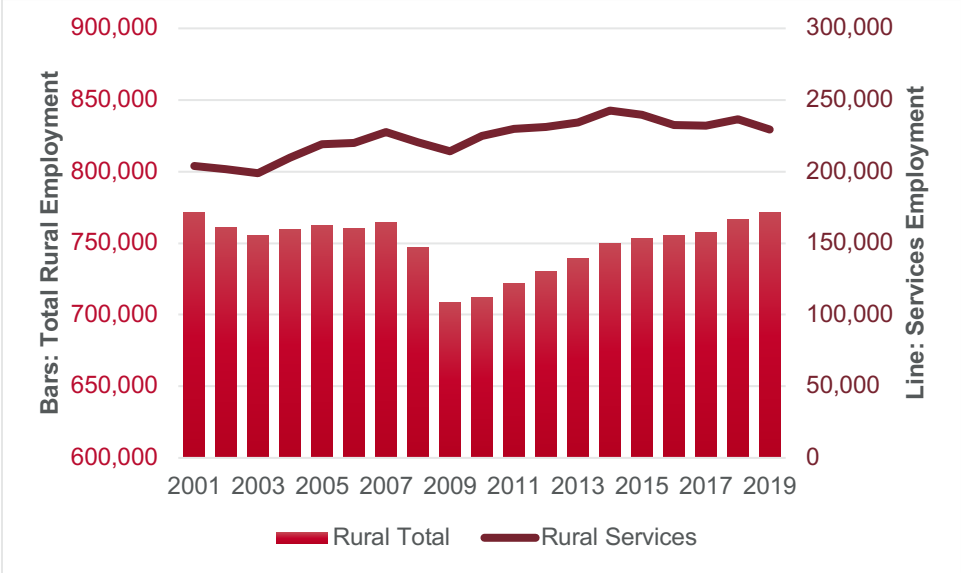

Source: Bureau of Economic Analysis

There are important differences when looking across rural and urban Indiana, however. Rural service employment experienced an increase from 2001 to 2019 of almost 13 percent, while rural GDP saw an increase of 21 percent. The rural sector with the greatest loss of employment was the information sector, which lost 36 percent of jobs over this period. The highest gain in rural service employment was in real estate, leasing, and rental employment, which increased by almost 52 percent from 2001 to 2019. Opposite of rural employment, the rural sector with the largest gain of GDP was the information sector, which increased by almost 80 percent. This shows that the information sector has continuously becoming more efficient with a fraction of employment that used to be in the rural information sector. The rural service sector with the biggest loss in GDP came from educational services, which lost almost 30 percent of its GDP from 2001 to 2019.

Overall, urban service employment increased more than in rural areas. From 2001 to 2019, urban service employment rose by almost 32 percent. Urban service GDP saw a similar increase, rising by almost 39 percent. Like rural employment, employment for urban information services experienced the greatest decrease and was also the only urban service subsector that lost jobs from 2001 to 2019. Urban information service employment dropped by 55 percent over this period. The urban service sector with the highest gain in employment was educational services, which increased by roughly 65 percent. Urban GDP also only had one service sector, the "other services," that suffered losses from 2001 to 2019. This subsector lost almost 13 percent of its GDP from 2001-2019. Urban administrative, support, waste management, and remediation services had the largest increase in GDP, which was up 69 percent from 2001 to 2019.

Next, we examine rural and urban services employment as its related to overall employment for rural and urban areas. Rural services employment has remained relatively stable compared to overall rural employment. While

73

total rural employment saw a major drop from 2007 to 2009 (*Figure 18.2*), rural services employment actually increased. From 2001 to 2019, rural services experienced an overall increase of 12.5 percent in employment. After the significant drop during the Great Recession, total employment in rural areas was approaching the 2001 level as of 2019.

Figure 18.2, Rural Employment in Service Sectors Compared to All Sectors, 2001-2019

Source: Bureau of Economic Analysis

In contrast, urban services employment has seen a steady increase over the same period. Total urban employment has also shown promise of continual growth, but just like total rural employment, there was a decrease in total urban employment from 2007 to 2009. Following the Great Recession in 2009, urban total employment increased drastically each year until 2019, for an overall increase of 15 percent from 2009 to 2019.

HEALTHCARE SERVICES

One important issue in services is the price of healthcare services. A number of studies have examined its high prices and market concentration (monopolization). White (2017) provides data on relative prices in the state, and Hicks (2019), and White and Whaley (2021) connected these prices to market concentration. In the following graphic, we display the prices derived from White (2017) study, with the number of unaffiliated hospitals per 100,000 residents. This measure does not count multiple hospitals in the same network.

Figure 18.3, Relative Price of Outpatient Services vs. Number of Unaffiliated Hospitals

The chart plots "Relative Price for Outpatient Services Compared to Medicaid Reimbursement" (y-axis, 0 to 6) against "Unaffiliated Hospitals per 100,000 Residents" (x-axis, 0 to 2.5). Trendline equation: $y = -0.7065x + 3.8011$, $R^2 = 0.1318$.
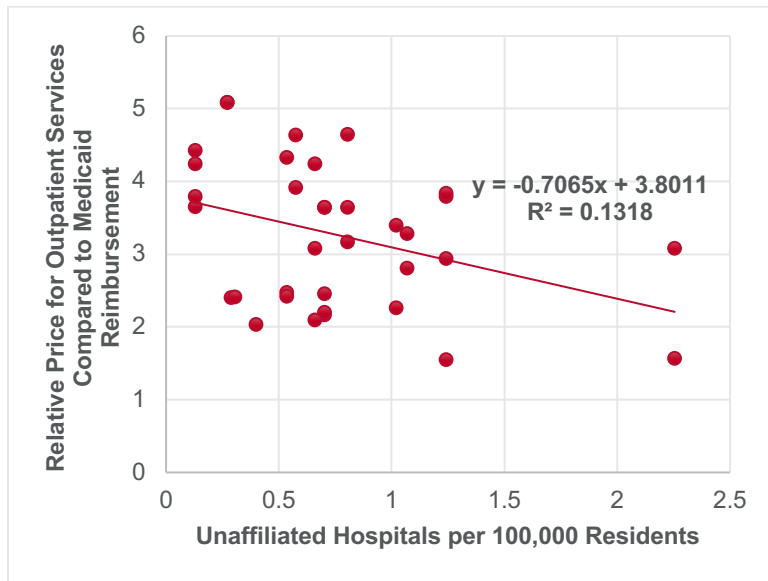
Source: White 2017, Hicks, 2019

As is clear from *Figure 18.3*, places with more hospitals per capita pay substantially lower rates for those measured services. This might be partially mitigated by the market structure of rural hospitals in Indiana. Several smaller Indiana towns have municipal hospitals where prices appear to be less affected by market power; however, these typically have limited services that leave many rural residents exposed to monopoly pricing among Indiana's large not-for-profit hospital networks.

Consumer preferences and related expenditures have changed from being dominated by goods to being dominated by services. This trend is reflected in the increasing level of employment and GDP generated by the services sector in urban areas and the stable to increasing employment in service industry employment and GDP in rural areas. While spending on services decreased during the pandemic due to mandated business closures, stay at home orders, and travel restrictions, the trend of increasing spending on services is expected to increase into the future.

Chapter 19. Commuting Patterns

This section examines commuting flows among Indiana counties, which provides evidence of the residential and labor market patterns in each county.

Table 19.1 shows net commuting flows using the most recent data available. A negative number means more workers commute into the county to work than those who commute out. These counties tend to have large concentrations of manufacturing, logistics, or defense-related jobs. Dubois County, for example, imported more than 5,300 workers to fill jobs, which represented about 20 percent of the jobs in the county. Positive number means more workers commute out of county to work than commute into county. These counties tend to be suburban counties or adjacent to metro areas. Another way to look at these numbers is that a negative number means people are largely choosing not to live in the county where they work, whereas a positive number means that people are willing to commute out of the county in order to live where they do.

Table 19.1, Commuting Flows by County of Employment, 2015

Rural County	# Net Workers = Commute Out Minus Commute In*	Net Workers as a Share of All Jobs in County*	Urban County	# Net Workers = Commute Out Minus Commute In*	Net Workers as a Share of All Jobs in County*
Dubois	-5,355	-19.8%	Marion	-125,430	-22.6%
Gibson	-4,649	-22.8%	Elkhart	-24,349	-21.4%
Martin	-3,427	-42.5%	Vanderburgh	-20,817	-19.7%
Decatur	-2,226	-15.2%	Allen	-12,828	-7.1%
Wayne	-1,799	-6.0%	Tippecanoe	-10,793	-11.3%
Grant	-1,757	-5.8%	Bartholomew	-9,904	-20.6%
Jackson	-1,732	-8.1%	Vigo	-8,630	-15.7%
DeKalb	-1,487	-7.2%	Monroe	-8,469	-11.1%
Knox	-982	-5.3%	Howard	-4,855	-12.2%
Kosciusko	-270	-0.7%	St. Joseph	-2,781	-2.3%
Adams	576	4.1%	Delaware	-2,070	-3.9%
Pulaski	634	12.4%	Ohio	1,194	73.1%
Orange	649	8.6%	Sullivan	1,268	18.5%
Wabash	660	4.7%	Benton	1,457	57.5%
Jefferson	746	5.6%	Vermillion	1,605	32.2%
Jay	759	8.8%	Putnam	1,632	11.9%
Perry	759	10.1%	Union	1,810	117.8%
LaGrange	793	5.4%	Wells	2,138	19.0%
Montgomery	846	5.2%	Jasper	2,309	18.3%
Blackford	1,286	33.7%	Shelby	2,454	13.2%
Tipton	1,377	23.9%	Newton	2,532	71.6%
Cass	1,429	9.2%	Posey	2,647	28.4%
Steuben	1,456	10.0%	Scott	2,702	38.1%
Marshall	1,522	7.8%	Carroll	3,528	64.2%
Fountain	1,574	27.3%	Owen	3,590	64.9%
White	1,593	16.6%	Brown	3,596	107.9%

Rural County	# Net Workers = Commute Out Minus Commute In*	Net Workers as a Share of All Jobs in County*	Urban County	# Net Workers = Commute Out Minus Commute In*	Net Workers as a Share of All Jobs in County*
Daviess	1,602	12.8%	Whitley	3,784	30.3%
Warren	1,639	72.7%	Clay	4,129	55.3%
Ripley	1,671	14.9%	LaPorte	4,609	11.1%
Switzerland	1,807	73.6%	Washington	5,220	81.6%
Pike	1,936	50.0%	Floyd	5,577	18.2%
Crawford	1,950	85.7%	Boone	6,245	26.4%
Fayette	2,003	28.1%	Harrison	6,673	59.2%
Fulton	2,020	29.3%	Clark	7,049	15.1%
Huntington	2,023	13.0%	Dearborn	8,395	54.4%
Noble	2,083	10.7%	Madison	10,309	23.8%
Spencer	2,280	30.2%	Lake	10,935	5.6%
Rush	2,458	46.7%	Warrick	12,407	72.3%
Parke	2,611	65.5%	Hancock	13,140	60.5%
Clinton	2,706	22.7%	Porter	14,264	22.9%
Randolph	2,932	36.0%	Morgan	14,693	84.6%
Jennings	3,884	47.1%	Hendricks	17,613	30.1%
Starke	4,216	80.6%	Johnson	20,968	42.5%
Miami	4,513	45.4%	Hamilton	24,173	18.9%
Lawrence	4,860	31.1%			
Franklin	5,679	109.8%			
Henry	5,702	42.0%			
Greene	5,963	74.0%			

Source: US Census Bureau, 2011-2015 5-Year ACS Commuting Flows, Tables 1 and 2.
  https://www.census.gov/data/tables/2015/demo/metro-micro/commuting-flows-2015.html
* Negative number means more workers commute INTO county to work than those who commute out. Positive number means more workers commute OUT of county for work than those who commute in.

The Bureau of Economic Analysis provides data on the annual earnings of in-commuters and out-commuters for a given area based on their place of residence—the net flow of income. See *Table 19.*2. A negative value here indicates that more income is flowing out of the county than into the county due to commuting patterns. This could be either because more total workers live elsewhere and/or because high income earners live elsewhere. A positive value indicates the opposite, that more income is flowing into the county than out due to commuting patterns, because more workers and/or high-income earners live in a particular county but work elsewhere.

Table 19.2 shows that 11 of the 48 rural counties in Indiana have a negative net flow of income, indicating either more workers and/or higher earners live in a different county than where they work. For example, Martin County has nearly 3,500 in-commuters every day. Those 3,500 workers earn an average of $468 million annually, but because they do not actually live in Martin County, the county itself does not directly benefit from those earnings by way of income taxes or property taxes.

Fewer urban counties have a negative net flow of income, but the dollar amount is much higher. Marion County, for example, imports almost 125,500 workers daily who represent nearly $17 billion in annual earnings. Each of these urban counties is the center of its labor market area. The counties with the highest net flow of income are the ring counties around Indianapolis, indicating that residents in these counties work in other counties, which causes a positive net inflow of income into the ring counties.

Table 19.2, Net Flow of Income Due to Commuting Workers, 2015-2019

Rural County	Avg. Annual Net Flow of Income ($)	Urban County	Avg. Annual Net Flow of Income ($)
Martin	-468,537,000	Marion	-16,972,427,000
Gibson	-413,823,000	Elkhart	-2,268,064,000
Dubois	-220,970,000	Vanderburgh	-1,515,834,000
DeKalb	-159,995,000	Bartholomew	-752,263,000
Decatur	-112,766,000	Allen	-724,709,000
Kosciusko	-95,630,000	Tippecanoe	-714,186,000
Wayne	-66,851,000	Howard	-427,090,000
Knox	-56,959,000	Vigo	-406,622,000
Grant	-54,448,000	Monroe	-280,788,000
Jackson	-10,299,000	Delaware	-183,144,000
Ripley	-1,886,000	Vermillion	58,087,000
Adams	3,463,000	Benton	66,282,000
Orange	30,792,000	Sullivan	83,418,000
Jay	38,107,000	Union	86,897,000
Pulaski	43,674,000	Ohio	87,317,000
Perry	48,095,000	Posey	126,909,000
Montgomery	54,885,000	Scott	134,942,000
Wabash	61,503,000	Wells	145,092,000
Blackford	68,065,000	St. Joseph	152,529,000
Cass	89,152,000	Shelby	154,493,000
Switzerland	91,049,000	Newton	165,820,000
Steuben	91,071,000	Owen	188,949,000
Pike	94,085,000	Putnam	201,896,000
Jefferson	94,971,000	Clay	202,961,000
Crawford	95,896,000	Carroll	238,203,000
Warren	107,593,000	Jasper	252,493,000
Fulton	111,264,000	Whitley	263,372,000
White	115,688,000	Brown	268,092,000
Tipton	116,041,000	Washington	317,587,000
Daviess	126,929,000	Clark	379,734,000
Fountain	142,585,000	LaPorte	525,751,000
Parke	145,765,000	Harrison	536,040,000
Randolph	154,437,000	Madison	709,939,000
Rush	156,391,000	Dearborn	760,796,000
Fayette	164,133,000	Floyd	837,269,000
Lagrange	167,919,000	Morgan	1,121,255,000

Rural County	Avg. Annual Net Flow of Income ($)	Urban County	Avg. Annual Net Flow of Income ($)
Clinton	168,408,000	Hancock	1,129,337,000
Miami	174,378,000	Warrick	1,219,986,000
Spencer	179,447,000	Lake	1,568,165,000
Huntington	187,640,000	Boone	1,616,239,000
Noble	207,776,000	Johnson	2,165,018,000
Starke	212,723,000		
Jennings	231,292,000		
Marshall	245,850,000		
Greene	374,911,000		
Franklin	386,013,000		
Lawrence	387,664,000		
Henry	395,445,000		

Source: Bureau of Economic Analysis
Note: The term the BEA uses to describe these income flows is "adjustment for residence." An adjustment made to those components of earnings and employee contributions to social insurance programs (income subject to adjustment) that are reported on a place-of-work basis to convert them to a place-of-residence basis reflecting the net flow of income of interarea commuters. For example, the source data for wages and salaries represent the wages paid by the establishments located in an area. The wages and salaries that the establishments in a given area pay to workers who live outside that area are treated as an outflow and the wages and salaries that the residents of that area receive from establishments located outside that area are treated as an inflow. The adjustment for residence in an area, then, is the net of the inflows to that area and the outflows from that area.

In aggregate, the dollar value of commuter inflows is higher than the dollar value of commuter outflows in both urban and rural counties. This is possible because Indiana has several counties bordering large urban centers outside the state (i.e., Chicago, Louisville, and Cincinnati). From 2000 to 2019, the net flow of income in rural areas has remained about the same while noticeably increasing in urban areas, meaning that an increasing number of urban commuters do not work in the county where they live. See *Figure 19.1*. We explore the cause of these dynamics in later chapters of this study.

Figure 19.1, Net Flow of Income, 2000-2019
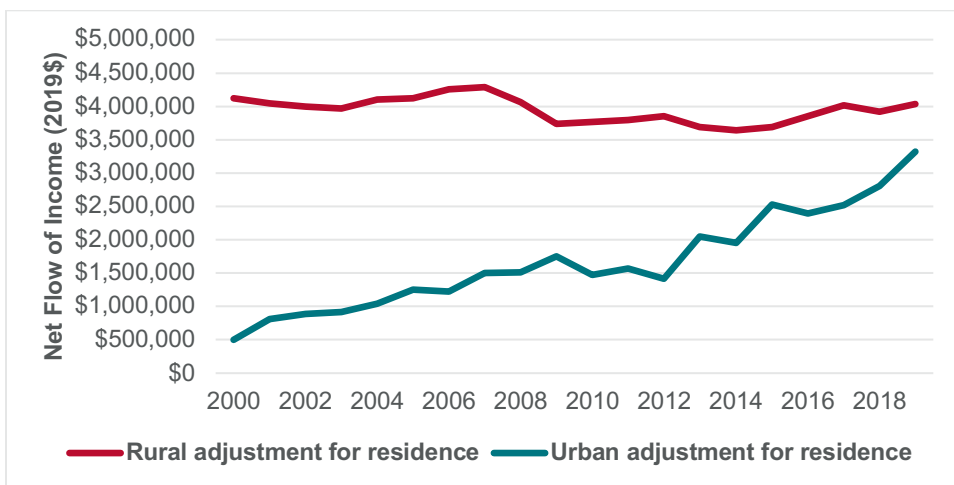
Source: Bureau of Economic Analysis
Note: Net flow of income equals the inflows of commuter income minus the outflows of commuter income. Data are inflation-adjusted to real 2019 dollars.

79

Chapter 20. Residential Migration Flows

Commuting is not the only way to examine population flow. This chapter examines migration patterns among Indiana counties using data from the 2017-2018 Internal Revenue Service county-to-county migration flows dataset. This data is constructed using year-to-year address changes reported on individual income tax returns filed in 2017 and 2018 with the IRS. This is most recent data available at the time of this analysis.

We first examine migration patterns for each county in Indiana. *Inflows* are the number of new residents who moved into a county, and *outflows* are the number of residents who have moved away. Net migration is the difference between these inflows and outflows. A negative number means more people move out of the county than move in. See *Table 20.1*.

Table 20.1, Migration Flows in Indiana Counties, 2017-2018

Rural County	Inflows	Outflows	Net Migration of Residents	Urban County	Inflows	Outflows	Net Migration of Residents
Steuben	1,901	1,647	254	Hamilton	23,071	18,263	4,808
Henry	2,216	1,981	235	Hendricks	12,313	9,930	2,383
Noble	2,562	2,347	215	Lake	20,519	18,977	1,542
Ripley	1,626	1,414	212	Hancock	5,731	4,436	1,295
Huntington	1,710	1,527	183	Johnson	11,257	10,135	1,122
DeKalb	2,264	2,141	123	Porter	8,875	7,782	1,093
Tipton	931	818	113	Allen	12,961	12,245	716
Jefferson	1,312	1,209	103	Floyd	5,383	4,668	715
Lawrence	1,629	1,527	102	Boone	4,993	4,285	708
Clinton	1,471	1,397	74	Morgan	4,425	3,819	606
Crawford	624	556	68	Harrison	2,169	1,807	362
Switzerland	533	465	68	Warrick	3,648	3,291	357
Starke	1,113	1,053	60	Washington	1,384	1,062	322
Pike	520	461	59	Clark	6,786	6,487	299
Fayette	827	768	59	Shelby	2,352	2,101	251
Fountain	891	839	52	Carroll	1,290	1,074	216
Warren	411	372	39	LaPorte	4,183	3,971	212
Orange	739	711	28	Howard	3,509	3,324	185
Fulton	965	938	27	Clay	1,419	1,235	184
Rush	898	882	16	Brown	1,070	910	160
Miami	1,692	1,681	11	Benton	585	450	135
Knox	1,302	1,291	11	Vermillion	719	646	73
Perry	629	629	0	Whitley	1,686	1,617	69
Decatur	1,300	1,304	-4	Jasper	1,633	1,567	66
Martin	408	412	-4	Wells	1,333	1,272	61
Jennings	1,344	1,349	-5	Owen	1,203	1,161	42
Greene	1,360	1,370	-10	Ohio	360	318	42
Spencer	854	865	-11	Putnam	1,903	1,876	27
Parke	661	696	-35	Dearborn	2,336	2,346	-10

Rural County	Inflows	Outflows	Net Migration of Residents	Urban County	Inflows	Outflows	Net Migration of Residents
Franklin	1,080	1,119	-39	Sullivan	792	812	-20
Pulaski	623	681	-58	Madison	5,171	5,192	-21
Blackford	539	605	-66	Posey	1,177	1,214	-37
Daviess	1,038	1,105	-67	Newton	736	798	-62
Jackson	1,947	2,027	-80	Union	333	404	-71
Cass	1,533	1,615	-82	Scott	1,091	1,170	-79
Dubois	1,367	1,459	-92	Bartholomew	4,049	4,178	-129
Wabash	1,128	1,234	-106	Elkhart	7,691	7,911	-220
Montgomery	1,501	1,616	-115	Vanderburgh	7,176	7,584	-408
Marshall	1,942	2,058	-116	Vigo	3,581	4,179	-598
Wayne	2,171	2,290	-119	St. Joseph	10,577	11,259	-682
Jay	639	782	-143	Delaware	3,820	4,555	-735
Gibson	1,246	1,416	-170	Monroe	6,020	7,039	-1,019
White	1,333	1,506	-173	Tippecanoe	7,788	8,820	-1,032
Randolph	959	1,148	-189	Marion	44,094	50,041	-5,947
Adams	975	1,169	-194				
Lagrange	1,543	1,789	-246				
Kosciusko	3,535	3,796	-261				
Grant	2,027	2,334	-307				

*Source: IRS Individual Master File, Statistics of Income*
Note: Net Migration is a calculated statistic and is the difference between the Inflows and the Outflows

Unsurprisingly, given the national trends, there are more rural counties with negative net migration; however, the magnitudes are much larger for urban counties. For example, rural Grant County had 307 more people move out of the county than move in, while Marion County had 5,947 more people move out than move in.

Positive net migration, meaning more people are moving into a county than moving out of it, tends to occur in urban counties, specifically those counties surrounding Marion County (Indianapolis). Indeed, four of the top five urban counties with positive net migration are adjacent to Marion County.

The rural counties with the highest levels of positive net migration tend to share a border with more than one metro county. See *Figure 20.1* for the geographic trend in net migration at the county level in Indiana. Counties with aqua color experienced positive net migration and counties with yellow colors experienced negative net migration.

Figure 20.1, Net Migration in Indiana Counties, 2017-2018
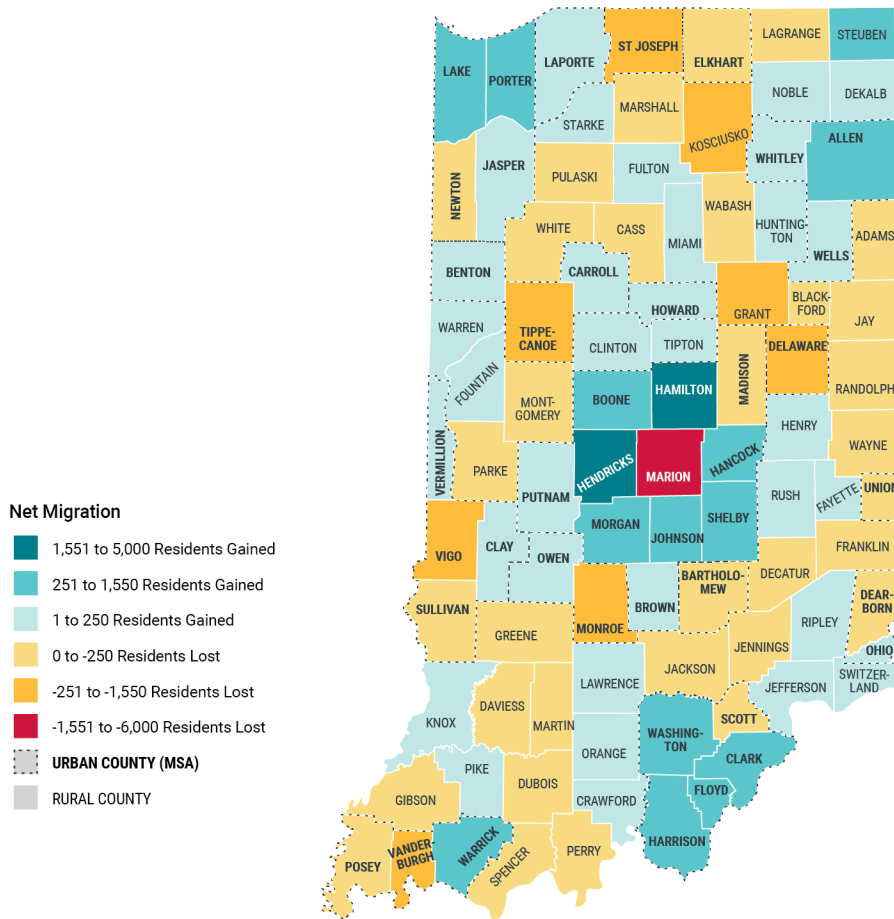
Source: Internal Revenue Service, author's calculations

Table 20.2 shows the aggregate inflow/outflow patterns and net migration for rural and urban counties. Overall, rural counties have a small negative net migration showing that more people leaving rural counties than moving in. The urban counties have a positive net migration. The total net migration is also positive, meaning that more people are moving into the state than leaving it.

Table 20.2, Migration Aggregates, 2017-2018

County	Sum of Inflows	Sum of Outflows	Sum of Net Migrations
Rural	61,819	62,399	-580
Urban	253,192	246,211	6,981
Total	315,011	308,610	6,401

Source: IRS Individual Master File, Statistic of Income, calculated using MSA dummy and summing rural and urban counties

In sum, migration patterns in Indiana are similar to national trends, with the state's rural and urban-core counties (Marion, Lake, Allen, and Tippecanoe) counties generally losing population while suburban counties are gaining population. These movements continue to contribute to the suburbanization of urban areas that has occurred over the past half century.

While we are generally confident in the general trends reported here, a word regarding the weakness of this analysis is necessary. The data presented here was derived from tax returns filed with the IRS, which has the potential to undercount migration in three ways. First, not all households (particularly the very poor and elderly) are required to file a tax return, resulting in an undercount of this portion of the population. Second, the migration flow data requires back-to-back years of tax returns to match up. When there are mismatches of returns resulting from marriage, divorce, or foreign in-migration, these numbers are not counted in the migration flows. This also results in undercounting. Finally, undercounting also occurs when the mailing address on the tax return is in a different county than the home address.

Chapter 21. Immigration in Rural Indiana

Whereas "migration" refers to the domestic movement of people, "immigration" relates to international movement. Regardless of the political implications, immigration has always been an important component of population change for the entire state of Indiana. We use data from the American Community Survey to examine the effects of immigration on population growth, demographics, social services, educational attainment, and innovation in Indiana communities.

While representing only 5.2 percent of the total population in 2019 (versus more than 13 percent nationally), nearly 30 percent of Indiana's total population gain from 2000 to 2019 came from an increase in its immigrant population. Like much of the rural U.S., many of the rural counties in Indiana are struggling to maintain population—27 of the 48 rural counties (56 percent) have lost total population from 2000 to 2019. However, of those 27 counties, all but four have simultaneously gained immigrant population. In one county, Spencer, the only population growth during from 2000 to 2019 came from an increase in its immigrant population. While rural Indiana saw a total population decrease of 7,349 from 2000 to 2019, its foreign-born population increased by 12,385. While these numbers are relatively small, they mark a demonstrable shift in the demographic makeup of these rural communities.

Overwhelming, the immigrant population in rural Indiana hails from Latin America (61 percent), with Asian-born immigrants the second most populous (22 percent). Only 17 percent of immigrants in rural Indiana come from all other parts of the world combined. The combination of total population decrease, foreign-born population increase, and the majority of immigrants coming from Latin America necessarily means that many rural communities throughout Indiana look different than they did 20 years ago, and certainly than they did 50 years ago. It also means that communities themselves must adjust their way of doing business to accommodate and address the challenges and strengths of their newest neighbors.

Many rural communities experiencing this immigrant increase are underprepared to adapt to sudden population increases or to accommodate the needs their new population, particularly in the form of language services in and out of the school system and access to low-income housing, and the services that are available can be quickly overwhelmed. Additionally, immigrants in these communities may lack the resources (e.g., churches, sports clubs, and advocacy groups) that would traditionally ease their integration into the community and the community's acceptance of its newest residents.

In some ways, however, immigrants throughout rural Indiana are very similar to native-born residents. Statewide, the unemployment rate of both foreign-born and native-born Hoosiers is essentially the same (3.1 percent vs. 3.0 percent, respectively, in 2019), and the mean individual income for the two groups is nearly identical ($28,111 for immigrants vs. $28,180 for native-born in 2019). However, there are differences that may be important for communities to consider as they plan for the future. For example, while immigrants in rural counties in Indiana

84

are more likely to live below the poverty line than their native-born counterparts (21 percent vs. 13 percent in 2019, respectively), they are less likely to use social services. When immigrants do use services, they typically use less money than their native-born counterparts. The only social service that immigrants use more frequently than native-born residents is SNAP, the Supplemental Nutritional Assistance Program (10.1 percent vs. 9.8 percent, respectively).

As throughout the United States, immigrants in rural Indiana are over-represented in the lowest and highest levels of education. While roughly 34 percent of immigrants aged 25+ do not have a high school diploma (compared to 12 percent of native-born residents), 20 percent have at least a bachelor's degree (compared to 16 percent of native-born residents). Assuming that immigrants in rural Indiana follow the state and national trends, and there's no reason to expect that they would not, this educational gap is closing. People living in Indiana who immigrated to the U.S. since 2010 are significantly better educated than those who immigrated prior to 2010. Fully 50 percent of foreign-born Hoosiers who immigrated to the U.S. since 2010 have at least a bachelor's degree, compared to 28 percent who immigrated between 2000 and 2010. The disparity is closing on the other end of the educational attainment spectrum as well. Of the foreign-born Hoosiers who moved to the U.S. between 2000 and 2010, nearly 36 percent did not have a high school diploma. That number is only 20 percent for those who immigrated since 2010. While this trend is predominantly driven by immigrants moving from Asia, it is also true for those from Latin America, which is rural Indiana's largest immigrant population.

Communities experiencing significant increases in their immigrant populations certainly face challenges. The provision of language services in and beyond the school systems and increased poverty are only two that are touched on here. On the other hand, these communities also benefit greatly from their newest residents. Immigrants are more likely to be entrepreneurs than their native-born counterparts, and they can play a critical role in revitalizing struggling downtowns with new businesses. Increased diversity through new customs, cultures, and traditions can also deepen and strengthen social and cultural capital. Ultimately, immigration is the best hope for population stabilization and growth that rural Indiana is likely to experience in the foreseeable future. The work of rural communities today should be to figure out how to keep their immigrant populations and their children to ensure a more sustainable future.[20]

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[20] See Wornell, Emily J. and Michael J. Hicks (2019). "Fiscal, Economic & Social Effects of Immigration in the Hoosier State." Center for Business and Economic Research, Ball State University.

Chapter 22. Broadband Deployment

As highlighted by the COVID-19 global pandemic, access to reliable, high-speed internet is essential to fully participate in our modern society. Even access to basic primary and secondary education is increasingly reliant on internet access, but, as Devaraj et al. (2020) found, roughly 6.5 percent of Indiana's school-age children lacked internet access when classrooms transitioned to an online-only model at the height of the COVID-19 pandemic.[21] In this section, we examine the rural/urban differential in internet access and quality and its possible implications for social and economic development among local communities.[22]

According to the 2019 American Community Survey, approximately 24 percent of rural households and 18 percent of urban households in Indiana did not have access to internet. For households with access, nearly all (more than 99 percent) had a broadband connection.[23] Between 2017 and 2019, the share of households with broadband has been increasing in both rural and urban areas, but the adoption has been faster in rural areas. See *Figure 22.1*.

Fig 22.1, Share of Households with Broadband Access in Indiana, 2017-2019
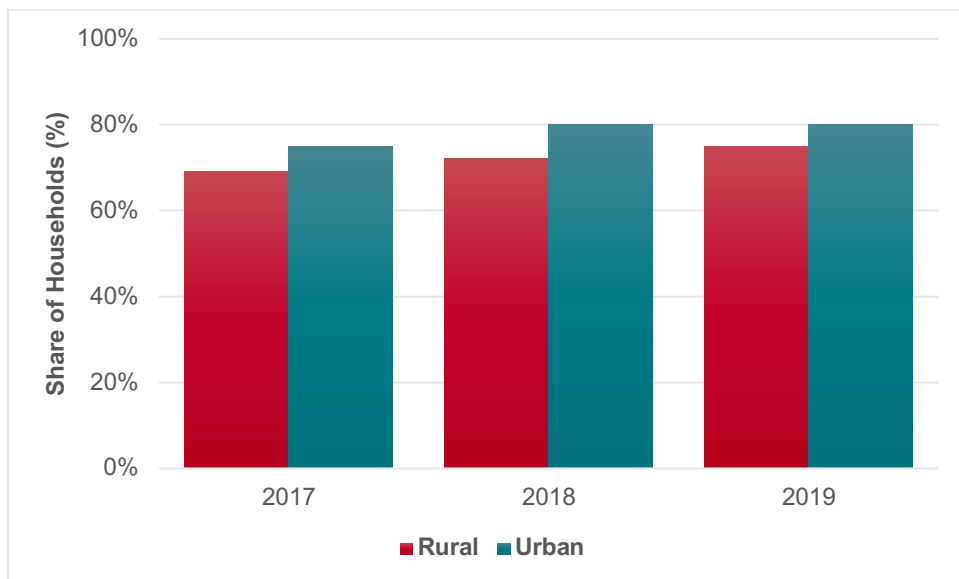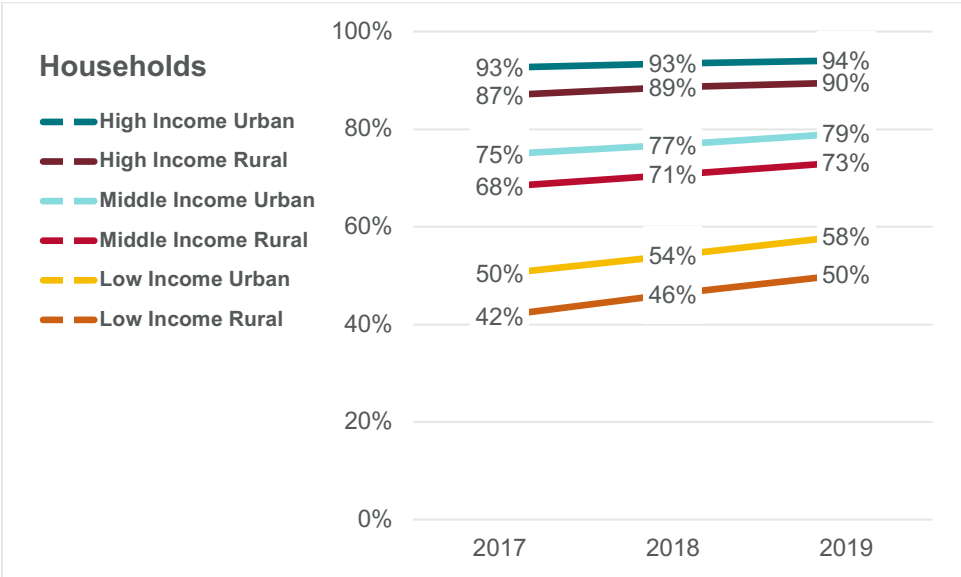

Source: American Community Survey, 2019

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21 Devaraj, Srikant, Dagney Faulk, Michael Hicks and Yuye Zhang (2020). How Many School-Age Children Lack Internet Access in Indiana? Center for Business and Economic Research, Ball State University.

22 Devaraj, Srikant, Sushil Sharma, Emily Wornell and Michael Hicks (2017). Assessing Indiana's E-Readiness in the Development of the Digital Society: An Exploratory Study, Center for Business and Economic Research, Ball State University

23 The remaining small share had dial-up internet connections.

While the broadband adoption trend has been increasing across households at all income levels in Indiana (*Figure 22.2*), the disparity between rural and urban adoption is largest in the lower income brackets, whereas adoption rural/urban differentials among high income households is half that between low income households. Although differences between broadband access rates across rural and urban areas exist, the real differences occur between high-income and low-income households. The share of high-income households (both rural and urban) having broadband is nearly twice that of low-income rural households.

Figure 22.2, Broadband Adoption in Indiana Households, 2017-2019

Source: American Community Survey

The COVID-19 pandemic highlighted the implications of this disparity in a way that researchers and practitioners in rural Indiana have been unable to for the last decade. There are clear public sector costs caused by the lack of internet availability. This was particularly true with public education, as mentioned previously, but these costs are also in health care, the labor market, and access to public services, to name a few. As of this writing there are significant funds available through the CARES Act and the American Rescue Plan targeting expanded broadband access.24 We are hopeful these policies, through state action, will significantly narrow the broadband gap in the coming years.

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24 See https://www.brookings.edu/research/the-american-rescue-plan-is-the-broadband-down-payment-the-country-needs/

Chapter 23. Rural Indiana and the Post-Pandemic World

The Coronavirus pandemic will lead to many long-term economic changes, particularly in aspects of the labor market that affect rural places. The most obvious change is the sudden growth of remote work. This development, which was accelerated by the pandemic may sever the link between work and domicile for a substantial share of American families. This will lead to significant geographic reallocation of households that may benefit some rural places.

The rapid urban population growth during the 21st century is influenced by both the amenity rich environment around large urban places as well as the opportunity for more productive employment. Similarly, skilled workers in urban places don't only earn more than those in rural places, they also produce more. Thus, metropolitan places grow more rapidly than non-metropolitan places. The advent of a large, sudden growth in work at home opportunities may result in considerable changes in household location decisions.

A number of studies attempt to quantify the potential range of affected workers. Among them is a McKinsey study that reports between 20 and 25 percent of jobs could be performed remotely for three to five days a week.[25] Another study reports that as much as 56 percent of American workers can work at least part-time from home.[26] A technical analysis of the persistence and nature of work-at-home concludes that a considerable share of work will be permanently conducted from home or remote offices (Bick, Blandin and Mertens, 2001). These studies all suggest that many families, perhaps one in four, will experience some reduced need to live within an easy commute of work. For some, this will mean a complete severing of the geography of work from home. For most remote workers there will be some remaining connection between work and home, since they will need to commute once or more day each week to their place of work. In the outset of this study, we noted the compactness of Indiana's geography. Nearly all Hoosiers live within an easy commute to an urban location. However, there is still a great deal of rural land across Indiana, and for households with a preference for small town or rural living, the post-COVID workplace opens up significant options.

A full accounting of the post-COVID geography of work is outside the scope of this study, but we have significant information about the likely places households will seek out in rural Indiana. Using this information, we estimate the rural places in Indiana that are likely to grow in the coming years. First, a note about our methodology. As described in our Quality-of-Life chapter, we can measure of the amenity-based value families implicitly place in each county's housing stock. We combine this with the share of home-based workers prior to the pandemic under the assumption that there is some combination of private and public infrastructure (e.g., airport access, broadband, or locally available meeting or teleconferencing services) that supports remote work.

25 https://www.mckinsey.com/featured-insights/future-of-work/the-future-of-work-after-covid-19

26 https://globalworkplaceanalytics.com/work-at-home-after-covid-19-our-forecast

Finally, we include only those counties with at least one school corporation scoring an "A" or "B" in the most recent school ranking because of the strong correlation between school quality and location decisions. Importantly, this includes about two-thirds of schools in Indiana, so we are not excluding a large number of counties.27 The top 20 rural counties we expect are likely to grow in a post-COVID environment are reported in *Table 23.1*.

Table 23.1, Top 20 Rural Counties Projected for Post-COVID Growth, 2020

Rural County	Remote Work %	Housing Rank	QoL Rank	School Corporations with A or B Ranking
LaGrange	9.4	3	2	Lakeland School Corporation
Franklin	5	2	3	Franklin County School Corporation
Rush	4.6	7	17	Rush County Schools
Adams	3.7	9	4	Adams Central, South Adams
Jay	3.8	12	5	Jay County
Tipton	6.3	5	43	Tipton, Tri-Central
Daviess	4.5	30	9	North Daviess, Barr-Reeve,
Randolph	4.8	28	24	Monroe Central, Randolph Central,
Parke	6.5	49	12	North Central Parke
Clinton	4.1	20	32	Clinton Central,
Fountain	4.8	27	38	Covington Community, Southeast Fountain
Dubois	3.8	33	19	Southwest Dubois, Greater Jasper Consolidated
Decatur	3.7	11	42	Decatur Community Schools
Starke	2.5	10	8	Knox Community, North Judson-San Pierre
Warren	6.2	25	75	MSD Warren County
Ripley	3	8	44	Jac-Cen-Del, South Ripley
Marshall	3	42	16	Argos, Plymouth, Triton
Huntington	3.5	54	33	Huntington HCCSC
Crawford	3.4	76	7	Crawford Community Schools
DeKalb	4.1	39	62	DeKalb County Eastern, Garrett-Keyser-Butler

Source: Weinstein, Wornell and Hicks, 2022, Indiana Department of Education, and U.S. Census Bureau

It is important to note that this listing is not exclusive, and it is not a formal forecast. The goal here is simply to highlight the counties that already display the characteristics we believe will be connected to the post-COVID changes to residency. There are also many urban places that are likely to perform well in this measure. Communities like Shelbyville, Daleville, Greenfield, and Yorktown lie within urban counties but have high-quality schools and growing communities that would appeal to newly footloose families.

It is likely that the adjustment process to the COVID-19 pandemic will continue for a generation. The housing adjustment to the Baby Boom shock continued well past the birth of the youngest of that generation, and

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27 In aggregate, only A ranked school corporations experienced student growth in the last year for which we have data.

households will continue to adjust their occupational and career choices to take advantage of workplace changes from the pandemic. Thus, communities who wish to take advantage of a more modest link between residence and workplace can still benefit from making appropriate adjustments.

Summary – Putting It Together

This section combines the data from the first section, the inputs from the second section, and the special issues from the third section into a chapter that summarizes the rural economy in Indiana and examines its strengths, weaknesses, opportunities, and challenges. We end with key points from our findings.

Chapter 24. Summary

In this study, we acknowledge the very important and close connections between rural and urban Indiana. From the outset, we note that the compactness of Indiana's geography means that the vast majority of Hoosiers have access to urban labor markets or, conversely, may commute from cities to work in rural places.

In our first section, we report and analyze data about the size, scope, and change to economic conditions between rural and urban Indiana. We note some important features of population change, education, employment, and business dynamics.

Despite the decline in rural **population** share, the total number of Hoosiers in rural Indiana is roughly the same as in the 1940s. Moreover, the share of GDP in rural areas is very similar to that share from the start of the 21st century. Indiana's population growth is concentrated in the Indianapolis Metropolitan Statistical Area, and sparse elsewhere, including other urban centers.

Examining **per capita income** differences between rural and urban Indiana, we note that nearly all the difference is generated by educational attainment differences. Educational attainment differences influence the mix of occupations within a region, and differences in education account for more than two-thirds of the difference in wages between urban and rural Indiana.

We then conduct a **shift-share of employment in industries** in both rural and urban Indiana. This non-causal analysis reports challenging employment conditions in the rural economy. Despite over-representation in nationally growing industries, rural job growth in Indiana was especially moribund over the recovery from the Great Recession. Had Indiana's rural industries grown at the national rate, we would have expected more than 21,000 new jobs in rural counties. Instead, we had fewer than 1,000. These shift-share results differ from those in urban Indiana, which saw reasonably strong job growth of more than 110,000 jobs, though this too was somewhat smaller than would be expected given our industry mix. We focus on the causal factors that may underlie this outcome later in this chapter.

We round out the section by reviewing **business dynamics of firm age and size and entrepreneurship** across rural and urban Indiana. Here we note that only modest differences exist between rural and urban Indiana across these different factors, and those which do are almost wholly attributable to commodity prices received for

agricultural production. Despite what many argue, there is no evidence of large variation in entrepreneurship between counties or between rural and urban Indiana. This means that entrepreneurship, or small business growth, cannot explain differences in economic growth between counties or between rural and urban places. This contrasts with the popular belief that regional differences in entrepreneurship play an important role in regional prosperity. With little or no evidence of entrepreneurial differences motivating differential economic outcomes, there is little to argue for policy intervention in these areas.

In our second section, we outline the inputs to economic growth across Indiana's rural counties and provide a comparison with the state's urban places.

This analysis begins with **population growth**, which has remained stagnant or declined across most of Indiana's rural counties so far this century. The chief differences in population demographics between rural and urban counties lie in the age structure. While rural places have a modestly higher share of children under the age of 15, urban places have a somewhat higher share of young adults overall, likely due to college locations. Rural places also have a higher share of older adults, at 17.6 percent versus 14.7 percent for urban counties. Rural Indiana is also more racially/ethnically homogenous across the broad categories of the Census. The chief difference is the share of African Americans, who make up 1.6 percent of rural counties and 11.6 percent of urban counties. Rural counties also have poorer healthcare outcomes, lower family incomes, and a higher poverty rate than urban counties. In terms of employment mix by industry, rural Indiana is notable for its high share of manufacturing (30.6 percent of jobs), and a smaller share of workers in health care and social assistance. Other sectors are very similar in size.

We also report the relative distribution of **footloose and non-footloose jobs**. *Footloose* jobs may be performed from nonspecific locations because they produce goods or services that are largely exported outside the local region. This includes manufacturing, some natural resource extraction, back office financial services, logistics, and construction and utilities. *Non-footloose* jobs must be performed locally because they serve a local market of consumers. This includes services such as child care, health care, and hospitality. Even using this broad definition, Indiana's urban counties created nearly 24 non-footloose jobs for every one footloose job.

Indiana's rural counties gained 8,126 non-footloose jobs over the past two decades but lost 15,741 footloose jobs. We note that the vast majority of resources spent on economic development in rural Indiana has focused on attracting footloose jobs. After two decades of broad and expensive efforts to attract these types of firms, rural Indiana has fewer of these jobs than at the start of the 21st century.

We next focus on **educational attainment differences** between urban and rural places, noting that rural counties have a significantly higher share of adults with a high school diploma or less. Urban counties have a higher share of adults with a bachelor's degree or higher, and have increased their share over the past 20 years. This widening

of the educational attainment gap is the single biggest challenge facing rural Indiana, and, as we will demonstrate later, the cause of disproportionate economic distress.

Private capital stock, or the value of building and equipment in a county, is an important contribution to the production of goods and services. In this analysis, we focus on the 2010 to 2019 period, reporting that overall capital stock (new investment minus appreciation and depreciation) remained largely static. On a per worker basis, however, capital stock declined in both rural and urban places. At the same time, the amount of capital per dollar of GDP produced also declined. This, combined with growing use of tax abatements and Tax Increment Financing (TIF), the available tax base for both rural and urban places was cut significantly. The difference in total capital between rural and urban Indiana is mostly due to the intensity of capital use in industries, which is higher in rural places.

Housing availability is thought to constitute a major challenge to population growth in many Indiana counties. However, housing represents the most fluid and responsive of markets for capital goods, and the lack of newly constructed housing in much of Indiana is due to market conditions, particularly an excess supply of housing. This is especially acute in rural Indiana. The vacancy rate of housing in rural Indiana is 13.5 percent, suggesting that more than one out of every eight homes statewide now sits empty. Of course, commercial data such as Multiple Listing Services (MLS) do not record many of these homes because they could not command a sufficient market price, rendering them effectively invisible in the real estate data. This data invisibility leads to a highly misinformed policy discussion statewide, generating a mistaken belief that there is an acute housing shortage.

Housing is a durable good, and nearly one in four rural homes were built prior to 1939. While many of these vacant homes may appear unlivable, the fact is that if they were located in Chicago or Atlanta, they would have a very high market value. This is true even for homes in desperate disrepair. Rural Indiana has a vacant housing problem because of population changes; building new homes will not fix the underlining condition that created the vacant housing issue in the first place. This excess supply of housing has consequences across the entire housing market, reducing the market price of nearby homes.

The rural housing problem is not dissimilar from the excess supply of homes in distressed urban places. Housing stock does not quickly adjust when populations decline, leaving behind housing units that further suppress prices across the region. To illustrate this, we offer a profitability estimate of housing, combined with new home construction permits. These data provide strong evidence that since the nationwide housing bust of 2006 to 2008, most of rural Indiana provided no profitable options for speculative home construction. While it does appear that this largely ended in 2019, as home price growth outstripped construction costs, we have only one year of evidence that housing markets in rural Indiana were profitable for speculative builders. In contrast, many urban counties have been profitable for builders for several years.

These data suggest that many policymakers have seriously misunderstood the housing problem in rural Indiana. There is not a supply problem, but a long-term and very intractable lack of demand for new housing. That may change in the wake of the COVID pandemic, but only if populations grow substantially in rural counties.

Taxation and spending policy play a role in the quality and availability of public services. As we note throughout this work, differences in outcomes of public services play a significant causal role in population and employment change. Thus, it is important to understand the types, history and amount of tax dollars local governments collect. Our chapter on this issue demonstrates much regional variation in tax capacity and tax source. However the differences between the average rural and urban county are modest. One area with significant rural and urban differences are on the state level collections and disbursement of tax dollars. A total of 20 counties, 18 of which are urban, pay more taxes than they receive in revenue. The remaining 72 counties receive higher disbursements per capita than they pay in state taxes. These issues connect closely to the structure of local government, which adds costs to production of services.

Another issue slow to change is **governmental fragmentation**. While rural counties have about the same number of local government units as do urban counties, the burden of government fragmentation appears heavy in rural Indiana once we adjust for population. On a per person basis, rural counties have 37 percent more local governments and there are 63 percent more municipal government units in rural than urban counties. Adjusted for population, rural counties have 56.4 percent more townships, 52.2 percent more special districts, and 66 percent more school corporations. The presence of so many extra governmental units leads to much higher fixed costs of government for rural taxpayers. Higher fixed costs necessarily cause higher taxes or lower quality services. Measuring these are outside the scope of this study, but the structure of state taxes suggests the largest variation will be in local income taxes and public service quality. With property tax rates capped, we note that the typical rural resident pays a significantly higher local option income tax rate but faces only a modest property tax difference.

Also, **school performance measures** reflect a rural deficit on the ISTEP+ tests and high school science testing (biology). These differences are sufficiently large to fuel differences in regional educational attainment that is the primary constraint on economic growth in Indiana.

In our third section, we address a variety of special issues that affect rural Indiana.

The first of these issues noted that true growth in rural Indiana is biased by the fact that counties with rapidly growing populations are routinely **reclassified as urban counties**. This is not inappropriate because the goal is to classify the level of urban areas, Nonetheless, it does cloud interpretation of the data because the rural counties that are the most successful at attracting residents and transition to the urban category are then removed from the rural definition.

Our longest section was devoted to **Quality of Life (QoL)** in urban and rural Indiana. Here we focus on a market measure of QoL that uses the unexplained variation in home prices and wages between counties to explain household decisions. This unexplained variation represents the local 'value of amenities,' which otherwise cannot be effectively measured. We report that population growth is caused by higher QoL, but that employment growth is even more strongly affected by differences in county-level QoL. These findings build on decades of research on this issue, but our analysis uses county-level data for the first time, which allows us to examine this issue in rural counties. Importantly, once we develop county-level estimates of QoL, we are able to correlate those measures with known amenities. We find nationwide that the strongest predictor of high QoL is education spending, followed by crime rates (a negative effect). Other measures, like shopping opportunities and warmer winter temperatures, follow findings from other research and are less reactive to policy intervention.

Our special topics continued into a discussion of **manufacturing**, and its size and distribution across the state. This more-detailed chapter offered considerable information about the size and scope of both durable and non-durable manufacturing. We note that manufacturing represents a large share of rural employment but continues to decline as an overall share. Factory jobs accounted for 25.7 percent of rural jobs in 2001, declining to 22.4 percent in 2019. In urban counties, factory work represents only 11.7 percent of jobs.

Indiana's factory employment peaked in 1973, but production (in inflation-adjusted terms) peaked in 2019, just before the COVID pandemic. The post-COVID data are not yet available, but it is likely that the productivity growth seen in 2019 extends to current years. As such, a recovery in manufacturing jobs seems highly unlikely.

Our review of **agriculture** reports that agriculture employment and GDP are small shares of the rural economy, accounting for about 10 percent of that provided by manufacturing. Agriculture still uses more than 60 percent of Indiana's total land area, and, with productivity growth, produces the largest volumes in history. However, agriculture GDP peaked in 1973 and total employment peaked much earlier. Plainly put, productivity growth in agriculture resulted in lower prices, while productivity growth in manufacturing increased quality (hence total GDP).

Many rural places rely on agriculture production, but the most helpful way to think about the connection of the agriculture industry and rural economy is simply that the industry is far more dependent on the health of rural economies than rural economies are on the health of the agricultural industry.

Logistics, or the transportation and warehousing sectors, are a rapidly growing share of the Indiana economy. Employment growth in these industries account for more than 80 percent of all the net job growth in urban places. In rural areas, logistics jobs have grown more than tenfold, overtaking growth in total employment. This source of employment growth uses significantly more land than previous expansions of warehousing, and the composition of employment in this sector has changed. In 2001, wages in this industry were above the state average but have

not kept pace. New jobs today pay lower than the state average, reflecting a change in the composition of workers. Importantly, most job growth has occurred in occupations at the highest level of automation risk. So, changes to the number and composition of these jobs should be expected in the next decade or two.

Growth of **service sector** jobs are a hallmark of an affluent and productive economy, and the share of service employment has risen from 40 percent in 2001 to nearly 47 percent in 2019. The composition of service sector jobs in rural Indiana reflects the lower levels of educational attainment in the state, and there are fewer high paying jobs in each subsector. The average pay of urban service workers are 23 percent higher than in rural areas. However, service sector workers face less business cycle fluctuations than do those who manufacture or move goods, thus stabilizing local economies during a recession.

One issue in service provision is the cost of **healthcare**. We report existing research examining monopolistic pricing by Indiana hospitals and illustrate higher healthcare costs in counties with fewer hospitals per resident. We also note that many municipal hospitals likely provide a price buffer in some rural counties.

Commuting patterns reveal the flow of workers into and out of a county. In Indiana, both rural and urban counties experience considerable cross-county commuting. A total of eleven rural counties lost income and workers as more residents commuted into the county to work, ultimately taking their earnings home to another county. A total of ten urban counties experience the same dynamic, including nearly all the large urban places. Some of this commuting is idiosyncratic, representing an abundance of employment options in nearby counties, as with a Toyota plant in Gibson Country, or reflects the dual income nature of many families attempting to shorten commute of two or more workers, such as Hamilton County. Because the benefit of employment typically flows with the employee, not the location of the firm, the level of commuting should provide an argument surrounding the role of policies designed to attract businesses. This is especially true with tax abatements used to attract a firm, which will have little or no fiscal benefit for a community if workers chose to live elsewhere and commute to work. Communities in which workers are happy to work but not live might consider asking themselves why that is the case. The answer may be that quality of life differences make a county attractive to an employer, but not to employees and their families.

Migration flows for the most recent year of available data (2017-2018) show movement into and out of rural and urban Indiana. These data show a modest loss, fewer than 600 residents, in rural Indiana and a gain of almost 7,000 people into urban Indiana. We note that these are imperfect data, but they tend to reflect trends in residence patterns other data provide and conform to what we'd expect to find. In addition to migration between counties, rural Indiana has experienced considerable immigration from outside the United States, though this is much smaller than the peak immigration period prior to World War I. Statewide, 30 percent of population growth in this century is derived from immigrants. In rural Indiana, of the 27 rural counties that have lost total population from 2000 to 2019, all but four gained immigrant population. Additionally, one county gained total population from

2000 to 2019 wholly due to an increase in its foreign-born population. While rural Indiana saw a total population decrease of 7,349 from 2000 to 2019, its foreign-born population increased by 12,385. Immigration is not new to Indiana. In addition to its early settlement, waves of European immigrants entered the state in the last quarter of the 19th and first quarter of the 20th century. The immigration growth we see today is very modest by comparison, but still offers an important option for many rural counties that otherwise would struggle with population loss or stagnant growth.

Broadband access is a matter of keen interest to policymakers, particularly in the wake of the COVID-19 pandemic. During this time, reliance on broadband to conduct daily business, government, and education operations became evident. We note that the share of households with broadband in rural places grew from 69.1 percent to 75 percent between 2017 and 2019. This is modestly faster than adoption in urban places. However, the big differences in growth among households appear not to be the rural/urban divide, but income differences. Thus, differences in broadband adoption among regions were explained primarily by differences in household income.

Finally, we examine Indiana's rural places in a **post-pandemic environment**. One opportunity provided by the pandemic is the increasing possibility of **remote work**. We conclude that the growth of remote work will sever the link between place of work and home for a growing share of families. Some studies identify that as many as one in five hours worked will be handled at home rather than the workplace in the near future. Naturally, this provides more flexibly to families to choose where they wish to live. This trend, which will likely play out for longer than a generation, is a great boon to many rural places in Indiana. However, it favors those communities which are already experiencing high quality of life. To highlight this dynamic, we adapt the quality of life measure by combining it with the share of residents currently working from home and the quality measure of school corporations.

From this analysis, we identify 20 rural counties likely to benefit from residential relocation in a post-pandemic world. While we believe that some communities are prepared technologically, the functional adjustment will take decades. Therefore, any community can work now to improve any shortcomings they might have. Notably, 10 percent of counties that would otherwise be good candidates for household relocation do not have a public school that is performing at the average level or better, and so were dropped from the list.

This review of Indiana's rural economy is broad and comprehensive, but it needs several additional analytical points to pull it together. We do so in the remainder of this chapter. We begin with economic growth.

ECONOMIC GROWTH

Economists model economic growth using some version of a regional growth model that combines people, skills, and physical capital into producing goods and services. One form of this model is that GDP = f(technology,

human capital, labor, physical capital), where physical capital is the value of structures, industrial machinery, and equipment. We compare what has happened in Indiana over the past decade by comparing inputs (i.e., technology, human capital, labor, and physical capital) and outputs (i.e., GDP).

Since 2010, the GDP in Indiana's urban counties grew by 14.8 percent in inflation-adjusted terms, versus 11.6 percent in rural counties. In terms of inputs, human capital (as measured by the number of years of college) grew by 3.5 percent in urban counties and by 1.0 percent in rural counties. Employment growth in urban counties was close to twice that of rural counties, at 15.0 and 8.3 percent respectively, and the stock of productive capital (machinery and equipment) in urban counties grew very modestly while it shrank in rural counties.

It is difficult to interpret these data points individually. The human capital measure only counts the education level of employed workers, so the first two inputs are functionally linked. Likewise, firms faced with low-skilled workforce will invest in technology very differently. Firms with low-skilled workers, for example, are more likely to substitute capital for labor (i.e., automation), while firms with high-skilled workers use capital as a complement to labor. Additionally, capital investment typically varies by industry, so the decline in capital in rural Indiana signals a shift away from more capital-intensive production, which is consistent with the post-World War II economy shift from production of goods to services. Nonetheless, slow growth of human capital (i.e., education) will surely result in slower GDP growth and lower capital investment for rural places.

Table 24.1, Input and Output Growth in Indiana's Economy, 2010-2019

| Counties | Output | Inputs | | |
	GDP Growth	Human Capital Growth	Employment Growth	Productive Capital Growth
Urban	14.8%	3.5%	15.0%	0.05%
Rural	11.6%	1.0%	8.3%	-3.26%

*Source: Bureau of Economic Analysis and author's calculations*

Of course, part of this consideration must be the relative unique character of Indiana's geography, namely, its compactness. More than 85 percent of Hoosiers live within a 20-minute drive to an urban county. For ease of discussion, in the following maps *(Figures 24.1 through 24.5)* we illustrate those linkages using smaller regions within the state. We show a measure called spatial autocorrelation, which is a historical link between the change in one county and the change in its contiguous counties. It is measured by estimating the following equation:

$$Y_{i,t} = \alpha + \delta \hat{W} Y_{j,t} + e_{i,t}$$

…where **Y** represents employment, **i** represents county, and **t** represents time in years. All these variables are a function of a common intercept **α**, and the weighted average **Ŵ**, of **Y** employment in **j** adjacent counties for each year **t**. In this estimation of Indiana's counties from 1969 through 2019, we measure how connected each county is to its adjacent counties.

In *Figures 24.1 through 24.5*, we indicate prominent urban centers in orange, with secondary counties in yellow. Counties marked in green are geographically peripheral (i.e., not largely influenced by adjacent counties).

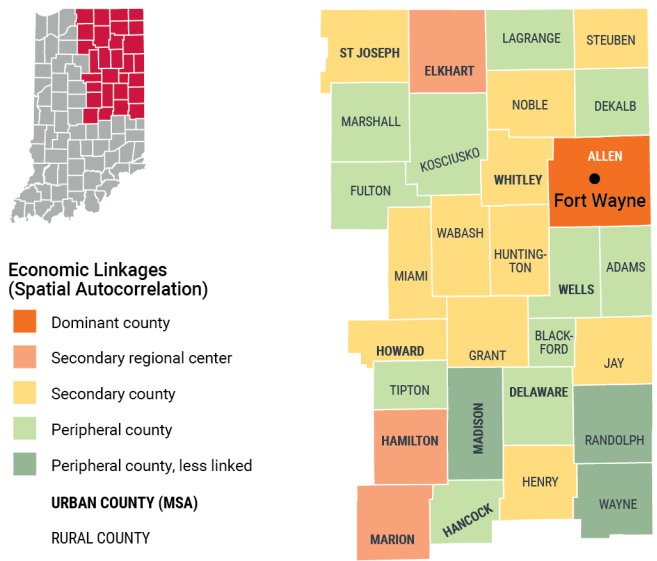**Figure 24.1, Economic Linkages in Northwest Indiana**
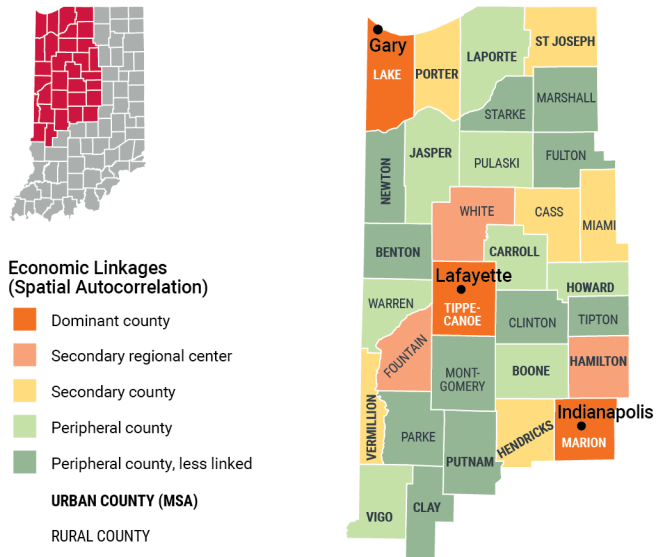
Source: Author's calculations

Figure 24.1 shows the dominant economic linkages in northwestern Indiana. Indianapolis (Marion County), Gary (Lake County), and Lafayette (Tippecanoe County) are all dominant urban centers in the northwestern region. The counties of Hamilton, White, and Fountain may serve as secondary regional centers.

For policy purposes, these maps should indicate some movement of households and businesses. Indeed, the GDP and population maps are nearly identical to the employment maps. The prime use of these linkage maps is to assist in identifying which counties may naturally form a region for economic development planning. An economic development district might naturally include an orange or yellow center and surrounding counties.

In practice, a challenge exists when a county (e.g., Jasper or Clinton) is located between two larger urban centers. In these cases, observed economic linkages provide little guidance to policymakers for where to align themselves regionally; they may need to look to cultural or social connections.
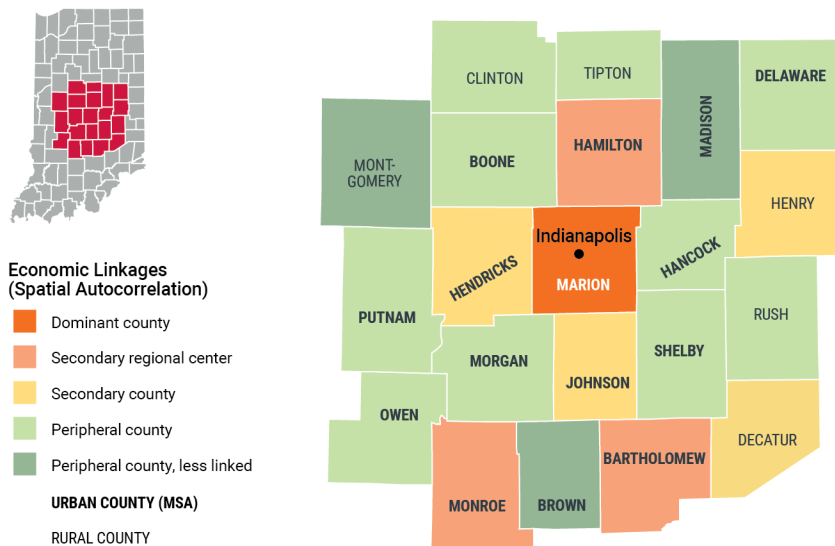
Figure 24.2, Economic Linkages in Northeast Indiana

**Economic Linkages
(Spatial Autocorrelation)**

- Dominant county
- Secondary regional center
- Secondary county
- Peripheral county
- Peripheral county, less linked
- **URBAN COUNTY (MSA)**
- RURAL COUNTY

Source: Author's calculations

Figure 24.2 shows the urban centrality of Fort Wayne (Allen County) and South Bend/Elkhart in northeastern Indiana. Looking southward, the challenges to regional planning and policymaking are apparent in eastern Indiana. Here, the two largest cities, Muncie (Delaware County) and Richmond (Wayne County) have few economic linkages with the surrounding area. The lack of a single urban centerpiece exacerbates the challenges of successful regionalism.

Figure 24.3, Economic Linkages in Central Indiana

**Economic Linkages
(Spatial Autocorrelation)**

- Dominant county
- Secondary regional center
- Secondary county
- Peripheral county
- Peripheral county, less linked
- **URBAN COUNTY (MSA)**
- RURAL COUNTY

Source: Author's calculations

100

Even in central Indiana (*Figure 24.3*), the geographically peripheral counties (e.g., Bartholomew and Monroe) are not closely linked to Indianapolis, despite considerable commuting flows. The urban centrality of Indianapolis is clear, as are the weak economic linkages that plague eastern Indiana and inhibit regional cooperation.

Figure 24.4, Economic Linkages in Southeast Indiana
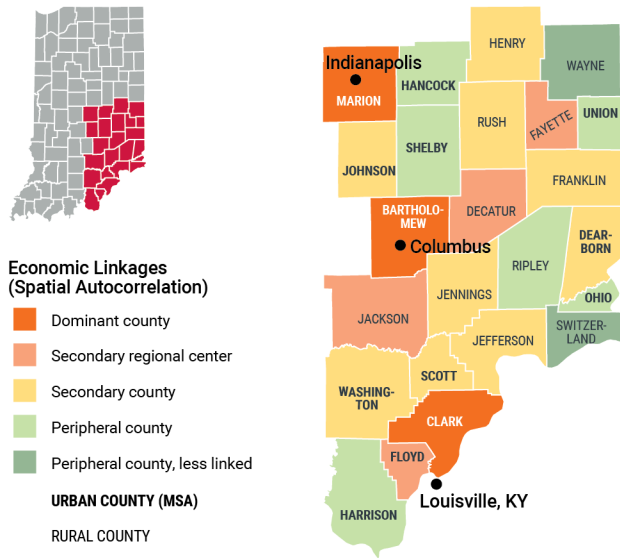
Source: Author's calculations

In southeast Indiana (*Figure 24.4*), we see that the influence of Cincinnati is very modest, while the centrality of Louisville is pronounced (i.e., Clark and Floyd). Again, this map makes clear the challenges of organizing a regional group in Eastern Indiana may be much larger than in many other sections of the state.

**Figure 24.5, Economic Linkages in Southwest Indiana**

Source: Author's calculations

101
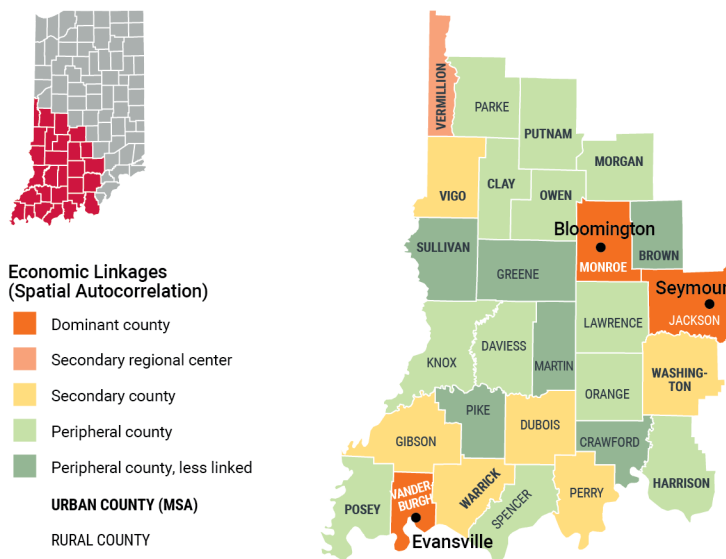
Figure 24.5 displays clear regional patterns around Bloomington (Monroe County), Evansville (Vanderburgh County), and Terre Haute (Vigo County) in southwestern Indiana.

These maps also reflect urban influences from outside the state, such as the large influence of Chicago, Louisville, and Cincinnati, along with smaller locations like Owensboro, KY. Ideally, *Figures 24.1 through 24.5* communicate the fairly strong economic linkages across rural and urban Indiana that we mentioned in the outset of this study. These connections have some symmetry, and urban and rural places are connected in ways that benefit residents in both areas.

Another place where this manifest displays itself is in commuting patterns. Workers live in places that align with their interests, providing them individually with higher quality of life. In our chapter on quality of life, we discussed the effects of wages and housing costs within counties, but it is worth noting that these phenomena affect commuting patterns as well.

Figure 24.6, Commuting Patterns and Market-Based Amenity Estimates in Indiana's Rural Counties
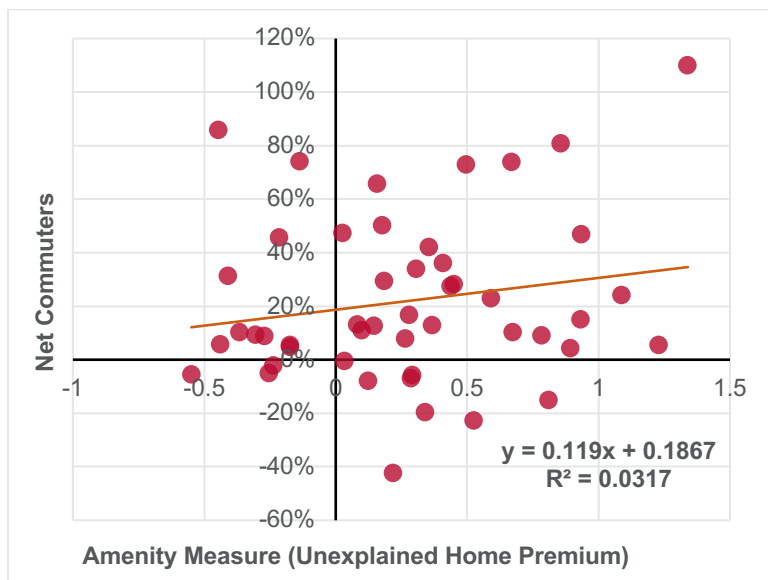

Source: U.S. Census, and author's calculation from Weinstein, Wornell and Hicks, 2022

In *Figure 24.6*, we plot the share of total commuters into and out of a county to the quality of life measure connected to that county's home prices. We note that there is strong spatial connectedness between these measures, so counties with a high QoL will have higher adjacent average QoL measures. This means that places with a high quality of life tend to see a higher share of residents who commute to work.

TAXATION AND QUALITY OF LIFE

In an earlier chapter, we briefly discussed taxation as a feature of quality of life; we expand on that issue here. We noted earlier that employment growth and combined state and local effective tax rates are positively correlated, as shown in *Figure 24.7*. To be clear, we do not suggest that this relationship is causal, although how tax dollars are allocated clearly affects economic and population growth. Higher local tax rates do not disincentivize economic activity within Indiana, and we know of no economic research that suggests otherwise.

Figure 24.7, Employment Growth and Combined S&L Tax Rates in Rural Counties, 2009-2019
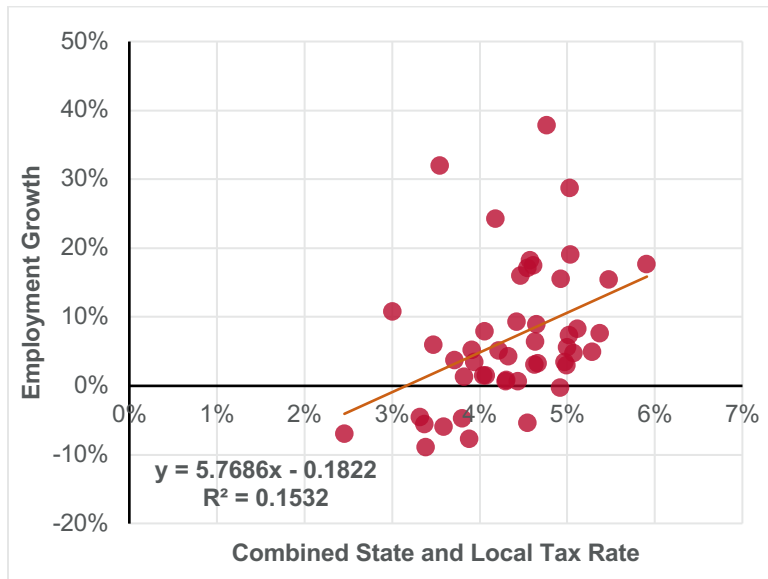
Source: Internal Revenue Service, author's calculations and Bureau of Economic Analysis

Figure 24.8, Combined S&L Tax Rates and Quality of Life in Rural Counties, 2010
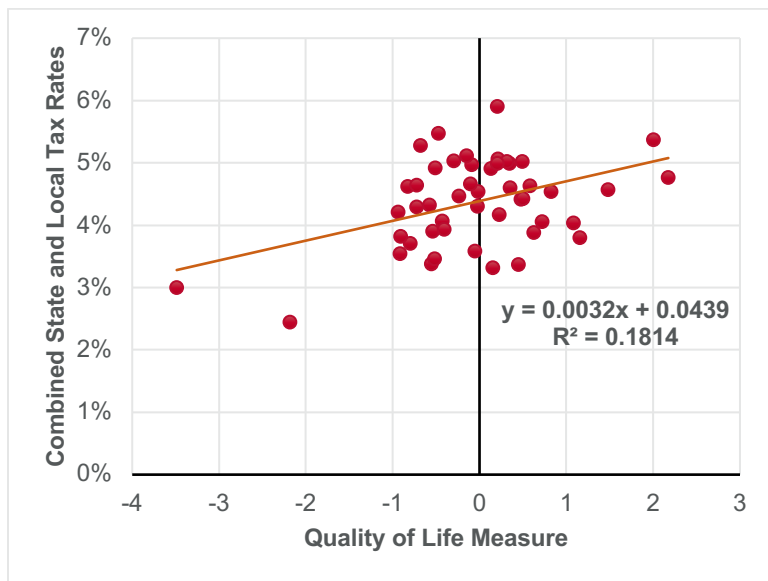
Source: Internal Revenue Service and author's calculations

A partial explanation for this relationship might lie in the link between quality of life and combined residential state and local tax rates. In *Figure 24.8*, we use IRS data to calculate the state and local effective tax rate, and we correlate this to our market-based quality of life measure in rural counties. Counties with higher tax rates also have a higher quality of life, most likely due to spending focused on the things that increase QoL within the counties.

To further examine these issues, we jointly estimated the effects of county-level taxes per capita and quality of life on population growth. We included commuting and population measures as controls. In rural counties, we find that taxes per capita have no effect on population growth, while quality of life and net commuting are statistically significant. Quality of life is by far the largest effect, with a single standard deviation in this measure leading to a 1.3 percent annualized difference in population growth. Of all the factors we have discussed, quality of life is the most essential element in regional population and employment growth.

CONCLUSIONS

In this study, we examine a broad range of issues affecting the rural economy. We offer some surprising conclusions. Much of what is thought to drive the differences between rural and urban economic performance is mistaken. For example, we find that entrepreneurial differences between rural and urban Indiana are trivial and cannot explain growth differentials across these two geographies. We also find broadband adoption is mostly connected to household income, not rurality, and that Indiana's rural counties have more heavy industry and lower-paying services, with a modest agricultural sector. All of these issues include some factors that cannot be changed (e.g., the relative cost of land) and some factors that can be affected by policy (e.g., educational attainment).

Throughout this study we have returned to a central series of points:

- In today's economy, most occupations can be performed anywhere, so household location decisions are motivated by quality of life.

- Businesses increasingly rely upon labor quality for profitability, and they increasingly move to communities with a growing population of educated workers.

- Educational attainment levels in rural counties are below the Indiana and national averages and are growing more slowly. Thus, educational attainment in rural Indiana is in relative decline.

- Places with a higher quality of life (as measured by our market-based estimates) attract people and jobs more quickly than places with a lower quality of life.

- Higher quality of life is strongly correlated with more school spending, the absence of crime, and a few key private sector amenities, such as recreational activities.

- Higher taxes do not disincentivize population or job growth in Indiana; indeed, higher local taxes tend to enjoy higher population growth in rural Indiana. This is almost certainly due to higher-quality public services.

- Indiana's geography is compact, meaning that rural places can access urban labor markets fairly easily, so rural counties can look to residential growth as a source of economic activity.

- Long-term economic outcomes in a region tend to be reduced when the local mix of economic activity contains large shares of volatile sectors such as manufacturing.

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