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Social and political forces as determinants of poverty: A spatial analysis

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Abstract

This study contributes to basic knowledge of the structural determinants of poverty in the US by analyzing an expanded set of determinants of poverty, namely factors related to economic, social, and political influence using spatial data analysis techniques. New data sets and creative use of existing data sets make it possible to measure some of these county-wide social and political factors that have previously been excluded from formal investigation. Social capital, ethnic and income inequality, local political competition, federal grants, foreign-born population, and spatial effects are found to be important determinants of poverty in US counties along with other conventional factors.

JEL classification: C21; I32; R10

Keywords: Poverty; Social capital; Political forces; Spatial effects; Counties

1. Introduction

Few problems have proven more intractable for social scientists and policymakers than that of poverty. Although the overall family poverty rate in the US declined slightly between 1989 and 1999, poverty persists in many areas. Geographic variation in and concentration of poverty rates remain a major aspect of the poverty problem. A total of 566 counties (18%) had family poverty rates in excess of 15% in 1999 according to the US Census Bureau, following the unprecedented national economic growth of the 1990s. Most (510) of these high-poverty counties are non-metropolitan (rural),[1] and many have been persistently poor since at least the 1960s. Although

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[1] We use *non-metro* and *rural* interchangeably in the text to refer to counties that have rural-urban continuum codes 4–9 (ERS).

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attention has focused mainly on suburban or urban areas, and their inner city neighborhoods, the data show that poverty is more persistent in rural than in urban areas. The rural South had the highest shares of families living under the poverty line in 1999 while metro counties in the Great Plains and Great Lakes regions reported the lowest shares.

This study contributes to basic knowledge of the structural determinants of poverty by analyzing an expanded set of determinants of poverty, namely factors related to economic, social, and political influence. Robert Putnam argues that the same factors that he found to contribute to civic engagement and high levels of social capital also foster economic and community development. Recent case study research suggests that some community leaders may deliberately retard local economic development to maintain their position of power, and promote only the well-being of those who are aligned with them politically or otherwise (Duncan, 1999). Other researchers have argued that income and ethnic polarization in a society may impede economic progress (Alesina et al., 1999; Ngarambe et al., 1998; Alesina and Rodrik, 1996). New data sets, and creative use of existing data sets, makes it possible to measure some of these county-wide economic, social, and political factors that have previously been excluded from studies of poverty, or included only anecdotally, and to quantify the complete set of forces determining poverty within counties.

It is well-known that poverty in the US occurs in clusters or geographic pockets. Counties in Appalachia, the Mississippi Delta, Rio Grande Valley, and the southern "black belt," for example, had above-average poverty rates in 1990 (Friedman and Lichter, 1998). Yet prior research fails to account for the statistical implications of this clustering. If this bias is ignored, econometric results may be incorrect and produce policy recommendations that are counterproductive. We use spatial data analysis methods in this study to explore the spatial clustering of poverty, and spatial econometric methods to incorporate the spatial bias formally into the econometric models.

2. Conceptual framework and previous literature

In this paper we incorporate economic, social, political, demographic, and spatial factors into one model that explains variation in poverty rates in US counties. It has become clear that while economic factors explain a large amount of variation in poverty across US counties (e.g., Levernier et al., 2000), they alone are not sufficient to explain, let alone reduce poverty. While scholars generally agree that raising educational attainment levels is one means of moving people out of poverty, for example, investments in human capital do not occur automatically if other complementary factors are not also in place. In the following section we describe these social, political, and demographic factors and their hypothesized relationship with poverty rates.

Sociologists complain that economists neglect the roles of social and institutional structure in the process of economic development and poverty alleviation (Rural Sociological Society (RSS) Task Force on Persistent Rural Poverty, 1993). Writers in the sociological, political science, and regional science literatures point out that certain community attributes are empirical correlates of successful communities (Glahe and Vorhies, 1989; Green et al., 1990; Batten, 1993; RSS Task Force on Persistent Rural Poverty, 1993; McDowell, 1995; Granato et al., 1996; Rupasingha et al., 1999, 2002). These and other studies suggest that many factors influence the level of community and economic development of a place. Farmer et al. (1989), for example, view poverty as a condition of the local social structure. Lloyd and Wilkinson (1985) found that community action, in the form of concerted efforts to achieve common local goals, and solidarity historically influenced manufacturing development in rural Pennsylvania.

The idea that institutions matter for economic development has received attention in the economics literature as well. Cole et al. (1992) write, "the interaction between the organization of

a society and its economic performance was once considered perhaps the fundamental question of political economy" (p. 1095). Abramovitz and David (1996) point out that the attributes and qualities of people and organizations that originate from social and political institutions influence the responses of individuals to economic opportunity.

The concept of social capital gained prominence with the widely cited work of Putnam (1993, 1995; also see Coleman, 1988 and Fukuyama, 1995). The social capital literature emphasizes indicators of trust and civic participation. Flora et al. (1997) found that social capital is associated with successful collective development action in the non-metropolitan US, while Temple and Johnson (1998) and others (see Helliwell and Putnam, 1995; Knack and Keefer, 1997; Narayan and Pritchett, 1999) found that various social capital indices perform well in predicting economic growth across countries and regions. Rupasingha et al. (2000, 2002) found that social capital has a significant positive effect on the rate of per capita income growth.

Another strand of the growth literature focuses on the impact of ethnic diversity or heterogeneity on economic outcomes. The RSS Task Force on Persistent Rural Poverty (1993) pointed out that minorities "have endured the most intense forms of economic deprivation and its consequences" (p. 173). Easterly and Levine (1997, p. 1204) argue that "[e]thnic diversity may increase polarization and thereby impede agreement about the provision of public goods and create positive incentives for growth reducing policies." Similarly, Alesina et al. (1999) argue that the provision of most public goods, such as education, roads, libraries, and sewer systems is inversely related to ethnic fragmentation in localities.

Some authors argue that income inequality increases income growth rates, while others claim the opposite. Income inequality is typically viewed as beneficial in those societies where it concentrates resources in the hands of those who invest in growth-stimulating activities. This is the assumption of standard growth theory (Aghion et al., 1999, pp. 1620–1621). Li and Zou (1998) find that income inequality has a positive effect on per capita income growth, while Barro (1999) shows that inequality reduces growth in poor countries, but increases it in rich countries. Conversely, in economies with high levels of inequality the political process may lead to income redistribution policies that hamper economic growth because of distortions (Alesina and Rodrik, 1996). Using data on US counties, Ngarambe et al. (1998) find that greater increases in inequality led to lower income growth in the 1970s, but that the opposite was true in the 1980s. Rupasingha et al. (2002) find that higher initial income inequality reduced per capita income growth in US counties during the 1990s.

Duncan (1999) demonstrated using rural case studies that subtle factors and processes are at work within communities according to which individuals in positions of power can deliberately hold back other members of their communities. The fact that economic development can hurt existing businesses by driving up local wages or reducing prices has long been recognized, but has for the most part not been confirmed by careful and rigorous study. At first glance the subtle forces identified by Duncan may appear to be impossible to measure empirically at the county-level. However, it is clear that the social capital network in place in a community and the relative power of local governments are critical in determining whether these "political" factors are able to come into play.

The influence of political characteristics of countries on economic well-being has received considerable attention in the growth and development literature (Adelman and Morris, 1965; Frey and Schneider, 1978; Baron, 1994; Rauch, 1995; Keefer and Knack, 1997; Levitt and Poterba, 1999; LaFerrara and Bates, 2001). Adelman and Morris (1965) years ago listed "political" variables thought to affect economic development in the developing world. Virtually all of these studies are based on comparisons of nations (i.e., cross-country studies), with different political

systems. We hypothesize that many of these variables, such as degree of centralization of political power, degree of commitment of leadership to economic development, extent of government participation in economic activity, and strength of the labor movement also play a significant role in poverty alleviation or perpetuation in rural America.

Congressional representation has been linked to the distribution of government-controlled economic benefits (Matsusaka, 1995; Gilligan and Matsusaka, 1995, 2000; Levitt and Poterba, 1999). This literature contends that seniority and membership on house committees, per capita senatorial representation, and political competition between parties are positively associated with federal spending across states. Levitt and Poterba (1999) find that states in which the two major political parties compete with one another experienced faster income growth than did states with less competition. Rauch (1995) argues that elected officials' desire to stay in power leads them to allocate public funds to the delivery of current local consumption services rather than to long-term infrastructure development or investments. In this manner, elected officials gain currency with local voters but fail to address long-term poverty problems. Most of these studies examine federal spending or employment data and voting patterns as policy indicators.

The regional variation of poverty has been the subject of several studies but, to our knowledge, none formally incorporates spatial spill-over effects into the estimated models.[2] Triest (1997) attributed much of the regional variation in poverty rates to differences in the distribution of potential family earnings. More recently, Levernier et al. (2000) explore a number of potential explanations for the regional variation in poverty across US counties. Studies that ignore spatial dependence can produce biased results (coefficient estimates) and lead to ineffective – and possibly counterproductive – recommendations for policies targeted at poverty alleviation.

Another issue is endogeneity or reverse causality of some of the variables included in the empirical model. Two particularly sensitive variables[3] are inequality and migration. As noted above the rich and educated may be moving out while the poor and undereducated workers stay behind. For inequality, a widening income gap may cause poverty to persist as argued in previous literature, but persistent poverty may also drive the widening income gap in a locality. We create instruments from two auxiliary regressions to address the reverse causality issue related to migration and income inequality. We also attempt to mitigate potential endogeneity of other right hand side variables by using starting or initial conditions at a point in time that precedes the year in which the poverty rate is calculated. This is a key difference between our work and that of Levernier et al. (2000).

Based on the above conceptual framework, we formulate as the primary hypothesis that economic, social, political, and other institutional factors, along with individual-level factors, independently affect US family poverty rates. A general conceptual model for a single time period is:

$$\mathrm{POV} = f(\mathbf{ESC}, \mathbf{DMC}, \mathbf{SPC}) \tag{1}$$

where POV is the family poverty rate, **ESC** is a vector of economic and structural characteristics affecting poverty, **DMC** is a vector of demographic characteristics, and **SPC** is vector of social and political characteristics.

[2] As one reviewer pointed out this may result from self-selection. For example, the rich and educated work force may be leaving central cities or rural areas for suburbs, increasing poverty in cities. On the other hand, the poor may be concentrating in certain areas to take advantage of welfare programs or low paying jobs.

[3] While there may be other candidates in our list of variables that should be treated similarly, the literature does not provide models for identifying such variables. As noted in the text, we also lag our regressors by 1 decade to reduce potential endogenity problems.

3. Empirical model, selection of variables, and data sources

Based on the conceptual model and using the earlier definitions we estimate a regression model of the following form:

$$\text{POV} = \boldsymbol{a} + \boldsymbol{b}\mathbf{ESC} + \boldsymbol{c}\mathbf{DMC} + \boldsymbol{d}\mathbf{SPC} + \varepsilon \tag{2}$$

where letters ***a*–*d*** denote parameter vectors to be estimated. We include 3047 counties in the contiguous US in the analysis, and conduct separate analyses using metro (urban–rural continuum codes 0–3) and non-metro counties (urban–rural continuum codes 4–9) to identify differences between rural and urban counties. We also estimate a separate model for rural South counties only, so that we are able to determine whether the factors that affect poverty in the nation overall and in rural areas in general also exist in the rural South (this region has had the highest poverty rates in the nation). The family poverty rate is from the 2000 Census and is measured for 1999.[4] Except where noted, the explanatory variables are measured in 1990, with a substantial lag of one decade, as starting conditions for the later year in which the poverty rate is measured (1999), to reduce endogeneity bias.

Below we list the different variables hypothesized to influence family poverty rates and the directions of their expected effects. Definitions of all variables and their summary statistics are given in Tables 1 and 2, respectively. To some extent the distinction between these factors is arbitrary. For example, human capital has been used by economists to "explain" economic growth and by sociologists to "explain" poverty; here we classify this variable among the demographic explanations of poverty.

3.1. Economic and structural characteristics (ESC)

A sizeable literature exists on economic and demographic determinants of poverty, and because of space limitations we only outline the regressors. Additional details can be found in Cotter (2002), Albrecht et al. (2000), Levernier et al. (2000), or Madden (1996).

Conventional wisdom holds that stronger labor demand reduces poverty rates. Following Levernier et al. (2000), we use employment growth over a 2-year period to measure the effects of labor market performance on the poverty rate, hypothesizing that higher growth rates reduce poverty. *Labor force participation rates* have also been linked to county poverty rates (Levernier et al., 2000). We also include the rate of *labor force participation by gender* to examine their effects on poverty rates. Other studies have used the *total labor force* to measure urban spillover effects and availability of local inputs (Henry and Drabenstott, 1996).

Albrecht et al. (2000) argue that the *changing industrial structure* of rural America has increased poverty in some communities. This is mainly due to the adjustment costs facing workers forced to move between sectors (see also Levernier et al., 2000). We measure this variable as a dissimilarity index based on the sum of absolute changes in the share of one-digit industry employment between two periods, divided by two (Allen and Freeman, 1995, as cited in Levernier et al., 2000). In addition, we use a static measure to reflect the degree of *specialization of the county by industry*.

[4] The U.S. poverty rate is often criticized as arbitrary. It does not take into consideration the differences in cost of living across geographic areas, the possibility that basic needs can differ across areas, and the differences in public services and infrastructure across areas. Despite these shortcomings, it has been widely used in the poverty literature and is used by public agencies to define eligibility for public assistance programs such as food stamps.

Table 1
Variables used in the regressions

Variable	Description, year and unit
Family poverty rate[1]	*Dependent variable*: family poverty rate, 1999, in percent
Economic and structural characteristics (ESC)	
URBAN901[2]	Central counties of metro areas of one million population or more, DV = 0,1
URBAN902[2]	Fringe counties of metro areas of one million population or more, DV = 0,1
URBAN903[2]	Counties in metro areas of 250,000 to one million population, DV = 0,1
URBAN904[2]	Counties in metro areas of fewer than 250,000 population, DV = 0,1
Δ Employment 1988–1990[3]	Growth of private employment between 1988 and 1990, in percent
Employed labor force[3]	Civilian employed labor force/total civilian labor force 1990, ratio
Female labor[4]	Female labor force participation (total female labor force/females 16 years and over × 100), 1990, in percent
Industrial dissimilarity index[3]	Industrial dissimilarity index, 1988–1990: the sum of absolute changes in the share of one-digit industry employment, 1988–1990, divided by two
Agriculture[4]	Agriculture, forestry, and fisheries employment, 1990, in percent
Manufacturing. . .[4]	Manufacturing, mining, construction employment, 1990, in percent
Transportation[4]	Transportation and public utilities employment, 1990, in percent
Trade[4]	Wholesale and retail trade employment, 1990, in percent
Finance, insurance[4]	Finance, insurance, and real estate employment, 1990, in percent
Services[4]	Services employment, 1990, in percent
Per capita big box retailers[6]	Big box retailers per 10,000 people, 1990
Proprietorships[3]	Non-farm proprietors in a county, 1990, in percent
Income inequality[4]	Family mean income/family median income, 1989, ratio
Demographic characteristics (DMC)	
Age 0–17 years[4]	Persons 0–17 years of age, 1990, in percent
Age 18–24 years[4]	Persons 18–24 years of age, 1990, in percent
Age 65 years and over[4]	Persons 65 years and over, 1990, in percent
Non-African Americans[4]	Non-African Americans minorities, 1990, in percent
High school plus some col[4]	High school plus some college, 1990, in percent of population 25 years plus
College[4]	Four-year college or more, 1990, in percent of population 25 years plus
Non-movers[5]	Persons who lived in the same county in 1985–1990, 1990, in percent
Foreign-born population[4]	Foreign-born population, 1990, in percent of county population
Ethnic diversity[4]	Ethnic diversity index, 1990, see text
Social and political characteristics (SPC)	
Social capital[1,6,7]	Index of social capital (principal component), 1990, see text
Federal grants[4]	Direct federal expenditures or obligations—grant awards, 1990, $/capita
Political competition[4]	Index of political competition, 1988, see text
Consumption expenditure[1]	Current (consumption) local government expenditure to total expenditure, 1987, ratio

Data sources: 1, US Bureau of the Census; 2, based on Beale codes; 3, Regional Economics Information System (BEA); 4, USA Counties; 5, County-to-County Migration Files; 6, County Business Patterns; 7, National Center for Charitable Statistics.

The attraction of "big box" retailers into a locality has been touted as an economic development strategy. On the other hand, jobs created by big box retailers are mostly low paying jobs that may not help families escape from poverty, and these establishments tend also not to reinvest locally their profits earned. Therefore, the relationship between big box retailers and poverty is difficult to determine *a priori*. To measure the density of "big box" retailers we use the number of retail stores employing 20 or more workers, and normalize this number by 10,000 residents of the county. These stores include general merchandise

Table 2
Descriptive statistics

	All Counties		Metro		Non-metro		Non-metro South	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Family poverty rate	10.76	5.79	7.99	4.05	11.75	6.00	15.15	5.82
URBAN901	0.054	0.226	0.205	0.404				
URBAN902	0.043	0.204	0.165	0.371				
URBAN903	0.102	0.303	0.388	0.488				
URBAN904	0.064	0.244	0.242	0.429				
Δ Employment 1988–1990	0.035	0.055	0.051	0.048	0.029	0.057	0.026	0.062
Employed labor force	93.33	3.06	94.00	2.01	93.09	3.33	92.15	3.28
Female labor	51.89	7.09	56.89	6.15	50.11	6.53	47.79	6.32
Industrial dissimilarity index	0.629	5.286	0.040	0.169	0.839	6.143	0.592	4.158
Agriculture	10.56	9.60	3.62	3.04	13.04	9.92	10.73	8.08
Manufacturing. . .	27.17	10.28	26.58	7.95	27.38	10.98	32.11	10.72
Transportation	6.537	2.088	7.141	2.060	6.322	2.055	6.447	1.958
Trade	19.59	3.50	21.42	2.53	18.94	3.56	18.32	3.45
Finance, insurance	4.356	1.803	5.942	2.142	3.791	1.249	3.594	1.151
Services	28.76	5.73	31.05	5.58	27.95	5.55	26.67	5.44
Per capita big box retailers	0.953	0.901	1.44	0.690	0.779	0.904	0.687	0.722
Proprietorships	17.26	5.339	16.29	5.461	17.60	5.253	16.68	5.584
Income inequality	1.460	0.138	1.453	0.166	1.463	0.126	1.479	0.139
Age 0–17 years	26.88	3.44	26.23	3.11	27.12	3.52	27.07	3.45
Age 18–24 years	9.310	3.379	10.686	3.229	8.819	3.296	9.580	2.743
Age 65 years and over	14.98	4.33	12.11	3.53	16.00	4.12	15.28	3.75
Non-Af. Americans	3.884	7.575	3.978	5.506	3.851	8.189	4.359	8.278
High school plus some col	56.18	7.536	57.01	5.944	55.88	8.008	49.40	5.863
College	13.37	6.393	17.94	7.864	11.74	4.828	10.18	3.789
Non-movers	0.749	0.071	0.720	0.079	0.760	0.065	0.770	0.060
Foreign-born population	2.180	3.464	3.721	4.762	1.630	2.656	1.722	3.303
Ethnic diversity	0.175	0.168	0.213	0.157	0.162	0.169	0.271	0.176
Social capital	0.011	1.350	−0.304	1.093	0.123	1.414	−0.840	0.923
Federal grants	476.7	511.8	447.1	604.4	487.2	474.1	527.2	455.7
Political competition	8.501	6.120	8.762	6.024	8.407	6.153	8.679	6.449
Consumption expenditure	88.57	7.020	86.39	7.341	89.35	6.734	89.11	6.871
N	3047		801		2246		1022	

stores, department stores, discount and mass merchandising stores, and warehouse clubs and superstores.

We also use the rural–urban continuum code to measure *urban influence* on poverty. This code represents: 1, central counties of metro areas of one million population or more; 2, fringe counties of metro areas of one million population or more; 3, counties in metro areas of 250,000 to one million population; and 4, counties in metro areas of fewer than 250,000 population. Non-metro counties are the excluded category.

3.2. Demographic characteristics (DMC)

A large literature exits on the contribution of *human capital* to poverty alleviation and economic growth. Varying educational and training levels among localities result in differing opportunities for economic advancement. Raising human capital levels is one means of moving people out of poverty, and investments in human capital are frequently encouraged as public policy prescriptions. A change in the economic structure of a community from primary industries to a service- or a high-tech industry changes employers' requirements in terms of worker education and training. Communities with more low-skilled workers in general are more likely to experience high rates of poverty. We use educational attainment to measure the quality of human capital.

Poverty rates are also higher for female-headed families, among most minority groups and among families with larger numbers of children ((Farmer et al., 1989; RSS Task Force on Persistent Rural Poverty, 1993; Levernier et al., 2000). We incorporate these variables to the extent possible[5], age cohort variables, and the share of foreign-born population to test whether they affect poverty. The foreign-born population has not been used in previous poverty studies of this nature, and the variable is included here as a contribution to the national debate on immigration. Another potentially important variable is mobility. We include the percent of people who stayed in the same county during the past five years as a measure of county-level mobility (or immobility, see Levernier et al., 2000). Out-migration is a positive force for those who move on to better opportunities elsewhere, but it can also concentrate poverty because those who remain behind when a community falls into economic decline are those with fewer opportunities. There also is research to suggest that the poor tend to migrate to persistent-poverty counties (Nord, 1998). In our study we do not measure migration directly, but rather the absence of migration, as the percent of population that has not moved within the last five years (these are "stayers.") We expect counties with larger share of "stayers" to have higher poverty rates as well. Conversely, counties with smaller shares of "stayers" have received relatively more in-migrants and should have lower poverty rates.

Finally, another potentially key variable that has not been used in previous studies of poverty is the share of non-farm proprietors, calculated as the number of full- and part-time proprietor jobs divided by all full- and part-time jobs in 1990, using REIS data. This variable is used to measure the propensity of local workers to start their own businesses in response to economic changes (either positive or negative). Historically, the *entrepreneurial class* was seen as a driving force in the growth of business enterprise in a community. While not all proprietors are entrepreneurs, they likely have more in common with this group than with wage-and-salary workers.

[5] Some of these variables are highly correlated and could not be used in the analysis. Details of the correlations are given in the results section of the paper. A detailed correlation matrix is available from the authors on demand.

3.3. Social and political characteristics (SPC)

Social capital consists of multiple components and demands a broad measurement strategy. From this perspective, it is a theoretical construct that is not directly observable and therefore not measurable. However, social capital is also a structural condition expected to influence the covariance of a set of observed variables or indicators. This premise allows the development of a measurement model that employs various proxies of social capital. We use several proxies that have been employed in the literature to create a comprehensive index of social capital.

For example, associational density has been used to proxy for social capital (Putnam, 1993; Narayan and Pritchett, 1999; Rupasingha et al., 2000, 2002, 2006). Using County Business Patterns (CBP) data maintained by the Census Bureau, we identify an extensive and comprehensive set of variables representing associations in each county (these establishments are measured on a per capita basis): (a) bowling centers; (b) public golf courses; (c) membership sports and recreation clubs; (d) fitness centers; (e) civic and social associations; (f) religious organizations; (g) labor organizations; (h) business associations; (i) professional organizations; and (j) political organizations. Several additional measures along with the associational density variables are used to create a separate index of social capital. These are the percent of eligible voters who voted in presidential elections (Alesina and La Ferrara, 2000), the county-level response rate to the Census Bureau's decennial census (Knack, 2002), and the number of tax-exempt non-profit organizations, compiled by the National Center for Charitable Statistics. We extract principal components of these four variables, and retain the first principal component (which capture 46% of the variation) as our index of social capital.

The interrelationship between political characteristics of communities, including patronage, and poverty rates has not received much attention in the U.S. poverty literature, at least not in statistical analyses covering all counties. According to Duncan (1999), greater inequality in a community can help to maintain the *status quo* that benefits the wealthy and powerful (leadership) class. We measure income inequality using the ratio of mean to median household income (see Alesina et al., 1999; Persson and Tabellini, 1994).

Ethnic diversity tends to increase polarization and thus impede agreement about the provision of public goods and the creation of positive incentives for poverty perpetuation and growth-reducing policies (Alesina et al., 1999). We use an ethnic fractionalization index to measure ethnic diversity. This measure reflects the probability that two people drawn randomly from the county's population belong to different ethnic groups. The measure is calculated as:

$$\text{Ethnic} = 1 - \sum(\text{Race}_i)^2 \tag{3}$$

where Race_i denotes the share of population self-identified as of race $i \in I = \{\text{White, Black, Asian and Pacific Islander, American Indian, and Other}\}$ (Alesina et al., 1999). We also use the percent of all minority populations in total county population as a supplementary measure of race.

Another variable measuring political influence is the extent of the *political leadership's commitment* to poverty reduction and economic development. Lobbying for federal funding, as well as state and federal jobs, are measures of such local commitment explored in this study. We use per capita federal grants (an injection of federal funds from the outside), which are hypothesized to be negatively associated with poverty. We also employ Levitt and Poterba's (1999) method to measure *political competition* in a county. This approach involves constructing the absolute value of the difference between the county vote for the Democratic presidential candidate and the national average for that candidate in national elections. Counties with vote outcomes closer to

the national average (smaller absolute value difference) are expected to be politically more competitive. The ratio of public sector maintenance expenditures (police and fire protection, health, parks and recreation, utilities, filling potholes, etc.) to total local government expenditures, available from the Census of Governments, Bureau of Census, is used to measure elected official's determination to stay in power in the short run as opposed to investing in the long-term needs of the community. A positive association between this variable and poverty rates is expected. The Census of Governments separates public expenditures into current operation, construction, and other capital outlay, making it feasible to sort out maintenance expenditures from capital investments.

4. Estimation issues

4.1. Endogeneity

Endogeneity is a potential concern that we address by using starting or initial conditions at a point in time (around 1990, given the availability of data on exogenous variables in only certain years), that precedes the year in which the poverty rate is calculated (1999). This is one key difference between our work and that of Levernier et al. (2000). In addition, we created instruments from two auxiliary regressions for two particularly sensitive variables[6], namely income inequality and mobility. Based on previous literature (Rupasingha and Goetz, 2004; Ritsilä and Ovaskainen, 2001; Meyer et al., 2001; Mueser and Graves, 1995), a (non-) migration (stayers) equation was constructed with the cancer risk rate, whether or not the location has a superfund site, natural and other amenities (including the incidence of serious crime), population density, whether the county is urban or rural, expected income, age, local taxes and expenditures, and industrial structure as independent variables. We employ empirical equations used in Braun (1988) and Bishop et al. (1992) to obtain instruments for income inequality, such that inequality is determined by mean family income, per capita health expenditure, years of schooling, per capita educational expenditure, percent of labor in manufacturing, and population density.

4.2. Spatial effects

The spatial distribution of poverty across counties is shown in Fig. 1. A high concentration of poverty occurs in Appalachia, the southern black belt, the Mississippi Delta, Native American areas in the Southwest, *colonias* along the US-Mexico border region, and a cluster of upper Midwest counties. Fig. 1 also reveals that poverty is not independently distributed over space. This spatial association can be quantified using a global Moran's *I*, which measures similarity or dissimilarity in a variable across neighboring spatial units. A higher value of the statistic indicates a greater degree of positive correlation in the variable over the study area, and hence greater clustering of values by geographical unit. We calculate *I* for poverty rates across all continental US counties, using a contiguity-based spatial weights matrix and find that these variables exhibit statistically significant clustering. The Moran's *I* value of 0.63 (see Fig. 2) is considerably higher than the theoretical mean of zero for the case of an absence of spatial dependence.

As a global statistic, Moran's *I* captures the existence of a homogeneous pattern of spatial association over the entire study area (Anselin, 1995). It is less helpful when clusters are unevenly

[6] While there may be other candidates in our list of variables to be treated similarly, the literature does not provide models for determination of such variables.

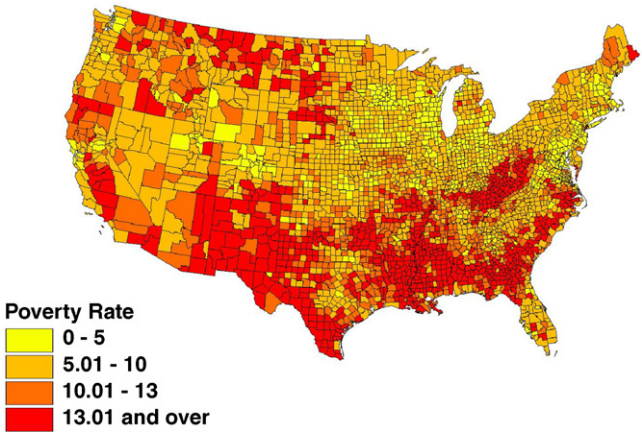

Fig. 1. Family poverty rate, 1999.

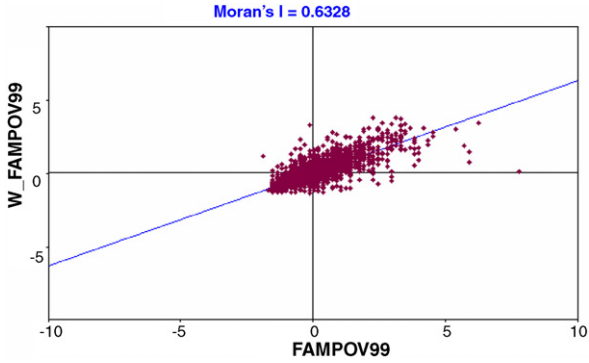

Fig. 2. Moran scatter plot for poverty rate 1999.

distributed over space, as in the case of varying levels of autocorrelation across regions of the study area; this non-stationarity can arise in the form of local "hot spots." To detect such spatial instabilities, local indicators of spatial association (LISA) are more appropriate.

Anselin's (1995, 2003) "Moran scatter plot" plots a variable of interest against spatial weighted component of that variable. This measure permits a more disaggregated view of the type of spatial autocorrelation that exists in the data. Fig. 2 plots the standardized family poverty rate of a county against its spatial lags[7] and shows the nature of the spatial clustering of family poverty rates for 1999. The quadrants of a scatter plot correspond to four types of local spatial association between a county and its neighbors:[8] (a) high-*high autocorrelation*—a county with a high-poverty rate has neighboring counties with high-poverty rates; (b) low-*low autocorrelation*—a county with low poverty is next to counties with low poverty; and (c) and (d) *negative autocorrelation* – a county with a low poverty rate is surrounded by counties with high-poverty rates, or a county with a

[7] A county's spatial lag is a weighted average of the poverty rate of its neighboring localities. The vertical axis represents the standardized spatial weighted average (average of the neighbors) for the poverty rates and the horizontal axis represents the standardized family poverty rates.

[8] Neighbors are typically defined in terms of their physical proximity to the local geographic unit.

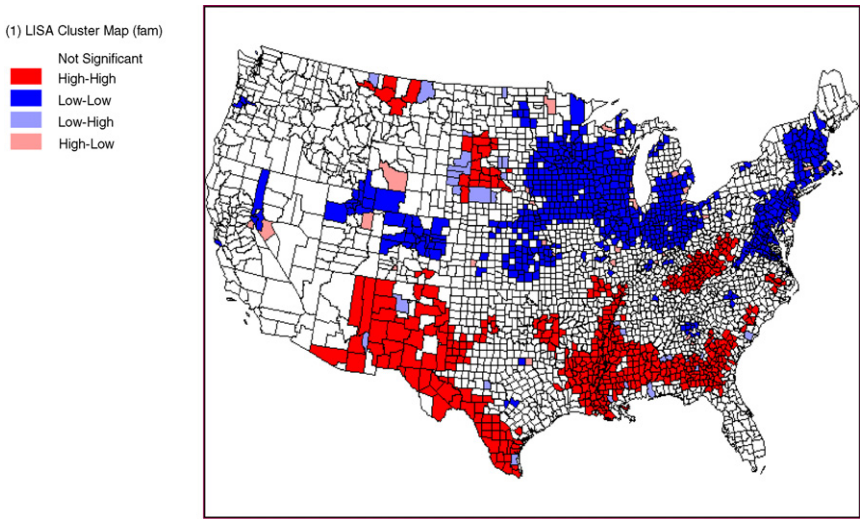

Fig. 3. LISA cluster map for family poverty 1999.

high-poverty rate is surrounded by counties with low poverty rates. Observations fall into these four types of spatial association are highlighted in a LISA cluster map in Fig. 3 (see Anselin, 2003).

The apparent clustering of poverty rates indicates that the data are not randomly distributed, but instead follow a systematic pattern. The spatial clustering of variables, and the possibility of omitted variables that relate to the connectivity of neighboring localities, raise model specification issues. In this section we review spatial econometric methods that account for the observed clustering of poverty rates. We employ two alternative specifications to correct for spatial dependence. One is the spatial auto-regressive model. This specification is relevant when the spatial dependence works through a spatial lag of the dependent variable:

$$\text{POV} = \rho W(\text{POV}) + X\beta + \varepsilon, \quad \varepsilon \sim N(0, \sigma^2 I_n), \tag{4}$$

where POV denotes an $n \times 1$ vector of the dependent variable, X represents an $n \times k$ matrix containing the determinants of poverty (**ESC**, **DMC**, **SPC**), and W is a spatial weight as explained above. Scalar ρ is a spatial autoregressive parameter and β denotes the k parameters to be estimated for the explanatory variables. The other specification is the spatial error model. This specification is relevant when the spatial dependence works through the disturbance term:

$$\text{POV} = X\beta + u, \quad u = \lambda Wu + \varepsilon, \quad \varepsilon \sim N(0, \sigma^2 I_n) \tag{5}$$

where λ is a scalar spatial error coefficient.

If evidence exists that spatial dependence is present in both forms, through both a spatial lag and error terms, the general spatial model (SAC) is appropriate (LeSage, 1999). The SAC model includes both the spatial lag term as well as the spatial error structure:

$$\text{POV} = \rho W(\text{POV}) + X\beta + u, \quad u = \lambda Wu + \varepsilon, \quad \varepsilon \sim N(0, \sigma^2 I_n). \tag{6}$$

5. Results

Variables used in the analysis are defined in Table 1, with descriptive statistics provided in Table 2. Column 1 of Table 2 presents means and standard deviations of variables for all counties, while columns 2, 3, and 4 present these statistics for metro, non-metro and rural South counties.

5.1. OLS results

Table 3 presents ordinary least squares (OLS) estimates of Eq. (2) corrected for heteroskedasticity.[9] We estimated a base model for all counties patterned after previous studies of the determinants of US poverty rates (Albrecht et al., 2000; Levernier et al., 2000; Madden, 1996), excluding the new variables proposed in the present study. We were unable to use some of the variables employed in previous studies because of multicollinearity (initial estimations revealed parameter instability when these correlated variables were included in the model). In particular, female and male labor force participation rates were highly correlated (0.71), and we elected to keep only the female labor force participation rate. Average child per family was correlated (0.91) with the age group 0–17 years, and we retained the latter in the model with other age groups for comparison purposes. The percent of African Americans was correlated with female-headed households shares (0.81) and both of these variables were correlated with the ethnic heterogeneity index (0.78 and 0.74, respectively) included in our expanded model. Because of our interest in the ethnicity index, we excluded both percent of blacks and percent of female-headed households from the model. The relationship between these two variables and poverty rates are well established in the literature.

Column 1 of Table 3 shows the results of the base model using all counties. Negative and significant coefficients for URBAN902 and URBAN903 show that these counties (fringe counties of metro areas of one million population or more and counties in metro areas of 250,000 to one million population) have significantly lower poverty rates than their non-metro counterparts. The effect of 1988–1990 employment growth (Δ *employment* 1988–1990) is not statistically significant in this specification. The coefficient of the *employed labor force* is negative and highly significant, indicating that employment reduces poverty rates, all else equal. As also found by Levernier et al. (2000), the effect of the *industrial dissimilarity index* is positive and significant, confirming that short-term shocks destabilize local job markets. *Female labor* force participation has a negative and statistically significant effect. Most of the industrial composition variables (*agriculture*, *manufacturing*, *transportation*, *trade*, *and finance and insurance*) have negative effects on poverty compared to the excluded category of public administration.[10] Service sector employment shares do not have a statistically significant effect on poverty rates in this specification.

Larger shares of children (*age* 0–17 years) and residents between the ages of 18 and 24 years (*age* 18–24 years), are associated with higher poverty rates, as are shares of non-African-American minorities (*Non-Af. Americans*). As expected, both educational attainment variables (*High school plus some col*, and *College*) are associated with significantly lower poverty rates, *ceteris paribus*. Prospects for reducing poverty by raising educational attainment differ significantly between high school plus some college, and a college degree or more, with high school plus some college

[9] Following Levernier et al. (2000), all models in this study, including the spatial models, control for state fixed-effects to account for missing state-specific variables.

[10] Levernier et al. (2000) found a positive association between the share of agriculture sector employment in 1990 and family poverty rate in 1989.

Table 3
OLS results for the base and expanded models

	Base model	Expanded model								
	All counties		All Counties		Metro Counties		Non-Metro Counties		Rural South	
	Coeff.	*P*-value	Coeff.	*P*-value	Coeff.	*P*-value	Coeff.	*P*-value	Coeff.	*P*-value
Constant	72.17	0.000	34.11	0.000	48.71	0.000	27.27	0.000	13.34	0.070
URBAN901	0.130	0.563	−0.241	0.251						
URBAN902	−1.046	0.000	−0.522	0.005						
URBAN903	−0.569	0.000	−0.528	0.000						
URBAN904	−0.060	0.693	−0.149	0.263						
Δ Employment 1988–1990	1.198	0.355	1.666	0.146	2.169	0.149	1.412	0.282	2.467	0.226
Employed labor force	−0.543	0.000	−0.367	0.000	−0.512	0.000	−0.342	0.000	−0.218	0.000
Female labor	−0.152	0.000	−0.162	0.000	−0.120	0.000	−0.171	0.000	−0.208	0.000
Industrial dissimilarity index	0.056	0.006	0.025	0.155	−1.071	0.004	0.017	0.308	−0.027	0.547
Agriculture	−0.025	0.093	−0.013	0.374	−0.028	0.348	−0.017	0.300	−0.066	0.003
Manufacturing. . .	−0.147	0.000	−0.084	0.000	−0.049	0.050	−0.086	0.000	−0.090	0.000
Transportation	−0.166	0.000	−0.116	0.000	−0.036	0.366	−0.127	0.000	−0.072	0.265
Trade	−0.088	0.000	−0.038	0.130	0.028	0.429	−0.033	0.238	−0.011	0.789
Finance, insurance, . . .	−0.098	0.018	−0.100	0.011	0.018	0.646	−0.173	0.002	−0.361	0.000
Services	−0.030	0.191	0.048	0.027	0.098	0.003	0.051	0.051	0.075	0.054
Per capita big box retailers			0.096	0.208	0.349	0.001	0.001	0.986	−0.004	0.972
Proprietorships			−0.046	0.001	−0.048	0.004	−0.040	0.026	−0.036	0.119
Income inequality (predicted)			6.083	0.000	3.679	0.000	7.725	0.000	6.633	0.000
Age 0–17 years	0.440	0.000	0.471	0.000	0.427	0.000	0.464	0.000	0.737	0.000
Age 18–24 years	0.188	0.000	0.055	0.021	0.104	0.000	0.032	0.283	0.106	0.036
Age 65 years and over	0.022	0.503	−0.026	0.440	−0.0001	0.998	−0.049	0.239	0.121	0.022
Non-Af. Americans	0.069	0.000	0.052	0.004	−0.056	0.097	0.065	0.000	−0.031	0.066
High school plus some col	−0.267	0.000	−0.226	0.000	−0.222	0.000	−0.209	0.000	−0.269	0.000
College	−0.087	0.000	−0.098	0.000	−0.173	0.000	−0.063	0.032	−0.081	0.073
Non-movers	10.78	0.000								
Non-movers (predicted)			19.83	0.000	13.74	0.000	22.508	0.000	20.657	0.000
Foreign-born population			−0.064	0.084	0.074	0.011	−0.065	0.298	0.046	0.464
Ethnic diversity			3.305	0.000	3.779	0.000	3.019	0.000	2.869	0.000
Social capital			−0.187	0.043	0.108	0.288	−0.229	0.032	−0.388	0.015
Federal grants			0.0005	0.000	0.0003	0.004	0.0005	0.009	0.001	0.009
Political competition			0.042	0.000	0.024	0.016	0.048	0.000	0.063	0.000
Consumption expenditure			0.0002	0.970	0.006	0.435	−0.002	0.846	0.001	0.925
Adjusted R^2	0.83		0.86		0.89		0.84		0.83	
Log-L	−6943		−6697		−1318		−5097		−2338	
N	3047		3047		801.000		2246		1022	

exerting a stronger effect on the margin (note that virtually all of those with college degrees also hold a high school degree). Furthermore, a high school degree or more reduces family poverty rates to a greater degree in metro than in non-metro areas, and the same is true *a fortiori* for a college degree or more. This also means that the additional effect of a high school degree plus some college in terms of reducing poverty rates is considerably greater in metro than in non-metro areas. The effect of geographic mobility (*stayers*) is as expected positive and significant, indicating that counties with more long-term or permanent residents also have more poverty. Alternatively, mobility or out-migration in pursuit of opportunities elsewhere, is one path to reducing poverty.

Next we turn to the main focus of this study, which is the expanded regression specification. This specification includes foreign-born population shares, ethnic heterogeneity, income inequality, per capita federal grants, political competition, social capital, big box retailers per 10,000 capita, the ratio of current (consumption) expenditure to total local expenditure, and the percent of non-farm proprietors. We again estimate one model for all 3047 counties, and separate regressions for metro and non-metro counties as well as non-metro counties in the South (columns 2–5, Table 3). The main results reported in the base model for all counties remain largely unchanged and robust to the inclusion of social and political variables for all of the estimates, with the exception of the industrial structural change variable and the shares of agricultural and trade sector employment variables. In the expanded model, these variables are no longer statistically different from zero. The coefficient on the share of service sector employment, which was not statistically significant in the base model, is significant and positive in the expanded model.

The *F*-statistic of 228, significant at less than one probability level, confirms the significance and relevance of the new variables entered as a vector in a model of family poverty rates. Among the new variables, *foreign-born population*, *ethnic diversity*, *income inequality*, *federal grants*, *political competition*, *social capital* and percent of non-farm *proprietorships* are each statistically significant and have the expected association with county-level family poverty rates, with the exception of per capita federal grants. This variable has an unexpected positive sign. Contrary to expectation, higher federal grant funding per capita tends to exacerbate rather than ameliorate poverty rates in a locality.[11] Our measures of ethnic inequality and economic inequality (operationalized as income inequality and entered as an instrument) exhibit positive and highly significant effects, indicating that ethnic and income polarization hampers poverty reduction efforts. The expanded equation includes a political competition variable that is based on the Democratic share of the votes in the 1988 presidential election. As indicated earlier, higher levels of this variable mean lower levels of political competition. This variable is statistically significant and positive, indicating that the lack of political competition among parties in a locality exacerbates poverty. Our results also confirm a common hypothesis in the literature, that social capital reduces assorted social and economic problems. The coefficient on the social capital index is negative and significant, implying that counties rich in social capital have lower poverty rates, all else equal. The per capita "big boxes" variable is not statistically significant.

Column 3 of Table 3 shows results of the expanded model for metro counties. Some of the statistically significant variables in the full model are no longer significant in the metro model. These are industry share variables for agriculture, transportation, and the finance and real estate sectors, and social capital. The effect of non-African American minority shares, which was positive in the full model, is reversed in the metro model (associated with lower poverty rates). In contrast,

[11] This suggests the possibility of reverse causality – that federal grants are directed more to poorer places. However, another set of regressions that uses the change in poverty rates between 1989 and 1999 as the dependent variable yields the same result, even when we control for initial poverty rates (in the same year as than in which federal grants are measured).

higher foreign-born population shares are linked to higher poverty rates in metro areas. The industry structural change variable, which had a positive but only weakly significant effect in the full model, had a negative and highly significant in the metro model, indicating that these short term industry-level changes are beneficial to metro counties in terms of reducing poverty rates.

Results of the expanded non-metro specification are remarkably similar to those of the full model, except that college-age (age between 18 and 24 years) and foreign-born population shares are not statistically significant in the non-metro model (column 4, Table 3). There are several notable differences in the results for the rural South and rural counties taken together. Agricultural jobs and non-black minorities help reduce poverty, but transport sector employment has no effect on poverty in the rural South. While the population shares aged 18–24 and 65 years and older were not significant in the non-metro model, they were positive and significant for the rural South. Also, non-farm proprietor shares had no statistical effect on poverty in the rural South.

5.2. Spatial results

LeSage (1999) presents several methods for choosing appropriate specifications of the spatial model. Since the general spatial model (SAC) nests both the spatial lag (SAR) and the spatial error model (SEM), we first estimate the SAC model. If both spatial parameters (*rho* and *lambda*) are positive and significant, then the SAC model should be chosen. If only *rho* (*lambda*) is positive and significant, then the SAR (the SEM) should be selected as the appropriate spatial model. The SAC estimation for all specifications showed both spatial parameters to be positive and statistically significant, except in the case of the metro specification. The spatial error parameter (lambda) in the metro model estimation was not statistically significant and therefore the most appropriate specification for metro areas is the spatial lag model (SAR). The significant spatial parameters further indicate that OLS is not appropriate for modeling poverty data for 1999. The following inference is based on the spatial model estimation, with results reported in Table 4.

The significant spatial parameters have interesting implications. A positive and significant spatial dependence in the dependent variable (poverty rate) indicates that the poverty rate in a particular county is associated with (not independent of) poverty rates in surrounding counties. The value of the spatial autocorrelation coefficient ($\rho = 0.21$ in the model for all counties) indicates that a 10 percentage point increase in the poverty rate in a county results in a 2% increase in the poverty rate in a neighboring county. This is strong evidence that spillover effects exist between counties with respect to poverty. The highly significant spatial error coefficients suggest that a random shock in a spatially significant omitted variable that affects poverty in a particular county triggers a change in the poverty rate not only in that county but also in its neighboring counties.

Differences exist in the results obtained for the OLS and spatial models based on all counties. The performance of most variables is enhanced when spatial effects are incorporated. The coefficients that improved from the OLS specification are: 1988–1990 employment growth, industrial structural change, agriculture and trade sector employment, and per 10,000 capita big boxes. Growth in employment is positive and statistically significant in the spatial model indicating that employment growth in a county increases poverty rates in that county, perhaps in part due to in-migration[12], but also due to changes in labor force participation (which we measure here only for females and only for 1990). The spatial model results also show that short-term industrial

[12] Levernier et al., 2000 point out that the poverty-reducing effects of employment growth are offset by in-migration in response to job opportunities.

Table 4
Spatial results for the expanded model

Variable	All Counties (SAC)		Metro Counties (SAR)		Non-Metro Counties (SAC)		Rural South (SAC)	
	Coeff.	*P*-value	Coeff.	*P*-value	Coeff.	*P*-value	Coeff.	*P*-value
Constant	27.71	0.000	46.73	0.000	21.27	0.000	7.393	0.116
URBAN901	0.043	0.861						
URBAN902	−0.201	0.351						
URBAN903	−0.413	0.008						
URBAN904	−0.118	0.501						
Δ Employment 1988–1990	1.348	0.091	1.789	0.147	1.330	0.165	2.693	0.037
Employed labor force	−0.337	0.000	−0.506	0.000	−0.312	0.000	−0.201	0.000
Female labor	−0.130	0.000	−0.104	0.000	−0.141	0.000	−0.169	0.000
Industrial dissimilarity index	0.022	0.009	−1.095	0.000	0.013	0.150	−0.055	0.009
Agriculture	−0.021	0.038	−0.032	0.200	−0.027	0.019	−0.073	0.000
Manufacturing...	−0.078	0.000	−0.049	0.002	−0.080	0.000	−0.086	0.000
Transportation	−0.118	0.000	−0.028	0.356	−0.141	0.000	−0.082	0.077
Trade	−0.057	0.001	0.019	0.516	−0.051	0.010	−0.029	0.354
Finance, insurance, ...	−0.075	0.033	0.017	0.658	−0.159	0.002	−0.350	0.000
Services	0.037	0.011	0.093	0.000	0.033	0.068	0.052	0.069
Per capita big box retailers	0.111	0.062	0.369	0.000	0.023	0.739	0.003	0.982
Proprietorships	−0.043	0.000	−0.047	0.001	−0.036	0.004	−0.021	0.261
Income inequality (predicted)	5.426	0.000	3.724	0.000	6.550	0.000	5.471	0.000
Age 0–17 years	0.440	0.000	0.427	0.000	0.447	0.000	0.701	0.000
Age 18–24 years	0.078	0.000	0.112	0.000	0.064	0.013	0.130	0.005
Age 65 years and over	0.014	0.540	0.020	0.539	0.007	0.798	0.164	0.000
Non-Af. Americans	0.068	0.000	−0.054	0.012	0.083	0.000	−0.016	0.285
High school plus some col	−0.200	0.000	−0.223	0.000	−0.178	0.000	−0.232	0.000
College	−0.094	0.000	−0.172	0.000	−0.058	0.009	−0.079	0.025
Non-movers (predicted)	19.65	0.000	13.60	0.000	21.75	0.000	20.95	0.000
Foreign-born population	−0.066	0.000	0.062	0.007	−0.044	0.080	0.070	0.028
Ethnic diversity	2.911	0.000	3.837	0.000	2.119	0.000	2.156	0.003
Social capital	−0.188	0.001	0.083	0.385	−0.237	0.000	−0.368	0.002
Federal grants	0.0004	0.000	0.0003	0.000	0.0004	0.001	0.001	0.000
Political competition	0.040	0.000	0.025	0.003	0.041	0.000	0.055	0.000
Consumption expenditure	0.0004	0.946	0.005	0.462	−0.001	0.864	0.001	0.895
Rho	0.205	0.000	0.090	0.024	0.221	0.000	0.206	0.000
Lambda	0.056	0.000			0.028	0.000	0.028	0.001
Adjusted R^2	0.87		0.89		0.86		0.84	
Log-L	−2249		−1035		−1830		−854	
N	3047		801		2246		1022	

structural change reduces a localities' ability to lower poverty rates. Contrary to the popular belief that big box retailers such as WalMart and K-Mart stores help local communities reduce poverty by providing employment opportunities, the results suggest that these types of retailers may in fact raise family poverty rates. The coefficient for URBAN02 becomes insignificant with the incorporation of spatial effects.

As is true for the OLS specification, differences arise in the spatially-corrected full model, as well as in the models for metro and non-metro counties. Initial estimation of a general spatial model showed that no spatial error effects are present in metro counties. Non-metro counties exhibited significance in both types of spatial effects. The industrial structural variable was negative and significant in the metro model, indicating that these short-term adjustments lead to lower poverty rates in metro areas; in non-metro areas this variable was positive but only weakly significant (at below the 20% level). As in the OLS model, several industry composition variables, namely, agriculture, transportation, trade, and finance and real estate sectors were not significant in the metro model whereas sectors were significant and tended to reduce poverty in non-metro areas. While higher shares of non-African American minorities are associated with lower rates of poverty in metro counties, they are associated with higher poverty rates in non-metro counties. The opposite is true for shares of foreign-born residents. As was observed in the OLS model, social capital is not significant in the metro model, but it is highly significant with a negative effect in the non-metro model. Density of big box retailers has a significant and positive effect on the poverty rate in the metro model, but not in the non-metro model.

A number of differences arise in the non-metro South spatial model compared to non-metro areas in general. As in the full model, the employment growth variable is positive and statistically significant. Unlike the result for non-metro areas in general, however, the structural change variable in the non-metro South model is negative and significant, indicating that short-term structural change in the industrial sector leads to poverty reduction in non-metro south. Trade sector employment and non-farm proprietor variables have no impact on poverty in the rural South. Also, unlike what is observed in non-metro areas in general, higher shares of foreign-born populations are associated with higher rates of family poverty in the non-metro South.

6. Social and political variables

The major focus of this study was to examine the impacts of social and political variables on poverty in a locality. As mentioned earlier, social capital, race and class relations, and political influence directly affect a community's well-being. And, the impact of these variables has not been formally addressed in previous empirical studies of poverty. The statistical analysis shows the relative and independent significance of most of these social and political factors, holding constant the effects of conventional determinants of poverty. The argument made at the beginning of the paper that ethnic and economic polarization is positively associated with poverty is confirmed by the empirical results. The coefficient estimates for ethnic heterogeneity and income inequality are both positive and highly significant in the model for all counties, as well as in the models for the metro, non-metro and rural South counties.

Numerous studies have found a positive association between economic development and social capital. In this study we investigated the independent effect of social capital on poverty rates. Our results indicated that counties rich in social capital have lower family poverty rates, with the exception of metro areas where the effect of social capital was not statistically distinguishable from zero.

Variables measuring political participation have been tied to the economic performance of communities. We incorporate political competition and per capita federal grants and find both variables to be statistically significant. Our results show that the political competition variable is positive and significant across all the models, so that counties that are politically less competitive (vote outcomes skewed towards a single party) also have higher family poverty rates. The initial postulate that federal grants help alleviate poverty is not supported by our results. This variable is positive and highly significant across all models, indicating, in fact, that federal grants exacerbate poverty in communities (the possibility of reverse causality, of course, arises, as discussed above). The ratio of maintenance expenditures (police and fire protection, health, parks and recreation, utilities, filling potholes, etc.) to total local government expenditures (CONEXP87) is not statistically significant.

7. Policy significance and concluding comments

In this study, the analysis of poverty is expanded to a wider set of factors, including income and ethnic polarization, social capital and political influence. Most importantly, this expanded approach shifts attention away from a narrow economic conceptualization and solutions to an emphasis on the complex, non-economic and difficult-to-measure processes that occur within communities. The results have important implications for public policy regarding community development in general and poverty alleviation in particular. Finding effective solutions to long-term poverty enhances the vitality of communities, and allows them to contribute to rather than detract from GDP. Also, because there are a number of shortcomings in the current official poverty measure (that also is used in this study), caution should be taken with any policy intervention that is based on a study that uses this poverty measure.

We calculated beta coefficients to investigate the relative importance of the major factors that are negatively associated with poverty. When ranked from higher to lower impacts, these coefficients reveal that counties with proportionately more high school graduates, higher employment rates and female labor force participation rates, more employment in manufacturing sector, more college graduates, and higher levels of social capital, had lower levels of poverty rates in 1999. On the other hand counties with more children, a higher number of permanent residents, higher income inequality, higher proportion of non-black minorities, greater ethnic diversity, higher proportion of young adults, and lower levels of political competition had higher levels of poverty in 1999.

In terms of policy implications these findings indicate several variables that can be influenced at the county-level. There is not much a government of any sort can do to increase the investment in social capital, since it is basically up to the local communities to enhance the level of social capital in respective communities. One thing that a government could do is to act to reduce the transaction costs facing local associations, and thereby move the associations to a higher level of efficiency. Perhaps government grants can be used to support local organizations once they have been formed voluntarily by local communities (Rupasingha et al., 1999). The government can provide formal institutional support to stimulate local development initiatives by developing work facilities for community groups, establishing technical assistance and making community-based initiatives a component of the overall local development strategy (Blakely, 1994).

Our results shed light on whether federal government projects or appropriations (pork barrels) that yield jobs or other benefits to a specific locality affect poverty level and find that localities that received these grants had higher poverty levels. While we cannot rule out the possibility of reverse causality here, it is possible that grants given to local communities by political representatives to seek patronage are not specifically targeted to reduce poverty and hence inefficient.

In addition, this study provides insights into spatial dimensions of poverty and the effect of spatial dependence in formal econometric models of poverty. The application of spatial data analysis methods revealed strong evidence of spatial interaction across county boundaries.

A note of caution is that one should not attempt to conclude from this study that policy makers should leave the poverty reduction efforts to local communities themselves. The effect of social and political forces on poverty must be viewed in combination with other significant economic, demographic, and structural factors. While the results on social and political forces are strong, we do not want to overstate their significance until further confirmation is carried out.

Results regarding social capital should be specifically viewed in the light of the fact that we did not investigate whether some forms of social capital may encourage poverty in a locality. Olson (1982) maintains that some social groups discourage economic performance by capturing a disproportionate fraction of a nation's resources or by restricting the economic progress of individuals. These types of organizations, according to Olson (1982), are rent-seeking and hence promote economic inefficiency. Another aspect that we did not investigate is the possible reverse causality of poverty on social capital. It is conceivable that poor communities lack social capital simply because they do not have the time required to engage in organizational activities or other social interaction activities.

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