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# SOCIAL RETURNS TO EDUCATION: STRENGTHENING RURAL ECONOMIES

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J.A. and KATHRYN  
ALBERTSON FAMILY  
FOUNDATION



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## • ACKNOWLEDGEMENTS •

The Rural Opportunities Consortium of Idaho (ROCI) was launched by the J.A. and Kathryn Albertson Family Foundation of Boise, Idaho during the summer of 2013. Since then, Bellwether Education Partners and a task force of experts led by Dr. Paul T. Hill have been working to foster a better understanding of the issues that affect rural education, inform policy discussions, and bring attention to the unique needs and circumstances of rural school children. A series of reports, published over the next year, will examine issues including migration, technology, human capital, economic development, postsecondary enrollment and persistence, and more. Papers will be posted online at [www.rociidaho.com/research-publications](http://www.rociidaho.com/research-publications).

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## ABOUT ROCI • RURAL OPPORTUNITIES CONSORTIUM OF IDAHO



ROCI brings together some of the nation's best thinkers to conduct research on the challenges of rural education and identify innovations, programs, and models to address them. This effort informs a national body of work on rural education and explores implications for increasing the educational attainment and economic competitiveness of Idahoans and Americans.

## ABOUT J.A. AND KATHRYN ALBERTSON FAMILY FOUNDATION



The J.A. and Kathryn Albertson Family Foundation is a Boise-based, private family foundation committed to the vision of limitless learning for all Idahoans. Since 1997, the J.A. and Kathryn Albertson Family Foundation has invested almost \$700 million in Idaho. The J.A. and Kathryn Albertson Family Foundation honors the legacy of Joe and Kathryn Albertson, founders of Albertsons grocery store, however it is not affiliated with Albertsons LLC. Grant-making is by invitation only. For more information, visit [jkaf.org](http://jkaf.org).

## ABOUT BELLWETHER EDUCATION PARTNERS



Bellwether Education Partners is a nonprofit dedicated to helping education organizations—in the public, private, and nonprofit sectors—become more effective in their work and achieve dramatic results, especially for high-need students. To do this, Bellwether provides a unique combination of exceptional thinking, talent, and hands-on strategic support.



**The school is the last expenditure upon which America should be willing to economize.**

**Franklin D. Roosevelt**

**If you think education is expensive, try ignorance.**

**Andy McIntyre and Derek Bok**

## • PROLOGUE •

McCall, high up in the mountains of Idaho, is known for its winter carnival, smokejumper base, and the beautiful glacial lake on which it is located. Local sawmills drove much of its early economy.

Sometime in the 1930s, Warren Brown was at work in his father's sawmill, pondering how to keep the family business ahead of its competition. The mill's location on the lake gave the family the advantage of easy transportation and water submersion to prevent wood splitting; new chainsaws had given them the capacity to build inventory before the November snows. But with the lake frozen from January through April, the inventory was inaccessible. The Browns tried cutting the ice and pumping hot water over it; they tried covering the ice with ashes to promote sun melt. It all proved impractical and uneconomical. What else could they do?

But then Warren remembered that the physics of water was strange. The densest water, at the bottom of deep Payette Lake, never froze; it remained a steady 39 degrees Fahrenheit. If he pumped that warm lake water over the logs, he might be able to thaw them free and keep feeding the mill. If it worked, he would have to tell his physics teacher!<sup>1</sup>

## • INTRODUCTION •

Economic growth is about productivity: accomplishing more with less. The last few decades have made economists increasingly aware that human capital, the stock of knowledge and creative skills, is crucial to the productivity and economic well-being of our society. The introductory story of Warren Brown illustrates a primary effect of education on human capital: it provides knowledge that leads to innovation. It does not, however, tell us how a series of such educated decisions, and decisions regarding education, helped the Brown family and the City of McCall achieve greater and lasting prosperity.

In this study, we will explore the role of human capital and its social returns in rural economies, and how formal education contributes to the well-being of communities. Most studies on human capital and the social benefits of education have limited themselves to metro areas (for example, Moretti 2003; Florida, Mellander, and Stolarick 2008). Little is known about the existence of these externalities in rural places, where population density, and thus the potential for individual interaction, is lower. This study examines how rural areas fare and the ways in which policies to increase and attract an educated workforce can assist rural economies in building human capital.

## • HUMAN CAPITAL IN ECONOMIC GROWTH •

The following is a synopsis of research that has looked at the empirical relationship between education, human capital, and economic growth (productivity):

- Rauch (1991) shows that human capital spillovers increase a community's aggregated productivity, over and above the direct effect of human capital on individual productivity in metro areas. This is corroborated by Moretti (2004), who shows that an increasing supply of college graduates in a city also increases the productivity of high school dropouts, high school graduates, and college graduates.
- Glaeser (2000) attests that firms gain competitive advantages when they locate in regions with high levels of human capital.
- Bauer, Schweitzer, and Shane (2006) demonstrate that a state's high school and college attainment rates are important factors in its per capita income growth. This is corroborated by Berger and Fisher (2013), who show that a well-educated workforce is key to state prosperity, and by Barro (1991), who stresses the importance of human capital presiding over a country's GDP growth.
- Glaeser (2009) argues that a substantial stock of well-educated people can increase local resilience to shake off decline and start new economic development paths.

- Educated workers are less likely to use social safety net programs or get involved in crime and violent activities (Lochner and Moretti 2004), which reduces public expenditures and foretells economic growth (Alesina et al. 1996).
- Educated workers tend to have better health and lower rates of mortality (Grossman and Kaestner 1997; Lleras-Muney 2005), which increases lifetime productivity.
- Education increases the productivity of future generations: children of more educated parents have better cognitive abilities and higher academic achievements (Haveman and Wolfe 1995; Wolfe and Zuvekas 1995; Smith, Brooks-Gunn, and Klebanov 1999), and are more likely to be better educated, be better paid, and live out of poverty as adults (Duncan, Kalil, and Ziol-Guest 2008; French and Fisher 2009).
- The concentration of human capital facilitates innovation. Since skills and techniques are often transferred by imitation (Marshall 1890; Jaffe 1989), it is clear that the spatial concentration of human capital allows ideas to flow quickly and freely. Workers in areas of dense population have greater opportunity to observe errors and thus can learn to avoid them, which in turn increases their productivity (Glaeser 1994) or ability to specialize (Becker and Murphy 1992).

**While the U.S. Census Bureau and the U.S. Bureau of Economic Affairs offer a vast amount of information for states and urban places, they offer limited information for rural areas.**

All of the research mentioned was done using country, state, or city data; none, as far as we know, has used rural county data. The reason is simple: while the U.S. Census Bureau and the U.S. Bureau of Economic Affairs offer a vast amount of information for states and urban places, they offer limited information

for rural areas. In the next two sections we cover some of the available information. We first assess the state of education in rural counties and then correlate education with economic indicators such as income and poverty.



## • THE STATE OF EDUCATION IN RURAL REGIONS •

### DEFINING RURALITY

What is rural? Sadly, it is simply the leftover—it represents everything that was not covered as urban in economic and census data. This also means that counties successful in attracting people and creating jobs will eventually be reclassified as urban. It is therefore not strange that “the language of decline and disadvantage dominate rural discussion” (Isserman, Feser, and Warren 2009), since the definition of rurality imposes a selection process on counties that grow more slowly.

When we want to study the effect of human capital on rural economies, we should therefore use a definition for rurality that better allows us to look at economic performance over time. Definitions of rurality have changed considerably over time, and we will use the 1993 Rural-Urban Continuum Codes (1993-RUCC) as defined by the Economic Research Service (ERS) of the USDA (**Table 1**).<sup>2</sup>

• Table 1 •

## 1993 Rural-Urban Continuum Codes

Code	Description
0	Metro—Central counties of metro areas of 1 million population or more
1	Metro—Fringe counties of metro areas of 1 million population or more
2	Metro—Counties in metro areas of 250,000 to 1 million population
3	Metro—Counties in metro areas of fewer than 250,000 population
4	Non-metro—Urban population of 20,000 or more, adjacent to a metro area
5	Non-metro—Urban population of 20,000 or more, not adjacent to a metro area
6	Non-metro—Urban population of 2,500 to 19,999, adjacent to a metro area
7	Non-metro—Urban population of 2,500 to 19,999, not adjacent to a metro area
8	Non-metro—Completely rural or less than 2,500 urban population, adjacent to a metro area
9	Non-metro—Completely rural or less than 2,500 urban population, not adjacent to a metro area

Source: USDA Economic Research Service

## EDUCATION OF THE RURAL LABOR FORCE

### The geographic distribution of high school attainment

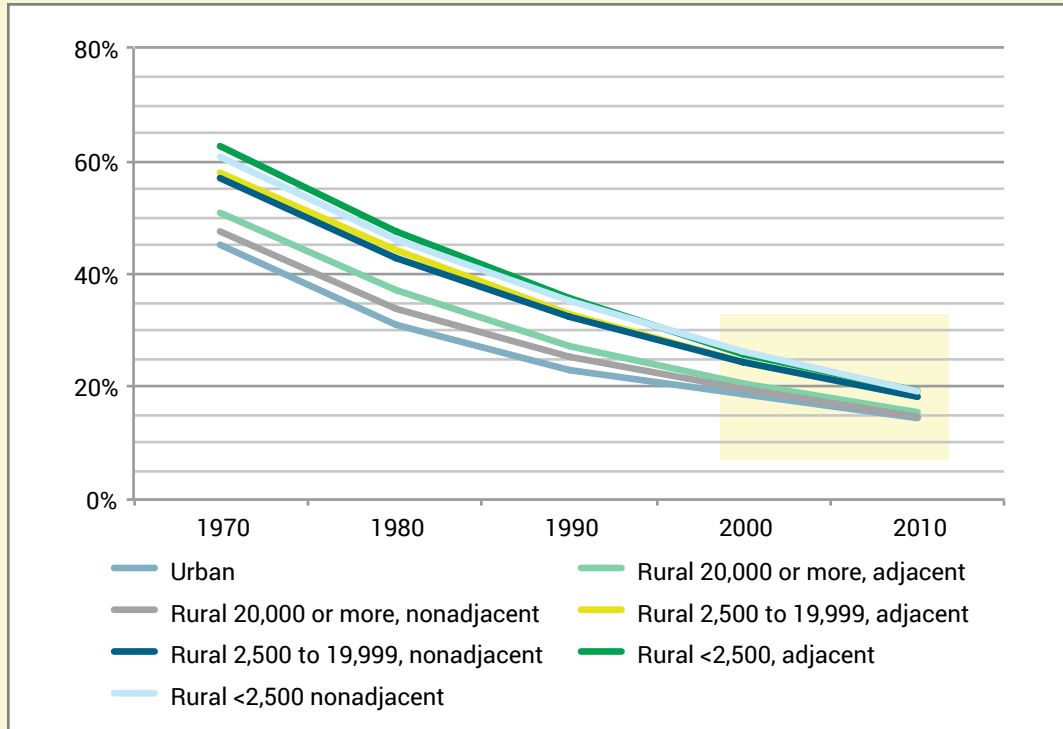
It is well known that educational attainment has increased significantly in the U.S. since 1970. The average percentage of adults (age 25 and over) with less than a high school diploma fell from 48 percent in 1970 to 15 percent in 2010 (USDA Economic Research Service 2015b).

**In 1970, the average percentage of adults without a high school diploma in the most rural counties (less than 2,500 urban population, not adjacent to a metro area) was 15 percentage points higher than in urban counties; by 2010 this difference was only five percentage points.**

The difference in high school attainment between rural and metro areas decreased during this period as well: In 1970, the average percentage of adults without a high school diploma in the most rural counties (less than 2,500 urban population, not adjacent to a metro area) was 15 percentage points higher than in urban counties; by 2010 this difference was only five percentage points (**Figure 1**).

• Figure 1 •

**Percentage of adults age 25 and over with no high school diploma by census year and level of rurality**



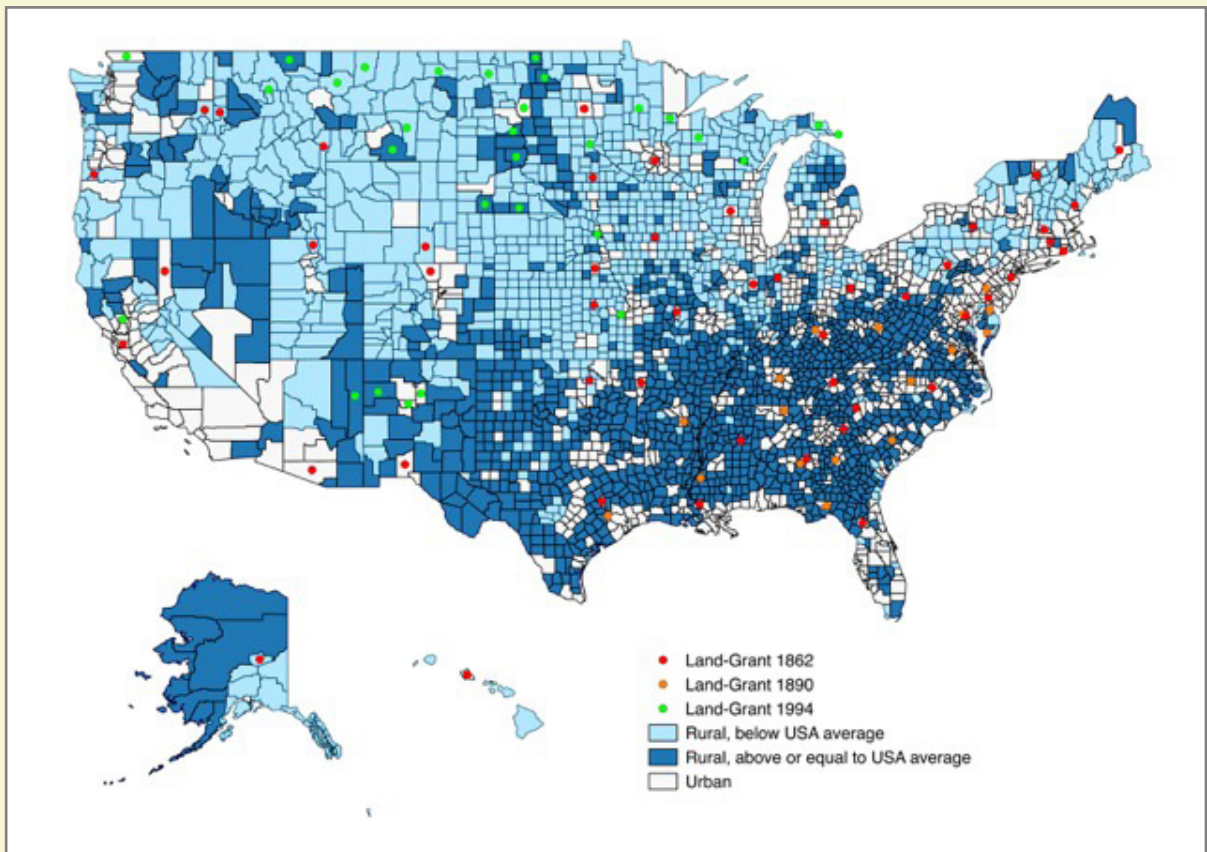
*Note:* Since we are only interested in research on rural counties, we aggregated all metro codes under “urban” to make figures and table easier to read.

*Source:* USDA Economic Research Service, County-Level Data

However, the geographic distribution of high school dropouts across the nation is still far from even. Individuals without a high school diploma are prevalent in rural counties in the southern states, as well as Nevada and Alaska. Several counties in the Dakotas and Idaho show higher than average proportions of adults without a high school diploma as well (Figure 2). While the average share is approximately 15 percent at the national level, the average percentage of adults without a high school diploma in these rural counties is 23 percent and can be as high as 52 percent.

### Individuals without a high school diploma in rural regions

• Figure 2 •



Note: The dark blue regions represent counties in which the percentage of adults age 25 and over without a high school diploma is equal to or above the USA average (2010).

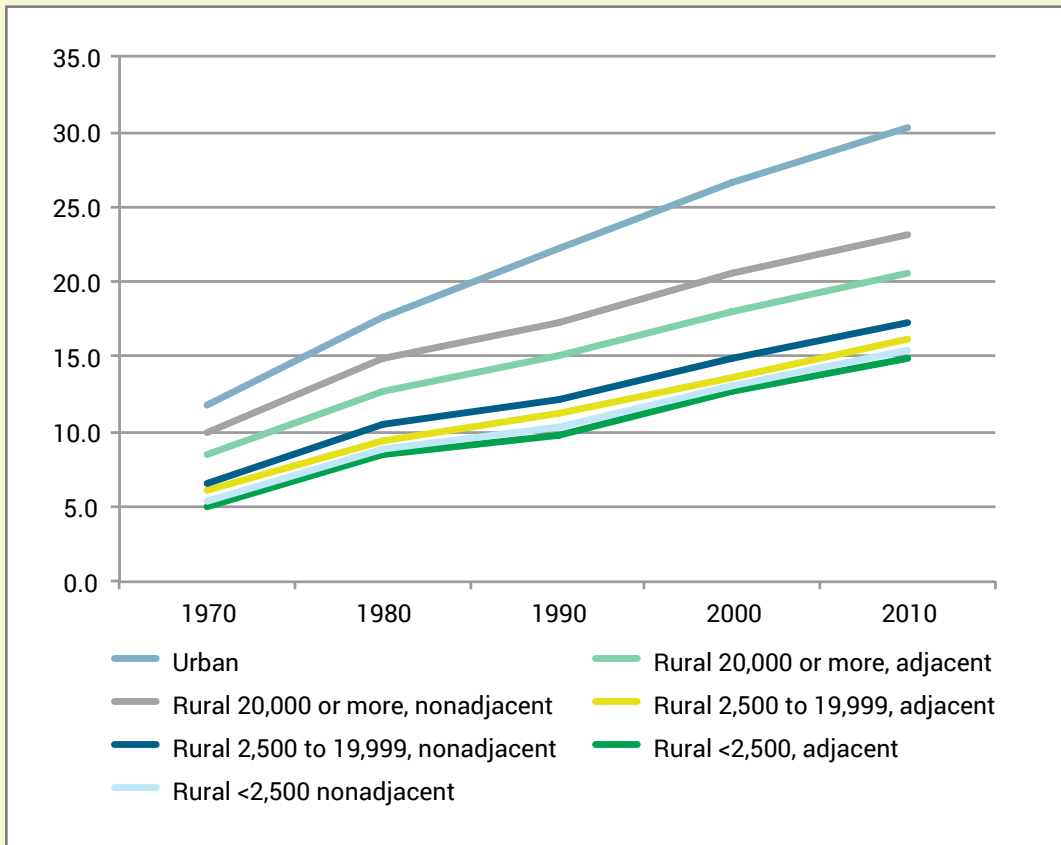
Source: USDA Economic Research Service, County-Level Data

### An increasing gap in advanced education

College graduation rates also increased in the period from 1970 to 2010. The percentage of U.S. adults age 25 and over with a bachelor’s degree or higher grew from 11 percent to 28 percent. Unlike with high school graduation, where the gap between rural and urban counties decreased, college graduation in rural counties grew at a significantly slower rate than in urban counties, thus increasing the attainment gap (Figure 3).

• Figure 3 •

### Percentage of adults age 25 and over with bachelor’s degree or higher by census year and level of rurality

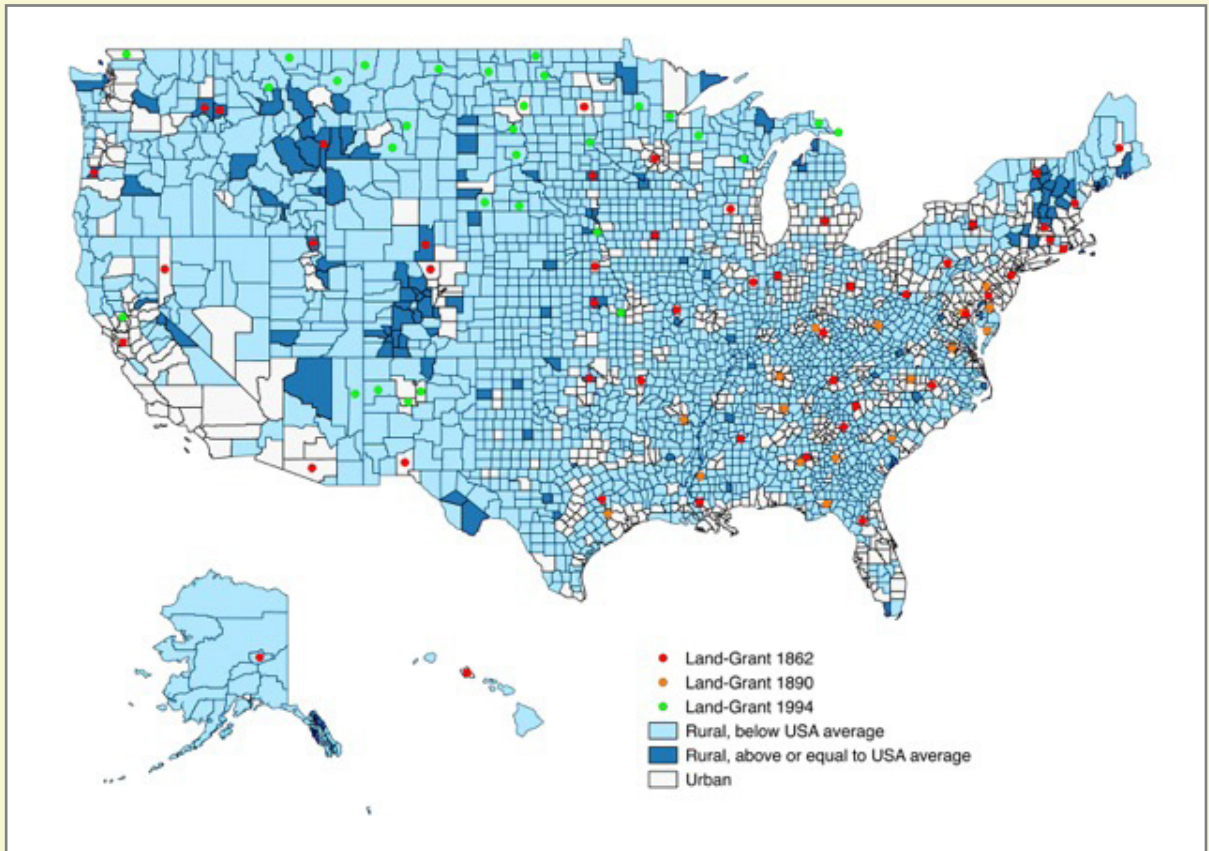


Source: USDA Economic Research Service, County-Level Data

Note that the national average of 28 percent of adults age 25 and over with a bachelor’s degree in 2010 is heavily weighted by urban counties since their population numbers are so much higher. So it comes as no surprise that most rural counties are below the national average. We can find scattered exceptions in most states, but there are pockets of rural counties with a larger-than-average percentage of adults age 25 and over who have a bachelor’s degree or higher in Colorado, Vermont, and New Hampshire, as well as along the Idaho-Montana-Wyoming border (**Figure 4**).

• Figure 4 •

**Rural counties in which percentage of adults age 25 and over with bachelor’s degree or higher is equal to or above the USA average (2010)**



Source: USDA Economic Research Service, County-Level Data

## • EDUCATION AND PRODUCTIVITY IN RURAL COUNTIES •

### MEASURING PRODUCTIVITY

How do we relate a community's educational attainment to its economy? We can do so by connecting education with productivity. As we noted earlier, productivity is the true driver of economic growth. If all else stays the same, a region that accomplishes more with less does things in a smarter way, reduces its waste, and increases its quality of life—or, in economic terms, becomes more productive.

Most researchers use the gross domestic product (GDP) as an indicator of economic activity. The GDP represents the total dollar value of all goods and services produced in a region over a specific time period, and economists associate an increase in GDP per capita with an increase in people's productivity and prosperity. The U.S. Bureau of Economic Analysis (BEA) estimates GDP for the nation, states, and urban areas, but not for counties or rural areas. We will therefore use a related measure, per capita personal income,<sup>3</sup> as an indicator of productivity.

Several scholars consider income a better measure of economic well-being than GDP.<sup>4</sup> An increase in output (GDP) does not necessarily translate into an improved standard of living: “[A]n influx of low-wage jobs can drive down average pay, and an increase in output can occur with little increase in employment or wages if it comes about through substituting capital for labor” (Berger and Fisher 2013).

We have noted that income goes up with education; how does productivity factor in? Educated workers are more likely to add value to products or services through innovative ideas, methods, and designs. Employers, then, are willing to pay a wage premium for educated workers' efforts, proportionate to the expected productivity or added value that they bring in. Economic theory stipulates that this increase in productivity translates to a matching increase in wages or income in a region.<sup>5</sup> Indeed, Berger and Fisher show that productivity and wages have increased more in states that have seen greater growth in the educational attainment of their workforce, positively correlating education with productivity.

It also matters how the reaping of increased productivity is distributed. If higher productivity translates to increased local wages and income, it can fuel local consumption and further local economic growth. If, instead, the benefits of higher productivity go to distant shareholders, or to a select few, a local economy is less likely to experience an uptick from increased consumption. Research confirms this for rural areas: prosperous rural economies consistently show a broader income distribution than their poorer counterparts (Isserman, Feser, and Warren 2009).

## PER CAPITA INCOME AND EDUCATION

Using per capita personal income, we measure how much of the new income generated by the increase of workers' productivity translates into personal income. *Note that, given the limited data available, our results do not demonstrate causality—only the existence of correlation.*

**The relationship between per capita personal income and the share of educated or uneducated workers does not change much by the level of rurality of the county.**

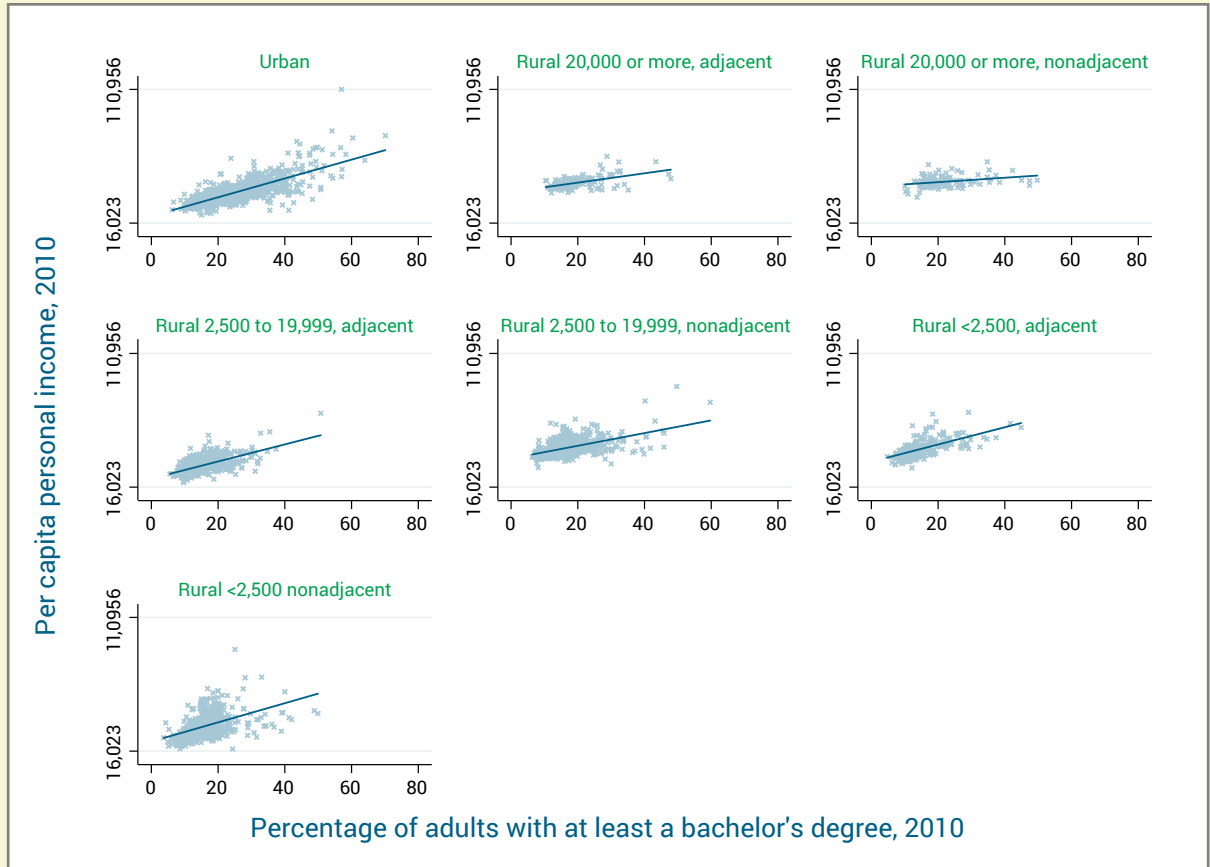
Our analysis shows that counties with a relatively large share of educated workers (adults age 25 and over with a bachelor's degree or higher) have higher per capita personal income (**Figure 5**). On the other hand, counties with greater shares of adult workers who did not receive a high school diploma have lower

per capita personal income (**Figure 6**). It is interesting to note that the relationship between per capita personal income and the share of educated or uneducated workers does not change much by the level of rurality of the county.



• Figure 5 •

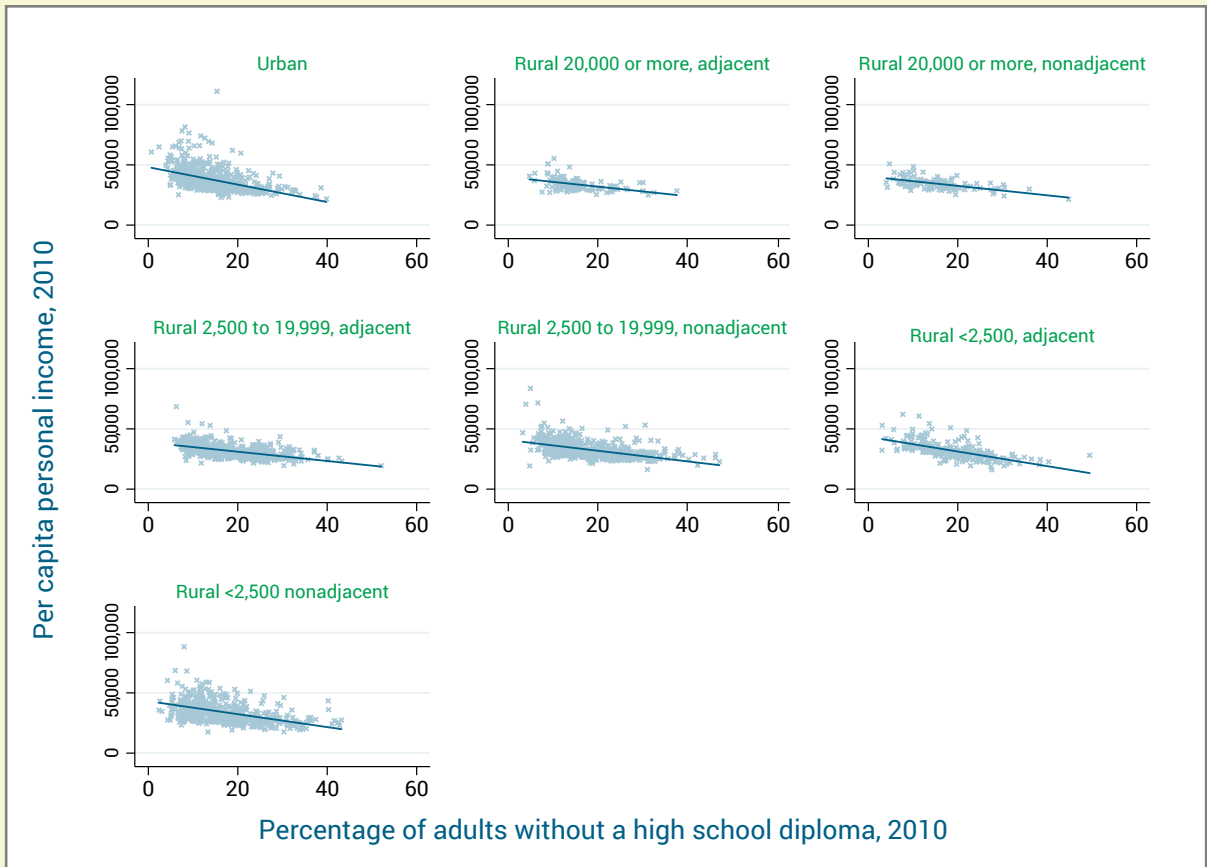
**Per capita personal income and percentage of adults age 25 and older with a bachelor's degree or higher by level of rurality (2010)**



Source: Own, using data from the USA counties database and the Bureau of Economic Analysis

• Figure 6 •

### Per capita personal income and percentage of adults age 25 and older without a high school diploma by level of rurality (2010)



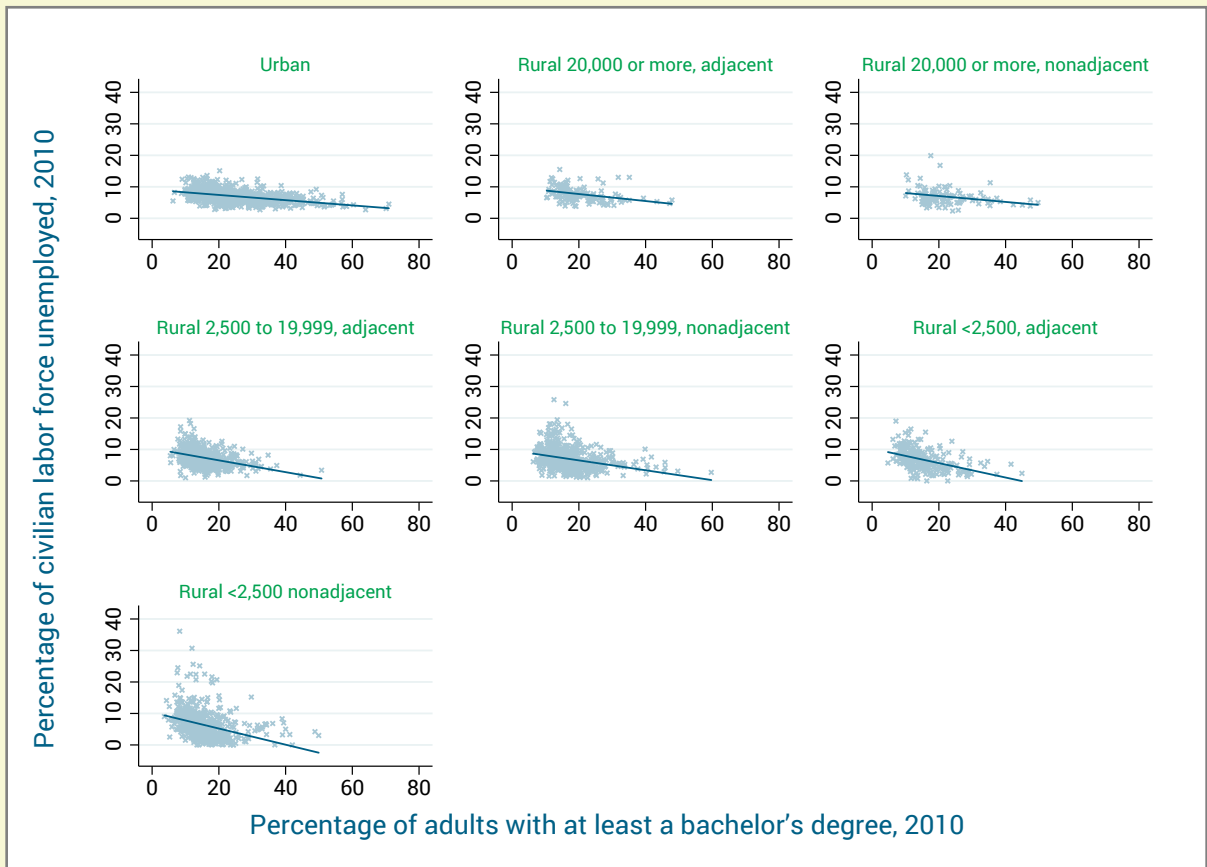
Source: Own, using data from the USA counties database and the Bureau of Economic Analysis

### Employment and Education

As we discussed previously, the correlation between per capita income and education is not surprising. We know that individuals with higher educational attainment earn more—approximately 7.7 percent more for each additional year of schooling (Lewin and Braak, 2015). Higher per capita income for those counties with more educated workers reflects not just higher hourly pay but more stable employment and lower levels of unemployment (**Figure 7 and Figure 8**). This result corresponds with French and Fisher’s (2009) research, which found that individuals with more education are more productive and more likely to be permanently employed

• Figure 7 •

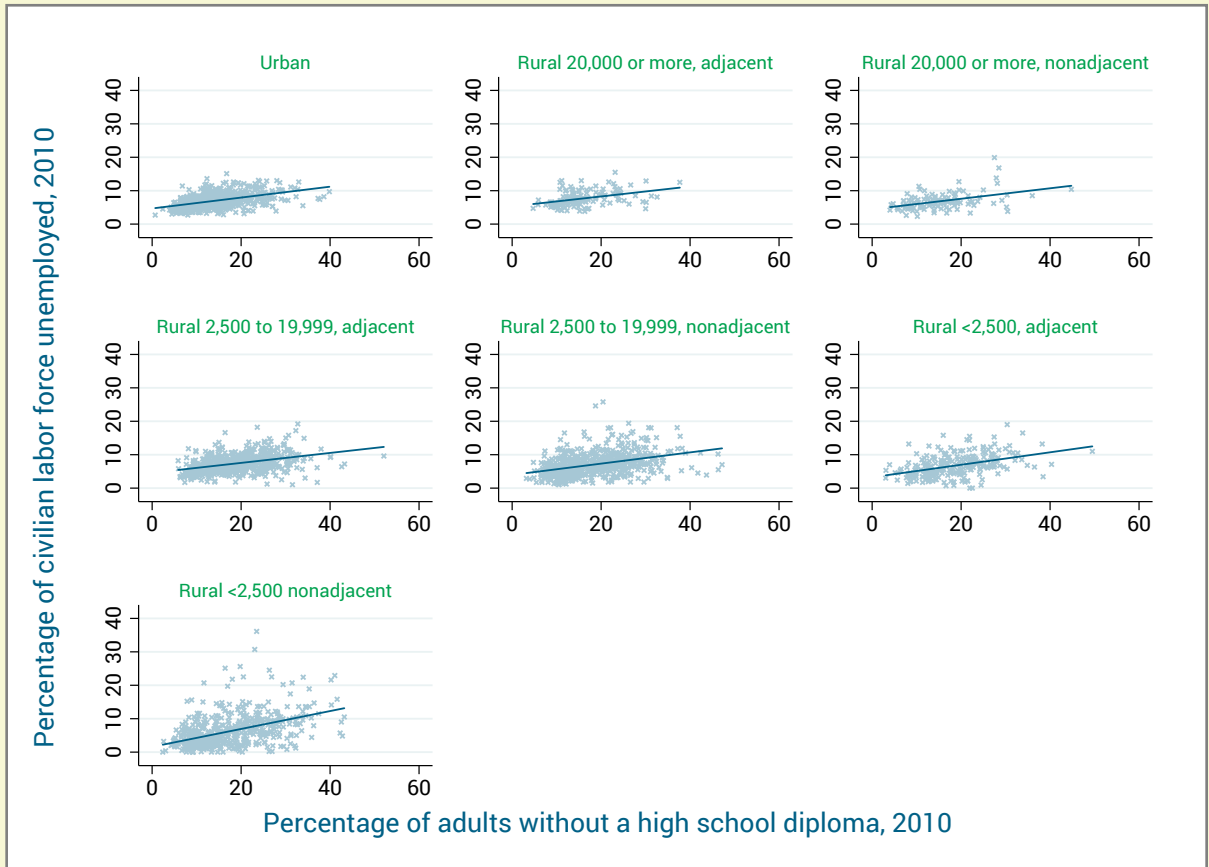
**Relationship between percentage of the civilian labor force unemployed and percentage of adults age 25 and older with at least a bachelor’s degree (2010) by level of rurality**



Source: Own, using data from the USA counties database

• Figure 8 •

**Relationship between percentage of the civilian labor force unemployed and percentage of adults age 25 and older without a high school diploma (2010) by level of rurality**



Source: Own, using data from the USA counties database

## INCOME IN COUNTIES WITH RISING EDUCATION

So far, we have seen that there is a positive correlation between the education level of a county, its per capita personal income, and a negative correlation with its unemployment rate. The next question is how much personal income in a county changes when its level of education increases. We know that most rural counties have been able to reduce the percentage of workers without high school diplomas, but they have not been equally successful in increasing the number of workers with a bachelor's degree or higher (**Figure 1 and Figure 2**).

**Our data suggest that when rural counties increase the level of education in their workforce, they see greater increases in per capita personal income. However, the opposite relationship is even stronger: counties that saw an increase in the percentage of adults without a high school diploma experienced relatively large declines in per capita personal income.**

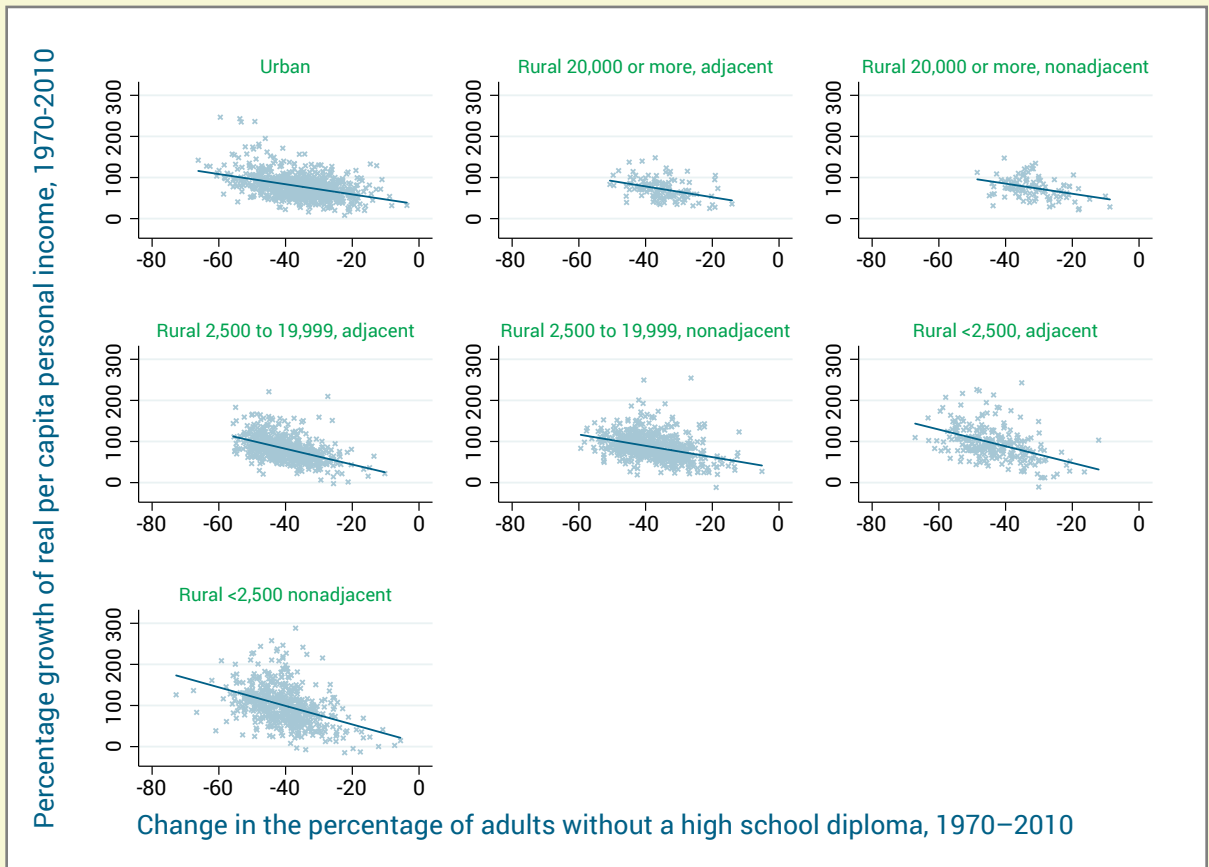
Our data suggest that when rural counties increase the level of education in their workforce, they see greater increases in per capita personal income (**Figure 9 and Figure 10**). However, the opposite relationship is even stronger: counties that saw an increase in the percentage of adults without a high school diploma experienced relatively large declines in per capita personal income. Figure 9 shows that between 1970 and 2010, rural counties with a greater decline in the percentage of adults without a high

school diploma experienced larger increases in their per capita personal income. Figure 10 shows the positive relationship between per capita personal income and the percentage of adults with at least a bachelor's degree in rural counties with a population below 20,000.

There are counties that are able to offer reasonably high per capita personal income without a well-educated workforce. Most of these benefit from a valuable natural resource industry—for example, oil and gas in Texas, Florida, the Dakotas, and Alaska. In the case of North Dakota and Alaska, it may also be a matter of being forced to offer high nominal wages to attract workers because of the high cost of living in these remote locations.

• Figure 9 •

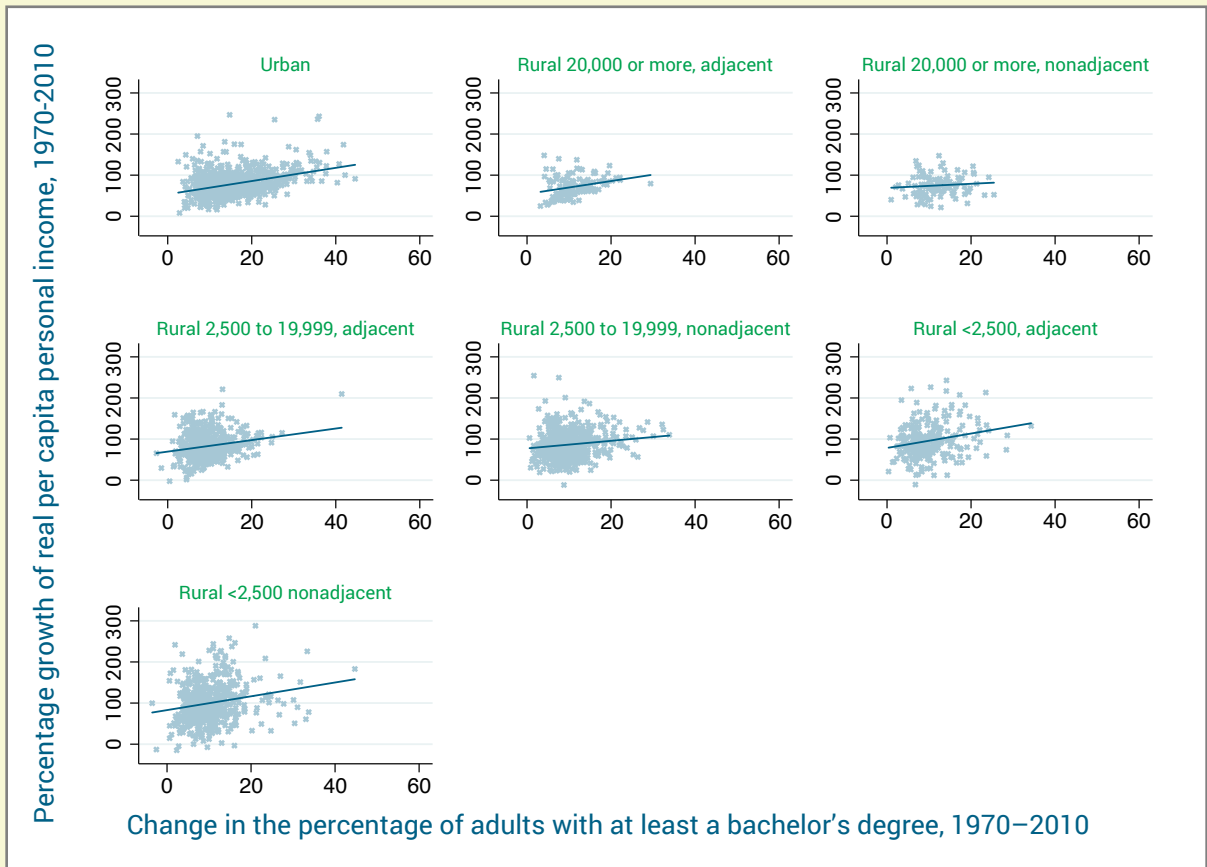
**Relationship between growth of per capita income and percentage-point reduction in percentage of adults age 25 and over without a high school diploma (1970–2010) by level of rurality**



Source: Own, using data from the USA counties database and the Bureau of Economic Analysis

• Figure 10 •

**Relationship between growth of per capita income and percentage-point increase in percentage of adults age 25 and over with at least a bachelor’s degree (1970–2010) by level of rurality**



Source: Own, using data from the USA counties database and the Bureau of Economic Analysis

Our analysis thus far suggests that education is associated with both income and a worker’s productivity. We need to view these results with some caution, however, since per capita *personal income* (as opposed to median wages) will rise even if all the gains for increasing productivity are captured by the company shareholders, rather than by workers. This effect is quite visible in the rising income inequality in the nation, which has increased substantially in the last 40 years. The overall level of inequality today is close to the extreme level that prevailed before the Great Depression (1929). For example, top executives in 1965 made 24 times more than the average production worker, whereas in 2009 they made 185 times more (Economic Policy Institute 2011).

## EDUCATION VERSUS POVERTY

We can further test the assumed link between education and per capita personal income by reviewing correlations between education and poverty. This test is not perfect, however, because a social safety net may affect its results.

**Our results indicate that higher levels of education reduce poverty levels, and more so at higher levels of rurality.**

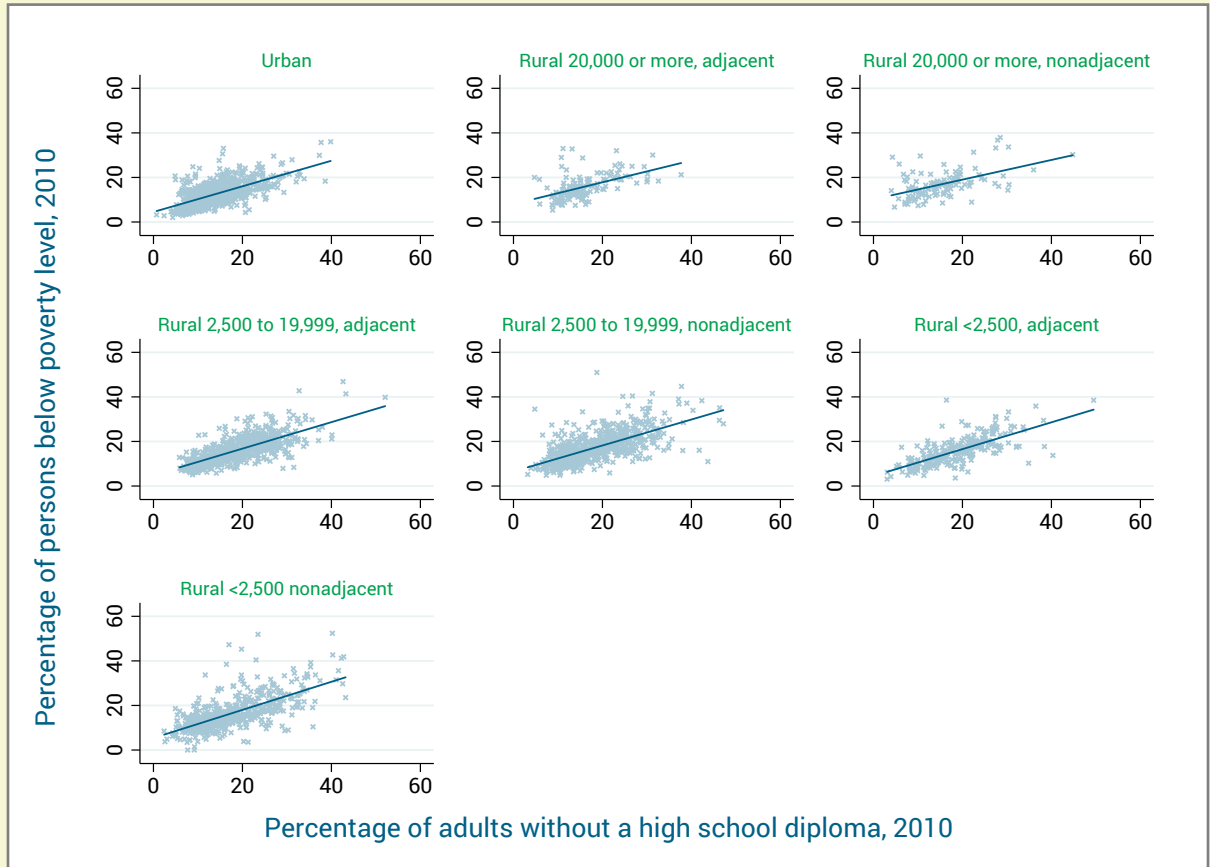
Our results indicate that higher levels of education do reduce poverty levels, and more so at higher levels of rurality. Figure 11 shows that the share of high school dropout workers is correlated with the share of people in poverty. For

example, in rural counties with cities of 20,000 people or more, adjacent to a metro area, a percentage point decrease in the percentage of adults without a high school diploma correlates to a decrease of 0.44 percentage points in the poverty level; in the case of rural counties with cities of 2,500 people or less, nonadjacent to a metro area, this decline is about 0.62 percentage points. On the other hand, the percentage of adults with at least a bachelor's degree is negatively correlated with the poverty level in rural counties with cities of fewer than 20,000 people. This effect is directly proportional to the level of rurality of the county. For example, in most rural counties with cities of 2,500 people or fewer, a percentage point increase in the percentage of adults with at least a bachelor's degree correlates with a reduction of 0.52 percentage points in the poverty level.



• Figure 11 •

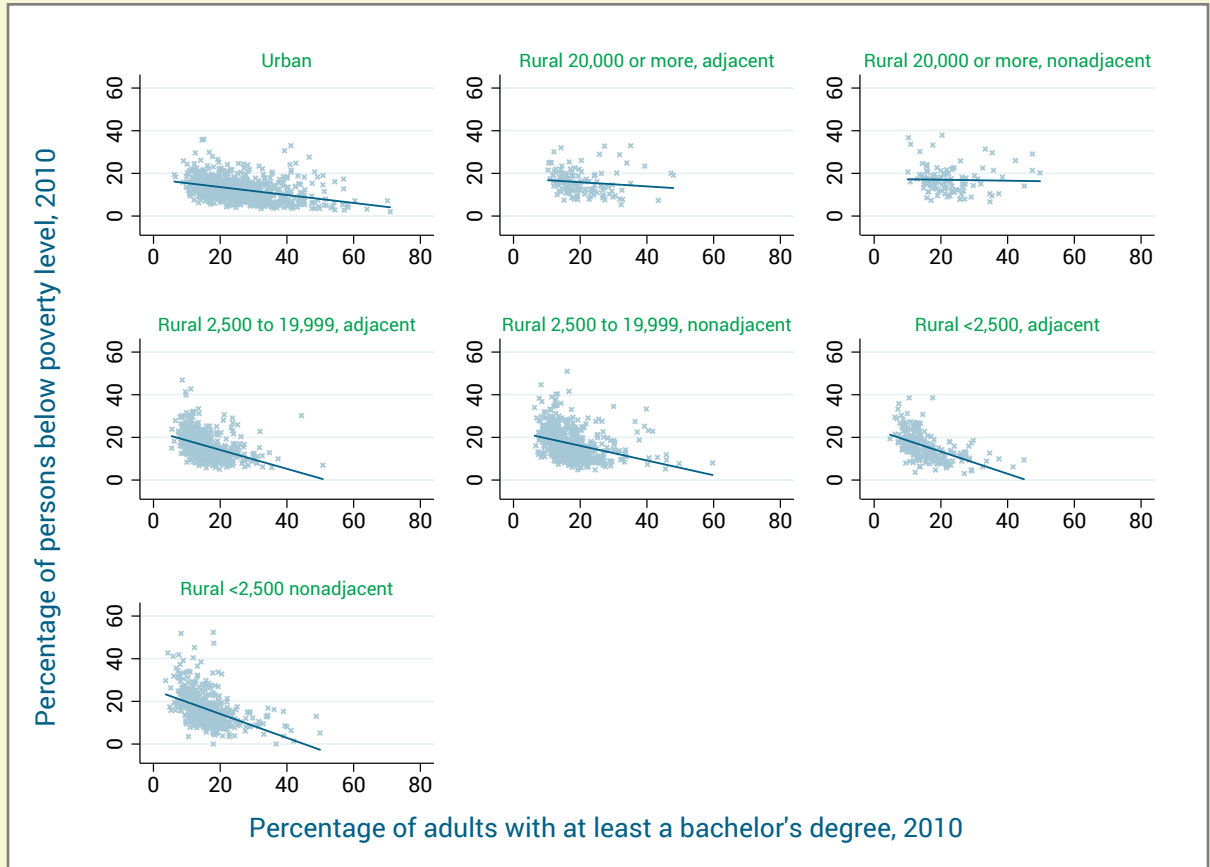
**Relationship between percentage of persons in poverty and percentage of adults without a high school diploma (2010) by level of rurality**



Source: Own, using data from the USA counties database

• Figure 12 •

**Relationship between percentage of persons in poverty and percentage of adults with at least a bachelor's degree (2010) by level of rurality**



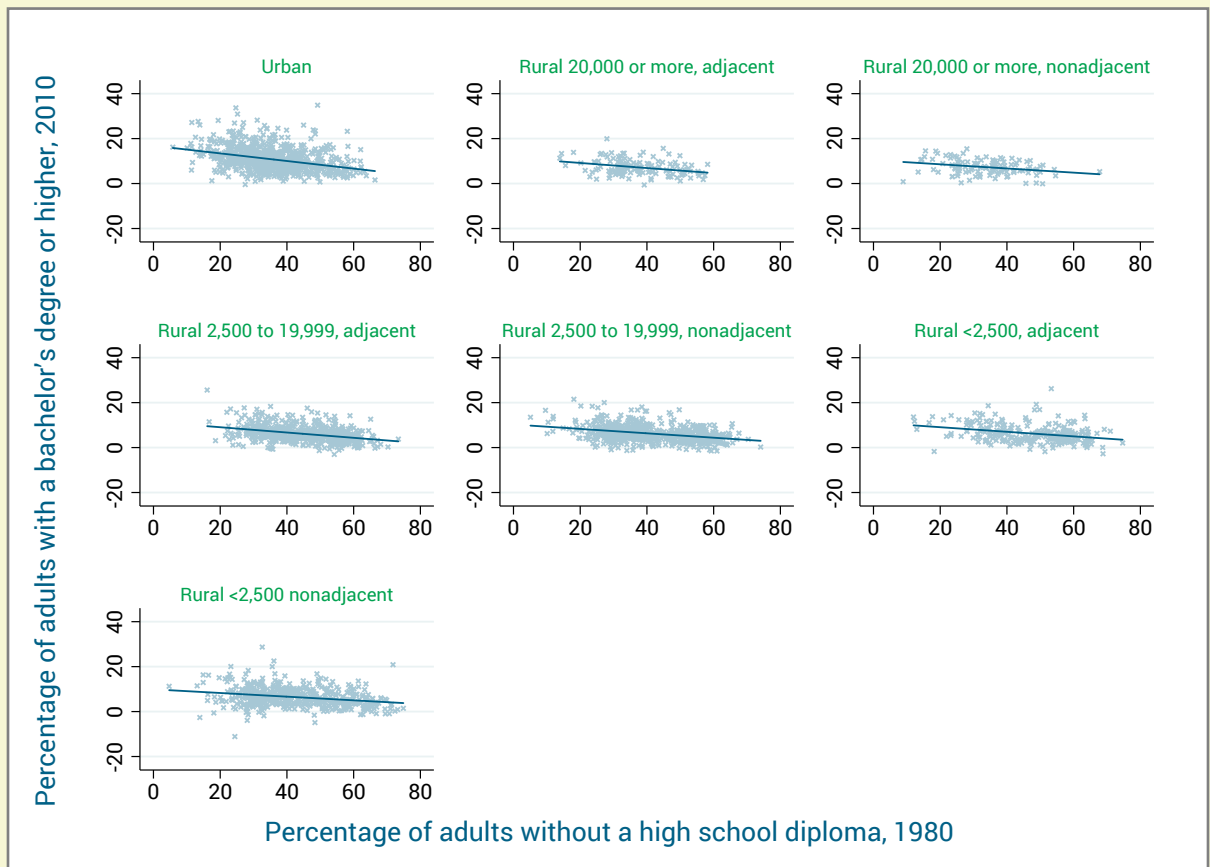
Source: Own, using data from the USA counties database

## EDUCATION BEGETS EDUCATION

Education not only leads to a better standard of living but also increases the productivity of future generations. Figure 13 shows that the share of workers with a bachelor’s degree or higher grew more between 1980 and 2010 in rural counties with a lower share of high school dropouts. Researchers have shown that, regardless of genetic disposition, children of more educated parents have better cognitive abilities and higher academic achievement (Haveman and Wolfe 1995). These children are more likely to be better educated and better paid, and to live out of poverty as adults (Haveman and Wolfe 1995; French and Fisher 2009).

• Figure 13 •

### Relationship between percentage of adults age 25 and older without a high school diploma and growth in percentage of adults age 25 and over with at least a bachelor’s degree (1980–2010) by level of rurality



Source: Own, using data from the USA counties database

## • IS EDUCATION A SMART ECONOMIC DEVELOPMENT POLICY? •

Does the correlation between education, productivity, and income mean that rural counties can strengthen their economies by adopting policies that increase the number of well-educated workers? We believe so, even though the effect is neither guaranteed nor immediate. As we mentioned earlier, education is important in economics because it promotes productivity, either directly by helping employees work smarter, or indirectly by the externalities that support a better-functioning society. Education may increase the potential productivity of a population, but there are many factors that influence whether or not a region actually translates that potential into reality. In the concluding section of this paper, we will discuss factors that increase opportunities for a region to build education-driven productivity. Here, however, we will discuss two strategies rural regions can use to build up their educated stock: by increasing the educational attainment of their own populations and by supplementing their own population with more educated workers from outside the region.

### INCREASING THE EDUCATIONAL ATTAINMENT OF THE RESIDENT POPULATION

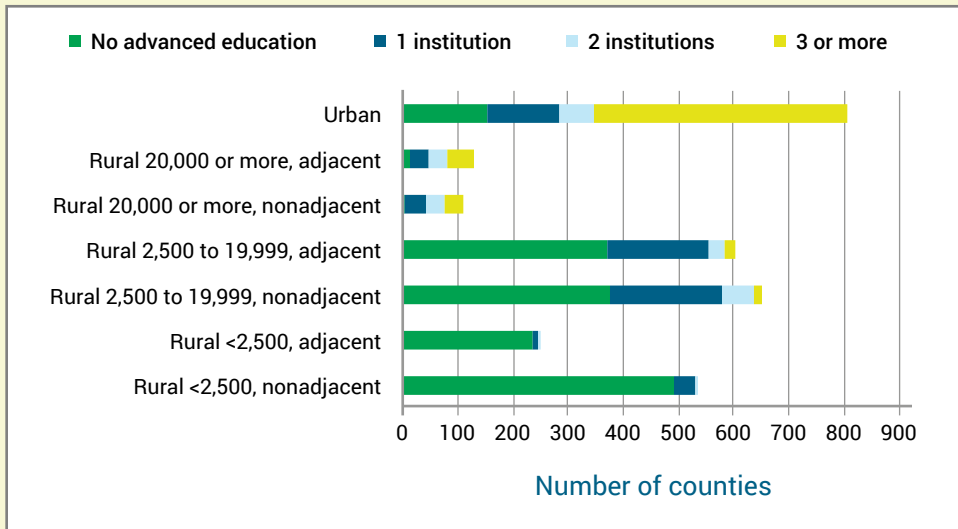
Since states have done an admirable job of improving high school graduation rates, regions will have to focus on advanced education as the next frontier. The Morrill Acts of 1862 and 1890 brought higher education to every state in the U.S., specifically covering rural areas at the time of enactment. Most of the home counties of these land-grant universities have since transformed themselves into urban areas, or have at least an above-average educational attainment (**Figure 4**). This transformation suggests the answer to the chicken-or-egg question that often accompanies questions about educational policies and whether or not education should drive or follow.

Does a region need to have local institutions to increase educational attainment, or can residents go elsewhere? Or is it desirable for students to return to their home region after graduation?<sup>6</sup>

Locally available higher education drives a number of positive side effects (externalities) in economic growth.<sup>7</sup> How do rural counties fare in the availability of advanced education? Figure 14 shows the availability of advanced education in increasingly rural counties. Only 35 percent of rural counties (according to the 1993 RUCC definition) had some type of advanced education in 2012 to serve the population (based on data from the Carnegie Foundation for Advanced Teaching). That percentage drops to eight percent if we look for colleges that offer a bachelor’s degree.

### Number of institutions for (any type of) advanced education in counties as classified by the 1993 RUCC in 2012

• Figure 14 •



Note: Some 65 percent of rural counties had no advanced education available to them. Note that 19 percent of urban counties had no advanced education either.

Source: American Community Survey (demographics) and Carnegie Foundation (educational institutions)

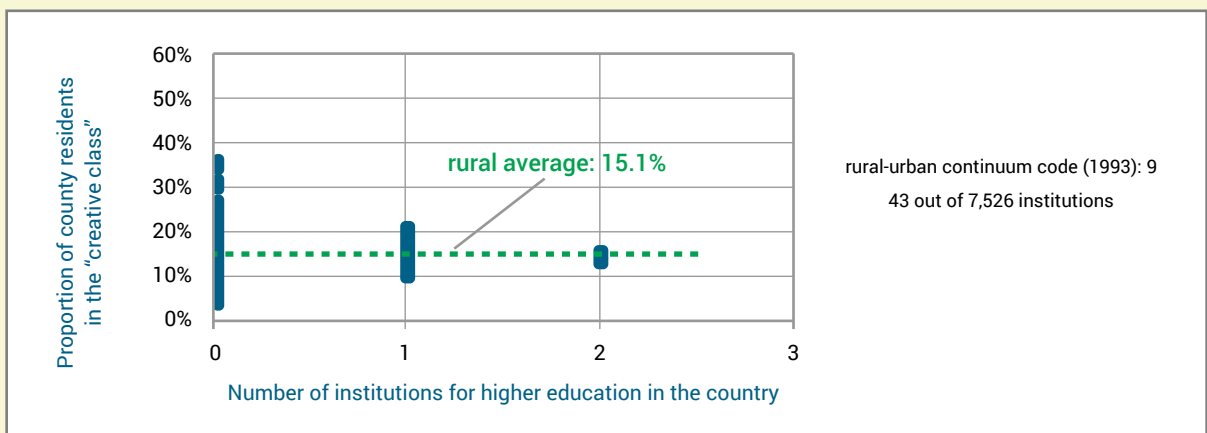
## ATTRACTING WORKERS EDUCATED ELSEWHERE

As with any type of capital, human capital can be acquired or attracted. The United States has a long history of attracting the best and brightest from all over the world to contribute to its economic growth. Successful cities and regions have learned this as well, and communities increasingly position and remake themselves to attract and retain the “creative class”—the innovators, entrepreneurs, and knowledge-based workers who drive economic growth (Florida 2003; Lewin and Braak 2015).

Which comparative advantages allow rural regions to compete with urban areas in attracting the creative class? When we inventory the creative class in relationship to availability of higher education for the most rural counties (<2,500 population; no adjacent metro area), we see that several counties with no opportunities for advanced education<sup>8</sup> have a much higher presence of the creative class than the 15 percent average for all rural counties (**Figure 15**). Many of these communities are concentrated in the Greater Yellowstone Ecosystem (the Wyoming-Idaho-Montana tri-border area) and Colorado Rockies in the West, or in the Adirondack, Green Mountains, and some coastal communities in the eastern United States (also evident in **Figure 4**).

• Figure 15 •

### Proportion of creative class versus the availability of advanced education in rural counties, including gateway communities to natural parks and similar amenities (Aspen, Jackson Hole, etc.)



*Note:* The graph clearly shows that these places are magnets for the creative class, reducing the correlation coefficient.

*Source:* American Community Survey (demographics) and Carnegie Foundation (educational institutions).

The access to natural amenities may attract the creative class, but gateway communities have their own set of problems: they struggle to balance overcrowding and preservation, are under great pressure to increase the capacity of the (low-wage) hospitality industry, and have difficulty offering affordable housing (Howe, McMahon, and Propst 1997). Over time, however, many gateway economies seem to diversify and their economies become more sustainable. Blaine County in Idaho (population 21,000), where the nation's first destination winter resort, Sun Valley, opened its doors in 1936, is now surprisingly diversified considering its remote location, and is headquarters for nationally recognized businesses like Smith Optics and Rocky Mountain Hardware.

Out of the 135 rural counties with high levels of education (where the percentage of adults with at least a bachelor's degree is higher than the national average), 62 percent have mountain or hill topographies. Also, if we use the recreation index<sup>9</sup> developed by the USDA ERS to approximate the level of amenities in a county, we find that 50 percent of rural

**Out of the 135 rural counties with high levels of education (where the percentage of adults with at least a bachelor's degree is higher than the national average), 62 percent have mountain or hill topographies. This contrasts with the 1,334 rural counties whose high school dropout ratio is higher than the national average, where 41 percent are in flat or irregular plain topography.**

counties with a high level of educated workers are recreational counties. This contrasts with the 1,334 rural counties whose high-school-dropout ratio is higher than the national average, where 41 percent are in flat or irregular plain topography and only eight percent have a high USDA ERS recreation index.

Counties cannot change their topography or their concentration of natural amenities, but they can implement policies to develop useful features, facilities, or traditions that attract educated workers. For example, the

people in Idaho's Latah County, which is also home to a land-grant university and has a rolling hill topography with cereals and legumes, invest heavily in one of the larger yearly jazz festivals in the Pacific Northwest and in streaming performances from New York City's Metropolitan Opera, live and in high-definition. These activities not only generate income from visitors from the surrounding areas, but also make it attractive to educated workers.

## ATTRACTING JOBS THAT DRAW EDUCATED WORKERS

Amenities may be a prerequisite, but they are not sufficient to retain or attract educated workers. The economic structure of a region is a significant factor as well. Different industries demand varying levels of skill and knowledge, thus affecting the labor force or human capital present in the county. The USDA ERS has determined the economic dependency<sup>10</sup> of rural counties. Table 2 shows that 41 percent of rural counties with a high level of educated workers have service-dependent economies and 28 percent of them have government-dependent economies (which can range from national labs to forest service). In contrast, 33 percent of rural counties with a high level of uneducated workers have manufacturing-dependent economies and 16 percent of them have farming-dependent economies.

• Table 2 •

### Economic-dependence indicator for rural counties in which the percentage of adults age 25 and over without a high school diploma or bachelor’s degree or higher is above or equal to the U.S. average (2010)

Economic dependence indicator	Counties where percentage of adults without high school diploma is higher than national average	Counties where percentage of adults with bachelor’s degree plus is higher than the national average
Farming dependent	208	9
Mining dependent	88	2
Manufacturing dependent	455	12
Federal/state government	148	37
Services dependent	32	51
Non-specialized	404	24
<b>Total</b>	<b>1,335</b>	<b>135</b>

Source: Own, using data from USDA ERS



These distinctions in economic dependency are quite encompassing. The point to take home from economic dependencies is that some sectors favor educated workers more, providing a region with a comparative advantage when it comes to the creative class.

## IMPORTING JOBS THROUGH TAX BREAKS

Over the years, states and counties have engaged in bidding wars to attract large firms to their region. These wars have generally employed tax incentives, such as credits, exemptions, and deductions, to make one region appear to be a better business operating climate than another. The practice has continued, if not grown, as a result of the economic decline that rural regions have experienced. The justification for these federal, state, and local tax incentives is that they are a small investment compared to the potential boost the company will give to the entire region. Tax incentives are therefore perceived as good politics, with the goal of creating more jobs, investments, and overall economic growth for the region. Economic benefits, however, refers not only to jobs and local investment but also to the distribution of benefits among different groups in society and over time.

Studies regarding the effect of tax incentives on economic growth show that they are generally not effective (Lynch 2004, Fisher 2013, Mazerov 2013). The share of state and local taxes in the cost function of businesses is too small to play an important role in their location decisions. It only works when companies can move closer to the source of their raw material or to their clients, and thereby reduce their costs, or when there is a qualified workforce in the area.

This does not mean that companies do not appreciate or try to negotiate tax incentives. And regions may have reason to use incentives in order to attract a business that brings in a large proportion of educated workers that may benefit the region's economic structure, as discussed in the previous section. Tax incentives can otherwise be very expensive for rural counties, since their use decreases the existing tax base and can put a strain on the provision of certain public services—such as infrastructure, education, and even waste treatment—that are needed to retain or attract the creative class. The negative effects of tax incentives are a stealth problem. Since tax breaks are usually considered as foregone revenues and therefore not included in the county budget processes, counties do not feel compelled to evaluate their success, and thus they escape attention.

## • HOW LOCALITIES CAN LEVERAGE EDUCATION FOR ECONOMIC GROWTH •

Education promotes creativity<sup>11</sup> and provides the required skills to bring ideas to life. It promotes innovation by networking science and applications and helps start-up communities, be it through industry-academic partnerships or alumni relationships. All of this is essential in entrepreneurship and business development, but it does not come automatically: education needs leverage and an outlet.

Take Detroit, for example, where strategic outsourcing since the 1970s exported much of its innovation elsewhere. The effect on the automotive business is still being debated, but it certainly degraded the local ecosystem of innovation and supplier externalities in greater Detroit. Despite a world-class university in nearby Ann Arbor, Detroit became the poster child for decay—losing a million residents, who left 70,000 vacant lots—some 27 percent of the city's 138 square miles—in their wake (Bonfiglio 2009).

Detroit's decline started after WWII. Instead of outsourcing its ecosystem of innovation overseas, it fell victim to commodification and economies of scale. Local meat processing and community dairies disappeared under regulatory and price pressure; local machine shops and pipefitters folded with no outlet to make a living. Reinvestments in the local infrastructure became impossible with ever-decreasing tax revenues, and the reduced spending base eroded the retail infrastructure and downtowns, further reducing the tax base and degrading the resilience of local economies.

Similar processes can destroy the economic bases of rural communities.

**Urbanization is neither a problem nor a solution in itself. We do not tell people to migrate; they go where the economic incentives are.**

Is this not the result of ongoing urbanization and the price we pay for progress? Urbanization is neither a problem nor a solution in itself. We do not tell people to migrate; they go where the economic incentives are. It is impossible to stop them unless we shift

the incentives. The 1970s-era beer industry provides a good illustration: consolidation and protective regulation concentrated production at just a few large national breweries, churning out pale lagers that were all but indistinguishable. Foreign competition, and the legalization of home brewing in 1978, inspired a renaissance in beer making and an emergence of local craft and micro-breweries throughout the nation. These creative breweries now contribute significantly to many local economies and have held their own through the recent recession.

Regions that encourage devolution, innovation, and local initiatives have a much better chance of maintaining and promoting positive feedback toward education. This seems plausible for metro areas, with their diversity and demand, but is it possible for rural economies to escape consolidation and scale? Perhaps. Compare the story of steel manufacturer Nucor with the beer industry—or as Nucor puts it, “the Story of the Little Steel Company that could: (1) take ‘mini’ technology and use it to become the nation’s largest steel producer; (2) redefine the rules on how steel is made and from what; (3) change the way the world looks at discarded scrap” (Nucor Corporation n.d.).

Business researcher Jim Collins studied how Nucor stacked up against Bethlehem Steel, one of the 20th century’s most powerful symbols of American industry (Collins 2001). Bethlehem Steel’s CEO summed up his view of the company’s problems in 1983: “Our first, second, and third problems are imports.” In response to the threat posed by imports, the company continued to bring down costs through consolidation and scale. Nucor, on the other hand, took the opportunity to redefine its business model. It restructured its manufacturing to bring production closer to the end-user through innovative mini mills. Bethlehem Steel went bankrupt in 2001. Nucor, by contrast, continues to thrive through a distributed organization with a corporate staff of less than 100. In addition, it now operates regional micro mills to absorb recycled materials in local markets, thus reducing the cost of energy, materials, and transportation.

**The lesson here is that education, though an effective tool in economic progress, can be much more powerful when leveraged by a local ecosystem of suppliers, knowledge institutions, and services.**

The lesson here is that education, though an effective tool in economic progress, can be much more powerful when leveraged by invoking the externalities of a local ecosystem of suppliers, knowledge institutions, and services.

Here are some questions for legislators and policymakers concerned with rural economic well-being and growth:

**How can we decentralize or structure advanced education so that regions can build local ecosystems where education comes alive and innovation feeds industry, services, and knowledge providers alike?**

We do not merely promote cutting up advanced education into smaller pieces. We recommend looking at advanced education as a regional pillar. Note that when we use the term decentralize, we do not mean distance learning, where a centrally located teacher can reach students in remote areas. This would inhibit the local interaction of knowledge, needs, and innovation that we are after. We do, however, envision a place-based curriculum that selectively taps into the vast array of opportunities offered by MOOCs (Massive Open Online Courses).

Take computer coding as an example. This is rarely, if effectively, integrated into the mainstream curricula. Three years ago, Zach Sims started a website, CodeAcademy.com, that teaches computer coding for free, simply because he saw a need for it. As he put it, “When I was looking for internships in my junior year, at companies like Goldman Sachs and McKinsey, I realized that nobody I was going to college with had any skills that would be relevant in that context” (News and Davos 2015). In the first weekend of CodeAcademy’s launch, more than 200,000 people used the product. Now, after three years, it serves 26 million students and prompted the 2015 World Economic Forum in Davos to invite Sims to speak at a lunch event entitled “Business Backs Education,” featuring a panel that included former U.K. Prime Minister Tony Blair. A place-based initiative to integrate materials like that of CodeAcademy into a curriculum may very well provide the jumpstart that local education providers need.

### **How can regions promote lifelong learning—the view that education does not stop at graduation?**

In order to stay competitive as a region (or nation), we need to continuously integrate new knowledge. The Organization for Economic Co-operation and Development (OECD) recently published a report inventorying human capital throughout the world. It supported the positive contributions of higher education to human capital but added that countries with graying populations were losing their edge<sup>12</sup> (Boarini, Mira d’Ercole, and Liu 2012, 44). That, of course, is only true if education stops at graduation. We need to reverse this trend by implementing policies that counteract aging as a negative contribution to human capital and thus economic success.

### **Can we encourage the selection of distributing technology as opposed to technology that centralizes services?**

The devolution of technology, as we have seen in the examples of beer brewing and Nucor’s steelmaking, inspires local ecosystems of know-how, producers, and suppliers. Let’s take a simple example: We can build centralized wastewater plants that serve millions or small systems that serve neighborhoods. If we do the latter, we create place-based initiatives that provide opportunities for entrepreneurship and innovation across many places, and that harness local knowledge and educational institutions. The regulatory process, however, tends to favor the former, since it thrives on economies of scale achieved by repetition, consistency, proven technology, and decades of experience. By connecting the regulatory process with industry and knowledge providers, it is possible to shift the focus from conservatism to innovation.

State and local government can be instrumental in this process. Yes, innovation requires the take-charge personality—the risk-taking, entrepreneurial spirit. Ever since the 1970s, when MIT’s David Birch provided the initial evidence that a band of small business start-ups turn out to be principal job generators (Dennis, Phillips, and Starr 1994), we have seen a renewed focus on entrepreneurship in economic development programming. However, using the above example of wastewater treatment, only a willingness to create demand for decentralized processes, and to fund research to expand the knowledge base of the processes, will allow entrepreneurs and innovators to take up the challenge and make it a reality. This progression can begin with federal grants, but can also cascade down all the way to regional policymaking.

## • EPILOGUE •

How did the Brown Lumber & Tie mill in our prologue fare? The Brown family was a strong catalyst for education and economic well-being in the region, but its mill did not escape the forces of commodification and consolidation. Many family-owned mills in the region were bought out by Boise Cascade,<sup>13</sup> one of the larger mills in the Pacific Northwest. Boise Cascade consolidated its mills and used economies of scale to cope with a lingering wood supply, foreign competition, and pressure from environmental groups calling for sustainable harvesting.

The Brown Mill closed in 1977. But in a county next to McCall, the small, family-owned Tamarack Mill used technology and innovation to advance business and fend off the giants. It survived the recent recession and is back to 100 employees. Can this success compound into something more? Only time will tell.

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## • END NOTES •

- 1 This anecdote of innovative (and successful) experimentation is referenced in Grace Edington Jordan's book *The King's Pines of Idaho: A Story of the Browns of McCall* (Portland, OR: Binford & Mort, 1961).
- 2 The definition of urban, and thus rural, has changed over time as well and is defined differently among institutions. In 2000, the Office of Management and Budget (OMB) made major changes in its metro-area delineation procedures:
 

*"OMB's changes added some additional metro areas by no longer requiring that a metro area must have at least 100,000 population if its urbanized area includes no place of at least 50,000 people. More importantly, simplifying the worker commuting criteria that determine outlying metro counties had the effect of adding numerous new outlying counties to metro areas while deleting a smaller number that were previously defined as metro."* (USDA Economic Research Service 2014a)

The U.S. Census Bureau, in the meantime, started using population density in census blocks to define urban, and added a new "urban cluster" classification (areas with at least 2,500 but fewer than 50,000 people) to the existing "urban area" classification (areas with 50,000 or more people).

All of these changes make it difficult to compare rural counties before and after 2000. To circumvent this issue, we will use in our analysis the 1993 Rural-Urban Continuum Codes (1993-RUCC) as defined by the Economic Research Services (ERS) of the USDA (Table 1). These codes "distinguish metropolitan (metro) counties by the population size of their metro area, and non-metropolitan (non-metro) counties by degree of urbanization and adjacency to metro areas" (USDA Economic Research Service 2014a). The 1993-RUCC is in the middle of the census series (1970–2010) we use in our analysis and thus includes rural counties like Benton County (OR) and Deschutes County (OR) that, in today's classification, are considered urban counties.
- 3 Per capita personal income is the total compensation received by a person. It includes salaries, wages, bonuses, dividends, distributions from investments, rental receipts, profit-sharing, etc. Personal income determines an individual's consumption and investment capacity. It is equal to GDP less the consumption of fixed capital (i.e., depreciation); corporate profits with inventory valuation and capital consumption adjustments; contributions for government social insurance; domestic net interest and miscellaneous payments on assets; net business current transfer payments; current surplus of government enterprises; undistributed wage accruals; and personal income receipts on assets from outside the country.
- 4 For a deep discussion about this topic see Joseph E. Stiglitz, Amartya Sen, and Jean-Paul Fitoussi, *Report by the Commission on the Measurement of Economic Performance and Social Progress* (Paris: The Commission 2009).
- 5 Economic theory holds that the salary of a worker should be equal to her marginal productivity when the economy is working well.
- 6 Rural regions have a hard time retaining their best and brightest (Carr and Kefalas 2009), partially because there are no opportunities to apply their education.
- 7 In a previous publication we mentioned the example of the yogurt maker Chobani, which chose Twin Falls, Idaho, as the location for a new factory specifically because of the existence of a large dairy industry in the area and the coalescence of expertise, resources, and a local community college (Lewin and Braak, 2015).
- 8 Gateway communities attract advanced educational opportunities, but they usually do not show up on the official lists, or are listed elsewhere. For example, the Teton Science School in Jackson Hole, Wy., and the University of Idaho Campus in McCall, Idaho, offer integrated graduate programs in place-based teaching that did not make the Carnegie Foundation list.
- 9 This index considers (1) the share of wage and salary employment in entertainment and recreation, accommodations, eating and drinking places, and real estate in relation to all employment; (2) the percentage of housing units intended for seasonal or occasional use; (3) the per capita receipts from motels and hotels; and (4) ERS's knowledge of counties.

- 10 An economic-dependence analysis determines which industries “drive” the economy of a county. These industries are critical because they bring outside money into the economy (that is, they export) and maintain growth and economic vitality. The USDA ERS used labor and proprietors’ earnings by place of work to estimate county earnings per industry, which are the basis for the economic-dependence categories (USDA ERS). “If a county qualified for more than one of mining, federal/state government, or manufacturing types, it was classified in the industry in which it was the largest number of percentage points above the threshold” (USDA ERS).
- 11 We realize that the debate as to whether or not schools can teach creativity has raged since the 1950s. However, the consensus seems to be that, while latent abilities may differ from individual to individual, creativity is significantly related to educational achievement and many excellent programs can stimulate creativity and creative thinking (Fasko 2001). What is important is that curricula support not just factual knowledge, but also understanding and creativity.
- 12 How it was stated: “In all countries population aging contributed negatively to [the change of human capital per capita] over the observed years.”
- 13 Boise Cascade was bought out by OfficeMax, which recently was bought out by Staples.

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