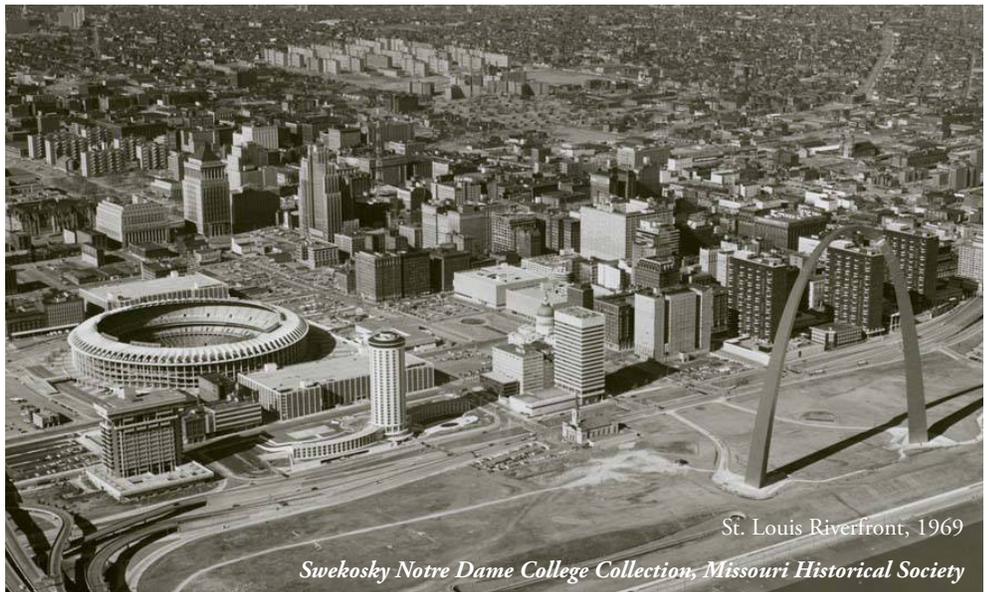




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THE MISSING MILLION: MISSOURI'S ECONOMIC PERFORMANCE SINCE THE MOON LANDING

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KEY FINDINGS

- Recent findings concerning Missouri's slow-growth economy are a part of a nearly 50-year trend. Missouri has, across several key economic measures, lagged the nation and most other regions in the country since 1969.
- The Kansas City and St. Louis metropolitan statistical areas have experienced slow growth in jobs and earnings per job relative to the nation and to other regions in the country since 1969. They have not been net contributors to overall state growth.
- In several other MSAs, most notably Springfield (MO) and Fayetteville (AR-MO), economic activity has exceeded the overall state average. They represent growth areas.
- Potential causes of Missouri's poor economic record include poor net job creation, little net immigration of college-educated individuals, and an industrial composition that is not matched to economic growth at the national level.

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INTRODUCTION

The first person to set foot on the moon, Neil Armstrong, did so on July 21, 1969. Since that day, just about 50 years ago, one million people have gone missing from the State of Missouri. Had Missouri's population growth rate simply kept pace with the national average, today Missouri would be home to 1.2 million more people. That is over half the current population of the entire Kansas City metropolitan area.

Those missing million represent not only missing neighbors and friends, but also entrepreneurs, innovators, volunteers, and workers. Due to the forces of urban development, those missing people mean lost innovation, creativity, and ultimately reduced productivity and earning capacity (Duranton and Puga, 2004; Combes, Mayer, and Thisse, 2012; and Moretti, 2011). Not surprisingly, Missourians are also missing thousands of dollars from their pay every year: Had the state kept pace with the national average, Missouri's average annual compensation would be \$3,387 higher today than it currently is.

Missouri's two major metropolitan areas, Kansas City and St. Louis, should be the main attractions to Missouri, but they have fared no better than the state as a whole. In absolute terms, their economic influence has expanded geographically as people and jobs spread out in their local regions. Unfortunately, neither metropolitan area has kept up with its urban peers in either population or earnings growth.

The silver lining in this litany of bad news is that it could be worse. People once moved with greater frequency to places with better economic opportunities (Barro and Sala-i-Martin, 1991). If this migration had continued, it would have placed Missouri's population growth under even more pressure as economic opportunities have grown proportionately more in the West and South.

A number of studies, as we review in the next section, have tried to explain Missouri's apparent lack of economic vitality. With the amount of energy expended on the topic, is there anything else to discover? We believe so, and in

several ways. Previous work has relied almost exclusively on using real GDP as the metric to measure economic success. This measure is essential in any economist's tool kit, but it is not without its limitations, especially when measured at the state level. Thus, one change from previous work is that we assess Missouri's economic track record using alternative measures, such as personal income and job growth.¹

This change gives us a different perspective on the state's economic history. It also allows us to expand the horizon of our analysis in two important ways. First, because of changes in the way GDP is measured at the state level, these data are available in a consistent form only since 1997: As a result, the studies cited below focus on the last two decades. This is problematic, in large part because the post-2000 period is dominated by the events surrounding the Great Recession, which lasted from 2007 through 2009. Using income and jobs data allows us to extend the period of analysis much further, back to 1969. We can, therefore, consider the question of whether Missouri has been a relatively slow-growth state over a much longer period.

Second, using a different set of economic variables allows us to change the level of aggregation. Instead of being constrained to using only state-level data, we are able to examine the economic record of the state's metropolitan areas and even more finely at the county level. We do not directly test the idea that growth of the state's metropolitan areas is or is not responsible for the state's overall growth. But our approach permits us to consider how Missouri's cities—specifically the metropolitan statistical areas (MSAs)—and counties have fared over time, and whether they have helped or hindered overall state growth.²

Why examine the economic record at sub-state level? One reason is that metropolitan areas account for the largest share of most states' population and output, and in this respect, Missouri is no different. There also is a large and growing literature that studies metropolitan growth and its impact on broader economic trends. Most notable in this regard are the works of Glaeser (2011) and Moretti (2012). If, as this research suggests, metropolitan areas are

¹ Although GDP is a widely used measure, it is not the only measure to assess economic success, especially at the local level. We will have more to say about this later in the paper.

² Haslag and Pretnar (2015) and Podgursky and Pretnar (2016) considered the record of the MSAs, but their work focuses only on the period since 2000.

hubs of economic growth, knowing how Missouri's MSAs have fared over the past 40-plus years helps us better understand current state-level economic activity.

Our study proceeds as follows. Section 2 provides an overview of previous work examining Missouri economic growth and related topics. Section 3 contains a brief discussion of the geographical areas studied, the economic series used, and the statistical measurement of those data in our analysis. Section 4 provides a perspective for our later work by first considering the state's overall economic record. We compare Missouri's track record with states in the region and the nation. This introductory work also helps us compare our longer-term results with previous findings based on GDP since the late 1990s.

With the state-level results established, Section 5 examines trends in the MSA data. Our analysis of the county-level data is in Section 6. Because many of our findings are comparative in nature, we are able to determine if there are MSAs and counties that one could point to as "growth nodes" in the state. We follow this in Section 7 by considering a few possible causes for the economic outcomes we reveal. Section 8 closes our study with policy prescriptions.

MISSOURI'S ECONOMIC PERFORMANCE: AN OVERVIEW OF RECENT WORK

Prior research on Missouri's economic performance has focused on the period since the late 1990s. This is largely because changes in how the Bureau of Economic Analysis (BEA) measured output, implemented in 1997, have meant that state-level output data before and after that date are not directly comparable.³ And what do the data for the past 20 years tell us? In Table 1 we report the growth rates of three widely used measures of economic

success: An overall measure of economic output, gross domestic product (GDP); GDP adjusted for price level changes (real GDP); and real GDP measured on a per person basis.⁴ The growth rates are for Missouri and the nation for the period 1997 through 2017. We also report where Missouri ranks among all other states by measure used.

A quick glance at Table 1 shows that Missouri's economy not only has lagged the national average in every measure, but that it consistently ranks as one of the poorest performing economies when compared to all the other states. Regardless of the measure, Missouri is always near the bottom in terms of economic success.⁵ But the real significance of the data in Table 1 is not in the simple comparison with the nation or other states: What these statistics *mean* is that Missouri's residents, on average, are facing a significantly slower improvement in their economic well-being compared to the national average.⁶

This sad outcome explains the numerous studies looking for some explanation(s). The possible causes investigated have been those that economic theory suggests are directly related to influencing worker productivity. One is education. Hanushek (2018) studied the abilities of students who are in or have graduated from Missouri schools. He found that the output of Missouri's educational system—assessed using standardized test results, among others—was substandard compared with other states. Podgursky (2018) also examined the state's educational system, but from the perspective of how it works: the role of teacher promotion, administrative activity, teacher tenure, and so on. He argued that changes in the structure of education would help improve student outcomes. Hafer and Hafer (2017) considered the effect of educational attainment on economic and social outcomes. They found that the relative lack of educational attainment

³ Technically, the Bureau of Economic Analysis (BEA) switched from using the Standard Industrial Classification (SIC) system to the North American Industrial Classification System (NAICS) in 1997. This change was made largely because of the changing composition of new businesses arising due to new technologies. Because the new classification system encompassed a different set of industries, a comparison of GDP before and after the change is problematic. Even if one chose to use GDP across the 1997 break, the BEA calculated state GDP go back only to 1988.

⁴ The source of the data for this table is the Bureau of Economic Analysis, accessed at <https://www.bea.gov/data/by-place-states-territories>, plus authors' calculations.

⁵ Of the 19 states defined as the "heartland" of the United States, only two states—Mississippi and Louisiana—have a lower annual average growth rate in real GDP over the period 2010 to 2015, a period of economic expansion. See Muro, et al. (2018), pp. 28–29.

⁶ To put this in a different light, if the average rates of growth experienced since 1997 were to continue, it would take about 58 years for the average individual in the U.S. to realize a doubling in their real income (measured by real GDP per person). For the average Missourian, it will take 174 years.

Table 1: Growth Rates and Missouri's Rankings

| Economic Measure | Growth Rates | | Missouri Rank |
|--|---------------|----------|---------------|
| | United States | Missouri | |
| Gross domestic product | 4.1% | 3.2% | 47 |
| Real gross domestic product | 2.3% | 0.9% | 47 |
| Real gross domestic product per capita | 1.2% | 0.4% | 48 |

Notes: Gross Domestic Product (GDP) is the total market value of goods and services produced in the economy measured in current prices. Real Gross Domestic Product is GDP adjusted for price level changes. Real GDP per capita is real GDP divided by the population. Growth rates are compounded annual rates of change over the period 1997 through 2017. Missouri's ranks compare Missouri's growth rate to all other 50 states.

Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-states-territories>) and authors' calculations.

across many of Missouri's counties helped explain their relatively low levels of family income and the prevalence of "bad" social outcomes, such as obesity and incidence of childhood poverty.

Other studies considered the role of government in explaining Missouri's sluggish growth. Some tested the idea that Missouri's tax policy could explain its slow growth. Hafer and Rathbone (2015) explored the structure of Missouri's personal income tax, and Hafer and Wall (2017) examined the state's corporate tax system. The evidence from both studies contradicted the widely held notion that Missouri is a "low-tax state," and the latter study concluded that "the high level of effective corporate taxes might partially explain why Missouri has experienced such slow economic growth during this century."

On the spending side, Haslag and Austin (2017) argued that state governmental spending decisions might account for some of the slowing in real GDP. While they find a break in the spending allocation data occurred in the 1990s, it is not clear from their results whether how the state government allocates its spending is a key factor explaining slow growth since 2000.

Still others have looked to the business side of the economy to see if there are clues that account for

Missouri's tepid growth. Haslag (2014) sought explanations in Missouri's industrial makeup, arguing that the state's mix of industries essentially misses many of the sectors that have grown the fastest over the past 20 years. Hafer and Sullivan (2015) and Haslag (2017) also considered the relatively low levels of entrepreneurial activity in Missouri as a cause of the state's poor economic record.

Though not for the lack of trying, it has been very difficult to pin down a dominant factor that explains Missouri's anemic economic performance since 2000. In the remainder of this study, we take a longer view of the question. In short, our analysis suggests that Missouri's lackluster growth began much earlier, dating back to the early 1970s. Moreover, having studied trends at the MSA and county level, we found that what growth that has occurred is concentrated in a few counties.

SOURCES, DEFINITIONS, AND METHODS

It is useful at the start to lay out the parameters of our study. That is, what exactly do we mean by the geographical measures used, what data do we use, and how we will measure those data in order to give some perspective to our study?

Geography

The three major geographic definitions that we will use are the state, county, and metropolitan area. When we use the term *states*, we mean all states in the contiguous United States, including Washington, D.C., but excluding Alaska and Hawaii. We also use counties (and county-like jurisdictions) and the Census Bureau's public use microdata areas (PUMAs). These building blocks, depending on each dataset's limitations, are used to construct our economic series.

Metropolitan Statistical Areas

Metropolitan statistical areas (MSAs) are defined by the Census Bureau.⁷ They represent urban areas and are defined by commuting patterns. Unfortunately, MSAs are difficult to work with as they are built using county-equivalent jurisdictions, sometimes cross state lines, and change in geographic size over time. Furthermore, MSAs change in geographic size with changes in commuting patterns. The original Saint Louis MSA vintage (circa 1950) consisted of Saint Louis City and four counties. The 2013 vintage includes an additional 10 counties.

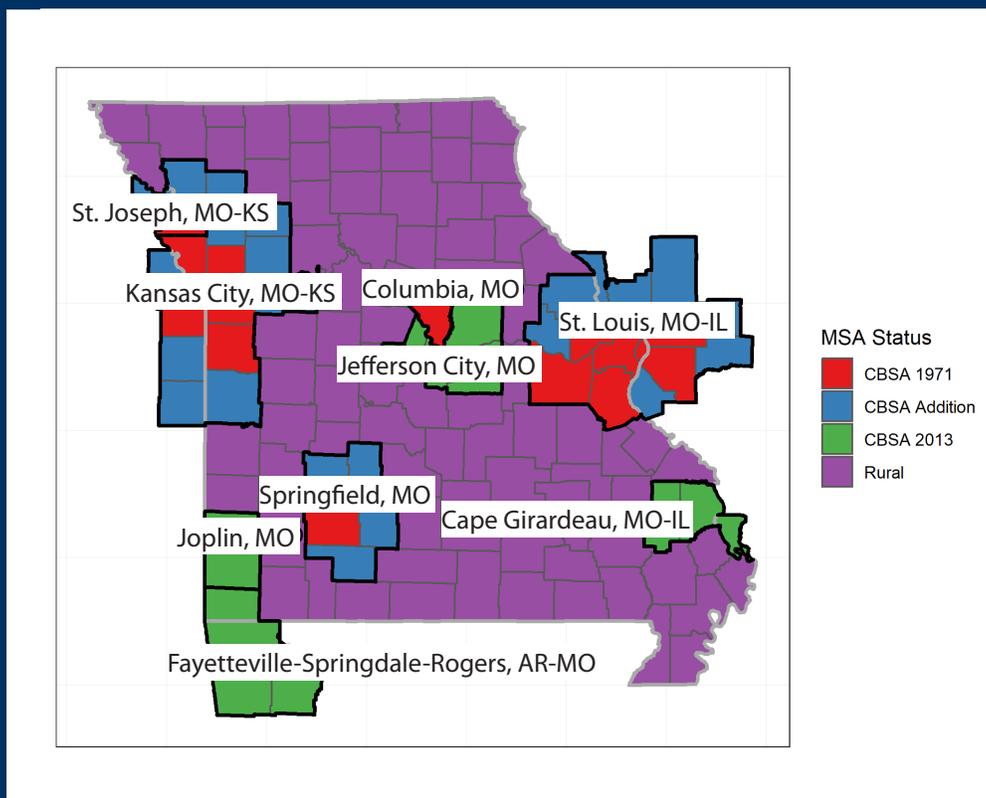
County-equivalent jurisdictions vary considerably in geographic size. Counties in the East tend to be relatively small and uniform, whereas counties in the West tend to be comparatively large. Thus, the percentage of urban activity in each MSA varies simply based on the geographical location of the counties.

Midwestern and Southern MSAs tend to increase geographically over time simply because the counties are relatively small and the MSAs are more spread out. MSAs in the Northeast and Far West do not grow much, however, because the MSAs are located in tight clusters

Figure 1

Missouri Counties by MSA Status

Figure 1 shows all of the counties in Missouri. It is color-coded to reveal Missouri's current MSAs along with their "vintage"; that is, when they were defined by the Census Bureau. The figure shows that some of the MSAs have expanded significantly over time.



Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-county-metro-local>), Census Bureau Tiger Files, and authors' calculations.

or the counties are already as large as some New England states.

Figure 1 shows all of the counties in Missouri, with special attention given to those that form the MSAs. It is color coded to reveal Missouri's current MSAs along with their "vintage"; that is, when they were officially added by the Census Bureau.⁸ As you can see, some MSAs have expanded geographically over time. To maintain

⁷ As defined by the Census Bureau, "Metropolitan statistical areas consist of the county or counties (or equivalent entities) associated with at least one urbanized area of at least 50,000 population, plus adjacent counties having a high degree of social and economic integration with the core as measured through commuting ties." <https://www.census.gov/programs-surveys/metro-micro/about/glossary.html>

consistency we will use two of the Census Bureau's vintages: 1971 and 2013. The 1971 vintage, which we will henceforth refer to as "Metro 1971", matches our earliest observations (1969), and the 2013 vintage matches the BEA's current definition.⁹ The CBSA 1971 definition will be used as our core MSAs as follows:

- Cape Girardeau (CBSA 2013 Only)
- Columbia (CBSA 1971 Only)
- Fayetteville (CBSA 2013 Only)
- Jefferson City (CBSA 2013 Only)
- Joplin (CBSA 2013 Only)
- Kansas City (CBSA 1971 and 2013)
- St. Joseph (CBSA 1971 and 2013)
- St. Louis (CBSA 1971 and 2013)
- Springfield (CBSA 1971 and 2013)

The Census Bureau sets MSA boundaries based on the amount of economic interaction (e.g., commuting patterns) between counties. Several MSAs border each other in Missouri and/or cross state boundaries. North of the Kansas City MSA and the Fayetteville MSA are the separate MSAs of St. Joseph and Joplin, respectively. The Columbia and Jefferson City MSAs also share a common border. This leaves Cape Girardeau, St. Louis, and Springfield as the only isolated Missouri MSAs.

Table 2 helps sort out the counties that comprise the original (1971) MSAs and current MSAs. The top tier of the table lists all counties (Missouri and other state) that comprise the MSAs. The lower tier lists only

Missouri counties. The first column are those counties that comprised the Metro 1971 definition, the second column are the counties added since then, and the third column lists those counties that make up the relatively new MSAs (e.g., Cape Girardeau). The MSAs of Kansas City, St. Joseph, St. Louis, and Springfield have expanded geographically over this time. Later in our analysis, we will deal with the fact that border MSAs, such as St. Louis and Kansas City, expanded over time and some of the added counties lie outside of Missouri. When we assess the role of the MSAs and counties in Missouri's economic history, we exclude the non-Missouri counties from the analysis.¹⁰

We should note that geographic expansion of an MSA is not necessarily a good sign. Urban sprawl arises from strong geographic expansion coupled with weak population and job growth. Generally, urban sprawl is considered a sign of weak urban performance (Glaeser, Kahn, and Chu, 2001). The reason is that if people have little reason to live and work in the urban core or even close to each other generally, they move to the suburbs. The bad sign may explain the fact that many counties have been added to the Kansas City, St. Louis City, and Springfield MSAs.

In addition to showing where Missouri's MSAs are located and by how many counties they have changed over the past 40 years, Figure 1 shows that most of the state's counties are classified as rural. Table 3 shows that most of the state's population resides in MSAs, in the past and today. About 75 percent of the state's population resides in non-rural areas. It also is true that MSAs today account for the lion's share of jobs and income. Even so, we feel it is important, especially from a policy standpoint, to consider the evolution of our economic measures across rural counties. Doing so will allow some comparison between

⁸ MSA refers to the family of metropolitan definitions. CBSA is a specific definition and is the most commonly used. Metropolitan Divisions divides the largest/Northeastern CBSAs into smaller parts (e.g., Chicago CBSA is divided into Chicago, Elgin, Gary, Lake County). CSA (Combined Statistical Areas) group CBSAs into larger clusters. Note that these are only MSAs and do not include micropolitan statistical areas.

⁹ With one exception: The 2018 definition expands the Columbia MSA. Using the 2013 CBSA definitions allows our readers to directly compare our results to other BEA datasets (including MSA GDP metrics) and past research.

¹⁰ One point of clarification. In Figure 1 and Table 2, it appears that out of all the original Metro 1971 MSAs, Columbia is the only MSA that did not expand geographically. In 1971 and as of 2013 this is true: It was designated only as Boone County. In September 2018, however, the Census expanded the Columbia MSA to include Cooper County and Howard County. This change is outside the time frame of our data and, to make all comparisons equivalent, we therefore do not reflect this change in our analysis. Instead, the Jefferson City MSA (Table 2, column 3) is identified as a separated economic entity, meaning that the surrounding counties are better integrated (economically) into Jefferson City relative to Columbia. This recent change to the Columbia MSA is not surprising in light of Columbia's relatively strong economic performance in the past.

Table 2: Listing of Metropolitan Statistical Areas and Constituent Counties

| Metro Name | Metro 1971 | Addition | Metro 2013 |
|-------------------------------|--|--|---------------------------------------|
| Cape Girardeau | | | Alexander, Bollinger, Cape Girardeau |
| Columbia | Boone | | |
| Fayetteville | | | Benton, Madison, Washington, McDonald |
| Jefferson City | | | Callaway, Cole, Moniteau, Osage |
| Joplin | | | Jasper, Newton |
| Kansas City | Johnson, Wyandotte, Cass, Clay, Jackson, Platte | Leavenworth, Linn, Miami, Bates, Caldwell, Clinton, Lafayette, Ray | |
| St. Joseph | Buchanan | Doniphan, Andrew, DeKalb | |
| St. Louis | Madison, St. Clair, Franklin, Jefferson, St. Charles, St. Louis, St. Louis | Bond, Calhoun, Clinton, Jersey, Macoupin, Monroe, Lincoln, Warren | |
| Springfield | Greene | Christian, Dallas, Polk, Webster | |
| Missouri Only Counties | | | |
| Metro Name | | | |
| Cape Girardeau | | | Bollinger, Cape Girardeau |
| Columbia | Boone | | |
| Fayetteville | | | McDonald |
| Jefferson City | | | Callaway, Cole, Moniteau, Osage |
| Joplin | | | Jasper, Newton |
| Kansas City | Cass, Clay, Jackson, Platte | Bates, Caldwell, Clinton, Lafayette, Ray | |
| St. Joseph | Buchanan | Andrew, DeKalb | |
| St. Louis | Franklin, Jefferson, St. Charles, St. Louis, St. Louis | Lincoln, Warren | |
| Springfield | Greene | Christian, Dallas, Polk, Webster | |

Source: United States Census Bureau (<https://www.census.gov/geographies/reference-files/time-series/demo/metro-micro/delineation-files.html>).

Table 3: Missouri Population by MSA Type and Year Group

| MSA Status | 1969–1973 | 2012–2016 | Change | Percent Change |
|------------|-----------|-----------|---------|----------------|
| Metro 1971 | 2,990,310 | 3,681,671 | 691,361 | 23.1 |
| Addition | 192,420 | 386,151 | 193,731 | 100.7 |
| Metro 2013 | 284,478 | 440,047 | 155,569 | 54.7 |
| Rural | 1,247,853 | 1,551,782 | 303,929 | 24.4 |

Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-county-metro-local>) and authors' calculations.

amenities. How? Locations with strong productivity growth will push earnings per job up thereby attracting more residents until earnings fall or the local cost of living rises. Locations with an improving mix of amenities will attract more residents, putting downward pressure on earnings per job and upward pressure on the local cost of living. (Neumark and Simpson, 2015)

the economic changes that have occurred in the “urban” and “non-urban” areas of the state.

Data Sources

We stated earlier that we do not rely on real GDP to assess economic success. Although it is a commonly used yardstick, real GDP, even at the national level, is an imperfect measure of economic achievement (e.g., Costanza, et al., 2009; McKinsey Global Institute, 2015). Moreover, at best the data series for state level GDP extend only back as far as 1988 and they are not disaggregated to the county level. To extend our ability to determine whether Missouri’s economic woes are more long-standing and perverse than is suggested in Table 1, and to provide some alternative views on the achievements of the state, county, MSAs, we chose to look at other gauges of economic success.

The economic measures that we use are gathered by the Census Bureau and the Bureau of Labor Statistics.¹¹ Our data cover the period since 1969, doubling the number of observations used in earlier work. Because these data are “noisy” —that is, there is some measurement error in the Census and BEA data—we use five-year averages in many instances. There is no loss of generality by doing this, because we are concerned with trends over time, not with year-to-year changes.

We focus on three major metrics: population, jobs, and earnings per job. These series provide the best combination of information regarding local economic performance, because they reflect both local productivity and local

We also will include several other metrics that are often used in policy discussions: income per person, employment-to-population ratio, net domestic migration, and establishment growth. We consider these metrics secondary because they come with many interpretational caveats. Income per person, for example, is collected from the BEA and is a popular measure. But it can be tricky to interpret at the local level since increasing amounts of capital income are often a sign of non-local (i.e., national) performance. The employment-to-population ratio, also collected by the BEA, provides a useful gauge of labor market participation. Even so, the urban research literature has yet to develop a unique local interpretation beyond demographics and preference differences. Net domestic migration, collected from the Census Bureau’s American Community Survey, allows one to identify individual characteristics of population changes but accurate data do not start until 2005. Establishment growth, collected from the Business Dynamics Statistics, can be used to measure local dynamism and the available series reaches back into the 1980s.

Measurement

We will use several statistical measures throughout this study. They include an index, a relative index, and a growth quotient. It is useful to briefly define each.

Index

An *index* is defined as a variable’s level in some year expressed as a percentage of its value in some

¹¹ The source of the raw data used is the Bureau of Economic Analysis website <https://www.bea.gov/data/by-place-county-metro-local>. We make our various calculations using this raw data.

predetermined year, which is referred to as its “base year”. For example, we can express your current weight as a percentage of some previous year’s value. If you currently weigh 180 pounds in 2019 and we chose your weight in 1990, say 160 pounds, as the base year, then the 2018 index value for your weight is $100 \times 180 \div 160 = 112.5$ percent. Notice that index values are always 100 percent in the base year: Your relative weight in 1990 was 160 compared to 160, or one-to-one. The value for 2018 tells us that you now weigh 112.5 percent of what you weighed in 1990, or that your weight has increased 12.5 percent since then.¹² Because index variables always start at 100 percent in the base year, they allow one to easily compare differences—increases as well as decreases—over time.

Relative Index

A *relative index* is an index variable for a subset group expressed as a percentage of some comparison group.¹³ Relative indexes allow one to know the growth of a series relative to the comparison group. For example, suppose I want to know how some variable for Missouri has changed over time relative to the same variable measured at the national level. If both variables are expressed as an index, then the relative index allows me to compare their behaviors over time in one statistic.

Quotients

A *share quotient* is a comparison of a location’s share¹⁴ to a comparison group’s share.¹⁵ It allows one to compare local concentrations of activity (e.g., local manufacturing employment share) to a comparison group. Values greater than one signal larger concentration relative to the comparison group.

A *growth quotient* is a way to measure a location’s share of the total change in a variable relative to that location’s share of the variable’s initial level.¹⁶ We use growth quotients to answer a question like the following:

How much of Missouri’s overall growth in, say, jobs, is attributable to a specific county or MSA? We can answer that question by comparing the MSA’s growth in jobs over time to the state’s, and then dividing that by the MSAs share of jobs. Because the growth quotient is comparative in nature, larger values indicate a larger *relative* contribution of a specific area to the overall growth. The higher the growth quotient, the more important (relatively) that county or MSA has been to overall state growth in, say, jobs, than counties or MSAs with low or even negative growth quotients.

¹² The index variable formally is defined as $I_{i,t} = 100 \times X_{i,t} / X_{i,t=b}$, where I is the index value, the variable of interest is defined as $X_{i,t}$, t is the period, and $t = b$ is the base-period. In our example, $X_{i,t}$ is your weight in 2018; $X_{i,t=b}$ is your weight in the base year, and $I_{i,t}$ is the calculated value of the index in 2018 relative to 1990.

¹³ A relative index ($R_{i,t,c}$) is defined as an index variable for a subset group as a percent of a comparison group (c), formally defined as: $R_{i,t,c} = (X_{i,t} / X_{i,t=b}) / (X_{i=c,t} / X_{i=c,t=b})$, where R is the relative index value, the variable of interest is defined as $X_{i,t}$, t is the period, $t = b$ is the base-period, and $i = c$ is comparison group. Following the weight example, where your 2018 weight index was 112.5, if your family’s mean 2018 weight index was 125, then your relative weight index is $R = 112.5 / 125 = 0.9$. In this case your weight gain was only 90 percent as much as the mean of your family members.

¹⁴ A share variable is the percentage of a subset compared to the whole, formally defined as: $S_{i,t} = X_{i,t} / \sum X_{i,t}$, where S is the share value, i is the location in question, and t is the time period. Following the weight example for 2019, where your weight is 180, assume your family members’ weights are 220, 155, and 120. Your share of your family’s weight is $S = 180 / (180 + 220 + 155 + 120) = 0.267$. In this case you make up 26.7 percent of your family’s biomass.

¹⁵ A share quotient is formally defined as: $Q^s = S_{i,t} / S_{i=c,t}$, where Q^s is the share quotient value, S is the share value, i is the location in question, t is the time period, and $i=c$ is comparison group. Following the weight example for 2018, where your share of your family’s weight is 26.7 percent, a typical person’s family weight share may be 22. In this case, your share quotient is $Q^s = 26.7 / 22 = 1.21$; thus, your share is about 20 percent (not percentage points) greater than a typical person’s share.

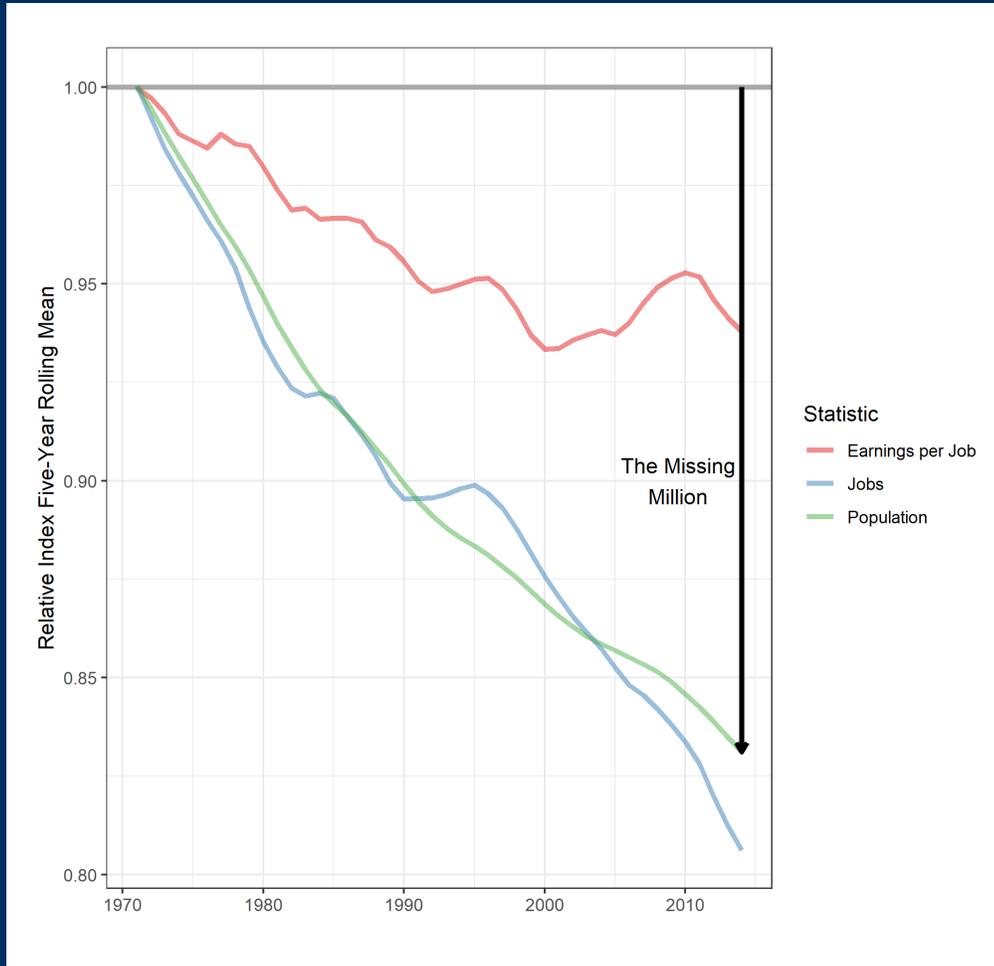
¹⁶ A growth quotient is formally defined as: $Q^g = (\Delta X_i / \Delta \sum X_{i=c}) / (X_{i=c} / \sum X_{i=c})$, where Q^g is the share quotient value, ΔX_i is the total change for some sub-population in location i , $\Delta \sum X_{i=c}$ is the total change for the whole population in location i , $\Delta X_{i=c}$ is the total change for the same type of sub-population in the comparison location $i=c$, and $\Delta \sum X_{i=c}$ is the total change for the whole population in location $i = c$. Following the weight example for 2018, assume your weight gain accounted for 15 percent of your family’s weight gain and the typical person’s weight gain accounted for only 5 percent. In this case, your growth quotient is $Q^g = 15 / 5 = 3$. Thus, your weight gain share is three times greater than the typical person’s—in other words, lay off the carbs!

¹⁷ Missouri’s initial five-year mean population (1969–1973) is 4,715,061. When multiplied by the remaining continental United States’ cumulative growth ratio of 1.5464446, it is 7,291,581.

Figure 2

Missouri's Growth Relative to That of the Rest of the Nation, 1969 to 2016

The fact that each colored line is declining indicates that Missouri's growth in terms of earnings per job, number of jobs, and population has fallen short of the national average. This means that Missouri's economy has been comparatively slower since 1969: It is by no means a recent phenomenon



Note: National five-year rolling mean equals 1.00, as represented by the gray line.

Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-states-territories>) and authors' calculations.

level. Doing so allows us to see the long-term developments in the data that were not available to previous studies that relied largely on GDP data available only since the late 1990s. It also allows us to create a foundation for our more disaggregated analysis. If we find that the state is lagging other states or the national average in some area, say jobs growth, and later find that this or that MSA is not keeping up with the state, this is evidence that that MSA is not contributing to state job growth and in fact may be impeding overall state growth.

As stated earlier, if Missouri's population growth had kept pace with that of the rest of the continental United States, then Missouri's population would be 7,291,581, which is 1,231,929 more people than the actual current population.¹⁷ Missouri also fell behind in earnings per job, where if the State had kept pace with the rest of the nation, annual earnings per job would be \$53,160 or \$3,387 more per job than is currently the case.¹⁸

A BIG-PICTURE LOOK AT THE STATE OF MISSOURI

To set the stage for our analysis of the MSA and county trends, it is useful to examine the results at the state

The lagging performance is best illustrated in Figure 2. Plotted there are comparisons of population, jobs, and earnings per job in Missouri relative to the remainder of the continental United States (including Washington,

¹⁸ Missouri's initial five-year mean annual earnings per job (1969–1973) is \$7,680. When multiplied by the remaining continental United States' cumulative growth ratio 6.9219278, it is \$53,160.

D.C.). The fact that each line is declining indicates that Missouri's growth rates in these areas are low relative to the remainder of the nation. In all three cases, even though Missouri has expanded over this period, it has done so at a pace that is slower than the national rate. It helps to point out that Missouri's growth has been generally slower since 1969: It is by no means a recent phenomenon.

The relative indexes for population and jobs are in the low 0.80s by 2016. This means that Missouri's cumulative growth since 1970 has amounted to only a little better than 80 percent of the rest of the nation. Missouri's job growth did see a small rally in the early to mid-1980s and a relatively large rally in the early to mid-1990s, but neither was sustained: After the mid-1990s Missouri job growth slows considerably relative to the national average. In fact, the steepening of the jobs line indicates that from the mid-1990s to the present, job growth in Missouri has lagged the nation even more than in the two decades after 1969.

In contrast to jobs, the relative index trend for population has been steadier, though still with a consistently lower growth. One aspect of Figure 2 worth pointing out is that there does appear to be a slight change in the relative growth rates by about 1990. That is, after 1990 Missouri's population growth is closer to keeping up the remainder of the U.S. compared to the 1969 to 1990 period. This is indicated by a flattening of the population line in Figure 2.

Finally, the earnings per jobs relative index in Figure 2 also follows the same downward trend.¹⁹ In this case, however,

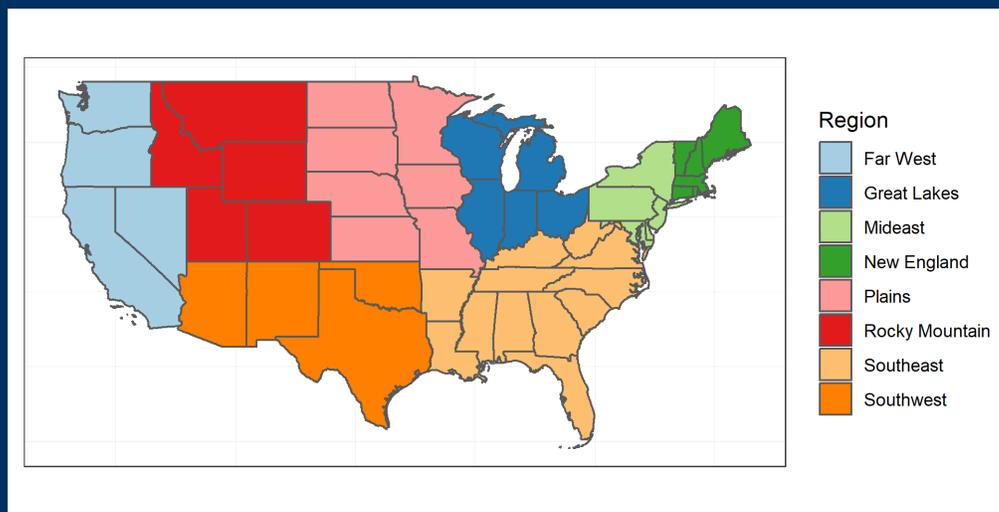
¹⁹ The focus on labor income stems from the fact that labor markets more closely reflect differences in local productivity. According to the BEA's GDP and Personal Income Tables, income from dividends, interest, and rent grew at a rate of 4.2% nationally from 1998 to 2017; the rate for MO was only 3%. The only BEA personal income category in which Missouri outpaced the United States was in farming.

²⁰ Investigation into the causes of the different growth rates is beyond the scope of this work.

Figure 3

Bureau of Economic Analysis Regions

The BEA-definition puts Missouri in the Plains Region, along with Iowa, Kansas, Minnesota, Nebraska, and North and South Dakota.



Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-states-territories>) and Census Bureau Tiger Files.

Missouri has generally kept pace with the rest of the nation since the year 2000. This is indicated by the flattening of the line since 2000. In fact, Missouri seemingly performed well according to this metric during the Great Recession. The concern is that earnings per job has taken a downward turn in the final few years of data.

Growth in earnings per job can be a good sign if it means more high-productivity jobs are being created. But it can be a bad sign if it means low-productivity jobs are disappearing. Strong or stable growth in earnings per job combined with weak growth in population suggests that higher-productivity jobs are surviving, and that people require the higher earnings to move to Missouri (Rappaport, 2008).²⁰

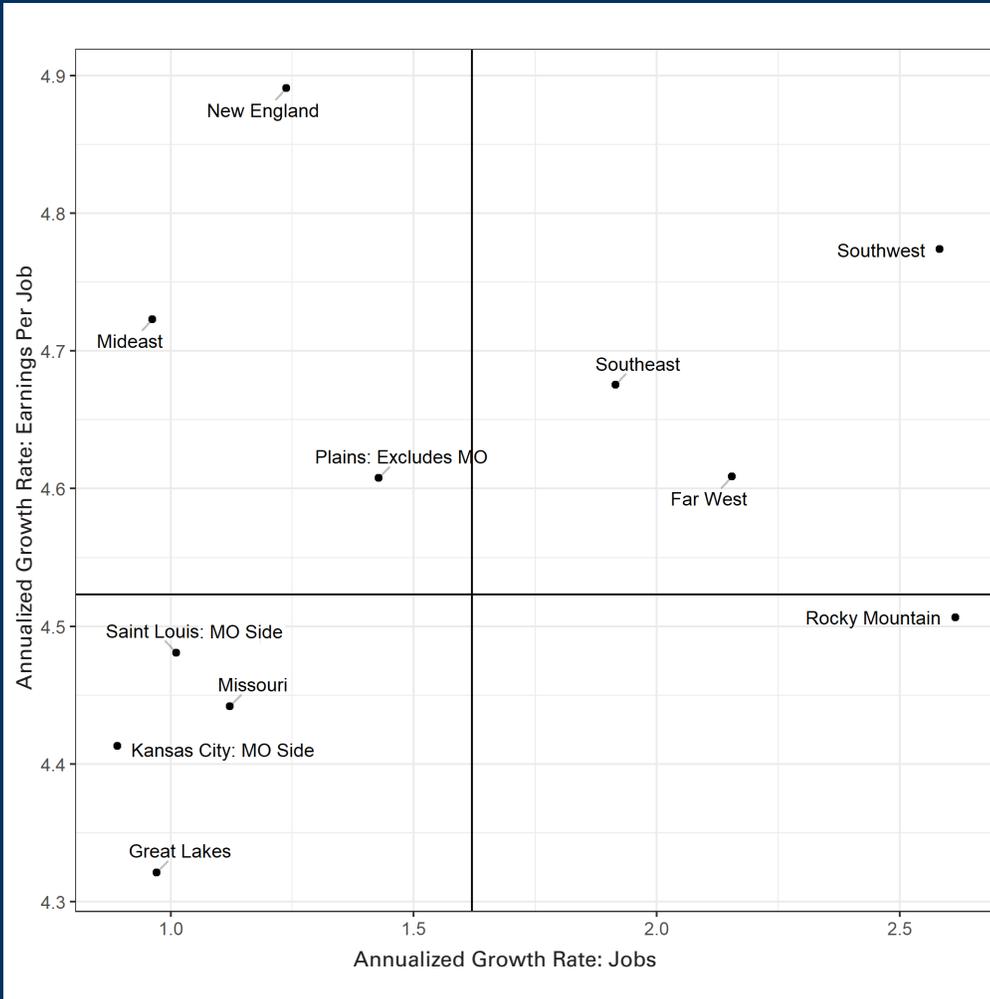
Regional Comparison

Comparisons of Missouri to the national average may be influenced by the unusual behavior of one or several other states. Although a state-by-state comparison is beyond

Figure 4

Jobs and Earnings-per-job Growth Rates, 1969 to 2016

Missouri's ability to create jobs is worse than the national average and five of the other regions. Earnings-per-job growth in the Missouri counties of the St. Louis MSA is less than the national average and all but one of the regions. Jobs growth also is much slower than the national average and all but two other regions. The Missouri portion of the Kansas City MSA has created fewer jobs than the national average and all other regions. Only the Great Lakes region has a lower growth in earnings-per-job than the Kansas City MSA.



Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-states-territories>) and authors' calculations.

We do this by using the BEA's regional definitions, shown in Figure 3. The BEA-definition puts Missouri in the Plains Region, along with Iowa, Kansas, Minnesota, Nebraska, and North and South Dakota.

How does Missouri's economic record compare to the states in its own region and to other regions? Figure 4 answers this question by comparing growth in jobs and earnings per job growth rates for Missouri and the BEA regions. To make such a comparison easy, we impose vertical and horizontal lines in the figure (and in later ones) to represent the national averages of the two series. Being above (to the right) of the line is preferable to being below (to the left). Put into this context, Missouri has not fared well.

The state's ability to create jobs is lower than the national average, and it has a worse record than five of the regions. When comparing growth in earnings per job, Missouri has done better than only the states in the Great Lakes Region. Closer to

the scope of this study, we can get a reasonably good approximation of how Missouri has fared relative to other states by comparing its growth in key metrics to regions.

home, Missouri's record for both metrics also is worse than the average of the other states in the Plains Region.²¹

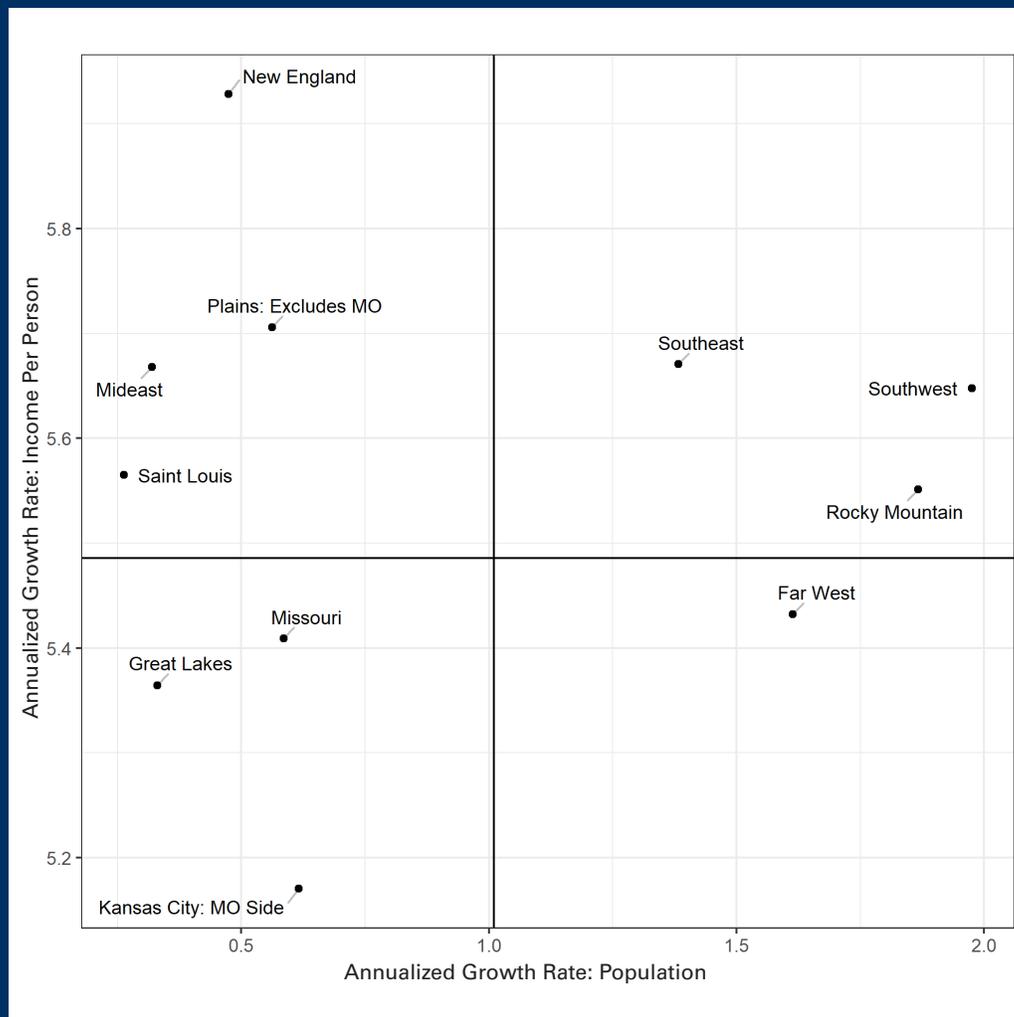
²¹ Muro et al (2018, p. 38–39) argues that high and rising wages are indicators of strong labor demand. Among the 20 states classified as the “heartland” of the U.S., Missouri ranks tied for 18th in the category of purchasing power-adjusted annual wage over the 2010–2016 period.

As a preview to results presented later in the study, we included in Figure 4 the performance of the Missouri side of the state's two largest MSAs, St. Louis and Kansas City. The location of the Missouri side of the St. Louis MSA indicates that earnings per job growth is less than the national averages and the averages of all of the regions except the Great Lakes, though it is roughly similar to that of the Rocky Mountain Region. Jobs growth in the Missouri side of the St. Louis MSA between 1969 and 2016 is much slower than the nation and that of all regions except the Mideast and the Great Lakes regions. To put this in perspective, jobs in the St. Louis MSA increased at less than half the rate experienced in the Southwest or Rocky Mountain Region.

Comparing the Missouri side of the Kansas City MSA to the regions tells an even grimmer story. Its ability to create jobs since 1969 is worse than the national average and worse than all of the other regions. Moreover, growth in earnings-per-job in the Missouri counties of the Kansas City MSA is below the national average and all but the Great Lakes region.

Figure 5 Population and Income-per-person Growth Rates, 1969 to 2016

Missouri's population increased at a slower rate than that of the nation, but at roughly the same rate as three other regions. Income-per-person growth in Missouri was slower than in most other regions and the nation as a whole. The Missouri side of the Kansas City MSA has the slowest growth in income per person. The Missouri portion of the St. Louis MSA has the slowest growth rate in population, but an average income-per-person growth rate.



Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-states-territories>) and authors' calculations.

Figure 5 shows average income per person growth coupled with the population growth for the state, its two largest MSAs, and the BEA regions. The vertical and horizontal

lines represent the national averages for the growth in income per person and in population, respectively. We see in Figure 5 that between 1969 and 2016 Missouri's population increased at about the same rate as the New England region and a bit faster than the Mideast and Great Lakes regions. Missouri and these other areas saw slower population growth than the nation as a whole. When looking at income growth, however, Missouri's record is slightly better than the Great Lakes region and about the same as the Far West region. More importantly, what Figure 5 shows is that income per person growth in Missouri is slower than in most other regions and in the nation as a whole.

We again include the Kansas City and St. Louis MSAs (Missouri counties only) in Figure 5. Two observations: One is that while Kansas City's population growth is not out of line with that of several other regions, it has the slowest growth in income per person. Compared to the national averages, Kansas City is a laggard. The other is that the St. Louis MSA has the slowest growth rate in population when compared to the nation or any other region, but it has an average rate of income per person growth rate.

The evidence suggests that Missouri's relatively poor economic performance is not confined to just the last two decades. Comparing the state's record in jobs, income per person, and earnings per job, we have shown that overall Missouri has lagged the national average for most of the past 45 years. Although there have been periods in which the state has performed better than the average, they have been short-lived. This conclusion also holds if we look at smaller geographic areas. For the most part, Missouri has not experienced the same pace of growth in income or jobs as most other regions in the country. As a preview to the remainder of this study, both the Kansas City and St. Louis MSAs have experienced slow jobs growth and earnings per job relative to the nation and to other regions

in the country. While the Kansas City MSA has one of the lowest growth rates in income per person amongst our comparison group, the St. Louis MSA has achieved a slightly above-average record in this area.

Next we will take a deeper dive into the MSA and county data, examining in greater detail the results for the state's two largest MSAs as well as other MSAs in the state.

Missouri's MSAs: The Engines of Growth?

Cities are typically described as engines of growth, and for good reason (Glaeser, 1998). This idea motivates several interesting questions. If Missouri is, as the previous section indicated, a state that has not fared well economically compared to the nation and other regions, is this because its MSAs have performed poorly? If urban areas are engines of growth, can they also be constraints on a state's economic success? On an even more micro level, can we identify counties that have or have not experienced economic success over the past several decades? These questions are the focus of this and the next section. The short answer? Missouri's MSAs have lagged behind in several areas. This is especially important for Missouri's two major urban areas, Kansas City and St. Louis. Neither has kept pace with their population-peer cities.

Metro Area Comparisons

Before we delve into the relative success or failure of Missouri's MSAs, it is informative to first look at the two major metropolitan areas in Missouri, St. Louis and Kansas City, compared to other MSAs based on population size. To determine where these two MSAs fit in the distribution among all others, we examined the population distribution of all MSAs in the country based on their average population from 1969 through 1973. The population was adjusted by the natural log, and the mean plus three standard deviations were calculated.

Populations between the second and third standard deviations were classified as "Mid-Major"; populations greater than three standard deviations were classified as "Major;" and all other MSAs were classified as "Smaller."

Table 4: Population of Mid-Major MSAs by Location and Year Group

| State | 1969–1973 | 2012–2016 | Change | Percent Change |
|----------------------|------------|------------|------------|----------------|
| Missouri mid-majors | 2,772,755 | 3,323,384 | 550,629 | 19.9 |
| All other mid-majors | 43,234,304 | 81,048,816 | 37,814,512 | 87.5 |

Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-county-metro-local>) and authors' calculations.

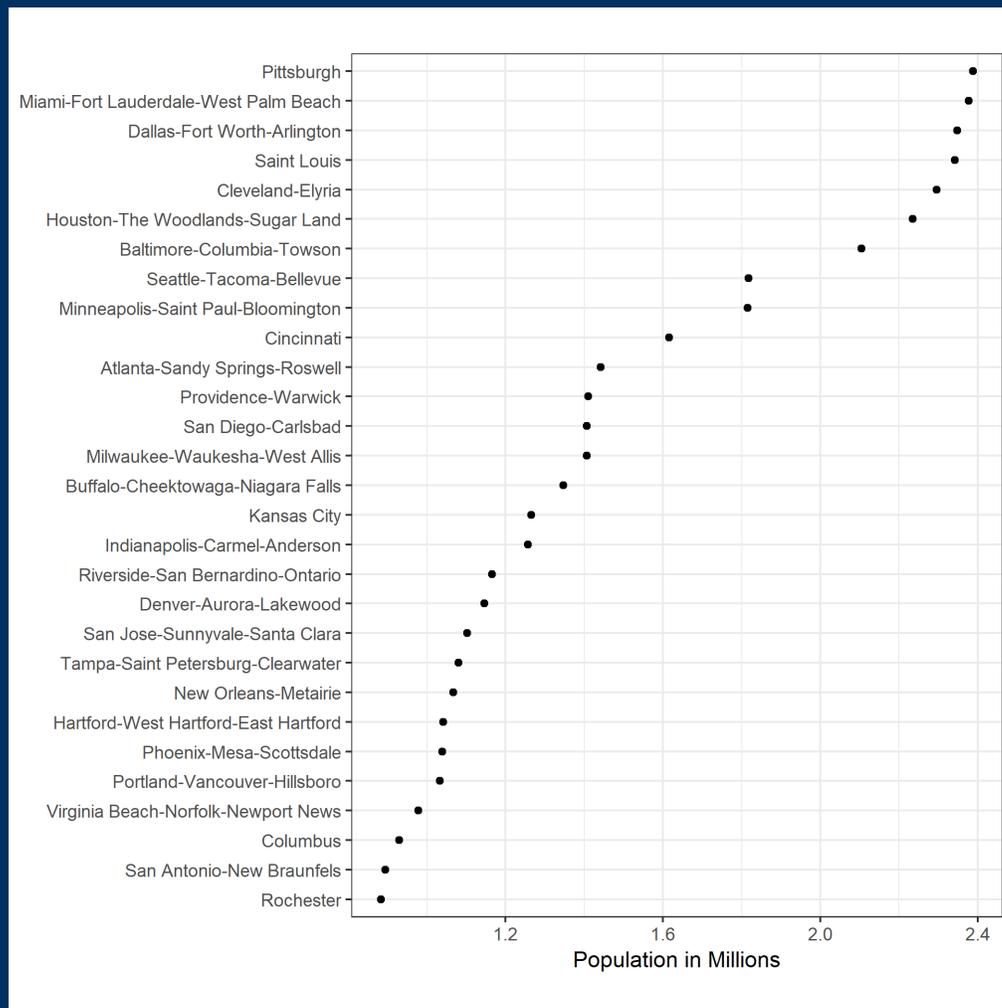
St. Louis and Kansas City were classified as Mid-Major.

Figure 6 shows all Mid-Major MSAs and their population mean from 1969 through 1973. At that time Kansas City and St. Louis were members of a class of urban areas, the likes of which included the Phoenix-Mesa-Scottsdale and Columbus (OH) MSAs. Unlike the St. Louis and Kansas City MSAs, many of these other MSAs became relatively high-growth areas in the ensuing 40 years.

While Kansas City and St. Louis are in the Mid-Major class of 1971, they greatly underperformed in population growth. Table 4 lists the combined population of the Missouri side of the Kansas City and St. Louis MSAs and the combined population of all other Mid-Majors. While Missouri's Mid-Majors made up about 6 percent of the 1971 class's population initially, the share has fallen to 4 percent since.

Figure 6
Mid-Sized CBSA Population Distribution (1969-1973 average)

Unlike many other Mid-Majors that became relatively high-growth areas in the ensuing 40 years, Kansas City and St. Louis greatly underperformed in population growth.



Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-county-metro-local>) and authors' calculations.

MSA Comparison

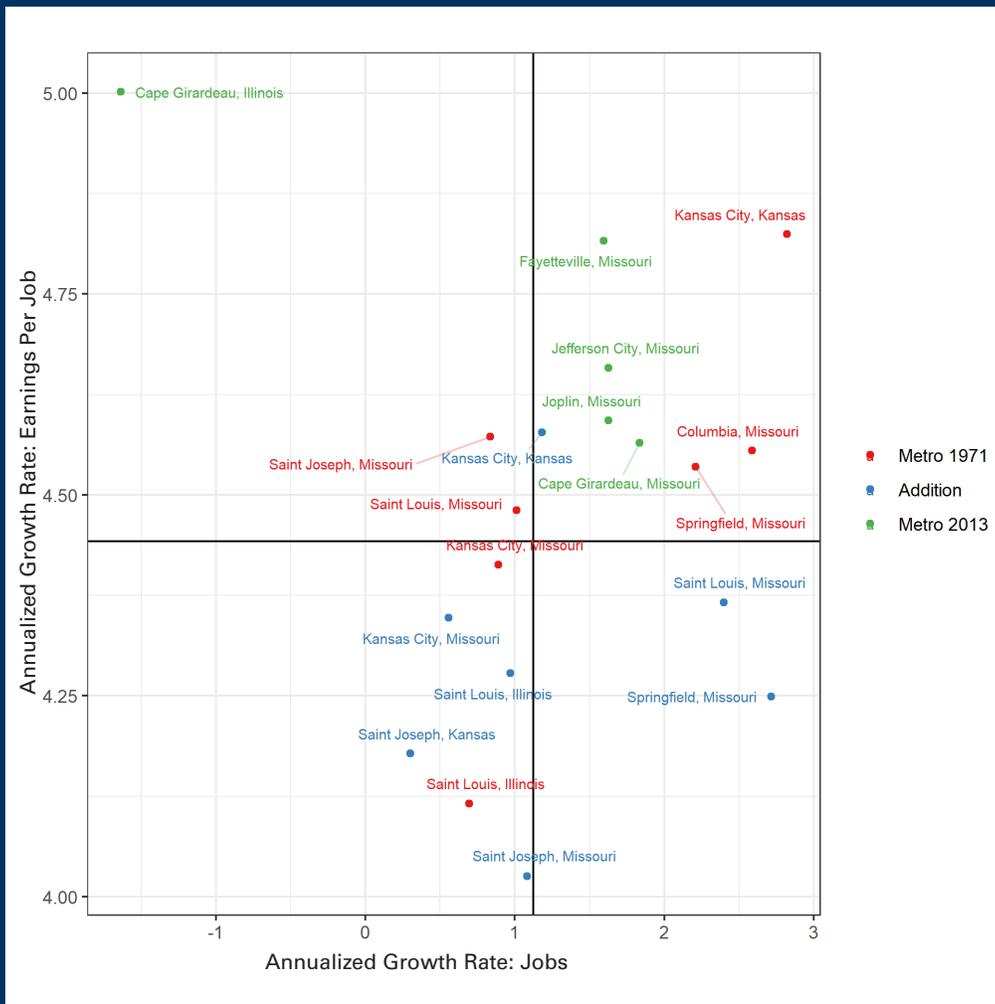
In Figures 7 and 8, we once again employ scatter plots to compare the economic record of the Missouri MSAs relative to the nation and to the BEA regions. These plots are useful in two important ways. First, for the metric under consideration, say, the growth in jobs and earnings per job, we plot the growth rates for all of the state's MSAs, both the original counties and the added counties.

This means that the Kansas City MSA is represented by two points in the scatter plot: one is the MSA as defined in 1971, and the other represents the counties added to make up the 2013 MSA. While it may be neater simply to use the 2013 MSA, we are interested in the distribution of growth across the MSA and how each contributed (or did not contribute) to overall state growth. Once again, we omit the counties that lie outside of Missouri.

Figure 7

Jobs and Earnings-per-job Growth Rates, 1969 to 2016

Only the Metro 1971 areas of the Springfield and Columbia MSAs and the more recently defined MSAs of Cape Girardeau, Joplin, and Fayetteville (AR-MO) have experienced growth rates in earnings-per-job or jobs that exceed the state average. Both the Metro 1971 and the added counties of the Kansas City MSA lagged the state average. The Metro 1971 portion of the St. Louis MSA experienced growth in jobs and earnings-per-job slightly above the state average, but the performance of the added counties was better than average in terms of jobs growth, and slightly below average for earnings-per-job.



Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-county-metro-local>) and authors' calculations.

Since we know already that the state overall has not performed well in several areas, any MSA that is below the state average is contributing to the state's poor overall economic record for that measure.

Which MSAs have contributed the most to both jobs and earnings per person since 1969? Look at Figure 7. The only MSAs that have experienced faster growth rates relative to the state average in these two areas are the Metro 1971 areas of the Springfield and Columbia MSAs, and the more recently defined MSAs of Cape Girardeau, Joplin, and Fayetteville. These areas, at least by these two measures, can be thought of as “growth centers” in the state. Which MSAs are lagging behind the state average? The Kansas City MSA—both the Metro 1971 and the counties added since then—are located in the southwest quadrant of Figure 7. This means that the Kansas City MSA has experienced a slower growth in jobs and in earnings per job relative to the state since 1969. In this way, it could be considered a drag on overall state growth. The counties added to the St. Joseph MSA also lie in this quadrant. Even though the growth rate in jobs in this part of the St. Joseph MSA is essentially equal to the state average, its growth in earnings per job is far below the state average. In contrast, the

Second, in each figure we insert a vertical line and a horizontal line to represent the *state's* average growth rate in the two relevant measures. These reference lines allow us to see which MSAs—and which parts of the current MSAs—are leading or lagging the state in which areas.

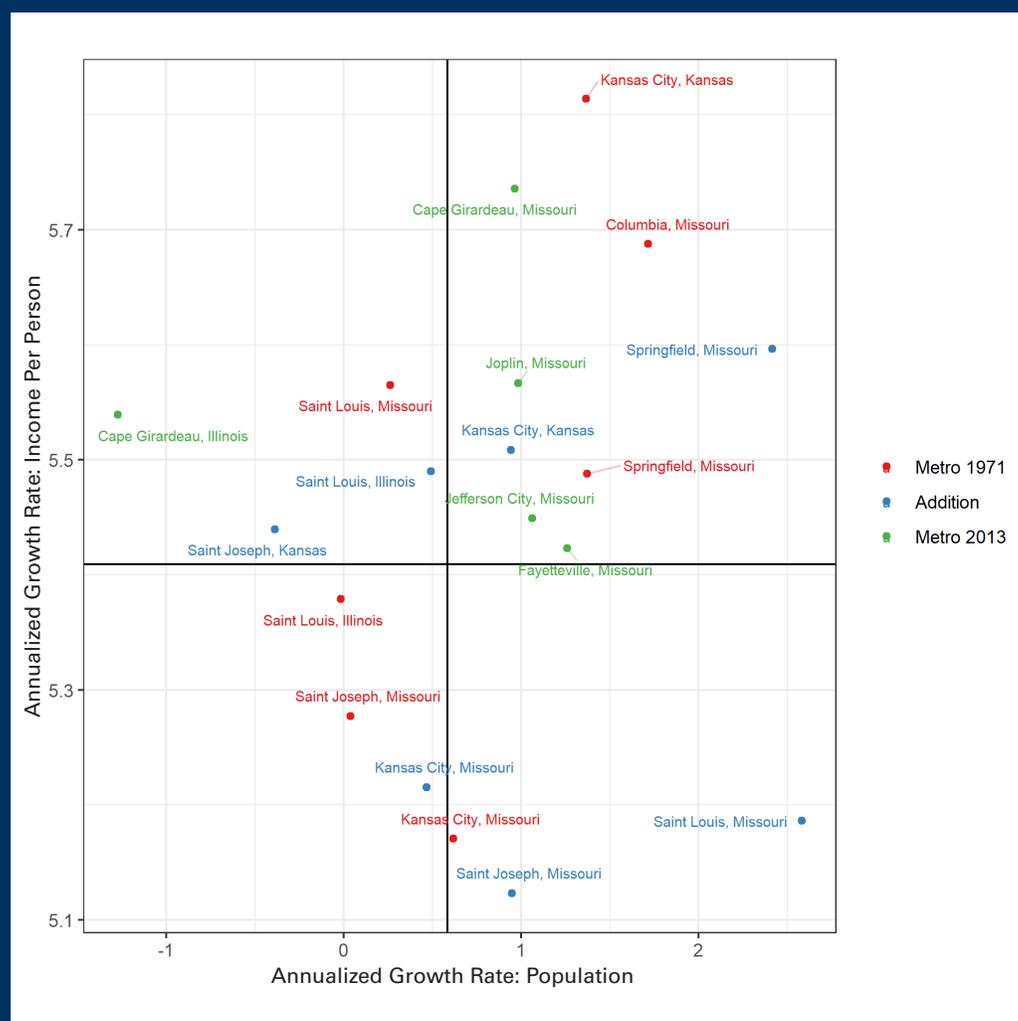
Even though the growth rate in jobs in this part of the St. Joseph MSA is essentially equal to the state average, its growth in earnings per job is far below the state average. In contrast, the

Metro 1971 St. Joseph counties experienced a growth in earnings per job that exceeded the state average, though its growth in jobs was somewhat below the average.

Where does St. Louis fit in? The Metro 1971 portion of the St. Louis MSA experienced growth in jobs that was slightly below the state average, and growth earnings per job that was slightly above the state average. The performance of the counties added was better than the state average in terms of jobs growth, and slightly below average for earnings per job. This may surprise some, but the explanation lies in the fact that even though the City of St. Louis has experienced a well-publicized reduction in overall economic activity during this time, the St. Louis MSA, and especially those counties added after 1971, have been expanding more rapidly. Indeed, in the following section where we examine the county data more fully, the reason for this this will become clear. What story is told by looking at population and income growth since 1969? Figure 8 shows us. Similar to the jobs and earnings per job evidence, we see that the Columbia, Joplin, Cape Girardeau, and Springfield—both the Metro 1971 and the added counties—experienced growth in population and income per person that were faster than the state-average.

Figure 8 Population and Income-per-person Growth Rates, 1969 to 2016

Columbia, Joplin, Cape Girardeau, and Springfield—both the Metro 1971 and the added counties—experienced growth in population and income-per-person that were faster than the state average. The Kansas City MSA—both the Metro 1971 and added counties—had a growth in income-per-person that was below the state average, though population growth was near the average. The evidence for the St. Louis MSA is mixed: Added counties experienced larger-than-average growth in population, but income growth was below the state average.



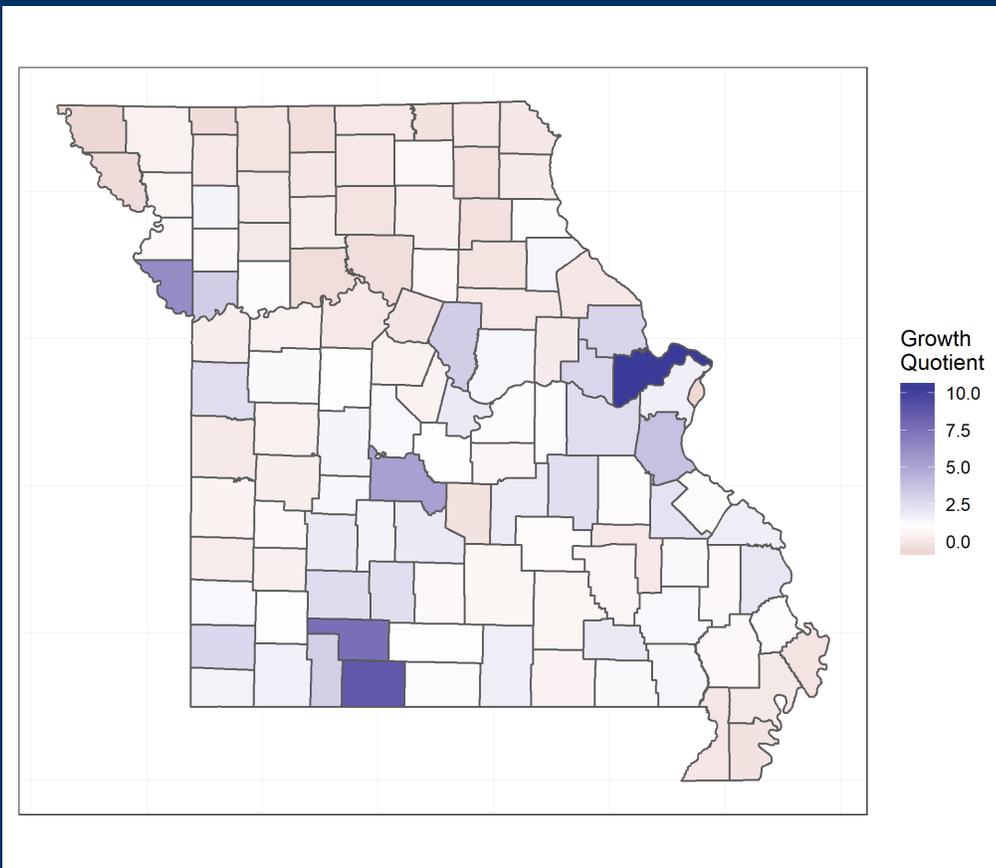
Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-county-metro-local>) and authors' calculations.

This again suggests that these areas have buoyed the overall state growth rate. Which MSAs have not fared well on both metrics? Again, we find that the Kansas City MSA—both the Metro 1971 and added counties—had a growth in income per person that was below the state average,

Figure 9

Missouri County Jobs Growth Quotients, 1969 to 2016

This heat map, based on jobs growth, shows that only a handful of counties, shown in darker shades of blue, fall into the category of overperformers. St. Charles County (the darkest blue county) has contributed more to state jobs growth than any other county. The jobs growth quotients for counties in the northern third of Missouri and the lower southeast portion of the state indicate they have slowed Missouri's overall job growth rate.



Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-county-metro-local>) and authors' calculations.

than average growth in population since 1969. This suggests that population was expanding outside of the city into the surrounding suburban areas. For the Metro 1971 counties, however, population growth was below the state average. Interestingly, when comparing the growth in income per person, the Metro 1971 counties enjoyed a relatively faster rate of income growth than the state and the additional counties. In fact, the latter counties saw income per person increasing at a rate that was noticeably lower than the state average.

Let us summarize our findings thus far. The first observation is that the MSAs that have raised the state's overall growth rate in these metrics are Cape Girardeau, Columbia, Joplin, Fayetteville, and Springfield. They generally had growth rates in every measure that were above the state average. In that sense, they are not likely suspects in explaining the state's poor overall

though population growth was near the average for both. The Metro 1971 counties of the St. Joseph MSA also did not fare too well: they had growth rates in population and income that were below the state average.

The St. Louis MSA again has a mixed record. The counties added to the 1971 definition experienced a larger-

record relative to the nation and the other regions. On the other side of the ledger, the evidence suggests that the Kansas City and St. Joseph MSAs have not done as well. Both MSAs—the Metro 1971 counties and the added counties—have had slower than average job growth than the state since 1969. The Kansas City MSA has lagged

the state in the growth of earnings per job and income per person as well. The St. Joseph MSA is a mixed bag in terms of population and income: While the entire MSA has experienced slower than average population growth, the Metro 1971 counties have seen income per person increase at a slower pace than the state while the added counties have had incomes grow at a relatively faster rate.

And St. Louis? Jobs have increased at a rate slightly below the state average, but earnings per job have increased slightly faster than the state average in the Metro 1971 counties. While population growth rates are lower than the state average, there has been a faster growth rate in income per person. When we look at the additional counties, while jobs growth is greater than for state overall, growth in earnings per job is lower, as is growth in income per person. But population growth is much faster than the overall state average. These results are much more mixed than those found for Kansas City, and suggest that the state's largest MSA may not be the source of the state's relatively poor ranking when we compare its record to those of the nation and the regions.

Our investigation thus far indicates that past studies finding Missouri to be a slow growth state are not unique to recent data: Using data since 1969 we find that the state has, across several economic measures, lagged the nation and most other regions in the country. In trying to explain this by looking at the behavior of the state's MSAs, we find that the Missouri side of the Kansas City MSA has an economic track record that is relatively worse than the state and has been, therefore, a drag on overall state performance. In contrast, several others, most notably Springfield and the Missouri counties in the Fayetteville (Ark) MSA, have been areas in which economic activity has exceeded performance of the state overall. In the next section we drill a little deeper by examining the record of individual counties across the state to see if there is any evidence of where the growth centers are.²²

ALL THE ACTION IS IN A FEW COUNTIES

State-level and MSA-level analyses provide a convenient aggregation to present economic data, especially since many metrics are only available at the state or MSA level. These aggregations can mask important geographical differences in economic activity, however. It would be

Table 5: Top Ten Missouri Counties by Jobs Growth Quotient

| County | Metro Status | Growth Quotient |
|-------------|--------------|-----------------|
| St. Charles | Metro 1971 | 10.3702 |
| Taney | Micro 2013 | 8.7769 |
| Christian | Addition | 7.6198 |
| Platte | Metro 1971 | 6.1814 |
| Camden | Other | 5.2893 |
| Jefferson | Metro 1971 | 3.7965 |
| Boone | Metro 1971 | 3.2472 |
| Clay | Metro 1971 | 3.2273 |
| Stone | Micro 2013 | 3.1581 |
| Lincoln | Addition | 2.8992 |

Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-county-metro-local>) and authors' calculations.

unwieldy to try and examine each county's economic record over the past 45 years. Instead, we compare the relative behavior across counties by using the growth quotient.

As explained earlier, the growth quotient basically calculates the share of growth in some statewide measure (say, jobs) that is accountable to a specific county. A high quotient indicates that that county is "overperforming" or contributing more to total state growth than their relative size in 1970 indicates they should. A low (or negative) quotient indicates just the opposite. This measure is quite useful because we can see just where growth has occurred in the state, and where it has not.

To make such comparisons we calculated growth quotients for each economic measure for each county, using data from 1969 to the present. To make the presentation as tractable as possible, we have chosen to present the outcome of this exercise using a "heat map" of Missouri for each metric. The growth quotient ranges from negative to over 10. The maps are most useful because they quickly reveal where the "overperforming" counties, those that are contributing relatively more to overall state growth, are located.

²² In their analysis of metropolitan area economic activity, Muro et al (2108) found that all of Missouri's MSAs except St. Joseph had negative productivity (measured by per-job output) growth between 2010 and 2016. (pp. 86–87)

Table 6: Top Ten Missouri Counties by Earnings Growth Quotient

| County | Metro Status | Growth Quotient |
|-------------|--------------|-----------------|
| St. Charles | Metro 1971 | 4.7214 |
| Taney | Micro 2013 | 4.2705 |
| Christian | Addition | 3.2880 |
| Camden | Other | 2.5066 |
| Platte | Metro 1971 | 2.3924 |
| Boone | Metro 1971 | 2.0447 |
| Crawford | Other | 1.9159 |
| Jefferson | Metro 1971 | 1.9135 |
| Lincoln | Addition | 1.9001 |
| Newton | Metro 2013 | 1.7611 |

Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-county-metro-local>) and authors' calculations.

Table 7: Top Ten Missouri Counties by Population Growth Quotient

| County | Metro Status | Growth Quotient |
|-------------|--------------|-----------------|
| Christian | Addition | 13.8785 |
| St. Charles | Metro 1971 | 10.1956 |
| Taney | Micro 2013 | 9.5859 |
| Warren | Addition | 7.5139 |
| Camden | Other | 7.4044 |
| Stone | Micro 2013 | 6.7719 |
| Lincoln | Addition | 6.6809 |
| Platte | Metro 1971 | 6.3384 |
| Cass | Metro 1971 | 4.9686 |
| Webster | Addition | 4.3743 |

Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-county-metro-local>) and authors' calculations.

Table 8: Top Ten Missouri Counties by Income Growth Quotient

| County | Metro Status | Growth Quotient |
|-------------|--------------|-----------------|
| Christian | Addition | 4.4295 |
| St. Charles | Metro 1971 | 3.4836 |
| Taney | Micro 2013 | 2.8232 |
| Camden | Other | 2.7383 |
| Platte | Metro 1971 | 2.4306 |
| Stone | Micro 2013 | 2.2781 |
| Warren | Addition | 2.2716 |
| Lincoln | Addition | 2.1942 |
| Cass | Metro 1971 | 1.9435 |
| Boone | Metro 1971 | 1.8819 |

Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-county-metro-local>) and authors' calculations.

Jobs

Figure 9 is the heat map based on jobs growth. It is immediately obvious that only a handful of counties fall into the category of overperformers. The darkest blue county is St. Charles County. It has the highest growth quotient of any county in the state. This finding helps explain the earlier result indicating that the St. Louis MSA had performed better than some might have thought *a priori*: Although Figure 9 shows that several other counties in the St. Louis MSA have greater than zero growth quotients, St. Charles County clearly exceeds them. Relative to all other counties, St. Charles County has contributed more to state jobs growth. For purposes of comparison, Table 5 lists the counties with the top 10 growth quotients. As suggested by the heat map, most of the action resides in a few counties.

Other counties with relatively high growth quotients for jobs are Christian and Taney (the home of Branson), both part of the Springfield MSA. Camden and Platte counties, (Platte being part of the Kansas City MSA), also have relatively high growth quotient for jobs.

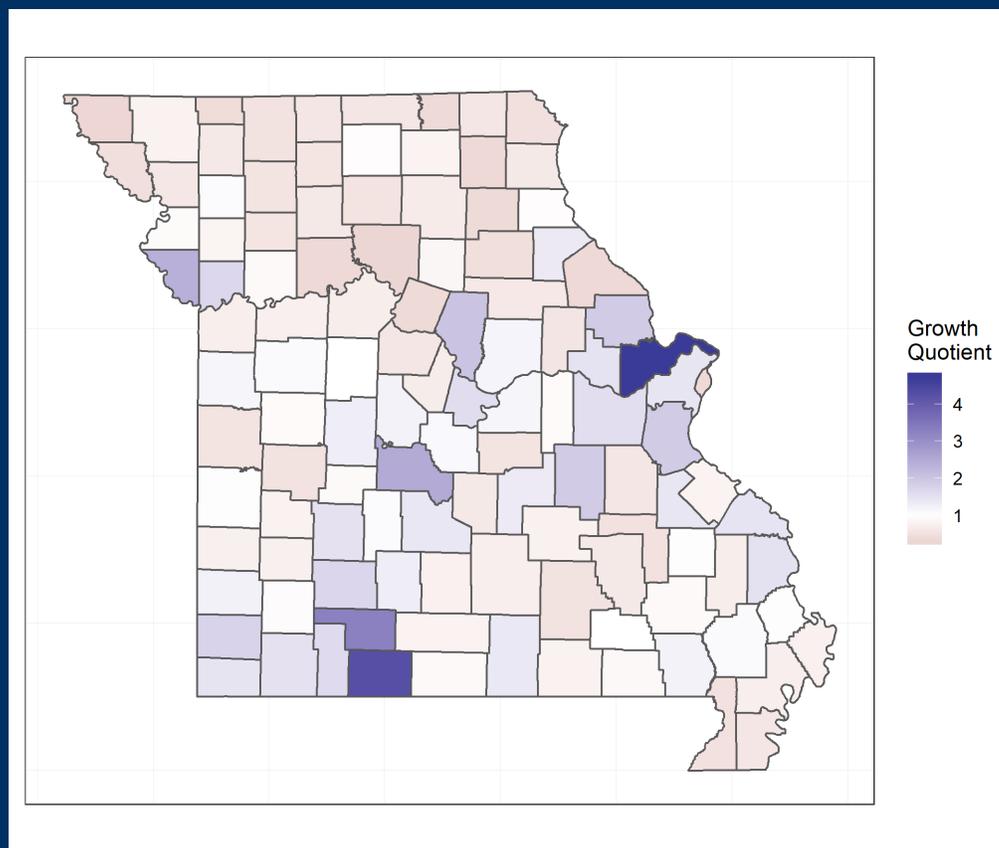
What is most notable from Figure 10 is the fact that most of the northern third of Missouri, effectively those counties north of Interstate 70, and much of the lower right-hand third of the state—especially the “bootheel”—have growth quotients for jobs that are near zero or even negative. This means that, as a group, they have dragged Missouri’s job growth rate down over time.²³

Earnings per Job

Which counties account for growth in earnings per job? We see in Figure 10 that more counties are shaded light blue than in Figure 9, indicating that they have positive, though small, growth quotients for earnings. What stands out, as in Figure 9, and the listing of the top ten counties by earnings growth quotient in Table 6, is that the highest concentration of earnings growth occurred in just a few counties. Once again it is St. Charles, Taney, and Christian counties that have contributed relatively more to state growth in earnings per job. Similar to the results for jobs, Camden and Platte counties have relatively high growth quotients, followed by Boone (home of Columbia) county and several counties surrounding the St. Louis MSA. Once again, we also find that the northern tier of counties and those in the boot heel have been drags on growth in earnings per job at the statewide level.

Figure 10 Missouri County Earnings Growth Quotients, 1969 to 2016

A number of counties (shaded light blue) have positive, though small, earnings growth quotients. The highest concentration of earnings growth once again occurs in just a few counties: St. Charles, Taney, and Christian counties. Northern counties and those in the southeast have been drags on state-level growth in earnings per job.



Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-county-metro-local>) and authors’ calculations.

Population

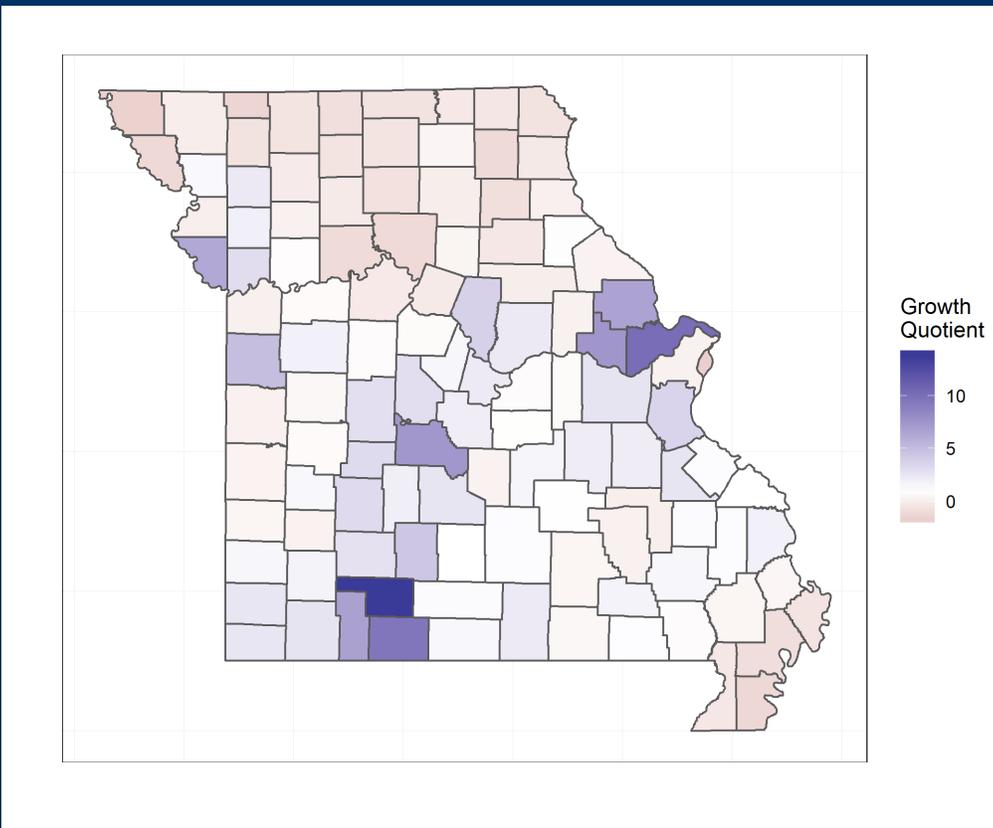
In Figure 11 we compare population growth quotients across Missouri’s counties. Unlike previous heat maps, there are a few more counties with higher growth quotients. Even so, we still find that the concentration of higher population growth counties is in the St. Louis MSA—St. Charles, Warren, and Lincoln—and in the Springfield MSA—Christian, Taney, and Stone. This is supported by

²³ Coincidentally, these counties are those with some of the lowest educational attainment scores in the state. See Hafer and Hafer (2017).

Figure 11

Missouri County Population Growth Quotients, 1969 to 2016

Counties with the highest growth quotients are concentrated population growth counties is in the St. Louis MSA—St. Charles, Warren, and Lincoln counties—and in the Springfield MSA—Christian, Taney, and Stone counties. Counties in the northern third of the state and those in the southeast corner of the state are, as a group, underperformers.



Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-county-metro-local>), Census Bureau Tiger Files, and authors' calculations.

answered in Figure 12 and Table 8, where we get much the same story that we saw with the other measures. That is, a few of the counties that are part of the St. Louis and Springfield MSAs are contributing relatively more to the state-level growth in income per person than their 1970s proportion would suggest. For income per person, Christian county, which has been added to the original Springfield MSA, has the highest growth quotient. Its growth represents spillover from the economic expansion of Springfield. The evidence for income per person, as with the previous measures, shows that those counties north of I-70 and in the boot heel are underperforming. Put another way, these counties have depressed the state's growth rate in income per person.

Summary

The finer detail afforded by using county data means that we can see not only why the different MSAs

the data in Table 7. And as before, the growth quotient for Camden County is relatively high, followed by Cass and Platte, counties that are part of the Kansas City MSA. We continue to find that counties in the northern third of the state and those in the southeast corner of the state are, as a group, underperforming.

Income

Lastly, which counties have contributed more to the growth in state income per person? This question is

grew faster or slower, but also where “problem” areas are. That is, it is a bit misleading to argue that Missouri is a slow growth state and imply that all areas are equally responsible. What we have shown is that, first, much of the growth in the measures used has occurred in only a few counties. And these counties are associated with only two of the state's MSAs; namely, St. Louis and Springfield. The former is due to the rapid expansion, economically and in population, of St. Charles County. The latter

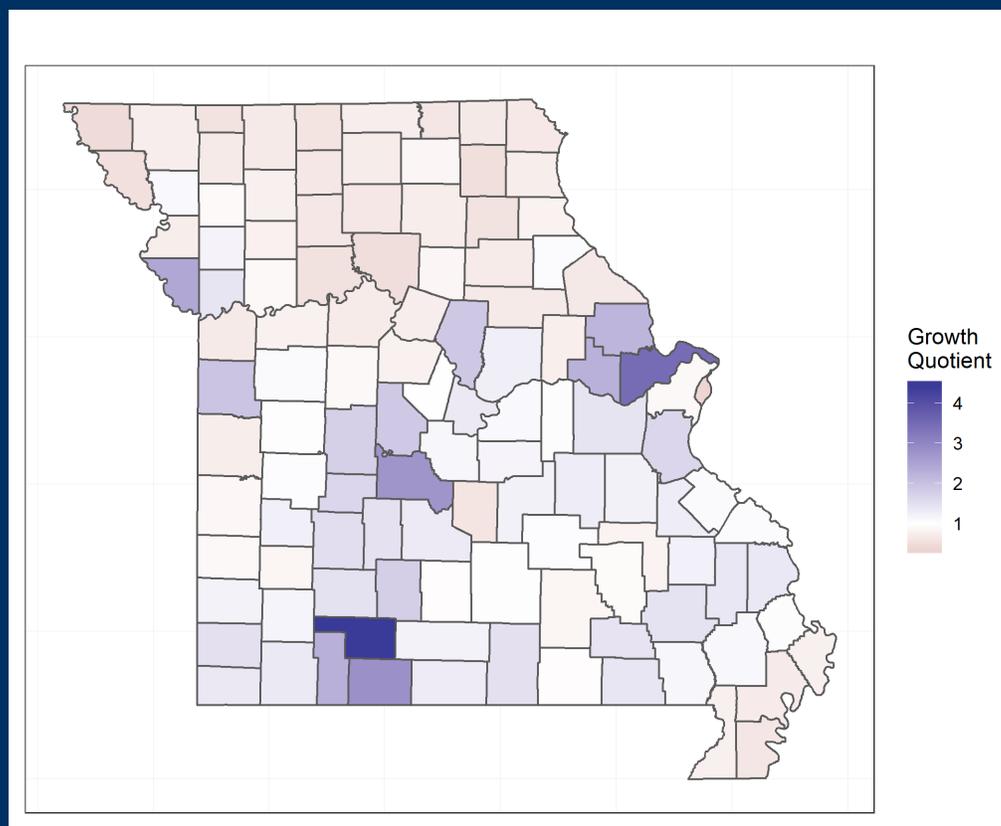
is due primarily to the growing economic and importance of the City of Springfield, and the spillover effects of Branson emerging as a major tourist destination. Second, the evidence indicates that with respect to the four economic measures used here, the counties that have contributed the most to the state's poor overall record most likely are those counties located in the northern third of the state, and in the southeast corner. These observations are not meant to criticize those counties for their poor performance, nor to laud the others for theirs. Rather, they point to objective facts that should provide a foundation for considering possible reasons for this unequal distribution of economic success, and for any policy discussion about allocating resources, especially government spending, across the state. In the following section we consider some possible explanations for our findings. By no means do we mean this brief discussion as a substitute for a more thorough investigation. Instead, we hope to offer possible suggestions for further discussion.

RELATED ISSUES

Are there key indicators that might explain the evidence presented earlier? In this section, we consider some areas that we believe are related directly to our findings. These

Figure 12 Missouri County Income Growth Quotients, 1969 to 2016

The St. Louis and Springfield MSAs are contributing relatively more to state-level growth in income-per-person than are other areas of the state. Christian county (the deepest blue county), which was added to the original Springfield MSA, has the highest growth quotient. Counties in the northern third and the southeast again have, as a group, depressed the state's growth rate in income-per-person.



Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-county-metro-local>), Census Bureau Tiger Files, and authors' calculations.

concern economic dynamism, the migration–education nexus, and the state's industrial mix. We realize that these topics have been explored before, but we think that another look, especially in the light of our evidence, is worthwhile.

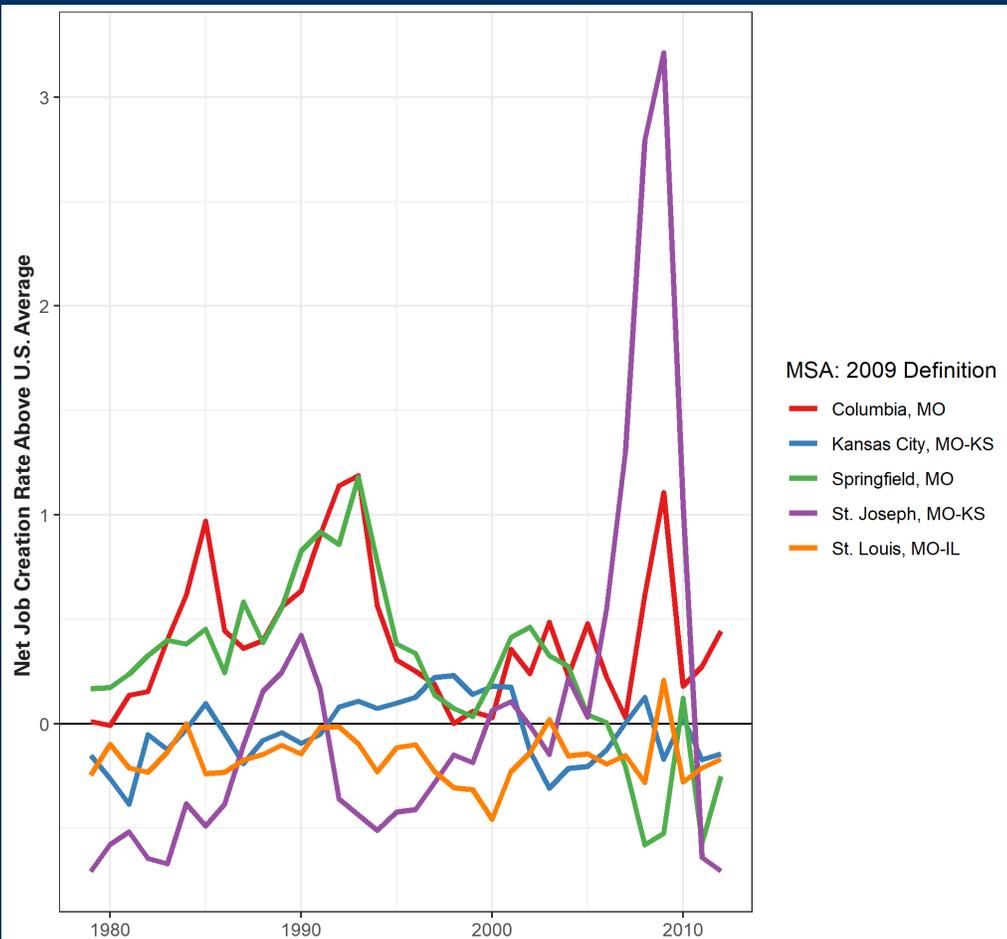
Dynamism

Economic dynamism is a phrase often used to denote an area that is thriving. In this regard, the Economic

Figure 13

Net Job Creation Rates of Missouri MSAs: Five-year Average Relative to U.S. Average, 1978 to 2013.

Of Missouri's original five MSAs, only Columbia has a net job creation rate that has been consistently above the national average. Springfield's net job growth also was strong until the early 1990s, from which time it has trended downward. The Kansas City and St. Louis MSAs have generally underperformed. The upshot is that most of Missouri's MSAs are not keeping pace with the national averages in terms of job growth.



Source: *Business Dynamics Statistics* (www.census.gov/ces/dataproducts/bds) and authors' calculations.

We already have seen that in terms of job growth and earnings per job, the state, the MSAs, and the counties do not have an enviable record of accomplishment. To provide another perspective on this, Figure 13 shows the net job creation rate minus the national net job creation rate since 1978.²⁴ This is a slightly different measure than the jobs growth measure used earlier. The reference line of zero indicates equality with the national figure: Lying above (below) the line indicates that the MSA is doing better (worse) than the national average.

We see in Figure 13 that of Missouri's original five MSAs, only Columbia has a net job creation rate that has been consistently above the national average. Springfield's net job growth was strong until the early 1990s, from which time it has trended downward. The Kansas City and St. Louis MSAs have steadily under-performed, save for Kansas City's relatively strong performance in the late 1990s. The upshot is that Missouri MSAs are

Innovation Group (2017) suggests two important measures to ascertain how dynamic an economy is: job growth and net expansion of businesses.

not keeping pace with the national averages in terms of job growth, and thus underperforming in this measure of economic dynamism.

²⁴ This change in sample period reflects data availability.

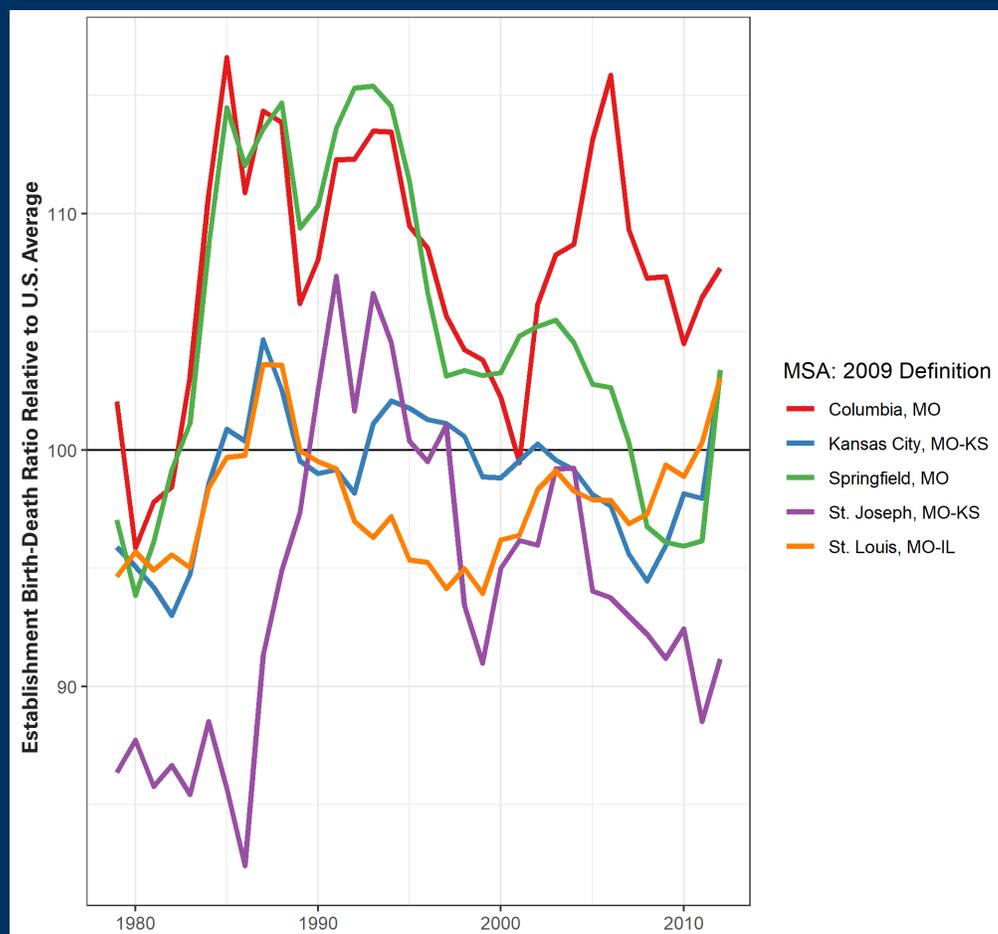
²⁵ According to the Bureau of Labor Statistics, "An establishment is a single physical location where one predominant activity occurs. A firm is an establishment or a combination of establishments and . . . [a]n enterprise is a firm or a combination of firms that engages in economic activities which are classified into multiple industries." See Sadeghi (2016).

The establishment birth:death ratio is another measure of economic dynamism.²⁵ It captures the net gain in establishments, a sign of growth in the number of establishments. Overall, this ratio has been on the decline in the United States (Economic Innovation Group, 2017). Figure 14 shows the birth:death ratio for the same five Missouri MSAs relative to the U.S. ratio. Kansas City and St. Louis track the national trends, although at a lower level. Over the past 20 years, the Springfield and St. Joseph MSAs are trending worse than the national average. Only the Columbia MSA is matching the U.S. trend at a high level of performance.

These findings are troublesome. The Economic Innovation Group (2017) has produced a Distressed Communities Index, the purpose of which is to show a connection between these measures (and others) and deeper community issues, such as poverty and other social ills. “Distressed communities were the only cohort to actually lose jobs and business establishments while national-level growth was in full swing from 2011 to 2015.” (pp. 4–5) This seems to describe Missouri’s MSAs and counties.

Figure 14 Establishment Birth-Death Ratio of Missouri MSAs: Relative to the United States as a Whole, 1978 to 2013.

Kansas City and St. Louis track the national trends, although at a lower level. The Springfield and St. Joseph MSAs are trending worse than the national average. Only the Columbia MSA is matching the U.S. trend at a high level of performance.



Source: *Business Dynamics Statistics* (www.census.gov/ces/dataproducts/bds) and authors' calculations.

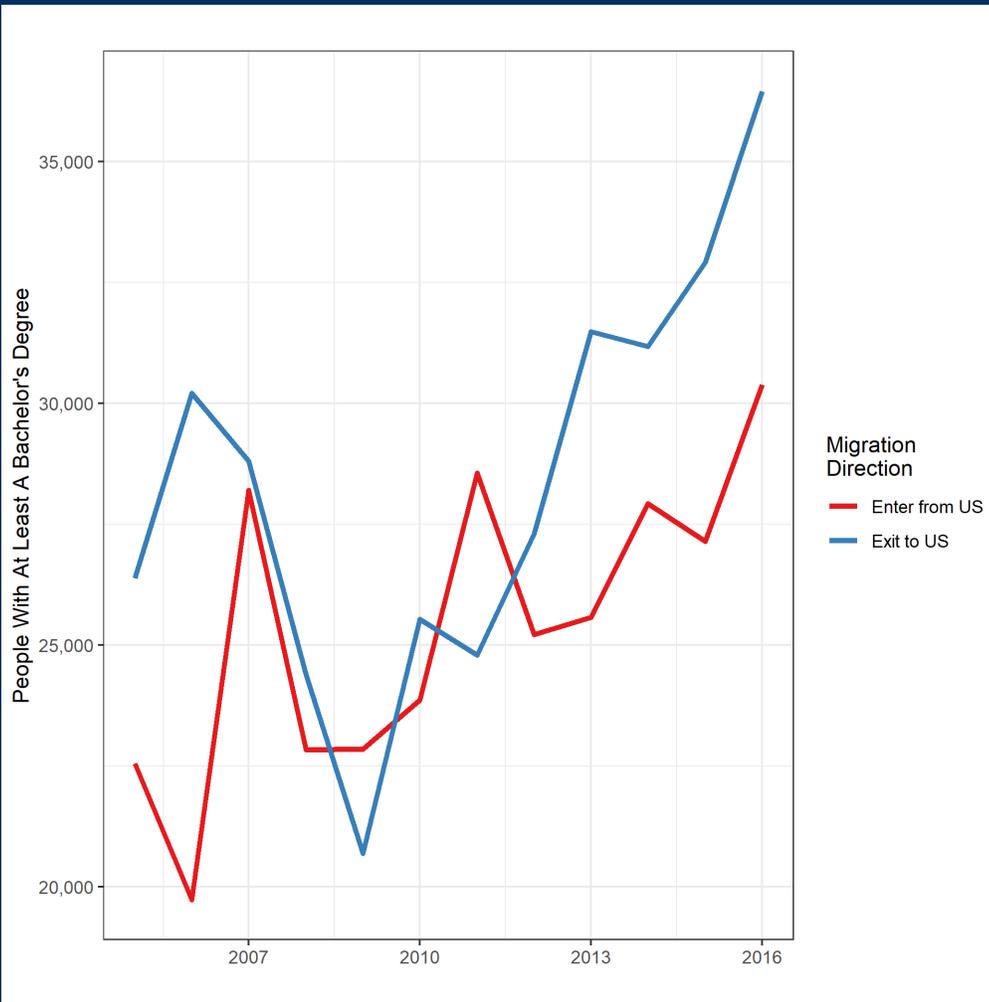
Migration and Educational Attainment

Hanushek (2018) notes that one explanation for Missouri’s poor economic record is the inability of its educational system to produce graduates who are, on average, competitive with those from other states. In the national and regional market for educated individuals,

Figure 15

Missouri's Domestic Migration: Bachelor's Degree or More, 1978 to 2013.

There has been a persistent net migration out of Missouri by individuals with an education level defined as a bachelor's degree or more. Prior to the Great Recession (2007–2009) and during the post-recession recovery, there more individuals with a bachelor's degree or more have left Missouri than have moved to the state. One interpretation: When labor markets are strong across the nation, Missouri loses more individuals with a bachelor's degree than it gains.



Source: *Business Dynamics Statistics* (www.census.gov/ces/dataproducts/bds) and authors' calculations.

environment induces the state's residents to leave for better opportunities elsewhere.

This observation is consistent with Missouri's recent migration data. Figure 15 shows the educational attainment of individuals moving into and out of Missouri over the past decade. The evidence indicates that there is a net migration out of Missouri of those with at least a bachelor's degree. Prior to the Great Recession (2007–2009) and during the post-recession recovery, there were more individuals with a bachelor's leaving Missouri than entering the state. One way to interpret this is that when labor markets are strong across the nation (2005, 2007, and post 2012), Missouri's net-domestic migration of those with a bachelor's degree falls.

What are the relative migration patterns among prime-working-age individuals (defined as individuals aged 25 through 54) with a bachelor's degree in Missouri and several neighboring states? The answer is in Figure 16.

Missouri is losing. The analysis in Gronberg et al (2018) suggests that an important factor in explaining Missouri's slow economic growth is the fact that it does not attract well-educated individuals from elsewhere. Rather, the local

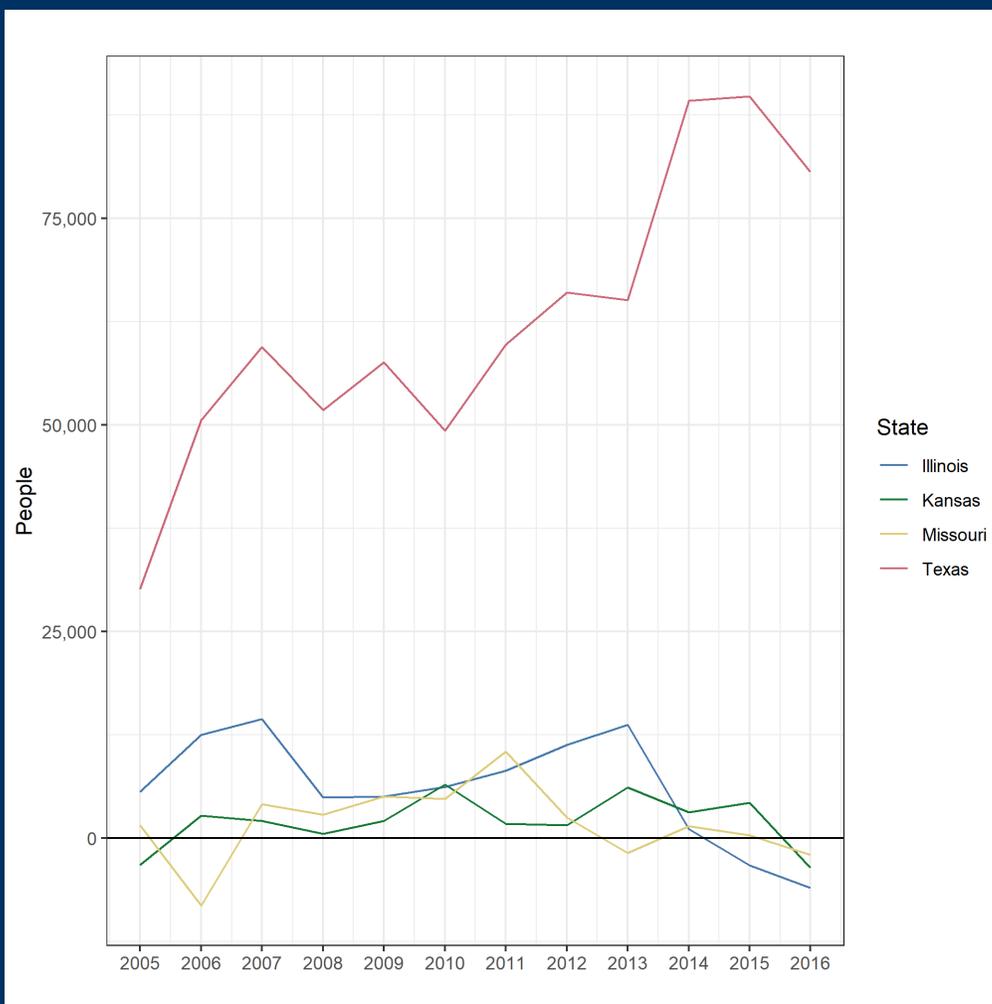
What we see there is that since 2005, the net migration of individuals has fluctuated around zero—down in some years (e.g., 2006, 2013, and 2014) and up in others. But, overall, there is very little net increase in those with

bachelor's degrees coming to Missouri. Kansas also has experienced a low net migration of individuals with at least a BA. This story is not true for Illinois and Texas, however. Though Illinois has in recent years seen a net out migration of those with a BA, much of the time since 2005 is characterized by a net migration into the state. In sharp contrast, Figure 16 shows that more individuals with college degrees have moved into Texas than to other states. Why include Texas? Because it is a state economy that has prospered relative to Missouri.

Now let us extend this comparison just a bit further. What if we also consider the migration patterns of those with advanced degrees? Are individuals with master's degrees, MBAs and PhDs, on net, moving into or out of these states? Table 9 provides the answer. To adjust for the size of the state, we state net migration numbers as per 10,000 population. Table 9 shows that while the net migration of those with bachelor's degrees was positive for each state, the numbers for Missouri are comparatively small, even after accounting for the fact that it is a low-population state.²⁶ Compared to Missouri,

Figure 16 Net Migration with Bachelor's Degree or More by State, 2005 to 2016.

Missouri, Kansas, and Illinois have, at least since 2005, experienced a small net in-migration of prime-working-age individuals with at least a college degree. This affects overall productivity, because average educational attainment is lagging other states. In contrast, many more individuals with college degrees have, on net, moved into Texas over time. The result is a Texas economy that has prospered relative to the others.



Source: American Community Survey PUMS (<https://www.census.gov/programs-surveys/acs/data/pums.html>) and authors' calculations.

the net number of individuals with a BA who moved into Texas between 2005 and 2016 was 31 times greater than in Missouri.

²⁶ All net migration figures are over-estimated because they do not account for people who have moved out of the country.

Table 9: Total Net Migration by Educational Attainment, 2005 to 2016

| State | Total Net Migration | |
|----------|---------------------|-----------------|
| | Bachelor's Degree | Advanced Degree |
| Kansas | 13,405 | 10,759 |
| Illinois | 50,816 | 23,113 |
| Missouri | 15,120 | 6,307 |
| Texas | 469,325 | 280,263 |

Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-states-territories>) and authors' calculations.

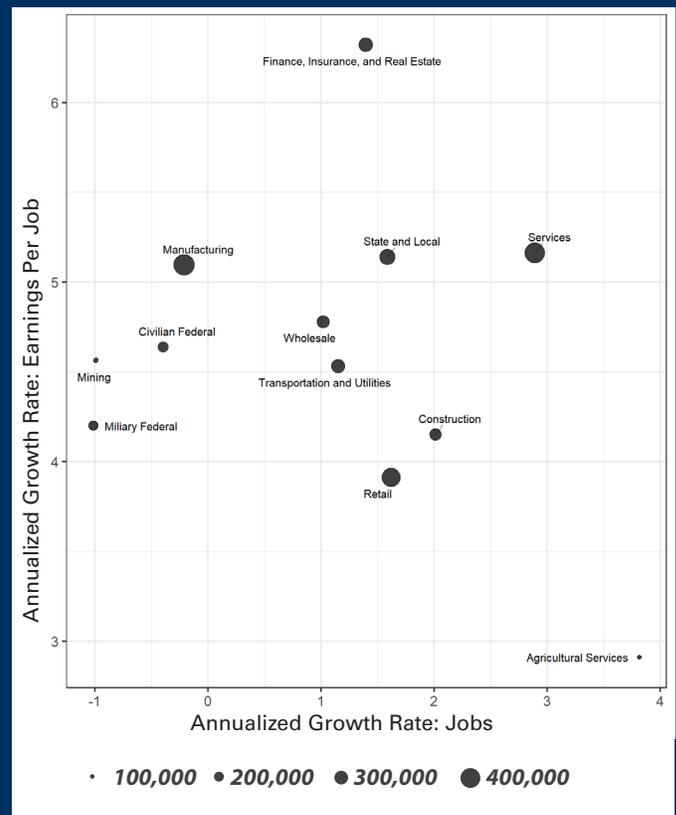
If we now consider the net migration of individuals with advanced degrees—Masters, MBAs and PhDs—the differences are even starker. Missouri stands out as having the lowest net migration of individuals with advanced degrees. The numbers in Table 9 tell a striking story. Missouri has the lowest net migration for individuals with advanced degrees since 2005. Net migration by holders of advanced degrees is somewhat larger for Kansas than Missouri, and about three and a half times larger for Illinois. But notice that Texas, a state experiencing a much faster growth rate, has a net migration that is over 40 times larger than Missouri. As is well known in the economic growth literature, economies with a higher percentage of more educated individuals tend to be those that experience faster rates of growth.

Industry Mix

Could it be that Missouri's growth record simply reflects the mix of industries located in the state? This issue has been addressed by Haslag (2014), but bears another look given the evidence presented thus far. Accordingly, we present the mix of industries in the state at the beginning of our sample and at the end. Figure 17 is a scatter plot of Missouri's major industries and their attendant earnings per job and jobs growth rates over the 1969 to 1973 period.²⁷ As noted in the sidebar, the relative importance of the industry—the size of each dot reflects—is determined by the level of initial (1969–1973) employment in that industry.

Figure 17
Missouri's Jobs and Earnings per Job Growth by Industry, 1969 to 1973

Manufacturing was the largest employer in the state 40-some years ago. The service sector also was relatively large employer. Even though manufacturing was a big employer, it was not a growth area: While earnings per job was increasing, no jobs were being created. Only the service sector was adding jobs and increasing earnings per job at a significant rate.



Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-states-territories>) and authors' calculations.

As evident in Figure 17, Manufacturing was the largest employer in the state 40-some years ago. This reflects the fact that Missouri at one time was the home of several major automobile plants, not to mention other manufacturing industries, such as aerospace. The Services category also was relatively large in terms of employment. But notice also that even though manufacturing was a

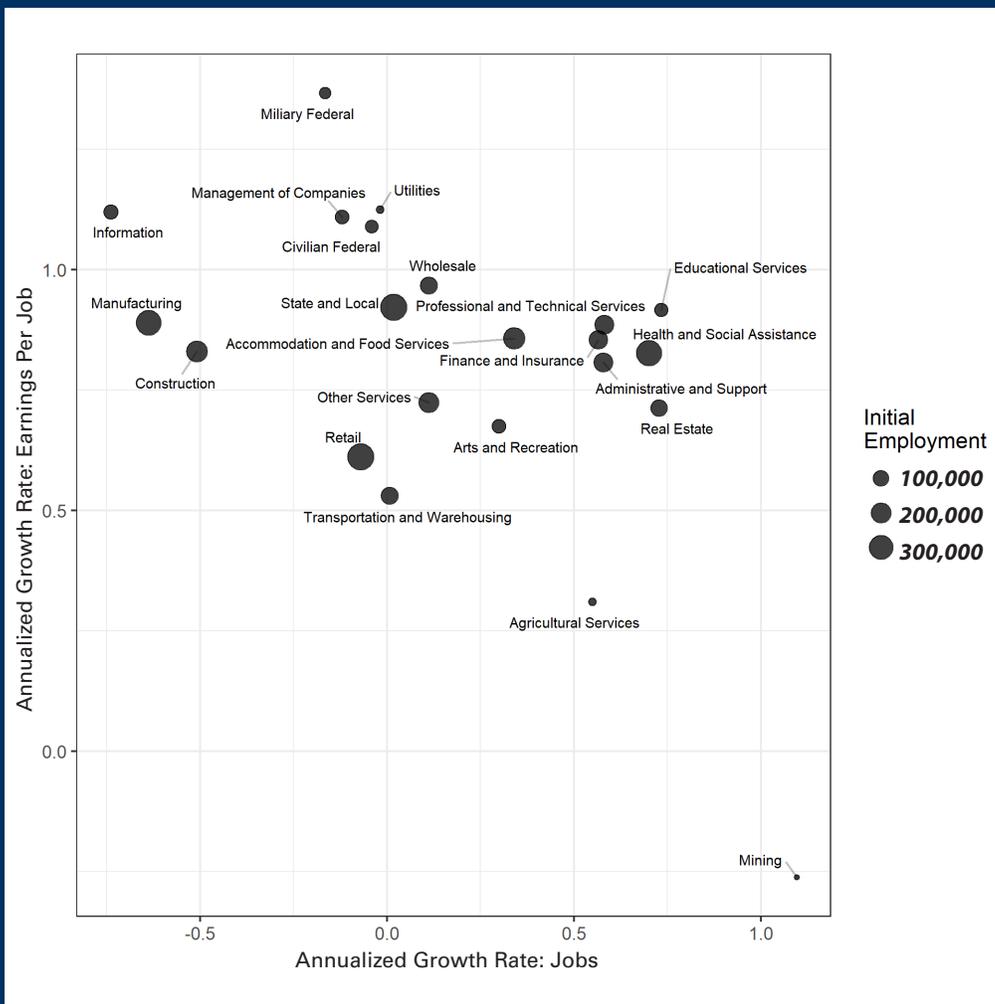
²⁷ Unlike our other scatter plots, it is impossible to include a national average for each measure (earnings per job and jobs) since it would require a line for each industry.

big employer, it was not, even then, a growth area: While earnings per job was increasing at a healthy clip, no jobs were being created. Compared with the others, only the service sector was adding jobs and increasing earnings per job at a significant rate.

Now look at Figure 18. This is the comparable figure for the period since 2000. The first thing you will notice is that there appear to be many more industries than in 1969 to 1973. This is an illusion: Given the redefinitions of the industrial codes in the late 1990s, there are technically more 2-digit industries than 50 years ago. Even with the changes, it is still true that the manufacturing sector is one of the largest employers in the state, as now are the retail, state and local government, and health and social assistance sectors. The problem is that two of these sectors—manufacturing and state and local government—have not experienced any job growth. Job growth in manufacturing has actually been negative during this period. And for those sectors that have seen some job growth, the growth in earnings per job has been miniscule: For all the major employers in the state, none have had a growth rate in earnings per job that averaged greater than one percent per year.

Figure 18
Missouri's Jobs and Earnings-per-job Growth by Industry, 2001 to 2016

For the period since 2000, manufacturing continued to be one of the largest employers in the state, followed by the retail, state and local government, and health and social assistance sectors. Though it employs many people, the state and local government sector did not experience any job growth, and job growth in manufacturing was negative during this period. For those sectors that experienced some job growth, the growth in earnings per job has been puny.



Source: Bureau of Economic Analysis (<https://www.bea.gov/data/by-place-states-territories>) and authors' calculations.

Gronberg et al. (2018) offer the following take regarding Missouri's composition of industries. Using data for the past 20 years, they report that the top five growing industries in the United States, based on contributions to real GDP, were (growth rates in parentheses) information

(103.15%), professional and business services (54.73%), education and services (52.45%), financial services (47.21%), and mining and logging (43.88%). As they note, Missouri’s “growth rate in all five of these sectors was slower than the U.S. average” and that “Missouri’s relative emphasis on industrial sectors experiencing slower growth than in the aggregate economy certainly provides a formidable headwind for Missouri’s own overall economic growth rate” (p. 9). Their evidence and ours suggests that Missouri’s industrial composition simply has not promoted overall economic growth and prosperity.

CONCLUSIONS

At the state level, Missouri’s growth has been slow. So slow, in fact, that it ranks among the worst in the country, at least over the past 20 years. In this study, we have tried to determine whether this harsh condemnation is justifiable. The evidence presented in this study indicates that the state’s lack of robust economic activity is long-standing. But is it fair to paint Missouri’s MSAs and counties with the same broad brush of underachievement? Except for a few bright spots, the answer is yes. Even more troubling, our analysis shows the Missouri’s economic underperformance has persisted for almost 50 years.

Why should you be concerned? The general finding of slower-than-average growth in several economic measures at all levels of aggregation means that the average individual in Missouri—whether in urban or rural Missouri—is losing out, economically, to their counterparts in many other states. It means that the growth and prosperity that occur in other areas have not trickled down to Missouri counties and towns and are unlikely to do so unless something is done.

Missouri policymakers and citizens must accept that Missouri has not been doing very well relative to other states for quite some time. Pointing to the relative success of a few counties or parts of MSAs—and there have been some²⁸—is not sufficient to claim victory. Policymakers must recognize this fact and take corrective actions. The conclusions offered by the Economic Innovation Group (2017) are appropriate in this context:

The challenge of “reconnecting” distressed communities is urgent and complex—especially so for policymakers. Not only have past efforts fallen short, but many of the underlying problems have been exacerbated thanks to failed policies—from restrictive zoning and onerous occupational licensure requirements at the local level to discriminatory housing policies and a slew of other federal actions that tip the scales in favor of incumbent firms, prosperous places, and advantaged individuals. Reversing those failures is an economic, social, and moral imperative. (p.49)

The sooner our policymakers—whether at the state, county or local level—recognize the problems confronting the state, the sooner Missouri’s citizens will begin to enjoy improved economic well-being.

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²⁸ For example, St. Louis was highlighted in a recent Brookings Institute study (Donahue, et al., 2018) for its cluster initiative in the so-called “ag tech” area.

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