

## The Geography of Prosperity

Ryan Nunn, Jana Parsons, and Jay Shambaugh



## MISSION STATEMENT

The Hamilton Project seeks to advance America's promise of opportunity, prosperity, and growth.

We believe that today's increasingly competitive global economy demands public policy ideas commensurate with the challenges of the 21st Century. The Project's economic strategy reflects a judgment that long-term prosperity is best achieved by fostering economic growth and broad participation in that growth, by enhancing individual economic security, and by embracing a role for effective government in making needed public investments.

Our strategy calls for combining public investment, a secure social safety net, and fiscal discipline. In that framework, the Project puts forward innovative proposals from leading economic thinkers — based on credible evidence and experience, not ideology or doctrine — to introduce new and effective policy options into the national debate.

The Project is named after Alexander Hamilton, the nation's first Treasury Secretary, who laid the foundation for the modern American economy. Hamilton stood for sound fiscal policy, believed that broad-based opportunity for advancement would drive American economic growth, and recognized that “prudent aids and encouragements on the part of government” are necessary to enhance and guide market forces. The guiding principles of the Project remain consistent with these views.





# The Geography of Prosperity

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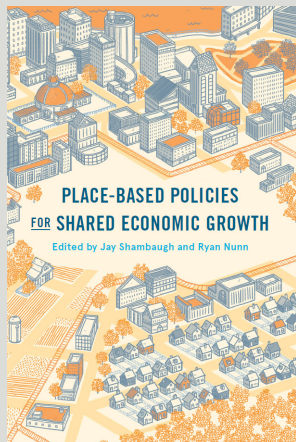
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A CHAPTER IN THE HAMILTON PROJECT BOOK



## Place-Based Policies for Shared Economic Growth

For a century, the progress our nation made toward realizing broadly shared economic growth gave our economy much of its unparalleled strength. However, for the last several decades, that progress has seemed to stall. On critical measures such as household income, poverty, employment rates, and life expectancy, there exist yawning, persistent gaps between the best- and worst-performing communities. These conditions demand a reconsideration of place-based policies. The evidence-based proposals contained in this volume can help restore the conditions of inclusive growth that make it possible for individuals from any part of the country to benefit from economic opportunity.

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## Abstract

Over the last several decades, the fortunes of regions and communities across the United States have stopped converging. Evolving patterns of trade and technology, among other factors, have created concentrated prosperity while leaving many places behind. In order to formulate an effective policy response at the local, state, and federal levels, it is necessary to understand how economic activity has shifted, as well as the factors that are associated with success or failure for particular places. To present a full picture of which places are thriving, how that picture has changed over time, and what factors are associated with success or failure, we created the Vitality Index, which measures the economic and social well-being of a place. We find that places in 1980 with higher levels of human capital, more diverse economies, lower exposure to manufacturing, higher population density, and more innovative activity tended to have higher vitality scores in 2016. Further, both the differences in fiscal capacity among states and declining migration rates can reinforce differences in economic outcomes across places. The analysis in this chapter underscores the complicated overlap of gaps across places: differences across regions, states, and counties are all substantial, as are differences within counties.

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## Introduction

Where people live is a crucial determinant of their economic opportunities. While much of economics concerns differences across individuals—gaps in income, wealth, and education—it is also important to examine differences across places; these geographic disparities can indicate important constraints on individual opportunity as well as failings of public policy to lay the groundwork for economic growth.

There is wide variation in economic outcomes across the United States. Not all economic gaps are surprising or new: for example, urban regions are on average richer than rural areas, and New England has a higher average income than the Southeast (U.S. Bureau of Economic Analysis [BEA] 2017). More surprising is that these regional patterns overlay dramatically different economic outcomes across counties in the United States, and that in recent decades struggling places have made unusually little headway in catching up with prospering places.

These gaps between counties are stark, with substantial inequality on a number of dimensions. Median household income in the top quintile of counties in the United States is more than twice as high as median household income in the bottom quintile of counties, and poverty rates are nearly three times as high in the worst-performing counties compared to top performers (see table 1). Other measures tell similar stories: unemployment rates are twice as high in the worst-performing counties, and 15.9 percentage points fewer prime-age (25–54) residents are employed in the worst-performing counties compared to the best-performing counties. These are striking disparities: consider that the national decline in prime-age employment from 2000 through 2010 was a

comparatively small 6.4 percentage points, and this decline has generated concern among researchers and policymakers alike (Bureau of Labor Statistics [BLS] 2000–10; Abraham and Kearney 2018).

Labor market disparities are accompanied by large gaps in life expectancy as well as differences in housing markets. Life expectancy is six years higher in the counties with the highest life expectancy compared to those with the lowest, and the share of houses in an area that are vacant is more than four times as high in counties from the worst-performing quintiles versus the best-performing quintiles. Taken together, these gaps suggest a meaningfully different economic life for residents in some counties relative to others.<sup>1</sup>

To present the full picture of which places are thriving, we created the Vitality Index, which measures the economic and social well-being of a place. Whereas county median income and poverty rates are the most important components of this index, the other variables described in table 1 also play important roles. See box 1 for a description of the index and its construction.

Figure 1 shows the Vitality Index for 2016, with blue counties receiving the highest scores and yellow counties receiving the lowest. The map also depicts relative population by representing populous areas in darker colors and sparsely populated areas with lighter colors.<sup>2</sup> The Vitality Index shows that in 2016 the East Coast metropolitan areas and their suburbs, many West Coast cities, and the upper Midwest and Plains regions were thriving. Some of the high-vitality parts of the upper Midwest in particular appear lighter on the map due to their relatively small populations. And a few successful cities score high on the index (e.g., Denver, Raleigh, and Seattle) even when the surrounding regions often score much lower.



TABLE 1.

## Worst-Performing and Best-Performing Quintiles of Selected County Indicators

	Worst-performing quintile	Best-performing quintile	Difference
Median household income	\$40,300	\$83,000	\$42,700
Poverty rate	22.7%	8.1%	14.6 p.p.
Unemployment rate	10.7%	5.8%	5.9 p.p.
Prime-age EPOP	66.7%	82.6%	15.9 p.p.
Housing vacancy rate	21.7%	5.2%	16.5 p.p.
Life expectancy	75.8 years	81.8 years	6.0 years

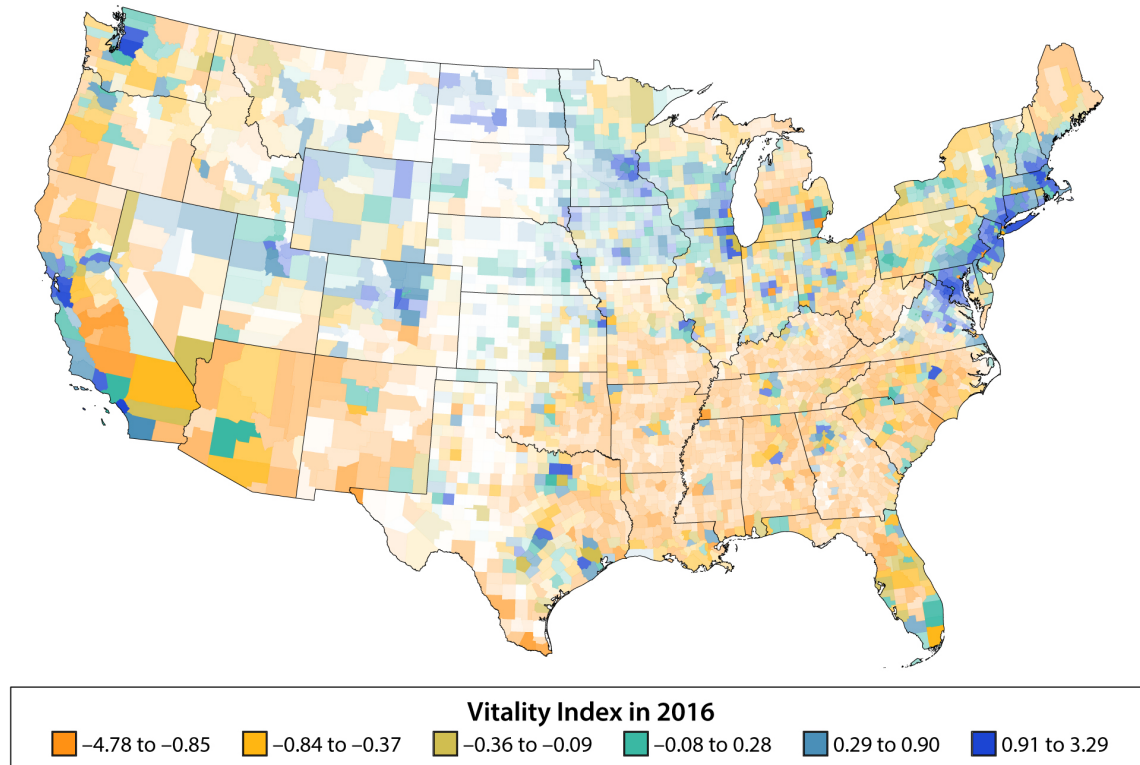
Source: American Community Survey (ACS; Census 2012–16); Institute for Health Metrics and Evaluation (IHME; 1980–2014); authors' calculations.

Note: Quintiles are calculated separately for each variable. For household income, population-weighted quintiles of county median household income are first calculated, and then population-weighted averages of median household income—within each quintile—are presented in the table. EPOP is the employment-to-population ratio. P.p. refers to percentage points.

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FIGURE 1.

## Vitality Index by County



Source: ACS (Census 2012–16); IHME 1980–2014; authors' calculations.

Note: Yellow counties have below-average vitality and blue counties have above-average vitality. Darker counties have larger populations.

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#### BOX 1.

## The Vitality Index

We construct a composite measure of several different indicators to determine a county's vitality in 1980 and 2016.<sup>3</sup> Employing a statistical technique called “confirmatory factor analysis,” we create an index that summarizes the common variation of several measures of economic activity and well-being. The indicators and their relative weights in the formation of the index are as follows:

- Median household income (45 percent)<sup>4</sup>
- Poverty rate (24 percent)
- Life expectancy (13 percent)
- Prime-age employment-to-population ratio (9 percent)
- Housing vacancy rate (5 percent)
- Unemployment rate (4 percent)

We chose these characteristics to provide a well-rounded—though necessarily incomplete—picture of the conditions that directly reflect economic and social well-being in a county. By contrast, we excluded from the index other important factors such as education, population density, and industry composition. Those characteristics of a place arguably do not themselves reveal whether a place is struggling or flourishing; rather, they might be responsible for generating or predicting that vitality. For example, the college-educated share of the population may be causally related to the vitality of a place, but in and of itself a higher share of college-educated residents does not necessarily mean that a place has greater vitality than another county with equivalent income, poverty, life expectancy, and other similar conditions. We also exclude variables such as employment growth that may largely be a function of changes in population; however, we include employment rate indicators to summarize the labor market as well as vacancy rates to distinguish places that are hollowing out from places that are flourishing.<sup>5</sup>

The Vitality Index is calculated in 1980 and 2016 for all counties in the contiguous United States.<sup>6</sup> Counties with a Vitality Index above zero are doing better than the (population-weighted) average county, and those with a vitality score below zero are doing worse. Because the measure puts the six variables on the same scale before combining them, a growing spread in any given variable would not be represented by a change in the index over time.

Other organizations have created indices that measure the economic well-being and standard of living of places, using a variety of variables and levels of geography. Examples include *The New York Times*' Upshot ranking of counties (Flippen 2014), the Economic Innovation Group's Community Distress Index (Economic Innovation Group 2017), Moody's Regional Diversity, Volatility, and Vitality Index (Lafkis and Fazio 2017), and the Brookings Metropolitan Policy Program's Metro Monitor (Shearer et al. 2018), which tracks the 100 largest metro areas. Relative to other approaches, one virtue of our Vitality Index is that it does not stipulate equal weight for all its component measures. Rather, the use of confirmatory factor analysis allows us to assign weights to components depending on how closely associated they are with the underlying county vitality we seek to capture.

For a more detailed description of the Vitality Index and its construction, see the accompanying online [technical appendix](#).

In contrast, broad swaths of the rural South, Southwest, and lower Midwest have below-average vitality scores. Except for a few better-performing cities, most of the South is below average, and virtually all of Arkansas, Kentucky, Mississippi, and West Virginia have low scores. Not all cities are thriving. Detroit, Gary, New Orleans, Toledo, and a number of other Midwestern and southern cities have low scores. While more of the map appears yellow than blue, this reflects the fact that many of the highly successful urban areas are geographically small (but populous) compared to some large rural counties that score lower on the index.<sup>7</sup>

## Economic Convergence Has Slowed

That there are differences within the U.S. economy or that some places are wealthier than others is not news. But it is newsworthy that struggling places have made unusually little headway in catching up with prospering places over the past few decades.

In the past, the usual process of convergence was one in which struggling places grow faster than places that are already thriving, thus closing the gap between them. Even vast disparities between areas can be eliminated over time as families move, businesses form and relocate, and policies are altered to better support growth. This dynamic had generally

characterized places and regions in the United States through the middle of the 20<sup>th</sup> century. The Southeast rose from 50 percent of average national income in 1930 to 86 percent by 1980; during the same time New England fell from 130 percent to 105 percent as the rest of the country caught up.

Furthermore, if a negative economic shock hit a particular place, subsequent recovery tended to reverse the local downturn. In some cases people moved away, and in other cases economic activity returned, but when unemployment rose in a given region it did not tend to stay high. In particular, high (or low) unemployment rates did not tend to persist from 1975 to 1985 (Blanchard and Katz 1992). More recently, unemployment rates have become far more persistent; local areas with high unemployment continue to have high unemployment in later years (Autor, Dorn, and Hanson 2013; Kline and Moretti 2013; Rappaport 2012).<sup>8</sup> Moreover, the rate of prime-age men in a particular place who did not work in 2010 is highly correlated with that same rate in 1980 (Austin, Glaeser, and Summers, forthcoming).

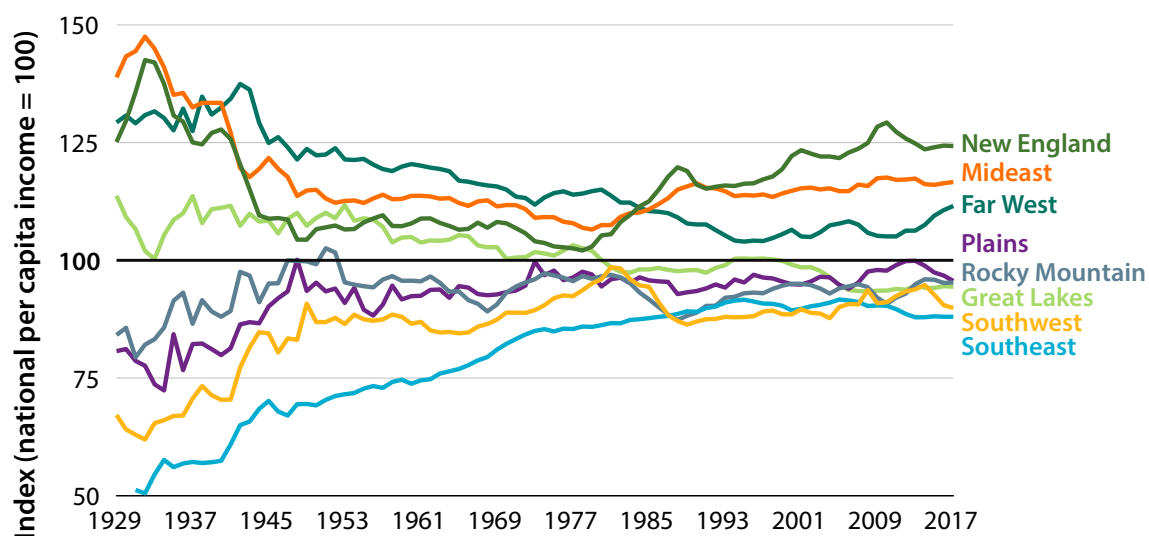
Robust convergence in regional income is also apparent throughout much of the 20<sup>th</sup> century. States were converging economically from the late 1800s to the 1980s, in terms of both per capita income and gross state product (Barro and Sala-I-Martin 1991). For example, southern states had low per capita incomes in 1880 and subsequently had relatively high growth rates. Indeed, figure 2 shows that per capita income among different regions of the United States converged toward the national average until about 1980.

However, this century-long trend appears to have ended. After 1980 per capita income convergence slowed dramatically, and perhaps even reversed to become slightly divergent. Ganong and Shoag (2017) document these trends at the state level, pointing to high housing costs in desirable areas and decreased net migration as factors slowing convergence. Austin, Glaeser, and Summers (forthcoming) find evidence consistent with a lack of convergence in median incomes for prime-age men at a more local level from 1980 to 2010.<sup>9</sup>

In our analysis of county-level data from 1960 to 2016 we find similar patterns. Figure 3a shows median household income in 1960 plotted against the annualized percent change in real median household income from 1960 to 1980. The fact that there is a negative relationship indicates that counties with low 1960 incomes tended to have higher percent increases in incomes from 1960 to 1980, allowing them to converge toward the richer counties. However, since 1980 this relationship has completely broken down. Figure 3b shows that there was no relationship between 1980 income levels and subsequent income growth. Some poorer counties were able to make progress—for example, low-income counties in the Atlanta and Memphis areas—but many were not. Similarly, though a few initially richer counties—for example, counties in the Cleveland and Indianapolis areas—experienced a relative decline, many did not. In the aggregate, though, recent years have seen no convergence between poorer and richer counties.<sup>10</sup>

FIGURE 2.

## Per Capita Income Relative to the National Average by Region, 1929–2017



Source: BEA 1929–2018; authors' calculations.  
Note: Regions are BEA regional categories.

FIGURE 3A.

## Levels and Growth of Real Median Household Income by County, 1960–80

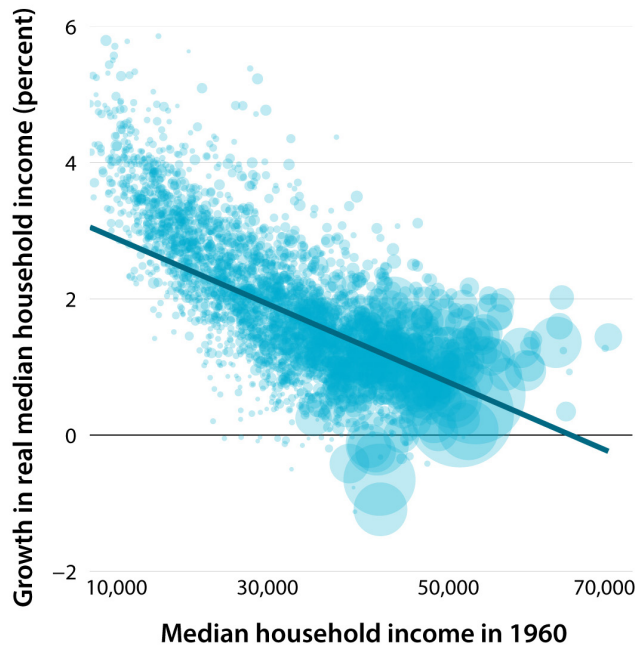
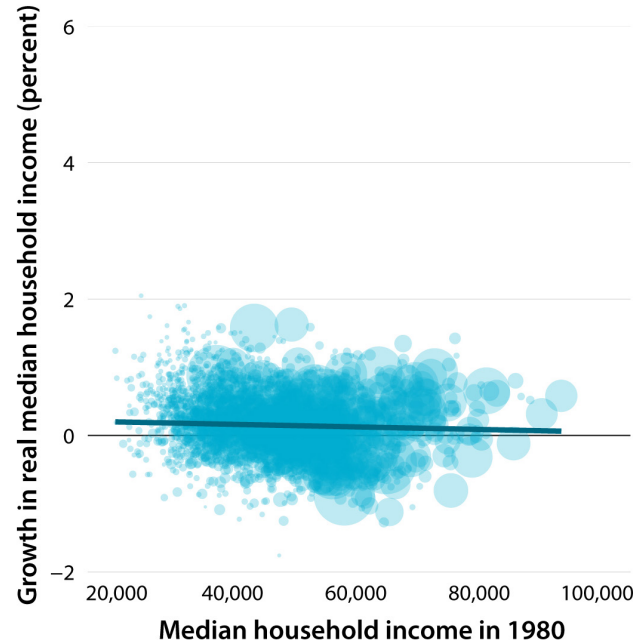


FIGURE 3B.

## Levels and Growth of Real Median Household Income by County, 1980–2016



Source: 1960 and 1980 Decennial Censuses and ACS (Census 1960, 1980, 2012–16); authors' calculations.

Note: Median household income is deflated using the CPI-U-RS. Bubble size is proportional to county population in 1980. Growth in real median household income is the annualized rate.

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### HOW PLACES HAVE CHANGED

To better understand how particular places have changed over time, we use the county-level Vitality Index—which encompasses more outcomes than just household income—to explore which counties are prospering and which are struggling.

County vitality has been relatively persistent over the past 40 years: the counties that are doing well continue to do well, and the counties that are not doing well continue to lag (figures 4a and 4b). One exception is the upper Midwest, which had many below-average vitality areas in 1980. With the relatively recent boom in U.S. oil and gas extraction (in particular the rise of hydraulic fracturing, or fracking), some areas in North Dakota, South Dakota, and northern Nebraska have experienced substantial increases in vitality. Conversely, many (though not all) of the core Midwest manufacturing cities slid down the Vitality Index: for example, figures 4a and 4b show Michigan and Ohio with lower vitality in 2016 than in 1980.

But, for the most part, if a county had low vitality in 1980 it was likely to have low vitality in 2016. Table 2 shows that 71 percent of counties in the bottom vitality quintile in 1980 remained there in 2016, and fully 92 percent remained in the bottom two quintiles. On the other end of the distribution,

58 percent of the counties in the top vitality quintile remained there over our sample period, and 87 percent remained in the top two quintiles. The places in the United States with the most consistently high levels of vitality are the Northeast corridor; West Coast areas including Los Angeles, Seattle, and Silicon Valley; and cities throughout the country, including Atlanta, Austin, Denver, and others.

Against a backdrop of relatively high overall persistence in vitality, figure 5 highlights areas of both positive and negative change. The Rust Belt extending throughout Indiana, Michigan, Ohio, and Pennsylvania saw steep declines in vitality over this period. As noted above, areas throughout the Dakotas south through Texas saw increases in vitality, likely driven by oil and gas extraction. However, given that these areas are relatively unpopulated, they show up only as light blue in figure 5. It is important to note that in some cases changes in vitality can tell a story quite different from that told by levels of vitality. For example, counties in Minneapolis and St. Paul experienced decreases in vitality, but the largest county in that metropolitan area was still in the top quintile of vitality in both periods.

The eight counties that began in the bottom quintile in 1980 and ended in the top quintile in 2016 are all low-population



FIGURE 4A.

## Vitality Index by County, 1980

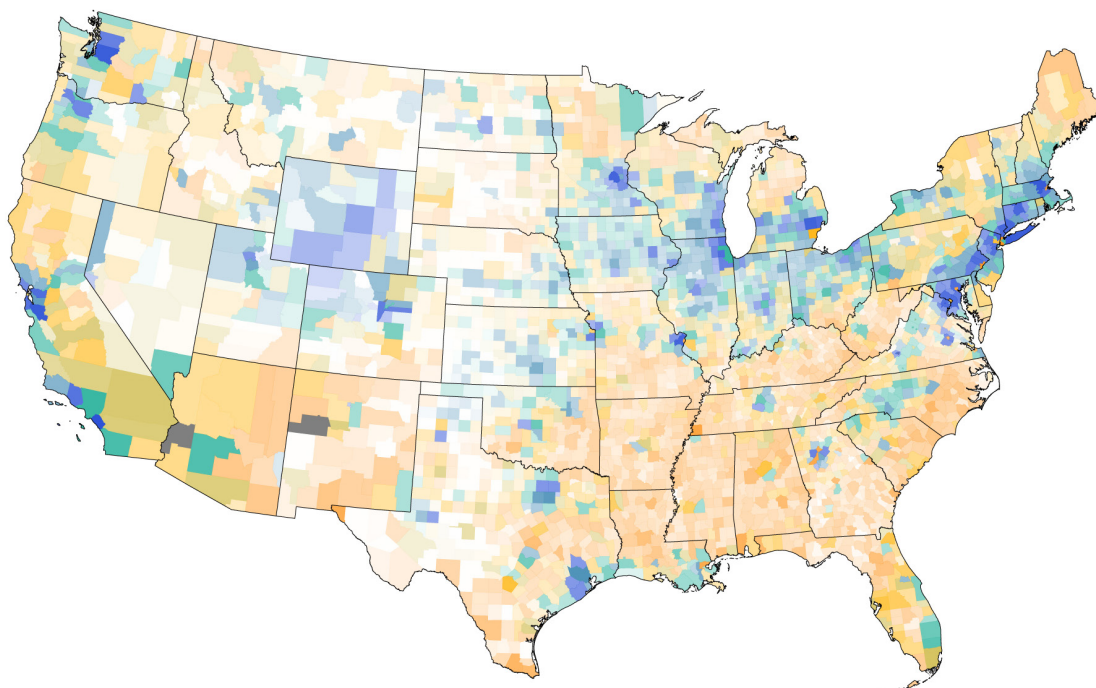
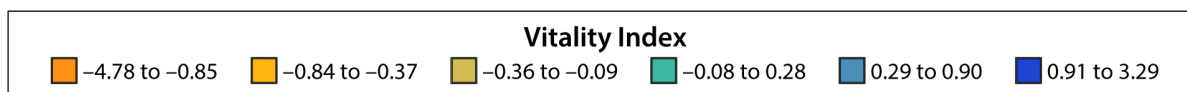
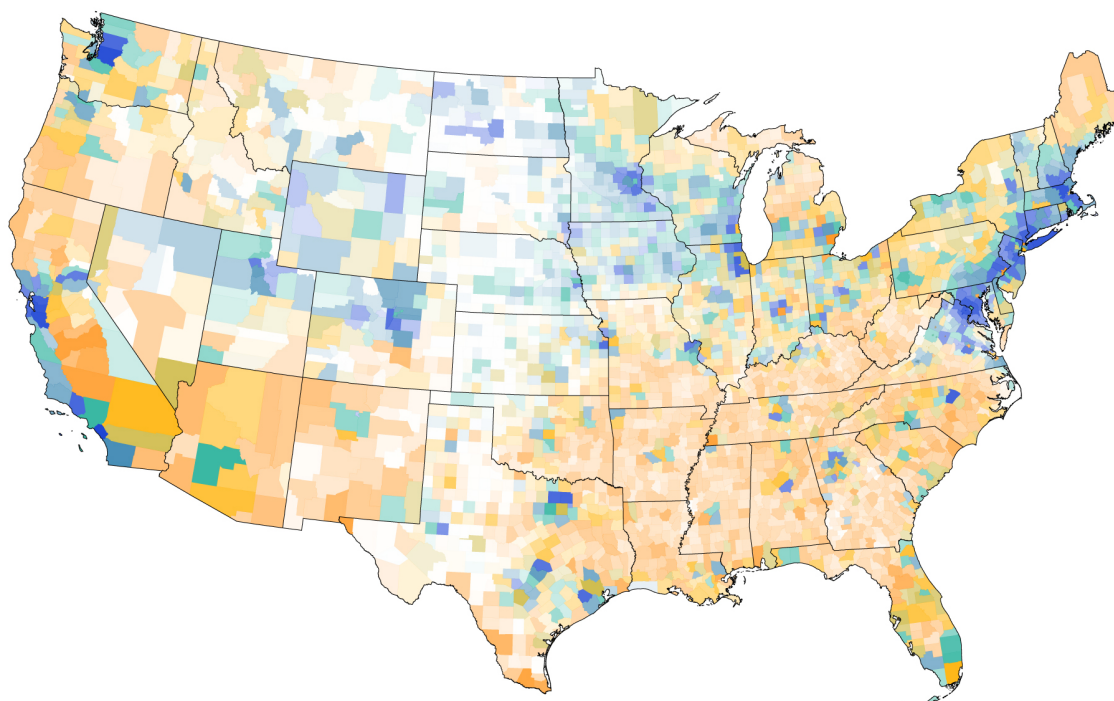


FIGURE 4B.

## Vitality Index by County, 2016



Source: 1980 Decennial Census and ACS (Census 1980, 2012–2016); IHME 1980–2014; authors' calculations.

Note: Map break points are based on 2016 population-weighted vitality. Yellow counties have below-average vitality and blue counties have above-average vitality. Darker counties have larger populations. Gray counties are those that did not exist in 1980.

counties in fracking areas (Nebraska, North Dakota, and South Dakota). However, New York County (i.e., the borough of Manhattan) jumped from the second-to-last quintile to the top quintile and is consequently in the 99<sup>th</sup> percentile for change in vitality from 1980 to 2016, higher even than San Francisco. Conversely, counties in Flint and New Orleans are two of the eleven counties that were in the top quintile in 1980 but fell to the second-to-last quintile in 2016, due to the decline in auto manufacturing and Hurricane Katrina, respectively.

Figure 6 highlights the Vitality Index in both 1980 and 2016 for an illustrative set of counties. For example, many coastal cities that were notably below average in 1980 are now among the highest vitality counties. By contrast, cities in the Rust Belt in 1980 had levels of vitality that were close to average. Rust Belt areas subsequently experienced substantial decreases in vitality from 1980 to 2016. This does not come as a surprise given the declines in the Rust Belt’s heavy manufacturing sector, which started before 1980 (Ohanian 2014).

Given that many have pointed to Pittsburgh as a model comeback city (e.g., *Time* 2015), it is particularly notable that the county containing Pittsburgh (Allegheny County) had only slightly above-average vitality in both 1980 and 2016.

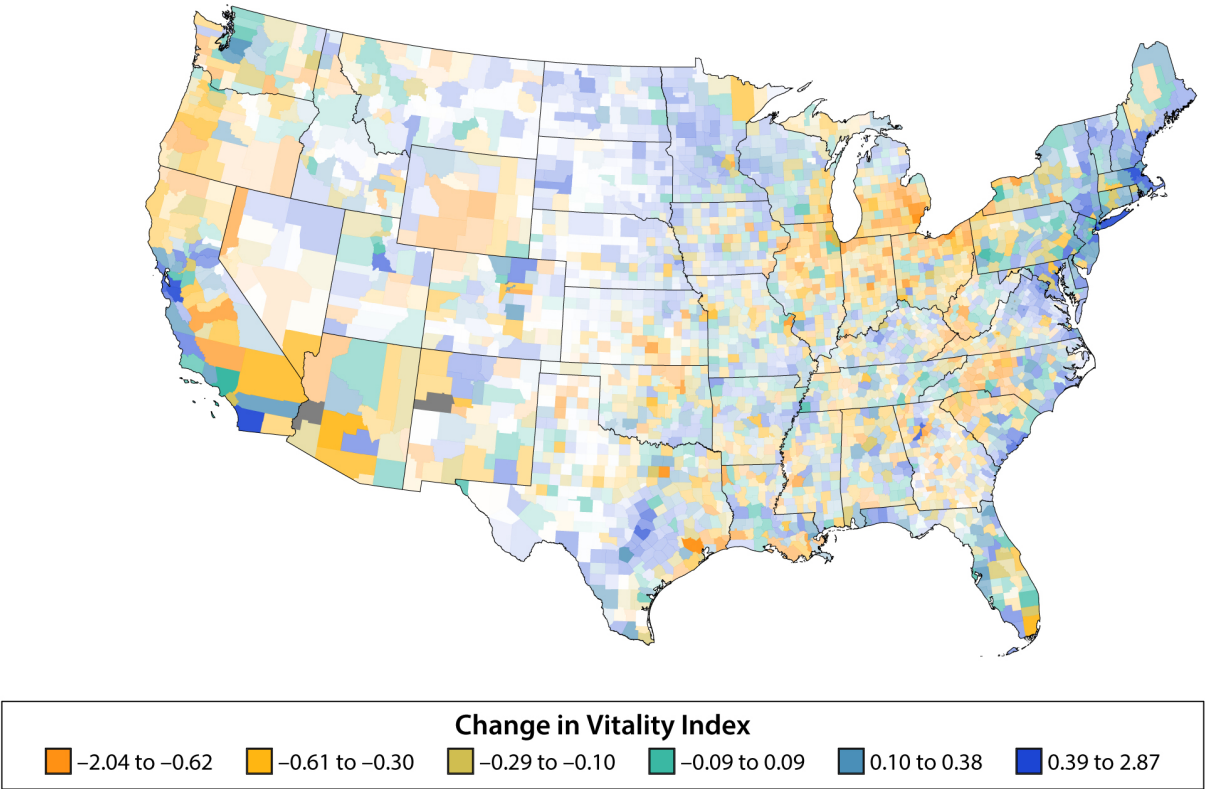
TABLE 2.  
County Vitality Mobility by Quintile, 1980–2016

		2016 Vitality quintile				
		1 (lowest)	2	3	4	5 (highest)
1980 Vitality quintile	1 (lowest)	71%	21%	5%	2%	1%
	2	23%	41%	19%	12%	5%
	3	5%	27%	34%	22%	12%
	4	0.5%	10%	31%	34%	24%
	5 (highest)	0.0%	2%	11%	29%	58%

Source: 1980 Decennial Census and ACS (Census 1980, 2012–16); IHME 1980–2014; authors’ calculations.  
Note: Quintiles are county-weighted.



FIGURE 5.  
Change in Vitality Index by County, 1980–2016

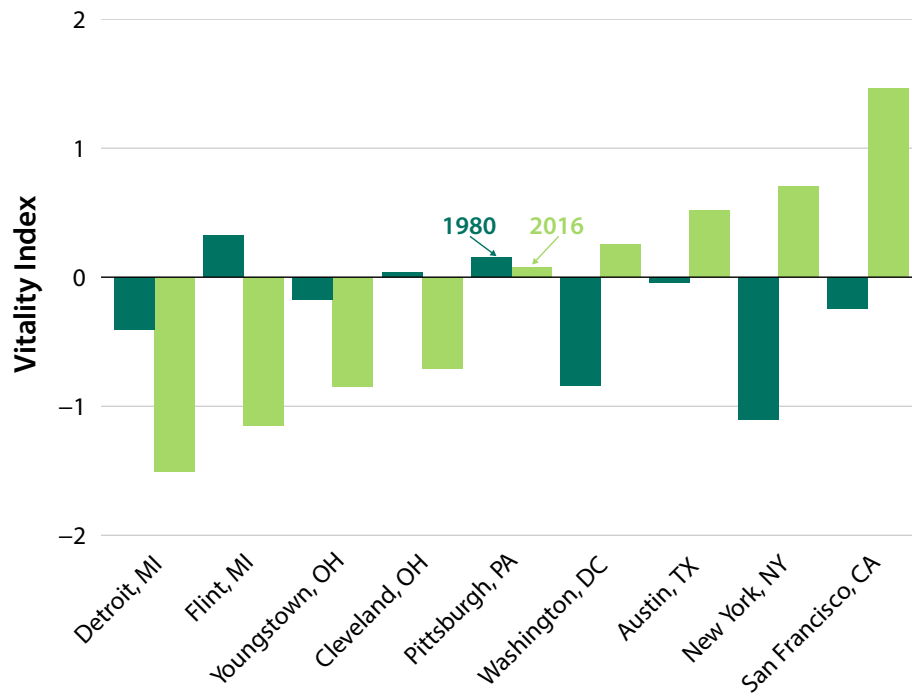


Source: 1980 Decennial Census and ACS (Census 1980, 2012–16); IHME 1980–2014; authors’ calculations.  
Note: Yellow counties decreased in vitality from 1980 to 2016 and blue counties have increased in vitality over that same period. Darker counties have larger populations. Gray counties are those that did not exist in 1980.



FIGURE 6.

## Vitality Index for Selected Cities, 1980 and 2016

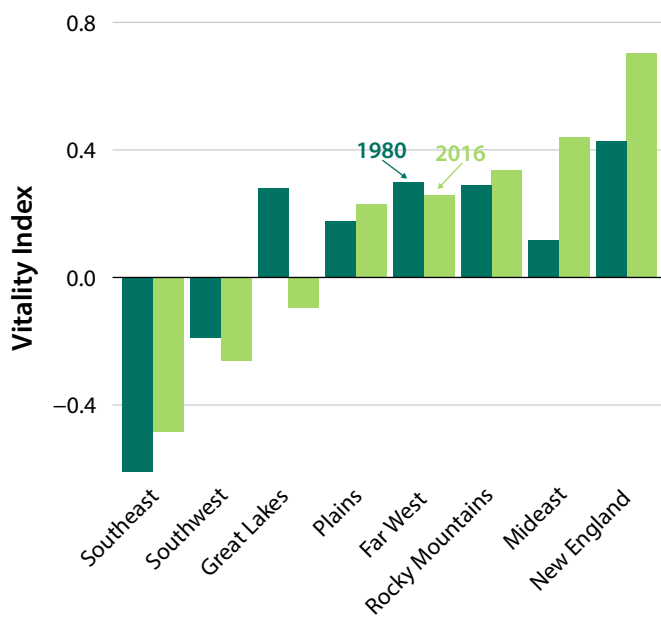


Source: 1980 Decennial Census and ACS (Census 1980, 2012–16); IHME 1980–2014; authors' calculations.  
Note: Cities refer to the largest county contained in the metropolitan statistical area.

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FIGURE 7A.

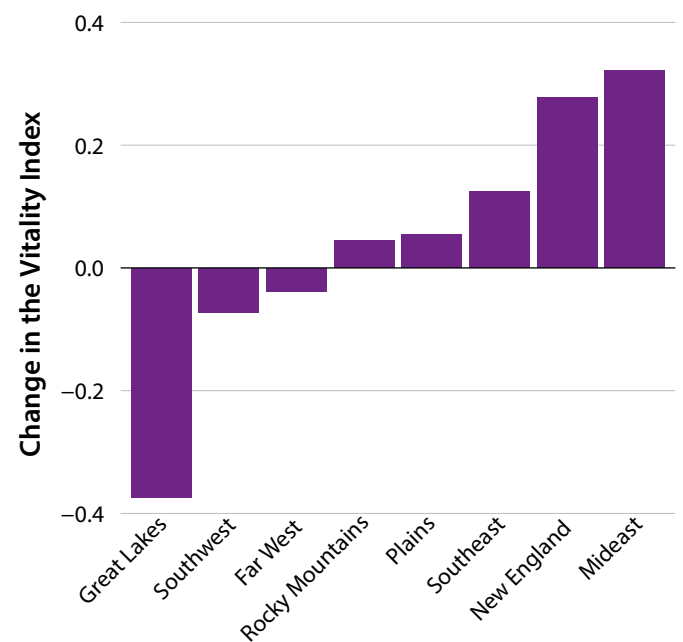
## Vitality Index by Region, 1980 and 2016



Source: 1980 Decennial Census and ACS (Census 1980, 2012–16); IHME 1980–2014; authors' calculations.  
Note: The Vitality Index is weighted based on region population in each year. Regions are BEA regional categories.

FIGURE 7B.

## Change in Vitality Index by Region, 1980–2016



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However, it is important to recall that much of the decline of Pittsburgh's manufacturing sector took place throughout the 1980s; the subsequent rebound (some of which occurred near but outside Allegheny County) is therefore not isolated in our data. In some sense, the striking feature of Pittsburgh's experience from 1980 to 2016 is that it did not decline in the way many other prominent Midwest manufacturing cities did.

At the regional level, the Southeast and Southwest were clearly struggling in terms of vitality in 1980, and are still not doing well. In contrast, New England and the Mideast (i.e., Delaware, the District of Columbia, Maryland, New Jersey, New York, and Pennsylvania) started above average in 1980 and improved from 1980 to 2016 (figures 7a and 7b). These patterns are consistent with previous findings of slowing regional convergence (Ganong and Shoag 2017) and contemporary regional disparities (Austin, Glaeser, and Summers, forthcoming). Some regions, though, saw a reversal of fortune. The Great Lakes region, which had above-average vitality in 1980, subsequently fell substantially below average by 2016 (experiencing the largest decline of any region). This Rust Belt decline is consistent with the Austin, Glaeser, and Summers characterization of what they call the "Eastern Heartland" as having suffered the most of all regions over the past 30 years.

## What Explains County Vitality?

What do struggling (or thriving) places have in common? Having described the broad patterns of convergence—or lack thereof—and the regions that have prospered or struggled in recent decades, it is also important to characterize the factors that are associated with county vitality. Below we consider five factors—population density, the degree of industry concentration, the manufacturing share of employment, the share of those without a high school degree, and the share of college graduates—that help explain both vitality and its change over time. In total, these five factors explain 71 percent of the variation in vitality across counties in 1980, and 66 percent of the variation in 2016 (in both cases, contemporaneous values of the factors are used). They are also helpful in understanding the change in vitality across counties over time. While it is not possible from this analysis to infer the causal impacts of these common factors, understanding associations can lead to further research and can help to direct policy toward relevant considerations. To conclude the section, we also consider the relationship between vitality and measures of innovation.

### POPULATION DENSITY

Both low- and high-density places can host thriving communities, and this is evident in our analysis. But one would ordinarily expect thriving, desirable places to attract

migration that boosts their populations, and struggling places to experience population decline. Moreover, economic changes can increase or decrease the relative productivities of rural, suburban, and urban areas with differing levels of population density.

Figure 8 shows the average Vitality Index for the most- and least-rural counties.<sup>11</sup> In 1980 the second-least-rural areas were the most vital, indicating that relatively high-density places (though not the highest) were having the most success. Holding these categorizations fixed over time—i.e., tracking counties based exclusively on their 1980 categorization—we see that this pattern persisted into 2016.<sup>12</sup> The most-rural counties saw some improvement, but continued to have the lowest vitality. The least-rural counties also saw improvement and are now about average.

Economists often invoke so-called agglomeration economies—the economic benefits derived from living and working in proximity—when discussing the relationship between population density and economic activity (e.g., Marshall 1920). Some industries have long benefited from clustering: the concentration of automotive manufacturers in southeast Michigan (with suppliers clustering in the broader region) is a prime example (Klepper 2010).

An important part of agglomeration economies is the labor market advantage that exists when there are many buyers and sellers of labor—that is, when labor markets are thick. Thick labor markets can benefit both workers and firms through better matches and lower risk (Bleakley and Lin 2012; Wheeler 2008). Better matches in turn can raise worker productivity, benefiting their particular areas and the country as a whole (Acemoglu 1997; Helsley and Strange 1990; Rotemberg and Saloner 2000, as cited in Moretti 2011). Agglomeration economies appear to be relatively strong for skilled workers in nonroutine jobs, but nonexistent for unskilled workers (Andersson, Klaesson, and Larsson 2014), suggesting that agglomeration interacts importantly with a county's share of more-educated workers.

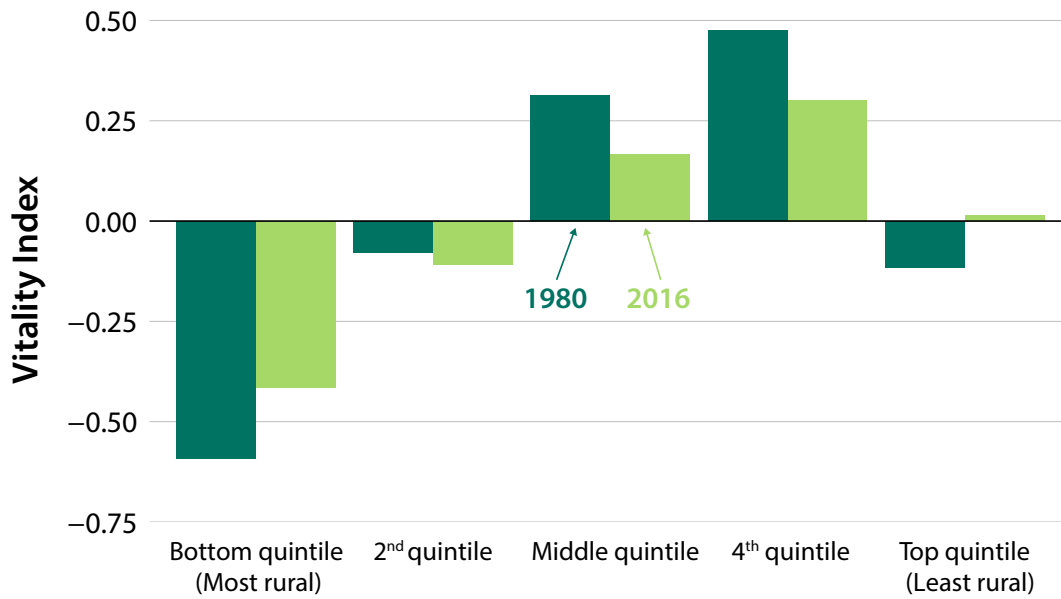
### THE DEGREE OF INDUSTRY CONCENTRATION

Dense counties with thick labor markets tend to offer lower risk to workers, who can more easily find new employment after job loss (Moretti 2011). Similarly, a county may be exposed to less risk—for example, from evolving trade and technological conditions—when it features a wide range of industries. Indeed, state and local policymakers often seek to diversify their local economies to avoid these sorts of risks (e.g., McAuliffe 2014).<sup>13</sup> We therefore examine the differences between counties with a relatively small number of dominant industries (high concentration) and those with a more even distribution of industries (low concentration) based on the share of employment in given industries.



FIGURE 8.

## Vitality Index by Quintile of Rural Population Share, 1980 and 2016



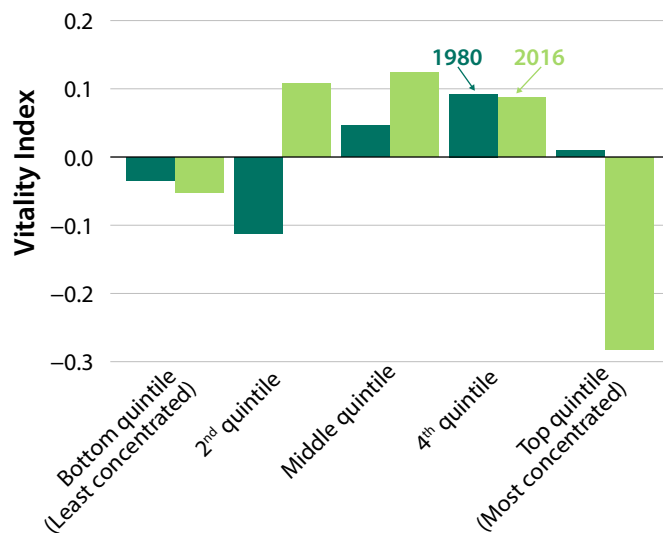
Source: 1980 Decennial Census and ACS (Census 1980, 2012–16); IHME 1980–2014; authors' calculations.

Note: Quintiles are set based on 1980 rural population share. The Vitality Index is weighted by county population in each year.

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FIGURE 9A.

## Vitality Index by Quintile of Industry Concentration, 1980 and 2016

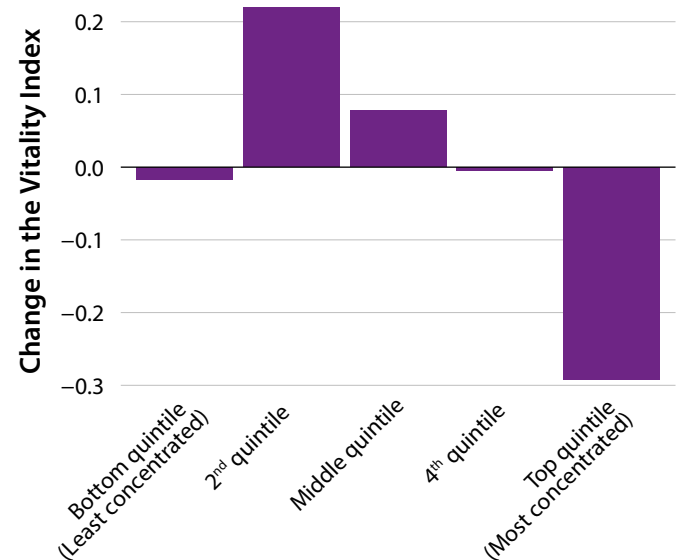


Source: 1980 Decennial Census and ACS (Census 1980, 2012–16); IHME 1980–2014; authors' calculations.

Note: Quintiles are set based on 1980 industry concentration. The Vitality Index is weighted by county population in each year. Industry concentration is calculated using a Herfindahl-Hirschman Index of industry employment shares.

FIGURE 9B.

## Change in the Vitality Index by Quintile of Industry Concentration, 1980–2016



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Figures 9a and 9b show the level of and change in vitality by quintiles of industrial employment concentration.<sup>14</sup> In 1980 there was not much of a discernable relationship between county vitality and the concentration of workers in a given industry, with all five quintiles grouped relatively close to each other, and none much more than 0.1 standard deviations from the national average of vitality. In contrast, those counties that had been highly concentrated in terms of employment in 1980 did not fare well by 2016. Those counties experienced the largest decline, and now have substantially lower vitality scores, on average.

## THE MANUFACTURING SHARE OF EMPLOYMENT

The decline in vitality for counties with more industry concentration may be related to trends in manufacturing: areas that were dependent on the manufacturing sector in 1980 did not fare well throughout the process of deindustrialization that has taken place throughout the late 20<sup>th</sup> century. For example, the United States lost about 850,000 jobs in the steel and auto industries from 1977 to 1987, with large volumes of subsequent out-migration from struggling places (as cited in Feyrer, Sacerdote, and Stern 2007). The share of manufacturing in employment in 2000 was also correlated with employment declines in the 2000s—in other words, employment did not completely reallocate to other sectors after manufacturing employment losses (Charles, Hurst, and Schwartz 2018).

Consequently, figures 10a and 10b focus on the manufacturing employment share, giving a sense of how manufacturing-dependent counties have fared relative to others. The results are striking: in 1980 the places with more manufacturing employment generally scored higher in vitality; by 2016 the counties most dependent on manufacturing in 1980 scored the lowest. Furthermore, when controlling for population density, educational attainment, and industry concentration, a higher share of manufacturing employment is correlated with a higher vitality score in both 1980 and 2016, but having high manufacturing dependency in 1980 is one of the strongest predictors of a decline in vitality over time.

The two most commonly cited causes of deindustrialization and the shrinking share of employment in manufacturing are U.S. trade policy and technology. One common formulation of the trade argument is that a combination of rising foreign competition—most importantly from China—and certain U.S. trade policy decisions have put pressure on domestic U.S. manufacturing, resulting in job losses in that sector (Asquith et al. 2017). The technology explanation is that, over the past four decades, technologies like computerization and other forms of task automation have entered the workplace en masse, with different effects in different sectors (Autor, Dorn, and Hanson 2015). According to this explanation, while the service sector experienced job polarization, manufacturing underwent large-scale automation in ways that have

increased labor productivity and reduced the need for labor in manufacturing. Most economists agree that the loss in manufacturing employment is the result of some combination of the two (Fort, Pierce, and Schott 2018).

Areas with more manufacturing clearly suffered from adverse trade and technological shocks, but they also may have suffered from underinvestment in human capital. Goldin and Katz (2009) find that places with more manufacturing activity invested less in education because the opportunity cost was too high: workers' time was better spent supplying labor than acquiring more education. Indeed, counties with more manufacturing employment in 1980 tended to have a smaller fraction of college-educated individuals. As discussed in the next section, this became a problem for counties once manufacturing employment contracted and the labor market advantage of a college education became much larger.

## EDUCATIONAL ATTAINMENT

The past few decades have seen a dramatic increase in the gains that flow from higher educational attainment. From 1980 to 2017 the wage advantage of a bachelor's degree over a high school diploma more than doubled, rising from 32 percent to 67 percent for full-time, prime-age workers (BLS 1980–2017; authors' calculations). Households headed by an individual with a college degree have a median family net worth more than 4 times larger than that of families headed by individuals with only a high school diploma, and almost 13 times larger than that of families with heads who have less than a high school diploma (Survey of Consumer Finances [Board of Governors of the Federal Reserve System 2016]; authors' calculations). Places with many college graduates benefited accordingly; a county's average level of educational attainment (both in terms of high school and college completion) is the strongest predictor of vitality that we find in our analysis.

Figure 11a shows that Vitality Index scores are lower for counties with a higher share of individuals who have less than a high school education; conversely, figure 11b shows that counties with a higher share of college-educated people are substantially more successful. The magnitude of the association is worth emphasizing. Counties with the highest share of individuals without a high school diploma were a full standard deviation below the average county in 1980 and almost two standard deviations below those in the top quintile of high school graduates. This difference in vitality is roughly four times the difference in vitality between the top and bottom quintiles of rural population share, and is also a much larger difference than for other measures we examine. When examining the share of the population that has a bachelor's degree, the association with vitality has grown slightly, with the lowest college attainment counties seeing their Vitality Index decline and those counties with the highest share of

FIGURE 10A.

## Vitality Index by Quintile of Manufacturing Employment Share, 1980 and 2016

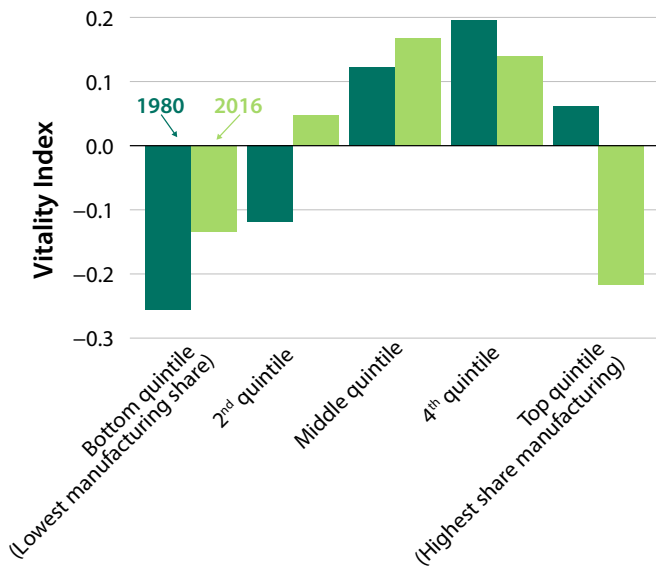
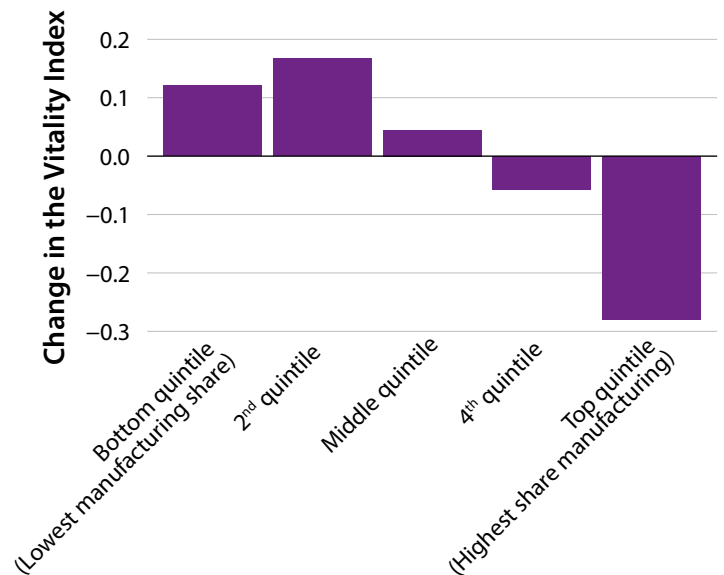


FIGURE 10B.

## Change in the Vitality Index by Quintile of Manufacturing Employment Share, 1980–2016



Source: 1980 Decennial Census and ACS (Census 1980, 2012–16); IHME 1980–2014; authors' calculations.

Note: Quintiles are set based on 1980 manufacturing employment share. The Vitality Index is weighted by county population in each year.

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FIGURE 11A.

## Vitality Index by Quintile of Less than High School Attainment, 1980 and 2016

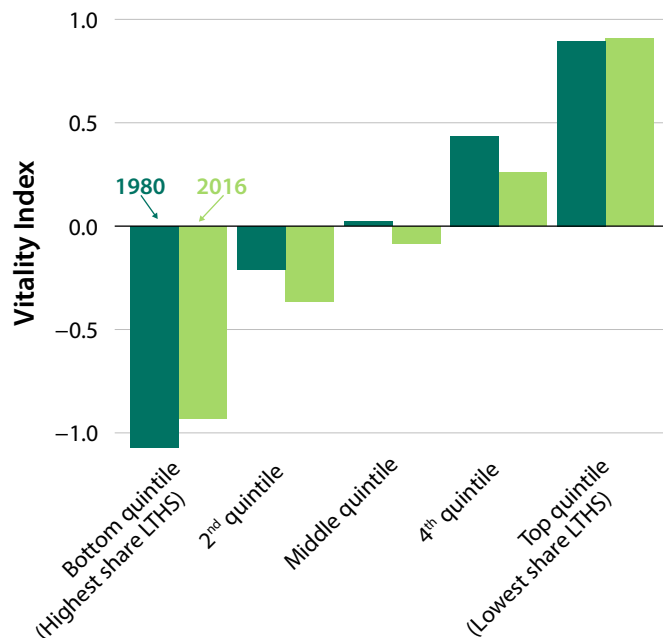
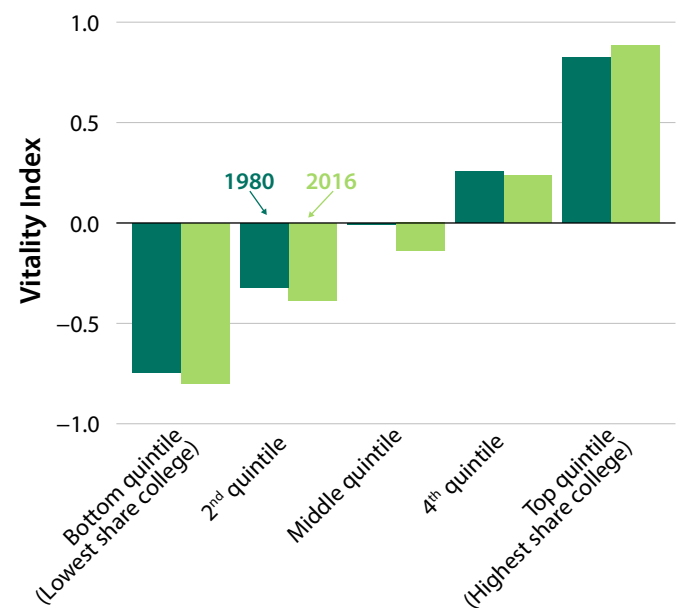


FIGURE 11B.

## Vitality Index by Quintile of College Attainment, 1980 and 2016



Source: 1980 Decennial Census and ACS (Census 1980, 2012–16); IHME 1980–2014; authors' calculations.

Note: In 1980 college attainment is assumed for those with four or more years of college education. Quintiles are set based on 1980 educational attainment. The Vitality Index is weighted by county population in each year. LTHS refers to less than high school.

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college graduates in 1980 seeing a further increase in their Vitality Index.<sup>15</sup>

College attainment directly benefits graduates, but it also generates positive spillovers that likely improve county vitality. Workers without college degrees experience stronger salary gains if they live in cities with faster growth in the number of residents with a college degree relative to cities where college attainment has stagnated (Moretti 2004). A city’s level of educational attainment is also important for future wage and housing price growth (Glaeser and Saiz 2004).

The relationship between vitality and education demonstrated in figures 11a and 11b is consistent with evidence from Giannone (2018), who finds that skill-biased technical change—innovations that disproportionately benefit skilled workers—can explain to some extent both regional divergence since the 1980s and cross-city wage differentials.

Given its relevance to counties’ success, it is important to track changes over time in how the educated population is distributed across the country. Two patterns are immediately apparent. First, counties with high fractions of people in 1980 who had not graduated high school generally were able to catch up in terms of high school graduation with counties that had

lower such fractions: in other words, we observe convergence at the bottom of the educational attainment distribution (see figure 12a). It is worth noting, though, that this improvement came with only a small improvement in relative vitality. These counties have closed the gap to some degree, but still lag the rest of the country in terms of the share without a high school diploma. It might be that as more and more work requires a minimum of a high school diploma, having 20 percent of the population without one today may be effectively as damaging as having 50 percent of the population without one in 1980. Second, counties with low fractions of people in 1980 who had received four-year college degrees experienced only small increases in that fraction through 2016, while counties that already had a higher share of college graduates made even more gains (see figure 12b). In other words, we observe divergence at the top of the educational attainment distribution: more-educated places have tended to become even more educated over time.<sup>16</sup> This is consistent with the slight intensification of the association between vitality and share of the population with a bachelor’s degree in 1980.

INNOVATION AND PATENTING

Closely related to educational attainment is the local volume of innovative activity, as proxied by the number of

FIGURE 12A.  
Levels and Growth of Less than High School Attainment by County, 1980–2016

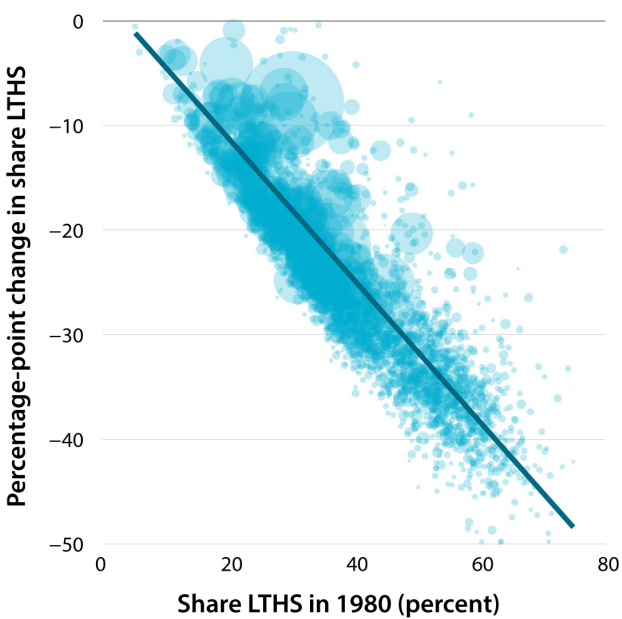
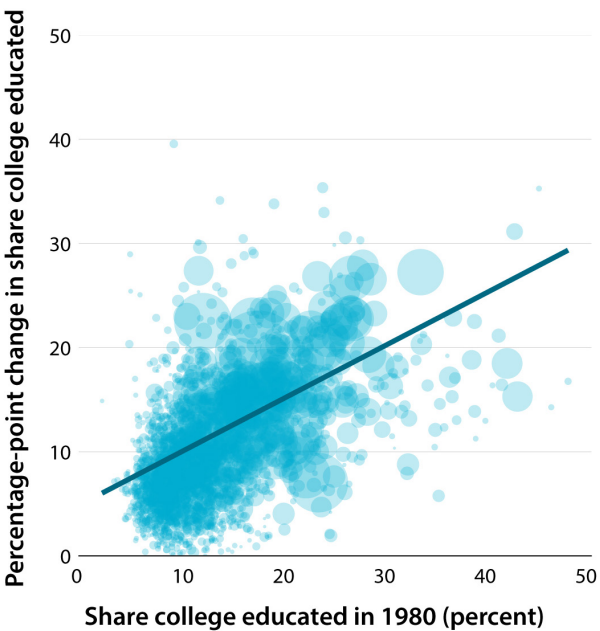


FIGURE 12B.  
Levels and Growth of College Attainment by County, 1980–2016



Source: 1980 Decennial Census and ACS (Census 1980, 2012–16); authors’ calculations.  
Note: In 1980 college attainment is assumed for those with four or more years of college education. LTHS refers to less than high school. Bubble size is proportional to county population in 1980.



patents generated within counties. There are large regional disparities in innovative activity across the country (Chatterji, Glaeser, and Kerr 2014). In 1975 almost half of all counties had no patent activity at all. Moreover, patenting is highly concentrated in metropolitan areas and near research universities (Shambaugh, Nunn, and Portman 2017).

Figure 13 relates county per capita patenting activity in 1975 (the closest year of available data to our baseline year of 1980) to vitality in 1980 and 2016. The relationship is similar in the two years: counties with more per capita patents have higher vitality scores. This association is consistent with the emphasis on local innovative activity in Moretti (2012).

## What Keeps Struggling Communities from Catching Up?

### DISPARITIES IN STATE REVENUE CAPACITY

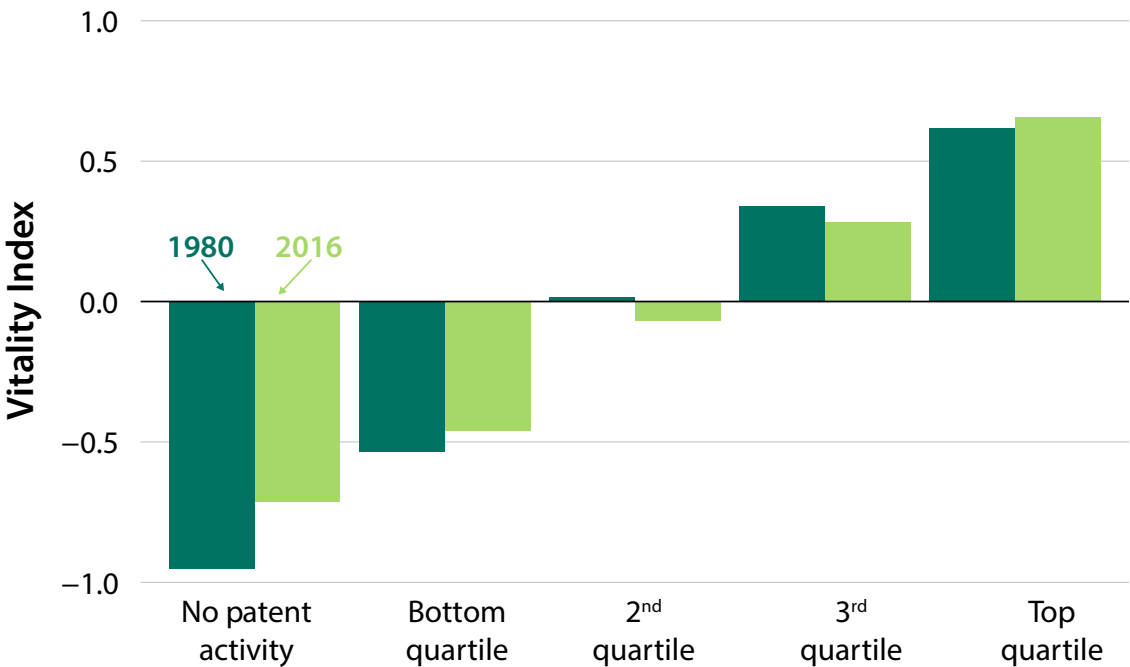
As explained previously, there has been little to no economic convergence since 1980. One factor that can reinforce differences in economic outcomes across places is the quality of investments in local public goods. State and local governments that are struggling may have difficulty paying for

such investments, which in turn limits economic opportunity for residents. In addition, places with more-limited resources will likely be less resilient in the face of negative shocks related to trade, technology, and other factors.

We therefore document states' capacity to raise revenue, as well as the gap between revenue capacity—i.e., the potential revenue that a state could access—and actual state revenues. We refer to this latter concept as states' revenue effort because higher values indicate that a state is choosing to raise more of its potential tax revenue through some combination of higher tax rates and a broader taxable base. In this way we distinguish between, (a) the resources that a state could potentially access for public investments, and (b) the actual policy choices that determine whether a state raises much or little revenue.

One commonly used measure of potential revenue is the U.S. Treasury Department's (Treasury's) estimates of Total Taxable Resources (TTR). For any given state, TTR is the sum of all potentially taxable income flows, including capital gains, for example, but excluding social insurance contributions (Treasury 2002). Figure 14a shows the distribution of TTR per capita by state in 2015. Some states have considerably more resources available to tax: for example, Connecticut and North Dakota have relatively high potential taxable resources at over \$87,500 and \$79,000 per person, respectively—higher than

FIGURE 13.  
Vitality Index by Quartile of Innovative Activity, 1975



Source: 1980 Decennial Census, ACS (Census 1980, 2012–16); IHME 1980–2014; Petralia, Balland, and Rigby 2016; authors' calculations.  
Note: The Vitality Index is weighted by county population in each year. Quartiles are set based on 1975 patent activity.

FIGURE 14A.  
Total Taxable Resources per Capita by State

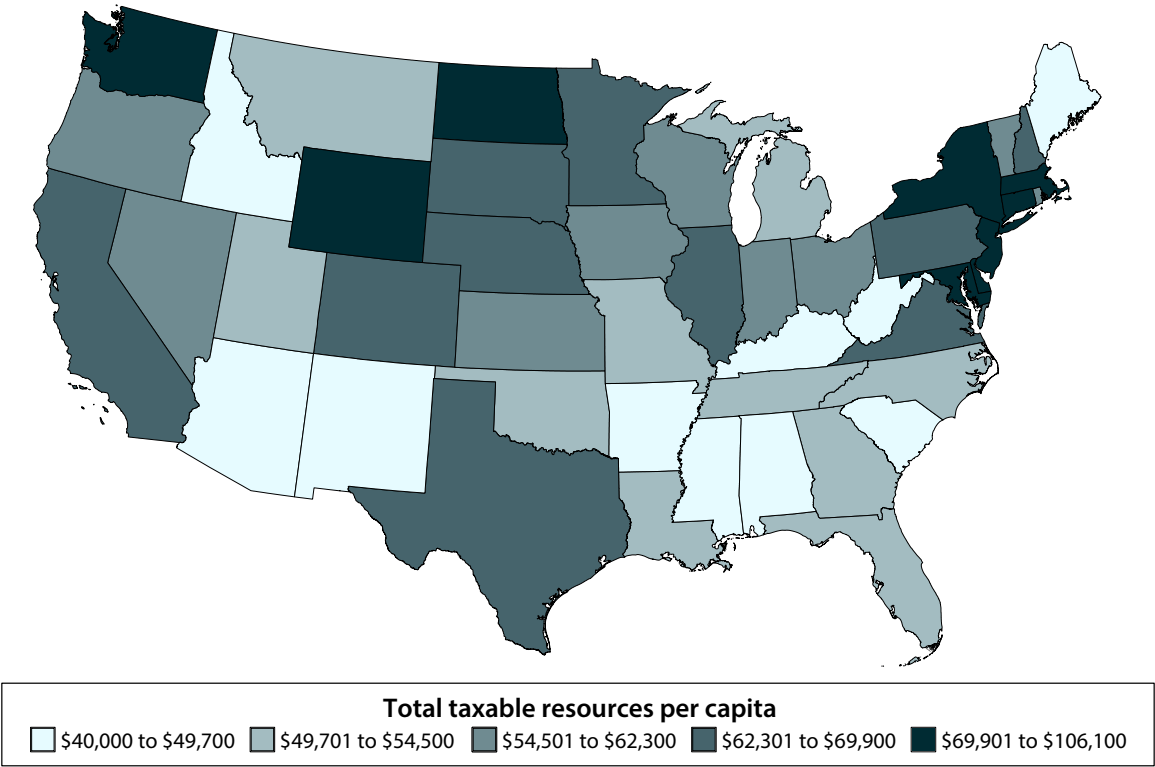
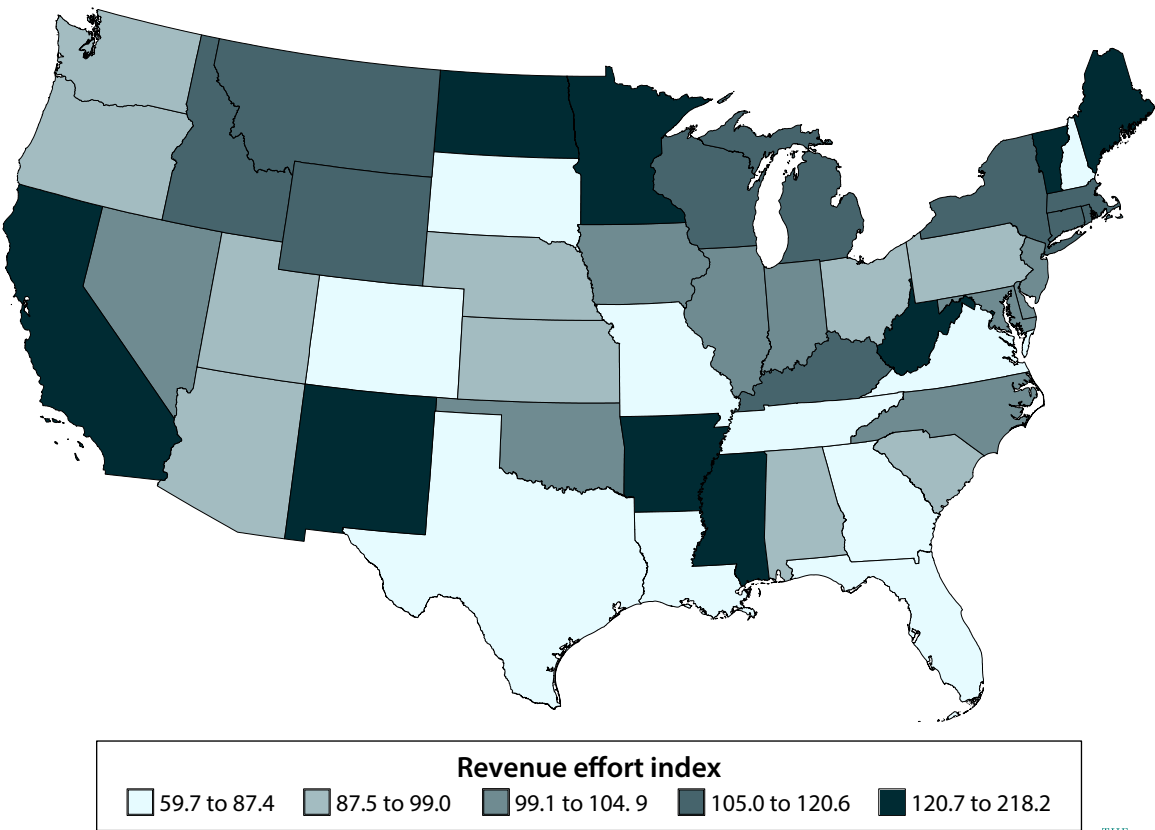


FIGURE 14B.  
Revenue Effort by State



Source: Census 2015; Treasury 2017; authors' calculations.  
 Note: Total taxable revenue is shown for the most recent year of data, which is 2015. The index of revenue effort is the ratio of the per capita tax revenues to the per capita total taxable resources. It is indexed to the population-weighted national average.

the United States average of \$62,300 (Treasury 2017). States in the Northeast and on the West Coast tend to have greater per capita revenue capacity, whereas states in the South generally have less. Many of the Plains states also have high TTR per capita, although much of their recent increase in capacity is likely attributable to oil and gas extraction.<sup>17</sup>

The revenues that states choose to raise are distributed somewhat differently across the United States. Figure 14b depicts an index of states' revenue effort—the ratio of a state's total tax revenue per capita to its TTR per capita—relative to the national average. Whereas states like Texas and New Hampshire have above-average revenue capacity, they have very low revenue effort. By contrast, a state like Arkansas has low taxable resources, but chooses to tax a relatively large portion of those resources. States like New York and California, which have relatively high potential revenue, also have high revenue effort. On average, despite the higher revenue effort in some places with low revenue capacity, low-vitality counties are in places with fewer resources to spend, meaning reduced public goods, education spending, social support spending, and other investments that help lift counties or individuals out of challenging circumstances.

## DECREASING MIGRATION

Migration has historically been an important mechanism by which labor markets equalize incomes across regions, as well as an important driver of wage growth (Ganong and Shoag 2017; Nakamura, Sigurdsson, and Steinsson 2017). In recent years, however, geographic mobility has declined (Molloy,

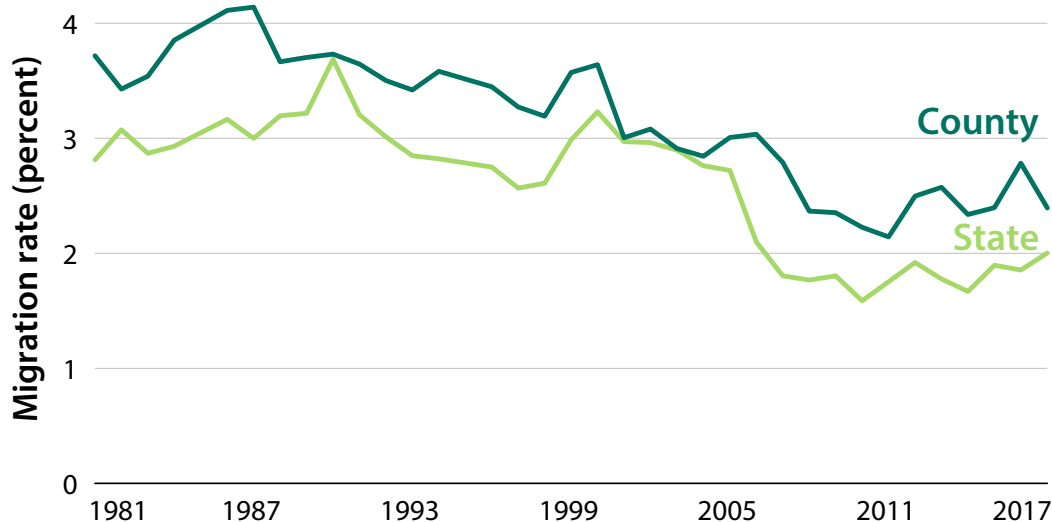
Smith, and Wozniak 2011; Molloy et al. 2016; Shambaugh, Nunn, and Liu 2018). Figure 15 depicts the decline in both intercounty and interstate migration.<sup>18</sup>

It is not fully clear what is driving this decrease in migration. Ganong and Shoag (2017) point to increasing housing costs that make it difficult for low-skilled workers to move to more-productive places.<sup>19</sup> Other research suggests that increasing occupational homogeneity across states has made it less necessary to move in order to access better employment opportunities (Kaplan and Schulhofer-Wohl 2017). In addition, Molloy, Smith, and Wozniak (2014) find that the returns to switching jobs have decreased over time.

Though decreased migration rates could be a cause for concern in their own right, low and falling mobility could also play a role both in exacerbating economic disparities between places and in slowing the rate of convergence. Moreover, falling migration rates could raise the returns to place-based policies, making it less likely that subsidies intended for local residents are instead captured by those who initially lived outside the target location, or by landowners in the struggling location (Kline and Moretti 2014). In fact, the positive association between county vitality and net prime-age migration into a county has weakened over time. This relationship is affected somewhat by house prices: when controlling for house prices in 2016, the relationship between migration and vitality strengthens, but house values do not change the relationship between vitality and migration in 1980 (authors' calculations; not shown). This suggests that house prices might matter more

FIGURE 15.

## Prime-Age Migration Rates across Counties and States, 1981–2017



Source: Current Population Survey Annual Social and Economic Supplement (BLS 1981–2017); authors' calculations.  
Note: Data are restricted to respondents ages 25–54. Data are interpolated for 1985 and 1995.

BOX 2.

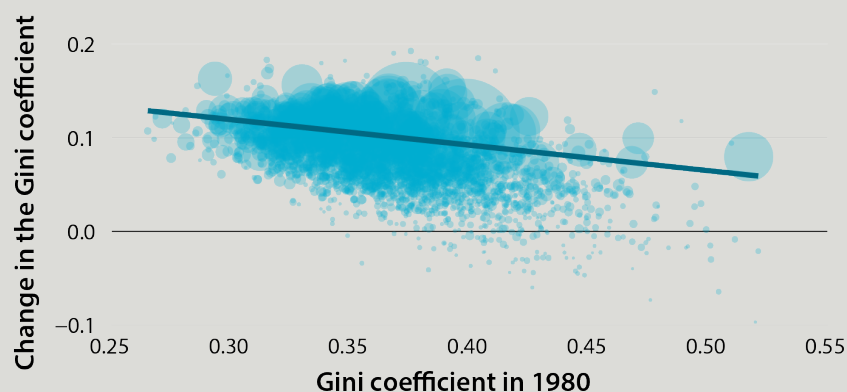
## Looking *within* Counties at Income Inequality and Poverty

Income inequality for the nation as a whole is high and rising. The Gini coefficient—a statistical measure of income inequality—in the United States rose from 0.40 in 1980 to 0.48 in 2016 (Census 2017). Some of this inequality is associated with disparities across geographic areas of the kind previously discussed in this paper, but there are also important disparities within counties.

In fact, not only has the United States overall seen an increase in inequality, but also counties across the United States have tended to become more unequal over time: the median county Gini coefficient has risen from 0.36 in 1980 to 0.46 in 2016.<sup>20</sup> However, internal inequality has risen most quickly for counties that were initially the most egalitarian, as shown in box figure 1.

BOX FIGURE 1.

### Level and Growth of Income Inequality by County, 1980–2016



Source: 1980 Decennial Census and ACS (Census 1980, 2012–16); authors' calculations.

Note: Bubble size is proportional to county population in 1980.

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Turning to county poverty rates, there is a large gap between the lowest quintile of county poverty (8 percent) and the highest quintile (23 percent) in 2016. These rates have converged somewhat since 1980. Poverty rates have gone up in the areas that previously had low poverty, while some high-poverty counties saw a decrease.<sup>21</sup>

The fact that poverty has gone up in previously low-poverty counties, or for that matter the fact that the poverty rate is still on average 8 percent in the lowest-poverty counties, underscores that being in a successful place does not eliminate the likelihood of being in poverty. A considerable number of very-low-income individuals live in counties that are doing well overall: 7 percent of extreme poverty Census tracts—tracts with a poverty rate of at least 40 percent—are in counties in the top quintile of median household income.

To take one example, the District of Columbia has experienced a sizable improvement in vitality from 1980 to 2016, moving from the second to fourth quintile of vitality. With a median household income in 2016 of \$73,000, which is well above the national average, the District of Columbia nonetheless contains 20 extreme poverty Census tracts and a concentrated poverty rate—the share of poor people living in extreme poverty Census tracts—of 22 percent. Box figure 2 shows median household income by Census tract within the District, illustrating the stark divides that exist within the nation's capital. In the next chapter of this volume, Bradley Hardy, Trevon Logan, and John Parman (2018) examine the interaction between racial and geographic disparities, which is a particularly important part of the story in the District of Columbia.

for migration today than they did in the past as high housing prices in high vitality areas dissuade in-migration.

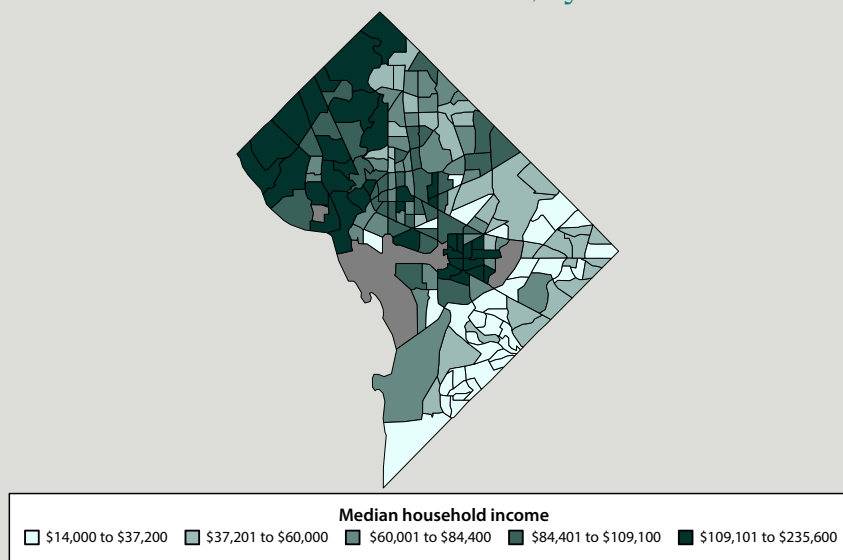
There is also evidence that people are not necessarily moving from low- to high-vitality counties. In fact, looking at migration data from 2015 to 2016, more than a third of people moving from a low-vitality county moved to a different low-vitality county, while just 13 percent moved to a high-vitality

county. In contrast, the bulk of people moving to high-vitality counties were coming from relatively high-vitality counties (see table 3). The limited extent of movement from struggling to thriving places may be an additional reason to take place-based policies more seriously today than in the past. Places are not converging quickly in economic outcomes, and people are often not moving to thriving places.



BOX FIGURE 2.

## Median Household Income in the District of Columbia, by Census Tract



Source: ACS (Census 2012–16).

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TABLE 3.

## County-to-County Migration by Quintile of Vitality Index in 2016

	Destination				
	1 (lowest)	2	3	4	5 (highest)
1 (lowest)	34%	22%	13%	18%	13%
2	18%	21%	23%	24%	15%
3	11%	24%	19%	21%	24%
4	12%	19%	17%	25%	27%
5 (highest)	7%	11%	17%	25%	39%

Source: Internal Revenue Service Statistics of Income (IRS 2015–16); ACS (Census 2012–16); IHME 1980–2014; authors' calculations.

Note: Percentages are probabilities of migration to a particular destination quintile for a given origin quintile. The Vitality Index is weighted by 2016 county population. Migration data consist of gross outflows from a county. Migration for a particular county origin-destination pair is observed only if at least 20 individuals moved from the origin to the destination over 2015–16.

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## Conclusion

The wide gaps in economic outcomes across places are striking: for example, the prime-age employment-to-population ratio is 83 percent in the top quintile of counties but only 67 percent in the bottom quintile. At both the regional and county levels,

convergence in income and overall vitality has slowed, making it less likely for struggling places to catch up to the rest of the country. Furthermore, the parts of the country with the most college graduates were already more successful in 1980 and have increased their lead in both education and economic vitality.

Along with the diminished geographic mobility of individuals, slowing convergence can make gaps across places more-permanent impediments to economic opportunity. Rather than a single economy offering broadly similar chances for advancement, the United States appears to be more a collection of disconnected economies with vastly different opportunities for economic advancement. Compounding this problem is a federal system that makes very different investments in local public goods depending on the resources of particular state and local governments.

It is therefore important to examine both the gaps across places and the characteristics of a place that have been associated with success or struggle. The analysis in this chapter underscores the complicated overlap of gaps across places: differences across regions, states, and counties are all substantial, as are differences within counties. This analysis affirms the central role of education in facilitating economic success, and also highlights the challenges that rural, manufacturing-intense, or highly undiversified regions face. Finding appropriate remedies in public policy will require a careful analysis of all of these patterns.

# Endnotes

1. As documented in Chetty et al. (2014), an individual's location of birth is also closely tied to their chances of increasing their economic standing. For example, in the bottom quintile of county upward mobility, a child born to parents in the 25<sup>th</sup> percentile of the income distribution reach, on average, the 36<sup>th</sup> percentile of the income distribution by the time they are 30. If born in the top quintile of county mobility, that same child would reach the 48<sup>th</sup> percentile of the income distribution.
2. The maps used throughout this chapter are Value-by-Alpha, or VBA, maps. For more information on VBA maps, see Roth, Woodruff, and Johnson (2011).
3. We calculated 2016 vitality using data from the 2012–16 five-year ACS published tables. Any reference to 2016 vitality is based on data from this five-year time span.
4. It would be reasonable to adjust median household income for cost of living, but we opted to not do this for two reasons. First, cost-of-living estimates that are comparable across places are not available for 1980. Second, cost of living may vary for reasons that are directly related to the county vitality we seek to measure. For example, a place with stronger labor demand or better local public goods could attract in-migration that contributes to higher housing prices. Finally, cost of living may reflect the amenity value of a place, and not simply inflated prices for the same goods and services.
5. In an unreported analysis, we incorporated rates of business formation into our vitality measure; however, it made only a negligible contribution to the measure, which is perhaps due in part to its being driven by shifts in population rather than differences in business dynamism.
6. Change in vitality, however, can be calculated only for counties that existed in both periods, and for counties for which data exist on all the Vitality Index components.
7. The index and the break points on the maps are constructed to be weighted by population. An equal number of people live in both yellow and blue areas, even if there is not an equal amount of yellow and blue land area.
8. Amior and Manning (2018) find that the persistence in joblessness in the face of migration can be attributed to persistence in labor demand shocks.
9. Parilla and Muro (2017) find that in terms of productivity, convergence across metro areas continued until the early 2000's, but was slowing down towards the end of the 20<sup>th</sup> century and has ended in the last 10 to 15 years.
10. We conduct a related analysis that examines convergence in vitality scores: If a place in 1980 is initially one standard deviation below the national mean of vitality, how many standard deviations of increase can we expect by 2016? The results of this analysis are in keeping with those focused on household income, although they have a somewhat different interpretation. When using a modified Vitality Index—which, for reasons of data availability, excludes life expectancy and incorporates the 16+ rather than 25- to 54-year-old employment-to-population ratio—we find strong convergence from 1980 to 2016, with weaker convergence from 1980 to 2016. In other words, the counties with low vitality are less likely to catch up to counties that are better off in the recent period than they were from 1980 to 2016.
11. Quintiles of rural population fraction are calculated as of 1980 and maintained through 2016. Population density and the percent of population that lives in a rural area of the county are highly negatively correlated, such that each is essentially the inverse of the other.
12. Here and in similar subsequent figures, we assign counties to bins (usually quintiles) based on initial-year values (in this case, 1980 values of rural population fraction) and then hold those assignments fixed when examining values in later years. In other words, counties remain within their initial bins.
13. One alternative possibility is that specialized places with employment concentrated in a small set of industries would benefit from enhanced agglomeration effects. However, there is some evidence that spillovers operate between industries, limiting the value of this type of industrial specialization (Glaeser et al. 1992).
14. We also constructed this figure while adjusting for industry mix (not shown). The most important differences made by this adjustment are (a) the least concentrated counties in 1980 score lower in vitality, and (b) the most concentrated counties in 2016 score somewhat higher.
15. While certainly correlated, the less-than-high-school share and college-educated share are distinct. Only roughly 50 percent of the counties in the highest quintile for college attainment are also in the quintile with the lowest share of individuals without a high school diploma.
16. Berry and Glaser (2005) document divergence in college attainment at the metropolitan area level from 1990 to 2000 and find that it is mainly driven by shifts in labor demand associated with the increasing wage premium for skilled people working in skilled cities.
17. Weighted based on county population in 1980 and 2016, respectively.
18. Counties that saw a decrease in poverty account for only 15 percent of the nation's population.
19. TTR is connected to vitality since both include a measure for income of a place. As such, county vitality is highly correlated with a state's TTR. This means that the lowest-vitality counties are often in the states that have the most limited resources to combat the problems in these counties.
20. Some of the decline in migration rate between 2000 and 2010 is likely due to a change in Census imputation procedure (Kaplan and Schulhofer-Wohl 2011).
21. Some have contended that barriers to migration to more-productive places may benefit less-productive places, if not workers themselves (Hsieh and Moretti, forthcoming).

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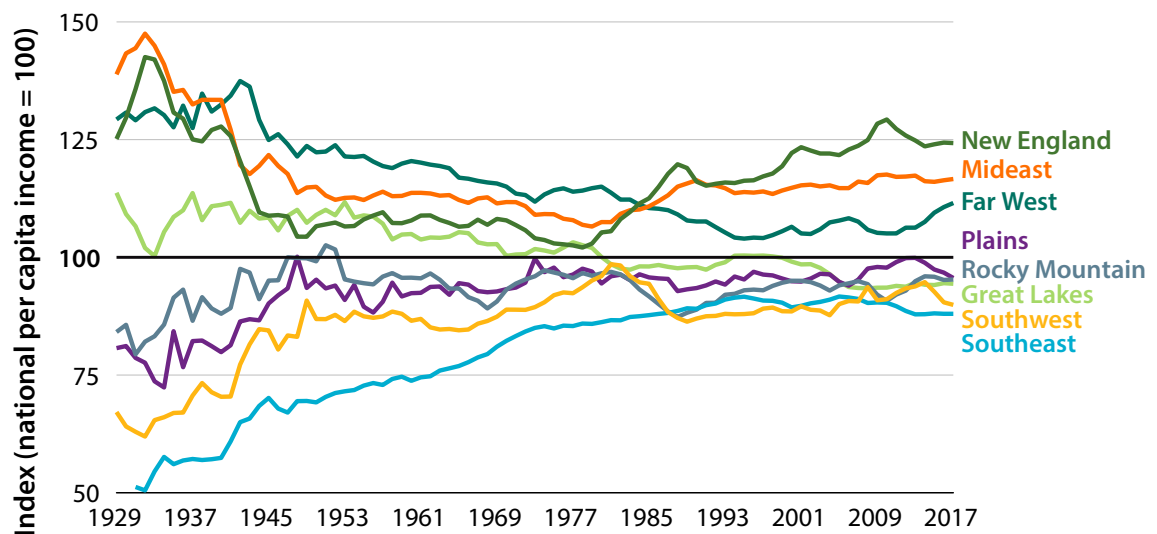
JAY SHAMBAUGH  
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## Abstract

Over the last several decades, the fortunes of regions and communities across the United States have stopped converging. Evolving patterns of trade and technology, among other factors, have created concentrated prosperity while leaving many places behind. In order to formulate an effective policy response at the local, state, and federal levels, it is necessary to understand how economic activity has shifted, as well as the factors that are associated with success or failure for particular places. To present a full picture of which places are thriving, how that picture has changed over time, and what factors are associated with success or failure, we created the Vitality Index, which measures the economic and social well-being of a place. We find that places in 1980 with higher levels of human capital, more diverse economies, lower exposure to manufacturing, higher population density, and more innovative activity tended to have higher vitality scores in 2016. Further, both the differences in fiscal capacity among states and declining migration rates can reinforce differences in economic outcomes across places. The analysis in this chapter underscores the complicated overlap of gaps across places: differences across regions, states, and counties are all substantial, as are differences within counties.

FIGURE 2.

### Per Capita Income Relative to the National Average by Region, 1929–2017



Source: BEA 1929–2018; authors' calculations.  
Note: Regions are BEA regional categories.

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