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Distribution of Employment Growth in Nine Kentucky Counties

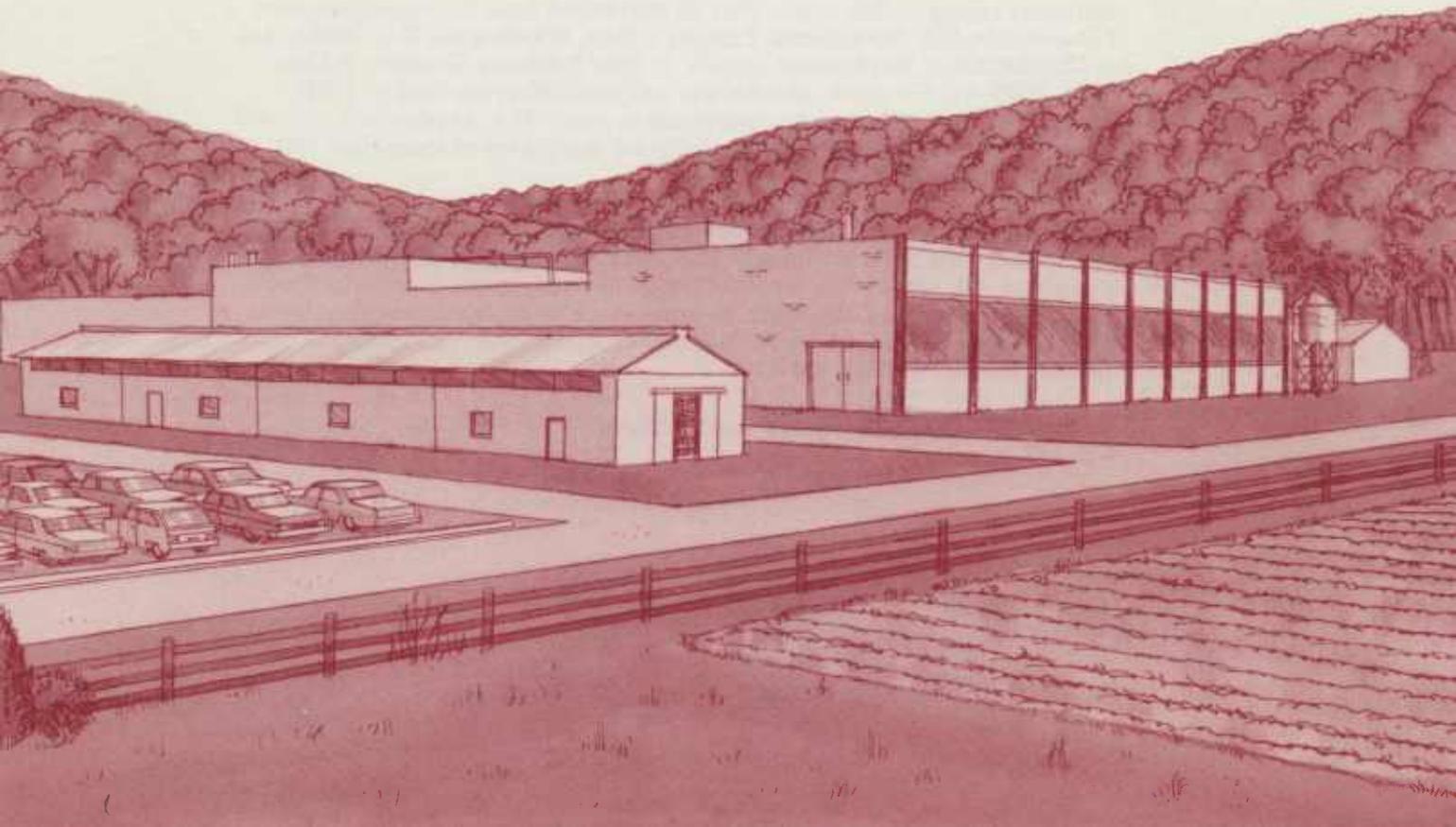
A Case Study

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Abstract

Rapid employment growth between 1974 and 1979 in a nine-county study area of south central Kentucky provided job opportunities both for local residents and for persons with limited labor force experience. But, recent inmigrants held a disproportionate share of better paying executive jobs. This case study, which examines the distributional effects of rapid employment growth in a nonmetropolitan area, shows that inmigrants also held a disproportionate share of jobs in growing business establishments. Although manufacturing was the major economic force in the study area in January 1980, jobs in the private service sector increased more than in other sectors.

Keywords

Inmigrants, rural employment growth, rural labor force, women, youth

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Contents

	<i>Page</i>
Summary	iii
Glossary	iv
Introduction	1
Background	1
Study Area	2
Survey Design	3
Study Area's Economy and People	5
Industrial Structure	5
Area Residents	7
Employment Growth	9
Sources and Distribution of New Jobs	10
Influence of Multiestablishment Firms	13
Employed Workers	13
Residency Status	14
Establishment Types by Workers' Residency Status	15
Female Workers	17
Youth	19
Older Workers	19
Recent Entrants to the Labor Force	21
Roles of Government in Employment Growth	22
Direct Employer	23
Provider of Infrastructure	23
Source of Capital	23
Employment Services and Training	24
Potential Labor Force	25
Implications	27
References	30
Appendix A: Survey Design and Procedures	32
Appendix B: Calculation of Variance Statistics	35

Summary

Rapid employment growth from 1974 to 1979 in a nine-county area of south central Kentucky provided job opportunities both for local residents and for persons with limited labor force experience. But, recent immigrants held a disproportionate share of better paying executive and professional jobs. This case study, which examines the distributional effects of rapid employment growth in a nonmetropolitan (nonmetro) area, shows that immigrants also held a disproportionate share of jobs in growing business establishments.

Enumerators interviewed a representative sample of business firms, government units, and households in the Kentucky study area in December 1979-January 1980 to determine the impacts of employment growth on rural residents. The Kentucky area reflects recent economic and demographic changes occurring in many nonmetro areas. Manufacturing was the Kentucky area's major economic driving force in January 1980, providing jobs for a third of the workforce. But, the private service sector, which provided services to the manufacturing sector and to the area's growing population, was an important contributor to job growth between 1974 and 1979.

The advantages of recent immigrants in obtaining executive and professional jobs did not lead to higher average weekly wages. Only early immigrants had a wage advantage over long-term residents. Many early immigrants may have held higher salaried jobs because they moved to the area, specifically to take managerial and highly skilled jobs, during a time of rapid expansion of both new manufacturing firms and other firms.

The expanding job market in the Kentucky study area provided a favorable environment for women and youth to enter the labor force. Most of these entrants had little previous labor force experience. About 60 percent of the recently (1974-79) employed were women, many of whom were 35 or more years old, were married, and no longer had young children at home. Youth, including young women, accounted for about 60 percent of the recently employed. The recently employed generally held lower paying clerical and sales positions and frequently worked in low-wage and private-sector establishments. They

were far more likely than experienced workers to work in new and expanding establishments. Thus, employment growth in the study area provided employment opportunities to people with limited labor force experience. Both this finding and the finding that long-term residents were able to achieve a proportionate share of employment suggest that these rural residents had at least partly achieved the development goal of Federal rural development legislation—namely, that of improving the economic well-being of all residents.

About 20 percent of the area's estimated 4,500 employers began operations between 1974 and 1979. An additional 20 percent expanded their operations. Of the nearly 11,000 jobs created over the 5-year period, half were created by new establishments and half by ongoing units. Those jobs in expanding establishments were primarily full-time positions in goods-producing occupations, provided principally by large units. By contrast, new establishments provided mostly technical, marketing, sales, clerical, and service jobs that were more likely to be part-time positions in small service-producing units. These results suggest that economic development policy should not be solely concerned with attracting new establishments to an area, but must also create a climate that encourages the expansion of existing units.

Federal, State, and local government involvement affects economic development, directly and indirectly. This survey does not provide all the necessary data for assessing government's full role in job expansion; however, the survey data do suggest that government played only a minor role in some important areas. Since 1969, nonfarm employers have not widely used government-sponsored loan programs to start up new businesses. Employers only occasionally used State employment offices to locate new workers, and workers seldom used these employment offices to find work. However, information from nonsurvey sources and from the analysts' personal observation suggests that government did help finance the necessary infrastructure to support private-sector economic activity and that local development associations, chambers of commerce, and other groups did make concerted efforts to attract employers to the area.

Glossary

Statistical testing and survey design:

Significant difference:

A comparison between two variables was statistically significant at the 95-percent confidence level in most cases when the observed difference was greater than twice the standard error of the difference. The variables tested were in the form of totals, ratios, percentages, dollar values, and so forth.

Survey sample design:

Area frame. The area frame consisted of a two-stage stratified cluster sample, where the first stage involved sampling segments and the second stage involved sampling establishments and households. The area frame provided a sample of establishments and households not identified by the list frame. The area frame and list frame together represented the total population of establishments and households.

List frame. The list frame sample was comprised of a list of private-sector establishments and government units located in the nine-county area. A subsample of employees was drawn from the surveyed list frame establishments which subsequently became the list frame sample of households.

Primary sampling unit. Primary sampling units (PSU's) are associated with the frame sample. For the list frame, establishments were the PSU's; for the area frame, land segments of varying size were the PSU's. PSU's serve as the base for deriving variances, as opposed to observations, in a complex survey design.

Employers, private and public sectors, and related terms:

Establishments:

An establishment is an economic unit, generally located at a single location, where business is conducted or where services or industrial operations are performed. A firm may consist of one or more such units.

Type of establishment:

Goods-producing. Includes establishments in the private sector engaged in construction, mining, and manufacturing activities.

Services-producing. Includes establishments in the private sector engaged in wholesale and retail trade; TCPU (transportation, communications, and public utilities); FIRE (finance, insurance, and real estate); and all other services, including hotels, personal, business, amusement, health, legal, education, and social services.

Government. Includes civilian Federal, State, county, city, or town governmental units. A unit of government or a nonprofit organization funded primarily with Federal, State, or local government funds, which has sufficient management over its own affairs or taxing authority to distinguish it from the administrative structure of other governmental units. Military units were excluded from the survey.

Size of establishment:

Small. Those units that employed 1-19 paid workers in December 1979.

Large. Those units that employed 20 or more paid workers in December 1979.

No paid employees. Those establishments totally operated by self-employed owners or partners in December 1979 and referred to as establishments with no paid employees. Some of these establishments had paid employees in 1974.

Establishment wage levels:

Mean-wage establishments. The average weekly wages paid full-time workers in the mean wage establishments ranged from \$181 to \$221 in December 1979. The authors calculated this wage by adding and subtracting 10 percent of the mean weekly wage of \$201 paid by all establishments.

Low-wage establishments. The average weekly wage paid full-time workers was less than \$181 in December 1979.

High-wage establishments. The average weekly wage paid full-time workers was greater than \$221 in December 1979.

Structure or age of establishment:

Multiestablishments. Private-sector establishments with two or more plants, branch offices, or outlets for business. Data presented under multiestablishments represent only information collected from the unit surveyed.

New establishments. Establishments which began operation in the nine-county area after 1974.

Ongoing establishments. Establishments which began operation in the nine-county area during or before 1974.

Establishment employment change, 1974-79:

Growth. Establishments that increased employment by one or more persons between 1974 and 1979; also includes new units.

No-growth. Represents establishments where employment levels did not change or declined between 1974 and 1979.

Population and employee-related terms:

Households:

A group of persons, not necessarily related by blood or marriage, whose usual place of residence is in a house, an apartment, a group of rooms, or a single room occupied as separate living quarters.

Annual household income. All income received during the year by household members, except income received from the sale of land, buildings, stock, or other capital assets.

Household member. Any person whose usual place of residence is in the housing unit that was surveyed. (A housing unit is a house, an apartment, a group of rooms, or a single room occupied as separate living quarters.)

Adult:

Any person who was 16 years of age or older in January 1980.

Labor force:

Includes only the adult population who were employed and unemployed.

Employed. Employed persons who were working for wages and salaries or who were self-employed in their own businesses or professions or on their own farms.

Unemployed. Unemployed persons who were looking for work or on layoff waiting to be called back to a job.

Employment rate. The proportion of the adult population that was employed.

Unemployment rate. The proportion of the labor force that was unemployed.

Residency status:

Long-term residents. Residents who lived in the nine-county area continuously between December 31, 1964, and January 1980.

Early immigrants. Residents who moved to the nine-county area between January 1, 1965, and December 31, 1974.

Recent immigrants. Residents who moved to the nine-county area between January 1, 1975, and January 1980.

Return immigrants. Residents who had moved from the nine-county area, lived outside the area for some time, and then moved back to the area after January 1, 1965.

New immigrants. Residents who moved to the study area between January 1, 1965, and January 1980, and who had not previously lived in the area.

Employment status:

Full-time. Wage and salary workers who worked 30 or more hours per week.

Part-time. Wage and salary workers who worked less than 30 hours per week.

Recent entrants to the labor force. Persons who were not in the labor force in 1974 and who were employed 1 or more weeks in 1979.

Experienced workers. Persons who were employed 1 or more weeks in both 1974 and 1979.

Self-employed. Persons who worked for profit or fees in their own businesses or professions or on their own farms.

Occupational groups:

Executive. Includes managerial, administrative, engineering, scientific, teaching, and related occupations, including creative artists.

Technical. Includes technicians (except health), clerical, sales, service, farming, forestry, fishing, and hunting occupations, and persons living in the area who were in the military.

Production. Includes production workers in manufacturing, construction, extractive, transport, and related occupations.

Workers age:

Youth. Persons 16-24 years of age in January 1980.

Older workers. Persons 50 years of age and older in January 1980.

Link-wage worker:

Persons who were sampled from the list frame establishments surveyed and who were working for wages and salaries 1 or more weeks in 1979. Establishment data linked to the worker are for the unit in which the worker worked the most days in 1979.

Distribution of Employment Growth in Nine Kentucky Counties

A Case Study

Stan G. Daberkow, Donald K. Larson,
Robert Coltrane, and Thomas A. Carlin*

Introduction

The U.S. nonmetropolitan (nonmetro) population grew faster than the metropolitan (metro) population in the seventies (3).¹ The rapid growth of non-farm employment opportunities in the sixties and seventies was a major factor influencing this rural population turnaround. Both Federal and State rural development policies were initiated primarily to increase employment opportunities and to raise income levels in rural areas, particularly for the disadvantaged.

In this report, we examine the distribution of jobs among rural residents during a period of rapid employment growth in a nine-county area in south central Kentucky. We focus on the employment situation of long-term residents, immigrants, women, the elderly, youth, and recent entrants into the labor force. Economic development agencies, local and State governments, Federal program managers, and national policy officials will find the information in this report useful in planning effective rural development strategies.

We discuss other topics related to the distribution of jobs. Sources of new employment in rural areas include: establishment of new businesses, relocation of firms or branch establishments into the area, and expansion of industries already in the area. We identify the types of employers that contributed to total employment in the Kentucky study area. We focus on the role of multiestablishment firms in providing new jobs. Research suggests that such firms, if headquartered outside the local community, are not sensitive to economic needs of the local area (29).

Government plays an important role in the job creation process in a rural community. Government is not only a major employer (27), but also provides employment services and training to local residents

to help them both prepare for and find jobs. Government constructs and maintains transportation facilities, industrial parks, and other forms of necessary infrastructure for private establishments to carry on business. Government is also a source of capital for new plant construction and plant expansion. We examine the role of government in facilitating employment growth in the Kentucky study area.

Finally, we discuss the characteristics of persons of labor force age who are not employed or actively looking for work. This information is helpful when one assesses the extent to which a local area can sustain rapid employment growth without substantial immigration.

Each major section reporting the study's results is introduced by a summary of the section's major points.

Background

Between 1960 and 1970, population in nonmetro areas grew 4.4 percent, whereas that in metro areas grew 17 percent. Conversely, between 1970 and 1980, nonmetro areas grew by 15.8 percent, compared with 9.8 percent in metro areas. Although 464 nonmetro counties continued losing population in the seventies, this figure represents a substantial decline from the 1,296 counties that lost population during the sixties.² More than 80 percent of the nonmetro counties gained population in the seventies, whereas less than 50 percent had gained population in the sixties.

Employment, environmental, and cultural aspects of nonmetro areas have facilitated, if not caused, the rural turnaround. Employment growth, the perceived quality of rural living, dissatisfaction with the urban environment, and the narrowing of urban-rural gaps (in income levels, housing quality, communication, educational facilities, and other community services) combine to form the magnets drawing people to rural areas (3, 9).

*The authors are economists with the Economic Development Division.

¹Italicized numbers in parentheses refer to items in the reference section.

²Based on the 1974 definition of Standard Metropolitan Statistical Areas.

The growing number of job opportunities in nonmetro areas is a major force encouraging metro-to-nonmetro migration while slowing nonmetro-to-metro migration, a common feature during the fifties and sixties. Wage and salary employment grew by over 27 percent in nonmetro areas in the seventies compared with a 21-percent growth rate in metro areas (40). In every major industrial sector—manufacturing, services, and government—employment growth in nonmetro areas exceeded growth in metro areas between 1969 and 1979. Nonmetro growth in manufacturing employment was a dramatic 22 percent, compared with a 5-percent metro growth. Government employment at the State and local level grew faster in nonmetro areas than in metro areas, and service employment grew over 40 percent in nonmetro counties compared with 35 percent in metro areas. The decentralization of manufacturing contributed to this nonmetro employment growth (14). Recent rapid expansion of service jobs in nonmetro areas is partly a response to earlier growth in manufacturing and mining employment. The following factors combine to make nonmetro areas attractive locations for job formation: a ready source of workers, positive attitudes of workers about work, lower wage rates, less unionization, improved transportation and communication resources, and lower tax and land costs (3, 31).

Recent rural development policy has focused on programs to increase employment opportunities and generate income in rural areas. The Rural Development Act of 1972 and the Rural Development Policy Act of 1980 had explicit goals for creating jobs and increasing incomes of rural residents. These goals were to be attained by subsidizing capital, providing education programs for rural people, and improving delivery of Federal programs to rural areas. Some critics have questioned the need for and the success of public policy in influencing spatial distribution of economic activity, particularly the rural turnaround of the seventies. But, the extent to which policy goals are met remains a vital part of the evaluation of rural development (9, 12, 26). In other words, regardless of the extent of public involvement, are jobs created and incomes raised for targeted populations as an area's economy grows?

Past studies offer conflicting evidence on the distribution of economic benefits among rural residents that result from rural employment growth or industrialization (17, 32, 33, 34). Immigration and incommuting are almost universal responses to employment growth in rural areas. Immigrants compete with long-term residents for new jobs. Estimates of new

jobs taken by immigrants range from 19 percent to nearly 50 percent (15, 21, 24, 28, 30).³ Studies show that immigrants tend to be younger and better educated and to have higher skill levels than do long-term residents; thus, they have a comparative advantage in the local labor market (4, 24). Some new jobs were taken exclusively by immigrants, incommuters, or experienced local workers rather than by less experienced local workers (5).

Some groups, such as the elderly living on small, fixed incomes and female heads of households, were found to be worse off after industrialization (4, 11, 32). Total, median, and per capita income typically increased as employment growth occurred, but the distribution of income was not always more equitable (21, 26).

Research has provided few conclusions on the impacts of rural industrialization on employment and income distribution among population groups. Earlier studies often omitted critical issues, used inadequate methodology, or lacked a comprehensive analytical approach, resulting in conflicting conclusions. Our study attempts to resolve some of these issues.

Nonmetro economies are diverse. The type of industry locating in nonmetro areas apparently influences the distribution of employment among specific population groups (22). Thus, the distribution of benefits in agriculture- or mining-based economies is expected to differ from those economies based on manufacturing or recreation and from those areas heavily populated by retirees. To hold as many variables constant as possible, one must investigate each of the most common types of rural economies. These separate studies taken together provide an overview of population and employment growth in nonmetro areas. Our study concentrates on one type of economy frequently found in nonmetro areas—that is, a rapidly growing area with a manufacturing base. The Economic Development Division will conduct subsequent studies in areas with an agriculture-manufacturing mixed economy and with a recreation- and retirement-based economy.

Study Area

A nine-county area (Russell, Clinton, Pulaski, Wayne, Laurel, McCreary, Clay, Knox, and Whitley) in south

³Incommuting, immigration, reduced outcommuting, and lack of workers to fill job vacancies are factors leading to overestimates of direct and indirect employment and income effects on long-term residents in rural areas experiencing rapid job growth (29).

central Kentucky was selected as the study site (see figure). We used three criteria in selecting this study site. First, the area had to have experienced a population and employment growth rate in the upper quintile for all nonmetro counties during 1970-75. That is, the study site had to be one of the most rapidly growing nonmetro areas. Second, the area's economy had to be based predominantly on manufacturing. Manufacturing was an important source of past nonmetro employment growth and is one of historical public policy interest (12, 17). Third, the boundaries of the study area were to coincide with the local labor market, thus minimizing incommuting and outcommuting. This last criterion increased the probability that individuals employed in the area would also reside in the area, thus assuring an analysis of the distribution of employment growth among different segments of the resident population.

Clay, Knox, Whitley, and Laurel counties lie on the southwestern edge of the eastern Kentucky coal fields. The Daniel Boone National Forest transverses the area in a north-south direction through McCreary, Whitley, Laurel, and Pulaski counties. Clinton, Russell, Wayne, and most of Pulaski County are west of the National Forest, are moderately hilly, and include Lake Cumberland. Local agriculture has historically been dominated by a large number of small farms. Since 1950, eight of the nine counties have

been among the lower income nonmetro counties in the United States.

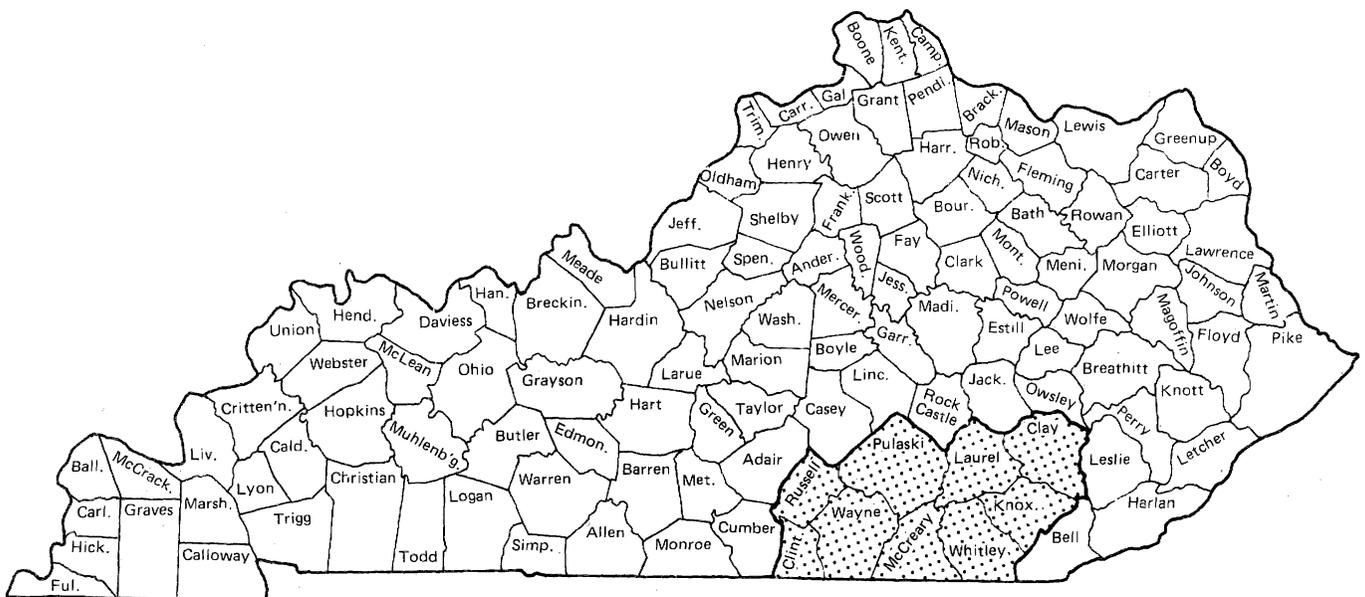
About 226,800 people resided in the area in 1980 (38). The area has experienced a nearly 30-percent population growth since 1970, more than 2.5 times the national population growth rate for the decade. In contrast, during the sixties, the study area lost about 2 percent of its population. The population resides in small towns and in the open country. Somerset, with 11,000 residents, is the largest town. The nearest metro areas—Knoxville, Tenn., and Lexington, Ky.—are about 80 miles away.

Total employment in the area increased 44 percent between 1970 and 1979 (40). Industries with the largest employment growth in the seventies were manufacturing, wholesale-retail trade, mining, and services. Although the service sector has grown considerably, the local economy still depends heavily on manufacturing.

Survey Design

The survey design differs greatly from those used in previous studies. In previous studies, one could not trace employment and income growth directly from employers that created jobs to the individuals they

Nine-County Kentucky Study Site



employed. The survey design in this study assured a direct link between the employing unit and workers and their households. This linkage necessitated two surveys. The first survey focused on private establishments and public agencies that provided employment opportunities. The second survey involved households and household members who were employed in the surveyed establishments.

Both these surveys provide the most recent data available on the characteristics of rural employees linked with information about their employers. Data were collected from 1979 through the beginning of 1980, and only preliminary findings were available until 1982 (35). This report presents a more extensive analysis of the data.

The sample of employers was drawn from a list of establishments compiled from information provided by the Kentucky State Employment Security Office, telephone books, records of local governments, and other sources. To ensure a representative sample by type of unit, we stratified the list by industry type and number of workers.⁴ A sample of employers within each stratum was randomly chosen for a personal interview. To account for incompleteness of the employer list, enumerators interviewed a stratified area frame sample of establishments not on the list. Combining the two frames gave total estimates of the employer characteristics of the study area. We designed the questionnaires, administered in December of 1979 to both list and area frame businesses, to obtain private establishment and government agency data on the following: type of organization, current and 1974 employment levels, date the unit began operation in the study area, occupational structure of the unit, number of full-time and part-time employees, number of male and female employees, wages by occupation, fringe benefits, sources of new hires, and participation in public economic development and worker training programs.

An important requirement of the study was to link or cross-reference information on the characteristics of business units and government agencies (size, type, change in employment, and date established) and on the characteristics of their workers (age, sex, work experience, education, residency status, and household income). Those employers in the list frame sample were asked to provide a current list of the unit's employees.⁵ Enumerators selected a

random sample of employee names with addresses from the list and later conducted a personal interview at the employee's residence, using the household questionnaire. Hence, all employees selected for interview were linked to their employer.

The employee and household members, aged 16 years and older, were asked to provide demographic data such as age, sex, and education; current and historical employment information; residence history; and the extent of participation in selected welfare and training programs. The employer and household surveys represented a comprehensive sample of the local labor market and provided a 5-year historical perspective of the study area as it underwent rapid growth and development.⁶ We used the data linking employers and employees to answer employment distribution questions wherever appropriate.

Enumerators used an area frame sample to obtain information from those households not having an employee in one of the units that appeared on the list of establishments. These households included those where all members were unemployed, out of the labor force, employed in establishments not on the list, or employed outside the study area. The list and area establishment and household sample frames together represented the study area's entire population.

Because the data were derived from a survey rather than a census, all estimates of totals, proportions, and means in this report are subject to sampling error. Even though a given estimate differs between two or more subpopulations or variables, the differences may not be statistically significant due to sampling variation. Statements of comparison in the text are based on differences statistically significant at the 95-percent confidence level, unless otherwise noted. When there are fewer than 30 sampled establishments, households, or persons associated with a given attribute, statistical testing was not attempted. The tables show when establishment, household, and person estimates are based on fewer than 10 sample observations. Such estimates typically have extremely large standard errors and should be interpreted with care. However, for most estimates, the coefficient of variation does not exceed 15 percent. Appendix B explains the statistical tests.

⁶The survey was conducted in December 1979 and January 1980. All respondents were asked to recall data back to 1974. However, a complete picture of the area's 1974 labor market cannot be produced, as some of the establishments or individuals in the area in 1974 have gone out of business, died, or moved from the area.

⁴See appendix A for more detail on survey design and procedure.

⁵A list of employees was not obtained from establishments interviewed in the area frame part of the survey.

Study Area's Economy and People

Manufacturing was the major driving force of the area's economy, providing jobs for a third of all employed persons at the time of the survey. The trades and service sectors (private and government) developed after the manufacturing sector and were the major sources of new jobs. Most establishments were small, but a few large units accounted for over two-thirds of wage and salary jobs. Wage levels were generally well below national levels. About 20 percent of all the jobs identified in 1979 were jobs that had been added since 1974. Of these new jobs, half were in new units that began operations after 1974.

The study area's rates of population and employment growth were large during the seventies, and reverse migration flows were typical of those reported for other nonmetro areas. Most immigrants had lived in the area prior to 1965, moved away, and then returned. Females and youth particularly benefited from rapid job expansion. Major economic indicators suggest the area still has income and employment problems despite impressive employment growth rates.

The following discussion elaborates on these survey results.

Industrial Structure

Data from the establishment survey represent an estimated 4,280 private-sector establishments and 220 government units in the study area (table 1). The private-sector employment mix in the study area is similar to aggregate U.S. nonmetro employment by major industry group (27). The proportion of the area's total employment in government is also similar to that of all nonmetro areas.

Manufacturing provided more wage and salary jobs in the area than any other industrial sector, and its annual payroll exceeded that of any other sector. The manufacturing sector included plants producing apparel, textiles, wood products, primary and fabricated metal products, processed food, and electrical and nonelectrical machinery. Although manufacturing was the major economic driving force in the area, about two-thirds of total employment was in the trades, services, and government sectors.

About 75 percent of all manufacturing establishments in the area in December 1979 were operating under their current management in 1970. Only 57 percent of the trade and service units were in business at that time. This sequencing of growth parallels the stages of growth for nonmetro areas in general. Coal mining was important only at the eastern edge of the area, and agriculture was comprised mostly of small, part-time farms. Neither coal mining nor agriculture provided more than a modest amount of full-time employment. Most private-sector trade and service establishments and government units were in business to provide services to the area's businesses and people.

About 92 percent of the establishments were small, employing fewer than 20 workers. But, these small units had 32 percent of the wage and salary jobs. Thus, a few large establishments, those employing 20 or more workers, provided about 68 percent of the wage and salary jobs. Manufacturing employers were generally large, employing an average of 92 workers. Over 75 percent of the government units were small, but most of government employment was in large units—for example, public school systems and the State Highway Department's regional offices. Most employers in the private service sector were small, employing an average of about eight workers per unit.

The local area's economy offered a variety of jobs. About 9 percent were held by self-employed workers.⁷ Wage and salary jobs represented the remainder. About 15 percent of these wage and salary jobs were held by executives, managers, and administrators. These occupations were more prevalent in government units than in the private sector. Of the wage and salary jobs, 44 percent were in production and related occupations, indicating the area's manufacturing base. The rest were in technical occupations, and most were in the private service sector.⁸

Wage levels of most area establishments were below the national wage level. Wages paid full-time workers averaged \$201 per week, compared with

⁷Self-employed farmers are not included in table 1. They were surveyed only through the household survey; thus, farm operators are not included in the establishment data.

⁸See glossary for details about the specific occupations making up each aggregate group. All occupational aggregations were based on the groupings found in the 1977 Standard Occupational Classification Manual (41).

Table 1—Distribution of estimated establishments and employment, by selected characteristics, December 1979

Item	Establishments		Employment			
			Total		Wage and salary	
	Number	Percent	Number	Percent	Number	Percent
Total	4,500	100.0	53,510	100.0	48,510	100.0
Type of establishment:						
Goods-producing	550	12.2	17,870	33.4	17,260	35.6
Construction, mining	390	8.7	2,940	5.5	2,500	5.2
Manufacturing	160	3.5	14,930	27.9	14,760	30.4
Services-producing	3,730	82.9	25,580	47.8	21,190	43.7
Wholesale, retail trade	2,140	47.5	16,320	30.5	13,450	27.7
TCPU, FIRE ¹	480	10.7	3,260	6.1	2,940	6.1
Other services ²	1,110	24.7	6,000	11.2	4,800	9.9
Government ²	220	4.9	10,060	18.8	10,060	20.7
Size of establishment:						
1-19 paid employees	2,970	66.0	18,770	35.1	15,580	32.1
20 or more paid employees	350	7.8	33,100	61.9	32,930	67.9
No paid employees ²	1,180	26.2	1,640	3.0	—	—

— = Not applicable.

¹TCPU is transportation, communications, and public utilities. FIRE is finance, insurance, and real estate.

²See glossary.

the national average of \$220 per week paid by private-sector industries (42).⁹ Weekly wages differed markedly by type of establishment and by employers within the same industry. Of the employers having one or more full-time workers, 60 percent were low-wage units; 20 percent fell into the mean-wage category; and 20 percent were high-wage units (table 2).¹⁰

Across the three wage categories, full-time wage and salary jobs were distributed differently than were employers. Workers in government units tended toward the mean- and high-wage categories; workers in goods-producing industries were more

prevalent in the mean-wage group; and private service sector workers fell generally in the low-wage category. Yet, among the goods-producing employers, half the manufacturing jobs fell in the mean-wage class, whereas 65 percent of construction and mining jobs were in the high-wage group. Private service employers also displayed a large range in wages. Transportation, communications, and public utilities (TCPU) and finance, insurance, and real estate (FIRE) jobs were more prevalent in the high-wage class, whereas trade and other service jobs were concentrated in the low-wage class.

About a fifth of the wage and salary jobs (10,850) existing in 1979 were created after 1974 (table 3). About half of these new jobs were in establishments starting operations in the previous 5 years, and half were in older units. A fourth of the private-sector establishments surveyed in 1979 did not exist in 1974.¹¹ New job growth was primarily in the private

⁹Although methods used to estimate area and national wages differ, the difference was judged not serious enough to prohibit the comparison. An industry wage level for nonmetro areas is not available.

¹⁰The wage classification, low-, mean-, and high-wage refers to relative wage levels of establishments in the area only. The classification is not intended to indicate wage differences of establishments within and outside the area. Full-time employees in low-wage establishments were paid weekly wages averaging less than \$181; full-time employees in mean-wage establishments were paid average weekly wages of \$181 to \$221; and in high-wage establishments, full-time employees were paid wages averaging more than \$221 per week.

¹¹Information was collected only from employers in operation at the time of the survey. No data were obtained from employers in operation in 1974, but not in operation between 1974 and the time of the survey, or from employers starting and ending operations between 1974 and December 1979.

**Table 2—Average weekly wage levels of full-time wage and salary workers
in private-sector establishments and government units, December 1979**

Wage level ¹	Type of industry								
	Total	Goods-producing			Services-producing				Government ²
Total		Mining and construction	Manufacturing	Total	Wholesale, retail trade	TCPU and FIRE ²	Other services ³		
	Number								
Establishment ⁴	3,000	470	310	160	2,310	1,330	390	590	220
	Percent								
Low-wage (less than \$181 per week)	60.0	57.4	48.4	75.0	63.6	67.7	38.5	71.2	27.3
Mean-wage (\$181-\$221 per week)	20.3	21.3	22.6 ⁵	18.8	19.5	19.5	20.5 ⁵	18.6 ⁵	27.3
High-wage (more than \$221 per week)	19.7	21.3	29.0	6.2 ⁵	16.9	12.8	41.0	10.2 ⁵	45.4
	Number								
Full-time wage and salary workers ¹	42,040	16,940	2,280	14,660	16,480	9,910	2,620	3,950	8,620
	Percent								
Low-wage (less than \$181 per week)	38.8	34.4	20.2	36.6	55.9	59.5	26.0	66.6	14.6
Mean-wage (\$181-\$221 per week)	36.0	46.1	14.4 ⁶	51.0	23.1	22.2	32.7 ⁶	18.9 ⁶	40.9
High-wage (more than \$221 per week)	25.2	19.5	65.4	12.4 ⁶	21.0	18.3	41.3	14.5 ⁶	44.5

¹Represents workers working 30 or more hours per week.

²TCPU is transportation, communications, and public utilities; FIRE is finance, insurance, and real estate.

³See glossary.

⁴Includes only establishments with full-time wage and salary workers.

⁵Estimate based on fewer than 10 unweighted establishment observations.

⁶Estimate of workers based on fewer than 10 unweighted establishment observations.

service sector and in large units with 20 or more paid employees. About a third of the new establishments had no paid employees at the time of the survey. Self-employed owners and/or partners comprised the employment in these units.

Across all industries, 50 percent of the new job growth was in new establishments. But, 77 percent of the new jobs in the private service sector were in new units. In contrast, only 18 percent of the new employment growth in the goods-producing sector came from new establishments. Although no new government units were created after 1974, about 14 percent of the area's job growth was in the government sector. Job growth in old establishments (those operating in the area in 1974) was primarily in large units, in low- and mean-wage units, and in goods-producing units. Over half the establishments interviewed had no employment increase from 1974 to 1979.

Area Residents

Data from the surveyed households represent about 61,500 households and nearly 175,000 persons (ta-

ble 4). About 99 percent of the population was white and non-Hispanic in origin. Almost three-fourths was of labor force age; that is, 16 or more years old. The age structure of the area closely resembled that of the Nation and of Kentucky.

Most of the adult population were long-term residents; that is, they had lived in the area continuously since 1964. About 25 percent of the adult population moved to the area after January 1, 1965; over 50 percent of these moved in after January 1, 1975. About 70 percent of all immigrants were return migrants; that is, they had lived in the area sometime prior to 1965, moved away, and then returned after 1965.

Household size in the nine-county area averaged 2.8 persons, similar to that for all nonmetro areas. Households averaged 1.1 income earners, which was below the national average of 1.6 (39). The mean household income in 1979 was about \$12,000, over \$5,000 less than that for all U.S. nonmetro households (37). About 28 percent of households surveyed were classed as poor in 1979, considerably higher than the 13.6-percent level for all U.S. non-

Table 3—Employment change, by selected establishment characteristics, 1974–79

Characteristic in 1979	New jobs since 1974 ¹	Employment change by:		
		New establishments, 1974–79	Establishments increasing employment, 1974–79	Establishments decreasing or not changing employment, 1974–79
Number				
Total wage and salary jobs	10,850	5,330	7,560	- 2,040
Jobs in—				
Establishments by wage category: ²				
Low-wage	5,850	3,580	2,990	- 720
Mean-wage	3,250	860	2,650	- 260
High-wage	1,780	820	1,830	- 870
No full-time workers	- 30	70	90	- 190
Establishments by type:				
Goods-producing ³	3,200	590	3,490	- 880
Services-producing ³	6,170	4,740	2,330	- 900
Government ³	1,480	0	1,740	- 260
Establishments with:				
1–19 paid employees	3,450	2,460	1,730	- 740
20 or more paid employees	7,490	2,870 ⁴	5,830	- 1,210
No paid employees ³	- 90	—	—	- 90

— = Not applicable.

¹Employment for 1974 and 1979 is based on establishments in the study area during December 1979, but excludes the 530 ongoing establishments starting under new management or new ownership during the 1975–79 period, for which 1974 employment data are not available (see table 5). ²Based on average wages paid to full-time workers working 30 hours or more per week. ³See glossary. ⁴Estimate based on fewer than 10 unweighted establishment observations.

metro areas in 1979 (36).¹² The below-average number of income earners per household probably contributed to the relatively low household income level.

Slightly over half of the January 1980 adult population was in the labor force, either working or looking for work (table 5). The balance had no direct attachment to the labor force. Most of the employed worked at jobs within the nine-county area. Only 3,700 persons, or 6.3 percent of the employed, commuted to jobs outside the area. Males in the study area had a much higher labor force participation rate than females, but both male and female labor force participation was below the rate for all nonmetro males and females (27). Most employed persons were single job holders and were employed as wage and salary workers. Only 10 percent of the

employed listed farming as either a primary or a secondary job, and only 7 percent were classed as multiple job holders at the time of the survey.

About 20,700 persons were recent entrants to the labor force; that is, they were employed sometime in 1979, but they were not in the labor force in 1974. The majority of these recent entrants were females and youth.¹³ Recent female entrants were older than recent male entrants. Most males entering the labor force had just reached working age or had just finished school. The rapid entry of females into the area's labor force parallels that observed in other nonmetro areas during the seventies (27).

About 11 percent of the labor force in the nine-county area was unemployed, a rate higher than in all nonmetro areas (27). The unemployment rate was about

¹²We used the Bureau of the Census' standard poverty thresholds for 1979 to determine the poverty status of the surveyed households.

¹³Youth were defined as those adults 16–24 years of age at the time of the survey.

Table 4—Study area population, January 1980

Item	Unit	Amount
Estimated total persons	Number	174,930
Persons, by years of age:		
Under 6	Percent	8.7
6-10	do.	8.9
11-15	do.	8.5
16-24	do.	14.7
25-34	do.	15.4
35-54	do.	21.6
55-64	do.	9.7
65 and over	do.	12.5
Adult population, 16 years and older	Number	129,280
Residency status: ¹		
Long-term resident	do.	95,220
Immigrant	do.	34,060
Early immigrant	Percent	48.8
Recent immigrant	do.	51.2
Return immigrant	do.	71.0
New immigrant	do.	29.0
Estimated households	Number	61,520
Mean household income	Dollars	11,980
Mean per capita household income ²	do.	4,840

¹See glossary for distinctions based on residency status.

²Total household income divided by number of members in the household at time of the survey.

the same for both males and females. However, the unemployment rate among recent immigrants was twice that of long-term residents, suggesting that some recent immigrants had not totally adjusted to the area's labor market situation.

Employment Growth

The area's service establishments provided nearly twice as many new jobs as goods-producing establishments between 1974 and 1979. The public sector added 14 percent of the new jobs after 1974. Thus, the Kentucky area appears to follow the national trend toward a service-oriented economy.

Survey results provided three major insights on the nature of employers creating jobs in the nine-county Kentucky area over the 5-year period. First, only 40

Table 5—Labor force status of adult population, January 1980

Item	Unit	Amount
Adult population	Number	129,280
Labor force	do.	65,950
Employed ¹	do.	58,620
Unemployed	do.	7,330
Not in labor force	do.	63,330
Labor force participation rate	Percent	51.0
Unemployment rate	do.	11.1
Males	Number	62,380
Labor force	do.	41,620
Employed ¹	do.	36,930
Unemployed	do.	4,690
Not in labor force	do.	20,760
Labor force participation rate	Percent	66.7
Unemployment rate	do.	11.3
Females	Number	66,900
Labor force	do.	24,330
Employed ¹	do.	21,690
Unemployed	do.	2,640
Not in labor force	do.	42,570
Labor force participation rate	Percent	36.4
Unemployment rate	do.	10.9

¹Employed is equivalent to the number of employed individuals estimated from the household survey, as opposed to the number of jobs estimated from the establishment survey.

percent of the area's employers contributed to job expansion. Establishments expanding employment were generally in the private service sector, had less than 20 paid employees, and paid relatively low wages. However, large establishments provided most of the new jobs.

Second, half the new jobs created were provided by new establishments and half were provided by ongoing units. New and ongoing units differed both in the characteristics of the employer and in the types of jobs offered. Most new establishments were in the private service sector, had few employees, and paid full-time workers relatively low wages. These new units relied heavily on part-time employment and provided proportionally more employment in technical, marketing, sales, clerical, and service occupations. By contrast, job opportunities in expanding ongoing units were in larger units that hired

primarily full-time workers and engaged in goods production.

Finally, branch establishments with headquarters outside the study area created about a third of all new jobs, a proportion close to their share of total employment. Although no single large firm dominated the manufacturing sector, the manufacturing sector could be most affected by decisions regarding employment levels and plant location that firms headquartered outside the area made.

The following discussion elaborates on these survey results.

Sources and Distribution of New Jobs

Generating jobs has been called the heart of development in rural areas (34). However, neither the process by which jobs are created nor the types of establishments which create job opportunities are well documented (6). Several studies have used aggregate firm or establishment data to identify sources of employment growth by employment size, age of firm, and ownership structure by industry (1, 6). Results from these studies are inconclusive on the types of establishments that create jobs (7).

New and expanding establishments were sources of new jobs in the study area. These two sources of new employment were offset by establishment contractions and closings. As this process netted new jobs, it created employment opportunities both for new labor force entrants and for workers displaced from contracting, moving, or dying units.

Establishment age and employment growth varied considerably among the surveyed units. Some establishments had started operations in the area for the first time after 1974; others were in business in 1974 and had employment increases; and others in business in 1974 either did not change or declined in employment. At least one other study found that the life cycle of many firms starts with only a few employees, increases employment as the firm ages, and then enters a stable employment period (6). In this latter stage, mature firms do not contribute much to an area's employment growth.

About 20 percent of the establishments in the study area were new; that is, they started local operations between 1974 and 1979 (table 6). Most new units were in the private service sector. The new

units employed fewer than 20 workers or had no paid employees. Those new establishments with wage and salary employees paid their full-time workers low wages compared with other area employers. Another 20 percent of the area's establishments were in business in 1974, and they showed employment gains between 1974 and 1979. Most of these expanding units were also in the private service sector. About 12 percent of all establishments could not provide information on their operations in 1974; thus, their contribution to job growth could not be assessed. The remaining 48 percent were in business in 1974, but employment either did not change or declined. The vast majority of this last group reported no employment change between 1974 and 1979.

Other research has shown that new establishments are not solely responsible for job creation and that public policy should not overlook the contribution of ongoing units to employment growth (16). The results of the Kentucky study support this conclusion. The net increase in the number of jobs was about equally divided between new and ongoing establishments (table 3).¹⁴

Over half the new jobs were added in the private service sector. For each new job added in goods-producing industries, about two were added in service establishments. The dramatic increase in new service sector jobs reflects changes in the Nation and in nonmetro areas in general (27). Manufacturing growth in the area in the sixties may have peaked in the middle and late seventies. As the export-oriented manufacturing base grew in the sixties and seventies, the service sector expanded in response to demand from manufacturing firms and demand for services from a growing population. Manufacturing still seems the major growth stimulus, but the study area may follow the national trend toward a service-oriented economy (12).

There is major controversy among industry analysts over the relative contribution of small and large firms to job creation (1, 6). In the Kentucky study area, establishments with 20 or more employees accounted for only 8 percent of the total units, but had about 62 percent of the area's nonfarm employ-

¹⁴The survey results would not permit a complete analysis of net job creation because information on establishment deaths was not available. In addition, managers of those 530 establishments which had come under new ownership or management were uncertain of their establishment's employment in 1974.

Table 6—Establishments, by selected characteristics, 1979

Characteristic	Establishments	New establishments, 1974-79	Establishments increasing employment, 1974-79	Establishments decreasing or not changing employment, 1974-79	Establishments for which 1974 information was not available ¹
			Number		
Total	4,500	890	890	2,190	530
			Percent		
Wage category of establishment: ²					
Low-wage	40.0	37.1	46.1	38.8	39.6
Mean-wage	13.6	11.2	24.7	11.0	9.4 ³
High-wage	13.1	9.0	20.2	13.7	5.7 ³
No full-time workers	33.3	42.7	9.0	36.5	45.3
Type of establishment:					
Goods-producing ⁴	12.2	10.1	16.9	12.3	5.7 ³
Services-producing ⁴	82.9	89.9	71.9	82.2	94.3
Government ⁴	4.9	0	11.2	5.5	0
Size of establishment in 1979:					
1-19 paid employees	66.0	56.2	83.1	62.6	67.9
20 or more paid employees	7.8	7.9 ³	16.9	5.9	0
No paid employees ⁴	26.2	35.9	0	31.5	32.1

¹These establishments changed ownership or management between 1974 and 1979. The 1974 employment was not available for these establishments. ²Based on average wages paid to full-time workers working 30 or more hours per week. ³Estimate based on fewer than 10 unweighted establishment observations. ⁴See glossary.

ment. These same large establishments contributed about 70 percent of the new jobs during 1974-79. Although large establishments created most of the new jobs, they added new jobs in about the same proportion as their share of employment. This result is similar to the conclusion of the study by Armington and others (1) and contrasts with that by Birch (6) who found that small establishments account for nearly two-thirds of all new employment even though small units account for less than one-third of total employment.

The survey results show that new establishments were important in job creation and that most jobs in the new units were in the private-service sector. The type of jobs created is also an important element in the economic development process. Because the type of job is not only important to the vitality of the local economy but also to the economic well-being of the work force, we compared the characteristics of workers and jobs in new and ongoing establishments to determine whether significant differences existed.

The attributes of the new and ongoing establishments include occupations, wage levels, full- and part-time workers, employment size, and distribution of employees by sex (table 7). Compared with ongoing establishments, new units—particularly the new service establishments—offered proportionately more job opportunities for part-time employment and for employment in technical, marketing, sales, clerical, and service occupations. Wages paid to workers in these occupations were also significantly lower in the new establishments. The average weekly wages paid workers in production and related occupations were significantly higher in new establishments than in ongoing units, but the ongoing units had a significantly larger share of their employment in production-type jobs. The average weekly wage of all full-time workers did not differ significantly between new and ongoing establishments. Jobs offered in ongoing units which expanded employment during the 1974-79 period were primarily full-time, predominantly in large units and in units engaged in goods production. About half the jobs in ongoing expanding units were in production occupations.

Table 7—Selected characteristics of wage and salary workers in new and ongoing establishments, 1979

Item ¹	All establishments	New establishments	Ongoing establishments	
			Expanding employment	Not expanding employment ²
			<i>Number</i>	
Total wage and salary workers	48,510	5,330	27,940	15,240
			<i>Percent</i>	
Male	53.4	49.5	49.6	62.8
Female	46.6	50.5	50.4	38.2
Full-time workers	86.7	59.1	91.6	87.4
Part-time workers	13.3	40.9	8.4	12.6
Wage and salary workers in establishments with:				
1-19 paid employees	32.1	46.2	18.9	51.4
20 or more paid employees	67.9	53.8 ³	81.1	48.6
Wage and salary workers in:				
Goods-producing establishments	35.6	11.1	46.3	24.5
Services-producing establishments	43.7	88.9	28.2	56.3
Government	20.7	0	25.5	19.2
Wage and salary workers by occupation:				
Executive, administrative, managerial, professional	15.7	7.9	18.7	13.0
Technical, marketing, sales, clerical, service	40.8	66.4	33.0	46.1
Production and related occupations	43.5	25.7	48.3	40.9
			<i>Dollars</i>	
Average weekly wage of all establishments ⁴	201	183	207	194
Average weekly wage, by occupation: ⁴				
Executive, administrative, managerial, professional	298	268 ³	298	308
Technical, marketing, sales, clerical, service	155	130	162	163
Production and related occupations	197	231	199	196

¹See glossary for definitions. ²Includes 530 establishments with new management or ownership between 1975 and 1979.

³Estimate based on fewer than 10 unweighted establishment observations. ⁴Based on wages received by full-time workers in private-sector establishments and government units.

The new establishments, which were primarily service-oriented, relied heavily on part-time employment. This feature gave the new units greater flexibility in responding to changing economic conditions, but it also meant that workers tended to work fewer hours per week compared with workers in ongoing

units. Thus, a large proportion of all employees in new establishments had reduced average weekly wages.¹⁵

¹⁵Average weekly wage data are available only for full-time workers.

Total nonfarm employment in the services-producing establishments did not differ significantly from employment in the goods-producing industries in 1979, but the service units provided nearly twice as many new jobs as the goods-producing sector between 1974 and 1979. This trend toward a service-oriented economy is similar to the nationwide trend. Governments provided about 20 percent of total employment in 1979, but this sector added less than 15 percent of the new jobs since 1974.

Influence of Multiestablishment Firms

Branch units of multiestablishment firms employ a significant part of the labor force in several nonmetro areas, and they play an important role in creating jobs (6, 13). Multiestablishment firms interest policy officials partly because they supply many of the jobs in nonmetro areas. Officials are concerned that the absentee owners of branch establishments seem more likely to move from areas with less regard for community welfare than do owners of locally owned plants, particularly when economic conditions warrant such a move (2). Smith and Summers point out that: "While this speaks well for the superior organizational longevity of multiple location firms, it also points to the limited ability of the local community to control or influence decisions made by absentee owners of industry that influence longevity and stability of branch plants" (29).

Branch units with headquarters outside the Kentucky study area accounted for over 40 percent of private-sector employment, but no single firm dominated the economy (table 8). However, branch units in the goods-producing sector with headquarters outside the study area were the most vulnerable to employment decisions by outside groups. These establishments had 66 percent of the total employment in the goods-producing sector.¹⁶ In comparison, only 23 percent of those employed in the private service sector worked for multiestablishment firms with headquarters outside the study area.

The manufacturing sector in the study area appears susceptible to decisions about employment and plant location made at headquarter locations outside the area. Because the service sector has developed primarily to provide services to local firms and population, major changes in employment by a few large

manufacturing firms can affect the overall economy. But, because there are many large multiestablishment employers in the area, the decisions of a single multiestablishment firm will likely have much less impact on the local economy than it would if it were the only large employer in the area.

Branch establishments are usually the largest employers in nonmetro areas. Thus, if local leaders can attract such a branch establishment to their community, job opportunities grow much faster than if a single-establishment firm opens. However, the area's economy will likely depend more on decisions made outside the local area regarding employment. Of the establishments surveyed in the study area, single units had about 6 employees per firm, whereas branch units with headquarters outside the area averaged 42 employees. The difference is even greater if one makes a similar comparison by industry. Each multiestablishment branch averaged 229 employees in the goods-producing industries and nearly 14 employees in the service sector. Single-establishment firms employed an average of only 9 employees and 4.5 employees in the goods-producing and service sectors, respectively. Both branch establishments and single establishment firms were important contributors to the area's employment growth. Branch units of firms with headquarters outside the Kentucky study area were estimated to have created about a third of all new jobs, roughly corresponding to their share of total employment in the area.

Employed Workers

The area's long-term residents were able to find employment at about the same rate as were immigrants. However, early immigrants had higher average wages than did either long-term residents or recent immigrants. Proportionately more long-term residents than immigrants were employed in low-wage establishments. Relatively more immigrants held jobs in mean-wage units, but neither residency group had a job advantage in high-wage establishments. There was no significant difference in the rate at which long-term residents and immigrants were employed in new establishments, but immigrants were employed at a greater rate than long-term residents in growth establishments.

Women, youth, and persons with little labor force experience (recent entrants) were able to take advantage of job growth in the area. Women held

¹⁶The survey did not provide information on actual establishment closings. Therefore, we could not compare the relative rate of closings of establishments with headquarters outside the area.

Table 8—Estimated number of private-sector establishments and employment, by location of headquarters, 1979

Type of establishment	Total		Type of industry			
			Goods-producing		Services-producing	
	Establishments	Employment	Establishments	Employment	Establishments	Employment
	Number					
All private-sector establishments	4,280	38,450	570	17,270	3,710	21,180
	Percent					
Single establishments	85.8	49.3	84.2	26.1	86.0	68.2
Multiestablishments	14.2	50.7	15.8	73.9	14.0	31.8
Headquarters in area	5.1	8.3	7.0 ¹	7.6 ¹	4.9	8.9
Headquarters not in area	9.1	42.4	8.8	66.3	9.1	22.9

¹Estimate based on fewer than 10 unweighted establishment observations.

more professional jobs (for example, teachers) in the public sector whereas men more often held executive or administrative positions. Few women held jobs in mining and construction, but over half the production jobs were filled by women. Women wage workers were more likely than men to hold part-time jobs, and their average weekly earnings were substantially lower. Youth in the study area tended to hold lower paying jobs and were more likely to work part-time than were older workers. Recent entrants were primarily youth and women, and they were concentrated in technical, marketing, sales, clerical, and service occupations. These occupations corresponded to the job opportunities created by the area's new and expanding service-producing industries.

Discussions about the relative merit of policies designed to stimulate rural employment growth often focus on the question of who benefits from industrial growth in rural areas (24, 26, 29, 32, 34). Understanding who benefits involves examining how jobs are distributed among the population subgroups. The following discussion focuses on five specific subgroups in the Kentucky study area: long-term residents, women, youth, elderly, and recent entrants to the labor force.

Residency Status

Debate on rural development suggests that immigrants, because of better training, skills, and educa-

tion, have an advantage over long-term residents in the local labor market (4, 5, 15, 21, 24, 28, 29, 30). This means that immigrants compete more successfully for jobs, take the higher wage and more desirable jobs, and leave the less desirable jobs to long-term residents. This conclusion implies that rural development benefits immigrants more than long-term residents.

The survey data suggest that this conclusion does not hold for the nine-county Kentucky study area. Long-term residents were able to compete with immigrants for jobs. This finding parallels that of Olsen and Kuehn who found that immigrants competed on a limited scale with local residents for jobs in four industrializing rural areas (24). Persons moving to the Kentucky area after 1964 (defined as immigrants) comprised about 28 percent of those employed in January 1980, about the same proportion as in the total adult population (table 9). And, the rate at which adult long-term residents were employed did not differ significantly from the employment rate for immigrants (table 10). Recent immigrants had a higher labor force participation rate than did long-term residents, but they also had the highest unemployment rate of the three residency groups. Thus, recent immigrants in the labor force had the most difficulty finding employment.

Long-term residents successfully competed for jobs despite certain comparative advantages of immigrants. The educational level attained by immigrant

Table 9—Employment status of the adult population, by residency status, January 1980

Residency status	Adult population	Employment status		
		Employed	Unemployed	Out of labor force
		Number		
All residents	129,280	58,620	7,330	63,330
		Percent		
Long-term residents	73.7	72.0	58.3	76.9
All immigrants	26.3	28.0	41.7	23.1
Early immigrants	12.8	13.4	13.0	12.4
Recent immigrants	13.5	14.6	28.7	10.7

workers surpassed that of long-term residents, a finding which parallels that observed in other non-metro areas (4, 24). More immigrants than long-term residents had some college training, particularly advanced college training beyond the 4 years usually required for a bachelor's degree.¹⁷ More immigrant workers than long-term resident workers had also participated in recent formal job training programs sponsored by a school, the military, or any special private-sector or government-sponsored program.

Educational attainment was associated with some comparative advantages for immigrants over long-term residents in the types of jobs held. The proportion of recent immigrants, but not early immigrants, holding higher status executive and related occupations was significantly higher than that for long-term residents (table 10).¹⁸ However, residency had no effect on employment in technical and production occupations. The proportion of workers in technical and production occupations did not differ significantly among residency groups.

The apparent advantages of recent immigrants in obtaining executive and related jobs did not necessarily result in higher average weekly wages for recent immigrants relative to long-term residents. Only the average weekly wages of early immigrant work-

ers were significantly higher than those of long-term residents. Many early immigrants may have held more of the higher salaried jobs because they moved to the area specifically to take managerial and supervisory jobs at a time of rapid expansion in both new manufacturing and other establishments. Over one-third of the manufacturing establishments and 30 percent of the other units began operations under current management between 1965 and 1974.

Although recent immigrant workers had more training and higher levels of education than did long-term resident workers, their average weekly earnings neither exceeded those of long-term resident workers nor did they match the earnings of early immigrants. Perhaps some recent immigrants had less time to advance in their work than did early immigrants. Some recent immigrants were willing to accept lower wages in the nine-county area than they received for jobs they had before moving to the area. About 20 percent of the recent immigrants received lower weekly wages upon moving to the nine-county area, which suggests that for some immigrants the nonmonetary benefits of the area outweighed shortrun monetary expectations.

Establishment Types By Workers' Residency Status

The survey sampling procedures permitted some worker data collected through the household survey to be directly matched or linked with employer information collected through the establishment survey. The linked sample represents 42,050 workers who were employed 1 or more weeks in 1979; 41,370 linked workers worked for wages and salaries, and the balance were self-employed owner-operators

¹⁷Average years of education between long-term residents and both immigrant residency groups differed significantly at the 95-percent level (table 10). Long-term residents lived continuously in the area between December 31, 1964, and January 1980; early immigrants moved to the area between January 1, 1965, and December 31, 1974; and recent immigrants moved to the area between January 1, 1975; and January 1980.

¹⁸See glossary for more details about specific occupations associated with the three aggregated groups defined for this study.

Table 10—Selected characteristics of adult population, by residency status, January 1980

Characteristic	Total	Residency status			
		Long-term residents	All immigrants	Early immigrants	Recent immigrants
		<i>Number</i>			
Adult population	129,280	95,220	34,060	16,610	17,450
		<i>Percent</i>			
Labor force participation rate	51.0	48.8	57.1	52.9	61.2
Employment rate	45.3	44.3	48.2	47.1	49.1
Unemployment rate ¹	11.1	9.2	15.7	10.8	19.8
		<i>Number</i>			
Employed persons	58,620	42,220	16,400	7,830	8,570
		<i>Percent</i>			
Major occupation:					
Executive, administrative, managerial, professional	14.8	13.1	19.2	17.4	20.9
Technical, marketing, sales, clerical, service	44.1	45.6	40.3	42.8	38.0
Production and related occupations	41.1	41.3	40.5	39.8	41.1
		<i>Years</i>			
Average age	38.0	39.5	34.1	37.3	31.2
Average education	11.4	11.1	12.2	12.2	12.2
		<i>Dollars</i>			
Average weekly earnings, 1979 ²	209	200	232	263	206

¹Percentage of the labor force unemployed.

²Based on earnings of full-time wage and salary workers.

(table 11). We use the term "linked worker" when referring to data from the linked sample. About 73 percent of the linked wage and salary workers were long-term residents. This percentage did not differ significantly from the percentage of long-term residents employed in wage and salary positions 1 or more weeks during 1979.

The distribution of linked workers based on their residency status varied mainly by the employer's wage level and employment change category (table 11). Proportionately more long-term residents than immigrants were employed in low-wage establishments. Among the mean-wage industries, proportionately more jobs were held by immigrants than long-term residents. However, the proportions of linked long-

term resident workers and linked immigrant workers holding jobs in high-wage units did not differ significantly.

The wage level of establishments was related to their predominant occupations. Low-wage units characteristically had a high proportion of employees in technical, marketing, sales, and service positions. Low-wage units with linked workers had 47 percent of their wage and salary employees within one or more of these occupations compared with only 32 percent for the mean-wage and 26 percent for the high-wage establishments. The percentage of executive, managerial, and professional jobs increased proportionally as the employer's wage level increased. In the low-wage establishments,

Table 11—Selected characteristics of linked wage and salary workers, by residency status, 1979¹

Characteristic	Total	Residency status	
		Long-term residents	All immigrants ²
		Number	
Total linked workers	41,370	30,400	10,970
		Percent	
Establishment characteristics:			
Wage category—			
Low-wage	36.5	39.5	28.1
Mean-wage	35.4	32.9	42.4
High-wage	28.1	27.6	29.5
Type—			
Goods-producing	35.6	36.1	34.3
Services-producing	38.2	38.5	37.3
Government	26.2	25.4	28.4
Size—			
1-19 paid employees	39.4	40.8	35.5
20 or more paid employees	60.6	59.2	64.5
Employment change, 1974-79—			
New establishments			
Growth establishments ³	8.9	9.2	7.9
No-growth establishments ³	62.8	58.2	75.8
Growth establishments ³			
No-growth establishments ³	28.3	32.6	16.3

¹Wage and salary workers sampled from the employment roles of the surveyed establishments.

²There were less than 30 early and recent immigrant observations for most of the establishment characteristics.

³Represents private and public ongoing establishments.

these higher status occupations accounted for only 8 percent of all wage and salary jobs. This proportion increased to 19 percent in the mean-wage units and to 34 percent in the high-wage establishments.¹⁹

Long-term residents were able to obtain jobs both in new establishments and in those expanding their work force between 1974 and 1979, partly because many long-term residents entered the labor force between 1974 and 1979. There was no significant difference in the rate at which long-term residents and

immigrants were employed in new units, but the percentage of immigrants employed in growth establishments was significantly greater than that of long-term residents (table 11).

Immigrant linked workers had no comparative advantage over long-term resident linked workers regarding jobs by type of industry or size of establishment (table 11).²⁰ However, occupational structure and wage levels varied considerably among establishments within each broad industry type. Thus, employer wage levels may be more important in indicating the economic impact on the local economy and its people than is the type of industry, when one assesses the benefits from employment growth.

Female Workers

One of the most significant changes that occurred in the nonmetro labor force during the sixties and seventies was the increased participation of women. At the national level, women accounted for almost 90 percent of nonmetro employment growth between 1960 and 1970 (10). Between 1973 and 1979, increases in female employment accounted for about 60 percent of the increase in employment in U.S. nonmetro areas (27). Much of the growth in jobs held by women was in low-paying occupations such as clerical and service work. The extent to which women in the nine-county Kentucky area participated in the labor force and benefited from employment growth over the 1974-79 period is important in this research.

Women constituted 37 percent of total employment in January 1980. Their labor force participation rate was 36 percent, substantially below that for males in the study area and below the average for all nonmetro areas (27). The study area's employed females had more years of education and were younger than male workers. Migrancy status had no differential effect on the employment rate of males or females (table 12).

The proportions of men and women workers in executive, administrative, managerial, and professional occupations did not differ significantly. Within that

¹⁹The proportion of executive occupations differed significantly among each employer's wage level.

²⁰Proportions of workers in each residency group (long-term, early immigrant, recent immigrant) did not differ significantly by each type of industry (goods-producing, services-producing, government) and size of establishment.

Table 12—Selected characteristics of workers, by sex, January 1980

Characteristic	Total	Male	Female
	Number		
Total adult population	129,280	62,380	66,900
	Percent		
Labor force participation rate	51.0	66.7	36.4
Employment rate	45.3	59.2	32.4
Unemployment rate ¹	11.1	11.3	10.9
	Number		
Employed persons	58,620	36,930	21,690
	Percent		
Residency status:			
Long-term resident	72.0	71.5	72.9
Early immigrant	13.4	13.8	12.6
Recent immigrant	14.6	14.7	14.5
Wage workers working:			
Full-time ²	73.0	69.6	78.8
Part-time	9.7	6.5	15.2
Self-employed workers	17.3	23.9	6.0
Major occupation:			
Executive, administrative, managerial, professional	14.8	13.3	17.2
Technical, marketing, sales, clerical, service	44.1	34.3	60.9
Production and related occupations	41.1	52.4	21.9
	Years		
Average age	38.0	38.7	36.9
Average education	11.4	11.0	12.1
	Dollars		
Average weekly earnings 1979 ³	209	231	158

¹Percentage of the labor force unemployed.²Worked 30 hours or more per week.³Based on earnings of full-time wage and salary workers.

group, however, men were more likely to hold executive, managerial, and administrative positions, whereas women were more likely to have professional positions (teacher, nurse, or social worker). Women were more likely than men to be employed in technical, sales, clerical, and service occupations. By contrast, male workers were more prevalent in production-related occupations. Women were less likely to be self-employed and, among wage workers, were more likely to work part-time. Men's average earnings exceeded women's by \$73 per week. This partly reflects the fact that women tended to hold lower skilled jobs than did men.

There were significant differences between males and females among some industry characteristics, based on the linked worker sample (table 13). Women were less likely to be employed in high-wage establishments, goods-producing units, and units with fewer than 20 employees. The proportion of men and women employed in low-wage establishments and in government agencies did not differ significantly.

Women in the public sector held more of the professional jobs, whereas men were more often executives or administrators. Public school systems were a major employer of women, who held most of the teaching jobs. Among the goods-producing industries, women held few, if any, jobs in mining and construction industries. Yet, among the area's manufacturing establishments, over half the production occupations were filled by women. Many of these women were employed in apparel and textile manufacturing establishments. The private service sector

Table 13—Selected characteristics of linked wage and salary workers, by worker's sex, 1979

Characteristic	Total	Male	Female
	Number		
Total linked workers ¹	41,370	25,320	16,050
	Percent		
Establishment characteristics:			
Wage category—			
Low-wage	36.5	36.5	36.5
Mean-wage	35.4	32.0	40.8
High-wage	28.1	31.5	22.7
Type—			
Goods-producing	35.6	41.2	26.7
Services-producing	38.2	34.5	44.0
Government	26.2	24.3	29.3
Size—			
1-19 paid employees	39.4	41.9	35.3
20 or more paid employees	60.6	58.1	64.7
Employment change, 1974-79—			
New establishments	8.9	10.1	6.9
Growth establishments ²	62.8	58.1	70.3
No-growth establishments ²	28.3	31.8	22.8

¹Wage and salary workers sampled from the employment roles of the surveyed establishments.²Represents private and public ongoing establishments.

contained many clerical and service jobs typically held by women. Although men were significantly less likely than women to hold jobs in the private service sector, the relatively large number of men in this sector suggests that growth in services does expand job opportunities for both men and women.

Among the linked workers, a higher proportion of employed women were working for new and expanding establishments. This finding suggests that women were able to take advantage of job growth in the area.

Youth

Labor market problems of youth in metro and non-metro areas center around high levels of unemployment and low-paying, unstable employment (23). Unemployment of nonmetro youth is substantially higher than that of the whole nonmetro labor force, and youth employment is skewed toward lower status occupations. For those rural areas experiencing outmigration, youth have typically been the most likely to leave.

About 52 percent of the youth population (persons 16-24 years old in January 1980) were in the labor force in the nine-county area. This rate is substantially below 68 percent, the rate for youth in all U.S. nonmetro areas (23). Of the youth in the labor force, about 80 percent were employed, a rate below that for all U.S. nonmetro areas. The vast majority of employed youth were wage workers, and they were more likely to hold part-time jobs than were workers 25 years old and over. Youth were employed almost exclusively in technical and production occupations. Within these broad occupational groups, youth held the lower paying jobs as evidenced by their substantially lower average weekly earnings relative to workers 25 years old and over (table 14).

Youth linked workers were most frequently employed in low-wage establishments and private services-producing units (table 15). Youth held fewer jobs in the government sector than did workers 25 years old and over. Most of youth workers were employed in new and existing establishments that expanded employment opportunities in the area. The proportion of youth employed in these units was consistent with the proportion of youth in the work force. This finding suggests that youth did participate in the area's employment growth.

**Table 14—Selected characteristics of youth,
January 1980**

Characteristic	Total	Age	
		16-24 years	25 years and over
		Number	
Total adult population	129,280	25,750	103,530
		Percent	
Labor force participation rate	51.0	52.5	50.6
Employment rate	45.3	42.4	46.1
Unemployment rate ¹	11.1	19.4	9.0
		Number	
Employed persons	58,620	10,910	47,710
		Percent	
Residency status:			
Long-term resident	72.0	73.6	71.7
Early immigrant	13.4	2.4 ²	15.9
Recent immigrant	14.6	24.0	12.4
Wage workers working:			
Full-time ³	73.0	76.2	72.2
Part-time	9.7	18.0	7.9
Self-employed workers	17.3	5.8 ²	19.9
Major occupation:			
Executive, administrative, managerial, professional	14.8	5.3	16.9
Technical, marketing, sales, clerical, service	44.1	52.5	42.2
Production and related occupations	41.1	42.2	40.9
		Years	
Average age	38.0	21.2	41.8
Average education	11.4	11.9	11.3
		Dollars	
Average weekly earnings, 1979 ⁴	209	159	221

¹Percentage of the labor force unemployed.

²Estimate based on fewer than 10 unweighted observations.

³Worked 30 hours or more per week.

⁴Based on earnings of full-time wage and salary workers.

Older Workers

About 37 percent of the area's adult population was 50 years of age and older. The labor force participation rate for older persons was 28 percent, less than half that for younger adults (table 16). Over 90

Table 15—Selected characteristics of linked wage and salary youth workers, 1979

Characteristic	Total	Age	
		16-24 years	25 years and older
		Number	
Total linked workers ¹	41,370	7,400	33,970
		Percent	
Establishment characteristics:			
Wage category—			
Low-wage	36.5	47.0	34.1
Mean-wage	35.4	36.1	35.3
High-wage	28.1	16.9	30.6
Type—			
Goods-producing	35.6	33.8	36.0
Services-producing	38.2	49.7	35.7
Government	26.2	16.5	28.3
Size—			
1-19 paid employees	39.4	47.8	37.5
20 or more paid employees	60.6	52.2	62.5
Employment change, 1974-79—			
New establishments	8.9	14.9	7.5
Growth establishments ²	62.8	64.8	62.4
No-growth establishments ²	28.3	20.3	30.1

¹Wage and salary workers sampled from the employment roles of the surveyed establishments.

²Represents private and public ongoing establishments.

percent of all older workers were long-term residents. Of the self-employed, 44 percent were older workers, twice the proportion of older workers among the total employed. Older workers were less likely than other wage workers to work full-time. Older workers were more likely to be in technical occupations, but younger workers were more likely to be in production occupations. However, the percentage of younger and older workers in executive occupations did not differ significantly. Finally, the average weekly earnings of the younger and older full-time workers did not differ significantly.

Among linked employees, older workers were more likely than younger workers to be employed in government units and in no-growth establishments (table 17). Few older workers were employed in new units, but over half the older workers worked in

Table 16—Selected characteristics of older persons, January 1980

Item	Total	Age	
		Less than 50 years	50 years and over
		Number	
Adult population	129,280	81,130	48,150
		Percent	
Labor force participation			
rate	51.0	64.5	28.3
Employment rate	45.3	56.1	27.2
Unemployment rate ¹	11.1	13.1	3.9 ²
		Number	
Employed persons	58,620	45,540	13,080
		Percent	
Residency status:			
Long-term resident	72.0	66.0	92.9
Early immigrant	13.4	16.0	4.2 ²
Recent immigrant	14.6	18.0	2.9 ²
Wage workers working:			
Full-time ³	73.0	78.5	53.7
Part-time	9.7	9.0	12.4
Self-employed worker	17.3	12.5	33.9
Major occupation:			
Executive, administrative, managerial, professional	14.8	14.2	16.7
Technical, marketing, sales, clerical, service	44.1	41.7	52.6
Production and related occupations	41.1	44.1	30.7
		Years	
Average age	38.0	32.2	58.3
Average education	11.4	11.8	10.1
		Dollars	
Average weekly earnings, 1979 ⁴	209	210	207

¹Percentage of the labor force unemployed.

²Estimate based on fewer than 10 unweighted observations.

³Worked 30 or more hours per week.

⁴Based on earnings of full-time wage and salary workers.

growth establishments. However, older workers did not participate in employment growth to the extent that youth and women did.

**Table 17—Selected characteristics
of older linked workers, 1979**

Item	Total	Age	
		Less than 50 years	50 years and over
		Number	
Total linked workers ¹	41,370	33,480	7,890
		Percent	
Establishment characteristics:			
Wage categories—			
Low-wage	36.5	36.3	37.1
Mean-wage	35.4	36.0	33.1
High-wage	28.1	27.7	29.8
Type—			
Goods-producing	35.6	37.3	28.1
Services-producing	38.2	37.9	39.4
Government	26.2	24.8	32.5
Size—			
1-19 paid employees	39.4	38.1	44.7
20 or more paid employees	60.6	61.9	55.3
Employment change, 1974-79—			
New establishments	8.9	10.1	3.8 ²
Growth establishments ³	62.8	64.9	54.0
No-growth establishments ³	28.3	25.0	42.2

¹Wage and salary workers sampled from the employment roles of the surveyed establishments.

²Estimate based on fewer than 10 unweighted observations.

³Represents private and public ongoing establishments.

Recent Entrants to the Labor Force

An important premise of policies intended to stimulate employment growth in rural areas is that they extend job opportunities to persons with little labor force experience. Survey data suggest that employment growth did provide job opportunities for persons with little labor force experience. Of those persons employed 1 or more weeks during 1979, 30 percent had not been in the labor force during 1974 (table 18). This group is referred to as recent entrants.

About 60 percent of the recent entrants were youth, persons 16-24 years old in 1979 (table 18). Also, about 60 percent of the recent entrants were women, which is significantly greater than their employment rate in 1979. Many women 35 years old and older

**Table 18—Selected characteristics of recent
entrants and experienced workers, 1979**

Characteristic in 1979	Total	Employed in 1979 ¹	
		Employed in 1974	Not employed in 1974 (recent entrants)
		Number	
Employed persons	68,810	48,110	20,700
		Percent	
Residency status:			
Long-term resident	70.9	71.1	70.1
Immigrant	29.1	28.9	29.9
Sex:			
Male	60.9	70.3	39.1
Female	39.1	29.7	60.9
Age:			
16-24 years	22.6	6.3	60.4
25-34 years	28.7	31.5	22.2
35 years and older	48.7	62.2	17.4
Education:			
Less than high school	41.6	42.1	40.7
High school	34.7	33.3	37.7
Beyond high school	23.7	24.6	21.6
Wage workers working:			
Full-time ²	73.0	72.4	74.3
Part-time	11.7	7.5	21.4
Self-employed	15.3	20.1	4.3
Major occupation:			
Executive, administra- tive, managerial, professional	13.4	15.5	8.5
Technical, marketing, sales, clerical, service	44.4	39.4	55.9
Production and related occupations	42.2	45.1	35.6
		Dollars	
Average weekly earnings ³	201	227	141

¹Includes persons working 1 or more weeks sometime in 1979.

²Worked 30 or more hours per week.

³Based on earnings of full-time wage and salary workers working 1 or more weeks in 1979.

with little recent labor force experience became employed between 1974 and 1979. These women were generally married and most no longer had young, preschool children. There was no significant difference in residency status and educational levels between recent entrants to the labor force and experienced workers.

During the survey, persons of labor force age in 1979, but not employed or looking for work in 1974, were asked to give reasons why they did not participate in the labor force in 1974. The most frequent

response (37 percent) was, "I was less than 16 years old in 1974." Another third stated they were not interested in paid employment in 1974. About 21 percent, primarily women, reported they were caring for their families in 1974 and could not participate in the paid work force. The balance, about 9 percent, indicated that health problems in 1974 restricted their entry into the labor force.

Recent entrants reported an average weekly wage of \$141, which was only about 60 percent of that reported by experienced workers. This low average wage was commensurate with the types of jobs held by recent entrants. Recent entrants were concentrated in technical occupations, but within that category they tended to hold lower paying clerical and service positions. Among wage workers, recent entrants were more likely to work at part-time jobs than were experienced workers. And, very few recent entrants were self-employed. Over 90 percent of the self-employed jobs were held by experienced workers, considerably higher than the percentage of experienced workers in the work force. Linked recent entrants were more likely to be employed in low-wage establishments and in private service units than were experienced workers (table 19). But, they were much more likely to be employed in new and growth establishments. Thus, those establishments that provided new jobs in the area appear to have enhanced the ability of persons with little recent labor force experience, primarily youth and women, to find employment.

Roles of Government in Employment Growth

The government sector (Federal, State, and local) was a major employer, accounting for 21 percent of all nonfarm wage and salary employment in 1979. Government also contributed about 14 percent of the area's new jobs between 1974 and 1979. The government sector played a lesser role in other activities. Government-sponsored loan programs for nonfarm business were not widely used. State employment offices were not frequently used for worker placement by either employers or employees. Participation in formal government training programs was small. However, local development associations and chambers of commerce made extensive efforts to attract new employers and to develop public facilities supporting growth. The following discussion elaborates on these survey results.

Table 19—Labor force experience of workers, by selected characteristics of industries in which workers were employed, 1979

Characteristic	Total	Linked worker's employment status in 1979	
		Recent entrants	Experienced workers
		Number	
Total linked workers ¹	41,370	9,670	31,700
		Percent	
Establishment characteristics:			
Wage category—			
Low-wage	36.5	45.0	33.9
Mean-wage	35.4	33.8	35.9
High-wage	28.1	21.2	30.2
Type—			
Goods-producing	35.6	28.1	37.9
Services-producing	38.2	47.0	35.5
Government	26.2	24.9	26.6
Size—			
1-19 paid employees	39.4	43.5	38.1
20 or more paid employees	60.6	56.5	61.9
Employment change, 1974-79—			
New establishments	8.9	13.8	7.3
Growth establishments ²	62.8	68.9	61.0
No-growth establishments ²	28.3	17.3	31.7

¹Wage and salary workers sampled from the employment roles of the surveyed establishments.

²Represents private and public ongoing establishments.

Government plays a multiple role in job creation in most nonmetro areas. It employs workers directly, which adds to an area's total employment and income levels. In all nonmetro areas, government accounted for 24 percent of the net change in employment between 1973 and 1979 and for 16.8 percent of all nonmetro employment in 1979 (27). Government indirectly influences employment levels through construction and maintenance of transportation facilities, industrial parks, and other forms of infrastructure necessary for private-sector establishments to function efficiently. It is also a source of capital for new construction and plant expansion. Federal economic development programs for business assistance of the Economic Development Administration, Farmers Home Administration, and Small Business Administration made \$2.9 billion in grants and loans available to nonmetro areas in 1979 (25). In most States, funds for industrial expansion are also available from local and State industrial bond sales.

Government also contributes to economic development by providing employment services through local employment offices and by providing training programs for unemployed and low-skilled workers. The Work Incentive Program (WIN), Targeted Jobs Tax Program, and Comprehensive Employment and Training Act Programs (CETA) were operating at the time of the survey.

Direct Employer

Federal, State, and local governments were important as direct employers of workers in the study area, accounting for about 21 percent of all non-farm wage and salary employment in 1979. Furthermore, government employees were more likely to work for high-wage employers than were employees in the private sector. About 45 percent of the area's government employees worked for high-wage employers, whereas about 20 percent of private-sector employees worked in high-wage establishments (table 2).

Provider of Infrastructure

Although the survey questionnaire did not provide data on government-financed infrastructure that supported the area's economic activity, information from other sources (18, 19) and the analysts' personal observations revealed both extensive development of public facilities supporting growth and concerted effort by local development associations and chambers of commerce to attract new employers. These groups, in cooperation with State economic development offices, furnished detailed information on the area's resources to prospective new employers. Local development associations issued industrial bonds to raise funds to build industrial parks which had electric, gas, water, sewer, highway, and rail transportation services available. New industrial parks which could aid growth in the area were also being planned at the time of the survey.

Interstate 75 runs through the area in a north-south direction. A four-lane major east-west artery was completed through part of the area and was under construction through the rest of the area at the time of the survey. Rail and truck transportation was available throughout the area, and regularly scheduled commercial air service was available at one airport. The town of Somerset owned and operated a natural gas pipeline linked to municipal-owned natural gas wells in the eastern Kentucky gas fields.

Somerset sells the gas to residential and commercial users. The Small Business Administration provided capital for the construction of the line. Commercial companies provided natural gas to users in other parts of the area.

Source of Capital

The survey questionnaire provided information on the sources of capital of private-sector establishments which began operations in the area after 1969 (table 20). In comparison with internal savings and private-sector financial institutions, government economic development programs, including State and local industrial revenue bond issues, were not frequently used by new establishments as a source of capital. Only 10 percent of the new establishments reported using public agency funds, and on average less than 3 percent of their funds were obtained from government agencies. Too few of the surveyed establishments used public capital sources for our study to make statistical tests of comparison by establishment characteristics.

Savings of establishment owners, which included personal savings and retained profits of corporations, and loans from the study area's private-sector financial institutions were the most frequently reported sources of capital used by new establishments. Except for establishments with 20 or more paid employees, relatively few establishments used private-sector financial institutions located outside the study area as sources of capital. Even for those large units obtaining capital from outside private financial institutions, only about 25 percent of their funds came from this source.

Since 1969, approximately 790 establishments reported making capital expenditures for land, buildings, or equipment that resulted in the unit's expanding its workforce.²¹ Only about 10 percent of these units reported using direct loans or loan guarantees from the public sector. Most establishments reported using savings and/or retained earnings and local lenders as sources of capital to finance plant expansion. Few employers went to lenders outside the study area to satisfy their capital needs.

²¹About 300 of the establishments that used capital to expand operations after 1969 also started operations in the nine-county area after that date. There were too few observations of establishments using capital for expansion to permit detailed analysis.

Table 20—Distribution of establishments, by sources of capital used to begin operation since 1969 and by establishment characteristics

Type of private-sector establishments	Starts since 1969		Percentage of establishments using capital from ¹			
	Establishments	Employees in 1979	Savings of owners or corporations	Private financial institutions		Public agencies
				Inside study area	Outside study area	
	Number			Percent		
All establishments	2,300	15,670	71	63	10 ²	10 ²
Establishment wage category:						
Low-wage	940	8,840	63	60	14 ²	13 ²
Mean-wage	230	3,160	87	57	22 ²	17 ²
High-wage	240	3,400	58	67	11 ²	8 ²
No full-time employees	890	270	78	66	3 ²	4 ²
Type of industry:						
Goods-producing	330	6,370	67	58	12	9 ²
Services-producing	1,970	9,300	72	63	10 ²	10 ²
Size of industry:						
1-19 paid employees	1,470	7,250	67	61	11 ²	12 ²
20 or more paid employees	130	8,420	46	62	38	8 ²
No paid employees ³	700	—	83	67	4 ²	6 ²

— = Not applicable.

¹Private sources of capital include banks and savings and loan institutions. Public sources of capital include loan guarantees or capital borrowed directly from such public agencies as the Small Business Administration, Farmers Home Administration, Economic Development Administration, Kentucky Development Finance Authority, or through State or local bond issues. An establishment may have used more than one source. Thus, the percentages may not add to 100.

²Estimate based on fewer than 10 unweighted observations.

³Establishments operated by self-employed owners or partners with no paid employees.

Employment Services and Training

State employment offices helped some establishments in the study area locate workers, but most of the new workers were located through other sources (table 21). Only about 14 percent of the employers in 1979 reported locating workers by using State employment offices. The methods employers most often used to locate new workers were walk-ins and referrals of workers by friends or relatives of employers and referrals by other establishments. Workers most often used direct inquiries with establishments and referrals by friends and relatives as a means of locating jobs.

The rate of participation by both establishments and adults in formal employment and training programs was small. Since 1969, only 15 percent of the employers participated in a CETA or other subsi-

dized employment program, and only 10 percent of the adult population participated in WIN, CETA, or other formal employment or job training programs offered by vocational schools, the military, or other organizations. No attempt was made during the survey to collect information on why establishments and adults chose not to participate in job-training programs. However, adults were questioned about the value of the job-training programs in which they participated. About half the participants said these programs helped them obtain jobs. Most people who participated in formal job programs had at least a high school education.

The low rate of participation in Federal training programs did not mean that area workers were always highly qualified to perform available jobs. About 30 percent of the employers surveyed indicated

Table 21—Methods used by establishments to locate employees and by employees to find jobs

Item	Establishments reporting hires in 1979 ¹	Workers starting jobs since 1974 ²
	Number	
Establishments and workers	1,370	23,630
	Percent	
Methods used to locate hires or jobs: ³		
State employment agencies	14.4	8.6
Walk-ins	60.9	54.6
Local or national ads	15.3	10.8
Referrals ⁴	52.8	38.0
Other sources ⁵	14.4	6.2

¹Of the new and ongoing establishments with one or more paid employees, 41 percent had new hires in 1979.

²Data were not obtained from persons who were employed in their current primary job prior to 1974.

³Because some establishments and persons used more than one source, percentages will not sum to 100.

⁴Includes referrals by friends, relatives, and other establishments.

⁵Includes vocational schools, unions, colleges or universities, private employment agencies, and other sources not already identified.

that they had difficulty finding qualified persons to fill positions (table 22). Mean-wage establishments reported difficulty finding qualified workers more often than did either low-wage or high-wage units. Large employers, employers in the goods-producing sector, government units, and establishments with employment growth between 1974 and 1979 were more likely to have difficulty locating qualified persons than were the service sector, small employers, and units not having employment growth.

Jobs in production occupations were most frequently reported by establishments as difficult to fill. Manufacturing establishments were the most likely to report difficulty filling production jobs. Private service establishments reported difficulty filling some clerical, sales, and service positions. All types of establishments reported difficulty in filling some clerical, executive, managerial, and professional positions.

Training provided by formal training and educational programs apparently did not satisfy the training needs of employers. Employers with difficulty

Table 22—Establishments reporting difficulty finding qualified persons, by establishment characteristic, 1979

Characteristic	Total establishments	Percentage of establishments with difficulty finding qualified workers
	Number	Percent
Establishments with one or more employees	3,320 ¹	29.5
Establishment wage category:		
Low-wage	1,800	28.3
Mean-wage	610	44.3
High-wage	590	30.5
No full-time employees	320	6.3 ²
Type of establishment:		
Goods-producing	510	37.2
Services-producing	2,590	27.4
Government	220	36.4
Size of establishment:		
1-19 paid employees	2,970	26.9
20 or more paid employees	350	51.4
Employment change, 1974-79: ³		
New establishments	890	29.2
Growth establishments ⁴	890	42.7
No-growth establishments ⁴	1,500	22.7

¹Represents establishments with one or more employees. Establishments operated by self-employed owners or partners are excluded from this table.

²Estimate based on fewer than 10 unweighted establishment observations.

³Excludes ongoing establishments starting under new ownership between 1975 and 1979.

⁴Private and public ongoing establishments with employment growth.

filling positions attributed the problem to workers not having sufficient training required for the job, workers lacking specific skills, workers lacking experience or special knowledge, or workers having qualifications not matching job requirements. One or more of these four reasons were reported 75 percent of the time by those employers with problems filling a position. Reasons listed 25 percent of the time included low wages and poor or dangerous working conditions.

Potential Labor Force

The nine-county Kentucky area has a relatively large potential labor force which could support employment growth without substantial immigration. However, new or expanding establishments may have to look to employed residents or immigrants for experienced executives and managers. But, expanding or new establishments will likely find willing em-

ployees with experience in production, sales, clerical, and service occupations. The following discussion elaborates on these survey results.

Employment growth depends on both increases in job opportunities and the availability of qualified workers. In nonmetro America, including the Kentucky study area, a substantial portion of the available jobs have been taken by immigrants in recent years. Between 1970 and 1975, 11 percent of nonmetropolitan residents employed had moved to nonmetro from metro areas (8). By 1979, 28 percent of the employed persons in the nine-county study area had moved into the area from both metro and nonmetro areas since 1964. A central issue related to employment growth in many nonmetro areas is whether they can continue to grow without a sustained flow of immigrants.

In the absence of immigration or outmigration, the nine-county area contains a fairly large potential labor force. The survey data do not permit a thorough assessment of the qualifications of these potential workers for specific occupations, but some characteristics of the workers are evident (table 23). At the time of the survey, the number of unemployed people who would have accepted employment if available was unknown, but their reasons for not working or for not looking for work were surveyed.

At the time of the survey, about 71,000 adults 16 years and over were not employed. An additional 15,000 people will reach labor force age by 1985.²² Approximately 10 percent of the adults were unemployed and looking for work; thus, this group was available for immediate employment.

Almost all the unemployed were under 55 years of age, with a third less than 25 years old. The average age was 35.8 years. As a group, the unemployed had completed 10.4 years of formal schooling. About 63 percent had less than a high school education, but some of these were still in school. About 88 percent of the unemployed had labor force experience and 81 percent had worked since January 1974. Of the unemployed with previous work experience, less than 5 percent had worked as executives, adminis-

trators, or managers. Most who had worked previously had been employed in sales, clerical, service, and production occupations.

Most of the nonworking adults were not actively looking for employment; that is, they were not in the labor force (table 23). About 21 percent of the nonemployed adults were not actively looking for work, but had worked sometime in the 5 years between 1974 and 1979. Most of this group were women. About half the group was 25-54 years of age, and over half had less than a high school education. When asked why they were not looking for work, 56 percent of those who had worked in the previous 5 years said that they were not interested in paid employment and 28 percent said they could not work because of health reasons (table 24). The others were not looking for work because they believed jobs were not available to them, that is, they were discouraged workers, or they could not work because of family responsibilities or because transportation was not available. Only about 4 percent of these persons had ever been employed as executives, administrators, or managers, but most had worked at technical, sales, clerical, or service jobs.

Of the nonworking adults, 17 percent were not looking for work and had not been employed since January 1974 (table 23). This group was comprised mainly of older persons, many of whom were retired. Their average age was 62.8 years. Most of these persons could not work because of ill health or they were not interested in paid employment (table 24). It is unlikely that many potential labor force participants were in this group.

About 52 percent of the nonworking adults were not in the labor force and had never been employed (table 23). About 23 percent of this group were less than 25 years old, and some were still enrolled in high school or college. However, about 45 percent were 55 years old or older and unlikely to enter the labor force. About 95 percent of the never employed group had poor health or were not interested in paid employment (table 24).

At the time of the survey, the study area had about 13,000 residents who were either unemployed, discouraged workers or who would like to work but could not because of family responsibilities or lack of transportation. The other adults not working were not interested in employment or had poor

²²This number was not adjusted for deaths in this age group during the 5-year period.

Table 23—Adult population, 16 years and older, not employed in January 1980, by previous work experience

Characteristic	Persons not employed				
	Total	Unemployed	Not in labor force		
			Worked sometime between January 1974 and January 1980 ¹	Worked prior to January 1974 ¹	Never employed
			Number		
Adult population	70,660	7,330	15,080	11,840	36,410
			Percent		
Male	36.0	64.0	32.2	69.7	21.0
Female	64.0	36.0	67.8	30.3	79.0
Age in 1979:					
16-24 years	21.0	35.7	25.5	0	23.0
25-54 years	35.0	62.9	47.7	9.7	32.4
55 years and over	44.0	1.4 ²	26.8	90.3	44.6
Education:					
Less than high school	71.2	63.2	54.5	89.5	73.7
High school	19.9	30.4	29.1	6.4	18.3
Beyond high school	8.9	6.4 ²	16.4	4.1 ²	8.0
			Years		
Average age	46.0	35.8	36.2	62.8	47.6
Average years of school completed	9.1	10.4	10.1	7.4	9.1
Average length of time since last worked	—	³	2.2	13.4	—

— = Not applicable.

¹Includes persons who worked 1 or more weeks for pay or were self-employed.

²Estimate based on fewer than 10 unweighted observations.

³Average not shown because the unemployed includes 910 persons who had never worked; 81 percent of the unemployed workers had worked since January 1974.

health. The number of residents who were interested in employment (13,000) were about 22 percent of the residents employed at the time of the survey. About 80 percent of this group had previous work experience. However, very few of these potential workers had held executive, administrative, or managerial jobs. Some had been employed in technical occupations, but most had worked in clerical, sales, production, or service jobs. New establishments starting operations in the area or existing units planning to expand may have to look to either employed residents or to immigrants for experienced executives and managers. However, new or expanding establishments may find willing employees with

work experience in production, sales, service, and related occupations. The survey data suggest that increases in the availability of child day-care services, nursing services for ill and aged adults, and transportation services could encourage a small group of adults to seek employment.

Implications

This study provides some important insights into the rural development process in terms of employment growth. Readers must interpret these findings within the context of the economic structure of the nine-county Kentucky area and the way its economy

Table 24—Reasons given for not looking for work by the adult population, 16 years and older, by previous work experience

Reason	Persons not in the labor force, January 1980			
	Total	Previous work experience		
		Worked sometimes between January 1974 and January 1980 ¹	Worked prior to January 1974 ¹	Never employed
		Number		
Adult population	63,330	15,080	11,840	36,410
		Percent		
Discouraged worker ²	6.6	12.1	9.7	3.2
Ill health	30.0	27.7	77.5	15.5
Not interested in paid employment	61.6	56.4	11.8	80.0
Interested in paid employment but could not work ³	1.8	3.8 ⁴	1.0 ⁴	1.3 ⁴

¹Includes persons who worked 1 or more weeks for pay or were self-employed.

²Includes persons who had stopped looking for work because they believed none was available.

³Includes persons who were interested in paid employment, but had to care for a child or a sick or aged adult or who had no transportation to and from a work place. ⁴Estimate based on fewer than 10 unweighted observations.

has evolved in the past 5-10 years. Economic Development Division research on other growth areas will determine the extent to which these conclusions apply to other rural areas.

This study shows that rural employment growth enhances employment opportunities for local residents and for persons with limited labor force experience. This conclusion is based on the finding that long-term residents were able to obtain jobs in new and expanding older establishments. Long-term residents did not have a representative share of higher paying executive and related positions compared with recent immigrants, but long-term residents were not disadvantaged in obtaining these higher paying jobs in comparison with early immigrants. Most immigrants were not newcomers to the area. About 70 percent had lived in the area previously and were returning home. This result tempers the popular notion that rural employment growth benefits outsiders, not the indigenous population. The study also showed that persons with little labor force experience, particularly women and youth, could find jobs in the area. Thus, the major goal of enhancing the economic well-being of all rural residents as articulated in major Federal rural development legislation was at least partially realized in the study area.

This study demonstrated that new establishments were important to job growth, but so were older units. About half the new jobs added to the area's economy between 1974 and 1979 were added in older ongoing establishments. These results suggest that economic development policy at local, State, and Federal levels should be concerned about ways to encourage existing businesses to expand employment as well as with activities to attract new ones.

It is frequently assumed that government plays a major role in the employment growth of local areas as a direct employer, as a provider of infrastructure necessary to support growth, as a source of capital for expansion of economic activity, and as a provider of employment services and training. As a direct employer, governments were important in the area's economy, providing about 21 percent of all nonfarm wage and salary employment and over 10 percent of the net addition to employment between 1974 and 1979. Government financial infrastructure—roads, industrial parks, and utilities—supported private-sector economic activity. But, government's role was not extensive in some other activities. Government-sponsored loan programs were not widely used by nonfarm businesses, and government employment offices were not frequently used for

worker placement. The results of other studies in this series will show if these findings are unique to the Kentucky study area or if they also describe other areas.

Conclusions about the extent to which rural development affected household income and poverty status must await further analysis of the data. But, preliminary information suggests that the recent

rapid employment growth in the study area has not eliminated the area's income and poverty problems. Part of the reason for this may be that much of the recent job growth, particularly in the private service sector, was part-time employment in low-paying jobs. But, the apparent conflict of attempting to enhance income levels by expanding lower paying jobs in the service sector is a problem inherent in the national economy rather than a problem unique to the study area.

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Appendix A: Survey Design and Procedures

Researchers from the Economic Research Service designed the study, developed the questionnaires, edited the data, and conducted the analysis. Statisticians from the Statistical Reporting Service (SRS) participated in developing the sample and survey materials. Data were collected by enumerators from the Louisville, Ky., SRS office.

A random stratified multiple-frame design was used to survey employers and households. The establishment list frame was composed both of private-sector and public-sector employers.¹ Military installations were excluded from the list frame. A sample of establishments was selected for interview. The characteristics of employers were based on this sample. A sample of persons employed in the sample establishments was selected for interview in the household survey. This sample of employees became the list frame for the household sample and the basis for the linked worker sample.

Area frames were used to account for the incompleteness of the list frames. The establishment area frame was used to estimate those establishments not included on the list. The household area frame was used to collect data on those households whose members were either all unemployed, out of the labor force, self-employed, employed by establishments not on the list, employed by establishments on the list that refused to participate in the survey, or employed outside the study area.

The establishment sample was stratified by Standard Industrial Classification (SIC) and by three size groups as measured by the number of employees. There were nine SIC groups: (1) mining, (2) construction, (3) manufacturing, (4) transportation, communication, and public utilities, (5) wholesale trade, (6) retail trade, (7) finance, insurance, and real estate, (8) other services, including agricultural services, and (9) government units. The three establishment size group were: (1) 19 or fewer employees, (2) 20 to 99 employees, and (3) 100 or more employees (app. table 1).

The employer size groups were not proportionately distributed; thus, each employer size group was

sampled at a different rate to assure a representative sample. Private and public establishments with 19 or fewer employees were sampled at the rate of 1 in 10. Units with 20-99 employees were sampled at a rate of 1 in 4, and large establishments with 100 or more employees were all enumerated. When a list frame establishment with fewer than 100 employees refused to participate in the survey, a replacement was drawn from the same SIC and size group. Information collected from the establishments included principal products or services provided, total employment for 1974 and 1979, and employment characteristics such as occupations of workers, male and female workers, part-time and full-time workers, and average wage and salary of full-time workers.

Before the enumerator concluded the interview with a sampled list frame establishment, the enumerator drew a random sample of employees from the establishment's list of current employees. Each employee selected from the list became part of the list frame for households and was interviewed in his or her home. Enumerators collected information on household composition, characteristics of household members, employment status, employment history back to 1974, type of job held by all household members 16 years of age and older, residency status, and household income. The establishment's identification was included on the employees' questionnaire, thereby assuring that linkage could be made with the unit's characteristics during data analysis.

The sampling rate of employees also varied by establishment size. Employees in establishments employing 19 or fewer employees were sampled at a rate of 1 in 4, employees in establishments with 20-99 employees were sampled at a rate of 1 in 10, and employees in establishments with over 100 employees were sampled at a rate of 1 in 40.

The supplemental area frame sample for households and establishments was stratified into three classes, or strata, based on three land use patterns in the nine-county Kentucky site (app. table 2). The three strata were urban, suburban, and rural. Each segment was a parcel of land varying in size by strata. In the urban stratum, a segment was approximately a city block; in the suburban stratum, the segment was about one-eighth of a square mile, and in the rural stratum, a segment was about 1 square mile. The segments were sampled at a rate of 1 in 25 in the suburban segments, 1 in 17 in the urban segments, and 1 in 50 in the rural segments. The household sampling rate within the sampled segments

¹The list frame of establishments was constructed from telephone directories, a State Employment Security list of employers, Government census list, and contact with local officials.

Appendix table 1—List frame universe and sample of establishments, employees, household members and employer-employee link sample, by strata

Industry and size strata ¹	Establishment universe	Establishments (primary sample units)		Employee household completion ³	Employee household members completions age 16 years and over	Employer-employee link sample	
		Completions	Out of business ²			Employers	Employees
Number							
Mining:							
Small	160	8	5	8	16	6	8
Medium	23	5	2	2	4	2	2
Large	3	1	1	1	2	1	1
Construction:							
Small	408	26	11	15	30	13	15
Manufacturing:							
Small	136	9	4	11	26	5	11
Medium	47	9	2	22	55	7	21
Large	37	31	0	144	331	26	144
TCPU: ⁴							
Small	211	13	8	12	29	10	12
Medium	14	4	0	14	33	3	14
Large	2	1	0	8	20	1	8
Wholesale trade:							
Small	235	19	3	18	44	13	18
Large	1	1	0	4	7	1	4
Retail trade:							
Small	1,162	82	30	54	125	33	54
Medium	69	10	1	23	60	6	21
FIRE: ⁵							
Small	173	15	2	11	27	9	11
Medium	22	5	0	14	31	5	14
Service:							
Small	705	52	9	42	91	27	41
Medium	12	2	0	8	16	2	8
Large	4	4	0	38	81	3	38
Government:							
Small	171	16	0	38	89	14	38
Medium	25	5	0	21	47	5	21
Large	21	19	0	120	269	18	120
Total	3,641	337	78	628	1,433	210	624

¹Small, fewer than 20 employees; medium 20-99 employees; and large, 100 or more employees.

²Establishments which were part of the sample, but had terminated operation by the survey date.

³In situations where a household had more than one member employed by a list frame employer, the household expansion factor was adjusted to reflect the household's increased probability of being selected.

⁴TCPU is transportation, communications, and public utilities.

⁵FIRE is finance, insurance, and real estate.

was 1 in 6 in the urban stratum, 1 in 4 in the suburban stratum, and 1 in 2 in the rural stratum. Enumerators interviewed all establishments not included on the list frame of establishments that were found in the sampled segments.

The survey field work was divided into three phases. Phase I involved identifying households and establishments in the area frame. The area frame sample was a two-stage stratified cluster design, where the first stage of sampling was the segment and the sec-

ond stage was the household or establishment. Phase 2 involved interviewing the selected list frame establishments and obtaining the employee list. Phase 3 required screening area frame households and area frame establishments and interviewing qualifying households and establishments. During Phase 3, enumerators also interviewed employee households obtained from employer lists during Phase 2. They collected data by personal interviews conducted during December 1979 for establishments and January 1980 for households.

The questionnaires from households and employers were edited to detect and correct omissions and inconsistencies. Questionnaires for which data entries could not be verified were deleted from the sample. Before a questionnaire was deleted, respondents were recontacted for additional data, and in some cases missing data were estimated. Completed questionnaires were obtained from 364 private-sector establishments, 40 public-sector units, and 900 households which contained 1,961 persons aged 16 and over (app. table 3).

Appendix table 2—Area frame universe, sample segments and completions for establishments and households, by stratum

Stratum	Segment universe	Segments sampled	Establishments		Households		
			Segments with one or more completions	Employer completions	Segments with one or more completions	Households	Household members age 16 years and over
Number							
Suburban	4,568	183	27	28	112	119	223
Urban	1,160	69	19	32	32	33	63
Rural	3,283	66	15	7	55	120	242
Total	9,011	318	61	67	199	272	528

Appendix table 3—Questionnaires completed by establishments and households, by sample frame

Sample frame	Establishment questionnaires completed	Household questionnaires completed	Questionnaires completed for household members 16 years old and over
Number			
Establishments:			
Private sector	364	—	—
List frame	297	—	—
Area frame	67	—	—
Public sector	40	—	—
List frame	40	—	—
Total establishments	404	—	—
Households:			
List frame	—	628	1,433
Area frame	—	272	528
Total households	—	900	1,961

— = Not applicable.

Appendix B: Calculation of Variance Statistics

The complexity of the survey design precluded using simple random sample formulas to calculate certain variance statistics that were required to compute confidence intervals and to test differences between means, proportions, and totals. We used the formulas given below to approximate the variances required for statistical testing.

We used the same formulas to calculate variances for subclasses. In situations where the subclass size was considerably less than the total number of primary sample units or observations, the resulting estimate may have seriously underestimated the subclass variance (20). Unless otherwise noted, no statistical testing was done unless the subclass contained at least 30 observations.

For the variance of total estimates, the formula is:

$$V(\hat{Y}) = \sum_{h=1}^H (1 - f_h) F_h^2 \frac{n_h}{n_h - 1} \left[\sum_{i=1}^{n_h} Y_{hi}^2 - \frac{Y_h^2}{n_h} \right]$$

where:

$(1 - f_h)$ = the finite population correction factor,

f_h = the primary sample unit sampling rate for the hth strata,

F_h^2 = the expansion factor for the hth strata,

n_h = the number of primary sample units in hth strata, and

Y_{hi} = the variable to be estimated within the ith primary sample unit and hth strata

where:

$$Y_h = \sum_{i=1}^{n_h} Y_{hi}$$

For the variance of ratio means, the formula is:

$$V(R) = V\left(\frac{\hat{Y}}{\hat{X}}\right) = \frac{1}{\hat{X}^2} \left[V(\hat{Y}) + R^2 V(\hat{X}) - 2R \text{COV}(\hat{X}, \hat{Y}) \right]$$

For the variance of difference between two ratio means or two totals, the formula is:

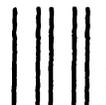
$$V(R - R') = V(R) + V(R') - 2 \text{COV}(R, R')$$

In all comparisons in the report, we assumed the covariance to be zero. Although the clustering aspect of the survey design may underestimate the variance if the covariance term is not included, the bias was not serious (20).

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