

---

Contemporary Journal of Anthropology and Sociology

---

### **Predicting County-Level Unemployment in the Census East South Central Region**

Joshua J. Turner  
Mississippi State University

W. Trevor Brooks  
Austin Peay State University

---

**Abstract:** Unemployment rates are one of the predominate measures used in characterizing an area's economic condition, especially in times of major recession, when unemployment rates are often treated as the chief indicator in gauging an economy's performance. Past research on unemployment trends have typically compared unemployment rates between states. This study utilizes public data to predict county-level unemployment rates in the Census East South Central region, by looking at the roles that a county's industrial and occupational structure, generative capital, demographic composition, and geographic context play in influencing a county's rate of unemployment. Results indicate that poverty rates and the percent of African Americans in a county were associated with higher rates of unemployment. Conversely, the percentage of the workforce employed in manufacturing, the percentage of the workforce employed in agriculture, female labor force participation rates, the percentage of the population with a Bachelor's degree or higher, and the percent of Hispanics in a county were associated with lower levels of unemployment. Results suggest that gaining a better understanding of the factors associated with unemployment at the county-level can assist policy makers in implementing strategies to better aid areas with higher unemployment.

**Keywords:** Unemployment, Economic Performance, Labor Market, Generative Capital

---

<sup>1</sup> Correspondence concerning this article should be addressed to Joshua J. Turner, Research Associate, Mississippi State University, 600 Russell Street, Starkville, MS 39759, Email: [jturner@nsparc.msstate.edu](mailto:jturner@nsparc.msstate.edu), Phone: 662-699-9744

## **PREDICTING COUNTY-LEVEL UNEMPLOYMENT IN THE CENSUS EAST SOUTH CENTRAL REGION**

Unemployment rates are one of the predominate measures used in characterizing an area's economic condition. This is especially true in times of major recession, when unemployment rates are often treated as the chief indicator in gauging an economy's performance. Past research on unemployment trends have typically compared unemployment rates between countries or states (Beyers 2013; Chan, Wang, Ditchman, Kim, Pete, Chan, and Dries 2014; Fernandez-Kelly 2008). Studies that have focused on county-level unemployment trends have either focused on a single state (Nistor 2007) or have been so specific in their orientation that the relationship between county-level characteristics and unemployment were not examined in the analysis (Groenewold 1997; Holzer 1991; Nistor 2009). While these studies provide valuable insights, they fail to capture the unique nature of unemployment within selected geographic regions, which raises questions about what specific county-level demographic and socioeconomic characteristics are associated with higher unemployment rates.

The purpose of this study is to determine what conditions related to a county's industrial and occupational structure, generative capital, demographic composition, and geographic context best predict unemployment rates<sup>10</sup> for the four states of the Census East South Central region. Counties were selected as this study's unit of analysis to place more emphasis on

---

<sup>10</sup> Unemployment rates are calculated on a monthly basis through a joint program between the Current Population Survey and the Bureau of Labor Statistics. Individuals are classified as unemployed if they do not have a job, are available for work, have been actively looking for a job for the last month, or have been laid off from a job and are waiting to be recalled to work (Bureau of Labor Statistics 2017d). Further explanation is provided in the Methodology section.

<sup>11</sup> Nonmetropolitan areas refer to those areas that do not possess a county with a core city of at

micro-level issues such as differences between nonmetropolitan<sup>11</sup> and metropolitan areas.<sup>12</sup> Selecting states as the unit of analysis may lead to these issues being overlooked. For example, the changing occupational structure may push younger workers away from nonmetropolitan counties, thus altering the economic structure within both nonmetropolitan and metropolitan locations (Albrecht and Albrecht 2007).

Due to the absence of a robust body of work on this topic, the current study selected a smaller sample of counties. For purposes of this study, the East South Central region states of Alabama, Kentucky, Mississippi, and Tennessee were examined. Besides being geographically adjacent to one another, these states share several demographic and socioeconomic similarities, such as modest population growth over the last several years and comparable median household income levels.

Perhaps the most compelling reason that lead to the selection of the counties of these states was their above average unemployment rates when compared to the nation. We propose that the most effective way to examine the factors and address the issues associated with unemployment is to look at areas with higher than average unemployment rates. Focusing on such areas could help researchers and policy makers better understand the factors that predict higher levels of unemployment, with the assumption that understanding these relationships could serve as an aid for designing and implementing strategies to more effectively address issues related to higher unemployment.

Overall, 78 percent of counties in the

least 50,000 residents, while also lacking a higher percentage of commuters to the core city for work purposes (United States Department of Agriculture 2017).

<sup>12</sup> Metropolitan areas refer to those areas that possess a county with a core city of at least 50,000 residents along with a higher percentage of commuters to the core city for work purposes (United States Department of Agriculture 2017).

East South Central region recorded unemployment rates that were higher than the national average in 2015 (Bureau of Labor Statistics 2017d). Further comparisons at the state level show that three of the states in this study had unemployment rates higher than the 2015 national average, while the annual average

for Kentucky matched the national rate at 5.3 percent (Bureau of Labor Statistics 2017d). Table 1 displays data related to the selected demographic and economic characteristics for the United States and the states included in this study.

**Appendix A: Table 1**

**Table 1: Selected Demographic and Economic Characteristics for the East South Central States**

<b>Region</b>	<b>2010-2016 Population Change (national rank)<sup>13</sup></b>	<b>2015 Unemployment rate (national rank)<sup>14</sup></b>	<b>2014 Median Household Income (national rank)<sup>15</sup></b>
United States	4.66	5.3	\$50,502
Alabama	1.74 (35)	6.1 (43)	\$41,415 (46)
Kentucky	2.25 (32)	5.3 (27)	\$41,141 (47)
Mississippi	0.72 (41)	6.4 (46)	\$36,919 (50)
Tennessee	4.81 (20)	5.6 (32)	\$41,693 (45)

## LITERATURE REVIEW

The following sections describe the relationships found in past research related to the conditions that predict unemployment rates. In this study, a particular emphasis is placed on an area's industrial and occupational structure, levels of generative capital, demographic composition, and geographic context. The literature review has been organized under these four major themes.

### Industrial and Occupational Structure

Industrial and occupational structures often serve as a reliable indicator of an existing workforce's skill set, educational attainment levels, and earning potential (Albrecht and Albrecht 2009). For example, a metropolitan county with a highly educated population is more apt to meet the demands for occupations requiring higher levels of skill and training (Albrecht and Albrecht 2009). Also, areas with the presence of in-demand industries, such as healthcare, are likely to have lower levels of unemployment due to the demand for a particular industry's goods or services (Albrecht and Albrecht 2007; Brooks, Cummings, Turner, and Khatiwada 2012).

Data from the Bureau of Labor Statistics

(2015) suggest that from 2014 to 2024, most occupational groups were projected to either remain steady, or decline. The only occupational group expected to experience substantial growth was within the service sector, especially healthcare (Bureau of Labor Statistics 2015). Another Bureau of Labor Statistics report shows that from 2007 to 2011, health and service occupations, including registered nurses, personal care aids, and physicians and surgeons saw substantial growth (Watson 2012). During the same time period, construction and retail-related occupations showed the most decline (Watson 2012).

Evidence shows that counties with more industrial diversity have an economic advantage. For example, manufacturing jobs may attract a stable population, while producing a ripple effect that can attract service-sector jobs (Scott 2015). Therefore, this study proposes the general hypothesis that counties with more industrial diversity, especially those with a stronger manufacturing presence, are likely to have lower unemployment rates. Conversely, counties dominated by one industry, particularly an industry that is declining, will likely experience higher rates of unemployment.

<sup>13</sup> Source: U.S. Census Bureau

<sup>14</sup> Source: Bureau of Labor Statistics

<sup>15</sup> Source: U.S. Census Bureau

## Generative Capital

Different types of human capital (financial, educational, or social), are highly correlated with an area's economic condition. Generative capital is a comprehensive concept that refers to resources that can be used to obtain goods and services, meet basic needs, and generate other forms of capital. Perruci and Wysong (2003) identify four types of generative capital: (1) consumption capital, (2) investment capital, (3) social capital, and (4) skill capital.

*Consumption capital* is generally associated with monetary income, while *investment capital* refers to surplus income that can be accumulated, invested, and passed down to future generations (Perruci and Wysong 2003). In terms of the relationship between these forms of capital and unemployment, studies have shown that areas with higher incomes have significantly lower levels of unemployment when compared to areas with lower income levels (Aliprantis, Fee, and Oliver 2014; Nistor 2009; Wood 2014).

Areas with historically high poverty levels may also have high unemployment levels, as both are affected by similar social forces, such as educational attainment levels (Thompson 2012). Both poverty and unemployment also represent conditions of disadvantage that are often found to coexist with one another, especially during times of economic downturn (Lichter and Jensen 2002; Parisi, Grice, Taquino, and Gill 2002). Furthermore, economic restructuring has displaced jobs for those with lower educational attainment levels. Given this situation, it is possible that counties with high poverty rates are at greater risk of industrial disruption, which can lead to job displacement and higher unemployment levels (Albrecht et al. 2007).

*Social capital* is a multidimensional resource that links socioeconomic status, race and ethnicity, and gender. Social capital can serve as an advantage to areas and individuals with high amounts of investment, consumption, and skill capital or as an obstacle to areas and individuals lacking such capital (Perruci and Wysong 2003). Social capital is related to the accumulation of resources, attributable to either groups or individuals that are built through certain social networks (Bourdieu and Wacquant

1992). For purposes of this study, we argue that areas with higher concentrations of social capital tend to fare better economically due to higher levels of established affluence. Such areas may hold more potential for attracting new businesses due to their possession of a highly-skilled workforce (Epifani and Grancia 2005).

In terms of how social capital relates to gender, female workers have historically been an exploited group, limited to lower-paying jobs and childcare duties (Fernandez-Kelley 2008; Maloney 2011a). Increased female labor force participation may be a sign of increasing gender equality, but may also be an economic strategy to deal with inflation and increased male unemployment trends (Mattingly and Smith 2010). During the later years of the Great Recession, male and female job loss was nearly identical and many women changed their work status from full-time to part-time. This trend is particularly troubling considering that nearly one-third of mothers who work full-time are sole providers (Fernandez-Kelly 2008). Other research has revealed the challenges facing women in the workforce. For instance, in 2009, about ten percent of mothers who were the head of the household were unemployed and almost a million U.S. mothers with children under the age of 18 wanted a job, but could not find employment (Maloney and Schuner 2011).

Finally, *skill capital* is related to specialized knowledge that is gained through work experience, training, and education (Perruci and Wysong 2003). Research related to the relationship between levels of skill capital and unemployment has shown that areas with higher proportions of residents with a college education were found to have lower levels of unemployment (Aliprantis, Fee, and Oliver 2014). Indeed, recent statistics at the national level show a consistent inverse relationship between educational attainment and rates of unemployment. For example in 2016, individuals with Bachelor's degrees or higher recorded an unemployment rate of 2.5 percent, versus unemployment rates of 5.2 percent and 7.4 percent for individuals with a high school diploma and those without a high school diploma, respectively (Bureau of Labor Statistics 2017a).

## Demographic Composition

The demographic composition of an area has been shown to be an effective predictor of an area's level of unemployment and potential for economic development (Gracia-Diez 1987; Snipp 1992). Areas with higher levels of minority populations may be more vulnerable to stagnant rates of economic development and higher unemployment (Gitter and Reagan 2002). Research on the unemployment trends of African Americans has shown that individuals from this racial group experience higher rates of unemployment, with recent data at the national level showing that African Americans recorded an unemployment rate of 8.4 percent in 2016, compared to a rate of 4.3 percent for Whites (Bureau of Labor Statistics 2017b) and 5.8 percent for Hispanics (Bureau of Labor Statistics 2017c).

African Americans have also shown longer stretches of unemployment and higher rates of marginal workforce participation. The prevalence of unemployment among African Americans may be due to a mismatch between skill levels and available jobs in areas with more skilled positions available; however, African Americans with a college degree have been shown to have unemployment rates that are nearly double when compared to Whites with similar levels of education and training (Maloney 2011b).

While there is a gap in the literature connecting Hispanic population growth to county-level unemployment rates, Hispanic population growth has been associated with other economic performance indicators. For example, the mismatch between current skills and the skills required in high demand industries is also seen as an issue in the Hispanic community, which has been vulnerable to labor market shifts and downsizing in the construction, manufacturing, and service and hospitality-related sectors (Maloney 2011b). However, unlike the south's African American population, the region's Hispanic population growth is somewhat new, especially for nonmetropolitan counties (Lichter and Johnson 2009).

Hispanics, similar to other migrant groups, choose destinations that offer economic opportunities (Kandel and Parrado 2005; Lichter

and Johnson 2009). For example, Hispanic population growth in nonmetropolitan areas can be partially attributed to meat packing plants (Kandel and Parrado 2005). Furthermore, Hispanic in-migrants tend to fare better economically than Hispanic immigrants. Therefore, counties with larger Hispanic populations have likely experienced economic growth and thus have lower unemployment rates, especially when growth comes from migration within the United States (Donato, Tolbert, Nucci, and Kauano 2008).

An area's age structure may also influence levels of unemployment (Nistor 2009). Research has focused on how young adults migrate from economically depressed areas, including certain nonmetropolitan counties (Johnson, Nucci, and Long 2005). Economic opportunities not only lower the unemployment rate, but also attract younger in-migrants looking for work (Epifani and Grancia 2005). Having a high prevalence of older adults and fewer residents in their prime working years speaks to an area's potential workforce, as various age groups are affected by unemployment differently (Gracia-Diaz 1987). For example, changing occupational trends may favor younger workers who work for lower wages and better understand recent technological developments (Sassen 1990; Wilson 2009).

### **Geographic Context**

Geographic context has long been effective in predicting a region's potential for economic development (Lee 1966). Isolation from core population centers and areas with higher levels of economic development often leave counties in nonmetropolitan areas in a state of uneven development relative to metropolitan areas (O'Hare and Mather 2008). This lack of development may lead to fewer opportunities in less populated areas (O'Hare and Mather 2008; Tickamyer and Duncan 1990).

Past research focusing on the relationship between nonmetropolitan areas and unemployment has demonstrated that nonmetropolitan areas tend to have higher unemployment rates than metropolitan areas (Lichter 1989; Mills 2000), while also being more susceptible to longer bouts of chronic unemployment (Swaim 1990). Multiple

examples have shown that the disparity in labor force composition (particularly as it relates to educational attainment) between metropolitan and nonmetropolitan areas may explain the differences in unemployment rates between the two types of geographic contexts. On a national level, work by Lichter and Costanzo (1987) found that nonmetropolitan workers were more likely to be marginally or temporarily employed than workers in metropolitan areas due to a mismatch between education levels and available jobs in nonmetropolitan areas. Research on this topic that has focused on the southern region of the United States has shown similar findings (Findeis, Jensen, and Wang 2000; Jensen, Findeis, and Wang 2000).

Lack of industrial diversification and reliance on one dominant industry may also help to explain nonmetropolitan-metropolitan unemployment rate differences (Lichter and Costanzo 1987; Wood 2014). Metropolitan areas are established economic, transportation, and cultural hubs that provide access to scarce resources related to healthcare, employment, and cultural enrichment. Metropolitan areas also provide opportunities in industries that call for specific levels of education and training, while possessing infrastructures that allow them to attract industries associated with amenity-based development such as manufacturing, retail sales, and entertainment and recreation services (Nord and Cromartie 2000). Adjacency to metropolitan areas can serve as an attractive feature for potential businesses and provide access to opportunities for work, education, and training. Conversely, non-adjacency and geographic isolation may serve as a disadvantage when compared to the features of metropolitan areas (O'Hare and Mather 2008; Tickamyer and Duncan 1990).

### **The Present Study**

The effects of structural conditions and socioeconomic and demographic characteristics on county-level unemployment rates is an understudied phenomenon, which presents an opportunity to perform exploratory research that will help establish a body of literature on this and similar topics. Broadly speaking, it is proposed that a county's unemployment rate is best predicted by factors related to its industrial and occupational structure, levels of generative

capital, demographic composition, and geographic context. To this end, the following hypotheses are proposed and organized into theoretically meaningful groups.

#### *Industrial and Occupational Structure*

- The *higher* proportion of the workforce employed in retail services in a county, the *higher* its unemployment rate.
- The *higher* proportion of the workforce employed in health and educational services in a county, the *lower* its unemployment rate.
- The *higher* proportion of the workforce employed in manufacturing in a county, the *lower* its unemployment rate.
- The *higher* proportion of the workforce employed in construction in a county, the *higher* its unemployment rate.
- The *higher* proportion of the workforce employed in agriculture in a county, the *higher* its unemployment rate.

#### *Generative Capital*

- The *higher* a county's poverty rate, the *higher* its unemployment rate.
- The *higher* a county's female labor force participation rate, the *lower* its unemployment rate.
- The *higher* the proportion of a county's population with a Bachelor's degree or higher, the *lower* its unemployment rate.

#### *Demographic Composition*

- The *higher* the proportion of Hispanics in a county, the *lower* its unemployment rate.
- The *higher* the proportion of African Americans in a county, the *higher* its unemployment rate.
- The *higher* a county's age dependency ratio, the *higher* its unemployment rate.

#### *Geographic Context*

- Non-adjacent counties will have a *positive* association with unemployment.
- Metropolitan counties will have a *negative* association with unemployment.

## **METHODOLOGY**

### **Data**

County-level data for the East South Central states of Alabama, Kentucky,

Mississippi, and Tennessee were retrieved from two primary sources. County-level unemployment rate data were retrieved from the Bureau of Labor Statistics (2017d). Data for the independent variables were retrieved from the United States Census Bureau (2010).

### Measurement

**Dependent Variable: Unemployment Rates.** Unemployment rates are calculated on a monthly basis by dividing the number of unemployed, working age individuals aged 16 and older by the number of total individuals in the civilian labor force. An individual is classified as unemployed if they do not have a job, are currently available for work, have been actively looking for a job for the last month, or have been laid off from a job and are waiting to be recalled to work (Bureau of Labor Statistics 2017d). When the unemployment rate is calculated, it appears as a percentage representing the number of unemployed individuals per 100 individuals in the civilian labor force (Bureau of Labor Statistics 2017d).

For purposes of analysis, annualized unemployment rates were utilized, which are calculated based on a county's 12-month average of their respective unemployment rates. Under the methodology established by the Bureau of Labor Statistics, these rates remain in preliminary status for several months and are subject to revision. With this in mind, annualized rates from 2015 were used for purposes of utilizing a more stabilized county-level unemployment rate. The mean county-level unemployment rate for 2015 for the states in this study was recorded at 8.4 percent. Table 2 presents the means, standard deviations, and minimum and maximum scores for the dependent variable and all interval-ratio independent variables.

**Independent Variables.** Due to the limited body of work on this topic, a variety of potential independent variables were reviewed to explain county-level unemployment rates. After extensive preliminary data screening and testing, variables were selected and organized into four distinct groups: (1) industrial and occupational structure, (2) generative capital, (3) demographic composition, and (4) geographic context. Data for the independent variables came from the

2010 decennial census to ensure that the independent variable preceded the dependent variable. Measuring the independent variables in 2010 is appropriate, especially for variables like poverty rates, which can be theoretically argued as both a predictor and consequence of unemployment. The specific indicators under each of these groups are presented in the following sections.

*Industrial and Occupational Structure.* Five variables were used to represent a county's industrial and occupational structure: (1) percent employed in retail, (2) percent employed in health and educational services, (3) percent employed in manufacturing, (4) percent employed in construction, and (5) percent employed in agriculture. Counties in this study averaged 12.08 percent employed in retail, 20.93 percent employed in health and educational services, 17.34 percent employed in manufacturing, 8.28 percent employed in construction, and 4.19 percent in agriculture.

*Generative Capital.* Three variables were used to represent the different types of generative capital. Poverty rates served as an example of the potential for a county's levels of consumption and investment capital. Skill capital was represented by the percentage of a county's population (age 25 or older) with a Bachelor's degree or higher. Social capital was measured by looking at the female labor force participation rate. The average poverty rate for this sample of counties was 20.67 percent. In terms of educational attainment, on average, 14.73 percent of individuals age 25 and older had attained a Bachelor's degree or higher. Finally, the average female labor force participation rate for counties in this study was 51.43 percent.

*Demographic Composition.* Three variables served as indicators of a county's demographic composition: (1) percent Hispanic, (2) percent African American, and (3) age dependency ratios. On average, Hispanic residents comprised 3.19 percent of the population in the counties under examination. By comparison, African American residents represented an average of 18.48 percent of the population. The average age dependency ratio for the counties in this study was 62.57, meaning

there were approximately 62.57 individuals aged 65 or older or aged 14 and younger for every 100 individuals between the ages of 15 to 64.

*Geographic Context.* Two dichotomous variables: (1) non-adjacency and (2) metropolitan status were constructed to measure geographic context. Non-adjacency refers to counties assigned a rural-urban continuum code of '9.' These are counties that are completely rural, non-adjacent to a metropolitan area, possessing an urban population of less than 2,500 residents (U.S. Department of Agriculture Economic Research Service 2015). Counties assigned a rural-urban continuum code of '9'

were assigned a value of '1' while all other counties were assigned a value of '0.' Forty-four counties (12.09 percent) in the sample were assigned rural-urban continuum codes of '9.' Metropolitan status refers to counties with a core population of at least 50,000 residents and high amounts of in-commuting for work purposes (U.S. Department of Agriculture Economic Research Service 2015). Counties designated as metropolitan were assigned a value of '1' while all other counties were assigned a value of '0.' There were 125 counties (34.34 percent) in the sample that were identified as metropolitan.

Appendix B: Table 2

Table 2: Descriptive Statistics for Dependent and Independent Variables

	Mean	Standard Deviation	Minimum	Maximum
<b>Dependent Variable<sup>16</sup></b>				
2015 Unemployment Rate	8.4	2.25	3.5	18.4
<b>Independent Variables<sup>17</sup> (measured in 2010)</b>				
<b>Industrial Structure</b>				
Percent Employed in Retail	12.08	3.41	1.48	24.71
Percent Employed in Health and Educational Services	20.93	5.78	3.6	40.8
Percent Employed in Manufacturing	17.34	6.69	1.9	37.5
Percent Employed in Construction	8.28	2.59	2.0	18.5
Percent Employed in Agriculture	4.19	3.59	0.2	24.71
<b>Generative Capital</b>				
Poverty Rate	20.67	6.75	5.2	43.4
Bachelor's Degree or Higher	14.73	6.85	3.6	51.8
Percent Females in Labor Force	51.43	6.15	32.8	66.6
<b>Demographic Composition</b>				
Percent Hispanic	3.19	1.99	1	14.2
Percent African American	18.48	21.45	1	87.1
Dependency Ratio	62.57	5.8	38.6	79.3
<b>Geographic Influence</b>				
Non-adjacent county	-	-	0	1
Metropolitan county	-	-	0	1

### Modeling Strategy

A four step OLS regression model was applied to test which variables best predicted 2015 county unemployment rates for the region under examination. With each step, a new group of variables was introduced into the regression model. This approach was taken to determine which set of variables made the most significant contribution to the model's explained variance.

### RESULTS

#### OLS Regression Results

The OLS regression model was constructed in a hierarchical fashion in order to determine whether the amount of explained variance showed an increase as different groups of variables were added to the regression model. Table 3 displays the OLS model results for the four steps of the OLS regression model.

Step I incorporated the five industrial

and occupational structure variables. By themselves, these five variables explained 8.62 percent of the variance in unemployment rates. Percent employed in agriculture ( $\beta = .23$ ;  $p \leq .001$ ) was positively associated with unemployment rates.

Step II added the generative capital variables to the analysis. With the addition of these three variables, the explained variance increased to 54.78 percent. Two of the generative capital variables, female labor force participation rate ( $\beta = -.22$ ;  $p \leq .001$ ) and percentage of residents holding a Bachelor's degree or higher ( $\beta = -.13$ ;  $p \leq .01$ ) were negatively related to unemployment rates. Also, as poverty rates increased, so too did unemployment rates ( $\beta = .57$ ;  $p \leq .001$ ). Of the industrial and occupational structure variables, the percent employed in manufacturing ( $\beta = -$

<sup>16</sup> Source: Bureau of Labor Statistics

<sup>17</sup> Source: U.S. Census Bureau

.09;  $p \leq .01$ ) and agriculture ( $\beta = -.16, p \leq .001$ ) negatively predicted unemployment rates.

The three demographic composition variables were added to Step III. Adding these three variables increased the explained variance to 61.44 percent. Two of the demographic composition variables showed statistically significant relationships with unemployment rates. First, as the percentage of residents identifying themselves as Hispanic ( $\beta = -.14; p \leq .001$ ) increased, unemployment rates declined. Conversely, as the percentage of African Americans ( $\beta = .25; p \leq .001$ ) increased, so too did unemployment rates. The percent employed in agriculture ( $\beta = -.19; p \leq .05$ ) was negatively associated with unemployment rates. As with Step II, all three of the generative capital variables were significant predictors of unemployment rates. The positive association between poverty rates and unemployment stayed consistent in Step III ( $\beta = .44; p \leq .001$ ). As the percentage of females in the labor force increased, unemployment rates decreased ( $\beta = -.27; p \leq .001$ ). Finally, the percentage of

residents holding a Bachelor's degree or higher continued to show a negative association with unemployment rates ( $\beta = -.16; p \leq .001$ ).

Step IV added the two geographic influence variables, which increased the explained variance of the model to 61.70 percent. In this final step, neither of the geographic influence variables were significantly related to unemployment rates. The same two variables that showed positive relationships with unemployment rates in Step III also showed positive relationships with unemployment rates in Step IV. These variables included poverty rates ( $\beta = .43; p \leq .001$ ) and the percentage of African Americans in a county ( $\beta = .26; p \leq .001$ ). Meanwhile, five variables, percent employed in manufacturing ( $\beta = -.07; p \leq .05$ ), percent employed in agriculture ( $\beta = -.20; p \leq .001$ ), female labor force participation rate ( $\beta = -.25; p \leq .001$ ), percentage of the population with a Bachelor's degree or higher ( $\beta = -.16; p \leq .01$ ), and percent Hispanic ( $\beta = -.13; p \leq .001$ ) were negatively associated with unemployment rates.

### Appendix C: Table 3

**Table 3: Ordinary Least Squares Regression Analysis**

	Step I	Step II	Step III	Step IV
	B (SE)	B (SE)	B (SE)	B (SE)
<b>Industrial Structure</b>				
Percent Employed in Retail	-.07(.03)	-.06(.02)	-.04(.02)	-.04(.02)
Percent Employed in Health/Educational Services	.07(.03)	.02(.03)	-.01(.02)	-.01(.02)
Percent Employed in Manufacturing	-.04(.03)	-.09(.02)**	-.07(.02)	-.07(.02)*
Percent Employed in Construction	-.08(.03)	-.05(.03)	-.03(.03)	-.03(.03)
Percent Employed in Agriculture		-	-.19(.01)*	-
	.23(.12)***	.16(.01)***		.20(.01)***
<b>Generative Capital</b>				
Poverty Rate		.57(.03)***	.44(.03)***	.43 (.03)***
Bachelor's Degree or Higher		-.13(.03)**	-.16 (.03)**	-.16(.03)**
Female Labor Force Participation		-.22(.09)***	-.27(.09)***	-.25(.09)***
<b>Demographic Composition</b>				
Percent Hispanic			-.14(.01)***	-.13(.01)***
Percent African American			.25(.01)***	.26(.01)***
Dependency Ratio			.05(.08)	.04(.08)
<b>Geographic Influence</b>				
Non-adjacent county				.04(.02)
Metropolitan county				-.03(.02)
$R^2$	.0862	.5478	.6144	.6170

\*= $p \leq .05$ ; \*\*= $p \leq .01$ ; \*\*\*= $p \leq .001$

## DISCUSSION

### Evaluation of Hypotheses

The purpose of this study was to determine what conditions related to a county's industrial and occupational structure, generative capital, demographic composition, and geographic context best predicted unemployment rates at the county level for the East South Central states of Alabama, Kentucky, Mississippi, and Tennessee. Results of the analysis revealed that there were several significant predictors of county-level unemployment rates in the study region. Due to the complexity of the analysis, an evaluation of the research hypotheses may be best conducted by re-visiting the four groups of variables and their utility in predicting county-level unemployment rates in light of the final results of the regression model.

*Industrial and Occupational Structure.* First, full results revealed that two variables related to industrial and occupational structure: the percentage of the workforce employed in manufacturing and the percentage of the workforce employed in agriculture, were significantly associated with unemployment rates. In the final model, the percentage employed in manufacturing negatively predicted unemployment rates. Interestingly, when examining only the industrial and occupational structure variables, the percentage employed in manufacturing was not significantly related to unemployment. However, when observing the generative capital variables with the industrial and occupational structure variables, the percentage employed in manufacturing became a significant predictor of unemployment rates.

The percentage employed in agriculture was a significant predictor of unemployment rates in all four models. In Step I, when only the industrial variables were observed, the percentage employed in agriculture positively predicted unemployment rates. However, when controlling for generative capital, demographic composition, and geographic context variables, the direction switched.

The results for manufacturing were as predicted, while the results for agriculture were opposite than hypothesized. More than any other

sector, manufacturing can create jobs in other industries (Scott 2015). In the East South Central region, a stronger presence of manufacturing and agriculture ultimately leads to lower unemployment. The negative relationship between agricultural employment and unemployment may also speak to the nature of the study region, which has a rich tradition of success in this particular sector. Economic development efforts to bolster agribusiness may help to explain the effect of agriculture on unemployment rates in this particular region. In other words, if the agricultural sector is experiencing success, the benefits may be felt for a county's economy as a whole.

*Generative Capital.* One of our most important findings is the impact generative capital had on predicting county-level unemployment rates, as all three variables were found to be statistically significant predictors of unemployment. Furthermore, the relatively high betas indicated that the generative capital variables displayed the strongest relationships with unemployment rates. These variables also provided the largest contribution to the regression models in terms of explained variance. Consistent with past research, results of this study indicated that high unemployment coincided with high rates of poverty. This relationship speaks to the accumulation of monetary disadvantages that can take place in a given area (Lichter and Jensen 2002; Parisi et. al 2002).

The negative relationship between female labor force participation rates and unemployment rates may partially be explained by changing family dynamics, especially the rise of single-mother households. Counties with high female labor force participation rates may have lower unemployment rates because there are more opportunities for females in the workforce. This may be beneficial both for single-mother families, who have little choice but to enter the labor force, and couples trying to maximize their family income by having both partners work (Mattingly and Smith 2010).

Another generative capital variable, percentage of the population with a Bachelor's degree or higher, was negatively associated with

unemployment rates. The negative relationship between higher levels of education and unemployment rates lends support to the idea that areas with higher levels of skill capital attract greater levels of economic development and are less vulnerable to high rates of unemployment (Aliprantis et. al 2014). This finding is consistent with Perruci and Wysong's (2003) notion that those with specialized skills are able to better adapt to economically harsh conditions, such as periods of recession that are characterized by high and chronic rates of unemployment.

*Demographic Composition.* Two variables related to a county's demographic composition were significantly associated with county-level unemployment rates and both of these relationships followed their hypothesized direction. Counties with higher percentages of African American residents showed higher levels of unemployment. These results suggest that past historical exploitation continues to negatively impact opportunities for African Americans, who continue to have higher unemployment rates than whites, even when possessing similar educational attainment levels (Maloney 2011b). Conversely, higher proportions of Hispanic residents were associated with lower levels of unemployment at the county level. These results are consistent with recent Hispanic migration trends, which suggest that Hispanics migrate to locations with available jobs (Donato et al. 2008; Kandel and Parrado 2005; Lichter and Johnson 2009).

*Geographic Context.* Of the two variables related to geographic context, neither metropolitan county status nor non-adjacency was found to be a statistically significant predictor of county-level unemployment rates.

In summary, several of the hypotheses presented in this study received support. In the full-model, two variables were positively associated with unemployment rates: percentage of residents living in poverty and the percentage of residents identifying as African American. Five variables: the proportion of the workforce employed in manufacturing, the proportion of the workforce employed in agriculture, female labor force participation rates, the percentage of residents holding at least a Bachelor's degree, and the percentage of residents identifying as

Hispanic negatively predicted unemployment rates.

### **Limitations**

This study was not without its limitations. Perhaps the most important limitation is that the Bureau of Labor Statistics does not produce seasonally adjusted unemployment rates at the county level. Thus, county-level unemployment rates are unadjusted, meaning factors like holidays, weather patterns, and school closings cannot be controlled for. This is particularly problematic for industries such as construction or tourism that fluctuate significantly from month to month. Another important limitation is the possible endogeneity concerns that may prevail between several of the independent variables and unemployment rates. For example, do educated individuals avoid areas with high unemployment rates or do counties with high unemployment rates simply lack educated people? Future studies may utilize more complex statistical models and examine multiple years of data to see if such patterns exist.

Another limitation was the fact that this study was limited to counties in a few select states. An analysis of counties in different states may have yielded different results. An additional limitation was the focus on unemployment rates as the main indicator of an area's economic condition. Indeed, unemployment rates are typically examined in periods of major recession as the main indicator in gauging the economic condition of an area, however a more expanded analysis may have looked at labor force participation rates and employment-to-population ratios as further indicators of the study area's economic state.

### **Practical Implications**

This study has practical implications for matters of both policy considerations and future research endeavors. In terms of policy considerations, a better understanding of the various factors associated with unemployment rates can assist policy makers in implementing strategies to better aid areas with high unemployment. Policy makers can potentially use this information to work with businesses to better assess which types of industries can best economically benefit an area and what type of job training programs will be necessary to

prepare workers and equip them with appropriate skills. Understanding that a lack of industrial diversity can be associated with higher levels of unemployment may encourage counties with a high percentage of manufacturing jobs to seek strategies to help diversify their economy. For example, suppliers of oil and gas have taken advantage of nonmetropolitan settings in western North Dakota and some parts of Appalachia to attract younger in-migrants to places that have historically struggled economically to the point of losing young residents to out-migration (Mather and Jarosz 2014).

This study also adds to the literature that addresses the disparity in unemployment rates that exists for racial minorities, particularly between non-Hispanic whites and African Americans. While human capital differences explain part of the unemployment gap between these two groups, there is evidence that employment discrimination still persists, most notably in the private sector (Pager, Western, and Bonikowski 2009). African Americans have achieved more gainful employment in the public sector due to more stringent discrimination laws when compared to the private sector (Pitts 2011). Stronger anti-discriminatory policies in the private sector may help to improve the unemployment rate for African Americans.

Future research could benefit from observing which factors best predict unemployment rates in other regions of the United States. It may also be useful to observe whether the factors that predict unemployment rates today also predicted past unemployment rates. Comparisons across place and time would allow for the development of more in-depth theories to better explain unemployment rates. In addition, understanding county-level predictors for unemployment increases our capacity to comprehend the relationship between societal factors and unemployment rates. This could inspire future research to examine impacts on other county-level factors like poverty rates or labor force participation rates.

## REFERENCES

Albrecht, Don E. and Carol Mulford. Albrecht. 2007. "Economic Restructuring and

Socioeconomic Outcomes in Metropolitan and Nonmetropolitan Counties." *Electronic Journal of Sociology*. Retrieved November 28, 2017 ([http://www.sociology.org/content/2007/albrecht\\_economic\\_restructuring.pdf](http://www.sociology.org/content/2007/albrecht_economic_restructuring.pdf)).

- Albrecht, Don E. and Albrecht, Stan G. 2009. "Economic Restructuring, The Educational Income Gap, and Overall Income Inequality." *Sociological Spectrum* 29(4):519-547.
- Aliprantis, Dionissi, Kyle Fee, and Nelson Oliver. 2014. "Which Poor Neighborhoods Experienced Income Growth in Recent Decades?" *Economic Commentary* 5:1-6.
- Beyers, William B. 2013. "The Great Recession and State Unemployment Trends." *Economic Development Quarterly* 27:114-123.
- Bourdieu, Pierre and Loiq J.D. Wacquant. 1992. *An Invitation to Reflexive Sociology*. Chicago and London: University of Chicago Press.
- Brooks, William T., Jacob Cummings, Joshua J. Turner, & Saileza Khatiwada. 2012. "An examination of geographic and socio-demographic impacts on private industry job change in the Dakotas, 2002 - 2008." *Great Plains Sociologist* 22:6-34.
- Bureau of Labor Statistics. 2015. "Employment Projections: 2014-24 Summary." Retrieved November 28, 2017 (<https://www.bls.gov/news.release/ecopr0.nr0.htm>).
- Bureau of Labor Statistics. 2017a. "Employment Status of the Civilian Noninstitutional Population 25 Years and Over by Educational Attainment, Sex, Race, and Hispanic or Latino Ethnicity." Retrieved November 28, 2017 (<https://www.bls.gov/cps/cpsaat07.pdf>).
- Bureau of Labor Statistics. 2017b. "Employment Status of the Civilian Noninstitutional Population by Sex, Age, and Race." Retrieved November 28, 2017 (<https://www.bls.gov/cps/cpsaat05.htm>).

- Bureau of Labor Statistics. 2017c. "Employment Status of the Hispanic or Latino Population by Age and Sex." Retrieved November 28, 2017 (<https://www.bls.gov/cps/cpsaat04.htm>).
- Bureau of Labor Statistics. 2017d. "Local Area Unemployment Statistics." Retrieved November 28, 2017 (<https://www.bls.gov/lau/lauov.htm>).
- Chan, Jacob Yuichung, Chia-Chiang Wang, Nicole Ditchman, Jeong Han Kim, Joseph Pete, Fong Chan, and Bradley Dries. 2014. "State Unemployment Rates and Vocational Rehabilitation Outcomes: A Multilevel Analysis." *Rehabilitation Counseling Bulletin* 57:209-218.
- Donato, Katherine M., Charles M Tolbert III, Alfred Nucci and Yukio Kauano 2008 "Changing Faces, Changing Places: The Emergence of New, Nonmetropolitan Immigrant Gateways." In *New Faces in New Places: The Changing Geography of American Immigration*. Ed. Douglas S. Massey. New York: Russell Sage Foundation. Pp. 75–98.
- Epifani, Paolo and Gino A. Gancia. 2005. "Trade, Migration and Regional Unemployment." *Regional Science and Urban Economics* 35:625-644.
- Fernandez-Kelly, Patricia 2008. "Gender and Economic Change in the United States and Mexico 1900-2000." *American Behavioral Scientist* 52:377-404.
- Findeis, Jill L., Leif Jensen, and Quiyan Wang. 2000. "Underemployment Prevalence and Transitions in the U.S. Nonmetropolitan South." *Southern Rural Sociology* 16:125-147.
- Gitter, Robert J. and Patricia B. Reagan. 2002. "Reservation wages: An Analysis of the Effects of Reservations on Employment of American Indian Men." *The American Economic Review* 92(4):1160-1168.
- Gracia-Diez, Mercedes. 1989. "Compositional Changes of the Labor Force and the Increase of the Unemployment Rate: An Estimate for the United States." *Journal of Business and Economic Statistics* 7:237-243.
- Groenewold, Nicolaas. 1997. "Does Migration Equalise Regional Unemployment Rates? Evidence From Australia." *The Journal of RSAI* 76:1-20.
- Holzer, Harry J. 1991. "Employment, Unemployment, and Demand Shifts in Local Labor Markets." *The Review of Economics and Statistics* 73:25-32.
- Jensen, Leif, Jill L. Findeis, and Quiyan Wang. 2000. "Labor Supply and Underemployment in the Southern United States." *Southern Rural Sociology* 16:96-124.
- Johnson, Kenneth M. 2012. *Non-metropolitan demographic change in the new century: Slower growth, increased diversity* (Issue Brief No. 44). Carsey Institute. Retrieved November 28, 2017 (<http://www.carseyinstitute.unh.edu/publications/IB-Johnson-Non-metropolitan-Demographic-Trends.pdf>).
- Kandel, William and Emilio Parrado. 2005. "Restructuring of the U.S. Meat Processing Industry and New Hispanic Migrant Destinations." *Population and Development Review* 31:447-471.
- Lee, Everett. 1966. A theory of migration. *Demography* 3:47-57.
- Lichter, Daniel T. 1989. "Race, Employment Hardship, and Inequality in the American Nonmetropolitan South." *American Sociological Review* 54:436-446.
- Lichter, Daniel T. and Janice Costanzo. 1987. "Nonmetropolitan Underemployment and Labor-Force Composition." *Rural Sociology* 52:329-44.
- Lichter, Daniel T. and Leif Jensen. 2002. "Rural American in Transition: Poverty and Welfare at the Turn of the 21<sup>st</sup> Century." Pp. 77-110 in *Rural Dimensions of Welfare Reform*, edited by Bruce A. Weber, Greg J. Duncan, and Leslie A. Whitener. Kalamazoo: W.E. Upjohn Institute for Public Research.
- Lichter, Daniel T. and Kenneth M. Johnson. 2009. "Immigrant Getaways and Hispanic Migration to New Destinations." *International Migration Review* 43(3):496-518.
- Mather, Mark, and Beth Jarosz 2014. "U.S.

- Energy Boom Fuels Population Growth in Many Rural Counties.” *Population Reference Bureau*. Retrieved November 28, 2017  
<http://www.prb.org/Publications/Articles/2014/us-oil-rich-counties.aspx>.
- Maloney, Carolyn 2011. “Understanding the Economy and Working Mothers in the Great Recession.” Pp. 93-98 in *Unemployment: A Closer Look*. Edited by Jacob S. Mlaker. Hauppauge, NY: Nova Science Publishers.
- Maloney, Carolyn 2011. “Understanding the Economy: Long-Term Unemployment in the African American Community.” Pp. 109-20 in *Unemployment: A Closer Look*. Edited by Jacob S. Mlaker. Hauppauge, NY: Nova Science Publishers.
- Maloney, Carolyn 2011. “Understanding the Economy: Unemployment in the Hispanic Community. Pp. 121-36 in *Unemployment: A Closer Look*. Edited by Jacob S. Mlaker. Hauppauge, NY: Nova Science Publishers.
- Maloney, Carolyn and C. E. Schuner. 2011. “Women in the Recession: Working Mothers Face High Rates of Unemployment.” Pp. 99-108 in *Unemployment: A Closer Look*. Edited by Jacob S. Mlaker. Hauppauge, NY: Nova Science Publishers.
- Mattingly, Marybeth J. and Kristen E. Smith. 2010. “Changes in Wives’ Employment When Husbands Stop Working: A Recession-Prosperity Comparison.” *Family Relations* 59:343-357.
- Mills, Bradford F. 2000. “Job Search, Employment Density, and the Rate of Exit of Unemployment in Nonmetropolitan Labor Markets.” *Southern Rural Sociology* 16:148-174.
- Nistor, Adela 2007. “Implications of Human Capital Public Investments for Regional Unemployment in Indiana.” *Regional Analysis and Policy* 37(3):279-286.
- Nistor, Adela 2009. “Assessing the Effectiveness of Human Capital Investments on the Regional Unemployment Rate in the United States: 1990 and 2000.” *International Regional Science Review* 32:65-91.
- Nord, Mark and John Cromartie 2000. “Migration in the Nonmetropolitan South.” *Southern Rural Sociology* 16:175-205.
- O’Hare, William and Mark Mather. 2008. “Child Poverty is Highest in Rural Counties in U.S.” Population Reference Bureau. Retrieved November 28, 2017  
<http://www.prb.org/Articles/2008/child-poverty.aspx>.
- Pager, Devah, Bruce Western, and Bart Bonikowski. 2009. “Discrimination in a Low-Wage Labor Market: A Field Experiment.” *American Sociological Review* 74:777-99.
- Parisi, Domenico, Steven Michael Grice, Michael Taquino, and Duane A. Gill. 2002. “Social Capital, Structural Conditions, and Mortality: A Study of Nonmetropolitan Counties in Mississippi.” *Southern Rural Sociology* 18(2):111-129.
- Perruci, Robert and Earl Wysong. 2003. *The New Class Society: Goodbye American Dream?* Lanham, MD: Rowman and Littlefield Publishers.
- Pitts, Steven. 2011. “Research Brief: Black Workers and the Public Sector.” *Work in the Black Community*. Berkley, CA: U.C. Berkley Center. Retrieved November 14, 2017  
[http://laborcenter.berkeley.edu/pdf/2011/blacks\\_public\\_sector11.pdf](http://laborcenter.berkeley.edu/pdf/2011/blacks_public_sector11.pdf).
- Sassen, Saskia. 1990. “Economic Restructuring and the American city.” *Annual Review of Sociology* 16:465-490.
- Scott, Robert E. 2015. “The Manufacturing Footprint and the Importance of U.S. Manufacturing Jobs.” *Economic and Policy Institute*. Retrieved November 28, 2017  
<http://www.epi.org/publication/the-manufacturing-footprint-and-the-importance-of-u-s-manufacturing-jobs/>.
- Snipp, Matthew C. (1992). “Sociological Perspectives on American Indians.” *Annual Review of Sociology* 18:351-371.
- Swaim, Paul 1990. “Rural Displaced Workers

- Fair Poorly,” *Rural Developmental Perspectives* 6:8-13.
- Thompson, Sanna J. 2012. *Homelessness, Poverty, and Unemployment: An Overview and Conceptual Model*. Hauppauge, NY: Nova Science Publishers.
- Tickamyer, Ann R. and Cynthia M. Duncan. 1990. “Poverty and Opportunity Structure in Rural America.” *Annual Review of Sociology* 16:67-86.
- United States Department of Agriculture: Economic Research Service. 2014. “2010 Rural-Urban Commuting Area (RUCA) Codes.” Retrieved November 28, 2017 (<http://www.ers.usda.gov/data-products/rural-urban-commuting-area-codes/documentation.aspx>).
- United States Department of Agriculture. 2017. “What is Rural?” Retrieved November 13, 2017 (<https://www.ers.usda.gov/topics/rural-economy-population/rural-classifications/what-is-rural.aspx>).
- United Nations Development Programme. 2015. “Human Development Report 2015.” Retrieved February 5, 2016 (<http://report.hdr.undp.org/>).
- Watson, Audrey 2012. “An Overview of U.S. Occupational Employment and Wages in 2011.” *Beyond the Numbers: U.S. Bureau of Labor Statistics* 6 (1). Retrieved November 28, 2017 (<http://www.bls.gov/opub/btn/volume-1/an-overview-of-occupational-employment-and-wages-in-2011.htm>).
- Wilson, William J. (2009). Toward a framework for understanding forces that contribute to or reinforce racial inequality. In E. Higginbotham, & M. L. Andersen (Eds.), *Race and ethnicity in society: The changing landscape, 3<sup>rd</sup> Edition* (pp.250-254). Belmont, CA: Wadsworth.
- Wood, Catherine A. 2014. “Unemployment continued Its Downward Trend in 2013.” United States Bureau of Labor Statistics *Monthly Labor Review*. Retrieved November 28, 2017 (<http://www.bls.gov/opub/mlr/2014/article/unemployment-continued-its-downward-trend-in-2013.htm>).