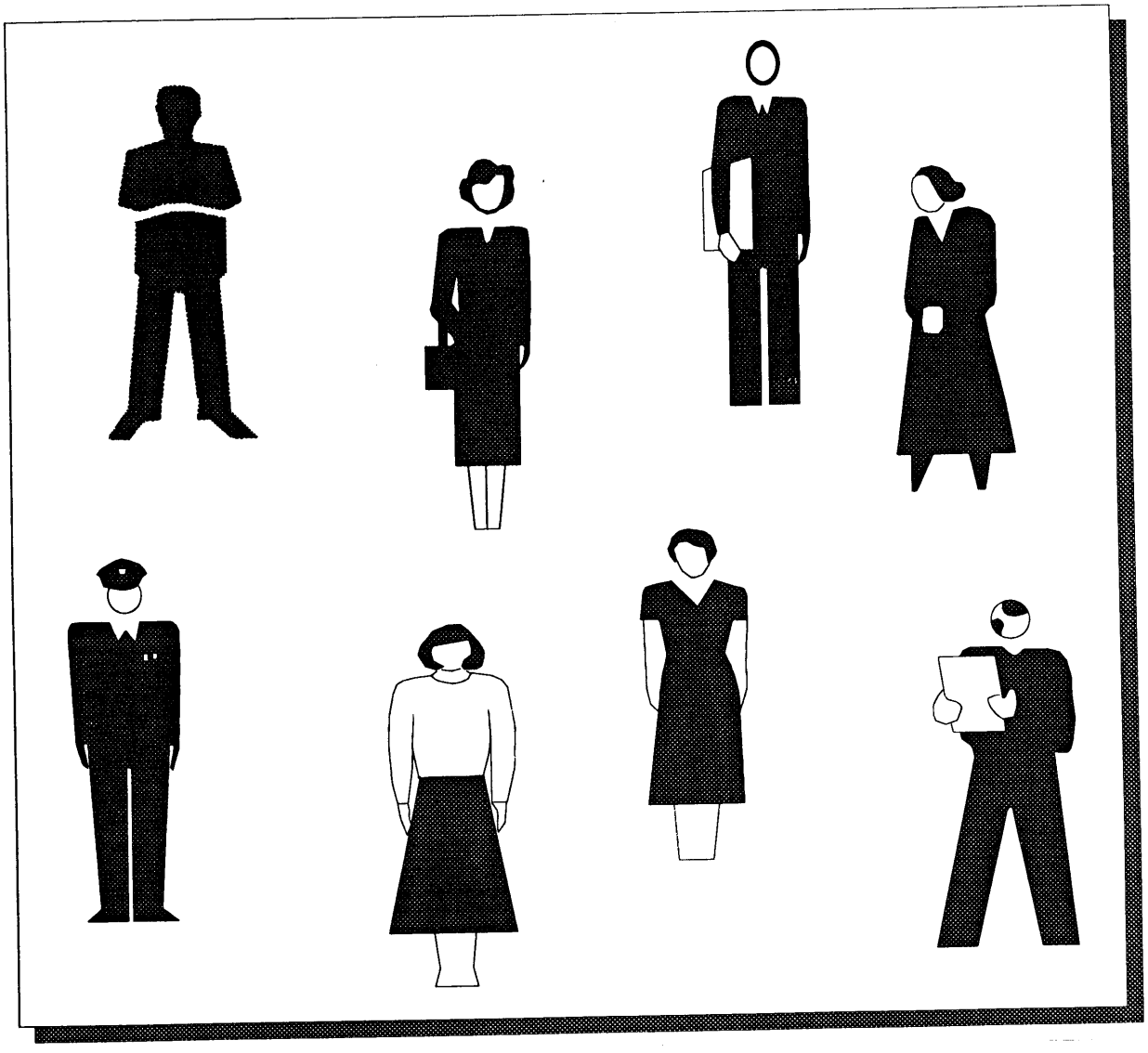
Labor Force Statistics:

A Review and Analysis



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FOREWORD

House Bill 812, passed during the 1992 Regular Session by the General Assembly, mandated the Legislative Research Commission to identify and evaluate a method to estimate labor surplus. In order to accomplish this mandate, a working group of labor market researchers and economic analysts was formed. Working group members consisted of the Legislative Research Commission staff economists, economists on the faculty of the University of Kentucky and the University of Louisville, and staff from several executive branch agencies. Staff of the Legislative Research Commission provided the research support, while the other members of the working group acted as advisors to staff. This report presents the results of that effort.

The Legislative Research Commission would like to express our gratitude to the members of the working group for their contributions to this research endeavor. Working group members dedicated much time and effort to the process. However, this report was prepared by the staff of the Legislative Research Commission, and therefore should not be construed as reflecting the opinions of individual working group members.

This report was prepared by Donna Cantrell. Karen Talley assisted in the production of the manuscript and Charles Bush edited the report. Once again, the assistance of the members of the working group is gratefully acknowledged.

Vic Hellard, Jr.
Director

The Capitol
Frankfort
June, 1993

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EXECUTIVE SUMMARY

Unemployment rates are often used as a criterion in the allocation of government funds. However, there has been a growing perception that unemployment estimates are inaccurate, and therefore result in inequitable allocation of funds. Because of these perceptions, surplus labor was selected as an alternate criterion for the allocation of coal severance tax receipts under the Local Government Economic Development Fund. However, there was also uncertainty regarding the accuracy of the labor surplus estimates. As a result, Section 14 of HB 812, which was passed in the 1992 Regular Session of the General Assembly, mandates that the Legislative Research Commission identify and evaluate a method to define and estimate a surplus labor rate. In order to accomplish this mandate, a working group of labor market researchers and economic analysts was formed. Working group members consisted of Legislative Research Commission staff economists, economists on the faculty of the University of Kentucky and the University of Louisville, and staff from several executive branch agencies. This report presents the result of the working group's efforts.

Labor Force Statistics

Employment and unemployment are two of the most closely monitored labor force statistics. In order to accurately interpret the economic trends reflected by labor force statistics, it is important to understand how they are defined and estimated. The working age population includes anyone over age 16. Employment is defined as the total number of people over age 16 working for pay, as well as those people doing at least 15 hours of unpaid work in a family-oriented enterprise. Unemployment is defined as the number of people who currently do not have a job and have actively sought a job within the last four weeks. The labor force is defined as the sum of the employed and unemployed. The rest of the working age population is considered to be not in the labor force. Therefore, individuals who report wanting to work but who are not actively seeking a job because they think that no jobs are available, or discouraged workers, are not included in the labor force statistics.

The U.S. Department of Labor develops the concepts, definitions, and technical procedures used to prepare employment statistics. There are different procedures used to estimate labor force statistics at the national, state and county level. Nationally, employment and unemployment is estimated from data collected through a household survey, the Current Population Survey. State and county statistics are estimated from data collected from employers by state employment security agencies. In Kentucky, the state employment security agency is the Department of Employment Services of the Cabinet for Human Resources.

Labor surplus, as defined by KRS 42.4592 (3), means the number of residents who can be classified as unemployed or discouraged. Labor surplus is a labor force

statistic developed by the Department of Employment Services. The labor surplus estimates are based on the critical assumption that labor force participation rates in all Kentucky counties are equal to the national labor force participation rate of 65.3%. However, labor force participation varies across areas and is the result of both labor demand and labor supply factors. Labor demand will be influenced by the type of economic activity in an area, the demand for goods and services provided by firms, and the availability of labor as reflected by both skill levels and wage rates. The supply of labor will depend on the wage rates that prevail in an area, non-wage income, skill levels and work-related costs.

Labor Force Participation

Labor force participation rates vary significantly across Kentucky counties. In Owsley County 36.7% of the total population is in the labor force, the lowest rate in the state. Boone County has the highest labor force participation rate, at 71.1%. A regression analysis was conducted to evaluate the relative effects of labor supply and demand factors in determining labor force participation rates of men and women in Kentucky counties.

Many factors were found to affect labor force participation for men and women. Increases in unemployment rates are associated with decreases in labor force participation, suggesting that high unemployment rates may discourage people from entering the labor force. Also, labor force participation is higher in counties that have a larger share of population that graduated from high school. There are also significant differences between factors affecting male and female labor force participation. Increases in commuting time are associated with increases in male labor force participation and decreases in female labor force participation. Labor force participation of women is more responsive than men's to increases in total economic activity in the county they live in. These two factors suggests that women are more likely to work in the county in which they live. Finally, increases in family size decreases the labor force participation of women. Because there are many factors that affect labor force participation and these factors differ across the counties, the assumptions used to develop labor surplus estimates are inappropriate.

Identification of Distressed Counties

The basic assumption underlying the use of labor surplus estimates for a criterion in the allocation of economic development funds is that they will more accurately identify distressed counties than will unemployment rates. The reasoning behind this assumption is that unemployment rates do not include discouraged workers and thus do not accurately reflect the long-term structural unemployment experienced by some counties. Therefore, a second step in evaluating the labor surplus estimates was to evaluate the unemployment rates. There are two critical questions concerning the use of an unemployment rate as a criterion in the allocation of government funds. One issue concerns the accuracy of the estimated number of unemployed persons. The perceptions

of the accuracy of unemployment statistics intertwines two issues: one related to the complicated procedures used to estimate unemployment, which may result in inaccurate estimates, and a second related to the exclusion of discouraged workers from the ranks of the unemployed. Labor force data collected in the 1990 Census of Population was compared to the labor force estimates from the Bureau of Labor Statistics. A comparison of unemployment rates suggests that unemployment may be both underestimated and overestimated in many Kentucky counties.

A second issue associated with unemployment rates is how accurately they identify economically distressed counties. County classifications based on employment situation were compared to county classification based on various measures of economic welfare to evaluate this issue. Rankings derived from unemployment rates were compared to rankings derived from surplus labor rates and employment-to-population ratios. Unemployment rates were found to perform better in identifying distressed counties than either of the other two measures.

Recommendations

On the basis of the deliberations of the Labor Surplus Work Group, the following proposals are presented for consideration of the Kentucky General Assembly.

1. **Surplus labor, as currently estimated, is an inadequate measure of the number of unemployed and discouraged workers residing in Kentucky counties. Therefore, it is recommended that surplus labor rates not be used in the allocation of state economic development funds. Furthermore, it is recommended that the surplus labor rate criterion be removed from the allocation formula for the Local Government Economic Development Assistance Fund.** The procedures used to estimate labor surplus do not take into consideration the many factors affecting labor force participation, including differences in economic structure, average wages, levels of educational attainment, and demographic composition of the population. While the labor surplus estimates include individuals who want jobs but think they are not available (discouraged workers), they also include individuals who do not want to or can not work.

2. **While not perfect, unemployment rates are the *best available* employment situation indicator for ranking counties.** County rankings based on the three employment indicators of unemployment rates, employment-to-population ratios, and surplus labor rates were compared to rankings based on measures of economic welfare. It is concluded from these rankings that unemployment rates identified the greatest number of distressed counties.

3. **There remains much debate regarding the accuracy of the estimated number of unemployed reported by the U.S. Bureau of Labor Statistics and the Cabinet for Human Resources. The members of the Labor Surplus Work**

Group did not reach a consensus regarding the best way to measure the number of people who are involuntarily unemployed. Based on the estimates of unemployment from the Census, there is some evidence that unemployment may be underestimated or overestimated for some counties. However, differences in the unemployment rates reported by the U.S. Bureau of Census and the U.S. Bureau of Labor Statistics (BLS) may be due to a variety of factors related to methods of data collection and estimation procedures. Data was not available on discouraged workers, one component of the involuntarily unemployed. Therefore, the magnitude of the discouraged worker effect and the number of discouraged workers in Kentucky is unclear.

4. **Because of the persistent debate surrounding the estimates of the number of unemployed and discouraged workers, it is recommended that there be continuing research into labor market conditions in Kentucky. It is recommended that this be accomplished through the coordinated efforts of the Department for Employment Services, other state agencies, state universities, and the Legislative Research Commission.** The procedures used to estimate unemployment could be improved through extensive analysis and statistical evaluation of the data gathered by the Department for Employment Services of the Cabinet for Human Resources. The research and data resources of the Department for Employment Services, other state agencies, state universities, and the Legislative Research Commission could be utilized to evaluate the accuracy of the estimates of the number of unemployed and the discouraged worker issue.

5. **Data that is currently collected on employment and unemployment in Kentucky should be made available to interested economic researchers throughout the state. The Department of Employment Services should publish an index detailing the type of employment data that is collected and the procedures to be followed in gaining access to this data.** The Department of Employment Services collects a multitude of employment data through the cooperative programs of the BLS. Much labor market research could be conducted using this data, especially research related to evaluating unemployment and discouraged workers in Kentucky counties. Procedures should be initiated immediately which would make the data available to the extensive research capabilities of state universities. Summary data should be made available both through printed materials and in electronic format. Procedures should also be adopted by the Department of Employment Services that will facilitate cooperative studies that will provide researchers access to relatively detailed data while maintaining the confidentiality of individual business. Priority should be given to providing the Department of Employment Services with the labor and technical expertise required to pursue these objectives.

6. **The only way to improve existing employment estimates would be to conduct a survey similar to the Current Population Survey conducted by the U.S. Bureau of Census. However, this would be a very expensive endeavor.** A

survey explicitly designed to measure employment, unemployment, and the reasons individuals are not in the labor force would provide baseline data that is more reliable than that obtained from the Census of Population. Data could be collected on unemployment, past work experience, job search behavior, expected wage rates, and current income sources for individuals who identify themselves as being out of the labor force because they think they cannot get a job.

7. **An event study could be conducted, utilizing data currently collected by the Department of Employment Services. An event study involves evaluating county levels of employment and unemployment before and after the location of a new business or the closure of an existing business. This study should be composed of numerous events, in order to provide statistical reliability and to control for other factors that may influence labor markets.** It is argued that discouraged workers enter the labor force when employment opportunities increase significantly and leave the labor force in time of economic decline. By evaluating labor market responses to changes in employment opportunities, researchers may be able to estimate the discouraged worker effect. This approach may also provide information on the relationship between employment, unemployment, discouraged workers, and local economic activity.

8. **It is recommended that members of the General Assembly contact federal officials and policy makers to emphasize the importance of accurate and reliable labor force statistics at the county and state level.** Effective planning and implementation of state and local government programs rely heavily on economic data. Furthermore, widespread public perception of inaccurate statistics undermines the ability of policy makers to effectively respond to the concerns of its citizenry. Because of the importance of the statistics, the data collection procedures and statistical methods should be reviewed periodically. This review would ensure that the concepts and estimation methods underlying the data reflect the information needed to formulate effective policies. A periodic review would also ensure the equitable allocation of government funds and that federal budgetary constraints have not impaired the reliability of labor force statistics at the state and county level.

9. **Employment indicators are incomplete measures of economic welfare. Therefore, additional indicators of economic welfare should be considered in the selection of criteria for the allocation of economic development funds. Once again, these indicators could be identified, with the assistance of the extensive research capabilities of the Commonwealth's universities.** The economic welfare of an area is determined by a combination of factors, including the level and type of employment, the level of income, and quality of life issues, such as access to services and amenities. Employment indicators do not reflect this complex set of factors. Since the official definition of unemployment includes only those individuals who have sought employment in the last four weeks, unemployment rates are better measures of cyclical economic activity than of long-term economic trends. Therefore, it is recommended that the General

Assembly examine other indicators of economic welfare, including but not limited to per capita personal income or the percent of the population receiving food stamps, as criteria in the implementation of programs designed to improve the economic welfare of areas.

CHAPTER I

LABOR FORCE STATISTICS AND STATE POLICY

Introduction

One of the responsibilities of the Kentucky General Assembly is to allocate state funds to counties through various economic development programs. In many of these programs, funds are distributed based on criteria which are intended to reflect the employment situation and economic well-being of a county. In the past, the principal criterion has been comparisons of county unemployment rates. Typically, a county unemployment rate is compared to that of the state for one or more years. If the county unemployment rate is consistently higher than that for the state, the county qualifies for receipt of economic development funds.

There are two economic development programs administered by the Kentucky Economic Development Finance Authority which utilize employment indicators as criteria in the allocation of state funding and financial assistance. The Rural Economic Development Program, formerly known as the Kentucky Rural Economic Development Authority (KREDA), provides for financial assistance and income tax credits to companies seeking to locate in qualified counties. In order for a county to qualify, the county must have had unemployment rates exceeding the state unemployment rate in the most recent five years. Funds are disbursed based on the merits of individual projects in all counties that qualify. Therefore, once a county qualifies, new businesses in that county compete with new business in all qualified counties for the available funds.

The Local Government Economic Development Fund provides for the allocation of a portion of coal severance tax receipts to coal-producing counties. Moneys are assigned to county accounts based on coal production in the county over the last five years and the employment situation in the county for the last five years. Funds are also set-aside in an account reserved for projects benefiting two or more counties. The employment situation indicators include the percent of employment in mining, the percent of earnings from mining, and the labor surplus rates. The funds are disbursed as grants for industrial development and related projects and are approved by the Kentucky Economic Development Finance Authority and the Economic Development Cabinet.

Similarly, many federal programs allocate moneys or focus federal programs to states and counties based on how an area's unemployment compares to national unemployment. Moneys are allocated to areas based on a combination of criteria and are summarized in Table 1. For example, under the Job Training Partnership Act, the Department of Labor identifies Areas of Substantial Unemployment (ASUs) based on unemployment rates. However, the funds are distributed within the ASUs based on the number of unemployed. Labor Surplus Areas (LSAs), which receive priorities in the

Table 1

ADMINISTRATIVE USES OF LOCAL AREA UNEMPLOYMENT STATISTICS

USER/AGENCY PROGRAM	ALLOCATION FORMULAS
DOL **Disadvantaged adults and youths (Title II-A)** **Summer Youth (Title II-B)**	Funding allocation for the JTPA program is based on the following proportions: 1/3 Relative number of unemployed in ASUs (i.e., where the unemployment rate is 6.5% or higher.) 1/3 Relative excess number of unemployed (i.e., number of unemployed in excess of 4.5% of civilian labor force.) 1/3 Relative number of economically disadvantaged youths.
Dislocated Workers EDWAA (Title III)	Funding allocation for EDWAA is based on state and substate algorithms. Allocation of funds to states is based on the following proportions: (1) 1/3 Relative number of unemployed 1/3 Relative excess number of unemployed 1/3 Relative number of unemployed for 15 weeks or more Substate allocation is based on the following six components: 1) insured unemployment data 2) unemployment concentrations 3) plant closing and mass layoff data 4) declining industry data 5) farmer-rancher economic hardship data 6) long-term unemployment data
Wagner-Peyser (Job Service Offices) **Labor Surplus Areas**	2/3 Relative number in civilian labor force 1/3 Relative number of unemployed An area qualifies as an LSA when the average unemployment rate is 20% or more above the national rate.
FEMA **Emergency Food & Shelter Program**	FEMA allocation is based on the number of unemployed combined with the following: 1) relative unemployment rate or 2) relative poverty rate
EDA **Public Works Program**	EDA allocation is based on the relative unemployment rate and family income.
USDA **Temporary Emergency Food Assistance Program (TEFAP)**	Farm commodities are allocated to States based on: 3/5 Relative number of persons in households below the poverty level 2/5 Relative number of unemployed persons
EUCA **Emergency Unemployment Compensation Act**	All states automatically qualify for 26 weeks of emergency unemployment compensation. Those qualifying for 33 weeks of benefits must meet the following criteria: 1) The average rate of total unemployment (TUR) is at least 9 percent for the most recent six months, OR 2) The adjusted rate of insured unemployment (AIUR) is at least 5 percent for the most recent 13 weeks.

(1) Once MLS data become available, the weights shown will decrease to 1/4 each and the remaining 1/4 will be allocated based on those data.

Table 1 (continued)

ADMINISTRATIVE USES OF LOCAL AREA UNEMPLOYMENT STATISTICS

USER AGENCY/ PROGRAM	Appropriations (in millions) FY '91	FY '92	Geographic Areas	Reference Period
DOL				
Disadvantaged adults and youths (Title II-A of JTPA)	$1,778.5	$1,773.5	States, and Areas of Substantial Unemployment (ASU)--consisting of counties, cities, and/or parts of each. States and ASUs	Most recent 12 month period.
Summer Youth (Title II-B of JTPA)	$682.9	$682.9	States and substate areas	Most recent 12 month period.
Dislocated Workers EDWAA (Title III of JTPA)	$527.0	$577.0	States only	Most recent 12 month period.
Wagner-Peyser (Job Service Offices)	$805.1	$821.6	Counties, cities over 25,000 population balance of county	Most recent calendar year.
Labor Surplus Areas	(1)	(1)		Most recent two calendar years: monthly data.
FEMA				
Emergency Food & Shelter Program	$134.0	$134.0	Counties, cities, and balances of counties	12-month averages
EDA				
Public Works Program	$140.1	$154.2	Counties and small cities	2-5 years of most recent quarterly data.
USDA				
Temporary Emergency Food Assistance Program (TEFAP)	$170.0	$165.0	States only	Fiscal year average
EUCA				
Emergency Unemployment Compensation Act of 1991, with 2/92 amendment	n/a	$5,000.0	States only	Most recent six months of total unemployment, OR Most recent 13 weeks of insured unemployment.
Total Appropriations	$4,237.6	$9,308.2		

(1) Program does not allocate funds, but gives preference to firms in labor surplus areas (LSA) in bidding on federal procurement contracts.

(2) State funding is drawn from the Unemployment Insurance Trust Fund, from which an estimated $5 billion is made available to the states until July 4, 1992.

awarding of federal contracts, are defined as areas where the average unemployment rate is 20% or more above the national rate. Under the Public Works program, the Economic Development Administration allocates funds based on relative unemployment rates and family income.

Employment and unemployment data are available approximately six weeks following a month's end and are the only timely measures of economic activity available at the county level. Other measures of economic activity, such as personal income, are

not available until approximately 16 months after the end of a calendar year. This is the major reason that unemployment rates are often used as the indicator of the economic situation in counties. However, there is a perception among policy makers and analysts that unemployment rates do not accurately depict the true employment situation in all counties. It is not uncommon to hear community leaders and economic development officials say that the "real" unemployment rate is much higher than what is published by government statistical agencies. Because of these concerns, members of the General Assembly have sought measures which may more accurately reflect labor market conditions.

Due to skepticism concerning the unemployment statistics, officials in the Department of Employment Services at the Cabinet for Human Resources developed an alternate measure of the employment situation in Kentucky counties, the labor surplus estimates. According to cabinet officials, labor surplus estimates are an assessment of the number of people who would be available for employment. Once these estimates were published, many people thought that these figures represented the "true" count of unemployed persons. As a result, SB 205, which was passed in the 1992 Session of the Kentucky General Assembly, included labor surplus rates as one of the criteria in the allocation of coal severance taxes to counties under the Local Government Economic Development Fund. Furthermore, it has been proposed that other state funds be allocated based on labor surplus rates.

In spite of the attractiveness of an estimate of "labor surplus", there was concern about the appropriateness of using this measure as a criterion in the allocation of state moneys. First, there was some confusion about how labor surplus was defined and what the numbers actually represented. Secondly, it was unclear how labor surplus was estimated. This confusion was confounded by inconsistencies in the concept of labor surplus areas, as defined by the U.S. Department of Labor, and labor surplus, as defined by the Cabinet for Human Resources. These uncertainties prompted the 1992 General Assembly to mandate an evaluation of the labor surplus estimates as indicators of the employment situation and economic status of counties.

Labor force statistics have been the subject of continuous scrutiny over the decades. In addition to periodic internal reviews by the agencies which are responsible for collecting the data, there have been two major reviews by external committees. In both cases, the external reviews were in response to widespread public doubts about the accuracy of labor force data.

The first major examination of the labor force statistics was conducted by the President's Committee to Appraise Employment and Unemployment Statistics, or the Gordon Committee, which was appointed by President Kennedy in 1961. Many of the commission's recommendations were later adopted by the U.S. Bureau of Labor Statistics (BLS) and the U.S. Bureau of Census and resulted in significant changes in the procedures and concepts used in the estimation of employment.[1]

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[1]Robert L. Stein, "National Commission Recommends Changes in Labor Force Statistics", *Monthly Labor Review*, April 1980, Page 11.

In the 1970's, controversy over the statistics emerged once again. This was prompted both by perceived inadequacies of the data and because of the use of unemployment figures as a criterion for the allocation of federal funds to local areas. Under the auspices of legislation enacted by Congress (PL 94-444), President Carter appointed a 9-member commission, The National Commission on Employment and Unemployment Statistics, to review the procedures used to collect employment and unemployment data, as well as the concepts underlying the data. The Commission, better known as the Levitan Commission, made almost 100 recommendations related to the procedures, definitions, and development of measures linking labor market activity to economic hardship, and measurement of employment and unemployment at the state and county level.[2]

Labor Surplus Work Group

Section 14 of HB 812, which was passed in the 1992 Session, mandates that the Legislative Research Commission identify and evaluate a method to define and estimate a surplus labor rate. In order to accomplish this mandate, LRC is directed to consult with the Department for Employment Services, the Bureau of Labor Statistics, labor researchers, and other state and local officials. This report presents the results of that effort.

A working group of labor market researchers and economic analysts was formed in the Spring of 1992. Working group members consisted of Legislative Research Commission staff economists, economists on the faculty of the University of Kentucky and the University of Louisville, and staff from several executive branch agencies. Figure 1 lists the individuals who participated in the work group. The first meeting was held on May 13, 1992. The group met approximately once a month over the next six-months.

The first step the group took was to review the current procedures used to estimate employment, unemployment, and labor surplus. Secondly, the group evaluated the adequacy of different employment and unemployment measures in ranking counties based on measures of economic welfare obtained from the Census of Population and other sources. Finally, the group discussed strengths and weaknesses of labor force statistics and ways they could be improved.

[2]For a review, see National Commission on Employment and Unemployment Statistics, *Counting the Labor Force*, Washington D.C., U. S. Government Printing Office.

Figure 1

Surplus Labor Working Group Membership

Dr. Mark Berger Business and Economics Department University of Kentucky	Dr. Stephan Goetz Agricultural Economics University of Kentucky
Ms. Donna Cantrell Legislative Research Commission Commonwealth of Kentucky	Mr. Bill Keesler Appalachian Center University of Kentucky
Mr. Bob Cox Finance and Administration Cabinet Commonwealth of Kentucky	Mr. Wayne Miller Department of Local Government Commonwealth of Kentucky
Dr. Charles Diamond School of Business University of Louisville	Dr. Jerry Skees Agricultural Economics University of Kentucky
Dr. Ron Eller Appalachian Center University of Kentucky	Mr. Earl Turley Department for Employment Services Commonwealth of Kentucky
Dr. David Freshwater Agricultural Economics University of Kentucky	Ms. Virginia Wilson Legislative Research Commission Commonwealth of Kentucky

The labor force statistics evaluated in this report are employment, unemployment and labor surplus. The second chapter of the report examines the definitions underlying these statistics and the methods used to estimate them at the national, state and county level. This is followed by a review of the definitions of and methods used to estimate surplus labor.

In the third chapter, the assumptions underlying the labor surplus estimates are evaluated. Both the type and level of employment in an area are determined by the interaction of decisions made by both employers (or prospective employers) and employees (or prospective employees). Many factors determine where a business will choose to operate and how many people it will employ. Other factors will influence an individual's decision to enter the labor force. Also, the debate surrounding discouraged workers and the implications for the official labor force statistics are reviewed. The chapter concludes with a review of the factors which influence labor force participation in Kentucky and Kentucky counties.

In the fourth chapter, the adequacy of labor force statistics as an indicator of economic activity in Kentucky counties is evaluated. There are two issues which are important in examining the reliability of labor force statistics: one, the accuracy of the actual counts of employed and unemployed persons; and two, the ability of unemployment rates to consistently and accurately rank counties. The first issue is addressed by comparing the unemployment rates published by the BLS to the unemployment rates from the 1990 Census of Population. The second issue is addressed by examining the relationships between the three indicators of the employment situation and various measures of economic welfare.

In the fifth chapter, the recommendations of the work group are summarized.

CHAPTER II

LABOR FORCE STATISTICS AND ECONOMIC INDICATORS

Various federal and state agencies are responsible for developing and maintaining the labor force statistics used to develop economic indicators. Knowledge of the definitions of various labor force categories and methods of estimation are critical to a proper understanding of the indicators.

National Labor Force Statistics

The US. Bureau of Census, in cooperation with the US. Bureau of Labor Statistics, conducts a monthly sample survey of households called the Current Population Survey (CPS). One of the primary purposes of this survey is to estimate the number of persons employed and unemployed by place of residence. Surveyors personally visit households and interview persons regarding the labor force status of all individuals residing in the household over the age of 16. Under the CPS labor force concepts, the population is divided into three categories; those who are employed, those who are unemployed and those who are not in the labor force.

The **Employment** category includes non-institutionalized civilian persons age 16 years and over who have worked for pay or who performed at least 15 hours of unpaid work in a family-oriented enterprise during the survey week. This includes both full-time and part-time employment, but each employed person is only counted once. Individuals who were absent from their regular jobs due to vacation, illness, or labor-management disputes are also counted as employed.

The **Unemployment** category includes non-institutionalized persons 16 years and over who were without a job during the survey week and who have actively looked for work in the last four weeks. This includes individuals who have been laid off and are waiting to be called back to work, as well as individuals who are waiting to begin a job within the next 30 days. Examples of actively seeking employment are contacting a potential employer, responding to help wanted ads in the newspaper, or contacting an employment agency.

The **Civilian Labor Force** is defined as the civilian non-institutionalized population 16 years and older that either have a job or are actively looking for a job. This is simply the sum of the employed and the unemployed.

The final category are those people **Not in the Labor Force**, which includes those who are unavailable for work, those who are not seeking employment for personal reasons, and those who are not actively seeking employment because they feel that no

jobs are available. People listed as being unavailable for work include disabled individuals or individuals with home or family responsibilities which prevent them from seeking employment. The second group, individuals not seeking employment for personal reasons, includes those who express no interest in obtaining a job and retirees. The third group consists of those who report wanting full- or part-time work but who are not actively seeking a job because they think that no jobs are available. These people are generally referred to as **discouraged workers**.

Local Area Labor Force Estimates

Approximately 57,000 households are surveyed monthly in the CPS. Of these households, approximately 700 are in Kentucky. The national sample is large enough that it provides statistically reliable estimates for the nation. However, because so few households in Kentucky are surveyed, it cannot be relied on as the sole source of information in estimating employment for Kentucky or Kentucky counties. Only the eleven most populous states (California, Florida, Illinois, Massachusetts, Michigan, New Jersey, New York, North Carolina, Ohio, Pennsylvania, and Texas) and two areas (the Los Angeles-Long Beach MSA and New York City) are represented with sufficient numbers in the sample to provide statistically reliable estimates.[3] Therefore, employment and unemployment for states, counties, and MSAs, (all termed Local Areas by BLS) are estimated through the data collection efforts of state employment security agencies.

The BLS provides technical assistance and funding to the state agencies to perform data collection services. Under a federal-state cooperative program, the US. Department of Labor develops the concepts, definitions, and technical procedures which are used by state agencies for the preparation of labor force estimates. Once the data are collected, they are sent to the federal agencies for review and statistical calculations. In Kentucky, the state employment security agency is the Department for Employment Services in the Cabinet for Human Resources.

Under the **Local Area Unemployment Statistics (LAUS) Program**, state employment security agencies collect data for the estimation of employment, unemployment, and the labor force. Data are collected from a combination of sources, including surveys of business establishments and unemployment insurance claims filed by individuals. Under the **Current Employment Statistics Program (CES or 790)**, approximately 4,600 nonagricultural business establishments in Kentucky are surveyed on a monthly basis. Businesses voluntarily provide information on the number of workers employed, the number of hours worked and average hourly earnings. Under the **Employment and Wages Program (ES-202)**, information is obtained on a quarterly basis from employers who pay state unemployment insurance. This data is transmitted to the BLS.

Local area employment is estimated from the establishment survey, which reflects employment by place of work. For most policy analysis purposes, data are needed by

[3] *How the Government Measures Unemployment*, Report 742, Bureau of Labor Statistics, US. Department of Labor, September 1987.

place of residence. Therefore, the place of work data is adjusted by information on commuting patterns from the Decennial Census of Population, in order to obtain employment estimates by place of residence.

The establishment surveys include data on employment covered by state unemployment insurance programs. However, there are many groups of workers that are not covered by an unemployment insurance program, including agricultural and nonagricultural self-employed persons, domestic employees, employees of non-profit organizations and elected officials. Employment for these groups is estimated from data collected from various federal data collection agencies. For example, agricultural employment is estimated from data collected by the U.S. Department of Agriculture. Covered and non-covered employment are summed to estimate total employment.

The "Handbook Method", outlined in Figure 2, is the primary procedure used by BLS to estimate local area unemployment. A review of Figure 2 illustrates the complexity of the process used. The primary sources of data on unemployment for local areas are the unemployment insurance claims. This number is then added to the estimated number of persons who have exhausted their benefits; the estimated number of people who were disqualified from receiving benefits; and the estimated number of persons who never filed or were not covered by unemployment insurance. To the extent that people must show proof that they are seeking employment in order to receive unemployment insurance benefits and that this group comprises the largest portion of the unemployed estimate, the handbook measures are similar in concept to the CPS measures.

The methods used to estimate local area labor force statistics were reviewed by the Levitan Commission. The committee concluded that the handbook method persistently over- or under-estimated employment and unemployment for state and local areas, resulting in significant bias.[4] However, it was deemed fiscally prohibitive to increase the CPS sample size to a level necessary to serve as the sole source of data on state and local area employment and unemployment. Therefore, the commission suggested that BLS develop a regression methodology which combines data collected through the CPS, the establishment survey, and data from non-survey sources, such as census data and administrative records, to estimate state level employment and unemployment. This recommendation was adopted by BLS in 1989. The committee also expressed concern over the current procedures used to estimate county employment and unemployment. However, because of the paucity of county level data and the absence of available alternatives, the commission recommended expansion of the establishment survey, which is the primary source of data for estimating county employment, and the continued use of the handbook method.[5]

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[4]National Commission on Employment and Unemployment Statistics, *Counting the Labor Force*, Washington D.C., U. S. Government Printing Office, p. 242

[5] In a reservation comment in the report, commission member Glen Cain suggested that because unemployment statistics are not primarily intended to measure economic hardship, annual income statistics, not unemployment statistics, should be used as a basis for federal aid to local areas. See page 263.

Figure 2

Summary Worksheet for Estimating Handbook Employment

I. Basic Data

A. Current Employment

		Place of Work	Residency Adjustment Factor	Place of Residence
1.	State UI-covered (lines a+b+c+d+e)			_____
a.	Private wage and salary	_____	... _____	_____
b.	State and local government	_____	... _____	_____
c.	Domestics			_____
d.	Agricultural			_____
e.	Training program participants (including UI exempt)			_____
2.	Federal Government	_____	... _____	_____
3.	Railroad	_____	... _____	_____
4.	Total Covered Employment (Lines 1+2+3)			_____
5.	Noncovered nonprofit institutions	_____	... _____	_____
6.	Noncovered domestics			_____
7.	Nonagricultural self-employed and unpaid family			_____
8.	Noncovered agricultural			_____
9.	Noncovered State and local government	_____	... _____	_____
10.	CURRENT EMPLOYMENT (lines 4+5+6+7+8+9)			_____

B. Current Claims Data

11.	State UI continued claimants	_____
12.	State UI continued claminants less earnings	_____
13.	State UI initial claims	_____
14.	State UI time-lapse ratio	_____
15.	Federal civilian continued claimants	_____
16.	Federal civilian continued claimants less earnings	_____
17.	Railroad Retirement Board	_____

II. Computation of Handbook Unemployment

A. Unemployment Related to Covered Employment

18.	STATE UI CONTINUED CLAIMANTS LESS EARNINGS (repost line 12)	_____
19.	UNEMPLOYMENT EXHAUSTEES (see Section 241)	_____

Figure 2 (continued)

Summary Worksheet for Estimating Handbook Employment

20. UNEMPLOYED DISQUALIFIED (see Section 242) ..... _____
21. Insured plus exhaustee unemployment rate (lines 18+19)/(lines 1+18+19) ..... _____
22. DELAYED AND NEVER FILERS (see Section 243) ..... _____
23. Total State UI Covered Unemployment (lines 18+19+20+22) ..... _____
24. State Covered Unemployment Rate (line 23)/(line 1+23) ..... _____
25. Ratio State Covered to State Insured (line 23/line 11) ..... _____
26. Ratio State Covered to State Insured less Earnings (line 23/line 12) ..... _____
27. Federal Covered Unemployment (line 15 x line 25 or line 16 x line 26) ..... _____
28. Federal Covered Unemployment Rate line 27/(lines 2 +27) ..... _____
29. Railroad Covered Unemployment line 17 x 1/2 (1.00 + line 25) ..... _____
30. TOTAL COVERED UNEMPLOYMENT (lines 23+27+29) ..... _____

B. Unemployment Related to Noncovered Employment (see Section 244)

31. Nonprofit institutions (line 5 x .02 rate) ..... _____
32. Domestics (line 6 and 3/4 rate of line 24 from Table 244-4) ..... _____
33. Nonagricultural self-employed and unpaid family (line 7 and 1/5 rate of line 24 from Table 244-5) ..... _____
34. Agricultural employment (line 8 and __ rate of line 24) ..... _____
35. State and local government (line 9 and 1/3 rate of line 24 from Table 244-19 or 3/4 rate of line 28 from Table 244-4) ..... _____
36. TOTAL NONCOVERED UNEMPLOYMENT (lines 31+32+33+34+35) ..... _____

C. New Entrant and Reentrant Unemployment (see Section 245)

37. Unemployed, excluding entrants (lines 30+36) ..... _____
38. "B" factor unemployed (line 37 x "B" factor of __) ..... _____
39. Employed plus unemployed excluding entrants (lines 10+37) ..... _____
40. "A" factor unemployed (line 39 x "A" factor of __) ..... _____
41. UNEMPLOYED NEW ENTRANTS AND REENTRANTS (lines 38+40) ..... _____

D. Handbook Employment and Unemployment

42. Employment (repost line 10) ..... _____
43. Unemployment (lines 37+41) ..... _____

Source: Bureau of Labor Statistics, Manual for Developing Local Area Unemployment Statistics, Worksheet 22-1.

Labor Surplus

There has been considerable debate as to the appropriateness of the definition of unemployed people. Specifically, some people argue that the criterion of actively seeking work in the last four weeks is too restrictive. Secondly, some believe that the individuals who are not seeking work because they believe they could not find it, or discouraged workers, should be included in unemployment figures, in order for the unemployment rates to serve as a reliable indicator of the employment situation in counties. These factors underlie the Department for Employment Services' (DES) efforts to identify another labor force classification, labor surplus.

The 1989 Labor Surplus estimates are presented in Table 2. Labor surplus is estimated by summing three categories of the population that is not currently employed. The first category includes individuals who are unemployed as defined by BLS. The second category includes individuals who are under-employed. Based on the DES publication, *Kentucky Labor Force Estimates by County 1989*, under-employed individuals are those people who worked only 14 to 26 weeks during the year. This data is estimated from the *1980 Census of Population*. These two components, the official unemployed and part-time employment, are summed to represent the "labor surplus from labor force population".

The third category includes the "labor supply from not in the labor force population". Conceptually, this is supposed to serve as an estimate of "persons classified as not being in the labor force, but who would like to work if jobs were available".38 [6] It is assumed that **if** jobs were available, the county labor force participation rate would be equal to the national labor force participation rate. Therefore, a county's male and female population 16 years and over is multiplied by the corresponding national labor force participation rates to obtain an estimate of the potential labor supply (Equation 1). The labor supply from "not in the labor force population" is calculated by subtracting the labor force as defined by BLS from the potential labor force defined by the DES (Equation 2).

Equation 1:	Potential Labor Force Defined by DES	=	Population	X	U.S. Labor Force Participation Rate
Equation 2:	Labor Supply from not in the Labor Force	=	Potential Labor Force Defined by DES	-	Labor Force defined by BLS

There are a number of concerns with the definition and method used to estimate Labor Surplus. First, the definition of underemployment is much too broad and does not conform to generally recognized definitions. According to the Interstate Conference of State Employment Security Agencies, under-employed persons are defined as those people who are working in jobs below their skill level or are working part-time while

[6] *Kentucky Labor Surplus Estimates by County 1989*, Department for Employment Services, Kentucky Cabinet for Human Resources, p. 2.

Table 2
Labor Surplus Estimates for Kentucky by County - 1989

	Total Labor Surplus			*Labor Surplus from Labor Force Population*						*Labor Supply From Not in Labor Force Population*		
				Unemployed			*Underemployed*					
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
KY TOTAL	***478,415***	***221,448***	***257,963***	***108,698***	***38,000***	***69,698***	***172,717***	***82,500***	***90,217***	***198,006***	***79,948***	***118,748***
Adair	1,224	709	515	547	294	253	677	415	262	0	0	0
Allen	1,589	927	662	548	252	296	617	324	293	424	351	73
Anderson	1,217	596	621	366	172	194	605	218	387	246	206	40
Ballard	1,670	698	972	375	245	130	368	185	183	927	268	659
Barren	3,489	1,503	1,986	1,167	603	564	1,648	703	945	674	197	477
Bath	1,171	583	588	486	301	185	511	282	229	174	0	174
Bell	8,338	3,951	4,387	1,037	708	329	1,153	668	485	6,148	2,575	3,573
Boone	3,564	1,393	2,171	1,160	572	588	2,404	821	1,583	0	0	0
Bourbon	1,373	596	777	478	215	263	728	381	347	167	0	167
Boyd	9,555	4,036	5,519	1,182	731	451	2,449	1,173	1,276	5,924	2,132	3,792
Boyle	2,886	1,444	1,442	809	409	400	1,244	590	654	833	445	388
Bracken	1,133	317	816	244	156	88	313	161	152	576	0	576
Breathitt	3,823	1,785	2,038	474	307	167	517	284	233	2,832	1,194	1,638
Breckinridge	2,924	1,287	1,637	561	299	262	872	504	368	1,491	484	1,007
Bullitt	5,629	1,937	3,698	1,153	614	539	2,174	964	1,210	2,302	353	1,949
Butler	819	487	332	472	314	158	347	173	174	0	0	0
Caldwell	2,527	1,070	1,457	447	234	213	630	272	358	1,450	564	886
Calloway	2,994	1,517	1,477	720	386	334	2,274	1,131	1,143	0	0	0
Campbell	5,900	2,334	3,566	1,893	1,012	881	3,360	1,322	2,038	647	0	647
Carlisle	1,023	480	543	203	116	87	237	125	112	583	239	344
Carroll	951	425	526	245	131	114	486	294	192	220	0	220
Carter	6,012	2,682	3,330	1,151	723	428	1,195	710	485	3,666	1,249	2,417
Casey	3,443	1,703	1,740	369	216	153	719	429	290	2,355	1,058	1,297
Christian	8,512	5,371	3,141	1,162	474	688	2,749	1,385	1,364	4,601	3,512	1,089
Clark	2,213	960	1,253	1,030	456	574	1,183	504	679	0	0	0
Clay	7,026	3,744	3,282	540	358	182	858	465	393	5,628	2,921	2,707
Clinton	1,770	940	830	342	183	159	563	283	280	865	474	391
Crittenden	1,063	456	607	275	153	122	354	192	162	434	111	323
Cumberland	827	553	274	314	193	121	414	261	153	99	99	0
Daviess	6,797	3,255	3,542	2,793	1,481	1,312	4,004	1,774	2,230	0	0	0
Edmonson	2,081	908	1,173	392	192	200	543	223	320	1,146	493	653
Elliott	2,640	1,464	1,176	274	204	70	446	288	158	1,920	972	948
Estill	3,791	1,901	1,890	547	331	216	734	418	316	2,510	1,152	1,358
Fayette	17,684	8,464	9,220	4,433	2,252	2,181	13,251	6,212	7,039	0	0	0
Fleming	1,541	535	1,006	418	237	181	592	248	344	531	50	481
Floyd	11,609	5,106	6,503	1,398	795	603	1,748	904	844	8,463	3,407	5,056
Franklin	3,375	1,818	1,557	1,044	571	473	1,946	862	1,084	385	385	0
Fulton	1,166	535	631	230	130	100	392	208	184	544	197	347
Gallatin	1,044	481	563	128	81	47	237	123	114	679	277	402
Garrard	1,830	880	950	380	206	174	497	287	210	953	387	566
Grant	1,105	563	542	464	260	204	641	303	338	0	0	0
Graves	3,823	1,645	2,178	1,093	621	472	1,569	671	898	1,161	353	808
Grayson	4,045	2,078	1,967	904	585	319	1,178	620	558	1,963	873	1,090
Green	1,267	552	715	317	192	125	430	232	198	520	128	392
Greenup	7,451	2,880	4,571	831	493	338	1,640	817	823	4,980	1,570	3,410
Hancock	1,560	649	911	258	142	116	372	176	196	930	331	599
Hardin	6,316	4,009	2,307	1,775	770	1,005	4,541	3,239	1,302	0	0	0
Harlan	10,237	4,485	5,752	1,102	690	412	1,390	751	639	7,745	3,044	4,701
Harrison	2,096	1,056	1,040	406	233	173	765	385	380	925	438	487
Hart	2,088	705	1,383	551	260	291	735	423	312	802	22	780
Henderson	3,352	1,391	1,961	1,427	641	786	1,925	750	1,175	0	0	0
Henry	1,237	461	776	364	190	174	657	271	386	216	0	216
Hickman	881	455	426	139	100	39	265	126	139	477	229	248
Hopkins	6,481	2,267	4,214	1,349	730	619	2,058	873	1,185	3,074	664	2,410
Jackson	3,016	1,476	1,540	412	267	145	540	354	186	2,064	855	1,209
Jefferson	51,085	23,627	27,458	21,348	11,049	10,299	29,737	12,578	17,159	0	0	0
Jessamine	2,092	1,331	761	640	353	287	1,452	978	474	0	0	0
Johnson	5,670	2,614	3,056	683	376	307	930	505	425	4,057	1,733	2,324
Kenton	9,324	4,275	5,049	3,035	1,647	1,388	6,289	2,628	3,661	0	0	0
Knott	3,071	2,155	916	638	436	202	625	369	256	1,808	1,350	458
Knox	6,808	3,194	3,614	889	512	377	1,109	569	540	4,810	2,113	2,697
Larue	1,839	791	1,048	335	205	130	399	211	188	1,105	375	730

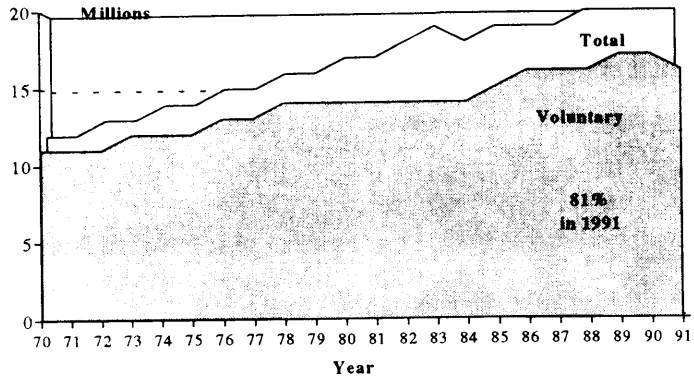
Table 2
Labor Surplus Estimates for Kentucky by County - 1989

	Total Labor Surplus			*Labor Surplus from Labor Force Population*						*Labor Supply From Not in Labor Force Population*		
				Unemployed			*Underemployed*					
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Laurel	6,815	2,884	3,931	1,300	725	575	1,914	975	939	3,601	1,184	2,417
Lawrence	3,777	1,738	2,039	450	299	151	595	335	260	2,732	1,104	1,628
Lee	1,323	587	736	272	189	83	353	187	166	698	211	487
Leslie	4,426	2,137	2,289	314	226	88	533	347	186	3,579	1,564	2,015
Letcher	7,773	3,460	4,313	715	498	217	1,265	826	439	5,793	2,136	3,657
Lewis	2,659	1,322	1,337	516	323	193	745	362	383	1,398	637	761
Lincoln	3,314	1,512	1,802	826	496	330	764	374	390	1,724	642	1,082
Livingston	2,082	945	1,137	416	273	143	435	212	223	1,231	460	771
Logan	2,751	1,240	1,511	800	412	388	1,035	489	546	916	339	577
Lyon	667	481	186	174	127	47	365	226	139	128	128	0
McCracken	6,275	2,276	3,999	1,785	912	873	2,605	1,043	1,562	1,885	321	1,564
McCreary	5,147	2,660	2,487	548	327	221	743	432	311	3,856	1,901	1,955
McLean	1,964	548	1,416	408	211	197	462	237	225	1,094	100	994
Madison	5,677	2,391	3,286	1,248	569	679	4,429	1,822	2,607	0	0	0
Magoffin	4,030	1,912	2,118	541	371	170	500	285	215	2,989	1,256	1,733
Marion	1,567	843	724	678	437	241	660	397	263	229	9	220
Marshall	4,744	1,762	2,982	928	497	431	1,218	494	724	2,598	771	1,827
Martin	4,281	1,918	2,363	311	215	96	515	220	295	3,455	1,483	1,972
Mason	2,557	1,057	1,500	425	189	236	741	305	436	1,391	563	828
Meade	7,078	3,681	3,397	557	234	323	1,106	462	644	5,415	2,985	2,430
Menifee	733	347	386	220	117	103	338	230	108	175	0	175
Mercer	2,112	737	1,375	570	319	251	805	342	463	737	76	661
Metcalfe	1,728	787	941	353	169	184	488	272	216	887	346	541
Monroe	861	436	425	408	211	197	453	225	228	0	0	0
Montgomery	3,794	1,944	1,850	824	462	362	1,052	498	554	1,918	984	934
Morgan	3,556	1,812	1,744	444	318	126	559	362	197	2,553	1,132	1,421
Muhlenberg	7,385	3,170	4,215	1,231	738	493	1,094	379	715	4,760	1,753	3,007
Nelson	2,502	1,320	1,182	1,209	637	572	1,293	683	610	0	0	0
Nicholas	1,064	551	513	218	108	110	346	172	174	500	271	229
Ohio	5,479	2,520	2,959	884	497	387	792	375	417	3,803	1,648	2,155
Oldham	2,499	1,327	1,172	602	267	335	1,897	1,060	837	0	0	0
Owen	1,368	693	675	199	127	72	372	196	176	797	370	427
Owsley	1,523	804	719	140	98	42	232	172	60	1,151	534	617
Pendleton	2,464	1,175	1,289	256	124	132	334	126	208	1,874	925	949
Perry	8,167	3,700	4,467	995	667	328	1,218	660	558	5,954	2,373	3,581
Pike	20,848	8,993	11,855	2,357	1,533	824	2,845	1,478	1,367	15,646	5,982	9,664
Powell	1,574	784	790	573	328	245	615	294	321	386	162	224
Pulaski	6,383	3,023	3,360	1,783	1,065	718	2,050	979	1,071	2,550	979	1,571
Robertson	469	189	280	76	53	23	116	57	59	277	79	198
Rockcastle	1,416	716	700	568	319	249	598	397	201	250	0	250
Rowan	2,112	1,026	1,086	580	331	249	1,532	695	837	0	0	0
Russell	1,334	805	529	516	303	213	818	502	316	0	0	0
Scott	1,966	1,016	950	678	382	296	1,288	634	654	0	0	0
Shelby	1,303	586	717	492	253	239	811	333	478	0	0	0
Simpson	1,240	454	786	489	177	312	751	277	474	0	0	0
Spencer	726	2,449	477	181	92	89	250	120	130	295	37	258
Taylor	1,823	1,053	770	600	391	209	1,015	454	561	208	208	0
Todd	952	337	615	302	129	173	411	208	203	239	0	239
Trigg	1,575	722	853	270	142	128	417	164	253	888	416	472
Trimble	596	342	254	188	107	81	408	235	173	0	0	0
Union	2,484	994	1,490	374	194	180	1,164	582	582	946	218	728
Warren	7,663	3,332	4,331	2,491	1,139	1,352	5,172	2,193	2,979	0	0	0
Washington	1,189	541	648	374	177	197	493	234	259	322	130	192
Wayne	2,946	1,618	1,328	613	369	244	835	506	329	1,498	743	755
Webster	1,780	378	1,402	404	160	244	476	189	287	900	29	871
Whitley	8,817	3,694	5,123	991	599	392	1,762	870	892	6,064	2,225	3,839
Wolfe	1,824	959	865	280	170	110	172	85	87	1,372	704	668
Woodford	1,184	476	708	308	139	169	876	337	539	0	0	0

Source: Kentucky Labor Surplus Estimates by County 1989, Department for Employment Services, Kentucky Cabinet for Human Resources

desiring full-time employment.[7] Secondly, these estimates are based on data from the 1980 Census. It was not reported how 1989 under-employment was estimated. Finally, while there are some individuals working part-time who would prefer to be working full-time, national data from the CPS indicates that the majority of part-time workers have chosen to work only part-time. Trends in US part-time employment are illustrated in Figure 3. In 1991, there were a total of 20.3 million people who worked part-time. Of these, 16.4 million, or 81%, worked part time because they chose to. In response to these concerns raised by the Labor Surplus Work Group, CHR representatives have decided to exclude this category from the 1990 estimate of surplus labor.

Figure 3
Trends in Part-Time Employment
in the United States, 1970 - 1991



Source: *Handbook of Labor Statistics*, Bulletin 2340, U. S. Department of Labor, Bureau of Labor Statistics, August 1989 and *Employment and Earnings*, U.S. Department of Labor, Bureau of Labor Statistics, January issues from 1990 to 1992.

There are also concerns about the category of "labor supply not in the labor force". The assumption that the labor force participation rate for counties will be equal to the national labor force participation rate is questionable. There are many things that effect an individual's decision to enter the labor force, including education and skill levels, wage rates, commuting distance, age, and family and home responsibilities. Also, many factors affect employment demand in an area. Examples of these include wage rates, the costs of productive inputs, such as energy and capital, the costs of transportation, and the demand for (the firm's) output. The interaction of these components results in a certain level of economic activity, employment and labor force participation, which may have a great deal of regional variation. The mechanics of labor markets and an analysis of why labor force participation may vary across localities are summarized in Chapter 3.

[7] *Labor Market Information, A Desk Reference for Administrators*, Interstate Conference of State Employment Security Agencies, 1989, p. 14.

Labor Force Statistics and Evaluation of Economic Status

Trends in unemployment are frequently used to monitor economic performance. However, unemployment can result from different economic influences and can be classified based on the factors that contribute to the unemployed state. In general, there are three types of unemployment: frictional unemployment, structural unemployment, and cyclical unemployment.

Frictional unemployment results from the delay in matching job seekers to job openings. At any point in time, there will be people who are switching from one job to another or new entrants to the labor market. However, it takes time for workers to obtain information about job openings. Also, it takes time for firms to obtain information about qualified applicants.

Cyclical unemployment is associated with fluctuations in business activity and results from a decline in demand for the product of a business or industry. In time of recession, businesses cut back on employment and unemployment increases. In time of economic expansion, businesses hire people and unemployment decreases.

Structural unemployment results when the demand for labor in a particular area or occupation is lower than the supply of labor in that occupation. Structural unemployment may result from long-run economic adjustments that take place in an industry. For example, there have been many changes in the coal mining industry over the last decade. One of these changes has been increased mechanization of the mining process, which has resulted in a substantial decline in the number of people needed to mine coal. Thus, mining employment has declined substantially over the last ten years. If it were easy for people to change occupations, workers could easily switch from one occupation to another. Similarly, if it were easy for individuals to move, they could move to an area where the demand for that occupation is higher. However, these conditions are not always met. First, a change in occupation may require additional education or training. Secondly, changes in occupation, especially when no additional training is required, may require that individuals accept lower wage rates, which most people are not inclined to do. Moving to a new area requires individuals to incur job search and moving costs. If these costs are considered too high by individuals or if the person thinks there is a possibility they can be re-employed in their current occupation or area, they may choose not to move to a new area.

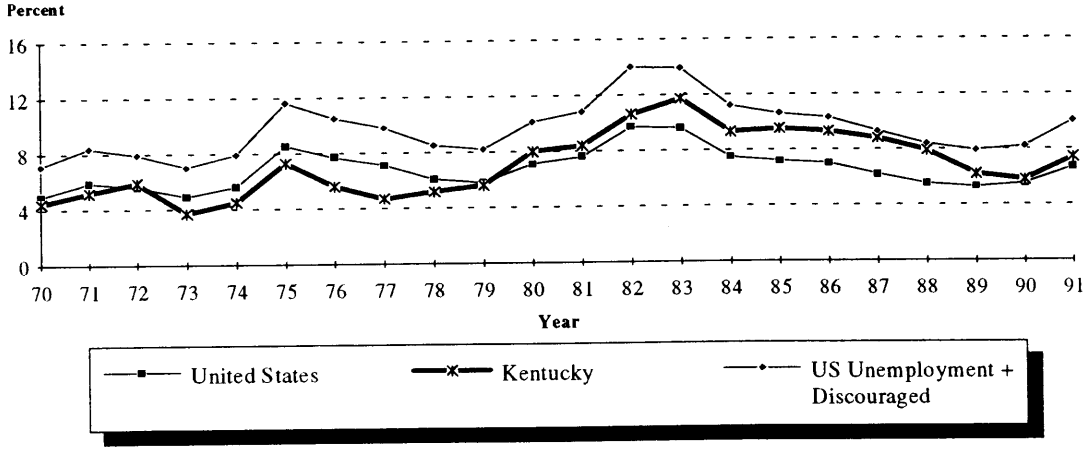
Unemployment Rate: The unemployment rate is defined as the ratio of the number of unemployed to the civilian labor force, multiplied by 100. Since the definition underlying unemployment, as measured by official government statistics includes individuals who looked for work in the last four weeks, frictional and cyclical unemployment are reflected in the official unemployment rates. Therefore, unemployment rates are relatively good measures of cyclical economic activity.

However, unemployment rates are also used to assess long-term economic conditions. Because the definition of unemployment excludes individuals who have not actively looked for work in the last four weeks, especially discouraged workers, the rates

may not capture structural unemployment and therefore may not reflect long-term economic trends.

Figure 4 illustrates trends in unemployment rates of the United States and Kentucky. The BLS publishes national statistics on seven classes of unemployment, termed U1 to U7, which are based on the duration of unemployment and the reasons cited for not being in the labor force.[8] Two of these measures, U5 and U7, are illustrated in Figure 4. The official measure of unemployment based on the criteria of having actively sought a job in the last four weeks is represented by U5. The second measure, U7, represents the official unemployed plus discouraged workers, half of total number of people seeking part-time job, and half of the number of people who are working part-time due to economic reasons. Historically, the broader measure has been about 3% higher than the official unemployment rate. Unfortunately, the U7 data is not available at the state or county level.

Figure 4
Unemployment Rates, 1970-91
Kentucky and United States



Source: Data provided by request from the U.S. Department of Labor, Bureau of Labor Statistics

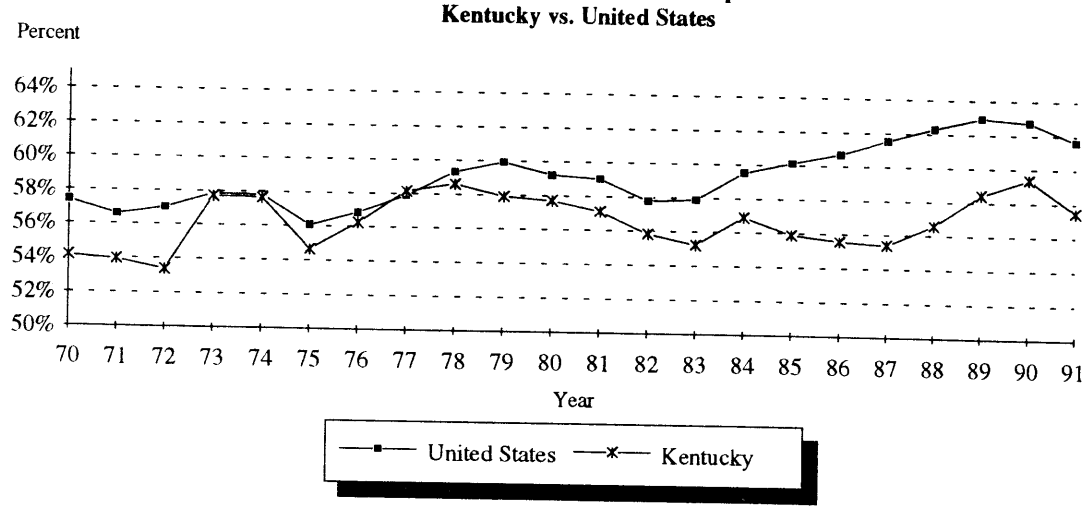
Employment-to-Population Ratios: An alternative measure for evaluating cyclical and long-term economic conditions is the employment-to-population ratio. The employment-to-population ratio is derived by dividing total employment by the working age population. Employment-to-population ratios are not subject to the shifts that occur when people move from the "unemployed" to the "out of the labor force" category.

Trends in employment-to-population ratios for Kentucky and the United States are illustrated in Figure 5. These trends can be compared to the trends in unemployment rates for Kentucky and the United States, to illustrate the differences in these two

[8]Shiskin, Julius, "Employment and Unemployment: The Doughnut or the Hole?" *Monthly Labor Review*, Volume 99, Number 2, February 1976.

measures. Based on the unemployment rates, the Kentucky economy fared better than the United States economy through the 1970's, then fared worse through the 1980's. However, by 1989 the gap between the two measures narrowed substantially. The employment-to-population ratios reflect a somewhat different scenario. During the late 1970's the percent of population employed in Kentucky reflected national shares. However, in 1978 these ratios began to diverge significantly and Kentucky had a much lower percent of working age population employed. Note also that, like unemployment rates, the employment ratios captured cyclical swings in the economy.

Figure 5
Employment/Population Ratio Comparison
Kentucky vs. United States



Source: Unpublished data provided by request from the U. S. Department of Labor, Bureau of Labor Statistics

Surplus Labor Rates: Surplus labor, as defined in KRS 42.4592 (3), means the number of residents who can be classified as unemployed or discouraged. Since data on the number of discouraged workers is not available at the state or county level, the Department for Employment Services of the Kentucky Cabinet for Human Resources is directed to estimate surplus labor using the best practicable method. Surplus labor rates are defined as the percent of potential civilian labor force which is surplus labor. Ideally, this measure would reflect the U7 measures of unemployment reported at the national level. However, the procedures used to estimate labor surplus may result in a much broader measure. These issues will be addressed in Chapter 3. Historical data on surplus labor rates are not available; therefore, trends in this indicator cannot be reviewed.

Chapter Summary

Trends in monthly employment and unemployment are often used to monitor economic conditions at the national, state, and county level. In order to properly interpret the economic trends reflected by these statistics, it is important to understand how they are defined and estimated. The working age population includes anyone over age 16. The labor force is defined as the sum of the employed and unemployed. Employment is defined as the total number of people, over age 16, working for pay, including full and part-time, as well as those people doing at least 15 hours of unpaid work in a family-oriented enterprise. Unemployment is defined as the number of people who currently do not have a job and have actively sought a job within the last four weeks. The rest of the working age population is considered to be not in the labor force. Therefore, individuals who are not employed and have not actively searched for a job in the last four weeks because they think that no jobs are available, or discouraged workers, are not included in the labor force statistics.

There are different procedures used to estimate labor force statistics at the national, state and county level. The Bureau of Labor Statistics develops the concepts, definitions, and technical procedures used to estimate labor force statistics. National labor force statistics are estimated from a household survey, the Current Population Survey. State and county labor force statistics are estimated based on data collected from numerous sources by state employment security agencies. Employment is estimated based on data obtained from surveys of business establishments, which are adjusted by data on commuting patterns reported in the Census of Population. Unemployment is estimated from unemployment insurance claims filed by individuals and national ratios of unemployment for groups that are not covered by unemployment insurance programs.

Labor surplus estimates are developed and calculated by the Department of Employment Services in the Kentucky Cabinet for Human Resources. The estimates are based on two critical assumptions; one, people who worked only 14 to 26 weeks during the year, or many part-time employees, would prefer to work full-time; and two, labor force participation rates in all Kentucky counties should be equal to the national labor force participation rate. However, national evidence indicates that the majority of part-time workers are voluntarily part-time. Secondly, labor force participation rates in Kentucky counties will not be equal to those of the Untied States because of differences in the personal characteristics of the population and differences in economic structure.

Three economic indicators are evaluated in this report: unemployment rates, employment-to-population ratios, and labor surplus rates. Because of the definitions underlying unemployment, unemployment rates are better measures of cyclical economic activity than of long-term economic trends. Employment-to-population ratios may be better measures of long-term economic adjustments. Issues underlying the reliability of labor surplus as an indicator are reviewed in Chapter 3.

CHAPTER III

EVALUATION OF MAJOR ASSUMPTIONS UNDERLYING LABOR SURPLUS ESTIMATES

There are two major assumptions underlying the construction of the labor surplus estimates. First, it is assumed that, if sufficient jobs were available, county labor force participation rates would be equal to the national labor force participation rates. Thus, it is assumed the reason that national and county labor force participation are not equal is because jobs are not available or because people think that jobs are not available (the discouraged worker effect). However, labor markets differ significantly across the United States. A review of the factors underlying labor markets can help to explain why employment patterns in Kentucky may differ from those of other states, or why employment patterns in one Kentucky county may differ from another.[9]

The markets for labor are very similar to the markets for other goods and services. The employers who purchase labor services represent the demand side of the labor market. Employees who sell their labor services represent the supply side of the market. However, in order for these two parties to be able to reach a purchase agreement, they must decide on a price, or wage rate, that they are either willing to pay or willing to accept. In general, the higher the wage rate, the greater the number of people willing to supply their services. Conversely, the higher the wage rate, the fewer the number of people or hours of service a firm is willing to purchase. The supply of and demand for labor depends not only on the number of people living in a labor market area, but on the availability of people with the desired level of skills who are willing to work for wages that prevail in that industry and area.

The level of employment and the terms of employment, such as wages, working conditions, and benefits, are outcomes of the labor market and are determined by the interaction of supply and demand. Labor markets are in equilibrium when, at the prevailing wage, the quantity of labor demanded just equals the quantity of labor supplied. A labor shortage exists when the demand for labor with specific skills and at *offered* wage rates exceeds the supply of labor. In this case, wage rates in the industry would tend to increase compared to wage rates in other industries, in order to attract more people to those occupations. A labor surplus exists when the supply of individuals, with specific skills and at *desired* wage rates, exceeds the demand for labor with those skills and wage rates. In this case, there would be downward pressure on wage rates in the industry, thus discouraging people seeking employment in that industry.

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[9]This review of the theory of labor markets draws heavily from the textbook *Modern Labor Economics*, authored by Ronald G. Ehrenberg and Robert S. Smith.

Labor Demand

Firms evaluate a wide range of issues in deciding how (and where) to allocate their production activities. On the demand side, firms combine inputs, primarily labor and capital, to produce goods or services that they in turn sell.[10] The primary factor affecting the demand for labor is the demand for the goods or services the firm is producing. As long as the relative price of all inputs remains constant, increases in demand for a firm's product will result in increases in demand for labor.

However, a firm's labor demand is also dependent on the nature of the production process. A firm's decision of how to combine inputs in the production process depends on how much of each it can acquire at a given price. Since firms are in business to make a profit, they seek the least cost and most efficient way to combine inputs to make their product. Therefore, production decisions are influenced by all costs that the business faces, including the cost of labor, cost of fuel, cost of equipment and the cost of delivering its product to market. If the cost of one of these factors increases, a firm will either attempt to pass on the higher costs in the form of higher product prices, or it will attempt to offset the higher price of one input by substituting a lower cost input in the production process. The choice often depends on the relative market power of the firm and how sensitive demand for the product is to changes in product price. In most cases, individual firms will try to offset increases in cost of one input by substituting another input. For example, if wage rates double a firm may find it cheaper to invest in a new technology that mechanizes the production process, thereby reducing the amount of labor, and labor costs, required to produce the product.

The demand for labor in an area will depend on the type of economic activity in the area. The demand for labor varies by industry because some industries are more labor intensive than others. Secondly, some industries tend to be more sensitive to economic fluctuations than others. Therefore, the demand for labor in these industries will be sensitive to economic fluctuations. For example, durable goods manufacturing products, such as televisions or dishwashers, are very sensitive to recessionary contractions in demand. However, the demand for medical services is not sensitive to economic fluctuations. Finally, long run shifts in consumption patterns result in changes in the demand for products of different industries. These shifts in demand for the product will in turn result in changes in demand for labor in these industries.

The demand side of the labor market is often the primary focus of policy makers and public officials. In fact, most economic development agencies focus their efforts on industrial recruitment or business development. By stimulating the level of economic activity, it is assumed that jobs will be created and previously unemployed workers will become employed.

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[10] Capital is broadly defined as machinery, equipment, and structures.

Labor Supply

On the supply side, individuals decide if they want to enter the labor market. If they decide to seek employment, they also decide what type of work they want to do.

Allocation of Time: The decision to work is basically a decision of how one chooses to allocate time. An individual may spend time enjoying leisure activities, working in non-paying activities, or working for pay. Working for pay reduces time allocated to the other activities.

Most people prefer to have leisure time in their day. Whether this leisure is spent reading a book or going to a ball game, it is an activity that has an intrinsic monetary value to individuals. The value of one's leisure time may be approximated by the wage rate an individual could earn in the marketplace and is referred to as opportunity cost.

Working in non-paying activities typically involves "household production" and entails the production of goods and services for household consumption. Examples of household production include growing one's own food and preparing meals, remodeling a home or caring for children. If the individual does not produce these goods or perform these services, they would have to be purchased or foregone. Therefore, the value of these household services to individuals is either what they would have to spend on alternatives, such as the cost of eating in restaurants, or what it would cost to have someone else do a job, such as the cost of remodeling a home. Whether one would choose to purchase the service rather than do it oneself would also depend on the wage rates that could be earned if working for pay, the time it takes to perform the service, the cost of the service if purchased from someone else, the individual's wealth, and personal preferences.

In deciding to work for pay, an individual intuitively compares the income that could be earned outside the home and their work preferences to the value of their household production activities and leisure time. If the expected earnings exceed the implicit earnings from household production and the value of leisure, one will choose to enter the labor force. Therefore, the decision to work depends on a comparison of the benefits and costs associated with working.

Wealth and Non-Wage Income: Wealth and non-wage income will affect the labor force participation of an individual. Wealth may include financial holdings, such as stocks and bonds, or physical property, such as ownership of a house. One way to measure wealth is by the income that is (or can be) earned from it. If individuals receive enough non-wage income to meet living expenses and satisfy their consumption preferences, the number of hours working for pay will decline, while the number of hours spent in leisure activities will increase. For example, a lottery winner may choose to spend time in leisure activities, such as travel, rather than seek employment.

Various federal and state income supplement and payment-in-kind programs provide non-wage income which can be used to meet basic living expenses. These include social security payments, unemployment insurance payments, worker's

compensation payments, and the Aid to Families with Dependent Children payments. It is argued that these programs provide dis-incentives to work for pay because they provide individuals with enough income so that it is more advantageous for them to perform their non-wage activities of household production and enjoy leisure rather than enter the labor force. Whether this is the case will depend on whether this income exceeds what could be earned in the labor force, meets one's living expenses and consumption preferences and satisfies work preferences.

Wage Rates, Education, and Occupational Choice: Wages play an important part in the choice of an occupation. People with similar preferences will be attracted to occupations that pay higher wages. Similarly, once an occupation is chosen, a person debating between accepting an offer from two different companies with similar working environments and benefits would rationally choose the one that pays the highest wage.

Occupational choices are also affected by the level of education or skill level required to perform the activities. An individual's skills are considered productive assets. Therefore, education is considered an investment in human capital. Whenever people make educational investments they are incurring some initial cost, such as the cost of tuition for vocational training, with the expectation that they will recoup the education costs in the future through either higher earnings or greater job satisfaction. Education and training will enable a worker to qualify for jobs in occupations that may be associated with higher expected wage rates or job satisfaction.

Alternatively, experience or training may enable a person to accomplish a particular task in a much shorter time, which increases their productivity. As a worker's productivity increases, their work becomes more valuable to an employer. Increases in productivity will increase the minimum wage rate a worker is willing to accept and the maximum wage rate an employer is willing to pay.

Another work-related decision individuals must make is how many hours and what hours they want to work. The hours worked are typically a demand side components in that employers have labor requirements related to the production process. Individuals are able to choose the hours of work by their choice of occupation. For example, a car salesperson may work full-time, but may typically work many nights and weekends. An accountant will typically work "regular" business hours on weekdays. A sales clerk may be able to work part-time and have more flexibility in scheduling work time around other household and leisure activities.

Reservation Wages and Work-Related Costs: Individuals also consider the value of work-related costs to determine the lowest wage they are willing to accept, or a "reservation wage". If a job can be obtained at or above the reservation wage, one may enter the labor force. There are many costs that may be incurred by individuals if they decide to enter the labor force. These include fixed costs of holding down a job, education and training costs, search costs, and mobility costs. If the expected future value of earnings from working exceeds these costs, individuals may choose to enter the workforce.

Two types of fixed costs associated with working include the cost of commuting to work and the cost of child care. Commuting to work will entail monetary costs in the form of gasoline purchases and car maintenance, and time cost, which is the time it takes to travel to and from work. Similarly, if the worker has children, child care expenses, which include both monetary costs of the child care and travel cost, may be incurred.[11] If the earnings from employment will not cover these fixed costs an individual may choose not to enter the labor force.

Search costs are incurred by individuals seeking employment. Examples of search costs include the cost of registering with an employment agency or subscribing to newspapers. Search costs are affected by one's chosen occupation and the area in which one seeks employment. For example, if one is employed in a market where buyers and sellers search nationally for each other, such as doctors or college professors, positions will be advertised nationally through professional organizations and networks. Therefore, information on employment opportunities in various geographic areas will entail relatively lower search costs. Alternatively, if one is employed in a market where buyers and sellers search locally for each other, such as retail clerks and auto mechanics, information on employment opportunities in other geographic areas will be harder to obtain.

An individual's ability to seek and obtain employment in a variety of geographic areas is called worker mobility. Worker mobility requires that relocation costs be incurred in order to increase future earnings. The costs of mobility include both the monetary costs of moving and psychological costs associated with leaving a familiar environment. The potential benefits of relocation will depend on the income one can earn in the new location compared to that earned in the current location. If the potential earnings are relatively low in one area compared to another and search and mobility costs are not prohibitively expensive, people will tend to relocate. However, studies have found that "while those workers in the poorest places have the greatest incentives to move, the very poorest areas also tend to have people with lower levels of wealth, education and skills - the very people who seem least willing (or able) to move."[12]

As the previous statement indicates, mobility will also be affected by the personal characteristics of individuals. Studies have shown that the most mobile individuals are those with more years of formal education, especially college graduates, and younger individuals. College graduates seeking employment in national markets may have relatively low search costs. Older individuals tend to have stronger psychological ties to their community than younger individuals and have fewer years over which to recoup their migration costs, thereby decreasing their mobility.

In summary, the supply of labor and labor force participation depends on a variety of factors. The prime motivation to work for pay is to receive the income earned from that work. The wage rates that prevail in an area will influence the decision to enter

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[11] This is one reason employers are beginning to offer on-site child care facilities to their employees. By doing so, they are able to reduce the worker's costs of employment and therefore may either have less pressure to increase wage rates or be able to reduce employee turnover.

[12] Ehrenberg, Ronald G., and Robert S. Smith. *Modern Labor Economics*, 4th Edition, HarperCollins Publishers Inc., 1991, p. 365.

the labor force. If someone can expect to earn a wage that is high enough to offset the fixed costs of working and the costs of household productive activities, then he may decide to enter the labor force. Conversely, there are a variety of reasons why an individual may not be in the labor force. He may choose not to work because he has family or household responsibilities which prevent him from working, he may have non-wage income sufficient to satisfy his lifestyle preferences, he may lack the occupational skills that are demanded by employers and choose not to obtain them, or he may not be able to obtain a job which pays the wage he expects or which is required to cover work-related costs.

Discouraged Workers

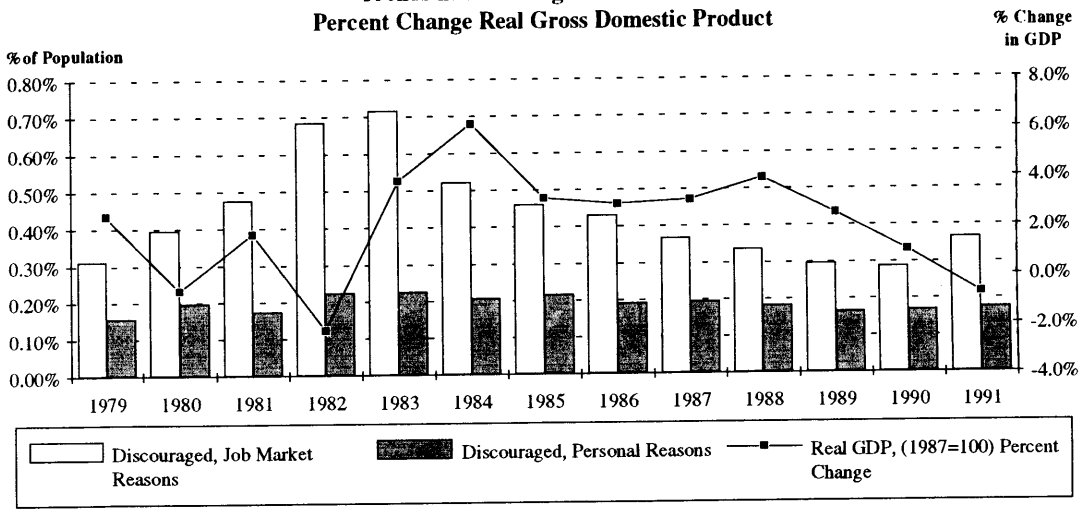
The concept of discouraged workers was introduced in Chapter 2. Theoretically, the discouraged worker effect results when individuals drop out of the labor market because they believe that no jobs are available. Conversely, individuals are expected to re-enter the labor market as employment opportunities increase. However, the extent of the discouraged worker effect is the subject of much debate among labor market analysts. The discouraged workers controversy basically arises from two opposing ideas. Some believe that in order to get a true picture of the employment situation in an area, discouraged workers should be included in the unemployment statistics. Others argue that since individuals classified as discouraged workers have not actively sought employment, they are not really interested in obtaining a job (or are weakly attached to the labor force) and should not be counted a part of the nation's workforce. The debate is further exacerbated by the procedures used to estimate discouraged workers. Discouraged workers are estimated from the Current Population Survey. Interviewers ask questions regarding current work status, desire to work, and why the interviewee is not currently working. Many feel that people are not inclined to admit that they really don't want a job, or that an individual may want a job that pays $10 an hour, but would not be interested in a job that pays $5 an hour. As the previous review of labor markets illustrated, the wage rate one could receive is a primary factor affecting the decision to enter the labor force.

As mentioned in Chapter 1, there have been two major national reviews of labor force statistics. As a result of recommendations made by the Gordon Commission, for the first time discouraged workers were defined and counted at the national level from the Current Population Survey (CPS). However, they were excluded from the definition of the civilian labor force. The Levitan Commission also recommended several changes in the measurement of discouraged workers. The categorization of discouraged workers was deemed to be too subjective. Therefore, it was recommended that the CPS questionnaire be revised to increase the validity of voluntary responses. Secondly, it was recommended that the definition of discouraged workers be made more precise by including only those people who report not being in the labor force for job market reasons and have actively looked for work in the last six months. Thirdly, it was recommended that the frequency of estimating discouraged workers be increased from quarterly to monthly. However, after much debate the Levitan Commission voted 5 to 4 to advise that discouraged workers remain in the Not in the Labor Force category.

The recommendations of the Levitan Commission have not yet been adopted by the Bureau of Labor Statistics (BLS). However, the BLS and the Census Bureau are currently revising the CPS survey to refine the classification of discouraged workers. Beginning in 1994, in order for individuals to be included in the discouraged worker category, they must have looked for work within the last 12 months.[13]

Discouraged workers are classified under two categories: those discouraged due to job markets reasons and those discouraged due to personal reasons. Job market reasons include one's conclusion that no work is available or one's failure to find a job in a previous search. Personal reasons include lack of education or training, and age, race or sex discrimination. Figure 6 illustrates trends in discouraged workers and economic cycles, as reflected by percent change in real Gross Domestic Product (GDP) from 1979 to 1991.

Figure 6
Trends in Discouraged Workers and Percent Change Real Gross Domestic Product



Source: *Handbook of Labor Statistics,* U.S. Department of Labor, Bureau of Labor Statistics, August 1989. *Employment and Earnings,* U. S. Department of Labor, Bureau of Labor Statistics 1990-1992, *Business Statistics,* U. S. Department of Commerce, Bureau of Economic Analysis, June 1992.

A review of these trends indicates that there are significant differences between the categories of discouraged workers. The number of individuals discouraged due to job markets factors increased in the recessions of 1981 and 1991 and decreased in the years of economic expansion, from 1984 to 1990, while the number discouraged due to personal reasons remained relatively constant throughout the time period.

[13] Jennifer M. Rothgeb and Sharon R. Cohany, 1992.

Research on Discouraged Workers at the National Level

In a 1989 analysis, Cullison addressed the discouraged worker issue by evaluating how changes in economic conditions, as measured by the percent change in GNP, affect labor force participation rates. The author concluded that labor force participation rates did not decrease in contractions or increase in times of economic expansion, which the author suggested cast doubt on the extent of the discouraged worker effect on labor force participation. However, trends illustrated in Figure 6 suggest that the number of people who say they are discouraged for job markets reasons does fluctuate with changes in GDP. The differences in the implications are likely due to the approaches used to evaluate trends in discouraged workers. The Cullison analysis evaluated total labor force participation rates, which does not include discouraged workers, while the percent of the population reported as discouraged is presented in Figure 6. The differences between GNP and GDP should not be a factor.

In an earlier study, Finegan (1981) also evaluated the relation between discouraged workers and economic fluctuations, but came to a conclusion that contrasts with Cullison's later one: "Since the federal government began gathering data on discouraged workers in 1967, their level has varied inversely with the level of economic activity".[14] In this study, the discouraged workers were divided into the two categories reported by the BLS: those who are discouraged due to job market reasons and those who are discouraged due to personal reasons. The author analyzed quarterly CPS data in a time series regression analysis for the 1969 to 1979 time period. Unemployment rates were used as the measure of economic activity. When evaluated separately, the group discouraged for job market reasons was very sensitive to cyclical economic activity, while the group discouraged for personal reasons was not. However, the author suggested that discouraged workers should continue to be excluded from the official labor force count, due to the relatively subjective nature of the classification of discouraged workers and in the interest of maintaining reliable and consistent unemployment statistics. He added that if the classification of discouragement could be made more objective, such as the requirement that work had been sought within the past six months, then the reliability of the discouraged worker data would be enhanced.

In *Hidden Unemployment: Discouraged Workers and Public Policy* (1988) Buss and Redburn evaluated several issues, including the demographic characteristics of discouraged workers compared to unemployed workers, the work history of discouraged workers the willingness of discouraged workers to seek and obtain work, and how discouraged workers are meeting living expenses since they have no wage income.

A review of national data indicates that the personal characteristics of discouraged workers differed significantly from those of unemployed workers. Discouraged workers were more likely to be women, especially women in the 25 to 59 age group, whereas the unemployed were more likely to be men. Also, discouraged workers were more likely to be those under 20 years old or over 60 years old and were more likely to be racial minorities than the unemployed were.

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[14] T. Aldrich Finegan, 1981, p. 100.

Data from the 1984 Special Plant Closing Supplement to the CPS was used to analyze work history and sources of income. The authors found that while a large majority of the discouraged workers had some work experience, relatively few were victims of plant closings or layoffs[15]. The largest source of individual income for discouraged workers was retirement payments (Social Security and private pensions); the second largest was payments received under Aid to Families with Dependent Children; third, general relief payments; and fourth, disability payments. However, nearly three-fourths of both discouraged and unemployed received less than $200 per month in individual income. Discouraged workers were more likely than unemployed workers to live with relatives (11.8% compared to 2.1%) and the major source of income to families of discouraged workers were earnings from other household members. It was suggested that this other income allowed discouraged workers to be more selective and less intensive in their employment pursuits compared to the officially unemployed.

In order to test the job preparation and search motivation of discouraged workers, Buss and Redburn analyzed data from two surveys conducted in Youngstown, Ohio: the Local CPS Follow-up Survey and the Discouraged Worker Survey. Survey results indicated that the skill levels of discouraged workers were similar to those of unemployed workers. Both groups tended to have fewer years of formal education and less on the job training than those currently employed. The authors concluded that "Despite the expressed desire of discouraged workers to find jobs, other evidence suggests that many are not highly motivated to work or search for work."[16] Consistent with the conclusions of the Finegan study, the authors found that those discouraged for job market reasons exhibit more interest in obtaining a job than those who are discouraged for personal reasons.

Job search behavior of discouraged workers was evaluated in an earlier analysis by Flaim (1984). Data for two different time periods were analyzed: one of relative economic prosperity, 1976-1977, and one of economic contraction, 1982-1983. In the CPS, households are interviewed in the same month for two consecutive years. Therefore, data may be obtained on an individual's job search behavior in the year following the initial survey. Flaim's analysis indicated that the majority of discouraged workers had not searched for work in the previous year. Therefore, the author concluded that discouraged workers had a weak attachment to the labor force and supported the current practice of not including discouraged workers as part of the labor force.

Research on Discouraged Workers at the Regional Level

Data on discouraged workers is not available at the state or county level. Therefore, researchers interested in trends at the state and county level have attempted to evaluate the discouraged worker effect by conducting surveys or evaluating the relationship between unemployment and labor force participation at the state and county level.

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[15]Terry F. Buss and F. Stevens Redburn, p.54
[16]Ibid. p. 116.

Preissing et. al. (1990) conducted a survey of a 19-county area of rural Eastern Kentucky to evaluate the adequacy of official unemployment statistics in rural areas. Survey respondents were queried on their employment status from 1979 to 1985, a time of rapid industrialization and economic expansion in this region. The definitions of unemployment used in the survey were much broader than those used by the Bureau of Labor Statistics in developing the official statistics. Therefore, the unemployment estimates are not strictly comparable. However, trends in the two measures can be compared. From 1979 to 1985, the official unemployment rates for this region increased despite overall increases in employment. However, based on the broader definition used in the survey, unemployment rates declined during the same period. The authors suggested that individuals who had not been included in the official unemployment estimates, or discouraged workers, entered the labor force as employment opportunities in the region increased, resulting in increases in the official unemployment rates. It was implied that if the official definition of unemployment included discouraged workers, the official rates would have exhibited trends similar to those found in the survey. The authors cited the Levitan Commission finding that the relative share of discouraged workers in areas outside Standard Metropolitan Statistical Areas (SMSA) was higher than in SMSA's and concluded that, due to conceptual and measurement problems, unemployment rates are poor measures of economic welfare in rural areas.

In a state-level analysis Dorsey (1991) examined the relationship between a state's labor force participation and data on unemployment rates, demographic characteristics, economic status and cultural factors. One of the primary objectives of the analysis was to determine why West Virginia had such a low labor force participation rate compared to other states and to examine the relationship between unemployment rates and labor force participation, in order to gauge the discouraged worker effect. If low participation rates are associated with high levels of unemployment, this would support the idea that people are not looking for employment because they believe they cannot find it and would be evidence of the discouraged worker effect. However, a statistically significant relationship was not found. The author concluded that cultural differences that influenced the job search behavior, rather than depressed labor market conditions, were the primary cause of low labor force participation in West Virginia.

An Examination of Labor Force Participation

Over the last forty years, there have been two major trends in labor force participation in the United States. First, women have entered the labor force in increasing numbers. In 1940, only 33.9% of women were in the labor force. By 1990, 56.8% of women were in the labor force. This growth was due mainly to increased participation by women 20 to 54 years old. Secondly, male labor force participation rates have declined over the same time period. In 1950, 86.8% of men over 16 years old were in the labor force. By 1990, this declined to 74.4%. The major source of decline in

the male labor force participation was for men over 55 years old, which has been primarily the result of men retiring at an earlier age.[17]

Labor force participation in Kentucky is low compared to that of other states and the nation as a whole. Table 3 lists 1990 labor force participation rates for Kentucky and the United States. The male labor force participation rate in Kentucky was 70.8%, compared to 74.4% for the U.S. The female labor force participation rate was 51.2% in Kentucky, compared to 56.8% for the nation.

Table 3
Labor Force Participation Rates, 1990

	Total	*Male*	*Female*
United States	65.3%	74.4%	56.8%
Kentucky	60.5%	70.8%	51.2%

Source: 1990 Census of Population, U.S. Bureau of Census via the State Data Center, University of Louisville.

In a study that examined why the percent of the population employed in Kentucky was lower than the national rate, Berger noted that Kentucky educational levels and average wages were low compared to those of other states.[18] Also, Kentucky's economic structure differed from that of the nation, in that a greater proportion of the state's output was produced in the manufacturing sector and a lower proportion was produced in the services sector. A regression analysis was conducted in order to compare the relationship between a state's employment rates and demographic and economic characteristics. Results from this study indicated that the lower level of education was the most important reason why Kentucky's employment rate is lower than those of most other states. Berger also found a strong relationship between the level of economic activity in a state and employment rates.

Labor force participation also varies significantly across Kentucky counties (Table 4). According to the 1990 Census of Population, only 36.7% of the Owsley County population is in the labor force, the lowest in the state. There are also significant differences in the labor force participation rates of men and women across Kentucky counties. Boone County has the highest total labor force participation rate, at 71.1%. Female labor force participation is highest in Franklin County, 63.1%, and lowest in Letcher County, 26.8%. Male labor force participation was highest in Boone County, at 81.1%, and lowest in Owsley County, at 39.4%.

In order to evaluate why labor force participation rates vary across Kentucky, data on the demographic, social and economic characteristics of Kentucky counties was collected. A regression analysis was conducted which compared the relationship between various factors and labor force participation. Variables included in the analysis

[17]Ehrenberg and Smith, 1990, and Cullison, 1989.
[18]Berger, 1990.

Table 4
Labor Force Participation Rates

County	Total	Rank	Female	Rank	Male	Rank
Adair	58.1%	70	50.9%	81	65.8%	52
Allen	58.9%	76	50.2%	76	68.6%	72
Anderson	69.3%	118	59.5%	115	80.1%	117
Ballard	58.2%	71	48.7%	65	68.6%	71
Barren	58.6%	74	48.6%	64	70.0%	76
Bath	55.5%	54	47.6%	58	64.0%	40
Bell	44.2%	14	34.2%	13	55.6%	13
Boone	71.1%	120	61.8%	119	81.4%	120
Bourbon	63.5%	100	53.9%	97	74.2%	103
Boyd	53.7%	41	42.5%	31	66.0%	53
Boyle	59.8%	83	53.9%	96	66.1%	56
Bracken	55.1%	48	44.1%	41	67.2%	61
Breathitt	44.1%	13	33.7%	10	55.4%	12
Breckinridge	55.4%	51	43.1%	34	68.0%	66
Bullitt	68.6%	114	59.0%	112	78.6%	116
Butler	56.7%	61	45.7%	50	68.3%	69
Caldwell	56.3%	59	47.5%	57	66.4%	57
Calloway	58.3%	72	52.1%	90	65.2%	48
Campbell	65.9%	108	57.6%	108	75.4%	110
Carlisle	57.8%	65	46.9%	56	70.1%	77
Carroll	60.7%	88	50.3%	78	71.9%	88
Carter	52.2%	31	41.2%	25	64.0%	39
Casey	54.9%	47	45.2%	49	65.4%	49
Christian	46.0%	20	51.0%	83	41.9%	2
Clark	62.5%	95	53.1%	93	73.0%	98
Clay	42.4%	6	34.4%	14	50.8%	5
Clinton	52.7%	33	44.3%	43	62.1%	33
Crittenden	53.4%	39	44.5%	44	63.1%	37
Cumberland	54.6%	46	48.6%	63	61.5%	31
Daviess	63.8%	103	54.1%	98	74.9%	105
Edmonson	51.9%	30	43.5%	35	60.8%	27
Elliott	45.7%	19	30.8%	8	60.8%	25
Estill	50.6%	26	39.1%	24	63.6%	38
Fayette	68.8%	116	61.5%	117	77.0%	113
Fleming	59.8%	81	49.1%	69	71.4%	85
Floyd	44.9%	15	34.8%	16	55.9%	14
Franklin	68.6%	115	63.0%	120	74.9%	108
Fulton	50.1%	25	39.0%	23	64.5%	41
Gallatin	63.2%	97	55.3%	101	71.5%	86
Garrard	59.5%	80	49.0%	68	70.9%	81
Grant	62.3%	93	51.2%	84	74.1%	102
Graves	55.7%	55	44.7%	45	68.0%	67
Grayson	55.3%	50	45.9%	52	65.4%	50
Green	60.4%	86	53.5%	95	68.0%	68
Greenup	54.4%	44	42.6%	32	67.3%	63
Hancock	59.2%	78	46.2%	55	72.5%	94
Hardin	51.2%	29	53.2%	94	49.4%	4
Harlan	42.3%	5	28.5%	4	57.7%	18
Harrison	59.8%	82	49.9%	74	70.5%	80
Hart	56.3%	58	44.0%	40	70.0%	75
Henderson	65.2%	106	55.3%	102	76.4%	111
Henry	62.7%	96	54.4%	99	71.6%	87
Hickman	53.7%	42	44.2%	42	64.8%	42
Hopkins	58.0%	67	48.0%	62	69.3%	74
Jackson	46.9%	23	36.7%	18	58.0%	20
Jefferson	64.7%	104	57.2%	106	73.6%	100
Jessamine	69.2%	117	59.2%	114	80.3%	118
Johnson	48.5%	24	38.4%	22	59.6%	21
Kenton	68.2%	113	59.2%	113	78.4%	115
Knott	41.6%	2	29.6%	6	54.1%	11
Knox	45.2%	16	37.6%	20	53.8%	9
Larue	57.5%	64	49.5%	70	66.1%	55
Laurel	55.4%	52	46.2%	54	65.2%	47
Lawrence	43.7%	10	28.7%	5	59.7%	22
Lee	43.9%	12	35.7%	17	52.9%	8
Leslie	41.7%	3	27.0%	2	57.2%	17
Letcher	43.5%	9	26.8%	1	61.9%	32
Lewis	53.0%	37	44.0%	39	62.4%	35
Lincoln	57.1%	62	47.9%	61	67.1%	60
Livingston	58.8%	75	45.7%	51	72.7%	95
Logan	62.4%	94	52.1%	91	73.9%	101
Lyon	43.7%	11	44.9%	48	42.7%	3
Madison	63.7%	102	56.6%	105	71.9%	89
Magoffin	43.3%	8	30.7%	7	56.4%	16
Marion	58.0%	68	49.7%	72	66.4%	58
Marshall	55.2%	49	43.9%	38	67.4%	64
Martin	42.3%	4	27.8%	3	58.0%	19
Mason	60.1%	85	49.5%	71	72.1%	91
McCracken	59.4%	79	50.2%	77	70.3%	78
McCreary	42.5%	7	32.9%	9	52.9%	7
McLean	57.2%	63	46.1%	53	69.1%	73
Meade	52.8%	35	49.8%	73	55.9%	15
Menifee	53.3%	38	43.5%	36	63.1%	36
Mercer	63.5%	101	54.9%	100	73.1%	99
Metcalfe	58.4%	73	50.4%	80	67.4%	65
Monroe	58.0%	69	50.2%	75	66.8%	59
Montgomery	60.9%	89	51.6%	86	71.3%	84
Morgan	45.4%	17	38.1%	21	52.5%	6
Muhlenberg	52.9%	36	41.3%	26	65.5%	51
Nelson	64.8%	105	55.7%	104	74.9%	106
Nicholas	61.9%	92	51.9%	89	73.0%	97
Ohio	52.8%	34	41.8%	28	65.0%	45
Oldham	66.4%	110	61.3%	116	71.0%	82
Owen	60.6%	87	51.3%	85	70.4%	79
Owsley	36.7%	1	34.0%	11	39.4%	1
Pendleton	61.7%	91	51.9%	88	72.0%	90
Perry	46.8%	22	34.1%	12	60.6%	24
Pike	46.6%	21	34.6%	15	59.7%	23
Powell	56.2%	57	44.7%	46	68.5%	70
Pulaski	56.1%	56	47.8%	60	65.1%	46
Robertson	54.5%	45	43.7%	37	66.0%	54
Rockcastle	52.3%	32	42.5%	30	62.4%	34
Rowan	55.4%	53	50.4%	79	60.9%	29
Russell	57.9%	66	51.8%	87	64.8%	43
Scott	68.1%	112	58.6%	110	78.4%	114
Shelby	67.3%	111	58.9%	111	76.6%	112
Simpson	65.8%	107	57.5%	107	75.3%	109
Spencer	63.3%	98	52.4%	92	74.4%	104
Taylor	63.3%	99	55.6%	103	72.1%	92
Todd	59.9%	84	48.8%	66	72.4%	93
Trigg	56.6%	60	49.0%	67	64.9%	44
Trimble	59.1%	77	47.7%	59	71.3%	83
Union	53.4%	40	44.8%	47	61.5%	30
Warren	66.2%	109	58.5%	109	74.9%	107
Washington	61.1%	90	50.9%	82	73.0%	96
Wayne	50.9%	27	41.4%	27	60.9%	28
Webster	54.0%	43	42.3%	29	67.3%	62
Whitley	51.1%	28	42.7%	33	60.8%	26
Wolfe	45.5%	18	37.1%	19	54.0%	10
Woodford	70.8%	119	61.5%	118	81.2%	119

Source: State Data Center, University of Louisville

encompass both labor demand and labor supply factors and are summarized in Table 5. Since men and women have very different histories of labor force participation, these relationships are evaluated separately for each gender.

Table 5
Mean Values of Factors Included in
Labor Force Participation Analysis[19]

Labor Market Factors	Mean Value
Total Labor Force Participation Rate	56.26%
Female Labor Force Participation Rate	47.00%
Male Labor Force Participation Rate	66.42%
Total Employment (Thousands)	14.36
Metropolitan Statistical Area	0.17
Unemployment Rate	7.25%
% Employment in Manufacturing	16.19%
% Employment in Farming	15.63%
% Employment in Services	17.69%
% Employment in Trade	14.95%
% Change in Population, 1980 to 1990	
% of Population over 25 that Graduated from High School	56.98%
Family Size	3.08
% of Personal Income from Dividends, Interest, & Rent	13.37%
Commuting Time (in minutes)	22.59
% Population over 65 Years Old	13.60

Labor Demand: Labor demand variables included in the analysis are total employment, whether the county is in an MSA, unemployment rate, measures of economic structure, and the percent population change from 1980 to 1990. Total employment in a county is a measure of the level of economic activity in the county. Higher levels of economic activity should be associated with a greater number of employment opportunities. An associated variable is whether a county is in Metropolitan Statistical Area (MSA). MSAs are characterized by relatively high levels of economic activity concentrated in a geographic area covering several counties. Residents of MSAs may work in another county within their MSA and respond to perceived employment opportunities in the entire MSA. The percent change in population is included as proxy for long-term economic trends in a county. Unemployment rates are another measure of relative economic opportunity. The higher the rate of unemployment, the lower the probability of finding employment. Unemployment rates are also a way to test for the discouraged worker effect. If labor force participation rates are inversely related to

[19]Note that these are the county averages of the variables included in the analysis. The average of counties is not a population-weighted average as the state-wide value is. Therefore, the values of labor force participation reported here are not equal to the values presented in Table 2.

unemployment rates, this would suggest that high unemployment rates discourage people from entering the labor force. Four measures were used in order to control for differences in economic structure. These include the percent of total employment in the manufacturing, farming, services, and retail trade sectors.

Labor Supply: Labor supply variables include educational attainment, non-wage income, family size, commuting time, and the percent of the population over 65 years old. Higher levels of education are assumed to increase skill levels and the wage someone can obtain in the labor market. Counties with a higher percentage of population who have graduated from high school are expected to have higher labor force participation rates. Higher levels of non-wage income, as measured by the percent of personal income from dividends, interest, and rent, may reduce an individual's willingness to enter the labor force.[20] Individuals with larger households may be faced with the responsibilities of caring for children or caring for other relatives, such as parents, which may increase the costs associated with working. This may be a more important factor in a woman's decision to work, since these responsibilities have traditionally fallen to women. Longer commuting times will increase work-related costs and may decrease labor force participation.

While the official definition of working age population includes individuals over 65 years old, many people retire at this age. Furthermore, many areas in Kentucky are becoming popular retirement communities. Therefore, a high percentage of retirement age individuals is expected to be associated with lower labor force participation rates.

The regression statistics for male and female labor force participation are summarized in Table 6. The relative importance of the statistically significant variables is illustrated in Figure 7 (female) and Figure 8 (male). The regression coefficients should be interpreted as the relative influence of a particular variable, holding all others constant.

[20] Transfer payments were not included in the analysis because they are not exogenous. That is, do individuals receive transfer payments, such as unemployment insurance benefits or AFDC payments, because they are unemployed, or does the income they receive from these programs enable them to remain out of the labor force? A model was estimated which included Social Security payments received due to a work disability. However, disability payments were highly correlated with education levels, which resulted in multicolinearity problems. Therefore, they were excluded from the analysis.

Table 6
Regression Equation Results of Factors Affecting Male and Female Labor Force Participation in Kentucky Counties

	MALE			FEMALE		
Labor Market Factors	**Regression Coefficient**	**Standard Error**	**Significance**	**Regression Coefficient**	**Standard Error**	**Significance**
Intercept*	4.03	28.10	NS	63.01	17.84	0.0006
Total Employment	-0.00	0.02	NS	0.02	0.01	0.0437
MSA	2.56	1.76	NS	1.11	1.12	NS
Unemployment Rate	-0.62	0.27	0.0237	-0.60	0.17	0.0007
% Employment in Manufacturing	42.85	7.25	0.0001	25.49	4.60	0.0001
% Employment in Farming	28.94	8.29	0.0007	43.17	5.26	0.0001
% Employment in Services	38.91	15.22	0.0121	14.25	9.66	NS
% Employment in Trade	33.73	19.10	0.0805	27.25	12.124	0.0268
% of Population over 25 that Graduated from High School	0.27	0.08	0.0016	0.33	0.05	0.0001
% of Personal Income from Dividends, Interest, & Rent	25.86	28.76	NS	14.128	18.26	NS
Commuting Time (in minutes)	0.57	0.21	0.0087	-0.25	0.14	0.0383
Family Size	3.26	8.39	NS	-10.96	5.33	0.0422
% Population over 65	0.09	0.39	NS	-0.75	0.25	0.0032
% Change in Population from 1980 to 1990	0.11	0.10	NS	0.24	0.07	0.0004

NS = Not Significant

Male Model Statistics:
N = 114
R^2 = .6127
Adjusted R^2 = .5624
F-Value = 12.171

Female Model Statistics:
N = 114
R^2 = .8659
Adjusted R^2 = .8485
F-Value = 49.668

*Intercept is a statistical control value. It represents the influence of other factors affecting labor force participation that are not included in the model.[21]

The model was much better at explaining labor force participation of women than men. Based on the model statistics, the variables included in the analysis of female labor force participation rates "explain" 85% of the variation among Kentucky counties, and eleven of the fourteen variables are statistically significant. The variables included in the analysis of male labor force participation rates "explain" 56% of the variation among Kentucky counties, and seven of the variables are statistically significant.

These results indicate that while there are many similarities between factors that affect male and female labor force participation, there are also many differences. Economic structure variables are important influences on the labor force participation rates of both groups. A high share of total employment in farming is one of the most important influences in the participation of women. This may be due to the direct contribution of women in the farm operation or off-farm employment. Studies indicate many women in farm households work off the farm. The percent of total employment in manufacturing is important for both groups; however, it plays a stronger influence in participation of men.

[21] Younger, pg. 171.

Figure 7
Relative Importance of Factors Affecting
Female Labor Force Participation in Kentucky Counties

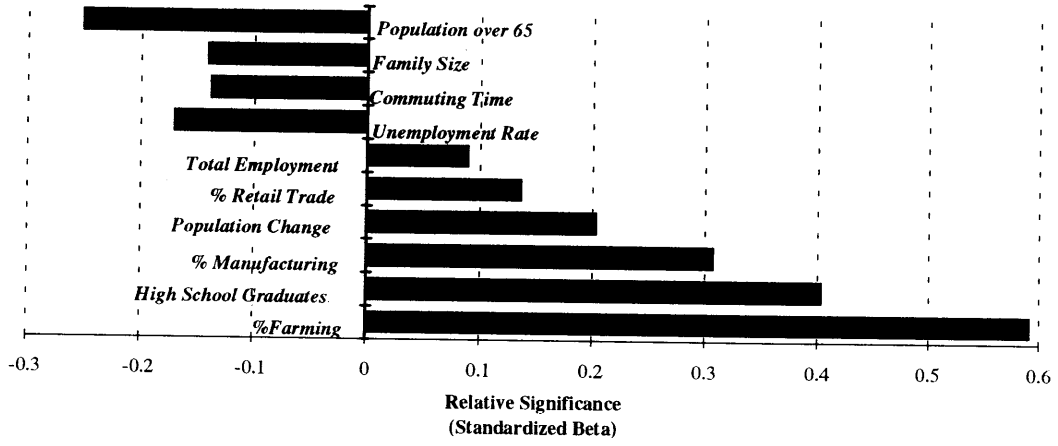
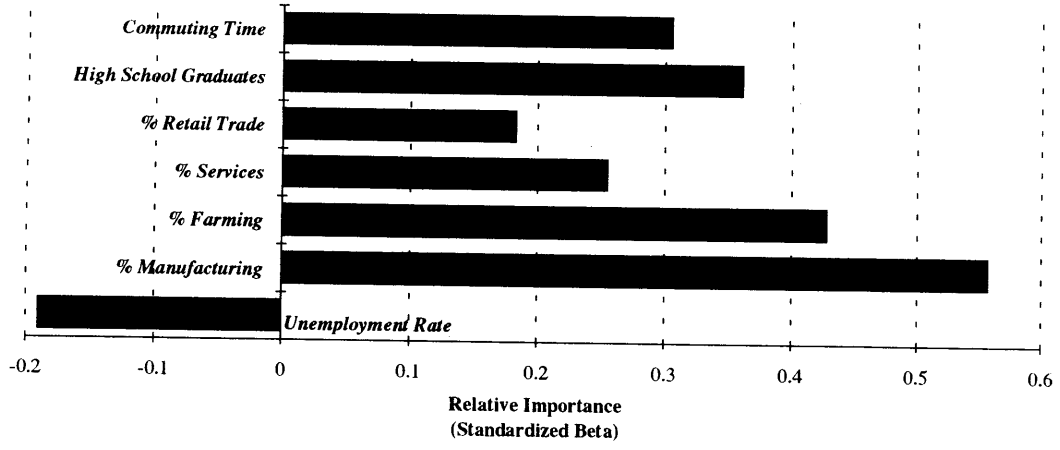


Figure 8
Relative Importance of Factors Affecting
Male Labor Force Particpation in Kentucky Counties



The level of unemployment in a county also has an effect on labor force participation rates for both women and men. The higher the unemployment rate in an area, the lower the labor force participation rate. This suggests the existence of discouraged workers in Kentucky counties. These results contradict Dorsey's findings. Differences in findings between these analyses may be related to the use of aggregate state level data. Most states are comprised of several geographic regions, which have unique economic characteristics. Therefore, labor force participation and socioeconomic characteristics may vary significantly more within a state than between state averages. This variability could be masked by using state level data, thus resulting in aggregation bias.

Education is also a very important factor in explaining the labor force participation rates. Counties which have a higher percentage of high school graduates have higher labor force participation rates. However, education appears to have a stronger influence on labor force participation of women than men.

Commuting time is also a significant factor; however, it affects men and women differently. Longer commuting time is associated with higher rates of male labor force participation and lower rates of female labor force participation. While these results may seem counter-intuitive, they may reflect differences in wage rates. While women have entered the labor force in increasing numbers over the past four decades, wages earned by women remain well below those of men. Since longer commuting time will entail higher costs, it is possible that men are more likely than women to earn wages high enough to cover these cost.

This supposition is supported by the variables representing the level of economic activity in the county of residence. There is a statistically significant positive relationship between the labor force participation rates of women and both total employment and percent change in population. These variables were not statistically significant in the model of male labor force participation rates.

There are other factors that are significant in explaining labor force participation rates of women, but not men. An increase in the percent of the population over 65 years old, holding all other factors constant, results in a decrease in the labor force participation of women. As expected, family size is negatively associated with labor force participation of women.

Implications for Labor Surplus Estimates

The procedures used to estimate labor surplus assume that county labor force participation rates are equal to the national labor force participation rates. However, as the previous analysis illustrates, there are many differences between Kentucky counties which will result in varying levels of labor force participation. These differences include not only variations in the level of economic activity, but also differences in economic structure, levels of educational attainment, and demographic composition of the population. The labor surplus rates do not take these factors into consideration. The data needed to control for these factors are collected only once every ten years in the Census of Population. Therefore, a model of labor force participation that includes these factors cannot be updated annually to provide accurate estimates of labor surplus. While the labor surplus estimates may include individuals who want jobs but think they are not available (discouraged workers), they also include many individuals who do not want to or can not work. Therefore, the use of labor surplus rates as an eligibility criterion may result in a biased allocation of economic development funds.

Chapter Summary

The level of employment in an area is the result of both labor demand and labor supply factors. Labor demand will be influenced by the type of economic activity in an area, the demand for goods and services provided by firms, and the availability of labor as reflected by both skill levels and wage rates. The supply of labor will depend on the wage rates that prevail in an area, non-wage income, skill levels and work-related costs. The interaction of labor supply and labor demand determines the level of employment.

Discouraged workers are individuals who have dropped out of the labor force because they believe that no jobs are available. Data on discouraged workers is collected at the national level and reported under two categories: those discouraged due to job markets reasons and those discouraged due to personal reasons. Research at the national level has generally found that the number discouraged due to job market reasons increases during economic downturns and decreases during periods of economic growth. However, studies have also found that discouraged workers are not highly motivated to search for employment. Because of this, they continue to be excluded from the labor force statistics.

Labor force participation rates vary significantly across Kentucky counties. In Owsley County 36.7% of the population over 16 is in the labor force, the lowest rate in the state. Boone County has the highest labor force participation rate, at 71.1%. A regression analysis was conducted to evaluate the relative effects of labor supply and demand factors in determining labor force participation rates of men and women in Kentucky Counties.

There are many similarities in the factors that affect labor force participation for men and women. Increases in unemployment rates are associated with decreases in labor force participation. Also, labor force participation is higher in counties that have a larger share of population that graduated from high school.

There were also significant differences between factors affecting male and female labor force participation. Increases in commuting time are associated with increases in male labor force participation and decreases in female labor force participation. Labor force participation rates of women are more responsive than those of men to increases in total economic activity in the county that they live in. Finally, increases in family size decrease the labor force participation of women.

A wide variety of factors affect labor force participation and these factors differ across the counties. Therefore, the assumptions used to develop labor surplus estimates are overly optimistic.

CHAPTER IV

ASSESSMENT OF THREE INDICATORS OF COUNTY EMPLOYMENT

It has been proposed that in addition to unemployment rates, labor surplus rates also be used as a criterion in the allocation of state funds. A basic assumption underlying the proposed use of labor surplus is that the official unemployment statistics are inaccurate in many counties. There are two questions regarding the use of unemployment estimates as a criterion: one, the accuracy of the estimated number of unemployed persons; and two, the ability of the unemployment rates to consistently and accurately rank counties.

Accuracy of County Unemployment Estimates

There has been continuing controversy regarding the measurement and concept of unemployed workers. One criticism questions whether the procedures used result in an accurate count of the number of unemployed as defined by Bureau of Labor Statistics (BLS). The second criticism questions whether discouraged workers should be included in the unemployed category. These two issues are intertwined in perceptions of the accuracy of unemployment estimates.

There are few options in evaluating whether the official unemployment rates are indeed accurate. One way to evaluate this issue would be to conduct a comprehensive household survey, replicating the Current Population Survey (CPS), in all Kentucky counties. However, this would be very expensive and is currently not feasible. An alternative is to evaluate the labor force data from the long-form survey from the 1990 Census of Population. In the long survey, individuals were queried as to their employment status. Questions were formatted so that they were similar to those of the CPS. The county unemployment data from the Census can be compared to the official unemployment estimates from the BLS.

Table 7 lists the county unemployment rates and rankings derived from both sources. For the United States as a whole, there is a difference of only 0.8 of a percentage point. For Kentucky, the Census estimate is 1.6 percentage points higher than the BLS estimate. There are substantial differences between the BLS and Census estimates in some counties, which are illustrated in Figure 9. The Census estimates were higher in many counties, especially those in southeast Kentucky. The greatest difference is in Owsley County, where the BLS estimate was 8.5%, compared to the Census estimate of 17.2%. The second largest difference was in Lawrence County, where the BLS estimate is 9.7%, compared to the Census estimate of 16.9%.

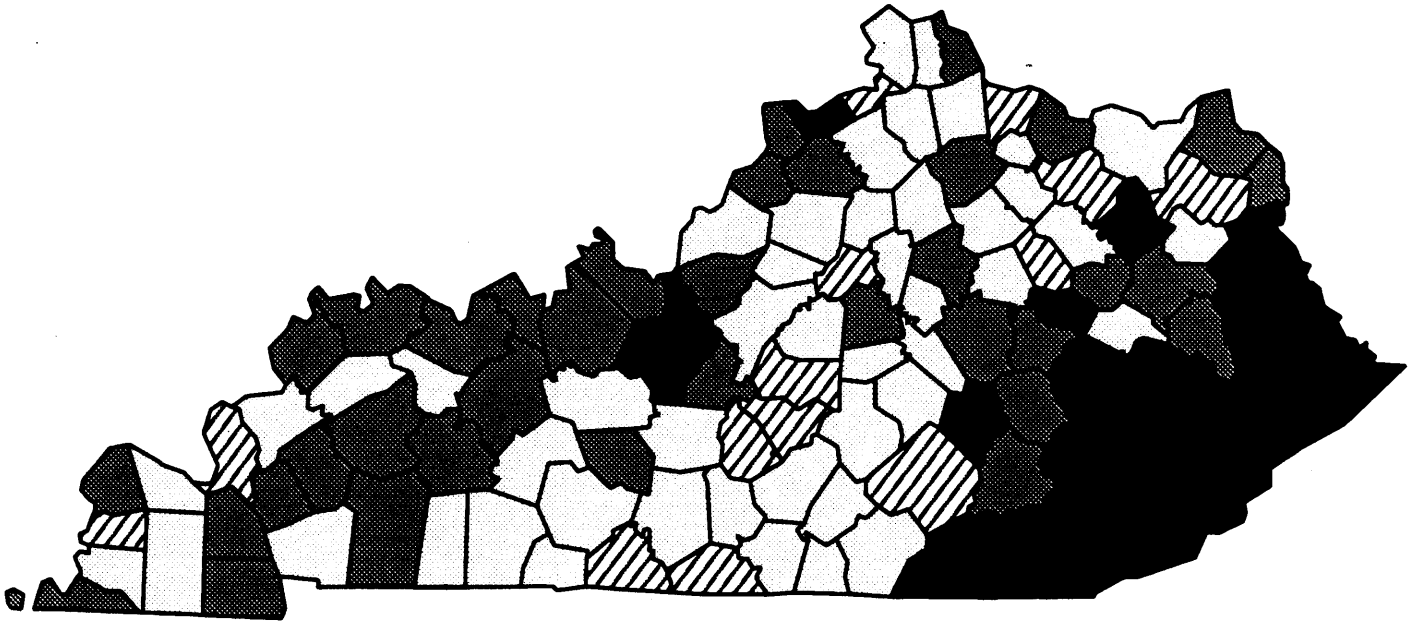
The Census estimates were lower than the BLS estimates in other counties. In Allen County, the BLS estimated unemployment rate was 13.1%, compared to the

Table 7
Comparison of County Unemployment Rates
BLS Versus Census

County	BLS Unemployment	Rank	Census Unemployment	Rank	Difference	Rank
Adair	6.4%	71	5.7%	100	0.7%	104
Allen	13.1%	6	9.5%	45	3.6%	120
Anderson	6.1%	80	4.0%	116	2.1%	115
Ballard	9.0%	25	11.3%	32	-2.3%	37
Barren	6.3%	73	7.0%	74	-0.7%	72
Bath	9.9%	14	9.6%	42	0.3%	97
Bell	9.1%	24	14.0%	14	-4.9%	20
Boone	3.4%	115	3.6%	118	-0.2%	81
Bourbon	5.6%	92	6.4%	89	-0.8%	70
Boyd	5.8%	88	7.8%	64	-2.0%	40
Boyle	6.1%	78	6.9%	77	-0.8%	64
Bracken	7.9%	40	6.6%	82	1.3%	109
Breathitt	9.1%	23	15.1%	9	-6.0%	13
Breckinridge	7.2%	54	9.9%	37	-2.7%	32
Bullitt	5.0%	106	6.4%	88	-1.4%	50
Butler	6.6%	68	6.3%	91	0.3%	99
Caldwell	8.5%	32	10.0%	36	-1.5%	47
Calloway	4.3%	109	7.5%	66	-3.2%	27
Campbell	3.8%	112	5.2%	103	-1.4%	51
Carlisle	9.9%	16	7.5%	68	2.4%	118
Carroll	4.8%	108	9.3%	47	-4.5%	23
Carter	13.5%	5	11.6%	30	1.9%	114
Casey	7.7%	45	7.5%	70	0.2%	95
Christian	6.8%	63	9.8%	38	-3.0%	30
Clark	6.7%	67	6.7%	81	0.0%	86
Clay	8.2%	36	14.2%	11	-6.0%	12
Clinton	10.0%	12	9.6%	41	0.4%	101
Crittenden	8.1%	39	8.0%	60	0.1%	91
Cumberland	7.4%	49	8.3%	56	-0.9%	60
Daviess	5.5%	95	6.9%	78	-1.4%	49
Edmonson	8.8%	27	10.8%	34	-2.0%	42
Elliott	17.3%	1	17.6%	3	-0.3%	79
Estill	12.2%	7	13.7%	17	-1.5%	46
Fayette	3.2%	117	4.6%	108	-1.4%	48
Fleming	7.6%	48	6.6%	86	1.0%	107
Floyd	6.9%	62	12.6%	20	-5.7%	15
Franklin	4.1%	111	4.4%	111	-0.3%	80
Fulton	8.6%	30	9.8%	39	-1.2%	53
Gallatin	6.0%	82	4.4%	112	1.6%	113
Garrard	7.3%	50	7.9%	63	-0.6%	73
Grant	5.0%	107	4.9%	106	0.1%	92
Graves	9.3%	20	8.9%	50	0.4%	102
Grayson	8.7%	28	8.8%	51	-0.1%	84
Green	6.1%	79	4.7%	107	1.4%	112
Greenup	6.0%	81	8.1%	58	-2.1%	39
Hancock	9.4%	19	11.8%	28	-2.4%	34
Hardin	5.0%	105	9.6%	40	-4.6%	22
Harlan	7.6%	46	14.1%	12	-6.5%	5
Harrison	5.4%	96	6.5%	87	-1.1%	57
Hart	7.6%	47	8.4%	55	-0.8%	67
Henderson	6.1%	77	7.3%	71	-1.2%	52
Henry	5.1%	101	6.3%	92	-1.2%	55
Hickman	6.2%	75	6.6%	83	-0.4%	75
Hopkins	6.4%	69	9.3%	46	-2.9%	31
Jackson	10.4%	10	12.4%	24	-2.0%	41
Jefferson	5.2%	97	6.1%	95	-0.9%	61
Jessamine	3.5%	114	4.3%	113	-0.8%	69
Johnson	7.1%	56	12.0%	27	-4.9%	19
Kenton	3.6%	113	4.4%	110	-0.8%	66
Knott	8.6%	29	15.5%	7	-6.9%	4
Kentucky	*5.8%*		*7.4%*		*1.6%*	

County	BLS Unemployment	Rank	Census Unemployment	Rank	Difference	Rank
Knox	7.0%	59	12.7%	19	-5.7%	16
Larue	6.7%	64	7.8%	65	-1.1%	58
Laurel	6.3%	72	9.6%	43	-3.3%	26
Lawrence	9.7%	17	16.9%	5	-7.2%	2
Lee	8.3%	34	14.1%	13	-5.8%	14
Leslie	5.7%	90	12.2%	25	-6.5%	6
Letcher	7.7%	44	13.8%	16	-6.1%	9
Lewis	9.9%	15	9.5%	44	0.4%	100
Lincoln	8.5%	33	8.6%	52	-0.1%	85
Livingston	10.1%	11	7.9%	62	2.2%	116
Logan	5.9%	85	6.1%	96	-0.2%	82
Lyon	5.1%	99	8.2%	57	-3.1%	28
Madison	5.1%	100	7.5%	69	-2.4%	35
Magoffin	14.9%	3	18.4%	2	-3.5%	25
Marion	8.2%	38	6.0%	97	2.2%	117
Marshall	7.0%	61	8.5%	54	-1.5%	45
Martin	7.8%	41	13.9%	15	-6.1%	8
Mason	5.1%	102	6.2%	94	-1.1%	56
McCracken	5.1%	103	5.9%	98	-0.8%	68
McCreary	14.1%	4	20.4%	1	-6.3%	7
McLean	9.2%	21	9.1%	49	0.1%	89
Meade	7.8%	42	11.7%	29	-3.9%	24
Menifee	10.9%	9	12.6%	22	-1.7%	44
Mercer	5.8%	89	7.0%	76	-1.2%	54
Metcalfe	5.9%	87	5.7%	101	0.2%	94
Monroe	6.3%	74	4.9%	105	1.4%	111
Montgomery	11.6%	8	8.5%	53	3.1%	119
Morgan	9.9%	13	12.6%	21	-2.7%	33
Muhlenberg	8.8%	26	11.1%	33	-2.3%	38
Nelson	6.4%	70	6.6%	85	-0.2%	83
Nicholas	7.8%	43	7.0%	75	0.8%	106
Ohio	9.7%	18	11.5%	31	-1.8%	43
Oldham	2.8%	120	3.9%	117	-1.1%	59
Owen	5.2%	98	4.9%	104	0.3%	96
Owsley	8.5%	31	17.2%	4	-8.7%	1
Pendleton	5.6%	93	5.5%	102	0.1%	88
Perry	7.2%	52	13.2%	18	-6.0%	10
Pike	7.2%	53	12.6%	23	-5.4%	17
Powell	9.1%	22	15.1%	8	-6.0%	11
Pulaski	8.2%	37	7.2%	73	1.0%	108
Robertson	7.2%	55	7.9%	61	-0.7%	71
Rockcastle	7.0%	60	12.2%	26	-5.2%	18
Rowan	5.9%	83	10.8%	35	-4.9%	21
Russell	5.9%	86	5.9%	99	0.0%	87
Scott	4.3%	110	4.2%	115	0.1%	90
Shelby	3.0%	118	3.3%	119	-0.3%	77
Simpson	6.7%	66	7.2%	72	-0.5%	74
Spencer	5.1%	104	4.5%	109	0.6%	103
Taylor	5.6%	94	4.3%	114	1.3%	110
Todd	5.9%	84	6.7%	80	-0.8%	63
Trigg	7.1%	58	6.3%	90	0.8%	105
Trimble	3.2%	116	6.2%	93	-3.0%	29
Union	5.7%	91	8.0%	59	-2.3%	36
Warren	6.2%	76	6.6%	84	-0.4%	76
Washington	7.1%	57	6.8%	79	0.3%	98
Wayne	8.3%	35	9.2%	48	-0.9%	62
Webster	6.7%	65	7.5%	67	-0.8%	65
Whitley	7.2%	51	14.2%	10	-7.0%	3
Wolfe	15.3%	2	15.6%	6	-0.3%	78
Woodford	3.0%	119	2.8%	120	0.2%	93
United States	*5.5%*		*6.3%*		*0.8%*	

Figure 9
Difference Between BLS Unemployment Rate and Census Reported Unemployment Rate, 1990



Census at least 4% Higher than BLS

Census and BLS within 1%

Census 1% to 4% Higher than BLS

BLS at Least 1% Higher than Census

Census estimate of 9.5%. In Montgomery County, the BLS estimate was 11.6%, compared to the Census estimate of 8.5%.

The definition of unemployment reported in the Census is conceptually like that reported in the CPS. However, the questions were not as numerous or detailed and the employment status is self-reported; therefore, the unemployment reported in the Census may be more subjective than that reported in the CPS. Because of this, the survey results may not equal those that would be obtained by conducting the CPS. However, the 0.8% difference in the national figure indicates relatively good conformity between the two, which lends credence to the reliability of the Census estimates. Also, the Census statistics are based on population counts from the Census, while the BLS statistics are based on inaccurate population estimates.[22] Based on the unemployment rates reported in the Census of Population, it appears that the official unemployment rates may both underestimate and overestimate actual unemployment in many Kentucky counties.

Ranking of Counties

It is often assumed by policy makers that unemployment rates serve as indicators of both the employment situation in a county and the relative economic well-being of counties. This is illustrated by the following statement of legislative intent in the Kentucky Revised Statutes which cover the Rural Economic Development Program: "The General Assembly hereby finds and declares that the general welfare and material well-being of citizens of the Commonwealth, and particularly those residing in qualifying counties, depends on large measure upon the development of industry in the Commonwealth."[23] Under this program, counties qualify based on their unemployment rate over a five-year period.

Typically, state funds are allocated based on how a county compares to the state. Counties which rank below the state qualify, while those that rank above the state do not. Therefore, it is important to examine how closely a ranking of counties based on unemployment rates reflects a ranking based on other measures of economic welfare and how the unemployment rankings compare to the rankings derived from alternative measures of employment situation. Since the BLS unemployment rates are used in allocating moneys, they are used in this analysis. While the surplus labor rates were used in the Local Government Economic Development Fund, another possible measure is the employment-to-population ratio.

Data on economic well-being of individuals at the county level are collected only once every ten years in the Census of Population. Therefore, an analysis of the rankings can only be done for Census years. Examples of data collected include poverty rates, median family income and income from public assistance. Data on the number of people who receive food stamps is also available from the Cabinet for Human Resources (CHR)

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[22]This issue is further explained later in the chapter.
[23]KRS 154.22.0020 (1)

and is included. Table 8 lists employment situation variables and selected measures of economic welfare for 1990.[24]

Problems with the employment estimates are illustrated in these tables. Based on the 1990 population from the Census and the 1990 employment statistics from CHR, Trimble County resident employment was greater than the working age population (i.e. employment-to-population ratio greater than 100%).[25] Possible errors in employment estimates may result from three basic factors. First, the method of estimating employment may be flawed. Second, commuting pattern data used to estimate employment may be inaccurate. Employment by place of residence is estimated from the data on employment by place of work. The process relies on information on commuting patterns which are obtained in the decennial Census of Population, which are released approximately two years after the end of the Census year. Therefore, 1990 county employment reflects the commuting pattern from 1980.

A third factor may be the inaccurate population estimates used to estimate employment. Population estimates are developed by the Bureau of Census and state data affiliates for years between Census years. These population estimates underlie the estimates of employment, unemployment, and surplus labor. When the Census figures were released in 1991 it was discovered that the 1990 population estimates had substantial estimation errors for some counties. Statewide population had been overestimated by 4.39% (Table 9). The error was much more pronounced for counties within Kentucky. The county percentage errors ranged from an underestimation of actual 1990 population in Gallatin County of 7.29% to an overestimation in Floyd County of 20.66%. In general, counties that had the largest overestimation of population were in the eastern part of the state, while those that had the largest underestimation of population were in the western part of the state.[26]

Employment Indicators and Economic Status

Correlation coefficients were evaluated to examine the relationship between employment indicators and economic well-being measures. Correlation coefficients represent the direction, whether positive or negative, and strength of the relationship between two variables. Correlation coefficients range from negative one (-1) to positive one (1). A coefficient close to zero indicates that there is little relationship; a coefficient close to negative one would indicate that there is a relatively strong inverse relationship, and a coefficient close to positive one indicates there is a relatively strong direct relationship. Table 10 lists correlation coefficients of the employment situation variables and the measures of economic welfare.

The unemployment rates are more highly correlated with the economic well-being data than the employment-to-population ratios for all variables except the census

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[24] Table 5 for 1980 and 1970 are presented in Appendix.

[25] The Department of Employment Services is aware of this problem and has been in negotiations with the Bureau of Labor Statistics in an attempt to correct these errors.

[26] The BLS employment data will be revised in 1993 to reflect both the 1990 population counts and the 1990 commuting patterns.

Table 8
Economic Data by County
1990

County	Unemployment Rate**	Labor Surplus Rate	Employment to Population Ratio	Median Family Income	% of Persons Receiving Food Stamps**	Poverty Rate
Adair	6.4	6.4%	65.38	$20,163	12.62	25.1
Allen	13.1	13.2%	54.91	$21,635	12.40	24.6
Anderson	6.1	8.4%	57.48	$31,054	5.04	9.3
Ballard	9.0	30.8%	51.23	$24,773	10.66	18.5
Barren	6.3	10.3%	60.01	$23,507	10.00	21.5
Bath	9.9	12.4%	66.46	$20,026	21.82	27.3
Bell	9.1	43.4%	39.29	$15,840	24.22	36.2
Boone	3.4	3.8%	70.64	$39,000	4.43	7.4
Bourbon	5.6	6.4%	64.34	$26,898	9.64	17.5
Boyd	5.8	26.0%	50.23	$30,241	10.58	16.5
Boyle	6.1	12.8%	56.29	$28,168	8.80	17.1
Bracken	7.9	21.6%	48.65	$24,721	12.25	21.4
Breathitt	9.1	43.0%	38.01	$14,908	36.99	39.5
Breckinridge	7.2	23.6%	52.97	$21,878	17.74	23.2
Bullitt	5.0	14.0%	60.78	$31,658	7.85	10.4
Butler	6.6	6.3%	83.72	$20,781	15.19	23.8
Caldwell	8.5	27.8%	48.44	$24,033	12.02	19.9
Calloway	4.3	4.6%	63.08	$25,012	7.13	17.7
Campbell	3.8	6.0%	63.00	$34,973	6.94	11.0
Carlisle	9.9	31.1%	43.47	$24,039	9.18	17.7
Carroll	4.8	9.0%	67.23	$24,164	19.05	22.0
Carter	13.5	37.4%	43.50	$20,826	20.02	26.8
Casey	7.7	36.7%	44.85	$18,176	15.35	29.4
Christian	6.8	23.7%	35.78	$23,838	10.52	18.1
Clark	6.7	6.6%	64.03	$29,089	10.84	17.7
Clay	8.2	54.3%	29.78	$14,721	40.19	40.2
Clinton	10.0	23.8%	50.70	$14,627	27.07	38.1
Crittenden	8.1	15.8%	48.67	$23,570	11.52	18.7
Cumberland	7.4	10.9%	61.34	$16,084	21.18	31.6
Daviess	5.5	6.2%	64.32	$29,696	9.82	15.4
Edmonson	8.8	29.9%	48.67	$17,295	17.56	27.0
Elliott	17.3	63.3%	25.81	$17,134	31.09	38.0
Estill	12.2	40.9%	38.85	$19,223	25.69	29.0
Fayette	3.2	3.3%	72.22	$35,936	6.70	14.1
Fleming	7.6	15.0%	53.70	$22,564	12.95	25.4
Floyd	6.9	40.2%	45.15	$18,270	21.98	31.2
Franklin	4.1	6.0%	69.28	$32,953	5.93	10.9
Fulton	8.6	20.3%	48.40	$22,592	20.83	30.3
Gallatin	6.0	29.5%	49.93	$25,959	10.68	14.3
Garrard	7.3	21.8%	51.31	$26,250	11.37	18.1
Grant	5.0	5.7%	67.38	$28,490	10.36	15.1
Graves	9.3	12.9%	54.90	$26,198	9.10	16.9
Grayson	8.7	25.2%	54.07	$20,716	14.49	23.8
Green	6.1	14.7%	64.46	$23,079	10.71	21.6
Greenup	6.0	29.6%	48.93	$29,054	9.97	17.6
Hancock	9.4	29.9%	45.04	$30,031	11.02	16.8
Hardin	5.0	5.0%	52.23	$27,220	6.87	13.5
Harlan	7.6	45.5%	40.33	$18,158	24.08	33.1
Harrison	5.4	16.5%	55.73	$26,503	10.44	16.9
Hart	7.6	17.5%	54.36	$19,587	19.66	27.1
Henderson	6.1	6.5%	62.38	$30,231	10.96	14.6
Henry	5.1	8.1%	67.33	$26,590	12.39	19.7
Hickman	6.2	22.2%	55.72	$24,647	13.01	20.1
Hopkins	6.4	19.2%	52.44	$27,089	11.75	17.2
Jackson	10.4	39.0%	43.69	$14,767	31.19	38.2
Jefferson	5.2	5.8%	67.60	$33,226	9.24	13.7
Jessamine	3.5	3.8%	69.46	$30,488	7.25	13.2
Johnson	7.1	38.9%	44.28	$19,114	24.08	28.7
Kenton	3.6	4.2%	66.48	$36,148	6.78	9.9
Knott	8.6	33.5%	35.04	$15,998	31.78	40.4
KY Statewide	**5.8**	**15.8%**	**58.62**	**$27,028**	**12.53**	**19.0**

County	Unemployment Rate**	Labor Surplus Rate	Employment to Population Ratio	Median Family Income	% of Persons Receiving Food Stamps**	Poverty Rate
Knox	7.0	38.5%	42.13	$15,412	33.67	38.9
Larue	6.7	22.4%	54.44	$26,064	11.85	19.9
Laurel	6.3	22.4%	53.34	$20,977	18.46	24.8
Lawrence	9.7	43.9%	39.59	$18,123	28.52	36.0
Lee	8.3	25.6%	48.39	$14,618	34.88	37.4
Leslie	5.7	52.5%	50.38	$16,419	33.18	35.6
Letcher	7.7	44.9%	43.21	$18,229	24.18	31.8
Lewis	9.9	27.3%	55.00	$19,591	18.54	30.7
Lincoln	8.5	25.5%	48.25	$21,239	16.53	27.2
Livingston	10.1	34.8%	42.55	$25,807	9.36	15.5
Logan	5.9	13.3%	63.00	$26,170	10.57	16.1
Lyon	5.1	9.3%	60.59	$24,940	7.10	14.3
McCracken	5.1	11.9%	56.51	$28,476	10.90	15.8
McCreary	14.1	56.3%	30.54	$12,223	42.44	45.5
McLean	9.2	27.3%	51.14	$25,386	9.62	19.2
Madison	5.1	4.3%	59.09	$27,052	10.10	21.2
Magoffin	14.9	53.2%	33.47	$13,955	36.60	42.5
Marion	8.2	10.8%	61.95	$22,656	15.50	25.6
Marshall	7.0	24.9%	52.36	$27,131	8.12	14.1
Martin	7.8	57.5%	31.29	$18,143	30.97	35.4
Mason	5.1	20.2%	58.26	$24,480	12.50	20.3
Meade	7.8	48.0%	40.28	$25,437	7.96	12.8
Menifee	10.9	14.4%	62.39	$16,538	24.84	35.0
Mercer	5.8	12.7%	61.80	$27,792	7.73	16.7
Metcalfe	5.9	23.7%	89.43	$18,543	15.31	27.9
Monroe	6.3	6.6%	69.77	$19,602	15.96	26.9
Montgomery	11.6	26.0%	50.03	$24,542	15.13	21.0
Morgan	9.9	51.5%	37.97	$16,031	30.01	38.8
Muhlenberg	8.8	39.0%	38.97	$22,507	14.67	20.7
Nelson	6.4	7.5%	69.64	$27,216	9.58	15.1
Nicholas	7.8	19.1%	56.00	$22,729	13.92	22.6
Ohio	9.7	44.6%	38.54	$20,965	16.28	23.6
Oldham	2.8	3.5%	67.53	$42,143	3.33	6.3
Owen	5.2	20.4%	57.39	$25,285	14.03	19.5
Owsley	8.5	46.8%	35.21	$11,110	48.03	52.1
Pendleton	5.6	37.0%	45.50	$26,919	11.94	18.9
Perry	7.2	41.6%	44.44	$19,119	26.53	32.1
Pike	7.2	44.3%	42.32	$20,656	16.60	25.4
Powell	9.1	16.0%	61.15	$19,540	24.69	26.2
Pulaski	8.2	17.5%	54.71	$21,792	13.37	22.7
Robertson	7.2	29.4%	49.52	$23,788	14.92	24.8
Rockcastle	7.0	10.5%	70.49	$18,144	22.52	30.7
Rowan	5.9	6.9%	51.93	$19,432	13.76	28.9
Russell	5.9	4.7%	97.60	$20,991	16.15	25.6
Scott	4.3	5.6%	63.33	$31,390	9.30	14.5
Shelby	3.0	3.8%	65.32	$33,376	6.73	14.2
Simpson	6.7	6.2%	63.85	$25,533	8.78	15.5
Spencer	5.1	14.0%	67.13	$26,192	11.19	19.2
Taylor	5.6	7.0%	67.59	$25,912	10.63	19.5
Todd	5.9	9.5%	67.69	$24,324	11.45	18.8
Trigg	7.1	22.8%	46.73	$24,885	9.05	18.0
Trimble	3.2	3.4%	120.88	$27,049	11.53	16.3
Union	5.7	18.7%	44.62	$30,317	9.39	22.1
Warren	6.2	6.0%	67.04	$30,016	8.50	17.5
Washington	7.1	13.4%	61.75	$22,668	10.03	18.8
Wayne	8.3	23.4%	50.81	$15,967	26.48	37.3
Webster	6.7	18.8%	53.49	$25,759	10.08	16.5
Whitley	7.2	40.7%	41.85	$18,021	23.59	33.0
Wolfe	15.3	50.1%	31.44	$12,469	39.14	44.3
Woodford	3.0	2.8%	69.13	$37,167	4.86	7.9
County Avg.	**7.2**		**54.70**	**$23,605**	**16.02**	**23.3**

*Data Sources: *=Census; **=CHR ***=BEA.*

Table 9
County Estimated and Final Population

County	1990 Estimated Population	1990 Actual Population	Number Error	Percent Error
Adair	16,490	15,360	1,130	7.36%
Allen	14,959	14,628	331	2.26%
Anderson	14,859	14,571	288	1.98%
Ballard	8,216	7,902	314	3.97%
Barren	34,662	34,001	661	1.94%
Bath	10,170	9,692	478	4.93%
Bell	34,924	31,506	3,418	10.85%
Boone	56,387	57,589	-1,202	-2.09%
Bourbon	19,815	19,236	579	3.01%
Boyd	52,642	51,150	1,492	2.92%
Boyle	26,264	25,641	623	2.43%
Bracken	7,721	7,766	-45	-0.58%
Breathitt	17,231	15,703	1,528	9.73%
Breckinridge	17,454	16,312	1,142	7.00%
Bullitt	49,537	47,567	1,970	4.14%
Butler	11,148	11,245	-97	-0.86%
Caldwell	13,214	13,232	-18	-0.14%
Calloway	30,035	30,735	-700	-2.28%
Campbell	80,552	83,866	-3,314	-3.95%
Carlisle	5,030	5,238	-208	-3.97%
Carroll	10,145	9,292	853	9.18%
Carter	26,381	24,340	2,041	8.39%
Casey	15,256	14,211	1,045	7.35%
Christian	68,059	68,941	-882	-1.28%
Clark	29,827	29,496	331	1.12%
Clay	25,133	21,746	3,387	15.58%
Clinton	10,392	9,135	1,257	13.76%
Crittenden	8,818	9,196	-378	-4.11%
Cumberland	7,573	6,784	789	11.63%
Daviess	90,350	87,189	3,161	3.63%
Edmonson	10,982	10,357	625	6.03%
Elliott	6,897	6,455	442	6.85%
Estill	15,589	14,614	975	6.67%
Fayette	228,481	225,366	3,115	1.38%
Fleming	12,904	12,292	612	4.98%
Floyd	52,592	43,586	9,006	20.66%
Franklin	44,340	43,781	559	1.28%
Fulton	7,696	8,271	-575	-6.95%
Gallatin	5,000	5,393	-393	-7.29%
Garrard	12,134	11,579	555	4.79%
Grant	14,995	15,737	-742	-4.72%
Graves	32,754	33,550	-796	-2.37%
Grayson	22,941	21,050	1,891	8.98%
Green	10,824	10,371	453	4.37%
Greenup	37,968	36,742	1,226	3.34%
Hancock	8,369	7,864	505	6.42%
Hardin	101,909	89,240	12,669	14.20%
Harlan	42,267	36,574	5,693	15.57%
Harrison	16,561	16,248	313	1.93%
Hart	16,011	14,890	1,121	7.53%
Henderson	43,696	43,044	652	1.51%
Henry	14,038	12,823	1,215	9.48%
Hickman	5,472	5,566	-94	-1.69%
Hopkins	47,873	46,126	1,747	3.79%
Jackson	13,440	11,955	1,485	12.42%
Jefferson	680,213	664,937	15,276	2.30%
Jessamine	30,644	30,508	136	0.45%
Johnson	27,071	23,248	3,823	16.44%
Kenton	141,072	142,031	-959	-0.68%
Knott	19,492	17,906	1,586	8.86%
Knox	31,469	29,676	1,793	6.04%
Larue	12,074	11,679	395	3.38%
Laurel	45,870	43,438	2,432	5.60%
Lawrence	15,753	13,998	1,755	12.54%
Lee	8,246	7,422	824	11.10%
Leslie	15,870	13,642	2,228	16.33%
Letcher	31,199	27,000	4,199	15.55%
Lewis	14,594	13,029	1,565	12.01%
Lincoln	20,001	20,045	-44	-0.22%
Livingston	9,034	9,062	-28	-0.31%
Logan	26,855	24,416	2,439	9.99%
Lyon	6,599	6,624	-25	-0.38%
McCracken	60,132	62,879	-2,747	-4.37%
McCreary	17,861	15,603	2,258	14.47%
McLean	10,101	9,628	473	4.91%
Madison	56,391	57,508	-1,117	-1.94%
Magoffin	15,094	13,077	2,017	15.42%
Marion	17,921	16,499	1,422	8.62%
Marshall	26,683	27,205	-522	-1.92%
Martin	14,914	12,526	2,388	19.06%
Mason	16,943	16,666	277	1.66%
Meade	24,395	24,170	225	0.93%
Menifee	5,456	5,092	364	7.15%
Mercer	20,686	19,148	1,538	8.03%
Metcalfe	10,487	8,963	1,524	17.00%
Monroe	12,490	11,401	1,089	9.55%
Montgomery	21,061	19,561	1,500	7.67%
Morgan	11,951	11,648	303	2.60%
Muhlenberg	32,250	31,318	932	2.98%
Nelson	31,251	29,710	1,541	5.19%
Nicholas	7,424	6,725	699	10.39%
Ohio	21,539	21,105	434	2.06%
Oldham	35,464	33,263	2,201	6.62%
Owen	9,815	9,035	780	8.63%
Owsley	6,005	5,036	969	19.24%
Pendleton	11,276	12,036	-760	-6.31%
Perry	36,482	30,283	6,199	20.47%
Pike	86,158	72,583	13,575	18.70%
Powell	12,773	11,686	1,087	9.30%
Pulaski	51,027	49,489	1,538	3.11%
Robertson	2,179	2,124	55	2.59%
Rockcastle	15,328	14,803	525	3.55%
Rowan	19,383	20,353	-970	-4.77%
Russell	15,294	14,716	578	3.93%
Scott	25,322	23,867	1,455	6.10%
Shelby	25,032	24,824	208	0.84%
Simpson	15,134	15,145	-11	-0.07%
Spencer	6,560	6,801	-241	-3.54%
Taylor	22,248	21,146	1,102	5.21%
Todd	10,403	10,940	-537	-4.91%
Trigg	10,213	10,361	-148	-1.43%
Trimble	6,487	6,090	397	6.52%
Union	17,719	16,557	1,162	7.02%
Warren	88,797	76,673	12,124	15.81%
Washington	10,081	10,441	-360	-3.45%
Wayne	18,432	17,468	964	5.52%
Webster	14,630	13,955	675	4.84%
Whitley	37,783	33,326	4,457	13.37%
Wolfe	7,208	6,503	705	10.84%
Woodford	19,722	19,955	-233	-1.17%
Kentucky	3,847,018	3,685,296	161,722	4.39%

unemployment rates. However, the correlations under the unemployment rates and surplus labor rates are very similar.

Table 10
Correlation Coefficients of Measures of Employment Situation and Measures of Economic Well-Being, 1990

	Unemployment Rate	Employment to Population Ratio	Surplus Labor Rate
Percent of Persons in Poverty (Census)	0.654	-0.544	0.641
Percent of People Receiving Food Stamps (CHR)	.0639	-.0539	0.669
Per Capita Money Income (Census)	-0.697	0.547	-0.678
Per Capita Income (BEA)	-0.662	-0.524	-0.605
Median Household Income (Census)	-0.695	0.534	-0.638
Median Family Income (Census)	-0.696	0.554	-0.663
Unemployment Rate (CHR)	1.000	-0.674	0.706
Unemployment Rate (Census)	0.731	-0.769	0.757

In order to test the ranking performance of the three employment indicators, counties were classified using two criteria, one which represents the employment situation of a county, and a second which represents the economic well-being of a county. In order to qualify as a distressed county, the values had to exceed the state value for both criteria. Because of the consistently high correlations and for ease in presentation, the economic well-being variables were restricted to per person poverty rates, median family income and the percent of population receiving food stamps.[27] Counties were classified for 1970, 1980 and 1990. Results from the rankings for 1990 are summarized in Table 11.

A **Positive** outcome indicates that a county qualified based on both the employment and economic well-being criteria. For example, 62 counties had unemployment rates exceeding the state unemployment rate and poverty rates exceeding the state poverty rate. **False Positives** qualified based on the employment criteria, but not the economic well-being criteria. There were 25 counties that had higher unemployment rates than the state but had lower poverty rates. **False Negative** counties

[27]The choice of economic well-being measures does not affect the results summarized here.

were those which did not qualify based on the employment criterion, but would have qualified based on the economic well-being criterion. There were 9 counties that had unemployment rates lower than the state level and poverty rates higher than the state level. **Negative** counties did not qualify under either criterion; both the employment and well-being criteria exceeded the state level.

Table 11
Employment Situation and Economic Well-Being Classification Outcomes, 1990

	Positive	False Positive	False Negative	Negative
Unemployment Rate				
Percent of Persons in Poverty	62	25	9	24
Median Family Income	77	10	12	21
Percent of Population Receiving Food Stamps	55	32	4	29
Employment Rate				
Percent of Persons in Poverty	53	22	18	27
Median Family Income	65	10	24	21
Percent of Population Receiving Food Stamps	47	28	12	33
Labor Surplus Rate				
Percent of Persons in Poverty	52	17	19	32
Median Family Income	63	6	26	25
Percent of Population Receiving Food Stamps	47	22	12	39

This ranking scheme facilitates the evaluation of several policy issues associated with using any of the proposed employment situation ratios in the allocation of funding. Positive counties can be considered to be economically distressed compared to the state based on either measure. False Negative counties would not qualify for public economic development assistance based on measures of employment distress, in spite of being distressed based on measures of economic welfare. False Positive counties qualify for assistance based on the employment criteria, even when the measures of economic welfare indicate that they are not distressed (compared to the state). Finally, Negative counties appear to be relatively well off under both measures of economic performance.

The unemployment rate criterion resulted in the highest number of "correct" classifications, or Positives and Negatives. The unemployment rates also resulted in fewer False Negatives, or counties which are excluded from participation in state programs even when they are distressed, than either the employment rates or the surplus

labor rates.[28] The surplus labor rates resulted in the lowest number of properly identified distressed counties and the highest number of false exclusions. This suggests that, of the three measures, unemployment rates perform best when identifying counties in distress.

Another categorization which is important in the efficient allocation of funds is the number of counties which would qualify for a program based on the employment criterion but which are not distressed based on the economic welfare measures. Both the unemployment rate and the employment rate performed similarly in this classification. However, once again, the surplus labor rate resulted in significantly more mis-classifications.

Based on these results, it is concluded that the unemployment rate performs better in the accurate ranking of counties than either the employment-to-population ratio or the surplus labor rate. Because of the ease of calculation and ranking performance, the employment ratio would be preferred over surplus labor if a second measure of employment situation is desired.

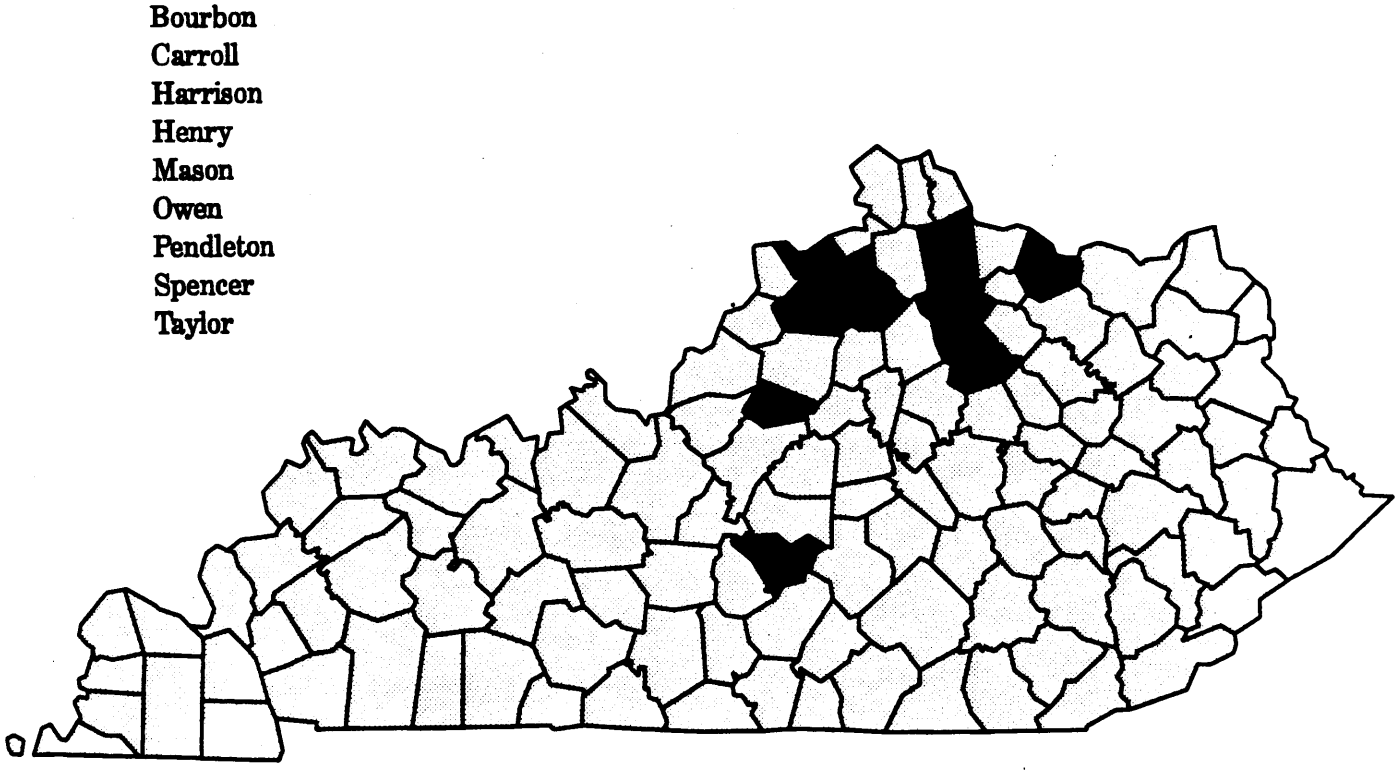
False Exclusion of Distressed Counties

Another issue associated with using unemployment rates to rank counties is the possibility of consistently excluding certain counties from programs when they are distressed (the false negatives). A comparison of county classifications for 1970, 1980, and 1990 indicated that counties were not consistently classified as false negative in all three time periods. However, some counties were consistently classified as false negative in both 1980 and 1990. Based on the unemployment rates and median family income category, nine counties which were identified as false negative in 1990 were also identified as false negative in 1980. Figure 10 illustrates the counties which were identified as false negatives in both 1980 and 1990.

Counties which are consistently excluded have low unemployment rates in spite of being economically distressed. It is possible that differences in economic structure may account for this. For example, individuals may be employed, but in relatively low wage jobs. Data for 1990 was used to compare the economic structures of the different classes of counties. The average share of employment in various economic sectors, unemployment rates, and measures of economic well-being were compared. The mean values of the counties in the False Negative category were compared to the mean values of the counties in the other three categories through an Analysis of Variance (ANOVA) procedure, to test for statistically significant differences between the groups. If the variability among counties within a category is large compared to the variability between categories, the mean values are not considered statistically significant. Table 12 summarizes the mean values for each category and T-Test results.

[28]The table presented includes the figures for 1990. However, the classification conclusions comparing unemployment rates and employment rates held for both 1970 and 1980. Surplus labor estimates were not available for either 1970 or 1980.

Figure 10
False Negative in Both 1980 and 1990
Unemployment Rates and Family Income



Interestingly, the economic structures, as measured by the share of employment in various economic sectors, of the False Negative and Positive counties were not significantly different. However, False Negative counties have a much larger share of employment in the farming sector and a lower share of employment in the trade and service sectors than the Negative counties. Also, False Negative counties have a much larger share of employment in farming than False Positive counties.

The consistent mis-classification of these agricultural counties may be due to factors associated with the methods used to estimate employment and unemployment. The definition of employment includes anyone who works for at least 15 hours a week in a family-oriented enterprise, which is an effort to count the labor of household members in farming. Because of this, agricultural counties have relatively high employment-to-population ratios. Similarly, since agricultural unemployment is estimated from the employment estimates based on national ratios, farming counties may have low unemployment rates due to the estimation procedures.

A comparison of the average values of the measures of economic welfare for the four groups suggests that the counties differ with respect to relative economic well-being. The counties which were identified as distressed by the unemployment rate criterion have the highest average poverty rates, 27.4%, and the lowest average level of family income, $20,382. Conversely, the counties that were not identified as distressed by the unemployment rate criterion have lower rates of poverty and higher average family income than the distressed counties. Therefore, the unemployment criteria appear to be capturing those counties that are the most economically distressed.

Table 12
T-Test Results of Average Values of Measures of Economic Structure and Measures of Economic Well-Being, 1990

Hypothesis = The Means of the variable for the False Negative and either the Negative, Positive, or False Positive classes are equal.

	False Negative (N=12)	Negative (N = 21)	Positive (N = 77)	False Positive (N=10)
Population	*14.52*	85.86**	17.82 (NS)	33.71*
Percent Employment in Farming	*19.95*	8.47*	18.60 (NS)	8.84**
Percent Employment in Manufacturing	*16.90*	14.97 (NS)	15.15 (NS)	24.50 (NS)
Percent Employment in Trade	*16.40*	20.6**	17.1 (NS)	18.41 (NS)
Percent Employment in Services	*16.04*	21.88*	16.42 (NS)	19.62***
Percent Employment in Government	*14.99*	15.62 (NS)	15.7 (NS)	11.02***
Unemployment Rate	*5.22*	4.39*	8.5*	6.64*
Poverty Rate	*20.09*	13.62*	27.42*	15.70**
Family Income	*$24,942*	$32,132*	$20,382*	$28,908*
Per Capita Income	*$12,972*	$16,623*	$11,402*	$14,927*
Census Unemployment Rate	*6.82*	5.58 (NS)	10.29*	7.59 (NS)

(NS) = Not Significant
* Significant at the .01 level
** Significant at the .05 level

Chapter Summary

Unemployment estimates are often used as a criterion in the allocation of government funds. However, there has been a growing perception that unemployment estimates are inaccurate, and therefore result in inequitable allocation of funds. There are two critical questions concerning the use of unemployment as a criterion: the accuracy of the estimated number of unemployed persons and the ability of unemployment rates to consistently and accurately rank counties for the purpose of government assistance.

The perception of the accuracy of unemployment statistics involves two related issues: one the actual estimates of unemployment, and a second the exclusion of discouraged workers from the ranks of the unemployed. Labor force data was collected

in the 1990 Census of Population. A comparison of unemployment rates reported by the Census Bureau to the official statistics reported by BLS suggests that unemployment may be both underestimated and overestimated in many Kentucky counties.

At the state level, allocations of government funds for economic development programs are based on unemployment rates, not the actual number of the unemployed. For example, counties that have unemployment rates above the state rates for the previous five-year period are eligible to participate in the Kentucky Rural Economic Development Program. Therefore, a second issue associated with unemployment rates is how accurately they identify distressed counties. Data on the employment situation and economic welfare were analyzed to evaluate this issue. Rankings derived from unemployment rates were compared to rankings derived from surplus labor rates and employment-to-population ratios. Unemployment rates were found to perform better in identifying distressed counties than either of the other two measures. Based on these findings, unemployment rates appear to be the **best available** indicator of the county employment situation.

CHAPTER V

FINDINGS AND RECOMMENDATIONS OF THE LABOR SURPLUS WORK GROUP

Section 14 of HB 812 mandated that the Legislative Research Commission identify and evaluate a method to define and estimate surplus labor rate and report its recommendations. To accomplish this mandate, the Labor Surplus Work Group was formed, which was composed of labor market researchers and economists.

In order to evaluate the labor surplus estimates, it was necessary that the group review and analyze the comparable labor force statistics of unemployment rates and employment-to-population ratios, to ascertain the relative merits of each. Much information was obtained through the course of the work group sessions relating to procedures used to estimate labor force statistics, the availability of labor market data, the accuracy of labor force statistics and the relationship between the employment indicators and measures of economic well-being. On the basis of these deliberations, the following proposals are presented for consideration of the Kentucky General Assembly. The proposals are offered as a point of initial consideration and should be subjected to the full discussion and review of the regular policy process.

1. **Surplus labor, as currently estimated, is an inadequate measure of the number of unemployed and discouraged workers residing in Kentucky counties. Therefore, it is recommended that surplus labor rates not be used in the allocation of state economic development funds. Furthermore, it is recommended that the surplus labor rate criterion be removed from the allocation formula for the Local Government Economic Development Assistance Fund.** The procedures used to estimate labor surplus assume that county labor force participation rates should be equal to the national labor force participation rates. However, there are many differences in labor markets within Kentucky, which result in varying levels of labor force participation and include not only differences in the level of economic activity, but also differences in economic structure, average wages, levels of educational attainment, and demographic composition of the population. The labor surplus rates, as currently estimated, do not take these factors into consideration. Since the data needed to control for these factors are collected only once every ten years in the Census of Population, a model of labor force participation that includes these factors cannot be updated annually to provide accurate estimates of labor surplus. While the labor surplus estimates include individuals who want jobs but think they are not available (discouraged workers), they also include individuals who do not want to or can not work.

2. **While not perfect, the unemployment rates are the *best available* employment situation indicator for ranking counties.** Employment indicators are often used as a proxy for the economic well-being of counties, as described in the legislation. County rankings based on the three employment indicators of unemployment rates, employment-to-population ratios, and surplus labor rates were compared to rankings based on measures of economic welfare that included poverty rates, median family income, and the percentage of the population receiving food stamps. It is concluded from these rankings that unemployment rates identified the greatest number of distressed counties. Counties that were identified as distressed by the unemployment rates had higher rates of poverty and lower levels of median family income than the counties not classified as distressed.

3. **There remains much debate regarding the accuracy of the estimated number of unemployed reported by the U.S. Bureau of Labor Statistics and the Cabinet for Human Resources. The members of the Labor Surplus Work Group did not reach a consensus regarding the best way to measure the number of people who are involuntarily unemployed.** Based on the estimates of unemployment from the Census, there is some evidence that unemployment may be underestimated or overestimated for some counties. However, differences in the unemployment rates reported by the U.S. Bureau of Census and the U.S. Bureau of Labor Statistics (BLS) may be due to a variety of factors: the relatively subjective nature of Census questionnaires, errors in the population estimates used by the BLS, or inadequacies in the procedures used by BLS to estimate unemployment at the county level. Data was not available on discouraged workers in Kentucky, one component of the involuntarily unemployed. Therefore, the issue of the magnitude of the discouraged worker effect and number of discouraged workers in Kentucky is unknown.

4. **Because of the persistent debate surrounding the estimates of the number of unemployed and discouraged workers, it is recommended that there be continuing research into labor market conditions in Kentucky. It is recommended that this be accomplished through the coordinated efforts of the Department for Employment Services, other state agencies, state universities, and the Legislative Research Commission.** County unemployment rates are estimated through a very complex procedure, combining data from a multitude of sources. These procedures could be improved through extensive data analysis and statistical evaluation by either the U.S. Bureau of Labor Statistics or the Department for Employment Services of the Cabinet for Human Resources. The functions of the BLS are beyond the direct control of the General Assembly. However, the research and data resources of the Department for Employment Services, other state agencies, state universities, and the Legislative Research Commission could be utilized to evaluate the accuracy of the estimates of the number of unemployed and the discouraged worker issue.

5. **Data that is currently collected on employment and unemployment in Kentucky should be made available to interested economic researchers throughout the state. The Department of Employment Services should publish an index detailing the type of employment data that is collected and the procedures to be followed in gaining access to this data.** The Department of Employment Services collects a multitude of employment data through the cooperative programs of the BLS. Two primary sources of data are the Current Establishment Survey and the ES-202 survey. Much labor market research could be conducted using this data, especially research related to evaluating unemployment and discouraged workers in Kentucky counties. In the past, data from these surveys have not been readily available to researchers throughout the state. While it is recognized that some of the data collected is confidential, steps could be taken to preserve confidentiality of individual firms, making the data available to the extensive research capabilities of state universities. Procedures should be initiated immediately which would enable interested researchers to have access to this data. Summary data should be made available both through printed materials and in electronic format. Procedures should also be adopted by the Department of Employment Services that will facilitate cooperative studies that will provide researchers access to relatively detailed data while maintaining the confidentiality of individual business. The resources required to conduct these functions may exceed the current resources of the Department of Employment Services. Therefore, priority should be given to providing the Department of Employment Services with the labor and technical expertise required to pursue these objectives.

6. **The only way to improve existing employment estimates would be through a survey similar to the Current Population Survey conducted by the U.S. Bureau of Census. However, this would be a very expensive process.** The survey could be conducted by one of the state university survey organizations, including the Survey Research Center at the University of Kentucky or the State Data Center at the University of Louisville. A survey explicitly designed to measure employment, unemployment, and the reasons individuals are not in the labor force would provide baseline data that is more reliable than that obtained from the Census of Population. Data on unemployment could be combined with information related to employment search, in order to refine the definition of employment. Also, data could be obtained on past work experience, job search behavior, expected wage rates and current income sources for individuals who identify themselves as being out of the labor force because they think they cannot get a job. Finally, data could be collected on individuals who are not in the labor force because they do not want to work or because of other personal reasons. This survey could be conducted in several ways, all of which have distinct advantages or disadvantages.

   a. **A statewide survey.** The advantages of this approach are that it would provide a statewide estimate of labor force status, including employment, unemployment, and discouraged workers. Also, it is the least expensive

approach. The disadvantages are that this survey would not provide any information on county labor force participation.

b. **A survey of all Kentucky counties**. The advantage of this approach is that it would provide for both a county-by-county and a statewide analysis of the employment situation. The disadvantage of this approach is that it would be prohibitively expensive.

c. **A survey of counties selected either randomly or based on some measure of economic or demographic characteristics.** For example, counties could be selected from categories of population, categories of economic welfare, or urban/rural status. This approach would provide data on employment status for the individual counties that could be compared to the official statistics. However, this approach may not provide information that could be generalized to all counties. Furthermore, this approach would not provide information on the statewide employment situation.

d. **A regional survey where counties are grouped together**. The advantage of this approach is that it would provide both a regional and statewide analysis of the employment situation. The cost of this approach would depend on the number of regions chosen, but it would be less expensive than the county analysis and more expensive than the state level analysis. The disadvantage of this approach is that county information would not be available.

7. **An event study could be conducted, utilizing data currently collected by the Department of Employment Services. An event study involves evaluating county levels of employment and unemployment before and after the location of a new business or the closure of an existing business. This study should be composed of numerous events, in order to provide statistical reliability and to control for other factors that may influence labor markets.** It is argued that discouraged workers enter the labor force when employment opportunities increase significantly and leave the labor force in time of economic decline. By evaluating labor market responses to changes in employment opportunities, researchers may be able to estimate the discouraged worker effect. This approach may also provide information on the relationship between employment, unemployment, discouraged workers, and local economic activity.

8. **It is recommended that members of the General Assembly contact federal officials and policy makers to emphasize the critical importance of accurate and reliable labor force statistics at the county and state level.** Effective planning and implementation of state and local government programs rely heavily on economic data collected by the various data collection agencies of the federal government, including the U.S. Bureau of Labor Statistics, the U.S. Bureau of Census, and the U.S. Bureau of Economic Analysis. Since unemployment rates are a major criterion for the allocation of federal funds to local areas, inaccurate statistics can lead to a misallocation of scarce federal funds. Furthermore,

widespread public perception of inaccurate statistics undermines the ability of policy makers to effectively respond to the concerns of its citizenry. Because of the importance of the statistics, the data collection procedures and statistical methods should be reviewed periodically. This review would ensure that the concepts and estimation methods underlying the data reflect the information needed to formulate effective policies. A periodic review would also ensure that federal budgetary constraints have not impaired the reliability of labor force statistics at the state and county level.

9. **Employment indicators are incomplete measures of economic welfare. Therefore, additional indicators of economic welfare should be considered in the selection of criteria for the allocation of economic development funds. Once again, these indicators could be identified, with the assistance of the extensive research capabilities of the Commonwealth's universities.** The economic welfare of an area is determined by a combination of factors, including the level and type of employment, the level of income, and quality of life issues, such as access to services and amenities. Employment indicators do not reflect this complex set of factors. Furthermore, employment in an area may be relatively high, yet the jobs may pay relatively low wages, resulting in low levels of income. Also, the unemployment rate of an area may be relatively low, yet the economy of the area may be undergoing long-term structural changes which contribute to low levels of employment and income. Since the official definition of unemployment includes only those individuals who have sought employment in the last four weeks, unemployment rates are better measures of cyclical economic activity than of long-term economic conditions. Therefore, it is recommended that the General Assembly examine other indicators of economic welfare, including but not limited to per capita personal income or the percent of the population receiving food stamps, as criteria in the implementation of programs designed to improve the economic welfare of areas.

BIBLIOGRAPHY

A Profile of the Working Poor, U. S. Department of Labor, Bureau of Labor Statistics, December, 1989, Bulletin 2345.

Abraham, Katharine G. "Structural/Frictional vs. Deficient Demand Unemployment: Some New Evidence", *The American Economic Review*, September, 1983, pp. 708-724.

Berger, Mark C. "Why Aren't More Kentuckians Working?", *Kentucky 1989 Annual Economic Report*, Center for Business & Economic Research, College of Business and Economics, University of Kentucky, December, 1989.

Blank, Rebecca M. "Understanding Part-Time Work", *Research in Labor Economics*, Volume 11, pp. 137-158.

BLS Handbook of Methods, U. S. Department of Labor, Bureau of Labor Statistics, Bulletin 2285, April, 1988.

Brooks, Clive and Paul Volker. "The Probability of Leaving Unemployment: The Influence of Duration, Destination and Demographics", *The Economic Record*, September, 1986, pp. 296-309.

Buss, Terry F. and F. Stevens Redburn. *"Hidden Unemployment Discouraged Workers and Public Policy"*, Praeger. New York.

Butler, Richard J. and James B. McDonald. "Trends in Unemployment Duration Data", *The Review of Economics and Statistics*, November, 1986, Vol. LXVIII, No. 4, pp. 545-557.

Cohany, Sharon R. and Jennifer M. Rothgeb. "The Revised CPS Questionnaire: Differences Between the Current and the Proposed Questionnaires", U. S. Department of Labor, Bureau of Labor Statistics and Bureau of the Census, August, 1992.

Concepts and Data Needs, National Commission on Employment and Unemployment Statistics, Washington, D. C., Appendix Volume 1, 1980.

Counting the Labor Force, National Commission on Employment and Unemployment Statistics, Washington, D. C., Labor Day, 1979.

Cullison, William E. "The Changing Labor Force: Some Provocative Findings", *Economic Review*, September/October, 1989, pp. 30-36.

Dorsey, Stuart. "The Strange Case of the Missing West Virginia Labor Force", *Growth and Change*, Summer, 1991, pp. 49-65.

Ehrenberg, Ronald G. "The Demographic Structure of Unemployment Rates and Labor Market Transition Probabilities", *Research in Labor Economics,* Volume 3, pp. 241-291.

Ehrenberg, Ronald G. and Robert S. Smith. *Modern Labor Economics, Theory and Public Policy*, HarperCollins Publishers, Inc., 4th Edition, 1991.

Finegan, T. Aldrich. "Discouraged Workers ad Economic Fluctuations", *Industrial and Labor Relations Review,* Vol. 35, No. 1 (October 1981) pp. 88-102.

Flaim, Paul O. "Discouraged workers: how strong are their links to the job market?", *Monthly Labor Review,* August, 1984, pp. 8-11.

Goss, Ernie and Chris Paul. "The Impact of Unemployment Insurance Benefits on the Probability of Migration of the Unemployed", *Journal of Regional Science,* Vol. 30, No. 3, 1990, pp. 349-358.

Hamilton, James D. "A Neoclassical Model of Unemployment and the Business Cycle", *Journal of Political Economy,* 1988, Vol. 96, no. 3, pp. 593-617.

Jones, Stephen R. G. "The Relationship Between Unemployment Spells and Reservation Wages as a Test of Search Theory", *The Quarterly Journal of Economics,* November, 1988, pp. 741-765.

Kentucky Total and Nonwhite Population and Labor Force Data by County, Kentucky Cabinet for Human Resources, Research and Statistics Branch, Local Area Unemployment Statistics Unit, July, 1990.

Kniesner, Thomas J. and Arthur H. Goldsmith. "A Survey of Alternative Models of the Aggregate U.S. Labor Market", *Journal of Economic Literature,* Vol. XXV (September 1987) pp. 1241-1280.

Nickell, Stephen. "Unemployment: A Survey", *The Economic Journal,* (June 1990) pp. 391-439.

Piore, Michael J. "Historical Perspectives and the Interpretation of Unemployment", *Journal of Economic Literature,* Vol. XXV (December 1987), pp.1834-1850.

Preissing, John, Jerry Skees, and Eldon Smith. "Problems With Unemployment Statistics for Rural Areas", *Kentucky Journal of Economics and Business,* 1990, pp. 55-64.

Shiskin, Julius. "Employment and Unemployment: the Doughnut or the Hole?" *Monthly Labor Review*, February, 1976, Volume 99, No. 2, pp. 3-10.

Summers, Lawrence H. "Relative Wages, Efficiency Wages, and Keynesian Unemployment" *AEA Papers and Proceedings*, May 1988, pp. 383-388.

Younger, Mary Sue. *A Handbook for Linear Regression*, Duxbury Press, 1979.

Appendix

Economic Data by County
1970

County	Total Population* (Thousands)	Unemploy-ment Rate**	Employment to Population Ratio	Poverty Rate	Median Family Income
Adair	13.04	7.3	36.42	43.2	$4,493
Allen	12.60	7.3	44.99	34.3	$4,930
Anderson	9.36	5.7	41.36	15.2	$8,000
Ballard	8.28	3.6	36.71	20.5	$7,000
Barren	28.68	5	55.57	28.3	$5,795
Bath	9.24	18.2	30.65	37.7	$4,892
Bell	31.09	13.9	36.80	45.3	$4,445
Boone	32.81	1.1	40.43	8.9	$10,020
Bourbon	18.48	3.2	47.84	19.7	$7,276
Boyd	52.38	4.4	66.65	14.6	$8,744
Boyle	21.09	5.3	66.86	18.4	$7,822
Bracken	7.23	2.6	41.23	28.9	$5,850
Breathitt	14.22	9.6	25.81	57.4	$3,176
Breckinridge	14.79	10.1	34.74	24.8	$6,316
Bullitt	26.09	7.7	19.07	13.7	$8,039
Butler	9.72	9.7	40.56	30.8	$4,774
Caldwell	13.18	10.9	59.59	26.3	$6,349
Calloway	27.69	6.2	44.62	20.4	$6,725
Campbell	88.50	1.9	27.94	10.2	$9,527
Carlisle	5.35	12.5	35.32	24.6	$5,839
Carroll	8.52	4.4	54.46	20.8	$6,888
Carter	19.85	11.8	31.23	33.5	$5,452
Casey	12.93	6.1	38.70	36.2	$4,886
Christian	56.22	5.7	44.48	26.7	$6,291
Clark	24.09	3.2	60.98	17.9	$8,125
Clay	18.48	11	28.42	64.9	$3,099
Clinton	8.17	10.7	43.15	46.6	$3,784
Crittenden	8.49	4.9	39.77	27.4	$5,480
Cumberland	6.85	6.8	41.62	46.3	$4,000
Daviess	79.49	6.1	54.80	14.3	$8,627
Edmonson	8.75	20	29.35	30.4	$5,101
Elliott	5.93	25.8	22.53	43.9	$3,787
Estill	12.75	16.2	28.80	39.1	$5,313
Fayette	174.32	2.7	71.05	14.2	$9,597
Fleming	11.37	3.8	45.99	33.2	$5,334
Floyd	35.89	10.4	32.04	40.6	$4,878
Franklin	34.48	3.3	88.27	11.2	$9,490
Fulton	10.18	5.7	51.62	34.2	$5,546
Gallatin	4.13	5.4	40.25	24.9	$5,864
Garrard	9.46	6.9	49.67	25.3	$6,397
Grant	10.00	2.6	36.71	18.7	$7,238
Graves	30.94	10.9	46.63	20.8	$6,662
Grayson	16.45	13.8	35.39	31.0	$5,402
Green	10.35	2.7	47.92	24.5	$6,102
Greenup	33.19	10.4	23.49	18.7	$7,593
Hancock	7.08	5.2	69.08	16.2	$8,257
Hardin	78.42	4	30.41	16.2	$7,263
Harlan	37.37	9.4	35.99	42.2	$4,682
Harrison	14.16	4.3	51.82	21.7	$6,651
Hart	13.98	5.6	43.88	33.6	$4,957
Henderson	36.03	4.8	48.18	16.7	$7,833
Henry	10.91	4.7	39.00	19.6	$6,793
Hickman	6.26	11.1	42.28	26.0	$5,784
Hopkins	38.17	2.6	49.03	21.5	$7,220
Jackson	10.01	13.3	29.56	55.7	$3,288
Jefferson	695.06	3.8	66.61	11.7	$9,819
Jessamine	17.43	10.4	57.02	19.6	$7,514
Johnson	17.54	10	36.38	43.2	$4,287
Kenton	129.44	1.5	32.41	10.7	$9,499
Knott	14.70	14.7	19.66	62.6	$3,279
KY Statewide	**3,218.70**	**4.40**	**52.66**	**22.9**	**$7,441**

County	Total Population* (Thousands)	Unemploy-ment Rate**	Employment to Population Ratio	Poverty Rate	Median Family Income
Knox	23.69	9.9	25.73	54.3	$3,526
Larue	10.67	8.2	35.20	25.9	$6,088
Laurel	27.39	6.7	37.46	38.9	$4,802
Lawrence	10.73	11.3	31.55	45.0	$4,185
Lee	6.59	8.6	30.55	55.2	$3,390
Leslie	11.62	15.6	19.12	60.9	$3,517
Letcher	23.17	7.9	37.75	44.2	$4,407
Lewis	12.36	6.7	34.19	31.1	$5,726
Lincoln	16.66	14	47.00	34.3	$5,330
Livingston	7.60	8.6	28.87	22.8	$6,167
Logan	21.79	2.6	57.96	27.7	$6,252
Lyon	5.56	17.2	27.23	22.7	$6,211
McCracken	58.28	3.8	54.82	17.7	$8,204
McCreary	12.55	15.6	20.49	58.1	$3,242
McLean	9.06	14.6	31.66	22.2	$6,221
Madison	42.73	5.8	46.73	24.3	$6,937
Magoffin	10.44	26.3	21.45	53.1	$3,664
Marion	16.71	10	42.86	29.2	$6,127
Marshall	20.38	5.4	59.70	17.2	$7,306
Martin	9.38	12.8	29.37	55.9	$3,415
Mason	17.27	1.7	61.06	20.3	$7,140
Meade	18.80	3.7	19.76	14.6	$7,803
Menifee	4.05	16.2	36.60	31.1	$5,065
Mercer	15.96	6.9	45.67	21.2	$6,943
Metcalfe	8.18	9.1	44.01	42.4	$3,920
Monroe	11.64	4.6	50.24	44.1	$4,042
Montgomery	15.36	3.5	63.33	23.8	$6,904
Morgan	10.02	7.3	37.95	50.0	$3,658
Muhlenberg	27.54	4.1	42.75	25.8	$6,720
Nelson	23.48	10.3	41.52	24.2	$7,024
Nicholas	6.51	3.2	51.87	26.3	$6,572
Ohio	18.79	6.7	36.80	27.3	$6,144
Oldham	14.69	3.3	31.88	16.0	$8,446
Owen	7.47	4.4	42.80	27.2	$5,895
Owsley	5.02	20	24.08	66.0	$2,407
Pendleton	9.95	2.9	43.05	16.7	$7,067
Perry	25.71	9.1	39.70	44.6	$4,607
Pike	61.06	7.7	34.19	35.7	$5,429
Powell	7.70	16.7	30.14	31.9	$5,666
Pulaski	35.23	6.5	49.63	33.7	$5,185
Robertson	2.16	4.3	46.64	30.4	$4,563
Rockcastle	12.31	25.4	25.53	42.0	$4,627
Rowan	17.01	8.9	34.04	31.0	$5,637
Russell	10.54	9.6	44.10	39.2	$4,497
Scott	17.95	5.7	38.87	20.5	$7,568
Shelby	19.00	2.1	47.92	20.9	$7,502
Simpson	13.05	3.1	68.80	23.3	$6,666
Spencer	5.49	6.7	42.37	24.7	$6,326
Taylor	17.14	3	63.16	24.0	$6,532
Todd	10.82	6.2	46.97	31.3	$5,548
Trigg	8.62	9.1	41.04	28.2	$5,764
Trimble	5.35	2.8	28.89	25.7	$6,596
Union	15.88	3.4	42.45	27.8	$8,122
Warren	57.43	4.7	58.98	22.5	$7,399
Washington	10.73	7.1	45.05	27.9	$5,852
Wayne	14.27	17.2	34.08	55.3	$3,292
Webster	13.28	7.5	38.64	26.2	$6,005
Whitley	24.15	6	45.50	45.6	$4,335
Wolfe	5.67	6.5	39.00	60.9	$2,694
Woodford	14.43	3.3	56.50	14.5	$8,715
County Avg.	**26.82**	**8.04**	**41.73**	**30.6**	**$5,981**

*Data Sources: *=Census; **=CHR, ***=BEA.*

Appendix

Economic Data by County
1980

County	Total Population* (Thousands)	Unemployment Rate**	Employment to Population Ratio	Median Family Income	% of Persons Receiving Food Stamps**	Poverty Rate
Adair	15.23	6.9	56.96	$11,361	15.34	28.5
Allen	14.13	10.3	58.28	$13,143	13.25	20.7
Anderson	12.57	5.9	65.77	$17,860	8.98	9.3
Ballard	8.80	7.6	51.41	$16,215	10.16	14.8
Barren	34.01	9.3	60.49	$14,927	8.42	17.7
Bath	10.03	12.8	54.22	$11,584	22.50	28.3
Bell	34.33	10.0	41.00	$11,913	23.75	30.5
Boone	45.84	5.8	70.23	$22,158	6.37	6.8
Bourbon	19.41	5.1	68.61	$15,400	12.90	19.6
Boyd	55.51	10.3	51.14	$19,478	10.78	13.5
Boyle	25.07	8.0	61.26	$16,585	10.38	16.3
Bracken	7.74	10.5	49.20	$15,088	10.03	17.9
Breathitt	17.00	11.8	37.91	$10,796	33.78	36.0
Breckinridge	16.86	7.8	53.33	$12,374	17.44	22.9
Bullitt	43.35	6.8	72.25	$19,237	11.30	9.9
Butler	11.06	12.5	48.86	$13,013	17.17	20.8
Caldwell	13.47	9.6	58.48	$15,741	8.09	12.2
Calloway	30.03	11.3	54.12	$15,390	5.65	15.3
Campbell	83.32	6.5	61.58	$20,223	8.64	9.8
Carlisle	5.49	14.5	49.17	$15,112	10.81	15.7
Carroll	9.27	5.5	58.94	$15,441	15.85	17.8
Carter	25.06	10.7	53.79	$12,778	20.48	25.9
Casey	14.82	9.8	48.26	$9,447	21.76	35.9
Christian	66.88	9.4	44.83	$13,464	14.23	20.2
Clark	28.32	8.6	69.63	$18,785	14.41	16.2
Clay	22.75	10.6	39.11	$8,901	36.59	42.4
Clinton	9.32	9.2	50.02	$8,312	27.95	39.4
Crittenden	9.21	10.8	51.76	$15,975	9.78	17.3
Cumberland	7.29	9.3	54.77	$9,944	22.64	30.6
Daviess	85.95	7.0	64.76	$18,813	8.38	12.5
Edmonson	9.96	16.6	46.40	$11,441	17.52	22.6
Elliott	6.91	15.4	35.07	$10,961	25.03	32.3
Estill	14.50	11.7	45.74	$12,538	27.99	28.1
Fayette	204.17	4.3	65.42	$19,821	8.56	13.5
Fleming	12.32	8.1	58.66	$12,994	15.27	23.9
Floyd	48.76	8.6	43.32	$14,374	15.79	22.3
Franklin	41.83	5.0	70.22	$19,923	8.11	10.6
Fulton	8.97	10.9	48.77	$15,400	22.56	27.1
Gallatin	4.84	8.0	53.95	$16,377	13.59	17.7
Garrard	10.85	8.0	56.78	$13,750	13.52	21.7
Grant	13.31	7.1	58.36	$17,045	10.20	13.1
Graves	34.05	14.1	53.67	$16,083	8.03	13.9
Grayson	20.85	10.9	50.26	$12,532	16.84	23.1
Green	11.04	7.0	59.23	$12,069	9.97	24.3
Greenup	39.13	8.3	53.75	$19,171	11.79	13.1
Hancock	7.74	7.0	53.97	$18,248	10.02	14.6
Hardin	88.92	8.9	38.65	$14,957	7.26	15.1
Harlan	41.89	8.7	42.09	$13,376	20.01	25.8
Harrison	15.17	6.7	58.59	$14,975	10.59	19.3
Hart	15.40	11.6	51.15	$11,509	19.43	28.2
Henderson	40.85	6.3	66.76	$18,895	8.64	11.0
Henry	12.74	7.5	58.59	$14,718	11.45	20.0
Hickman	6.07	9.1	55.96	$16,397	13.29	18.0
Hopkins	46.17	7.3	54.73	$18,442	9.35	14.5
Jackson	12.00	14.1	38.62	$8,823	31.11	39.2
Jefferson	685.00	7.6	55.67	$19,960	11.04	12.2
Jessamine	26.15	4.8	69.61	$16,454	9.89	14.7
Johnson	24.43	8.7	47.20	$14,209	19.68	22.9
Kenton	137.06	6.0	63.15	$20,463	9.50	10.1
Knott	17.94	10.9	38.91	$12,085	29.64	30.9
KY Statewide	**3,660.78**	**8.0**	**56.27**	**$16,444**	**12.79**	**17.6**

County	Total Population* (Thousands)	Unemployment Rate**	Employment to Population Ratio	Median Family Income	% of Persons Receiving Food Stamps**	Poverty Rate
Knox	30.24	10.9	41.24	$10,425	31.43	37.1
Larue	11.92	7.2	55.58	$13,573	11.42	22.5
Laurel	38.98	9.0	49.81	$13,390	20.18	21.1
Lawrence	14.12	9.9	42.49	$11,500	26.95	29.9
Lee	7.75	12.5	38.01	$9,506	31.11	33.4
Leslie	14.88	8.5	35.53	$10,728	31.44	34.1
Letcher	30.69	11.0	38.63	$12,702	22.57	27.4
Lewis	14.55	11.6	50.49	$11,279	23.95	31.2
Lincoln	19.05	11.0	53.33	$11,891	19.51	27.9
Livingston	9.22	10.9	54.92	$15,683	6.52	14.7
Logan	24.14	9.9	59.43	$14,548	11.93	16.2
Lyon	6.49	11.6	41.04	$16,594	6.50	13.5
McCracken	61.31	7.1	55.44	$18,728	11.40	12.9
McCreary	15.63	14.2	36.21	$8,746	36.43	39.5
McLean	10.09	9.6	52.31	$16,049	10.19	15.2
Madison	53.35	8.2	60.37	$14,754	11.41	21.1
Magoffin	13.52	13.8	38.85	$10,721	35.77	35.0
Marion	17.91	9.3	58.37	$13,610	17.95	23.0
Marshall	25.64	11.5	51.36	$17,294	6.55	9.8
Martin	13.93	5.6	42.35	$15,646	23.15	27.0
Mason	17.77	6.5	58.68	$15,327	11.70	19.8
Meade	22.85	7.1	40.55	$15,168	8.40	13.6
Menifee	5.12	14.3	50.81	$10,971	26.44	28.9
Mercer	19.01	7.1	61.84	$16,515	9.43	16.7
Metcalfe	9.48	9.3	58.31	$10,515	13.45	30.8
Monroe	12.35	8.7	54.48	$10,546	20.38	29.1
Montgomery	20.05	10.9	57.22	$13,648	18.08	21.7
Morgan	12.10	11.2	41.16	$9,114	30.22	36.7
Muhlenberg	32.24	9.8	49.28	$17,130	11.60	15.0
Nelson	27.58	10.2	55.77	$16,294	13.28	16.8
Nicholas	7.16	5.4	58.12	$12,840	14.67	21.0
Ohio	21.77	11.8	46.95	$16,150	14.61	17.1
Oldham	27.80	5.7	66.02	$22,676	4.52	6.5
Owen	8.92	5.4	56.36	$12,895	13.60	23.2
Owsley	5.71	14.6	32.27	$7,170	43.84	48.3
Pendleton	10.99	6.5	59.36	$15,704	11.47	17.3
Perry	33.76	9.8	43.15	$14,084	22.02	24.3
Pike	81.12	6.5	46.81	$15,436	10.60	19.4
Powell	11.10	12.3	52.25	$12,532	26.24	25.6
Pulaski	45.80	10.4	51.83	$12,425	15.16	22.3
Robertson	2.27	8.8	54.05	$12,160	14.26	24.5
Rockcastle	13.97	11.9	45.79	$10,288	24.78	33.1
Rowan	19.05	9.8	51.30	$12,791	15.58	21.8
Russell	13.71	12.0	49.01	$10,310	21.50	32.4
Scott	21.81	5.1	69.10	$17,287	10.03	14.1
Shelby	23.33	5.4	62.84	$18,200	8.95	14.8
Simpson	14.67	8.4	63.16	$15,944	11.85	16.5
Spencer	5.93	6.2	68.01	$15,668	13.27	18.2
Taylor	21.18	4.9	65.15	$15,470	10.64	18.8
Todd	11.87	12.0	55.06	$13,151	11.52	19.8
Trigg	9.38	11.0	56.72	$14,565	11.29	17.3
Trimble	6.25	7.3	60.47	$14,988	10.08	13.2
Union	17.82	7.4	51.11	$19,739	6.14	22.2
Warren	71.83	8.3	65.32	$17,333	8.44	15.3
Washington	10.76	8.7	58.90	$14,030	14.53	23.2
Wayne	17.02	11.7	49.70	$9,612	27.06	35.1
Webster	14.83	7.9	52.26	$16,904	9.27	17.9
Whitley	33.40	11.0	44.21	$11,823	24.30	26.6
Wolfe	6.70	12.8	43.47	$9,669	34.50	34.9
Woodford	17.78	3.8	69.30	$20,283	8.66	11.6
County Avg.	**30.51**	**9.2**	**53.21**	**$14,435**	**16.13**	**21.7**

*Data Sources: *=Census; **=CHR, ***=BEA.*