Economic Dynamism Across the Rural-Urban Divide: A County-level Spatial Analysis

Finn Dobkin
Master of Public Policy
Certificate in Data Science

Abstract

As the United States recovered from the Great Recession, nonmetropolitan counties have failed to recover as the national economy continues to grow. Simultaneously, quality-of-life in these counties deteriorated as economic opportunities atrophied. This study aims to understand how rurality impacts county-level declines in economic growth. Specifically, it examines how the percentage of a population occupying nonmetropolitan space and a county's proximity to metropolitan areas impact absolute mobility, growth elasticity of poverty, and growth semi-elasticity of poverty. The results show that the percentage of a county that occupies a rural area is the most reliable geographic determinant of the economic strength of a county—although proximity to a metropolitan county also plays a significant role in the economy. Based on these conclusions, policymakers should tailor economic development plans to increase the productive capacity of these nonmetropolitan counties.

Introduction

Estimates from the USDA Economic Research service indicate that nonmetropolitan areas have experienced higher poverty rates relative to their urban counterparts dating back to at least 1960 (Farrigan, 2020b). Data from the 2019 American Community Survey (ACS) indicates that nonmetropolitan areas experienced a 16.1% poverty rate, while metropolitan areas only stood at 12.6% (Farrigan, 2020b). This gap was most pronounced in Southern states, while the Midwest showed a nominal difference.

The peer effects of living in impoverished communities worsen the geographic concentration of poverty. From a financial perspective, concentrated poverty creates a spatial mismatch between jobseekers and stable employment while limiting available liquidity (Wilson, 1996). From a quality-of-life perspective, lower-income communities experience reduced access to healthcare and higher rates of nutritional issues and psychological distress (Blumenthal & Kagen, 2002). This is a well-documented contributor to the metropolitan-nonmetropolitan opportunity gap.

This opportunity gap underlines the uneven recovery following the Great Recession. Since the Great Recession ended, the average growth of the rural economy has lagged behind urban areas. Between 2010 and 2018, nonmetropolitan GDP grew by 14.8%, compared to 19.2% in metropolitan areas. Similarly, nonmetropolitan employment grew at a rate of 3.2% annually, compared to 25.6% in metropolitan areas (Farrigan, 2020b).

The academic literature lacks sufficient research that attempts to connect community-level economic indicators with community-level supply- and demand-side determinants of economic health across the metropolitan-nonmetropolitan divide. To address this gap in the literature, this article examines the economic strength of rural America by estimating how the magnitude and nature of rurality impact economic opportunity at a county level.

Background

Macroeconomic Trends: There is a wealth of academic literature connecting macroeconomic growth with regionally variant economic indicators. Most notably, Okun's Law describes the empirically significant relationship between unemployment and economic productivity. As a rule-of-thumb, Okun's law posits that for every 1% increase in cyclical unemployment, there is a corresponding 2% decrease in GDP (Ball et. al., 2013). However, the exact change in output relative to unemployment can vary based on a variety of factors, such as inflation, labor force participation, and productivity, among others.

Notably, this relationship has changed since the Great Recession. Chinn et. al. (2013) found that the Okun coefficient has shifted over the past decade, such that the long-run output-employment relationship is about 1% below predicted levels. Given the economic differential between metropolitan and nonmetropolitan areas, geographic-economic variation may drive this change in the Okun coefficient.

This is a particularly salient theme for rural regions. Nationally, GDP growth steadied at 2.2% annually between 2010 and 2019 (McCorkell & Hinkley, 2019). Likewise, unemployment remained below 6.0% between 2010 and 2019, while poverty declined from 15.3% to 13.1% over the same period. Nonmetropolitan regions have not replicated this pattern of economic prosperity. Between 2010 and 2019, nonmetropolitan areas experienced an annual employment growth rate of 0.4%, while their metropolitan counterparts experienced a growth rate of 1.5% (Farrigan, 2020b). This indicates that these areas have failed to catch up to the pre-recession levels, falling far behind their metropolitan counterparts.

Top-down forces—including the outsourcing of low-wage labor and Schumpeterian destruction—partially explain the stagnant economic performance of nonmetropolitan areas. Partridge (2020) confirms this, noting that new technology has favored the growth of capital-intensive urban cores that offer greater access to an educated workforce, while lower-productivity manufacturing is outsourced overseas to lower production costs. Similarly, Caballero and Hammour (2000) find that technological progress has muted the demand for much of the manufacturing workforce, as machines complete processes historically reserved for manual laborers.

Other prominent issues facing rural communities have exacerbated these high-level trends. For one, age demographics in nonmetropolitan communities have shifted increasingly older compared to their metropolitan counterparts, resulting in a smaller workforce. Census data indicate that 13.8% of the population in metropolitan areas is 65 or older, compared to 17.5% in nonmetropolitan areas (Smith & Trevelyan, 2019). While this is partially attributable to an influx of retirees seeking preferable amenities, Cromartie (2018) suggests that younger adults moving out in search of economic opportunity contributes to this phenomenon.

The declining labor force participation of nonmetropolitan areas worsens the "graying" of these communities. Following the Great Recession, the labor force participation rate for prime-age adults declined in nonmetropolitan areas from 82.2% in 2008 to 78.6% in 2017. In large metropolitan areas, the rate only declined from 83.4% to 82.4% over the same period (Farrigan, 2020b). While the direction of causality between the spatial mismatch of employers to employees remains ambiguous, this trend suggests that a lack of labor may explain some of the economic losses in rural counties.

In its totality, these economic trends and population loss show a clear relationship with the magnitude of rurality, as defined by proximity to metropolitan areas. Ajilore and Willingham (2019) indicated that most metropolitan counties experienced a 6.08% increase in population from 2010 to 2017, whereas nonmetropolitan counties adjacent to metropolitan areas experienced a 1.31% decline in population. The nonmetropolitan counties not adjacent to metropolitan areas experienced a 1.63% decline in population. Hendrickson et. al. (2018) suggest that greater accessibility to the agglomerative effects of industrial centers may explain this difference among rural counties.

Agglomerative Forces: On a regional level, the declining economic dynamism of rural America relates to the take-off of industry in urban areas. The Lewis Structural Change model theorizes the economy as composed of two sectors: a rural primary-resource sector and an urban manufacturing sector. According to Lewis (1954), a rural-dominated labor force characterizes the early stages of economic development, but as the quantity of labor increases in rural areas, the marginal rate of product decreases, leading to unemployment in the rural sector. Conversely, the urban sector, primarily engaged in manufacturing, produces a higher level of output relative to the rural economy. As a result, urban areas experience higher wages, leading to out-migration from rural areas.

Research in agglomeration economies expands the understanding of rural economic decline. According to Glaeser (2010), firms and human capital cluster near one another and generate positive externalities. As these clusters develop into cities, the network effects of a stronger and more specialized labor force increase productivity, spurring the growth of wages and consumer amenities.

Labor market growth due to agglomeration is not isolated to highly specialized jobs. The growth in amenities and consumer spending characteristic of urban development requires a low- and medium-wage labor force to develop alongside. A report by the California Employment Development Department found that the Bay Area of California has a nearly equal number of low- and high-wage jobs, 37.9% and 38.1% respectively. Likewise, between 2016 and 2018, low-wage jobs grew by 11%, while high-wage jobs grew by 14% (Occupational Employment Statistics and Wages Program [OES], 2020). While low-wage workers must contend with higher housing costs in the Bay Area, so long as housing-wage elasticity is low enough, they stand to increase their quality-of-life relative to residing in alternative regional labor markets, thereby theoretically driving out-migration from rural areas.

County and Household Impacts: The decline of nonmetropolitan economic dynamism corresponds with a downward trend in several quality-of-life indicators in nonmetropolitan communities. For example, nonmetropolitan communities have experienced an increase in drug addiction, particularly opioids. Data from the National Center for Health Statistics (NCHS) show that the age-adjusted death rate of drug overdose deaths was 20.00 per 100,000 individuals in 2017, a sharp increase compared to the 1999 rate of 4.0 (Hedegaard et. al., 2019). Notably, midlife individuals, defined as those between 25-44 years of age, experience this phenomenon most acutely. This population has an overdose rate of 38.4, while the 15-24 age group only has a rate of 10.9. (Hedegaard et. al., 2019)

Inadequate access to healthcare and a disproportionately older population compounds the physical health issues of drug addiction. Foutz et. al. (2017) showed that there are 13.1 rural physicians per 10,000 rural residents, compared to 31.2 urban physicians per 10,000 urban residents. These rural physicians tend to be spread over a larger geographic area, further hindering accessibility because individuals must travel further to obtain services. This may partially be the result of a higher reliance of rural patients on Medicaid. While Medicaid expansion states saw 5% increases in Medicaid coverage in rural areas between 2013 and 2015, many states opted not to bolster the program. As a result, rural hospital closures have increased significantly, with 19 closures in 2019 alone (Topchik, et al., 2020).

There has also been a significant lag in educational attainment. In 2018, 51.2% of rural residents had, at a minimum, some college experience. While this number represents a 27.4% increase from 2000, higher educational attainment for rural residents still trails behind their urban counterparts by 12 percentage points (Farrigan, 2020a). These disparities are important. As Case and Deaton (2020) point out, the widening earnings gap can be traced along educational lines, but more importantly, the gap is not merely a product of increased earnings for the highly educated. Those without a four-year degree also experience reduced earnings.

Data

This analysis of the relationship between rural economic dynamism and proximity to urban clusters relies on county-level data from the U.S. Census Bureau's Small Area Income and Poverty Estimates Program (SAIPE, 2019); the U.S. Department of Agriculture's Economic Research Service (ERS, 2020); the National Vital Statistics System of the National Center for Health Statistics (NCHS, 2020); and Opportunity Insights (2019) located at Harvard University.

Dependent Variables*: Growth Elasticity of Poverty (GEP)* measures the percentage change in poverty associated with a percentage change in median household income (Heltberg, 2002). It is calculated by dividing the percent change in poverty over a given period by the percent change in income over the same period. A higher absolute GEP value suggests a greater change in poverty associated with a smaller change in income. To reduce volatility from year-over-year fluctuations, this study uses elasticity between 2012 and 2018. GEP is calculated using data from the U.S. Census Bureau's SAIPE Program (2019).

Growth Semi-Elasticity of Poverty (GSEP) measures the absolute change in poverty associated with a percentage change in median household income. It is calculated by dividing the absolute change in poverty over a given period by the percent change in income over the same period. Unlike GEP, GSEP does not assume a linear elasticity across all levels of income and poverty (Klasen & Misselhorn, 2008).

To reduce volatility from year-over-year fluctuations, this study uses elasticity between 2012 and 2018. Data on GSEP is calculated using data from the SAIPE (2019).

Absolute mobility measures the percentage of individuals whose income exceeds that of their parents. A higher absolute mobility value indicates that more individuals earn a higher income than their parents. The data used in this study begins with the 1940s birth cohort and ends with the 1980s birth cohort. Data on absolute mobility is taken from Harvard University's Opportunity Insights (2019).

Independent Variables: *Rural-Urban Continuum Codes (RUCC)* are a classification system developed by the U.S. Department of Agriculture (USDA)'s Economic Research Service that identifies metropolitan and nonmetropolitan areas by population size and proximity to larger urban areas (ERS, 2020). The RUCC is broken down into nine categories. Codes 1-3 are all metropolitan areas classified ordinally by population size. Codes 4-6 are nonmetropolitan areas located adjacent to a metropolitan area and classified ordinally by population size. Codes 7-9 are nonmetropolitan areas not located adjacent to a metropolitan area and classified ordinally by population size (ERS, 2020).

County rurality level measures the percentage of a county that lives in a rural area. The U.S. Census Bureau defines rural as anything that is not "a densely settled core of census tracts that meet minimum population density requirements, along with adjacent territory containing non-residential urban land uses as well as territory with low population density included to link outlying densely settled territory with the densely settled core" (Geography Program, 2019). Data on county rurality levels are taken from the U.S. Census Bureau's Geography Program (2019).

Control Variables: *Teen Birth Rate* is the number of teen births per 1,000 females aged 15-19. This analysis includes teen birth rates because child-rearing at an early age is associated with a reduction in future economic opportunities (Kearney & Levine, 2012). Data on teen birth rates are taken from the National Vital Statistics System (NCHS, 2020).

Local Tax Rate measures the aggregated municipal, state, and federal taxes at a county level. It is included in this analysis because lower effective tax rates can be associated with stronger regional economic growth, depending on how tax revenue is disbursed (Helms, 1985). Data on local tax rates are taken from Opportunity Insights (2019).

Commute time measures the average time in percentage of an hour that it takes the average labor force participant to commute to their job. It serves as an indicator for one's ability to access a job that is proximal to one's place of residence. Data on commute times are taken from Opportunity Insights (2019).

Local Government Expenditures per capita measures the level of municipal investments made per person within a county. It is included in this study because state and local governments overwhelmingly invest in assets that actively contribute to local human and social capital (Francis & Sammartino, 2015). Data on local government expenditures per capita are sourced from Opportunity Insights (2019).

High School Dropout Rate measures the percentage of individuals, ages 16 to 24, who were not enrolled in school and failed to receive a high school diploma or GED. It is included because dropping out of high school is predictive of lower economic success later in life (Case & Deaton, 2020). Data on high school dropout rates are taken from Opportunity Insights (2019).

Labor Force Participation Rate measures the percentage of the noninstitutionalized population between the ages of 16 and 65 that is employed or actively seeking employment (Farrigan, 2020b). It is included because labor force participation positively correlates with economic opportunities (Case & Deaton, 2020). Data on labor force participation rates are sourced from Opportunity Insights (2019).

Methodology

This paper uses county-level data about social, demographic, and economic characteristics from survey and administrative sources. For RUCC measurements, values were pooled into intervals of three. This allows the measurement of metropolitan, nonmetropolitan but adjacent to metropolitan, and nonmetropolitan and nonadjacent to metropolitan counties. In the relevant models, RUCC measurements were coded as fixed effects variables. For county rurality levels, values were collapsed so counties with over 50% of the population in a rural area were valued at 1, whereas counties with under 50% of the population in a rural area were valued at 0.

To estimate the relationship between proximity to urban areas and economic strength, the following six models were used. The first model, as given by *Equation 1*, uses Ordinary Least Squares (OLS) regression to estimate the relationship between intergenerational social mobility and county rurality levels. Whereby Y_i represents the outcome of social mobility, X_i represents a set of controls for each county, δ_i represents the dummy variable of more or less than 50% rural, and ε_i is the error term. Controls include local tax rate, government expenditures, high school drop-out rate, labor force participation rate, and teen birth rate.

$$Y_i = \beta_0 + \beta_1 X_i + \beta_2 \delta_i + \varepsilon_i \qquad \textit{Eq. 1}$$

The second model, as given by *Equation 2*, also uses OLS to estimate the relationship between county-level proximity to urban areas (X_i) and intergenerational social mobility (Y_i). In *Equation 2*, θ_i represents rural fixed effects.

$$Y_i = \beta_0 + \beta_1 X_i + \beta_2 \theta_i + \varepsilon_i \qquad \textit{Eq. 2}$$

Models 3 through 6 use GEP and GSEP as outcome variables. These models use the same set of controls as *Models 1 and 2*. Due to the heteroskedasticity associated with the relationship between the control variables and the GEP and GSEP outcome variables, the standard OLS methods were replaced with quantile regression models. Therefore, $\boldsymbol{\tau}$ represents the quantile intercept, which is estimated at the median point or the 50th percentile.

Given by *Equation 3*, *Model 3* estimates the relationship between county rurality level (δ_i) and GEP (Y_i), and *Model 5* estimates the relationship between county rurality level (δ_i) and GSEP (Y_i). In both *Model 3* and *Model 5*, X_i represents the set of controls for each county.

$$Q_\tau(Y_i) = \beta_0(\tau) + \beta_1(\tau) X_i + \beta_2(\tau) \delta_i + \varepsilon_i \qquad \textit{Eq. 3}$$

Given by *Equation 4*, *Model 4* estimates the relationship between county-level proximity to urban areas via RUCC (X_i) and GEP (Y_i), and *Model 6* estimates the relationship between county-level proximity to urban areas via RUCC (X_i) and GSEP (Y_i). In both *Model 4* and *Model 6*, θ_i represents rural fixed effects.

$$Q_\tau(Y_i) = \beta_0(\tau) + \beta_1(\tau) X_i + \beta_2(\tau) \theta_i + \varepsilon_i \qquad \textit{Eq. 4}$$

Note that *Equations 3 and 4* each include separate models with GEP and GSEP as the outcome variable. By using each of these six regression models, we can better understand the effect that rural environments have on community economic development.

Results

Rural-Urban Continuum Results: Estimates of the relationship between metropolitan proximity and the modeled economic indicators produced mixed results. *Model 2* showed that after adjusting for the control variables, absolute mobility had the most statistically significant difference between geographic groups. The coefficient for RUCC groups 4-6, which represent nonmetropolitan counties that were adjacent to metropolitan counties, yielded a coefficient of 0.585 with statistical significance at $p < 0.01$. This coefficient suggests that, relative to the metropolitan counties and nonmetropolitan counties that were not adjacent to metropolitan counties, these residents could expect an average of 0.585 percentage points greater mobility.

The coefficient for RUCC groups 7-9, which represents nonmetropolitan counties that were not adjacent to metropolitan counties, yielded a coefficient of 1.963 with statistical significance at $p < 0.001$. This suggests that relative to metropolitan counties and nonmetropolitan counties located adjacent to metropolitan counties, this group could expect an average of 1.963 percentage points greater mobility. While the causal mechanism for this variation is unclear, Weber (2018) noted that the distinct difference in technological capacity between metropolitan and nonmetropolitan areas is a key factor in determining economic growth.

Using *Equation 4*, *Model 4* measured the relationship between median county-level GEP and proximity to metropolitan areas. This model lacked the same explanatory power as the OLS regression of *Model 2*. However, the fixed effects were still statistically significant for nonmetropolitan counties that were not adjacent to metropolitan counties. The coefficient of -0.135 suggests that this set of counties has a median of 0.135 percentage point lower GEP relative to metropolitan counties and nonmetropolitan counties located adjacent to metropolitan counties. Notably, the only statistically significant control variable in *Model 4* was labor force participation.

In the second iteration of *Equation 4*, *Model 6* measured the relationship between median county-level GSEP and proximity to metropolitan areas. This model showed no statistical significance for any of the RUCC measures. Of the control variables, teen birth rate showed statistical significance, at $p < 0.001$. Local tax rate also showed statistical significance at $p < 0.05$.

Table 1: *Regression Results*

	Absolute Mobility Ordinary Least Squares (OLS) Regression		Growth Elasticity of Poverty (GEP) Quantile Regression		Growth Semi-Elasticity of Poverty (GSEP) Quantile Regression	
	Rural Level (1)	Rural-Urban Continuum Code (2)	Rural Level (3)	Rural-Urban Continuum Code (4)	Rural Level (5)	Rural-Urban Continuum Code (6)
Local Tax Rate	0.547**	0.519**	0.070	0.111	3.160*	3.471*
Government Expenditures	-0.489***	-0.477***	-0.004	-0.010	-0.231	-0.365
Commute Time	17.059***	13.469***	0.013	-0.268	-4.123	0.800
High School Dropout Rate	-52.489***	-56.601***	-1.104	-0.909	-30.866	-21.104
Labor Force Participation Rate	3.825**	3.500*	-1.082**	-1.381***	3.903	3.493
Teen Birth Rate	-44.690***	-43.863***	-0.605	-0.734	-45.877***	-44.591***
Rural Level	1.909***		-0.103*		-1.669*	
RUCC 4-6		0.585**		-0.092		-1.694
RUCC 7-9		1.963***		-0.135*		-2.124
Constant	41.872***	43.686***	-0.068	0.025	-8.923	-10.557*
N	2,134	2,135	2,134	2,135	2,134	2,135
R^2	0.584	0.574				
Adjusted R^2	0.582	0.573				
Residual Std. Error (df=2126)	3.620	3.662				
F Statistic	425.996*** (df=7; 2126)	358.749*** (df=8; 2126)				

*p < .05; **p < .01; ***p < .001

Rural Level Results: *Model 1* indicates that across all measures, the percentage of a community that occupies rural areas is a statistically significant determinant of absolute mobility, GEP, and GSEP. For absolute mobility, the reference group for the dummy variable is counties with between 0% and 50% of the population living in a rural area. The rural level coefficient indicates that, after adjusting for a set of control variables, counties with over 50% of the population in a rural county experience, on average, 1.909 percentage points of greater mobility than counties with under 50% of the population in a rural area at $p < 0.001$. This model also showed statistical significance across all other control variables. For specific coefficients and p-values, see *Table 1*.

Model 3 measures the relationship between median county-level GEP and rural levels. After adjusting for a set of control variables, this model indicates that counties with over 50% of the population in a rural area experience a median difference of 0.103 lower GEP compared to their peers located in counties with under 50% of the population in rural areas. The difference was statistically significant at $p < 0.05$. *Model 3* also indicates that labor force participation had a statistically significant impact on GEP at the county level.

Model 5 measured the relationship between median county-level GSEP and rural levels. After adjusting for a set of control variables, the model indicates that counties with over 50% of the population in a rural area experienced a median difference of 1.669 lower GSEP compared to counties with under 50% of their population in rural areas. Similar to *Model 3*, these findings are statistically significant at $p < 0.05$. Notably, unlike the GEP model, local tax rate showed statistical significance at $p < 0.05$, and teen birth rate showed statistical significance at $p < 0.001$.

Policy Implications

The seemingly contradictory results between absolute mobility relative to GEP and GSEP muddle the practical significance of this study. One would expect a healthy economy to experience strong economic indicators universally. Instead, poverty increased at a faster rate relative to income changes in rural areas compared to metropolitan areas. When considering the control variables, labor force participation, local tax rate, and teen birth rate show statistical significance uniformly across models, suggesting there are both demand- and supply-side factors involved. This has several policy implications that policymakers should consider, including strategies that can be used to promote human capital and public investment while maintaining a business-friendly environment.

Effective investments in the rural labor force must focus on the early years of education and child development. Almond and Currie (2010) show that inadequate prenatal and early-childhood environments can have long-term effects on physical health, educational outcomes, and cognitive development. To correct for this, they suggest that policymakers enhance existing income and nutritional assistance programs, as well as provide greater support for home visits and childcare assistance. The findings from *Table 1* also indicate that teenage pregnancy played a crucial role in economic outcomes throughout the counties in this study. Ogawa et. al. (2019) shows that teenage pregnancy is associated with a higher risk of adverse birth outcomes, including preterm birth and low birthweight. Both of these correlate with lower long-term cognitive function, suggesting a positive feedback loop between teenage pregnancy and low human-capital outcomes. Although Ogawa et. al. do not provide solutions to reduce teenage pregnancy, policymakers should work with stakeholders to develop solutions to reduce this phenomenon from occurring and promote healthy pregnancies. Developing solutions for this issue does not just reduce the teenage birth rate, but it also enhances the labor-force capacity of rural communities.

Sustaining human capital should be coupled with the establishment of a business-friendly environment through fiscal and capacity-building measures. The Great Recession and following years atrophied the capacity of rural areas to support businesses. Declining economic supports, particularly CDFIs, internet access, and prime-age labor force have placed significant pressure on local communities, and the COVID-19 pandemic has exposed these rifts even further (Dobkin, 2020). Likewise, the business behavior of the recent Opportunity Zones program has disproportionately helped struggling urban areas rather than rural areas (Farmer, 2019). Developing similar tax incentive programs that cater to the unique circumstances of rural areas is crucial to a successful development strategy.

Finally, policymakers must ensure that economic growth is equitably distributed across rural communities. Current tax break measures, particularly opportunity zones, lack accountability measures. This program, as well as other tax incentive programs, should mandate that participating companies report how their business activity benefits the local community, as argued by Judy (2020). Similarly, municipalities should seek to invest dollars saved on public benefit programs to fund programs that support community vitality in beneficiary communities.

The economic policies of impacted counties should also seek to support individual well-being by establishing economic self-sufficiency via early-life and teenage support programs. These communities must also develop pull factors that bring businesses to the area by increasing the local productive capacity and decreasing production costs associated with rural counties.

Conclusion

Rural communities showed clear signs of economic deterioration in the post-Great Recession years, especially compared to their urban counterparts. Defining rurality, however, has implications for the significance and magnitude of the relationship between the human geography and economic strength of a community. As the nation moves past the COVID-induced recessionary phase, it will be crucial that policymakers reexamine economic indicators to identify the hardest-hit counties and the most significant factors that contribute to their weakening economies. Understanding this dynamic is necessary to craft effective solutions to bolster rural economies that consider the unique supply- and demand-side factors of each community.

References

Ajilore, O., & Willingham, Z. (2019). *Adversity and assets: Identifying rural opportunities*. Center for American Progress. https://www.americanprogress.org/issues/economy/reports/2019/10/21/476097/adversity-assets-identifying-rural-opportunities/

Almond, D., & Currie, J. (2010). *Human capital development before age five*. National Bureau of Economic Research, 1–142. https://doi.org/10.3386/w15827

Angrist, J. D. (1990). Lifetime earnings and the Vietnam era draft lottery: Evidence from social security administrative records. *American Economic Review*, *80*(3), 313–336. https://ideas.repec.org/p/pri/indrel/251.html

Ball, L. M., Leigh, D., & Loungani, P. (2013). *Okun's law: Fit at fifty?*. National Bureau of Economic Research, 1–40. https://doi.org/10.3386/w18668

Blumenthal, S. J. & Kagan, J. (2002). The effects of socioeconomic status on health in rural and urban America. *JAMA*, *287*(1), 109–134. https://doi.org/10.1001/jama.287.1.109-JMS0102-3-1

Caballero, R. J., & Hammour, M. L. (2000). *Creative destruction and development: Institutions, crises, and restructuring*. National Bureau of Economic Research, 1–32. https://doi.org/10.3386/w7849

Case, A. & Deaton, A. (2020). *Deaths of despair and the future of capitalism*. Princeton University Press. https://doi.org/10.1515/9780691199955

Chinn, M. D., Ferrara, L., & Mignon, V. (2013). *Post-recession U.S. employment through the lens of a non-linear Okun's law*. National Bureau of Economic Research, 1–20. https://doi.org/10.3386/w19047

Cromatie, J. (2018). *Rural aging occurs in different places for very different reasons*. Economic Research Service, U.S. Department of Agriculture. https://www.usda.gov/media/blog/2018/12/20/rural-aging-occurs-different-places-very-different-reasons#:~:text=Why%20are%20rural%20areas%20aging,as%20having%20recreation%2Dbased%20economies

Dobkin, F. (2020, May 19). *Coronavirus aid prioritizes big banks. That's a problem for rural America*. Talk Poverty. https://talkpoverty.org/2020/05/19/coronavirus-aid-prioritizes-big-banks-thats-problem-rural-america/

Economic Research Service. (2020). *2013 Rural Urban Continuum Codes* [Dataset]. U.S. Department of Agriculture. https://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx

Farmer, L. (2019). *'Investors are hesitant': Rural America might miss out on 'opportunity zones'*. Governing. https://www.governing.com/archive/gov-opportunity-zones-rural-communities.html

Farrigan, T. (2020, May). *Rural education*. Economic Research Service, U.S. Department of Agriculture. https://www.ers.usda.gov/topics/rural-economy-population/employment-education/rural-education/

Farrigan, T. (2020, December). *Rural poverty & well-being*. Economic Research Service, U.S. Department of Agriculture. https://www.ers.usda.gov/topics/rural-economy-population/rural-poverty-well-being/#:~:text=ERS%20research%20in%20this%20topic,elsewhere%20on%20the%20ERS%20website

Francis, N., & Sammartino, F. (2015). *Governing with tight budgets: Long-term trends in state finances*. Urban Institute. https://www.urban.org/research/publication/governing-tight-budgets

Foutz, J., Artiga, S., & Garfield, R. (2017). *The role of Medicaid in rural America*. Kaiser Family Foundation. https://www.kff.org/medicaid/issue-brief/the-role-of-medicaid-in-rural-america/

Geography Program. (2019). *2010 Census Urban and Rural Classification and Urban Area Criteria*. U.S. Census Bureau. https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural/2010-urban-rural.html

Glaeser, E.L. (2010). *Agglomeration economics*. National Bureau of Economic Research, 1–14. https://www.nber.org/system/files/chapters/c7977/c7977.pdf

Helms, L. J. (1985). The effect of state and local taxes on economic growth: A time series-cross section approach. *The Review of Economics and Statistics*, *67*(4), 574–582. https://doi.org/10.2307/1924801

Heltberg, R. (2002). *The poverty elasticity of growth*. United Nations University World Institute for Development. https://www.wider.unu.edu/publication/poverty-elasticity-growth

Hendrickson, C., Muro, M., & Galston, W. A. (2018). *Countering the geography of discontent: Strategies for left-behind places*. Brookings Institution. https://www.brookings.edu/research/countering-the-geography-of-discontent-strategies-for-left-behind-places/

Hedegaard, H., Miniño, A. M., & Warner, M. (2019). *Urban-rural differences in drug overdose death rates, by sex, age, and type of drugs involved (NCHS Data Brief, no. 345)*. National Center for Health Statistics. https://www.cdc.gov/nchs/products/databriefs/db345.htm

Judy, J. L. (2020). *Opportunity zones: Improved oversight needed to evaluate tax expenditure performance (GAO-21-30)*. Government Accountability Office. https://www.gao.gov/products/GAO-21-30

Kearney, M. S., & Levine, P. B. (2012). "Why is the teen birth rate in the United States so high and why does it matter?" *Journal of Economic Perspectives*, *26*(2), 141–63. https://doi.org/10.1257/jep.26.2.141

Klasen, S. & Misselhorn, M. (2008). Determinants of the growth semi-elasticity of poverty reduction. *EconStor*, 1–33. https://www.econstor.eu/bitstream/10419/57314/1/608771767.pdf

Kopparam, R. (2020). *Gaps in U.S. rural and urban economic growth widened in the post-Great Recession economy, with implications amid the coronavirus recession*. Washington Center for Economic Growth. https://equitablegrowth.org/gaps-in-u-s-rural-and-urban-economic-growth-widened-in-the-post-great-recession-economy-with-implications-amid-the-coronavirus-recession/

Lewis, W. A. (1954). Economic development with unlimited supplies of labour. *The Manchester School*, *22*(2), 139–161. https://doi.org/10.1111/j.1467-9957.1954.tb00021.x

McCorkell, L., & Hinkley, S. (2019). *The post-recession labor market: An incomplete recovery*. Institute for Research on Labor and Employment, University of California Berkeley. https://irle.berkeley.edu/the-post-recession-labor-market-an-incomplete-recovery/

Mills, D. E. (1981). Growth, speculation, and sprawl in a monocentric city. *Journal of Urban Economics*, *10*(2), 201–226. https://doi.org/10.1016/0094-1190

National Center for Health Statistics. (2020). *Teen Birth Rates for Age Group 15-19 in the United States by County* [Dataset]. Centers for Disease Control and Prevention. https://catalog.data.gov/dataset/nchs-teen-birth-rates-for-age-group-15-19-in-the-united-states-by-county

Occupational Employment Statistics and Wages Program. (2020). *OES Employment and Wages*. California Employment Development Department. https://www.labormarketinfo.edd.ca.gov/data/oes-employment-and-wages.html

Ogawa, K., Matushima, S., Urayama, K. Y., Kikuchi, N., Nakamura, N., Tanigaki, S., Sago, H., Satoh, S., Saito, S., & Morisaki, N. (2019). Association between adolescent pregnancy and adverse birth outcomes, a multicenter cross sectional Japanese study. *Scientific Reports*, *9*(1), 108–134. https://doi.org/10.1038/s41598-019-38999-5

Opportunity Insights. (2019). *Preferred Estimates of Causal Place Effects by County* [Dataset]. Harvard University. https://opportunityinsights.org/data/?geographic_level=0&topic=0&paper_id=599#resource-listing

Partridge, M. D. (2020). *Rural America's stagnant economic performance: What's the role of declining dynamism*. American Enterprise Institute. https://www.aei.org/research-products/report/rural-americas-stagnant-economic-performance-what-is-the-role-of-declining-dynamism/

Small Area Income and Poverty Estimates (SAIPE) Program. (2019). *Small area income and poverty estimates* [Dataset]. U.S. Census Bureau. https://www.census.gov/programs-surveys/saipe.html

Smith, A. S., & Trevelyan, E. (2019). *In some states, more than half of older residents live in rural areas*. U.S. Census Bureau. https://www.census.gov/library/stories/2019/10/older-population-in-rural-america.html

Topchik, M., Gross, K., Pinette, M., Brown, T., Balfour, B., & Kein, H. (2020). *The rural health safety net under pressure: Rural hospital vulnerability*. Chartis Center for Rural Health. https://www.chartis.com/forum/insight/the-rural-health-safety-net-under-pressure-rural-hospital-vulnerability/

Weber, B., Fannin, J. M., Miller, K., & Goetz, S. (2018). Intergenerational mobility of low-income youth in metropolitan and non-metropolitan America: A spatial analysis. *Regional Science Policy & Practice*, 10(2), 292–301. https://doi.org/10.1111/rsp3.12122

Wilson, W. J. (1996). *When work disappears: The world of the new urban poor*. Penguin Random House. https://doi.org/10.1080/05775132.1997.11471958