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U.S. Regional Poverty Post-2000: The Lost Decade

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Abstract

The strong U.S. real income gains and reductions in poverty during the 1990s were largely erased in the following decade, which contained two economic recessions and tepid job growth otherwise. Areas most affected by weak U.S. economic performance could be expected to also have experienced the largest increases in poverty, particularly if interregional labor market adjustment diminished during the decade. We examine this issue, finding that not only was regional poverty affected by regional labor demand shocks, the effect was stronger post-2000. Consistent with the poverty results are findings of greater post-2000 regional labor demand effects on employment rates and reduced population adjustments to asymmetric labor demand shocks.

Keywords

U.S. poverty, spatial equilibrium, Great Recession

Introduction

The strong U.S. economy during the 1990s led to significant declines in poverty rates, with greater reductions in states with faster employment growth, ceteris paribus (Partridge & Rickman, 2006a, pp. 9, 92–93). However, the Great Recession, along with tepid employment growth during expansion years, largely erased the gains of the 1990s. After increasing nearly 10% in the previous decade, real median household income declined by 7% from 2000 to 2010 (DeNavas-Walt, Proctor, & Smith, 2011, Table A-2). The poverty rate climbed from 11.3% in 2000 to 15.1% in 2010, a rate last seen in 1993 (DeNavas-Walt et al., 2011, Table B-1). The reversal of progress in reducing poverty and the erasure of income gains have led to references of a "lost decade" (Fremstad, 2011; Shierholz&Gould, 2012; Tavernise, 2011), with concerns that we may currently be in a second lost decade (Detrixhe & Keene, 2012).

Given the documented connection between local employment growth and poverty in the literature for prior decades (see Partridge, Rickman, Olfert, & Ali, 2012, for a review), we should expect areas especially hard hit by globalization (Autor, Dorn, & Hanson, 2013) and the Great Recession to have experienced the largest increases in poverty. Reduced labor mobility post-2000 (Partridge, Rickman, Olfert, & Tan, 2012) may have magnified regional disparities in poverty rates through larger local labor demand effects on regional unemployment and labor force participation. Yet in a study of the largest 100 U.S. metropolitan areas, Fodor (2012) reports that areas with faster population growth during 2000 to 2009 had higher poverty and lower per capita incomes, suggesting the lack of a connection between growth and poverty during the decade; this outcome may, however, arise from amenity migration and resulting spatial equilibrium.

Therefore, using a disequilibrium adjustment model, we examine the relationship between poverty and employment growth during the period of 2000–2010 for U.S. counties. We use the industry mix employment growth component from the shift-share model to proxy labor demand shocks (Bartik, 1991; Bound & Holzer, 2000) rather than overall employment growth, as the latter contains both labor demand and labor supply influences (Partridge & Rickman, 2006b), which would also be the case if we used other measures such as the unemployment rate. To be sure, it may be the labor supply component of employment and population growth that underlies the result of Fodor (2012) noted above. To confirm the poverty results, the effects of industry mix employment growth on the employment rate and population growth also are examined. In addition, we compare the post-2000 results to those for the 1990s to assess whether the poverty-employment nexus changed between decades. Finally, we separately examine the 2000–2007 and 2007–2010 periods to

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assess whether the recession and expansion periods exhibited differing regional poverty dynamics, or whether the post-2000 trends generally held across both subperiods.

Our primary contribution is that we provide a post-2000 view of the local poverty and employment rate impacts of spatially unequal demand shocks. Along with the Great Recession, the post-2000 period also has been characterized by increasing income inequality and increased technological, institutional, and international pressures on low-skilled American workers. While the national metrics may be well known, solutions to localized high unemployment and poverty will need to include a local or regional dimension, especially in the face of some evidence of reduced interregional mobility of labor. A better understanding of the new regional dimensions of poverty and employment are of utmost importance in light of the sluggish national job growth and rising poverty rates since 2000.

Among our primary findings, the short-run antipoverty effects of demand-based employment growth strengthened post-2000 for metropolitan areas across all industries and for manufacturing employment in nonmetropolitan areas. Employment growth affected population growth less, and the employment rate more, from 2000 to 2010 (compared with the 1990s) in both metropolitan and nonmetropolitan areas. Persistence of poverty also increased in both metropolitan and nonmetropolitan areas post-2000, suggesting more limited regional labor market adjustments to previous poverty rate differentials. The increased persistence translates the short-run poverty effects of labor demand into larger long-run effects. The results taken together suggest declining interregional mobility in response to differential labor market shocks.

During the recession, labor demand effects on poverty in nonmetropolitan areas fell, whereas there was no (or negative) population response to industry mix employment growth in any area. This is suggestive of increased prominence of other regional factors in influencing poverty during the recession, such as increased labor market competition that especially hurt less-skilled workers and the collapse of area housing markets. Overall, it appears that the recent decade was characterized by both weaker national employment growth and more limited interregional labor market adjustments to asymmetric labor demand shocks and previous poverty differentials. Regional economic development efforts that successfully spur local labor demand may be needed more than ever, raising the question of what best practices might be in this regard.

Relevant Literature

Spatial equilibrium theory implies that labor mobility should alleviate the effects that spatially asymmetric labor demand shocks have on regional poverty (Partridge & Rickman, 2006a, Chap. 3). Severe geographic concentrations of poverty would need to be explained by other factors such as the sorting of poor individuals into particular locations. However, in a review of prior U.S. empirical evidence, Partridge et al. (2012) conclude that the spatial equilibrium view holds weakly in terms of adjustments for the unemployed and for those with lower incomes. The evidence suggests that spatially asymmetric labor demand shocks have long-lasting effects on regional poverty, through both employment rates and wages. We review the most relevant evidence for this study below.

Over the period 1960–2003, Partridge and Rickman (2006a, p. 9) find changes in the U.S. unemployment and poverty rates to be strongly positively correlated. State (current and lagged) employment growth of 1 percentage point reduced the poverty rate by 0.5 percentage points from 1984–2000 (Partridge & Rickman, 2006a, pp. 92–93). The channels through which state employment growth reportedly affected poverty were through increased employment rates and reduced teen birth rates. Gundersen and Ziliak (2004) similarly find that over the period of 1981-2000 stronger U.S. state economic performance reduced both the rate and severity of poverty.

In a review of the early literature on local area labor market effects of employment growth, Bartik (1991, Chap. 4) reports that estimated 1 percentage point employment growth effects on regional unemployment rates over long periods of time range across studies from –0.04 percentage points to no effect, whereas for labor force participation, they range from no effect to 0.08 percentage points. He notes that studies generally failed to distinguish between whether employment growth represents labor demand or supply. Bartik's (1991) own analysis of U.S. metropolitan areas revealed a 1 percentage point increase in employment growth reducing unemployment by 0.06 to 0.07 percentage points and increasing the labor force participation rate by 0.14 percentage points in the long run.

To address the issue of identifying labor demand, Partridge and Rickman (2003, 2006b) construct long-run restrictions structural vector autoregression (SVAR) models in assessing U.S. state labor market dynamics. In the SVAR, identifying restrictions are used to separate the influences of labor demand from labor supply shocks. Partridge and Rickman (2006b) find that about 20% of a state-level labor demand shock is reflected in the employment rate in the long run, which varies from 13% for Sun Belt states to 55% for Rust Belt states.

In terms of income, Bartik (2005) concludes that 5 years after a 1% increase in local employment, real earnings per capita as a share of local area personal income increase 0.28%. One-half of this occurs because of area residents moving to higher-paying occupations, whereas the remaining half results from increased employment rates. In a recent review of the literature, Bartik (2012) concludes that a 1% demand shock to local employment increases local

employment rates by 0.2% and occupation wages by 0.2%, for a total effect on real earnings per capita of 0.4%.

Turning to more direct evidence on the employment growth effects on the distribution of income and poverty at the local level, Bartik (1994) finds that employment growth in U.S. metropolitan areas from 1979–1988 increased the long-run share of income received by those in the lowest income quintile. He interprets the finding as evidence that strong employment growth particularly benefits workers with the least skills; a strong labor market pushes employers to hire labor force members with the least education and skills. In a further study of U.S. metropolitan areas, Bartik (1996) finds that a 1 percentage point increase in employment growth reduces the probability of poverty for females by 0.33% and males by 0.20%. He also finds the same increase in metropolitan statistical area (MSA) employment growth as increasing average real earnings by 0.5% or 0.6%, in which half is attributable to increased annual hours worked and the other half to greater wages. Bartik (2001, p. 148) concludes that 10% to 20% of an increase in employment and earnings may persist in the long run, in which the most important channel is poor individuals moving into higher paying jobs. Bound and Holzer (2000) find that population responses partially offset U.S. metropolitan area effects of demand shifts, with the responses more limited among less educated workers. This leads to estimates of a 10% decline in an area's labor demand reducing nominal earnings by 11% for high school educated workers, but only 6% for workers with a college degree.

In a study of U.S. metropolitan areas, Partridge and Rickman (2008b) generally find employment growth to reduce poverty, but the effect varies across metropolitan size and county type. A 1 percentage point increase in employment growth reduces poverty by 0.4 percentage points in large metropolitan area (MA) central city counties, with no effect found for suburban counties. For medium-and small-sized MAs, a 1 percentage point metropolitan-wide increase in employment reduces poverty by 0.5 and 0.6 percentage points in the long run, respectively.

More relevant to this study are analyses of U.S. county poverty. Partridge and Rickman (2006a, p. 142) find a 1 percentage point increase in job growth to be associated with lower U.S. county poverty by 0.37 percentage points in 1989 and 0.23 percentage points in 1999.

For high poverty nonmetropolitan U.S. counties, Partridge and Rickman (2005) report that a 1 percentage point increase in job growth reduces poverty by 0.11 percentage points in the long run; this is approximately double the magnitude of the estimate they found for the remaining nonmetropolitan counties. In a related study, Partridge, Rickman, and Li (2009) report that persistent poverty counties experienced the largest employment growth effects on unemployment and labor force participation, among all U.S. Department of Agriculture (USDA) Economic Research Service county types.

In a follow-up study, Partridge and Rickman (2007) further examine the poverty-generating process in persistently high-poverty nonmetropolitan counties using geographically weighted regression. They find that employment growth has three times the magnitude effect on poverty in persistently high-poverty counties relative to other nonmetropolitan counties, which is attributed to more limited migration and commuting adjustments to local labor demand shocks. However, the effect is not found to vary across differing persistent-poverty county clusters.

In a pair of related papers, using GIS data, Partridge and Rickman (2008a, 2008c) find that remoteness influences how job growth affects poverty. Local job growth reduces poverty only in nonmetropolitan counties at a sufficient distance from the nearest metropolitan area. In both studies they find lower migration responses to employment growth the farther a nonmetropolitan county is from an MA, which they interpret as underlying the greater antipoverty effects of local employment growth. Correspondingly, job growth in the nearest MA is found to reduce nonmetropolitan county poverty, but the effect attenuates with distance. At a finer geographic level, Crandall and Weber (2004) show that job growth reduced poverty more in high poverty U.S. Census tracts during the 1990s. A 1 percentage point higher rate of employment growth rates reduced poverty by 0.011, 0.046, and 0.088 percentage points in low-, medium-, and high-poverty tracts, respectively.

Empirical Approach

We assess whether the connection between regional employment growth and poverty typically found for the 1980s and 1990s has continued into the 2000s. Slower employment growth likely underlies the post-2000 rise in U.S. poverty, in which areas hardest hit by globalization and the Great Recession may have experienced the largest increases in poverty. We examine whether limited migration post-2000 exacerbated the effects of asymmetric labor demand shocks on regional poverty.

To allow for persistence in poverty rate differences and to capture labor demand effects, we use the disequilibrium approach of Partridge and Rickman (2005, 2006a, 2007, 2008c, 2008b). In this approach, a spatial equilibrium of labor market outcomes is hypothesized to be determined by numerous factors, including labor demand, local labor market policies, and area household amenities: $Y_{it}^{*} = \beta X_{it}$. Deviations of labor market outcomes from its equilibrium induce adjustments in the labor market with speed α: $Y_{it} - Y_{it-1} = \alpha(Y_{it}^{*} - Y_{it-1})$. Substituting in the expression for the equilibrium labor market outcomes yields the econometrically estimable equation: $Y_{it} = (1 - \alpha)Y_{it-1} + \alpha\beta X_{it}$. α is the speed of adjustment, which implies that $(1 - \alpha)$ is persistence of disequilibrium, and αβ is the short-run impact of X on Y. β is the long-run impact of X on Y, which is obtained as $(\alpha\beta/\alpha)$.

Our sample includes over 3,000 continental U.S. counties, along with the District of Columbia.[1] Due to differences in expected rural and urban responses, we separate metropolitan area and nonmetropolitan area counties in the empirical analysis.[2] We focus on 2000–2010 but also consider 1990–2000 for comparison; the earlier period contained robust employment growth nationally, and in most states, while the latter period can be characterized by general economic weakness with little net job creation. The latter period also exhibits a general decline in economic migration (Molloy, Smith, & Wozniak, 2013; Partridge et al., 2012), which limits interregional labor market adjustment. We also consider the 2000–2007 and 2007–2010 subperiods to assess whether the Great Recession (which began in December 2007) altered longer-term patterns.

The dependent variables consist of measures related to economic outcomes associated with policy or economic success. We first consider the employment/population ratio (EPR) over the respective periods. The EPR captures labor market tightness attributable to both unemployment and labor force participation, in which the latter reflects factors such as older workers who lose their jobs and move onto disability assistance (Autor et al., 2013). Favorable demand shocks will increase the EPR, suggesting that original nonemployed residents benefit. The EPR is approximated by dividing the number of employed residents, using U.S. Bureau of Labor Statistics Local Area Unemployment Statistics data, by county population from the U.S. Census Bureau.

Our second dependent variable is the poverty rate. Consistent with findings for previous decades, we expect to find that positive economic shocks reduce the poverty rate. This stands in contrast to arguments that suggest that impoverished workers with less inclination to work sort themselves into poor places. The 1990 and 2000 poverty rates are from the 1990 and 2000 Census of Population, whereas we use U.S. Census Bureau SAIPE estimates for other years.[3]

We also use population growth as a dependent variable. Changes in the EPR suggest smaller (larger) migration adjustments as the new jobs are filled by previously unemployed and non-labor-force participants. Because population data come from another source, the population model also serves as confirmatory analysis of our EPR and poverty results.

Our regression models closely follow Partridge et al. (2012), though we consider the poverty rate as a dependent variable and include lagged variables to assess persistence. Variable details and sources of the explanatory variables can be found in the earlier paper. For each subsample, our base specification for a given county *i* located in state *s* is:

$$\begin{aligned}\mathbf{OUTCOME}_{\mathbf{is}(t)} = \alpha + \lambda\mathbf{OUTCOME}_{is0} + \theta\mathbf{ECON}_{is0} + \\ \varphi\ \mathbf{GEOG}_{is0} + \gamma\mathbf{AMENITY}_{is} + \\ \delta\mathbf{DEMOG}_{is0} + \sigma_s + \varepsilon_{is(t-0)},\end{aligned}$$

where the dependent variables are EPR and the poverty rate measured in period *t* (e.g., 2000, 2010), and the population growth rate measured over the entire decade (1990–2000, 2000–2010). $\mathbf{OUTCOME}_{is0}$ is the initial-period level of the dependent variable (except in the population model where we use a rate). A larger λ indicates greater persistence. **ECON** includes economic characteristics of the county, **GEOG** is a vector of variables that measure the location's access to the urban hierarchy, **AMENITY** contains measures of natural amenities, and **DEMOG** contains demographic/human capital attributes. The regression coefficients are α, $\boldsymbol{\lambda}$, $\boldsymbol{\theta}$, $\boldsymbol{\varphi}$, $\boldsymbol{\gamma}$,and $\boldsymbol{\delta}$; σ_s are state fixed effects that account for common features within a state; and ε is the error term, assumed to be spatially correlated to produce robust standard errors.[4] The explanatory variables are lagged (initial-period) values to mitigate endogeneity concerns.[5]

The primary **ECON** variableis the industry mix employment growth for each period. It is the "share" variable from shift-share analysis (Bartik, 1991; Bound & Holzer, 2000) and is constructed by summing the products of the initial-period county industry shares and the national industry growth rates.[6] Industry mix employment growth represents the overall growth rate that would occur in a county if all of its industries grew at their respective national rates. Variation in the measure then is solely due to different initial industry composition. If an industry experiences a national or international demand shock, it influences the county's industry mix growth rate through its intensity in the county. The industry mix variable's key empirical advantage is that it represents exogenous demand shocks to the local labor market conditional on initial local industry composition. An advantage of our industry mix variable compared to past research, including Partridge et al. (2012), is our use of four-digit industry data versus one- or two-digit data, which provides a more precise depiction of industry shocks.[7]

To the extent that migrants are attracted to a region with favorable (industry mix) labor demand shocks, the local EPR and poverty rate are affected to a lesser extent. The industry mix variable will be more strongly related to the EPR and the poverty rate, the more local labor supply, rather than migrants, satisfy local labor demand shocks. In contrast to using overall measures of employment (unemployment) or population growth (Fodor, 2012), the use of the industry mix variables allows us to identify labor demand effects on poverty.

GEOG contains measures of agglomeration economies including spatial distance measures that reflect proximity to urban areas differentiated by their tier in the hierarchy. First is distance to the nearest urban center of *any* size including micropolitan areas. For a county that is part of an MA, this distance is from the population-weighted center of the county to the population-weighted center of the MA. For a nonmetropolitan county, distance is measured from the county center to the center of the nearest urban area.[8]

Beyond the nearest urban center, we include the incremental distances to more populous higher-tiered urban centers: incremental distance in kilometers from the county to reach a MA of any size; and the incremental distances to reach MAs of at least 250,000, 500,000, and 1.5 million people.[9] The incremental distance terms reflect incremental distance costs to reach successively higher tiers of the urban hierarchy, akin to a Central Place Theory notion of the hierarchical relationships in an urban system. The largest population-size category generally reflects national and top-tier regional centers. Generally, more remote counties have less economic growth, lower wage and land prices, and higher poverty (Partridge & Rickman, 2008a). The **GEOG** vector also includes the county's population, as well as the population of the nearest/actual urban center, to account for net urbanization economies. Finally, the vector includes the county land area in square miles.

We account for natural amenities (**AMENITIES)** with a 1 to 7 scale provided by the USDA using measures of climate, proximity to water, topography, and so forth. Three indicator variables are added for close proximity (within 50 kilometers) to the Atlantic Ocean, Pacific Ocean, and the Great Lakes. State fixed effects control for policy differences such as tax or welfare policies, as well as other state-specific omitted influences. Thus, the other regression coefficients are interpreted as the average response for *within*-state changes in the explanatory variables.

The **DEMOG** vector includes several variables associated with human capital and mobility, all measured in the initial period. There are five variables measuring race or ethnicity, four variables measuring county educational attainment, percentage of the population that is female, percentage of the population that is married, and percentage with a work disability.[10]

Empirical Results

The descriptive statistics and the regression results for the key variables are presented in Tables 1–4, with the MA results in the upper panels and the nonmetropolitan results in the lower panels. In Table 2, columns 1–3 report the results for the 2000 EPR, 2000 poverty rate, and 1990–2000 population growth; columns 4–6 report the corresponding results for the 2000–2010 period. In Table 3, columns 1–3 report the results for the 2007 EPR, 2007 poverty rate, and 2000–2007 population growth; columns 4–6 report the corresponding results for the 2007–2010 period. Table 4 reports the results of adding the change in manufacturing employment share to the models featured in Table 2.

From Table 2, we can see that the coefficients on the lagged EPR range from 0.66 to 0.79 in the 2000 model, and from 0.81 to 0.96 in the 2010 model (Columns 1 and 4). Lagged variable coefficients also are larger in the latter period for the poverty rate (Columns 2 and 5), increasing roughly from 0.6 to 0.9 in both metropolitan and nonmetropolitan areas. The large lagged coefficients suggest a high level of persistence in the disequilibrium adjustment to spatially asymmetric shocks.

The coefficient on the 1990–2000 industry mix variable is not statistically different from zero for metropolitan areas and is small for nonmetropolitan areas in the 2000 EPR

Table 1. Descriptive Statistics.

Variable	Obs.	Mean	Std. dev.	Min.	Max.
Metropolitan areas					
Industry mix employment growth 1990–2000	1,053	0.168	0.054	–0.209	0.355
Industry mix employment growth 2000–2007	1,053	0.073	0.037	–0.123	0.2
Industry mix employment growth 2007–2010	1,053	–0.04	0.019	–0.144	0.047
Industry mix employment growth 2000–2010	1,053	0.031	0.05	–0.226	0.258
Employment population ratio 1990	1,053	0.468	0.059	0.122	0.76
Employment population ratio 2000	1,053	0.485	0.056	0.154	0.676
Employment population ratio 2007	1,053	0.477	0.056	0.129	0.678
Employment population ratio 2010	1,053	0.448	0.053	0.149	0.61
Poverty rate 1990[a]	1,053	13.268	6.261	2.18	56.84
Poverty rate 2000[a]	1,053	11.554	5.193	2.117	35.871
Poverty rate 2000[b]	1,053	10.882	4.436	1.7	31.7
Poverty rate 2007[b]	1,053	12.708	4.943	2.4	34.5
Poverty rate 2010[b]	1,053	14.712	5.194	3.5	35.8
Population growth rate 1990–2000	1,053	0.181	0.18	–0.123	1.921
Population growth rate 2000–2007	1,053	0.09	0.116	–0.649	0.825
Population growth rate 2007–2010	1,053	0.026	0.037	–0.094	0.559
Population growth rate 2000–2010	1,053	0.121	0.149	–0.453	1.12
Manufacturing employment share change 1990–2000	1,053	–0.022	0.038	–0.198	0.221
Manufacturing employment share change 2000–2010	1,053	–0.040	0.037	–0.251	0.062
Nonmetropolitan areas					
Industry mix employment growth 1990–2000	1,971	0.13	0.047	–0.085	0.351
Industry mix employment growth 2000–2007	1,971	0.05	0.043	–0.16	0.269
Industry mix employment growth 2007–2010	1,971	–0.036	0.024	–0.146	0.093
Industry mix employment growth 2000–2010	1,971	0.015	0.058	–0.243	0.336
Employment population ratio 1990	1,971	0.432	0.058	0.195	0.844
Employment population ratio 2000	1,971	0.455	0.063	0.19	0.808
Employment population ratio 2007	1,971	0.46	0.074	0.191	0.836
Employment population ratio 2010	1,971	0.443	0.079	0.183	0.837
Poverty rate 1990[a]	1,971	18.531	7.998	2.402	63.118
Poverty rate 2000[a]	1,971	15.5	6.616	2.925	52.319
Poverty rate 2000[b]	1,971	14.608	5.643	2.7	42.2
Poverty rate 2007[b]	1,971	16.402	6.345	3.1	49.3
Poverty rate 2010[b]	1,971	17.917	6.358	3.2	49.1
Population growth rate 1990–2000	1,971	0.074	0.134	–0.272	0.882
Population growth rate 2000–2007	1,971	0.01	0.08	–0.313	0.79
Population growth rate 2007–2010	1,971	0.006	0.028	–0.175	0.264
Population growth rate 2000–2010	1,971	0.017	0.1	–0.38	0.898
Manufacturing employment share change 1990–2000	1,971	–0.019	0.05	–0.387	0.29
Manufacturing employment share change 2000–2010	1,971	–0.040	0.049	–0.386	0.195

[a]Poverty rate data from the Census of Population.
[b]Poverty rate data from U.S. Census Bureau SAIPE.

Table 2. Empirical Results: 1990–2000 and 2000–2010.

	1990–2000			2000–2010		
	2000 emp. ratio	2000 poverty rate	1990–2000 pop. chg.	2010 emp. ratio	2010 poverty rate	2000–2010 pop. chg.
Metropolitan areas						
Lagged employment ratio	0.79*** (20.24)			0.811*** (22.75)		
Lagged poverty rate		0.598*** (15.65)			0.9*** (23.85)	
INDMIX employment growth	0.025 (0.99)	–4.582*** (–3.26)	1.026*** (8.1)	0.131*** (5.94)	–6.428*** (–3.9)	0.197* (1.85)
N	1,053	1,053	1,053	1,053	1,053	1,053
R^2	.907	.92	.577	.878	.909	.45
Nonmetropolitan areas						
Lagged employment ratio	0.657*** (19.47)			0.958*** (25.71)		
Lagged poverty rate		0.583*** (25.55)			0.936*** (40.9)	
INDMIX employment growth	0.039** (2.45)	–6.748*** (–4.81)	0.746*** (8.63)	0.317*** (13.25)	–6.559*** (–5.48)	0.166*** (3.01)
N	1,971	1,971	1,971	1,971	1,971	1,971
R^2	.865	.896	.544	.778	.908	.459

Note. For the 1990–2000 period, poverty data are from the decennial census; for 2000–2010, they are from SAIPE. Robust *t*-statistics from STATA cluster command are in parentheses. In all models, control variables include distance to nearest or actual urban center; incremental distance to an MA; incremental distances to MA > 250,000, > 500,000, and > 1,500,000 population; county population 1990/2000; population of nearest or actual MA 1990/2000; county area (square miles); amenity dummy variable represented by a 1 to 7 scale (USDA); proximity (within 50 kilometers) to the Atlantic Ocean, Pacific Ocean, and the Great Lakes; state fixed effects; demographic variables including five ethnicity shares (four for 1990); four education shares; percentage females; percentage married; and percentage with a work disability.
*, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

Table 3. Empirical Results: 2000–2007 and 2007–2010.

	2000–2007			2007–2010		
	2007 emp. ratio	2007 poverty rate	2000–2007 pop. chg.	2010 emp. ratio	2010 poverty rate	2007–2010 pop. chg.
Metropolitan areas						
Lagged employment ratio	0.898*** (31.21)			0.867*** (34.58)		
Lagged poverty rate		0.922*** (24.9)			0.755*** (26.58)	
INDMIX employment growth	0.108*** (3.93)	–4.988*** (–2.59)	0.638*** (5.8)	0.088** (1.98)	–5.812** (–2.01)	–0.236*** (–3.14)
N	1,053	1,053	1,053	1,053	1,053	1,053
R^2	.894	.923	.468	.947	.921	.355
Nonmetropolitan areas						
Lagged employment ratio	1.005*** (29.24)			0.933*** (43.28)		
Lagged poverty rate		1.004*** (32.99)			0.695*** (28.58)	
INDMIX employment growth	0.306*** (9.25)	–5.912*** (–4.87)	0.334*** (5.79)	0.385*** (10.22)	–2.172 (–0.82)	–0.007 (–0.2)
N	1,971	1,971	1,971	1,971	1,971	1,971
R^2	.801	.925	.483	.927	.899	.344

Note. The poverty data are from SAIPE. Robust *t*-statistics from STATA cluster command are in parentheses. In all models, control variables include distance to nearest or actual urban center; incremental distance to an MA; incremental distances to MA > 250,000, > 500,000, and > 1,500,000 population; county population 1990/2000; population of nearest or actual MA 1990/2000; county area (square miles); amenity dummy variable represented by a 1 to 7 scale (USDA); proximity (within 50 kilometers) to the Atlantic Ocean, Pacific Ocean, and the Great Lakes; state fixed effects; demographic variables including five ethnicity shares (four for 1990); four education shares; percentage females; percentage married; and percentage with a work disability.
*, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

Table 4. Manufacturing Employment Share Results: 1990–2000 and 2000–2010.

	1990–2000			2000–2010		
	2000 emp. ratio	2000 poverty rate	1990–2000 pop. chg.	2010 emp. ratio	2010 poverty rate	2000–2010 pop. chg.
Metropolitan areas						
Lagged employment ratio	0.795*** (20.58)			0.812*** (23.19)		
Lagged poverty rate		0.599*** (15.38)			0.901*** (23.66)	
INDMIX employment growth	0.004 (0.18)	–4.153*** (–2.74)	1.101*** (8.36)	0.095***(4.01)	–5.675*** (–2.97)	0.414*** (3.61)
Manufacturing employment share	0.077*** (3.20)	–1.738 (–0.96)	–0.305*** (–2.59)	0.079*** (3.45)	–1.701 (–0.86)	–0.478*** (4.03)
N	1,053	1,053	1,053	1,053	1,053	1,053
R^2	.908	.92	.58	.88	.909	.458
Nonmetropolitan areas						
Lagged employment ratio	0.661*** (19.12)			0.959*** (25.96)		
Lagged poverty rate		0.584*** (25.42)			0.943*** (40.27)	
INDMIX employment growth	0.025 (1.45)	–6.318*** (–4.47)	0.752*** (8.32)	0.168*** (5.41)	–3.604*** (–3.14)	0.177*** (2.73)
Manufacturing employment share	0.044*** (3.1)	–1.401 (–1.09)	–0.019 (–0.4)	0.32*** (11.65)	–6.50*** (–4.83)	–0.024 (–0.47)
N	1,971	1,971	1,971	1,971	1,971	1,971
R^2	.865	.896	.544	.798	.909	.459

Note. For the 1990–2000 period, poverty data are from the decennial census; for 2000–2010, they are from SAIPE. Robust *t*-statistics from STATA cluster command are in parentheses. In all models, control variables include distance to nearest or actual urban center; incremental distance to an MA; incremental distances to MA > 250,000, > 500,000, and > 1,500,000 population; county population 1990/2000; population of nearest or actual MA 1990/2000; county area (square miles); amenity dummy variable represented by a 1 to 7 scale (USDA); proximity (within 50 kilometers) to the Atlantic Ocean, Pacific Ocean, and the Great Lakes; state fixed effects; demographic variables including five ethnicity shares (four for 1990); four education shares; percentage females; percentage married; and percentage with a work disability.
*, **, and *** indicate significance at 10%, 5%, and 1% levels, respectively.

model, suggesting that almost all of the newly-created jobs went to new residents. Yet in both samples there were significant antipoverty effects associated with the newly-created jobs, possibly through wage effects, or through poor residents moving up the job ladder to better jobs (Bartik, 2005). A 1 percentage point increase in industry mix employment growth during the 1990s reduced poverty by approximately 0.045 percentage points in metropolitan areas and 0.067 percentage points in nonmetropolitan areas in the short run. The corresponding long-run impacts are calculated to equal 0.11 (0.045/[1 – 0.598]) and 0.16 percentage points (0.067/[1 – 0.583]), respectively. These fall within the range of those reported by the studies reviewed above for U.S. counties.

The industry mix coefficients for the 2010 employment rate are larger than for the 2000 employment rate, ranging from 0.13 to 0.32. The short-run antipoverty effect of industry mix employment growth rises to 0.065 percentage points in metropolitan areas post-2000, while remaining approximately the same in nonmetropolitan areas at 0.063 percentage points. Nevertheless, because estimated poverty persistence increased dramatically post-2000, the long-run estimated antipoverty effects of a 1 percentage point rise in employment growth equals 0.64 percentage points in nonmetropolitan areas and 1.02 percentage points in nonmetropolitan areas, which represent substantial increases from the 1990s.

Columns 3 and 6 of Table 2 contain the corresponding results when using 1990–2000 and 2000–2010 percent population growth as the dependent variable. Population growth as the dependent variable precludes the use of lagged poverty rate as a measure of persistence. The population growth model results confirm the EPR and poverty results. There is almost a one-for-one MA migration response in the 1990s to industry mix employment growth and about a 0.75 response in nonmetropolitan areas. In contrast, the population growth responses range between 0.17 and 0.20 during 2000–2010, indicating smaller migration responses to economic shocks (Partridge et al., 2012) and larger responses in the EPR and poverty rate.

The significant antipoverty effects of faster industry mix employment growth during 2000–2010 contrast with the lack of a relationship between growth and poverty reported

by Fodor (2012). A key difference is that the use of industry mix employment growth isolates the influence of labor demand, whereas overall population and employment growth reflect both demand and supply influences, and increases in labor supply would have less of a poverty-reducing role. To confirm this conjecture (in results not shown), we replace industry mix employment growth as an independent variable in the 2010 regressions with overall employment growth. The antipoverty effect of overall employment growth is less than one-half that for industry mix employment growth in nonmetropolitan areas and less than one third as large in metropolitan areas. This likely occurs because overall employment growth also reflects labor supply influences. Consistent with the lower poverty responses, there are noticeably lower employment rate effects and greater population growth responses to overall employment growth in both metropolitan and nonmetropolitan areas.

We now explore whether the Great Recession altered adjustment patterns by splitting the sample for the latter period into 2000–2007 and 2007–2010 subsamples. We then reestimate the model using 2007 and 2010 employment and poverty rates as dependent variables, and the employment industry mix variables measured over 2000–2007 and 2007–2010 (shown in Table 3) and initial period variables measured in year 2000.[11] Correspondingly, the response of population growth to industry mix employment growth is examined during the subperiods.

The results for EPR are similar across post-2000 subperiods, with little difference in the estimates of persistence and industry mix effects. For the poverty rate, estimated persistence is noticeably higher for the 2000 to 2007 period for both metropolitan and nonmetropolitan areas, with values at or near unity. The industry mix employment effect on the poverty rate drops off by more than half during 2007–2010 in nonmetropolitan areas, and becomes statistically insignificant. Consistent with reports in the literature of declining U.S. internal migration during the Great Recession (Rickman & Guettabi, 2015; Saks & Wozniak, 2011), population became unresponsive to industry mix employment growth in nonmetropolitan areas and is negative and significant in metropolitan areas.

The reduced responsiveness of poverty to industry mix employment growth in the face of declining migration in nonmetropolitan areas suggests that other factors drove changes in regional poverty differentials during the recession. For one, such a finding is consistent with an abundance of labor, where firms may not hire as many disadvantaged workers out of the poverty pool. Another possible factor could be the fallout from the housing market, such as reduced local consumption through household debt deleveraging induced by declining housing prices (Mian & Sufi, 2009, 2011; Rickman & Guettabi, 2015). In fact, overall employment growth, subjected to the adverse effects of regional housing markets, significantly reduced poverty during the recession (in results not shown). In general, employment growth also continued to be associated with population growth during the recession. The reduced persistence of poverty in the latter period points to other forces altering the previous regional poverty differentials.

Finally, Table 4 shows the results from adding the change in the manufacturing share of employment for 1990–2000 and 2000–2010. This assesses whether manufacturing had differing employment growth effects from the average across industries. We examine manufacturing separately because of its prominence in the discussion of adverse globalization effects on U.S. employment (Autor et al., 2013) and its general exogeneity to local demand conditions. Descriptive statistics for the sector employment shares are included in Table 1.

The change in the manufacturing share shows some significantly different effects in the two decades (Table 4). In the 1990s, the greater the change in the manufacturing share, the larger was the employment rate response in both metropolitan and nonmetropolitan areas. The change in the manufacturing share also was associated with a lower population response in metropolitan areas during the decade. Manufacturing employment did not have a statistically significant differential effect on poverty rates in any area.

Post-2000, the manufacturing share continued to have a differentially significant positive effect on the employment rate, particularly in nonmetropolitan areas. Manufacturing employment also continued to be associated with a lower population response in metropolitan areas. In nonmetropolitan areas, the change in manufacturing share differentially affected the poverty rate; for example, a hypothetical drop in the manufacturing share would raise the poverty rate more than an average employment decline in other industries. Thus, while manufacturing is a small share of the U.S. economy, its influence in lifting lesser skilled Americans into the middle class remains important.

Summary and Conclusions

In this article, we examined the reversal of 1990s U.S. regional poverty gains during the first decade of the 21st century. Using a disequilibrium adjustment approach, we find lower population responses and increased employment rate responses to spatially asymmetric labor demand shocks post-2000. For metropolitan areas, a unit labor demand shock increased short-run poverty more in the recent decade, on average. Only for manufacturing did a labor demand shock have a larger short-run poverty effect post-2000 in nonmetropolitan areas. Regional poverty also became more persistent post-2000 in both metropolitan and nonmetropolitan areas, possibly because of reduced interregional labor market adjustments. The increased persistence of poverty led to substantially larger long-run area poverty effects of regional labor demand shocks after year 2000.

In separate analyses of the 2000–2007 and 2007–2010 periods, persistence of employment rates was found to not vary across the decade, but poverty rate persistence decreased during the latter (recession) period in both metropolitan and nonmetropolitan areas. We also found greatly-reduced responsiveness of poverty to industry mix employment growth during the recession in nonmetropolitan areas becoming statistically insignificant, and an absence of a (or negative) population response to industry mix employment growth. Industry mix was negatively related to population growth in metropolitan areas during the recession, and had slightly larger poverty effects. The pattern of responses in nonmetropolitan areas suggests factors other than industry composition drove changes in regional poverty differentials during the recession. One possible explanation is that the abundance of available labor supply decreased demand for less-skilled workers who were at greater risk for becoming impoverished. Another possible reason relates to the economic fallout from regional housing markets collapsing (Rickman & Guettabi, 2015).

Overall, local employment growth continues to be an important influence on area poverty. To be sure, its importance increased post-2000 in metropolitan areas across industries generally and for manufacturing employment specifically in nonmetropolitan areas, particularly in the long run. Economic development efforts devoted to spurring local labor demand remain an important antipoverty tool. In the case of local policy efforts, an important consideration would be the cost-benefit ratio of the incentive or new investment, including consideration of potential crowding out effects. Lower interregional mobility post-2000 likely increases the benefits of state and national policies. To be sure, the relative effectiveness of various approaches to stimulating local demand remains an open question (Bartik, 2012; Glaeser & Gottlieb, 2008; Partridge & Rickman, 2006a, Chap. 9; Partridge et al., 2012).

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Notes

1. Following the U.S. Bureau of Economic Analysis, there are cases where independent cities are merged with the surrounding county to form a more functional region (mostly in Virginia). Due to the lack of economic data, we omit 43 mostly small rural counties.
2. We use the 2003 metropolitan area definitions from the U.S. Census Bureau. In results not shown, Chow tests confirm the expected differences between the metropolitan and nonmetropolitan samples for all regressions at the 1% significance level.
3. The 1990 and 2000 poverty rates are for 1989 and 1990 as the Census measures income in the prior year. The SAIPE estimates are poverty rates from a computer simulation model. While the Census is more accurate, the correlation between the SAIPE and Census poverty estimates is approximately 0.95, suggesting that SAIPE data are reliable.
4. The residual is assumed to be spatially correlated with neighboring counties in their Bureau of Economic Analysis functional economic region but independent of county residuals outside the region.
5. An alternative model would be a panel specification that accounts for county fixed effects or a dynamic panel model with a lagged dependent variable using SAIPE estimates of the poverty rate for the intervening years. Despite some inherent advantages of controlling for the fixed effects, there are key practical problems of such a specification. First, most of the control variables are either time-invariant or reported only for 1990 and 2000, which would require us to omit those variables. Second, as noted in note 3, the SAIPE estimates are estimated with some error, which would introduce measurement error into the fixed-effect model. This is especially problematic in our case because the poverty rate is quite persistent, meaning the noise/signal ratio of changes in the poverty rate would be quite high and we would have relatively large standard errors (Hauk & Wacziarg, 2004).
6. Industry mix employment growth for a county equals $\sum_i(e_i/E)*gn_i$, in which e_i is county employment in industry i, E is total county employment, and gn_i is the national employment growth rate for industry i. Driven by national or international shocks, the industry mix growth rate is often used as an exogenous measure of total employment growth (Bartik, 1991; Bound & Holzer, 2000).
7. An advantage of four-digit data is that rather than accounting for growth in say manufacturing at the one-digit level, we can account for industry composition as fine as railroad equipment or auto assembly. The source of the four-digit industry level data is the EMSI consulting company. Typically, public data sources do not report detailed industry data at the county level to maintain confidentiality. EMSI produces accurate data for industries that are not publicly disclosed through an algorithm that uses many government data sources. For details of EMSI's process, see Dorfman, Partridge, and Galloway (2011).
8. For a one-county urban center, the distance term is zero. The MA population is based on initial-year population.

9. For a county already located in an MA or micropolitan area, the incremental value to reach a micropolitan area or MA (of any size) is zero. See Partridge and Rickman (2008a) for more details of the incremental distances and maps that illustrate their construction.
10. In models that use 1990 as the initial year, there are only four race and ethnicity measures due to data availability.
11. With the exception of the industry mix variables that correspond to the respective sample periods, we use the same explanatory variables in both the 2000–2007 and 2007–2010 models, measured in 2000. We experimented with models that omit the demographic variables but the results were robust to those changes.

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