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Determinants of Young Adult Poverty: A ZIP Code Level Analysis

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Abstract of Thesis

"Determinants of Young Adult Poverty: A ZIP Code Level Analysis"

The "war on poverty" started in America in the early 1960s, and the poverty rate of 22.4 percent in the year 1959 decreased to 11.1 percent in 1973. Regrettably, this war did not last long enough, as poverty rate increased to 15.1 percent in 1993. In the year 2000 the US poverty rate declined, but always stayed above 11.1 percent. Kentucky also did not achieve success in this poverty war, and it resulted in growing numbers of poor people.

Analysis of poverty has always aroused the interest of economists, sociologists and policy makers. Goal of this paper is to intricate appropriate strategies and invent effective prevention efforts to eradicate the young adult poverty. Estimation of Gini coefficients for various age groups indicates that the young adult population of Kentucky is at risk. The purpose of this paper is to determine the factors of young adult poverty, employing ZIP Code data in Kentucky. Data analysis reveals that rural young adults are more vulnerable than urban young adults in Kentucky. Some significant factors such as; male and female educational level, presence of minorities and type of employment are the primary determinants of poverty for this age group. Analysis of outcomes leaves suggestions for the policy makers to exterminate young adult poverty from Kentucky.

Key words: young adult, Kentucky, ZIP Code, poverty, Gini coefficient

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June, 2007

"Determinants of Young Adult Poverty: A ZIP Code Level Analysis"

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THESIS

Kaustav Misra

The Graduate School

University of Kentucky

2007

"Determinants of Young Adult Poverty: A ZIP Code Level Analysis"

THESIS

A Thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in the
College of Agriculture
At the University of Kentucky

By

Kaustav Misra

Lexington, Kentucky

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Lexington, Kentucky
2007

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Chapter I

Introduction

The word "young adult" has different meanings depending on the context. The terms youth, young adult, or young people are used to refer specifically to those aged 18-24 years in this paper. The sociological definition of a young adult is a transition stage between childhood and adult-hood. More precisely, it comprises a series of transitions "from adolescence to adult-hood, from dependence to independence, and from being recipients of society's services to becoming contributors to national economic, political and cultural life" (UNDP, Jordon Human Development Report 2000). Poverty means a state of condition when an individual faces limited resources to do well enough in their day to day life. So the poor young adults are the portion of the population who suffer from this inadequacy.

US Census statistics revealed that nationwide about 31.1 million people were poor in 2000, but the trend of the poverty rate declined from13.1 percent to 12.4 percent over the last decade. The number of poor young adults also decreased from 1990 to 2000, but still represents a significant group of people among the total population in the U.S. Poverty among young adults has become an increasingly important topic as policy makers; government and non-government officials become interested because of the tremendous social and financial cost.

Poverty is unevenly distributed across America, as well as in areas of Kentucky. Geographical variation in poverty is present, but it is higher in some areas than in other

areas or cities in the same state. Poverty levels change not only over time but also over space. The reason for these disparities in living standard mainly come from communities in different locations and the differences among communities, such as industrial structure, density of economic activity, type of natural resources, levels of public goods, and access to government policies and programs (Ravallion and Wodon). Authors from various disciplines have compared rural and urban poverty using different types of data. Friedman and Litchter used county level data to explain child poverty in America. Crandall and Weber introduced Census-tract level data to measure poverty changes during the past two decades in US. This study uses ZIP Code data to determine the spatial difference in young adult poverty in Kentucky.

There are some obvious advantages for using ZIP Code level data for this study. According to the U.S. Census Bureau, the census tract is defined as a geographic unit that defines a neighborhood and contains an average of about 3,000-4,000 people, and a county defines a bigger neighborhood and contains a large average number of people than a Census tract, where as a ZIP Code identified a smaller neighborhood than a Census tract or a county in a state[1].

So a ZIP Code will provide information about the neighborhood and identification of the poor people will be much easier than using other types of available census data in U.S.

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[1]http://0-www.cdc.gov.mill1.sjlibrary.org/nchs/datawh/nchsdefs/censustrack.htm

Most poverty researchers use demographic characteristics like, sex, age, race, and family structure; and economic conditions, such as employment types and duration, and other social factors, to measure poverty. Poverty research reached a new level when spatial externalities were included in the model. Renkow found that rural labor-market conditions are more sensitive to human capital stocks and local labor market conditions than urban labor-market conditions, and he showed that number of individuals returning to school from among those who had dropped out was significantly lower in rural counties than in urban counties.

A rapidly changing society and a decreasing sense of community have reduced or eliminated many of the traditional ways that young people receive the support they need to move toward maturity and self-sufficiency. Young people need opportunities to fulfill their development needs; intellectually, psychologically, socially, morally and ethically. Sometimes young people fail to get these opportunities and this contributes to them being trapped in poverty (Delahanty). Poverty can influence them to adopt risk-taking behavior and an unhealthy life style, and ultimately, these poor young adults become an economic burden for the entire society.

The purpose of this thesis is to identify the determinants of young adult poverty in Kentucky using ZIP code level data. The determinants of young adult poverty suggests that developing young adult development programs for geographical areas which provide young people with increasing responsibility and opportunities to play meaningful roles in their own development, and in the community. A commitment by policymakers,

politician and communities to support positive young adult development approach to programs and service that meet young people's development needs is essential. If poverty is distributed evenly throughout all age groups in the population, general policies aimed at poverty alleviation are justified. However, if young people in poverty suffer from spatial inequalities in certain geographic areas, policies need to be focused on addressing specific challenges.

1.1 Research Objectives

The objectives of this thesis are:

1. To estimate the extent of young adult poverty in Kentucky,

2. To estimate the Gini coefficients for various age groups of people in Kentucky in United States by ZIP Code, and

3. To evaluate and compare the socioeconomic and demographic factors that influences the rural and urban young adult poverty at ZIP Code.

The total population growth rate and employment rate has increased over the last 20 years in Kentucky. But the growth of employment is much slower than the growth rate of population. Unemployment rates for young adults (18-24 years) not in school were lower among those with higher education levels. The unemployment rates for young adults who had college degrees were 5.4 percent for males and 3.6 percent for females. In contrast, youth without a high school diploma who were not enrolled in school had unemployment rates of 15.3 percent for males and 21.2 percent for females (Table 1.1).

Table 1.1. Percentage of unemployed male and female based upon educational level in Kentucky.

Education Level	Male (in percent)	Female (in percent)
Unemployed with college degree	5.4	3.6
Unemployed without high school diploma	15.3	21.2

Source: US Bureau of the Census 2000

Data from Census 2000 reveals that 34.3 percent of the rural population has not completed high school, while 19.2 percent of the urban population lacks a high school diploma. This will underscore a need for policies directed to rural areas, however, the unique differences between rural and urban poverty must be reviewed.

1.2 Hypothesis

This study will examine three sets of hypotheses regarding factors that can determine young adults' poverty in Kentucky using U.S. 2000 Census data. Poverty is distributed sporadically across the landscape in Kentucky, due to the uneven industrial structure, differences in density of economic activity among Kentucky regions, so the different ZIP Codes experience various poverty rates. The ZIP Code with higher unemployment rates will have a higher poverty rate. The first hypothesis in this paper is that a ZIP Code with a higher number of unemployed male and female workers will increase the young adult poverty rate. One can expect a positive relationship between these variables, which indicates that unemployed male or female population will increase the young adult poverty rate in a Kentucky ZIP Code. The alternate hypothesis is that a

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ZIP Code with higher unemployed male or female population will not increase the young adult poverty rate within a ZIP Code. Crandall and Weber, Alwang, and several other authors have shown that the poverty rate is higher in rural areas due to slower economic growth. We are also expecting to see the higher young adult poverty rate in rural ZIP Codes than in urban ZIP Codes in Kentucky. In a country like the United States, a world leader in terms of economic development, the presence of persistently poor regions, economic inequalities and income disparities between rural and urban areas is disturbing. ZIP Code based policies targeting unemployed poor young adults', could facilitate the poverty eradication process.

Race is an important determinant of the poverty. Previous researchers consistently showed that a minority population suffers more in child poverty, teen poverty or poverty in total than the white population in the United States. The claim of this research is that minorities such African American and Hispanic population will influence young adult poverty in a ZIP Code in Kentucky. So the second null hypothesis in this study is that a ZIP Code with a higher African American and Hispanic population is positively related with young adult poverty rate, and the alternate hypothesis is that a ZIP Code with increasing both populations will decrease the young adult poverty rate in Kentucky. If the income level and racial gaps in poverty play an influential role in determining poverty among young adults, then a policy that focuses on raising overall income level or eradicating poverty may be more appropriate irrespective of rural and urban areas.

The linkage between education and poverty can be explained in two ways. First, investment in education is a poverty reduction strategy that can enhance the skills and productivity among the poor people. Second, poverty is a constraint to educational achievement, in that children of poor households receive less education. In more if not most developed and developing countries, females on average receive less education than males. Research on females schooling explains the persistence of gender gaps and indicates how the combined effects of household poverty and gender reduce educational opportunity for them (Oxaal). Further he mentioned female young adults, on average, have lower educational attainment and face a greater risk of welfare dependence in rural areas than urban areas. So the last null hypothesis in this paper is that a ZIP Code with proportion of female high school graduates has negative impact on young adult poverty rate. The alternate hypothesis would be that a ZIP Code with high number of high school graduate female will increase young adult poverty rate in Kentucky. This hypothesis will help in a gender perspective on poverty reduction, and education highlights several possible strategies to tackle rural female disadvantages such as educational initiatives for girls or reducing opportunity cost for girls' schooling. To date, no empirical investigations concerning the linkage of female education and young adult poverty have been conducted using data from all Kentucky ZIP Codes.

1.3 Definition of a ZIP Code

In 1963, the U.S. postal system introduced a system of postal-zone codes (ZIP stands for "zone improvement plan") to improve mail delivery and exploit electronic

reading and sorting capabilities. The original code, which corresponds to the postal codes used in the U.S., consists of five numbers. The first three numbers identify the state and portion of the state, and the last two numbers indicate a specific post office or zone information. After some time, the U.S. postal systems become more sophisticated in order to handle fast delivery system. In 1983, a nine-digit code was created just to improve the delivery speed. Among the last four digits in a ZIP Code, the first two added digits specify a particular "sector," and last two gets even smaller "segment" as for example a single floor in a large building or one side of a block.[2]

ZIP Codes primarily identify areas within the United States to simplify and speed the distribution of mail. The other important purpose of the ZIP Code is to identify demographic and socioeconomic characteristics for a smaller geographic area. The alignments of ZIP Code do not necessarily conform to boundaries of cities, counties, States, or other jurisdictions. Introducing five or nine digits ZIP Code not only helps the postal delivery system, but these ZIP Codes can also increase efficiency for different industries and government organizations. The size of a ZIP Code may vary from place to place but it always corresponds to a smaller geographic unit than county level data or Census-tract level data. The evolution of a ZIP Code is useful for marketers, industrialists, government program developers and policy makers to reach a target audience more conveniently than before. So research based upon the ZIP Code will provide better essence about the people to the policy makers to employ program for the target audiences in a geographic location. Using ZIP Code in this paper would be helpful

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[2] http://www.maponics.com/ZIP_Code_Maps/ZIP_Code_FAQ/ZIP_code_faq.html

to the policy markers to identify and employ policies for the poor young adults in a smaller geographic unit.

The county, Census-tract or other level of data has their own advantages and disadvantages. These are very useful and convenient geographic units, but county data suffers from spatial aggregation (Crandall & Weber). There are only a few studies where researchers used ZIP Code data, as it is one of the smallest geographic units to measure poverty. Kirby, Coyle & Gould used ZIP Code data to study the relation of young teenage birth rates and teen poverty in California. This is the first attempt where ZIP Code data was used to identify teen pregnancy.

Economically-deprived young adults are not only at higher risk for themselves but also for the entire society. The poor young adults will enter a vicious circle, which will likely continue producing poor adults and poor children, into the future. Ultimately, this process reduces social welfare as a whole. Young adult poverty is a threat to societies for the future. From a social welfare perspective, the goal should be to search for the causes of young adult poverty and invent better policies to eradicate it. Public policy based upon the data sets of ZIP Code data could be effective and efficient, since the analysis can apply to very small communities. Different prevention programs and comprehensive intervention efforts with poor youth can break the vicious cycle of young adult poverty and help them to make a path toward a productive, healthy future.

1.4 Thesis Structure

This thesis has six chapters. Chapter I represented background and justification of the research topic addressed in this thesis. Chapter II provides the detail economic and sociological review of the related hypothesis in this thesis. Chapter II is divided into three sections and each section represent the related strands of the previous research. This chapter is structured as follows. The first section of this chapter indicates the relation between the poverty and unemployment. The second section concerns about the race as it relates to poverty. And the last section reviews studies concerning the relationship between education and poverty. Chapters 3 discuss the economic model and provide a justification of this model. This chapter is divided into two sections. The first section of the third chapter discusses about the importance of the Lornez curve and Gini coefficient, and assesses the appropriateness associated with young adult poverty. This chapter also provides a framework for an economic model of young adult poverty. Chapter 4 introduces an econometric model derivation and the data from Census, which is used for the analysis and also presents the descriptive statistics. Chapter 5 is devoted on the empirical results and presents analysis of the factors affecting young adult poverty. Finally, chapter 6 provides a summary of the thesis and concludes discussing limitations of the study, and possible policy implications of the empirical results, and opportunities for extension of this research.

Chapter II

Literature Review

In this section several economic literature research themes will be inter connected to make the case for the model proposed in Chapter III. In the introduction in this chapter I will explore why and how this study is essential. The first theme concerns the relationship between unemployment and poverty. The second theme pertains to studies that examine the effect of different races on poverty and determines the connection between poverty and various minority groups. The third theme in this section is that to examine the linkage between the education and poverty. Finally, studies are examined that discuss how young adult poverty is related spatially. Each theme is related to those hypotheses that I have mentioned in the first chapter. This section also helps to construct the econometric model in Chapter IV. The purpose of the thesis is to learn about the poor young adults in Kentucky at the ZIP Code level data. Development of an economic model based on work from the existing literature is essential to frame the young adult poverty.

2.1 Definition of Young Adults

Defining a young adult is difficult, as it refers to person who is neither a child nor an adult, but in between. The United Nations defines the individual in between the age 13 and 30 as a young adult. Different countries and administrative regions use a narrow definition within that age frame. In this paper the age group of 18-24 years is defined as young adults, consistent with the 2004 Report on Illinois poverty studies. Increased

responsibilities and partial independence make them separate from all other age groups. According to the 2000 Census data, the total number of young adults (18-24 years) in Kentucky is 401,455, which is ten percent of the total population and within this total young adult population almost 15.8 percent have incomes below the poverty line. This is a significant number of poor young adults relates to other groups of population in Kentucky.

2.2 Importance of Young Adults

Young adulthood is a most important time for a person. In this transition period, young adults build their future through access to educational opportunity, adequate health care, stable housing and positive relationships with others. Once a young adult enters in poverty, it is hard to get out from under this insufficiency of basic needs, because young adults that are raised in poor families are more likely to engage in high-risk behavior (Remeika). These behaviors include pregnancy, dropping out of college, or entering the job market before they are ready. Again, young adults who engage in high-risk behavior are most likely to be exposed to poverty in the future because they drop out of college. Young parents will have less income because of low education all levels coupled with higher family responsibilities.

Young adults are not solely responsible for their poverty, but the surroundings in which they live in also play a major role. Demographic, social and economic factors are all play a contributory role to poverty among young adults. Factors like, education, race,

employment status, and age of the parents also help to explain the causes of poverty in young adults.

2.3 Poverty Literatures Linking to :

2.3.1 Unemployment

This literature connects previous studies with the first hypothesis in this study. The relationships between the poverty rates and unemployment rates have been previously studied. Previous researchers also determined that the nature and types of unemployment rates has the different impacts on poverty rates. The effects of increased unemployment rates are not distributed randomly across the population. An increase in unemployment rates in certain areas will first affect those who are marginal, low skill and low wage workers. They are the prime candidates to be trapped in the poverty net.

Young and old workers experience different patterns of unemployment than do other ages workers. Young workers relatively frequently become unemployed because their high tendency to quit temporary jobs (Hall).   According to Anderson, who argued that unemployment, low wages and poverty are correlated. Unemployment or low wage employment is the prime reason for poverty. Further, Anderson found migratory workers, unskilled domestic workers, female-headed families, the presence of children, and disabilities leads to a higher incidence of unemployment.

According to Renkow, over the period 1990-2000, many American rural communities suffered from stagnant or increasing, poverty rates, unemployment rates,

and stagnant real incomes. Spatial dispersion of income measured by the variance of income or per capita earning was a growing interest of the researchers. He identified the effect of schooling, human capital accumulation (learning by doing), and endogenous technical change as underlying causes of the rural and urban poverty gap in United States. Renkow examined the forces to determine real income, and how they affect poverty within rural and urban areas of North Carolina. He discussed how real income depend on the wage and types of employment, and ultimately how it is related to the poverty rate. At the time of this study the state was composed of rural counties and metropolitan counties, with slightly less than half of population living in the rural areas.

A basic equation of the Renkow model is $Y = WL$, where

Y is earnings (income),

W is wages, and

L is labor.

Earning is the product of labor force participation (L) and wages (W). Renkow used the Tokle and Huffman approach that for any geographic area, L and W depend on the existing stock of human capital, the type of employment, transitory local labor market conditions, macroeconomic conditions, local amenities, age distribution of the population, and other socioeconomic variables. Data consisted of 20 years of county-level, cross-sectional, time-series observations. The 24 North Carolina communities included in the analysis contain a small number of counties in adjoining states. Variables included were education, US GDP, expected unemployment, race, gender, children in the

family, employment type, and geographic locations. Data came primarily from the Bureau of Economic Analysis, U.S. Department of Commerce GNP deflator, and U.S. Census. Generalized Least Square (GLS), Instrumental Variables (IV) methods were used for the analysis.

Renkow found differences in earnings between rural and urban communities in the stock of human capital (education) was higher in urban than in rural communities, and there were differences in earnings linked to unemployment and local labor market conditions (expected and unexpected). Socioeconomic factors were found to be responsible for earning differentials between rural and urban areas, and migration was a contributory factor.

2.3.2 Race

Poverty exists in all regions of the country, in both rural and urban areas, and among all races of the population, but its incidence is heavier among some races than others. Socioeconomic status is measured by income level and education and is correlated with racial status. The second hypothesis examines the relationship between minorities and young adult poverty. The incidence of poverty is higher among minorities than the white population and, in many places; a majority of these need public assistance. The other important aspect is increasing welfare expenditures due to crime and delinquency among these minorities (Anderson). Policy makers should focus on these simultaneous problems. Tienda and Lii investigate the influence of racial and ethnic

composition of labor markets on earnings inequality among white and non-whites. Further, they also found that level of education was another factor explaining an earning differential among the different ethnic groups. This earning differential and racial discrimination are the major contributory factors for poverty (Renkow).

The main objective of Friedman and Lichter (1990) was to document spatial variation in child poverty rates, and to evaluate how the economic circumstances of American children were affected by local area economic opportunities available to their parents. According to the study thirty six percent of children lived in poor conditions in America. They identified several reasons related to poverty and inequality. Uneven economic development and opportunity were identified as the main reason for racial and spatial inequality. The authors concluded that the industrial location and discriminations effect the spatial variation in county level poverty rate.

County-level data came from the 1990 United States Census Summary Tape. The proportion of children age 17 or younger living in the county with family incomes below the poverty line in 1989 was the dependent variable. They used several local economic indicators such as county industrial composition, unemployment, and underemployment. A logit model provided the basis for evaluating the comparative effects of labor market conditions and family structure on child poverty in metro and non metro counties.

Child poverty was found to be unevenly distributed over geographic space and race, but was concentrated in economically-depressed areas, such as Appalachia, the

Mississippi Delta and the southern African-American belt, and within minorities in these areas. The analysis of spatial inequality clearly reasserted the primacy of local-labor market conditions in influencing county-level poverty rates.

Many results from previous child poverty studies are also relevant to young adult poverty, because many young people still live at home with their parents which are similar to children in many dimensions. In the other hand, older groups of young people are likely to have an independent life with children in their households, and therefore child poverty has an impact on their households. So it is important to know the factors that influence child poverty that in turn determine youth poverty. Other determining factors of poverty included geographic location, race, education, labor force participation and educational attainment.

2.3.3 Education

Various researchers have identified the linkages between education and poverty. A base hypothesis is that higher education negatively affects poverty. Higher level of educational achievement may be associated with higher incomes because education and experience open better opportunities. In this world, people are hired into an occupational hierarchy and progress within it according to their skills and abilities. Thus, it is possible that education can have a favorable effect on well-being by allowing income to increase, which, in turn, would lead a better life. An extremely important context, however for a discussion of poverty is that part of production which takes place outside the formal

sector, much of which is characterized by self-employment in rural and urban areas. It has been shown that primary schooling helps to increase the productivity, particularly when they have access to the other inputs needed to enhance their production. Further, it has been shown also that the earnings self-employed individuals will be higher for educated than for the uneducated person (Anderson). Previously in different studies in different times by various authors demonstrated that increasing the schooling of women brings beneficial effects for their own control of fertility and own health.

Thornburg, Hoffman and Remeika argued that poor people put themselves in a risky position because of negative educational outcomes. A continuing rise in the national economic costs for the institutions, social services, and medical care, and an increasing social cost due to increase in the crime rate, as well as effects of drug and alcohol abuse are increasing concern to policy makers. Further, poverty, a lack of guidance and support, and negative peer pressure are the main reasons for creating risks. Statistical evaluation of different social and economic indictors reveals that minority populations are affected more by poverty than the rest of the population. The primary reasons they found that lower educational achievement, change in family structures, and increasingly under-skilled adults. They emphasize the role of school and colleges towards the eradication of poverty.

2.4 Spatial Difference in Poverty

Poor people have less access to educational facilities than others living in the same geographic location. In a community, poor people are hampered by high school

early drop out rates, low educational achievement or irregular school attendance (Clawson). Lucas argued that education, training and conference are the methods of investing in human capital. Poor people have less exposure to the educational facilities than non poor people and education completion rates are an important factor in determining youth poverty rate.

2.4.1 Comparison Rural and Urban Poverty

Ghazouani and Goaied identified factors contributing to poverty in rural and urban areas. They used cluster of household data for their research. Probit and logit models were used to estimate their model, assuming that twenty percent of the Tunisian population was poor, according to the Census data for this research year period. Per capita consumption expenditures were used as the welfare level indicator of the household, and controlling for the heterogeneity of clusters in the household survey. The sample contained both urban and rural households. Most of the variables measured socio-demographic characteristics of the household, as well as variables representing the time frame and geographic location of the household.

The main differences between rural and urban poverty rate could be attributed to education of household head, the child dependency ratio, the ratio of male to female employees in the household, the socioprofessional category of the head, the geographic location of the family residence, and the share of the food budget spent for cereal

products. A female headship of the household was a factor but only in urban and not in rural areas (Ghazouani and Goaied).

Kirby, Coyle and Gould employed a new methodology of employing ZIP Code data to identify factors affecting childbearing teenage among teen, which was a national problem. Childbearing within this age group has been linked to a variety of negative consequences for adolescent mothers and their infants. Researchers were not only interested in understanding the relationship between individual characteristics and rates of child bearing among younger adolescents but the associated community characteristics. They provide evidence of a relationship between teenage birthrates and community poverty using the ZIP Code aggregation.

The dependent variable was the mean of the annual birthrate for teen (12-18years) during the period of 1991-1996 for each ZIP Code. Regression analysis was conducted. Sixteen social indicator variables with five major categories were selected for these studies. They analyzed the bivariate correlation and regression coefficient between each of the social indicators and young teen (12-18 years) birth rates. Then multivariate correlations were used to examine the probability of the relationship between becoming a teen mother and other socioeconomic indicators. Results indicated that teen mothers were often found in households below the poverty line. Other social factors such as education, race, ethnicity and employment were strongly related to teen birthrates.

Other authors such as Renkow, Ghazouani and Goaied, measured poverty in many ways and some rural people are more vulnerable to poverty than urban dwellers. A number of different factors are affecting rural poverty, and developed and developing countries are facing critical socio-economic infrastructure issues. This paper comparatively focuses on the new arena of poverty among youth population, based on ZIP Code data. Specifically, this research will explore the role of geographic location, economic inequality, social and educational level in shaping the problem of young adult poverty in Kentucky by summarizing and integrating the economic theory and econometric methods.

Chapter III

The Economic Theory of Young Adult Poverty

3.1 Measure of Inequality

The primary goal of this chapter is to develop the Lorenz curve and calculate the Gini coefficient to measure young adult poverty among different age groups. The chapter also develops the economic framework to study young adult poverty.

3.1.1 Gini Coefficient

Eighty-five years after its discovery, the Gini technique is still one of the most important indexes for measuring inequality. Researchers use various methods to formulate and interpret the Gini coefficient. This coefficient is closely related to the Gini social-welfare function and it is an important component for Sen's original poverty intensity and his modified version of the Sen Index of poverty intensity. Xu illustrated theoretical research results primarily focused on different formulations and interpretations of the Gini coefficient, implication of social welfare and source and subgroup decomposition. Sen, Gini, & Gaswirth demonstrated how the Gini coefficient measures the inequality in income in a population.

3.1.1.1 Definition of Gini Coefficient

The Gini coefficient is a measure of inequality in a distribution, but it is also widely used to measure the income inequality of a population for a geographic area. The

Gini coefficient is the ratio of area between the Lorenz curve of the distribution and the curve of the uniform distribution to the area under the uniform distribution (Xu). It is a number which is bounded by 0 to 1, where 0 corresponds to perfect (income) equality and 1 represents perfect (income) inequality.

3.1.2 Lorenz Curve

Max O. Lorenz was an American economist who developed the Lorenz Curve in 1905 to describe income inequalities. The Lorenz curve is a graph showing the concentration of the cumulative distribution function of a probability distribution. A perfectly equal income distribution would be one in which every person has the same income. This can be depicted by the straight line y = x; called the line of perfect equality. Again, a perfect inequality distribution would be one in which one person has all the income and everyone else has none. In that case, the curve would be at y = 0 for all x =100 percent, and y = 100 percent when x = 100 percent. Then this curve is called the line of perfect inequality (Lorenz, pg 212).

Figure 3.1 illustrates the income inequality among different age groups in Kentucky. The Lorenz curve suggests that the presence of greater inequality of income among youth population than other age groups in Kentucky. So we found the evidence about the poverty among the youth in Kentucky, and the Gini coefficient calculation supports the evidence.
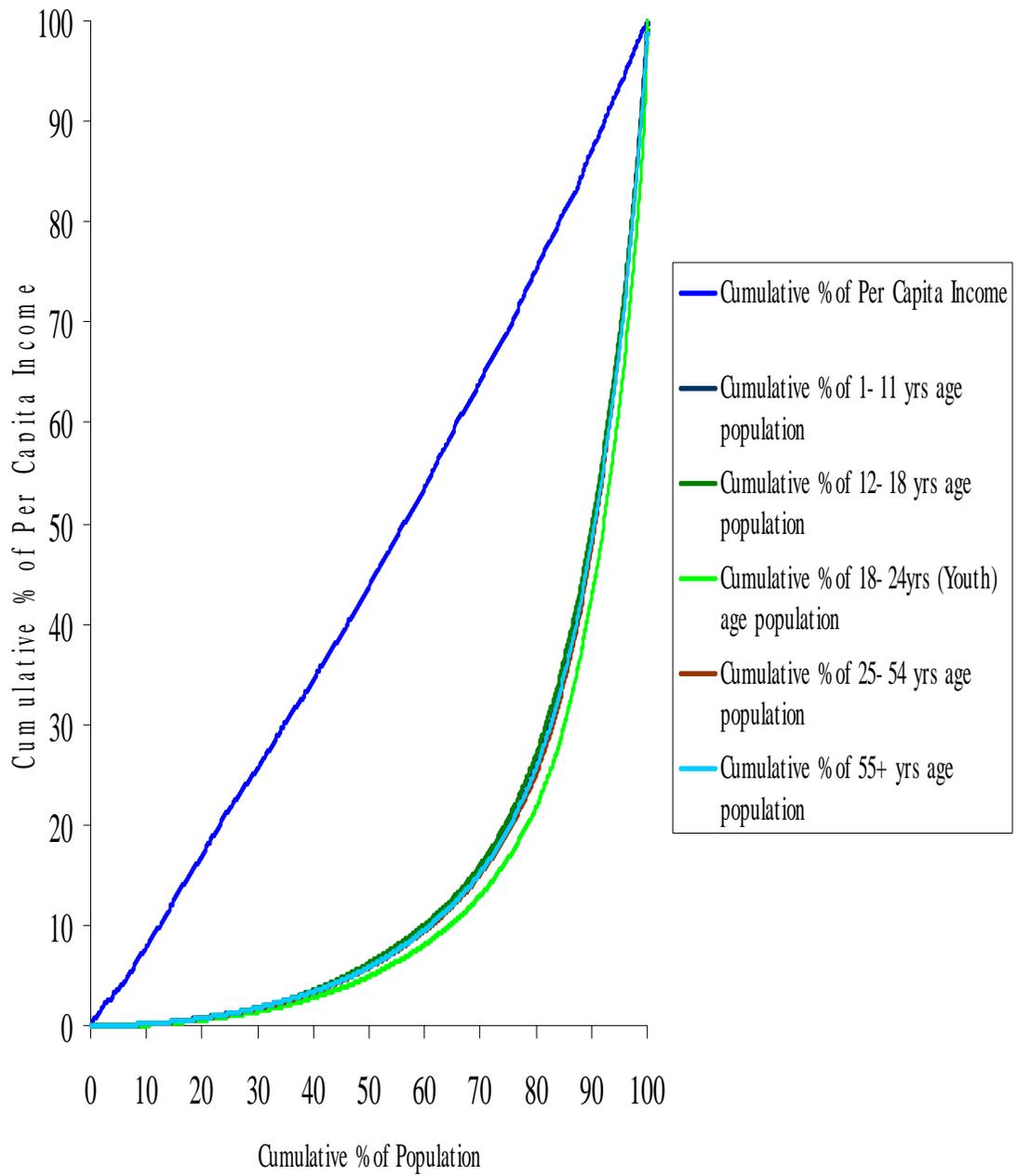
Figure 3.1 The Lorenz Curve

Source: US Bureau of the 2000 Census and calculations by the author

3.1.3 Mathematical Derivation of Gini Coefficient

Assume n is the population, and y_i is population by age group indexed in increasing order $(y_i \leq y_{i+1})$ within a ZIP Code. Feiand, Ranis and Kuo defined the Gini index as $G = \frac{2}{n} u_y - \frac{n+1}{n}$, and where u_y is the mean, and is given by

$$u_y = \frac{\sum\limits_{i=i}^{n} i y_i}{\sum\limits_{i=1}^{n} y_i} \ , \text{ and}$$

$$G = \frac{2}{n} u_y - \frac{n+1}{n} \ ,$$

$$= \frac{2}{n} u_y - 2\frac{n+1}{n} + \frac{n+1}{n} \ ,$$

$$= \frac{n+1}{n} - 2\frac{n+1}{n} + \frac{2}{n} u_y \ ,$$

$$= \frac{1}{n}\left[n + 1 - 2(n + 1 - u_y) \right] \ ,$$

$$= \frac{1}{n}\left[n + 1 - 2(n + 1 - \frac{\sum\limits_{i=i}^{n} i y_i}{\sum\limits_{i=1}^{n} y_i}) \right] \ ,$$

$$= \frac{1}{n}\left[n + 1 - 2\frac{\sum\limits_{i=1}^{n} (n + 1 - i) y_i}{\sum\limits_{i=1}^{n} y_i} \right] \ , \text{ which is also consistent with Sen's and Xu Gini}$$

coefficient.

Then the Gini coefficient is $\quad G = \dfrac{1}{n}\left(n + 1 - 2\, \dfrac{\sum_{i=1}^{n} (n + 1 - i)\, y_i}{\sum_{i=1}^{n} y_i} \right).$

The Gini coefficient was calculated for all age groups and the results are in Table 3.1. The Gini coefficient is highest for young adult population in Kentucky according to the analysis based on the 2000 Census data. The Gini coefficient is 73 percent for Kentucky young adults, which is greater than the coefficient for the total population of the state. This evidence of income inequality leads to this study of young adult poverty.

Table 3.1. Calculation of Gini Coefficient for different age groups in Kentucky.

Different age groups population	Gini Coefficient
1-11 yrs age population	0.6904
12-17 yrs age population	0.6821
18-24yrs(young adult) age population	0.7307
25-54 yrs age population	0.6957
55+ yrs age population	0.6923
Total population	0.6904

Source: US Bureau of the Census 2000 and calculations by the author.

3.2 Various Poverty Measures

3.2.1 Head-count Ratio

This section will concentrate on how to measure young adult poverty. The most popular measures of poverty are head-count ratio (*HCR*), the poverty gap ratio (*PGR*),

and the income gap ratio (*IGR*) (Ray). The first measure, head count (*HC*), is the number of the population under the poverty line, the mean (p-y_i); where p is the income or expenditure border which differentiates poor or rich. The next measure is the head-count ratio (*HCR*), which is a fraction of the population under poverty.

$$HCR = \frac{HC}{n} \; ,$$

where n, is total population (Ray).

3.2.2 Poverty Gap Ratio

The next method for poverty measurement is the poverty gap ratio (*PGR*)

$$PGR = \frac{\sum_{y_i<p}(p-y_i)}{nm} \; ,$$

where m, is the mean income for a particular economy. This measure helps us to understand how large the poverty gap is relative to the resources of the society for a particular geographic location, and what potentially use to minimize the poverty gap (Ray).

3.2.3 Income Gap Ratio

$$IGR = \frac{\sum_{y_i<p}(p-y_i)}{pHC} \; ,$$

The income gap ratio (*IGR*), is similar to the poverty gap ration (*PGR*), however the denominator is different. The income gap ratio (*IGR*) is widely used to measure

poverty that measures the relative terms of income needed to eradicate poverty from an economy (Ray).

In the following section a theoretical model of young adult poverty is developed. The Head count (*HC*) method is used to measure the number of poor young adult state. The calculation employed here is number of young adult between 18-24 years of age, who are below the poverty line according to the 2000 Census data.

3.3 Renkow and Tokle and Huffman Combined Approach

Key variables included in the model of young adult poverty are type of employment, education, race and geographic location. The economic model of young adult poverty can be expressed as

$$Y_{Ti} = f\,(X_{ji}\,Y_{Pi}) \quad i \in N, \tag{3.1}$$

where $Y_{Ti,}$ is income of the young adult population. Young adults partially depend upon their parents or guardians for income and at this age they frequently join the workforce either part-time or full-time. Assume X_{ji} is the different socioeconomic parameters, and P is parents or guardians of young adult on whom they depend directly or indirectly for their day-to-day basic needs.

$$\text{Then} \quad Y_{Pi} = g\,(Z_i) \qquad i \in N, \tag{3.2}$$

where Y_{Pi}, is the income of the parents and depends on $\boldsymbol{Z_i}$ a vector of socioeconomic variables. Thus young adult poverty rate depends upon their parents' or guardians' income, their income, and socioeconomic characteristics in the area they live.

The U.S. Census defines as poor those people whose income is below the poverty level. Again assume Y_{Pi} is the earning which is a product of wage (W) and labor participation (L). $Y_{Pi} = W_i.L_i$, and the wage and labor participation depend on the various factors. Tokle and Huffman indicated that for any geographic area, the wage rate and participation in the labor force is a function of the existing stock of human capital, local labor market conditions, macroeconomic conditions, and age of the population. In this model the wage of labor (W_i) and quantity of labor (L_i) depend upon the education or training of the workers, type of employment (farming or non-farming), local labor market conditions including the number of full-time workers, race of the worker, and other demographic and socioeconomic factors. Therefore

$$Y_{Pi} = W_i\, L_i \tag{3.3}$$

$$Y_{Ti} = f\,(\boldsymbol{X_{ij}},Y_{Pi}) \tag{3.4}$$

$$Y_{Ti} = h\,(Y_{Pi}) \qquad \forall i \in N,\ \boldsymbol{X_{ij}} = \text{Constant.} \tag{3.5}$$

Hence, several direct or indirect factors are accountable for young adult poverty. Poor young adults have limited resources and as a result may not be able to support the next generation, resulting in a poverty cycle.

Chapter IV

The Econometric Model

This chapter develops an econometric model and provides detailed definitions, and summary statistics for variables used in the regression. The model is similar to that proposed by Friedman and Litcher in determining the level of child poverty in the U.S. However, the model used in this study differs from Friedman and Litcher in two ways. First, this study is trying to find the determinants of young adult poverty, so the variables used in this thesis are different than in the Friedman and Litcher study. Second, the model is applied to all Kentucky ZIP Codes, which has not been previously employed.

The specific variables for this thesis rely extensively on three specific studies. The first, a U.S. county-level study by Friedman and Litcher focuses on the influence of spatial and racial influences on U. S. child poverty. The second study, by Remeika, confirms the linkage between poverty and education among U.S. individuals. The last study by Renkow revealed that poverty and unemployment are correlated.

The sample used in this analysis was divided into rural and urban subsets based upon the ZIP Code. Rural (countryside) areas are sparsely settled places away from cities and the urban areas are mostly those geographical areas which distinct from rural areas. The ZIP Code unit works well if it serves only in a rural community or urban community but problem arise when rural and urban ZIP Codes cross the rural-urban boundaries. In this study the ZIP Code is categorized as rural or urban, depending upon the rural and urban population in ZIP Code. If more people are in the rural area than urban then the

ZIP Code is categorized as a rural ZIP Code, and if more people are in the urban area than rural then the ZIP Code categorized as urban ZIP Code. For our sample in Kentucky 82 percent of ZIP Codes serve rural areas and 18 percent serve urban areas (Figure 4.1).

Figure 4.1 Rural and Urban ZIP Codes in Kentucky
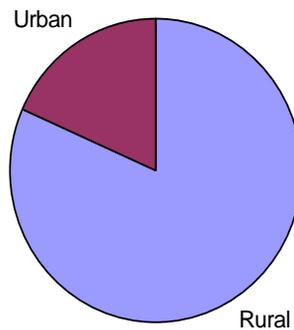
Source: US Bureau of the Census 2000 and calculations by the author.

4.1 Data Sources

Data used for this study are from the 2000 United States Census Summary Tape File 3F. This analysis follows Kirby, Coyle and Gould who use ZIP Code data to examine the linkages between poverty and birth rates among teen girls' in California.

Table 4.1. Descriptive Statistics for Young Adult Poverty in Kentucky.

Variable	N	Mean	Std.Dev.
Dependent Variable			
Proportion of youth in poverty	765	0.45	0.50
Explanatory Variable			
Rural or urban population	765	0.71	0.42
Proportion of agricultural related employment	765	0.15	0.16
Proportion of retail store related employment	765	0.12	0.08
Proportion of transportations related employment	765	0.12	0.11
Proportion of finance related employment	765	0.07	0.07
Proportion of education related employment	765	0.43	0.20
Proportion of management related employment	765	0.09	0.08
Proportion of white population	765	0.95	0.09
Proportion of African-American population	765	0.03	0.08
Proportion of Hispanic population	765	0.01	0.02
Proportion of male high school graduates	765	0.23	0.09
Proportion of female high school graduates	765	0.24	0.08
Proportion of unemployed male	765	0.04	0.04
Proportion of unemployed female	765	0.02	0.03
Proportion of male not in labor force	765	0.30	0.13
Proportion of female not in labor force	765	0.42	0.13
Proportion of male worker work full-time worker	765	0.56	0.15
Proportion of male worker work part-time worker	765	0.06	0.04
Proportion of female worker work full-time worker	765	0.37	0.12
Proportion of female worker work part-time worker	765	0.12	0.06

Source: US Bureau of the Census 2000 and calculations by the author.

4.2 Data Description

In this model, the dependent variable is the ratio of poor youth age (18 to 24 years) male and female with income below the poverty level in 1999 living in a ZIP code, relative to the total young adults' population. Friedman and Lichter followed a similar approach but used the ratio of children aged 17 and younger living in the county with

family incomes below the poverty line in 1989 relative to the total population in that age group, as the dependent variable.

The explanatory variables employed here are place of residency, rural or non-rural population, males working 13-35 hours per week or above 35 hours per week in a year, female education, race and male or female working employments types. This study employ a functional form similar to one used by Friedman and Lichter.

4.2.1 Rural and Urban Population

The intensity of poverty varies with respect to geographic location, such as, across the country or within a state or even within a county. Bluestone and Harrison, and Colclough, argued that US labor markets vary because of uneven regional development. Due to uneven economic development rural and urban communities face varying poverty levels. Asra identified linkages between poverty and the cost of living in rural versus urban areas in Indonesia. Failure to account for the proper cost-of-living calculation in rural and urban areas may lead to a regionally inconsistent poverty line and may introduce poor or wrong policy prescriptions. This paper includes a rural-urban variable to quantify the difference between these two geographic locations in Kentucky.

4.2.2 Types of Employments

Labor force is divided into three categories based on the nature of employment, whether they are employed or unemployed or not in the labor force. Again the employed category is divided into two broad subcategories based on type of jobs and duration of

employment. There are two major types of jobs in the economy, and they are farm or agriculturally related employment and non-farm employment such as retail stores, transportation, finance, education or management-related jobs. And last, the labor force is divided into part-time workers (who work 13 to 35 hours in a week) and full-time workers (who work 35 and above hours in a week).

Non-agricultural employment includes retail store jobs, transporation-related jobs, finance-related jobs, education-related jobs or any other non-farming jobs. Generally, urban people depend on non-farm income but rural people depend on income from agriculture and revealed non-agricultural sources. Janvry, Sadoulet and Zhu examined the linkage between non-farm income and poverty rate in China and found that participation in non-farm employment significantly reduced the rural poverty rate in China. They also mentioned in their research that non-farm income not only reduced the gap between the rural and urban poor households, but helped them improve the income for the poorest households. However, Martin and Taylor identified a significant positive relationship between poverty rates and California farm employment.

In this sample, on average 12 percent of the population was employed in retail stores, 15 percent of the population were working in agricultural-related works, 12 percent of the population is working in transportation industry, 0.8 percent of the population worked in finance-related jobs, 43 percent of population worked in a educational sector but only 8 percent of the population was working in a managerial position in a ZIP Code in Kentucky. A majority of the population is working in educational, and agricultuarl sector in Kentucky. On average, 30 percent male and 42

percent female are not in the labor force and 3 percent male and 2 percent female are unemploed according to the 2000Census data.

In Kentucky, the unemployment rate has been decreasing in recent years and within the last five years it had fallen to 4.2 percent (Figure 4.2). Working hours is also a key variable influencing the poverty level. The number of hours worked per week for young adult or their parents present in the family is also extremely important variable.

Figure 4.2 Rate of Unemployment over the years in Kentucky
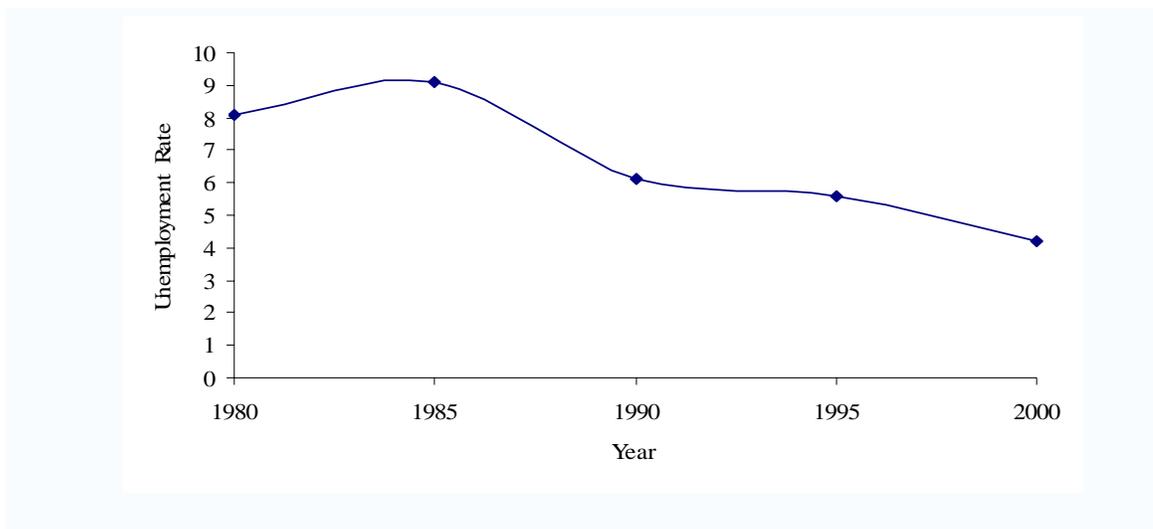
Source: US Bureau of the Census 1980-2000 and calculations by the author.

The factors associated with young adult poverty are more complicated than for other age groups. Young adult income partially depends upon their parent's income, as they may be in school, or they may be employed part-time. As a young adult becomes older they frequently leave home and take a better job. Young adults who are depend entirely on their poor parent's income, will likely become poor (McLanahan, Astone, and Marks).

Eggebeen and Litcher extended their work of assessing the change in family composition and work patterns affecting the poverty rates of American children over the 1960-1988 periods (Remika). A number of researchers have recognized that male and female labor force participation has a significant effect on poverty. In Kentucky, there are more male full time workers (56 percent) than female (37 percent), but surprisingly female part-time worker is higher (12 percent) than the male part-time worker according to the U.S. Census 2000 data.

4.2.3 Male and Female Education

In the literature review section, poverty was shown to be strongly related to the educational level. Including both the male and female educational level in the model will help to evaluate the gender perspective policy implications. According to the Census 2000 data, only 23 percent of males and 24 percent of females are high school graduate in Kentucky without other post-secondary education.

Although Kentucky has a predominantly white population, the population of other races with different ethnic backgrounds has been increasing average the last couple of decades in this state. Clawson explained that the living condition for urban poor is much better than for the rural poor for African-American population as well as Caucasians. Lewit argued that increasing Hispanic poor families in between 1970 to 1990 was also a contributory factory for U.S. child poverty in 1992. There are some cases that researchers showed that poverty level vary by races in the same geographic location. Racial prejudice and institutionalized racism can lead to lower income and higher poverty

rates among the non-white races. Perlman argued that racial discrimination increased poverty.

4.2.4 Race

Figure 4.3 illustrates population growth in Kentucky from 1970 to 2000. Different race are growing at different rates, but the Hispanic population growth are significant in Kentucky over the last four decades (Fig. 4.3a, 4.3b). White (95 percent), African-American (3 percent) and Hispanic (1percent) are the three major races in the Kentucky population according to Table 4.1.

Figure 4.3 a. Historical Changes in Hispanic populations in Kentucky
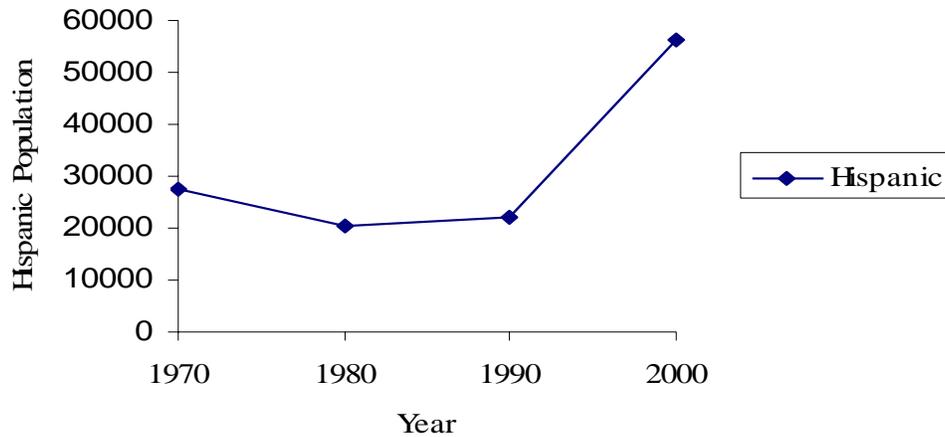
Source: US Bureau of the Census 1970, 1980, 1990, and 2000 and calculations by the author

Figure 4.3b.Historical Changes in White and African-American population in Kentucky
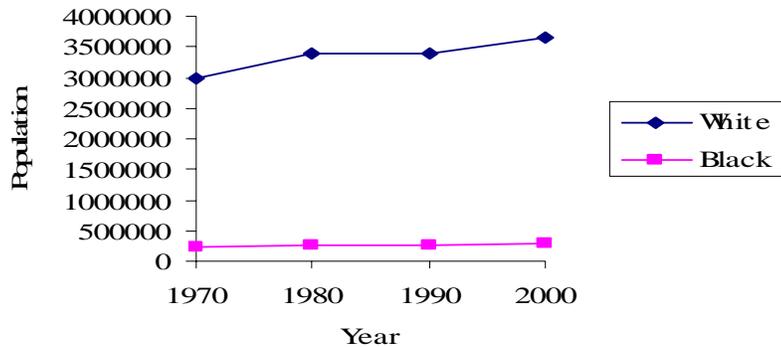
Source: US Bureau of the Census 1970, 1980, 1990, and 2000 and calculations by the author

4.3 The Econometric Model

The methodology of this research is inspired by Friedman and Litcher and Ghazouani and Goaled. One of the objectives in this paper is to identify the consistency of contributory factors to young adult poverty by employing ZIP Code data, and to compare these results with previous poverty studies. The intensity of vulnerability of young adult poverty varies over ZIP Codes, and these differences can provide a comparative basis for model estimation.

Different econometric models have been employed to identify the determinants of poverty, but selecting the functional form of the model is critical. Some authors used two stage ordinary least square methods, some used ordinary least squares method and some used random, or fixed, effect models to determine the factors of poverty. This paper employed a logit model. The dependent variable is the proportion of young adults living in a ZIP Code who were considered to be poor in 1999. Because this measure is a

proportion, all responses are bounded between zero to one. In order to linearize this relationship we employed the logit model. Another reason for employing this model is to predict the probability of each variables of young adult poverty, and the motivation we got from the previous research work done by Friedmand and Litcher who determined the factors and probability of each factor of child poverty in U.S. employing the logit model.

This model consists of two alternative and mutually exclusive situations. A sample of total young adult population from the 2000 Census data was collected and calculated the poor young adult population in Kentucky by multiplying the poverty rate 15.8 percent in the year 1999. The sample is divided into two categories. In this paper we employed fourteen percent as a cut off point because ten percent to fourteen percent is the range in which we can divide our sample to employ the logit model, anything lower than ten percent and above fourteen percent does not produce the proper sample specification to use logit model. Using any percent in range of ten to fourteen percent does not produce any inconsistent results. The first category indicates ZIP Codes in which the number of poor youth is equal to fourteen percent or higher, called "high poverty ZIP Code", and "lower poverty ZIP Code", includes the remaining poor young adult population. Friedman and Lichter; and Ghazouani and Goaled; used the same econometric approach.

4.3.1 The Logit Model

The logit model is

$$Y_i = L \left(\beta_0 + \beta_j X_{ik} + \beta R_{ij} \right) + \varepsilon_i \ ,$$

Y_i = 1 if proportion of higher number of poor young adult population in a ZIP Code;

= 0 if proportion of lower number of poor young adult population in a ZIP Code.

X_k= number of explanatory variables;

R_j= Rural or Urban, j=1 if rural

j= 0 if urban

ε = error term.

The error terms in logistic distribution follows the Weibull distribution. In this model, L (.) is the cumulative distribution function, where $L(X) = e^x / (1+e^x)$.

The maximum likelihood function helps to get estimators for this model. The data for young adult poverty consist of n (n=765) numbers of ZIP Codes (i=1,.....n) in Kentucky in 2000 and which are assumed to be statistically independent. For each ZIP Code, the data consist of Y_i and X_i, where Y_i is the dependent random variable with possible values 0 and 1 and the vector of explanatory variable is X_i = [1 X_{i1} ......X_{ij}]' including 1 as an intercept.

Assume P_i is the probability of Y_i =1, and then solve the logit equation for P_i and get

$$p_i = \frac{\exp(\alpha + \beta_1 X_{i1} + \beta_2 X_{i2} + ...+ \beta_k X_{ik})}{1 + \exp(\alpha + \beta_1 X_{i1} + \beta_2 X_{i2} + ...+ \beta_k X_{ik})} \qquad (4.1)$$

Exp is the exponential function and is equivalent to e^x, as

$$p_i = \frac{1}{1 + e^{-\beta x_i}}.$$

(4.2)

which is equivalent to equation (4.1).

Next, the likelihood function is calculated, in order to estimate the unknown parameters. The likelihood function is $L = \Pr(y_1, y_2, \ldots\ldots y_n)$. The overall probability calculated is the product of individual probabilities as all observations are assumed to be independently distributed. Thus,

$$L = \Pr(y_1)\Pr(y_2)\ldots\ldots\ldots\ldots\Pr(y_n) = \prod_{i=1}^{n} \Pr(y_i)$$

(4.3)

Where $\prod$ is product of individual probabilities.

The dependent variable in the logit model is a binary choice variable. Therefore probability is calculated as for a single observation $\Pr(yi = 1) = p_i$ and $Pr(yi = 0) = 1\text{-}p_i$ and for all observations it would be $\Pr(y_i) = p_i^{y_i}(1 - p_i)^{1 - y_i}$.

(4.4)

Each y_i can be either 1 or 0 depends upon 1 or 0, and substituting the value of Pr (y_i) in the L and get as below

$$L = \prod_{i=1}^{n} p_i^{y_i}(1 - p_i)^{1 - y_i} = \prod_{i=1}^{n} \left(\frac{p_i}{1 - p_i}\right)^{y_i} (1 - p_i).$$

(4.5)

Taking the log on both sides of the equation (4.5) gives

$$LogL = \sum_i y_i \log\left(\frac{p_i}{1 - p_i}\right) + \sum_i \log(1 - p_i). \qquad (4.6)$$

The product, consisting of the sum and exponents, becomes the coefficients in the likilihood function. Substitute the value of p_i (equation 4.2) into equation (4.6) as

$$LogL = \sum_i \beta x_i y_i - \sum_i \log(1 + e^{\beta x_i}) \qquad (4.7)$$

Now maximize the function by taking the derivative of *log L* in respect of β and set it equal to 0.

$$\frac{\partial \log L}{\partial \beta} = \sum_i x_i y_i - \sum_i x_i (1 + e^{-\beta x_i})^{-1} \qquad (4.8)$$

$$= \sum_i x_i y_i - \sum_i x_i \hat{y}_i = 0.$$

The predicted probability of y for a specific value of x_i is

Where $\qquad \hat{y}_i = \dfrac{1}{1 + e^{-\beta x_i}} \qquad (4.9)$

Here $\hat{y}$ is a non linear function of β (Allison)[3].

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[3] For further discussion please see Pindyck and Rubinfeld(pg.307-315);or Greene(pg.667-670).

<center>**Chapter V**</center>

<center>**Results for the Analysis**</center>

This chapter is devoted to the results. Geographic, socio-economic, and demographic variables are employed in this paper, but the purpose is to identify key variables that affect young adult poverty in Kentucky. This chapter is divided into three subsections, which are, the impact of employment on young adult poverty, the impact of education on young adult poverty, and the influence of race on young adult poverty.

5.1 Parameter Estimates for Young Adult Poverty

The results represented in Table 5.1 display how different key factors affect young adult poverty in Kentucky. Table 5.1 presents the results of the logit regression analysis of the proportion of young adult living in poverty. A 10 percent two-tailed significance test is performed to analyze the results

<center>43</center>

Table 5.1. Parameter Estimates for Young Adult Poverty in Kentucky

Parameters	Estimates	Std. Err.	Prob. hat
Intercept	-12.96**	5.89	
Rural or urban population	0.03	0.20	0.4258
Proportion of agriculture related employment	0.77	0.60	0.6061
Proportion of retail store related employment	0.81	1.09	0.7407
Proportion of transportation related employment	-0.43	0.81	0.3173
Proportion of finance related employment	-0.45	1.36	0.3824
Proportion of education related employment	-0.04	0.43	0.4064
Proportion of management related employment	-2.22**	1.13	0.0718
Proportion of male full-time workers	2.22***	1.22	0.8682
Proportion of female full-time workers	2.56***	1.41	0.9026
Proportion of male part-time workers	5.66*	2.25	0.9951
Proportion of female part-time workers	1.93	1.62	0.8319
Proportion of unemployed male	10.49*	2.63	0.9999
Proportion of unemployed female	0.65	3.36	0.5784
Proportion of male not in labor force	2.85**	1.29	0.9246
Proportion of female not in labor force	2.29***	1.40	0.8757
Proportion of white population	8.55	5.72	0.9997
Proportion of black population	10.09***	5.80	0.9999
Proportion of Hispanic population	17.71*	6.60	0.1000
Proportion of male high school graduates	-2.08***	1.13	0.0821
Proportion of female high school graduates	-4.47*	1.21	0.0067

Source: US Bureau of the Census 2000 and calculations by the author.

Notes: Single, double and triple asterisks (*) denote statistical significance at the 0.01, 0.05 and 0.10 levels respectively

Analysis of these factors of young adult poverty rates for ZIP Codes in Kentucky gives an indication of where the poverty rate is highest and its causes. However, it fails to provide information about the duration of poverty experienced by young adult population.

5.1.1 Impact of employment on young adult poverty

Table 5.1 illustrates how young adult poverty is divided with the employment type, nature and duration of employment. Employment is one of the major components affecting young adult poverty because employment is the major source of income. So the type, nature and duration of employment in a year and for the family head play an important role in determining the level of poverty among young adults. Each category and subcategories have different impacts on young adult poverty. Approximately 88 percent of households in Kentucky engage in some form of non-agricultural employment, and the rest engage in agricultural employment (U.S. Bureau of the 2000 Census).

Participation in the labor force and unemployment are the most important factor affecting young adult poverty. The expected probability of a ZIP Code with high young adult poverty will increase 92.46 percent after one unit increase in male not in labor force and 87.57 percent after one unit increase in female not in labor force. Both variables are significant. These results are consistent with studies by Ghazouani and Goaied, Friedman and Lichter.

Over the past few decades, the female employment rate has been increasing The expected probability of a ZIP Code with high young adult poverty will increase 99.99 percent after one unit increase in unemployed male, and 57.84 percent after one unit increase in unemployed female population. Only unemployed male variable is significant, so unemployed male directly influence the young adult poverty rate. The variable unemployed female is not significant in this model, but carries the expected the sign. So,

increasing unemployed male and female population will increase the young adult poverty in Kentucky. And there is no evidence that we can reject the first null hypothesis in this paper.

Agricultural workers in a ZIP code are likely to increase the young adult poverty rate to a greater degree than non-agricultural service holders. The agricultural employment variable carries a positive sign, which suggests that populations in a ZIP Code who engage in agricultural occupations are likely to increase young adult poverty assuming all other factors remain constant. The expected probability of a ZIP Code with high young adult poverty will increase 60.61 percent after one unit increase in employment in agriculture. However this variable is not significantly different than zero.

For non-agricultural employment such as transportation, finance, education or management-related jobs in Kentucky, where the negative sign is consistent with previous studies, populations in a ZIP Code who engage in non-farm occupations are likely to result in a decrease in the young adult poverty rate. The expected probability of a ZIP Code with high young adult poverty will increase 31.73 percent after one unit increase in transportation related jobs, 38.24 percent in finance related jobs and 40.64 percent in education related jobs. These three variables are insignificant. The expected probability of a ZIP Code with high young adult poverty will increase 7.18 percent after one unit increase in management related jobs. Increase in the management related jobs will decrease young adult poverty. Management related jobs offer higher salaries on average than any other jobs. Those with management related job are less likely to

produce poor young adults. This is the only significant non-agricultural employment variable. Retail store workers are positively related with the young adult poverty. Number of the retail store workers in a ZIP Code will increase the young adult poverty rate in Kentucky but this variable has a coefficient not significantly different from zero. The expected probability of a ZIP Code with high young adult poverty will increase 74.07 percent after one unit increase in retail stores jobs but, again, this coefficient on this variable is not significant.

Males or females who are working part-time are more vulnerable to poverty than males or females who are working full-time. The direction and magnitude of this relationship for full-time male or female workers (who work 35 and above hours per week in a year) or part-time male or female workers (who 13 to 35 hours per week in a year) helps to explain the levels to young adult poverty. If other factors in this model are held constant, then the increase of full-time male workers and part-time male workers in a ZIP code will increase young adult poverty. The expected probability of a ZIP Code with high young adult poverty will increase 99.51 percent after one unit increase in male part-time worker, and 86.82 percent after one unit increase in male full time worker. Both of these variables are significant. The expected probability of a ZIP Code with high young adult poverty will increase 83.19 percent after one unit increase in female part-time worker, and 90.26 percent after one unit increase in female full time worker. The full-time female worker variable is significant but the part-time female worker variable was insignificant in this model.

The magnitudes of both coefficients are also important. Part-time male workers are more vulnerable to poverty than full-time male or female workers, as part-time male workers. Many of young adults are part-time workers, and their income may not be sufficient to cover all their expenses and needs. If they are not depending upon their parents, most likely they will be in poverty. People who are working as full-time workers are also vulnerable to poverty in that they might face bigger responsibilities such as maintaining a larger family size, or have earlier financial burdens imposed on them.

5.1.2 Impact of race on young adult poverty

The impact of race on young adult poverty is varied. According to the 2000 Census Bureau report, Kentucky has became more racially diverse over the last century. The African-American population in this state grew from 7.13 percent in 1990 to 7.27 percent in 2000. Census figures indicate the Hispanic population more than doubled, growing from 0.60 percent in 1990 to 1.40 percent in the year 2000. This study includes three different races white, African-American and Hispanic.

The African-American young adult population in Kentucky are more vulnerable to poverty than other races in Kentucky. The positive sign suggests that the information that young adult poverty is positively related with the white, African-American and Hispanic population. The expected probability of a ZIP Code with high young adult poverty will increase 99.97 percent after one unit increase in white, 99.99 percent after one unit increase African-American and 100 percent after one unit increase Hispanic population. The white variable is insignificant but the African-American variable and the Hispanic

populations are both significantly differ from zero. The magnitudes of the coefficients for the African-American and Hispanic population are higher, which indicates that the African-American and Hispanic young adult population is more vulnerable to poverty than the white population in Kentucky, which is the second hypothesis in this thesis. And theses results found no evidence to reject the second null hypothesis of this thesis.

5.1.3 Impact of education on young adult poverty

Educational levels among males and females influence poverty in different ways. Earnings are higher for educated than for the uneducated population.The gender gap is prominent when we measure the poverty in terms of education.

Male and female educational levels are significant contributory factors to young adult poverty. Male and female high-school graduate variables carry a negative sign and large magnitude. The expected probability of a ZIP Code with high young adult poverty will decrease 8.21 percent after one unit increase in male high school graduate and 0.67 percent after one unit increase in female high school graduate. Both of these variables are significant. However female education is an extremely important factor in determining young adult poverty in Kentucky. These results also fail to find any evidence to reject the last hypothesis of this paper.

5.1.4 Impact of geographic locations on young adult poverty

Research has shown that geographic targeting can be very effective since poor households tend to be concentrated in specific areas. However, the effectiveness of a

program depends on the level of geographic detail at which targeting decisions are made. Several studies previously explained the importance of the existence of a causal link between geography and the level of well being. Spatial poverty traps are areas where poor resource endowments lead to limited access to educational, social and economic opportunities, thereby further increasing the differences between poor and non poor areas.

A ZIP Code which belongs to rural areas is more vulnerable to young adult poverty than an urban ZIP Code. Pulver and Rogers argued that rural America needs to seek solutions to the acute income problem. Income is one of the major resources, and lack of income creates poverty. The expected probability of a ZIP Code with high young adult poverty will increase 42.58 percent after one unit increase in rural areas. A strong and positive relationship exists between geographic location and young adult poverty was found in this study. The positive sign indicates that rural young adults are more commonly face poverty than urban young adults.

5.1.5 Concluding comments

The theory and research in this paper make a compelling case for the thesis that employment, race, education and geographic location are underlying agents in the production of young adult poverty in Kentucky. Although these structural conditions do not often have a direct effect on producing poor young adults, they are important because of the impact they have on other social attributes influencing young adult poverty. Education does not influence poverty directly but generates significant positive

externalities in a society, which helps individual earn increased wages (Rupasinga, Goetz and Freshwater).

The results suggest that almost all variables in this model were important in determining young adult poverty levels in Kentucky. Clearly, the effect of education and employment status on young adult poverty was more important than any other factors considered in this model. The significance of the variables is also consistent with previous studies on poverty, although this paper used a new methodology. The key factors also remain indifferent while evaluating young adult poverty at the ZIP Code level in Kentucky. The results suggest that increased employment opportunities and female education will reduce young adult poverty in Kentucky, which is consistent with Thornburg, Hoffman and Remeika findings.

Although some geographic variables in this model were found to be insignificant, the model still demonstrates the fact of variation among the rural and urban poor young adults in Kentucky. The uneven geographic distribution of economic and demographic characteristics contributes to spatial differences in young adult poverty. This implies the causes of poor young adults are higher in rural ZIP Code than non rural ZIP Codes. Clearly, these differences contribute to the inequality of young population between rural and non-rural areas.

Chapter VI

Conclusion

This paper is the first attempt to use the ZIP Code level data across Kentucky using only year 2000 Census data to model the determinants of young adult poverty. The conclusion regarding the methodology of using ZIP Code data in this study successfully demonstrates the analysis and opens a way to further research with this smaller geographic unit. The key factors of poverty suggest that ZIP Code level data are still very good indicators while this study has been done in the smallest geographic unit. Evidence from the analysis implied that young adult poverty in Kentucky is higher in rural areas than in urban areas. This thesis has successfully quantified the impact of key geographic and socioeconomic variables in young adult poverty in a ZIP Code level analysis.

Male and female working hours, the type of work, their educational level, and race in a ZIP Code are explanatory factors which underlie rural and urban young adult poverty in Kentucky. The model in this paper reveals the variables; part-time male and female workers, males not in labor force, Hispanic and African-American population, and female high school graduates as having the most explanatory power. Economic development can help to eradicate poverty from society. Development of better economic conditions for young adults or their parents is crucial, as many young adult indirectly depend upon their parents or guardians. Economic development only occurs when more people are employed, and employment clearly helps to eradicate poverty.

Corbett showed that promoting work among single mothers is important to eradicate poverty. Friedman and Litcher argued about the balanced approach of community development as well as that individual economic development helps to minimize poverty levels. Hence, the necessity of engaging programs such as; promoting jobs for females and the African-American populations, and to organize training programs, workshops, and conferences that will help them to get jobs.

A key finding is the strong relationship between female education and young adult poverty. Education influences human capital accumulation in a community, which in turn, ultimately influences community economic development. So young adults who are not high school graduates are more likely to stay poor or will face poverty in the future. A literacy program influences and motivates these young adults to engage themselves in the education related programs and help to alleviate poverty.

The results are supported by the earlier research and indicate the vulnerability of young adult poverty is more in rural ZIP Codes than in urban ZIP Codes in Kentucky. Once social welfare reforms creates more jobs in the community, increasing educational facilities and provide a better infrastructure in Kentucky, young adult poverty or poverty could be reduced. A ZIP Code is a small geographic unit, identification of the problem should be easier, and employing policies like welfare and economic development programs, funds for antipoverty might be used in very specific needs for poor young adults in Kentucky could be accompanied at the ZIP Code level.

6.1 Limitations

ZIP Code geography would be a way to make the linkage between the development program and a smaller area. Like other geographic units observations such as county, census-tract; ZIP Codes also are not homogeneous over the population in a geographic area. Some ZIP Codes serves as large a total population as 49311 and one serve only 7 people in Kentucky according to the Kentucky 2000 Census data, but the mean population served by a single ZIP Code is 5242. A cluster of similar ZIP Codes could be used to employ any antipoverty program.

Another limitation for this study is a spatial auto correlation problem. Spatial autocorrelation is an assessment of the correlation of a variable in reference to spatial location of the variable. Spatial autocorrelation measures the level of interdependence between the variables, the nature and strength of the interdependence. Two different types of spatial autocorrelation are possible, one is positive and another is negative. In case of positive spatial autocorrelation, similar values are appear together, while for the negative spatial autocorrelation dissimilar values are appear in a cluster.

6.2 Scope for Advance Research

For further research and model improvement, including the use of a data set young adult mother would be great extension of this paper. The recent unavailability of this data set by a ZIP Code in Kentucky gives us a possibility for further research.

Finally, analysis for one state is somewhat limiting and a useful extension would be to include other states for further analysis.

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