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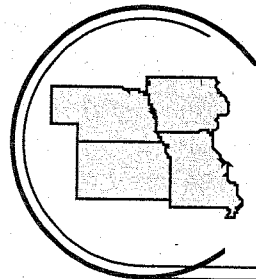
Employment and Commuting by Rural Women on the Metropolitan Periphery

Heather I. MacDonald
Assistant Professor
Graduate Program in Urban and Regional Planning

Alan H. Peters
Assistant Professor
Graduate Program in Urban and Regional Planning

Public Policy Center
The University of Iowa
Iowa City, IA 52242

July 1993



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Iowa State University

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Ex-officio members: Tom Maze, Director, and David Forkenbrock, Associate Director

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PREFACE

This report is the product of a third-year research project in the University Transportation Centers Program. The program was created by Congress in 1987 to “contribute to the solution of important regional and national transportation problems,” following a national competition in 1988. A university-based center was established in each of the ten federal regions. Each center has a unique theme and research purpose, although all are interdisciplinary and also have educational missions.

The Midwest Transportation Center is one of the ten centers; it is a consortium that includes Iowa State University (lead institution) and the University of Iowa. The Center serves Federal Region 7 which includes Iowa, Kansas, Missouri, and Nebraska. Its theme is “transportation actions and strategies in a region undergoing major social and economic transition.” Research projects conducted through the Center bring together the collective talents of faculty, staff, and students within the region to address issues related to this important theme.

This project is central to the Midwest Transportation Center’s theme in that it examines the relationship between commuting and economic development. The east central Iowa region has undergone substantial economic restructuring over the past decade and a half as a result of changes in agriculture and manufacturing. Economic restructuring has intersected with social restructuring as rural women’s labor force participation rates have increased. New patterns of employment have in turn created new commuting patterns as different industrial sectors have centralized and in some cases decentralized jobs.

The principal investigator was Heather I. MacDonald. The co-investigator was Alan H. Peters. Both are faculty in the University of Iowa’s Graduate Program in Urban and Regional Planning. This project was undertaken at the University of Iowa’s Public Policy Center. Research efforts undertaken by the Public Policy Center reflect the University’s renewed commitment to applied research that seeks to advance the public interest.

ACKNOWLEDGMENTS

This project involved the assistance and support of many people. We are especially grateful to the ten members of our Project Advisory Committee. They provided counsel throughout the project and carefully reviewed our draft final report. Stephanie Hickman of the Iowa Department of Transportation, the chair of the committee, deserves special thanks. The other committee members were: Judy Erickson of the Iowa Department of Employment Services; Allen Baker of Linn County's paratransit service, LIFTS; Pat Marshall of the IBEW; Linda De Wolf of St. Luke's Hospital in Cedar Rapids; Kathy Forcht, of AEGON USA; Lynn Avant of the United Way of Story County; Pat Hougan of Heartland Senior Services; Joan Allsup of Prairiefire, Des Moines; and Charlotte Nelson and Jane Shockemoehl, both of the Iowa Commission on the Status of Women.

The University Transportation Centers Program of the U.S. Department of Transportation and the Iowa Department of Transportation provided the support that made this project possible; this is gratefully acknowledged. We are also grateful for the support provided by the Midwest Transportation Center staff, the staff of the University of Iowa Public Policy Center and the Graduate Program in Urban and Regional Planning.

In particular, David Forkenbrock played a crucial role in the initiation of this project and through the course of our research. His detailed review of the draft final report was especially helpful. Norman Foster developed the graphics used throughout and saw this report through its final production stages. His advice and help were invaluable. Cathy Young, also of the Public Policy Center, provided assistance with the questionnaire's construction and the downloading of census files. We owe Norman and Cathy a special thanks. Barbara Yerkes edited the report and Anita Makuluni made some important final editing changes.

Mary Losch of the Iowa Social Science Institute was responsible for the smooth completion of the telephone survey; we are especially grateful for her advice on questionnaire design. John Fuller was an unfailing source of sound counsel and many documents.

Our research assistants—Kala Sridhar, Shawn Rich, Kirsten Couch and Roxanne Addink—were much appreciated; special thanks go to Joanna Jiang, whose patience and good humor were unfailing over the course of this project. Finally, we would like to thank our survey respondents, without whom this report would not exist.

PROJECT ADVISORY COMMITTEE

Stephanie Hickman, Chair
Iowa Department of Transportation

Joan Allsup
Prairiefire, Des Moines

Lynn Avant
United Way, Story County

Allen Baker
LIFTS, Linn County

Linda De Wolf
St. Luke's Hospital, Cedar Rapids

Judy Erickson
Iowa Department of Employment Services

Kathy Forcht
AEGON, Cedar Rapids

Pat Hougan
Heartland Senior Services

Pat Marshall
International Brotherhood of Electrical Workers
(IBEW)

Charlotte Nelson
Iowa Commission on the Status of Women

Jane Shockemoehl
Iowa Commission on the Status of Women

Contents

PREFACE	iii
ACKNOWLEDGMENTS	v
PROJECT ADVISORY COMMITTEE	vii
FIGURES	xi
TABLES	xiii
EXECUTIVE SUMMARY	1
I. Study purpose	1
II. Gender and employment	1
III. Labor force participation	2
IV. Commuting patterns	2
V. Explaining women’s commuting choices	2
VI. Policy options	3
VII. Conclusions and policy recommendations	3
CHAPTER ONE: INTRODUCTION	5
Research questions	6
Study area	7
The survey	8
Structure of this report	8
CHAPTER TWO: GENDER AND EMPLOYMENT	11
Rural employment in the United States and women’s labor force participation	11
Women’s work and the rural household economy	12
Industry, occupation, employment and labor force participation in eastern Iowa	13
Employment change in the four-county region and the surrounding MSAs	14
Labor force participation, employment, and occupation of women	16
Conclusion	19
CHAPTER THREE: LABOR FORCE PARTICIPATION	21
Demographic profile of household survey respondents	22
Women not in the labor force	24
Home-based workers	26
Respondents working outside the home	28
Job characteristics by occupational and industrial sector	29
Job location	30
Part-time and seasonal employees	32
Conclusion	33
CHAPTER FOUR: COMMUTING PATTERNS	35
Commuting patterns	37
Commuting patterns by metropolitan/nonmetropolitan job location	38
Commuting patterns by occupational and industrial sector	38
Trip length and job characteristics	38
Assessing the cost and time burdens of commuting	42
Proportional cost burdens	42
Time burdens	44
Conclusion	46

CHAPTER FIVE: EXPLAINING WOMEN’S COMMUTING CHOICES 49

- Defining job rewards 50
- Distinguishing groups of respondents 51
 - Cluster groupings 52
- A model of commuting behavior: health benefits and work site location 54
- Conclusion 57

CHAPTER SIX: POLICY OPTIONS 59

- Rural economic development strategies 60
- Public transit service provision 62
- Study area characteristics 65
- Ridesharing and vanpooling 66
- Study area 69
- Conclusion 71

CHAPTER SEVEN: CONCLUSIONS AND RECOMMENDATIONS 73

- Labor market structure in the study area 74
- Labor market participation, commuting patterns and the area labor market 74
- What can we conclude from these findings? 75
- What are the policy implications of these findings? 75

APPENDIX A: QUESTIONNAIRE STRUCTURE 79

APPENDIX B: SHIFT-SHARE ANALYSIS 81

APPENDIX C: VARIABLE DEFINITION 83

REFERENCES 87

Figures

1-1 Study area	7
1-2. Population change in the study area and surrounding metropolitan counties, 1980-1990	8
2-1 (a). Women as percentage of labor force and of total employment, 1990, by area	16
2-1 (b). Unemployment rates for women and for total population, 1990, by area	16
3-1. Primary and all reasons cited for not being in the labor force	25
3-2 (a). Total and self-employed home-based workers, by type	27
3-2 (b). Mean hourly pay for home-based workers, by type	27
3-3. Reasons for choosing home-based work	28
4-1 (a). Distribution of work trip lengths in the study area: sample responses versus 1990 Census	37
4-1 (b). Proportion of workers commuting to metropolitan areas: sample responses versus 1990 Census	37
4-2 (a). Length of work trip in miles by percentile and work site location	38
4-2 (b). Length of work trip in time by percentile and work site location	38
4-3. Mean and median hourly pay rates by work trip length	41
6-1. Rural-based female employees by zip code	71

Tables

2-1. Indices of employment growth by sector for U.S., Iowa, and study area, 1979 and 1989	15
2-2. Occupation and industry of employed females in the U.S., rural Iowa and the study area	17
2-3. Industrial and occupational distribution of employed respondents by place of work	18
3-1. Comparison of survey sample with Current Population Survey for rural Iowa	22
3-2. Demographic profile by labor force participation	23
3-3. Distribution of household income by labor force participation	24
3-4. Household transportation resources by labor force participation	25
3-5. Evaluations of job attributes by location of employment	28
3-6. Selected job characteristics by occupation and industry	30
3-7. Distribution of respondents, mean hourly pay, and health benefit coverage, by location of work-site and industry	31
4-1. Commuting patterns by occupational and industrial sector	39
4-2. Commuting patterns by job characteristics, human capital attributes, and domestic role	40
4-3. Distribution of hourly pay rates by length of work trip and human capital attributes	41
4-4. Commuting cost burden by industrial sector	43
4-5. Commuting cost burden by job and human capital characteristics	43
4-6. Commuting time burden by industrial sector	44
4-7. Commuting time burden by job characteristics, human capital attributes, and domestic role	45
5-1. Respondent evaluation of job rewards by employment status, hourly pay, human capital characteristics and domestic role	50
5-2. Cluster groupings obtained	52
5-3. Analysis of job characteristics by cluster groupings	53
5-4. Analysis of commuting characteristics by cluster groupings	54
5-5. Probability of long distance commuting	57
6-1. General public rural transit systems identified	63
6-2. Level and types of service provided by rural transit systems	64
6-3. Modal split of journey to work for four rural counties, survey sample, total for study area, and state of Iowa, 1990	69
6-4. Distribution of rural-based female employees of four metropolitan firms, by sector and number of workers from same zip code	71

EXECUTIVE SUMMARY

I. STUDY PURPOSE

Over the past decade, rural women have rapidly expanded their participation in the labor force, and their contribution has become indispensable to the economy of rural communities. Metropolitan labor markets offer the widest range of jobs and best job rewards to rural residents, but these jobs entail long work trips that impose time and cost burdens on women who frequently also have time-consuming domestic responsibilities and consistently earn lower wages than men.

This study surveyed rural women in four eastern Iowa counties, collecting and analyzing data on their work experiences and commuting patterns; this analysis is a basis for policy recommendations aimed at reducing the burden commuting currently imposes on women workers in rural areas. The research questions addressed in this study can be summarized as follows:

- How do commuting costs vary between different forms of labor force participation (defined by occupational sector, part- or full-time status, or location of job)?
- What rewards do different categories of women workers receive in return for the commuting costs they bear, and which rewards are most important in explaining why some women commute longer distances than others?

- How important a disincentive is commuting cost for women who are engaged in home-based paid work or those who choose not to participate in the wage labor force?
- How do the costs of mobility constrain or shape rural women's participation in the labor force, and do these effects differ among categories of current and potential women workers?

The policy options discussed fall into two main categories: those that address transportation problems directly (public transit service, ridesharing, and vanpooling) and those that address the location and nature of employment.

II. GENDER AND EMPLOYMENT

The study area offers two sorts of labor market: local decentralized employment and contiguous metropolitan areas with differing degrees of economic health, offering a range of employment options for rural residents. Almost all residents of the four rural counties in the study area are within 50 miles of Cedar Rapids.

Cedar Rapids is by far the most healthy of the three metropolitan economies; it has retained the volume of jobs it had in 1979, although the balance by industry has changed, with manufacturing and the

finance, insurance, and real estate (FIRE) sectors losing jobs and the service and retail sectors gaining jobs.

On the other hand, Waterloo and Dubuque suffered large employment and population losses in the late 1970s and early to mid-1980s; these two metropolitan areas offer far fewer job opportunities for rural residents. Employment growth in the four rural counties has been negative over the past decade, although some sectors have gained jobs and the majority of rural residents continue to find local employment opportunities.

III. LABOR FORCE PARTICIPATION

We compared women in home-based paid employment, women in part- and full-time employment outside the home, and women not in the waged labor force. Transportation was found to be a contributing but not the primary factor in the decision to work for wages outside the home, and some relatively transportation-disadvantaged groups of respondents were identified.

Among women employed outside the home, the location of the job (in a metropolitan or nonmetropolitan site) was found to be the most important factor influencing whether the job was part-time or full-time, whether it was seasonal or full-year, and whether it offered health and retirement benefits. The location of a job had different effects on hourly pay rates, depending on the occupational or industrial sector.

The survey respondents were much more likely to commute to metropolitan jobs in manufacturing, FIRE, and transportation and distribution; sales, service, and clerical workers were much more likely to be employed in nonmetropolitan jobs.

IV. COMMUTING PATTERNS

Significant relationships were found between trip length, job characteristics, and occupational and industrial sector, supporting the findings about the effect of metropolitan or nonmetropolitan job location. However, the relationship between trip length and hourly pay rates was complex and nonlinear, even after we controlled the analysis for

the education and experience of respondents and their receipt of health benefits.

Commuting cost and time burdens were significantly related to occupational and industrial sector, to job location, and to the receipt of health benefits. Cost and time burdens were equivalent for part- and full-time employees, and women with children were slightly more likely to have time burdens than those without, suggesting that domestic responsibilities have little impact on commuting choices.

V. EXPLAINING WOMEN'S COMMUTING CHOICES

Respondents evaluated a set of job attributes, and the analysis of their responses suggested that rural women represent a dichotomized labor pool. On the one hand are full-time, moderately well-paid workers who are most concerned about benefits, pay, and security and less concerned about minimizing commuting; on the other are predominately part-time workers with less regular hours who value shorter work trips above benefits, pay, and security.

This apparent dichotomization was explored further with cluster analysis. Cluster analysis revealed three groups of employees:

- a relatively young group with less than median education and experience who earned lower hourly pay and were much more likely to be cost-burdened commuters;
- a small group of predominately part-time employees in very localized labor markets with short work trips and low cost burdens;
- a group of predominately metropolitan employees with more than average education and experience, whose longer work trips were rewarded with higher hourly pay and a greater likelihood of receiving health and retirement benefits.

Using logistic regression, we constructed a more solid explanation for longer work trips; the analysis revealed no linear relationship with pay rates, but

women who received health benefits were three times more likely to commute longer distances than those who did not. Long-distance commuters were unlikely to be in clerical occupations but were more likely to have higher educational qualifications and shorter job tenure.

VI. POLICY OPTIONS

We primarily discussed policy options that would overcome the friction of distance for rural women by easing their commuting burdens, rather than economic development strategies that would decentralize jobs to rural locations.

The economic development strategies we reviewed had little potential in the short-term for decentralizing better quality jobs. Experience elsewhere seems to indicate that rural areas are not well equipped to compete with metropolitan areas for jobs in faster growing industries or innovative high technology sectors. Metropolitan labor markets will probably continue to offer rural residents a better choice of jobs than will nonmetropolitan markets.

Two transportation options were considered: expanding public transit services in rural areas and expanding ridesharing or vanpooling programs. The analysis of respondents' current commuting patterns showed that most respondents travelled to work alone in a car but that they were also more likely than residents of the state or study area as a whole to share rides. Ridesharers were more likely to be full-time, metropolitan employees and to live in one-car households.

Just over half our respondents claimed they would be willing to use public transit if it were available; those who spent a higher proportion of daily pay on commuting were much more likely to respond positively. Experience with similar initiatives elsewhere was reviewed. We reached the following conclusions.

- The small number of potential users and high levels of household mobility in the study area suggested that there is no reason to extend existing rural public transit services. A transportation brokerage service within

the existing Regional Transit Authorities would be a more viable option for serving the small number of labor force entrants and intermittent users for whom public transit would be attractive.

- Ridesharing is a viable option for the majority of cost-burdened commuters and could be a cost-effective and beneficial strategy for metropolitan employers drawing on the rural labor force.

VII. CONCLUSIONS AND POLICY RECOMMENDATIONS

When findings from our telephone survey are integrated with our analysis of labor markets in the study area, the following results emerge:

- Women were most likely to commute to metropolitan jobs in sectors that are declining in the Cedar Rapids MSA (except for transportation and distribution, which employed only a few respondents). Commuting longer distances to these jobs was a rational decision, since these sectors offered higher hourly pay than similar jobs in nonmetropolitan locations or were more likely to offer benefits.
- Respondents tended not to commute to metropolitan jobs in sectors that have shown the most growth in Cedar Rapids; women in the personal services and retail industries were most likely to work in nonmetropolitan locations. This decision is also rational, since these women received significantly higher hourly pay in nonmetropolitan jobs in those sectors, were less likely to receive benefits no matter where they worked, and expressed more resistance than other respondents to commuting.

Thus, we make the following conclusions:

- Only some rural women are willing to commute to metropolitan jobs.
- Transportation costs may represent a substantial barrier to increasing (or even

maintaining) the labor force participation rates of younger, less-skilled, and less-experienced women workers.

- Lower rates of labor force participation in this group of women will have severe effects on the well-being of many rural households and will affect the viability of smaller rural communities.

The policy recommendations are drawn from our discussion in Chapter Six. There we made the following arguments:

- Ridesharing and vanpooling offer the best solutions for the commuting burdens identified among our survey respondents. Although it may be somewhat difficult to extend these programs to part-time employees and those working in small firms, they could accommodate a large proportion of longer distance commuters.
- A small group of respondents may benefit from easier access to the transportation services that currently exist in the study area; a brokerage function assumed by the Regional Transit Authority may be warranted.

CHAPTER ONE

INTRODUCTION

Since World War II, rural employment opportunities have become more diverse, and today most rural employment is in nonagricultural sectors (Clark 1991; Deavers 1992). The rural Midwest in particular has offered employers a highly educated low cost work force, which has afforded the region some competitive advantage over large metropolitan areas in attracting some kinds of investment. One notable change in rural labor markets over the past decade has been the dramatic increase in women's labor force participation rates; rural women now have participation rates very similar to those of urban women (Godwin and Marlowe 1990; Ollenburger, Grana and Moore 1989).

The kinds of jobs available to rural residents fall into two broad categories—metropolitan and nonmetropolitan. Metropolitan labor markets tend to offer more stable jobs with higher pay and better benefits; nonmetropolitan markets offer a narrower range of jobs, and they are more often part-time or seasonal. Research has shown that rural counties adjacent to metropolitan areas have had higher rates of job growth and lower unemployment rates than more remote rural counties (Deavers 1992; Fuguitt 1991; Galston 1992).

While jobs in metropolitan markets offer better returns to rural residents, they also impose substantial commuting costs. Workers (particularly women) may have to choose between underemployment in a narrow local market, with

fewer rewards but lower commuting costs, and stable employment in a more diversified metropolitan labor market, with better rewards but higher commuting costs (Tickamyer and Bokemeier 1988). This trade-off between better rewards and higher commuting costs is mediated by the individuals' education and experience, their sector of specialization within the labor force, and their domestic responsibilities (McLaughlin and Perman 1991; Hanson and Johnston 1985).

Men's rate of participation in the rural Midwestern labor force is not likely to increase, but women's participation rate may increase to as much as 75 percent (Iowa Department of Employment Services 1992), particularly if some of the barriers to their entering the work force can be lowered. It has been assumed that the most important constraints were domestic and child care responsibilities; the solutions proposed were therefore flexible workdays and part-time or shift-work patterns. These solutions do not reduce women's domestic responsibility but only shift the daily burden (Christensen 1985). Child care and elderly care services do reduce the time burden for many women, but they also impose new costs that reduce the contribution women's wages make to the household.

The costs in time and money of commuting are especially relevant to women workers. First, the family responsibilities and domestic roles of most women workers put a premium on time that might be spent commuting; second, women on average

earn lower salaries than men, so that the cost of commuting would consume a proportionately higher fraction of their earnings (Wekerle and Rutherford 1988; Fox 1986; McLafferty and Preston 1991; Madden 1981). A strategy to maintain and expand the supply of labor in the next decade must lower the barrier created by commuting costs.

Most rural workers commute by personal car, especially in the Midwest where car ownership rates are high. However, other options are possible. Rural public transit has been used successfully, especially for lower income workers. Ridesharing and vanpooling are now underused, but clean air legislation provides incentives for their use and requires that states reduce individual car travel by the end of the decade (Valdez and Wang 1989; Torluemke and Roseman 1989). Local employment can also be reached on foot or on bicycle. No single option will be suitable for every worker.

As women's labor force participation rates have increased, their job opportunities, rewards, and constraints have become much more diverse. The general arguments made above for the distinctiveness of women's commuting patterns need to be qualified to take into account the divisions that have emerged within the female work force, if we are to use research effectively as a basis for policy. The central purpose of this study is thus not only to describe women's commuting patterns and analyze the cost and time burdens these impose on women workers, but also to distinguish among women workers with different labor market experiences and different commuting constraints.

We also approach the problem of commuting constraints from another angle, by measuring the disincentives potential transportation costs represent for women who are not in the labor force, who are employed in home-based work rather than in the workplace, or who are underemployed. If the permanent female labor force is to expand in the future, we need to understand the barrier that transportation poses to nonparticipants and those tied to very localized labor markets. In part, this will be accomplished by examining the actual commuting burdens of current labor force participants, but part of the analysis must also address the interdependence of

factors that keep potential women workers out of the waged work force.

RESEARCH QUESTIONS

This study addresses the following research questions:

- How important a disincentive is commuting cost for women who are engaged in home-based paid work or who choose not to participate in the wage labor force?
- How do commuting costs vary between different forms of labor force participation (defined by occupational sector, part- or full-time status, or location of job)?
- What rewards do different categories of women workers receive in return for the commuting costs they bear, and which rewards are most important in explaining why some women commute longer distances than others?
- How do the costs of mobility constrain or shape rural women's participation in the labor force, and do these effects differ among categories of current and potential women workers?

These questions explore the relationship between commuting choices and the choice to participate in the labor force. We recognize that explanations of commuting choices differ among categories of labor force participants; a substantial portion of our analysis is devoted to establishing these categorical differences. The most important distinguishing features are the location of the job (in metropolitan or nonmetropolitan markets), the industrial or occupational sector of employment, the human capital of workers (education and job experience), their evaluation of job attributes, and the structure of work (part- or full-time, seasonal or permanent, with regular or irregular hours).

We found that the choice to participate in the labor force had little relationship to domestic responsibilities (measured as marital status and the presence of young children). Many earlier studies

assumed these characteristics were important determinants of both labor force participation and commuting patterns (Ericksen 1977; Fox 1983; Madden 1981), and they may have been more important in the 1970s. Over the past decade, however, social norms and expectations have changed, and child care and other domestic services are more commercially available.

Because we distinguish categories of current and potential women workers, we can better explain the commuting choices women make and use that explanation to assess policies that affect commuting patterns. These policy options are of two types: those that address transportation or accessibility directly and those that address the location and nature of employment. For most women, the two sets of issues are interrelated. Women who cannot afford high commuting costs often have low-paying local jobs with little potential for advancement; better jobs often entail higher commuting costs. For some women, even unstable, low-paying jobs entail high commuting costs. Policy must address how jobs are distributed across rural and metropolitan areas and how accessible better jobs are to rural women.

STUDY AREA

The research questions address the commuting patterns of rural-based women workers in regions that have undergone economic restructuring and some job growth over the 1980s. Since rural residents work in both nonmetropolitan and metropolitan labor markets, our study area includes four contiguous nonmetropolitan counties in east central Iowa (see Figure 1–1) that are adjacent to metropolitan areas. Those metropolitan areas (Cedar Rapids, Waterloo, and Dubuque) have different degrees of economic health and represent a range of employment opportunities.

Almost all residents of the study area are within 50 miles of Cedar Rapids, by far the most healthy of the three metropolitan areas. Cedar Rapids has

maintained the volume of jobs it had in 1979, although shifts have occurred between employment sectors. Jobs were lost in manufacturing and in the finance, insurance, and real estate sector (FIRE); jobs were gained in the service and retail sectors. Even in the 1991-92 recession, Cedar Rapids had an unemployment rate much lower than the national average, and employers drew a substantial proportion of their work force from outside Linn County. Waterloo and Dubuque, on the other hand, offer far fewer job opportunities for rural residents; economic restructuring in these metropolitan areas resulted in large employment and population losses in the 1970s and in the early to mid-1980s.

Figure 1–2 summarizes data on population change in the four-county study area and its contiguous metropolitan areas. Like the state, whose population shrunk by 4.7 percent in the 1980s, these four counties have lost population. Employment growth in the four rural counties has been negative over the past decade, although some sectors have gained jobs and the majority of rural residents continue to find local employment opportunities. The four counties have housing prices that are similar to those in other rural areas and much

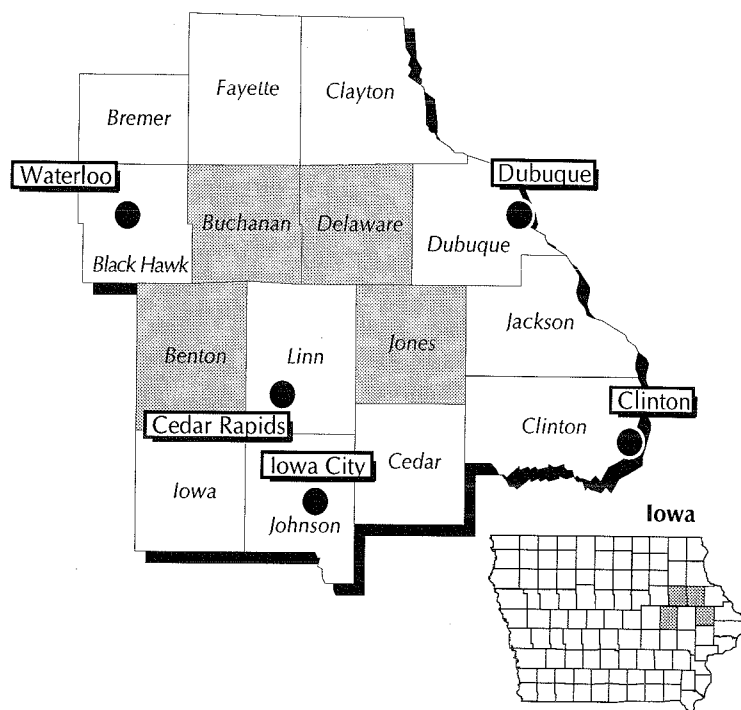


Figure 1–1 Study area

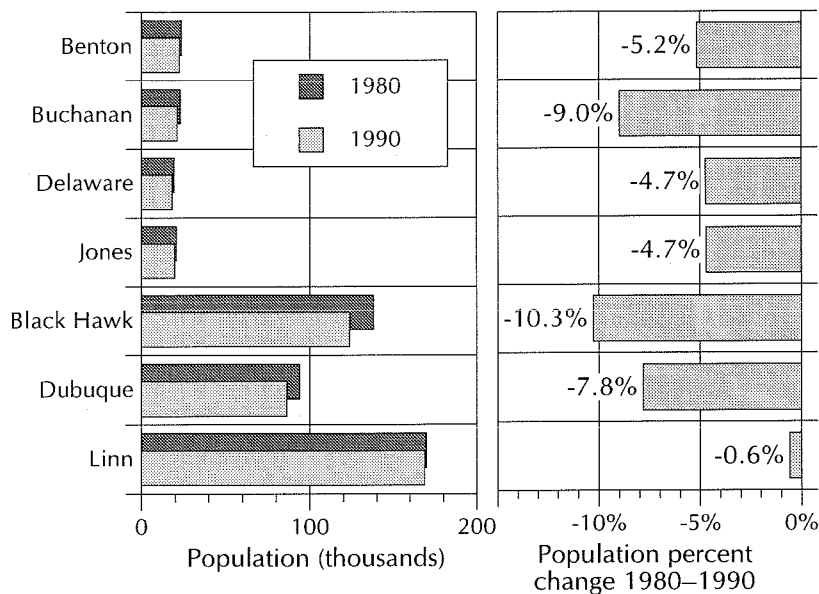


Figure 1-2. Population change in the study area and surrounding metropolitan counties, 1980-1990

SOURCE: Iowa Department of Economic Development (1991).

lower than the national average. This differential lowers the costs of labor and makes the region more attractive for new employment. Chapter Two profiles the economic base and the labor market in the four-county area, comparing its features with those of the rest of the state and of rural areas in the nation as a whole. The study area provides a typical case of rural employment growth and restructuring based on a mix of local and metropolitan labor markets, for which the rural labor force will continue to represent an important source of labor in the next decade.

THE SURVEY

Most of our data were obtained in a telephone survey conducted in September 1991 by the University of Iowa's Social Science Institute. The survey used a random-digit-dialing method to reach 646 households in the rural areas (places less than 2,500 in population) of the four eastern Iowa counties. The response rate from qualified households (those containing a woman between the ages of 18 and 65) was very high (73 percent); the overall response rate was 59 percent.

The survey instrument (see Appendix A) was divided into six separate, but not sequential, sections. The first section focused on the respondent's then-

current job (industrial sector, occupation, earnings, benefits, the regularity of work, and whether supplementary jobs were also worked) and then on the job the respondent had held six months earlier (March 1991). Respondents also ranked the importance of various potential job attributes. The second section was administered to women not then in the labor force, exploring reasons for their nonparticipation. The third section was addressed to unemployed respondents and the characteristics of their previous jobs; these respondents also ranked the importance of various potential job attributes. The fourth section was addressed to homeworkers, with questions about their

occupation, earnings, and the reasons they preferred working at home. Section five focused on commuting patterns: place of work, mode of transportation, and costs of transportation. The final section covered a range of demographic information about the respondent and her household. Wherever technically feasible, the wording of questions, the categories of answers allowed to questions, and the definition of terms used, conformed to the Bureau of the Census' *Current Population Survey*, to ensure comparability with the national survey.

STRUCTURE OF THIS REPORT

Chapter Two reviews previous research on rural employment and compares employment in the study area and its economic structure with those of the state of Iowa as a whole and with the nation. Labor force and employment data and trends provide the context within which our study of women workers is located.

Chapter Three discusses the demographic profile of the survey respondents, comparing them with respondents to the *Current Population Survey* conducted by the U.S. Bureau of the Census. The later sections of the chapter focus on respondents who were engaged in home-based paid work or

who reported that they were not currently in the labor force. Those sections examine the importance of transportation costs in the decision not to work outside the home and the job rewards of home-based paid workers, answering the first of our research questions:

- How important a disincentive is commuting cost for women who are engaged in home-based paid work or who choose not to participate in the labor force at all?

The final section of the chapter examines the labor force participation patterns of non-home-based workers, comparing metropolitan and nonmetropolitan employees and job structures.

Chapter Four focuses on the 333 survey respondents who were employed outside the home, examining the relationship between the structure of employment developed in the previous chapter and the commuting patterns reported by respondents. The first section of the chapter answers the second research question:

- How do commuting costs vary between different forms of labor force participation (defined by occupational sector, part- or full-time status, or location of job)?

Next, the costs in time and money that commuting entails for different groups of employees are analyzed, to assess how commuting patterns affect individual employees. The chapter concludes with a discussion of the effect of metropolitan adjacency on the labor market choices of rural women.

Chapter Five analyzes respondents' own evaluations of a set of job attributes (including

commuting distance) and develops an explanatory model of commuting behavior. An empirical model of the differences among the three principal groups of women workers answers the third of our questions:

- What rewards do different categories of women workers receive in return for the commuting costs they bear, and which rewards are most important in explaining why some women commute longer distances than others?

Finally, we draw conclusions from the analysis in order to answer the fourth research question:

- How do the costs of mobility constrain or shape rural women's participation in the labor force, and do these effects differ among categories of current and potential women workers?

Chapter Six discusses the policy options identified for policy responses outlined above. The chapter first looks briefly at local economic development strategies for bringing jobs to rural areas. We conclude that, in the short term, rural women would benefit more from access to metropolitan labor markets than from rural economic development initiatives. The remainder of the chapter thus focuses on access and transportation-related policy issues. We present our analysis of modal choice and explore policy solutions based on rural public transit and ridesharing or vanpooling. The final chapter integrates the findings of the telephone survey and the analysis of labor market structure to present a coherent picture of the relationship between commuting burdens and labor market choices.

CHAPTER TWO

GENDER AND EMPLOYMENT

Nationwide, women rapidly increased their labor force participation during the 1960s and 1970s, but rural women's participation rates did not increase as rapidly until the 1980s. In the past decade, family farms have become much more dependent on off-farm earnings, and women's wages are now crucial for the well-being of farm households. The farm crisis of the early 1980s helped accelerate changes in rural employment opportunities and in the structure of the farm household that affected women's labor choices. However, rural areas are not predominantly composed of farming households, and most rural residents are employed in nonagricultural sectors. Rural women from nonfarm households have entered the labor force in part because nonagricultural employment is increasingly available and in part because they face a problem that has also pushed urban women into the labor force: the need to maintain and improve the household's standard of living as the value of wages earned by men eroded.

This chapter examines the relationship between gender and the economic structure of rural America, focusing on the four-county area examined in this report. The dynamics described here are important because they define the context within which our study of rural-based women workers is placed and provide the basis for our later discussion of how labor markets are related to job structures and rewards, to occupational and industrial sectors, and to commuting patterns. The chapter is divided into two parts: the first summarizes current scholarly thinking on how changes in the rural economy

have affected women, and the second is an empirical summary of industrial and employment change in the study area.

RURAL EMPLOYMENT IN THE UNITED STATES AND WOMEN'S LABOR FORCE PARTICIPATION

The rural economy in the Midwest has changed substantially over the past two decades. Several developments have undercut farm-related and nonfarm employment sectors: agricultural holdings have been consolidated among fewer owners, a trend reinforced by the farm credit crisis of the early 1980s, and the demand for farm inputs has changed. Meanwhile, the service area for consumer and retail goods has grown, consolidating retail trade in fewer and larger communities. However, employment in back office business service functions and in some types of manufacturing has expanded; firms have been attracted to the rural Midwest in part by generous economic development incentives and in part by a relatively skilled, well-educated, and low cost labor force. In the late 1970s and 1980s, nonmetropolitan areas became attractive locations for corporations anxious to cut labor costs; many routinized and fairly "deskilled"¹ jobs were relocated to rural labor markets over this period, as firms took advantage of simultaneous rapid declines in agricultural and related employment.

¹ We recognize that the definition of "deskilled" jobs is somewhat arbitrary; the term is normally used to describe jobs that have become more automated or that have been fragmented into repetitive component activities.

Rural labor markets became more integrated into, and therefore more similar to, urban labor markets. But by the mid-1980s,

corporate restructuring was beginning to open up new opportunities for relatively higher capital yields in metro-areas and in the more protected investment havens of the developing world. Rural areas in the U.S.A. were not uniformly able to compete in this expanded arena (Clark 1991, 187).

Some rural areas, especially those that relied on a low wage structure to attract jobs, suffered significant disinvestment in this period.

However, employment growth in the rural areas of the Midwest indicates that low wages are not the only attractive feature of the region. Manufacturing employment growth in the Midwest has tended to be in more innovative (or primary) sectors of the industry, which have experienced higher rates of growth than subsectors in more mature phases (Bloomquist 1988). Nevertheless, the rural manufacturing sector may be more "headless" than the urban sector: that is, routine tasks and component production processes appear to be highly concentrated in rural areas (Bloomquist 1988, 54). There are fewer managers, professional and technical workers, and sales and clerical employees in rural areas and more assembly workers (operatives) than in urban areas.

In parts of the rural Midwest, producer services—often seen as the most desirable of all service sector jobs—have also grown significantly. Because of developments in communication and telecommunication technology, various component service activities have decentralized to suburban and rural locations. Noyelle (1983) has argued that rural locations will increasingly attract the clerical processing facilities of large businesses, especially insurance and banking. Like manufacturing operations, routine service operations can be deskilled and then distributed to areas that have lower wages and are more industrially flexible. One study found that, in back office producer service facilities, suburban female workers offer considerable advantages over traditionally located central city labor: they are better educated (or at least educated in white suburban schools) and have better labor discipline,

with limited wage demands and little labor organization (Nelson 1986). This argument may plausibly be extended to the Midwest, where the farm crisis has helped create a potentially ready pool of educated, disciplined back office workers (Bokemeier, Sachs, and Keith 1983). As a result, rural producer services are likely to develop in the direction that rural manufacturing has, toward occupational specialization in routine production jobs. The major difference is the higher level of female participation in producer services.

Many of the jobs created in rural areas over this period have been in sectors traditionally dominated by female workers. Within these sectors, and indeed within innovative manufacturing sectors, women have tended to hold jobs of lower status than men. Partly because of this, women's earnings are lower than men's: however, even within equivalent occupational categories, men in rural manufacturing earn considerably more than women (Bloomquist 1988, 71).

The increases in "female" jobs in rural areas were accompanied by fairly rapid increases in the labor force participation rates of rural women, so that by the late 1980s their participation rates were very similar to those of urban women. The most marked change was in farm-based women working away from the farm. Ollenburger, Grana, and Moore (1989) report that, between 1977 and 1985, 17 percent more farm women in their sample entered the labor force as full-time workers and seven percent as part-time workers, compared to a four percent rise in the number of nonfarm rural women who worked at home. In a study of small towns in Nebraska, Semyonov (1983) found that women's participation in the labor force is closely related to occupational segregation; that is, low status job opportunities tend to be concentrated in communities with a large proportion of women in the labor force. Female participation tends to increase in towns located farther from urban centers that offer manufacturing job opportunities.

Women's work and the rural household economy

Farm families increasingly depend on off-farm wages, particularly women's off-farm wages. In

1978, farm families received 56 percent of their income from nonfarm sources (USDA 1979); in 1982, this proportion was 60 percent (USDA 1985, 17). However, nonfarm income was especially important for small farms (annual farm sales less than \$5,000), which received 90 percent of their income from off-farm sources in 1978 (USDA 1979). In 1985, the average farm with sales less than \$40,000 lost income, so that off-farm income for these farm families constituted more than 100 percent of income (USDA 1986). By 1987, off-farm income still made up 95 percent of total income for farms with sales less than \$40,000.

Farm women bear substantial responsibility for family income; Godwin and Marlowe (1989) found that on average farm women's off-farm employment contributed more to family income than did married nonfarm women's employment. However, as Clark (1991) points out, the farm population is only a small part of the total rural and nonmetropolitan population; only one in ten nonmetropolitan residents were employed in the agricultural sector. Farm-based and nonfarm-based women suffer similar disadvantages in the rural spatial division of labor.

Tickamyer and Bokemeier (1988) isolate what they describe as a "pattern of interaction effects" that suggests men are more likely than women to increase their earnings as they increase their human capital (i.e., skills, experience, and education). They identify important disparities in labor force experiences by gender: women workers earn less and are less mobile, and overall they show less variance in earnings and stability (Tickamyer and Bokemeier 1988). Other researchers have suggested that these gender-based disparities have been the basis of rural economic development. Rural industrialization, it is argued, has relied on rural women employed in industries and occupations typified by low wages, low productivity, minimal job security, and limited job mobility (Beck, Horan, and Tolbert 1978; Morrissey 1982).

In a study of the earnings gap between metropolitan and nonmetropolitan women and men workers, McLaughlin and Perman (1991) conclude that this gap results chiefly from differences in returns on human capital and that those differences grew in

importance (for white workers) between 1977 and 1987. They conclude that returns to labor depend to an important extent on the structure of the labor market—the existence of a locally dominant industry, sectoral specialization, and labor supply and demand.

Other research has confirmed the importance of labor market structure for women workers. For instance, nonmetropolitan women workers tend to be concentrated in peripheral industries and to report higher unemployment rates than other women (Bokemeier, Sachs, and Keith 1983); they are also more likely to be in operative and service jobs than in white-collar employment (Bokemeier and Tickamyer 1985). An earlier study of small towns in Iowa reported a similar finding: nonmetropolitan towns tend to have high levels of occupational segregation (Rogers and Goudy 1981). As Bokemeier and Tickamyer (1985) argue, the occupational and industrial structure of local labor markets are the most important primary determinants of women's pay and conditions of work.

Thus, although employment opportunities have expanded for women in the rural Midwest, rural women workers continue to be disadvantaged in nonmetropolitan labor markets: even after taking into account differences between urban and rural costs of living, women are underemployed, receive low returns on education and experience, have a narrower range of job options (and of promotion opportunities), and earn lower wages. Nevertheless, waged employment is as important for rural-based women as it is for urban-based women. The literature review has demonstrated that rural regions in the United States have become more, not less, integrated into a national economy as a result of economic restructuring. The mode of women's integration into the wage labor force in eastern Iowa is the subject of the following section.

INDUSTRY, OCCUPATION, EMPLOYMENT AND LABOR FORCE PARTICIPATION IN EASTERN IOWA

Rural-based women in the study area make their labor force participation decisions in the context of such a set of metropolitan and nonmetropolitan

labor markets. The study area, which comprises a relatively integrated set of metropolitan and nonmetropolitan labor markets, has undergone substantial economic restructuring since the late 1970s. In this section we examine the changing employment structure in the region. We begin by documenting general employment trends and indicate which sectors have done worst and best. We then discuss the participation of women in the labor force, and the sectoral and occupational distribution of female workers. Finally, we look at the occupational distribution of women by their place of work.

Employment change in the four-county region and the surrounding MSAs

To summarize recent industrial changes in our study area, we compare industrial indices of sectoral employment growth in the four-county rural area to those of the surrounding metropolitan areas, the state, and the nation. Table 2-1 presents indices based on *County Business Patterns* data for the 1979-1989 period.² Employment grew in Iowa but more slowly than in the nation as a whole, primarily because of considerably slower growth in the finance, insurance, and real estate sector (FIRE) and in services sectors. Employment decreased in the four-county study area over the 1979-1989 period. Only the FIRE and services sectors grew, and FIRE expanded much more slowly than at the state level. The service sector did show reasonably solid growth in the study area over the decade; rural Iowa has proportionately far more service sector workers than the U.S. as a whole, many of them in professional occupations.

Retail trade, which grew at the state level but grew more rapidly at the national level, declined in the rural counties; construction declined precipitously. These two sectors are clearly consumer driven. Given the sharp decline in population in the survey area and the consolidation of retail trade in fewer and larger communities (notably Cedar Rapids), it is not surprising that both the retail trade and construction sectors lost jobs in the four rural counties.

Of the adjacent metropolitan counties, only the Linn County-Cedar Rapids MSA experienced employment growth. Cedar Rapids appears to have successfully restructured itself from a manufacturing to a service-, retail-, and transportation-based economy. In particular, the transportation, distribution, and communications sectors have grown dramatically, reflecting Cedar Rapids' new status as a regional air hub and a headquarters and back office location for a few successful telecommunications concerns. Moreover, retail employment has centralized in the Cedar Rapids MSA, reflecting and magnifying the population losses of surrounding rural counties. As a result of these trends, unemployment has remained low in the metropolitan area, hovering between four and five percent in 1991-92.

The two other metropolitan areas—Waterloo (in Black Hawk county) and Dubuque (in Dubuque county)—have not fared nearly so well: both employment and population declined dramatically over this period. Waterloo has had a massive loss of jobs in its traditional manufacturing specialization, agricultural machinery. The differences between Cedar Rapids and the other two cities highlight the care with which the concept of metropolitan adjacency should be used: proximity to the Waterloo and Dubuque MSAs offered few employment opportunities to our rural survey respondents.

To chart the dynamics of employment decline, we performed several shift-share analyses on employment changes in our rural survey counties, with the state and the nation as alternative base regions. The shift-share technique allows us to measure precisely how industrial structure (called the "proportional shift" term) and overall industrial growth (called the "share" term) affects employment change. The technique also provides a measure of the extent to which growth in a region is the result of local factors, such as an unusually good business climate for a particular industry (the residual or the "differential shift" term).³ The analyses were done at the SIC Division level for the entire 1979-1989

² 1989 was the last year of available published CBP data. Although 1979 was not at an identical stage in the business cycle (the post-1982 and 1976-79 recoveries were, in any case, very different), the two years remain broadly comparable.

³ See Dunn (1960) for a more detailed explanation of shift-share analysis. Note that the technique is controversial and has been criticized by some economists and regional scientists. See, for example, Holden, Swales, and Nairn (1987).

Table 2-1. Indices of employment growth by sector for U.S., Iowa, and study area, 1979 and 1989

Sector	1989						
	1979	U.S.	Iowa	Study area	Adjacent metropolitan areas		
					Linn County	Black Hawk County	Dubuque County
Agriculture	100.0	173.1	144.3	n.d.	188.1	n.d.	133.0
Mining	100.0	74.9	70.1	n.d.	25.9	n.d.	n.d.
Construction	100.0	109.3	71.8	68.3	84.7	69.8	70.3
Manufacturing	100.0	90.7	88.1	90.2	80.6	55.4	75.5
Transportation	100.0	117.7	108.9	96.0	194.5	74.2	88.9
Wholesale trade	100.0	118.7	92.0	85.3	114.6	75.8	96.8
Retail trade	100.0	127.6	108.2	91.4	129.4	97.1	111.8
Finance, insurance, and real estate	100.0	131.8	119.1	105.5	84.7	90.8	102.6
Services	100.0	163.0	139.7	140.0	133.3	123.4	131.1
Nonclassifiable	100.0	176.4	129.8	n.d.	189.7	n.d.	n.d.
Total	100.0	122.7	106.7	97.2	107.3	82.8	96.9

SOURCE: Calculated from *County Business Patterns* data for 1979, 1989.

NOTE: n.d. indicates nondisclosure of data.

period and for each year within that period. (See Appendix B for detailed empirical results.)

In summary, the rural counties performed much more poorly than the state. The proportional shifts were mostly negative, indicating a local specialization in industries that were growing slowly or declining. Unsurprisingly, the construction, manufacturing, retail, and wholesale sectors were primarily responsible for the negative shifts; services were the most important positive component of the shifts. The differential shifts, which tell something of the local business climate, were also negative. When the nation was used as the base in the analysis, the longer-term and more recent proportional shifts were slightly positive (because a high percentage of workers are in service sectors, which grew very fast at the national level); however, the total (or summary line) differential shifts were strongly negative. Indeed, the differential shifts were very negative for every sector of the economy over the 1979-1989 period. Like many areas of the rural Midwest, the employment performance of the four-county study area was dismal.

Thus, while economic restructuring has increased employment opportunities and to some extent centralized them in one of the metropolitan labor markets (Cedar Rapids), it has reduced employment opportunities in the nonmetropolitan portions of the study area. The 1990 *Census of Population* reported that a high proportion (averaging 33.5 percent for the four rural counties) of employed residents in the rural counties worked outside their county of residence. In the state as a whole, only 13.3 percent of employed respondents worked outside their county of residence. Our survey results suggest that the vast majority of female rural residents who worked in metropolitan areas commuted to Cedar Rapids. Only a tiny proportion commuted to the economically distressed cities of Dubuque and Waterloo. It is also clear that the Cedar Rapids economy depends on access to labor from rural areas. We obtained breakdowns of female employees by zip code from four of the largest Cedar Rapids employers (a hospital, an insurance company headquarters, and two manufacturing concerns); between 20 and 33 percent came from surrounding rural areas.

Labor force participation, employment, and occupation of women

Economic restructuring in the study area has been accompanied by increasing rates of female participation in the labor force. Economic restructuring is not gender-neutral (Kuhn and Bluestone 1987); expansion and decline have taken place in sectors with distinctive, "gendered" employment patterns. In this section we describe these changes; however, given the paucity of data on the employment of women, our analysis necessarily moves among a variety of databases that are not always compatible.

In 1990, women made up 42 percent of the Iowa labor force and the Iowa employed, and 38 percent of the unemployed. In 1989, 63 percent of women in Iowa participated in the labor force, a large increase from the participation rate of 40 percent in 1970. The state Department of Employment Services projects that this rate will reach 69 percent by 1996. The participation rate for men has been generally stable over the 1970 to 1989 period, hovering around 77-78 percent (Department of Employment Services 1991, 11). Thus, the ratio of men to women in the total labor force has declined. If the projections for female labor force participation are correct, then by 1996 women will make up 49 percent of Iowa's estimated employment of 1,515,000 people. Overall then, the movement of women into the labor force has been responsible for the continued expansion of Iowa's labor force during the 1980s (a period of state population decline).

In the rural counties of the study area, both the labor force and those

employed included higher proportions of males than the state as a whole; in Buchanan and Jones counties, the unemployment rates for men were actually lower than those for women (see Figure 2-1). The Iowa Department of Employment Services projects labor force participation only for multicounty Service Delivery Areas (SDAs) and not for individual counties. Nevertheless, these projections suggest that women's participation rates in the four-county study area will continue to be well under the state average, possibly by as much as six percentage points (Iowa Department of Employment Services 1992). Thus, although the participation rates of women in the study area have increased and are likely to continue to increase, women have played a smaller role in the regional labor force than they have in the state as a whole.

We also examined how rural women's employment is distributed by industrial sector in the state, comparing data from the 1989 *Current Population Survey* (CPS) to data from the telephone survey of our study area (Table 2-2). Note that these data are not directly comparable, since they refer to differ-

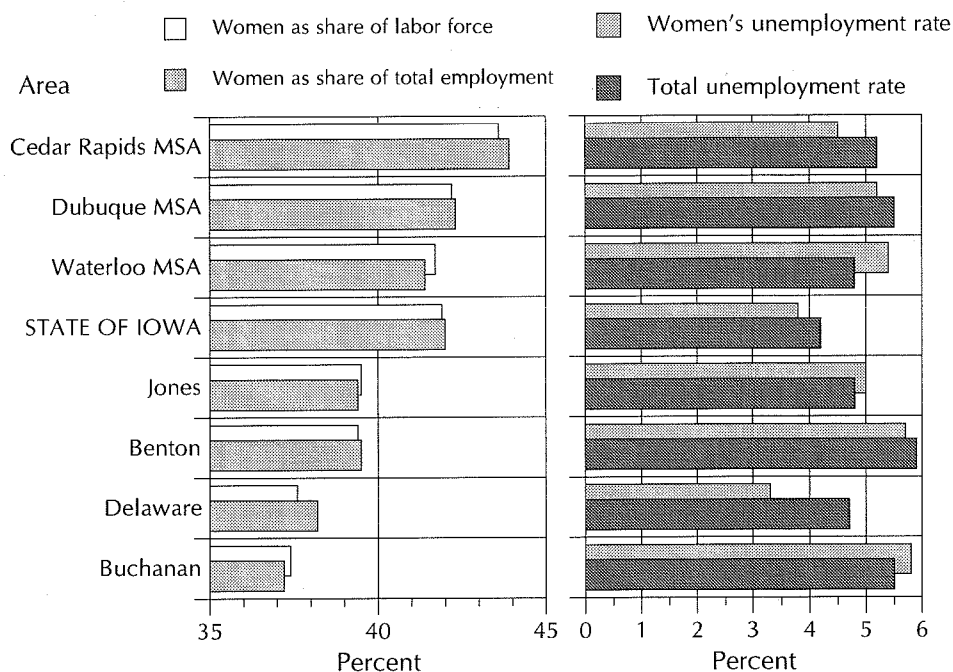


Figure 2-1 (a). Women as percentage of labor force and of total employment, 1990, by area

Figure 2-1 (b). Unemployment rates for women and for total population, 1990, by area

SOURCE: Iowa Department of Employment Services (1991).

Table 2–2. Occupation and industry of employed females in the U.S., rural Iowa and the study area (percent)

	U.S. ^a		Iowa rural ^a	Study area ^b
	Urban	Rural		
Occupation				
Farming, forestry and fishing	0.4	3.1	2.5	2.1
Managerial and professional speciality	27.2	21.8	25.2	35.4
Technical, sales and administrative support	45.2	41.0	38.9	32.4
Service	17.5	19.2	22.9	14.7
Precision, production, craft, and repair	2.1	2.8	2.5	0.9
Operators, fabricators, and laborers	7.7	12.2	7.9	14.1
Total	100.0	100.0	100.0	100.0
Industry				
Agriculture, forestry and fisheries	0.9	5.2	3.5	4.5
Mining	0.3	0.4	0.0	0.0
Construction	1.7	2.3	1.1	1.5
Manufacturing	18.2	22.9	11.9	19.8
Transportation	6.7	5.2	2.6	5.7
Wholesale trade	3.7	3.1	2.0	2.4
Retail trade	27.8	28.6	19.7	9.0
Finance, insurance, and real estate	14.1	9.8	6.9	6.3
Services	19.7	16.8	48.2	43.5
Public administration	6.9	5.6	4.1	6.9
Total	100.0	100.0	100.0	100.0

SOURCES: Data for U.S. from Department of Commerce (1989); for Iowa, calculated from 1989 Current Population Survey tapes; and for study area, from survey sample.

NOTE: The occupational and industrial composition data given in this table are not directly comparable—most significantly, the data refer to different years and in the case of our sample exclude women younger than 18. The CPS excludes those younger than 16.

^a1989.

^b1991.

ent populations, and there are some differences between the CPS definition of employed females and our definition.⁴ The table is therefore intended for only the broadest of comparative purposes, to highlight general patterns of women's participation in industry.

There were some startling differences between the rural U.S. and the four-county study area. Our survey found far fewer women employed in the

retail sector (or in technical, sales, and administrative support occupations) than the CPS reports for either rural America or rural Iowa. In part, this difference reflects overall employment trends in the four-county region, where the retail trade sector suffered a large employment decline over the 1980s. On the other hand, our survey found a far larger proportion of workers in the service industry (43.5 percent) than the CPS reports for the rural U.S. (19.7 percent), but a somewhat smaller proportion than in rural Iowa (48.2 percent).

Notice, however, that there were fewer women in service occupations in the study area than in rural

⁴ 1990 Census of Population data breaking down employment by sex were not available at the time of writing. Unfortunately the sample size of the Current Population Survey is much too small to provide reliable breakdowns.

Iowa or rural America. The reason is the occupational distribution of jobs within the service *industry*. A large number of women who were classified to the service *industry* were also classified to managerial and professional specialty *occupations*. One further trend is worth noting. More women were involved in manufacturing in the sample than in rural Iowa (a result that appears to reflect manufacturing job opportunities in Cedar Rapids). The study area therefore had significantly more women in the operators, fabricators, and laborers occupations than did rural Iowa.

We also compared rural women's and men's employment by industrial sector in the state, again using the 1989 CPS data. Again these are rough comparisons only. In three major industrial categories (agriculture; mining, construction, and manufacturing; and transport, distribution, and communications) men made up more than two thirds of employees. Women made up two thirds or more of all employees in two industries (personal services and professional services), and retail trade also employed a majority of women (54 percent), although women made up 47 percent of employed respondents. Breakdowns by gender were almost even in predominantly "white-collar" industries (FIRE; business services; and public administration). It is clear that the study area reflects the occupational segregation by gender typical of the national economy, despite the relatively high proportions of women in manufacturing.

Judging from the responses to our telephone survey, Cedar Rapids, Waterloo, Dubuque, and nonmetropolitan places in our study area represent three labor markets that are sectorally and occupationally quite different from one another

(see Table 2-3). Of those who commuted to Waterloo or Dubuque, almost two thirds were in executive, managerial, professional, or administrative positions; the remainder were employed primarily in offering other services. A much higher proportion of respondents who commuted to Waterloo or Dubuque were involved in those

Table 2-3. Industrial and occupational distribution of employed respondents by place of work (percent)

	Total	Cedar Rapids	Waterloo & Dubuque	Other places
Industry				
Agriculture, forestry, and fisheries	4.5	0	8.3	6.1
Construction	1.5	2.3	0	1.3
Durable goods	15.3	17.4	0	15.3
Non-durable goods	4.5	10.5	8.3	2.2
Transportation	5.7	9.3	16.7	3.9
Wholesale trade	2.4	2.3	0	2.6
Retail trade	9.0	7.0	8.3	10.0
Finance, insurance, and real estate	6.3	8.1	8.3	5.7
Business and services	4.2	4.7	8.3	3.9
Personal services	7.5	4.7	0	8.7
Entertainment	3.0	1.2	0	3.5
Professional services	29.0	29.1	41.7	27.9
Public Administration	6.9	2.3	0	8.7
Total (n=333)	100.0	100.0	100.0	100.0
Occupation				
Executive and management	15.6	20.9	16.7	14.0
Professional specialty	20.1	22.1	8.3	19.7
Technicians	7.8	10.5	0	7.4
Sales	6.9	4.7	0	8.3
Administrative support	17.7	15.1	41.7	16.6
Private household service	2.7	1.2	0	3.5
Protective services	0.9	1.2	0	0.9
Other services	11.1	8.1	25.0	11.4
Precision production, craft workers	0.9	1.2	0	0.9
Machine operator, assembly workers	7.8	10.5	0	7.0
Handlers, laborers, equipment cleaners	6.3	4.7	0	7.4
Farming, forestry, fishing	2.1	0	8.3	2.6
Total (n=333)	100.0	100.0	100.0	100.0

SOURCE: Data for study area from survey sample.

nonprofessional and nonmanagerial service occupations. Since the number of respondents working in Waterloo or Dubuque was small (a total of 15), our sample here may be unrepresentative of the population commuting there. Among those commuting to Cedar Rapids, women were concentrated in manufacturing activities (machine operators, assembly workers, and technicians) and in executive, managerial, and professional occupations. Of those who commuted elsewhere (to nonmetropolitan areas), there were fewer in executive, managerial, and professional occupations and more in sales occupations.

In summary, the restructuring experienced in the metropolitan and nonmetropolitan labor markets in the study area over the past decade is typical of patterns identified in the Midwest as a whole. Manufacturing employment, a predominantly "masculine" sector, has declined both in traditional industrial centers and in rural counties (except in one county that gained assembly jobs). Nevertheless, the data available indicate there were more female manufacturing workers, fewer service industry workers, and considerably fewer retail workers in the study area than in rural Iowa as a whole (but more service industry workers than the rural U.S. as a whole). The sample showed a distinct concentration in professional services. There was considerable gender segregation of the work force. Women were concentrated in just a few industries, especially personal and professional services and retail trade. Finally, retail and consumer services (predominantly "feminized" sectors) have centralized in some metropolitan areas, while white-collar employment has been slightly decentralized to nonmetropolitan areas. The Cedar Rapids job market has thus retained its job base by growth in regional hub functions, while nonmetropolitan markets have lost jobs in most sectors.

CONCLUSION

Women have become an increasingly significant part of the labor force in rural Iowa over the past decade, a period of significant economic restructuring. Economic change in the study area is similar to changes identified at the larger regional level, with declines in manufacturing employment offset to some extent by increases in service sector employment, a diverse employment category. However, the study area is distinctive in that it provides more manufacturing jobs and a slightly smaller proportion of service jobs than does rural Iowa as a whole; it has also seen large losses in retail employment.

Cedar Rapids offers rural residents of adjacent counties a relatively stable job market. However, sharp declines in employment in Waterloo (and Dubuque) suggest that these two metropolitan areas offer rural residents few job opportunities; this suggestion was borne out in the responses to our telephone survey. Thus, the extent to which metropolitan adjacency benefits the residents of the study area differs with the health of the accessible metropolitan labor market and the sector of employment. Overlaid on this are the gender segregation in specific sectors and the gendered nature of job structure and job rewards.

While the growth of nonagricultural employment and the decline of the family farm sector have expanded rural women's participation in the labor market, economic restructuring has sharpened the differences between rural and urban labor markets. The restructuring outlined in this chapter has affected men and women differently, and the increasing disparity in the health of various metropolitan and nonmetropolitan labor markets has made commuting a central component of rural residents' employment choices.

CHAPTER THREE

LABOR FORCE PARTICIPATION

Although women in the rural Midwest now have more employment opportunities, they continue to be disadvantaged by underemployment, low returns to education and experience, a narrower range of job and thus of promotion opportunities, and lower pay. These disadvantages persist even after differences between urban and rural costs of living are taken into account (McLaughlin and Perman 1991; Bokemeier and Tickamyer 1985; Little 1991) and form part of the context within which rural women make decisions about participating in the labor force. This chapter focuses on the conditions under which women participate in the labor force, comparing three groups of survey respondents: those not in the wage labor force, those in home-based paid work, and those in the non-home-based wage labor force. Specifically, the chapter seeks to answer the following questions:

- What are the factors that differentiate these three groups of respondents?
- What factors motivate the decision to participate or not to participate in the labor force?

In this chapter we address the issue of commuting only for the first two groups, assessing the extent to which perceived transportation costs influence the decision not to work for wages outside the home. Chapter Four examines the commuting patterns of those in the traditional labor force in detail.

This chapter begins with a profile of the demographic characteristics of the survey respondents, comparing them with rural Iowa respondents to the *Current Population Survey* of 1989 to demonstrate the similarities between the study area population and the state population. Focusing on our survey respondents, we compare those not in the labor force to those in the home-based and non-home-based labor force. Next, we examine respondents who are not in the labor force in more detail, drawing a distinction between potential and unlikely recruits to the labor force and analyzing the role of transportation barriers in discouraging labor force participation. Home-based workers are the focus of the subsequent section; their rates of pay and job preferences are compared with those of non-home-based workers, and the extent to which the decision to work at home is based on resistance to commuting is assessed. The final section of the chapter examines the nature of participation in the traditional labor force; we attempt to answer the following two questions:

- Are different occupational and industrial sectors characterized by significant differences in job rewards, work patterns, or human capital attributes?
- How does the work experience in metropolitan labor markets differ from rural labor markets?

DEMOGRAPHIC PROFILE OF HOUSEHOLD SURVEY RESPONDENTS

This section outlines the patterns of labor force participation revealed in our household survey and compares the educational attainments, age structure, and participation rates of respondents with those in the sample of rural Iowa women reported in the *Current Population Survey (CPS)* of March 1989. We explore the relationships between labor force participation and several demographic and socioeconomic characteristics (including household transportation resources) to develop a coherent profile of our respondents. We compare basic demographic data for women who are not in the wage labor force, women who work at home for wages (home-based workers), and women who work outside the home for wages, either part-time or full-time.

The household survey sample and the CPS found similar rates of women's participation in the labor force: 59.3 percent of our study area respondents were currently active in the waged labor force, as were 58.7 percent of the CPS sample (see Table 3-1). Unemployment rates were slightly higher in our sample (3.4 percent versus 2.0 percent), in part because 1991 was a recession year. Similar proportions of women were employed part-time (30 percent of those currently employed in our sample and 31.3 percent of those in the CPS sample). The CPS does not collect data on those who earn income by working at home, but this group formed 12.8 percent of current workers in our sample.

The education levels of the two samples were similar, although our survey included more detail about college and other tertiary education (see Table 3-1). Our sample included slightly fewer younger respondents than the CPS sample, in part because we interviewed only one woman from each household, whereas the CPS collects data on every household member.

Car ownership rates among respondents were high, as might be expected since most

rural residents lack other means of transportation. Only two percent of households did not have a car available, and the vast majority (86.6 percent) had two or more vehicles in their household. Almost all respondents (96.7 percent) had a current driver's license; most of those without driver's licenses (68.4 percent) were 65 years or older. Overall, 95 percent of sample respondents had a car available to them daily. The mean age of the car available was 5.7 years (median five years), and only 20 percent of respondents' cars were more than ten years old. We may conclude that the sample population has a high level of personal mobility, especially since a national study estimated that only 39 percent of married working women have a car available to them exclusively (Michelson 1983, 50).

Table 3-1. Comparison of survey sample with Current Population Survey for rural Iowa (percent)

	Survey sample ^a	Current Population Survey ^b
Employment		
Currently employed	59.3	58.7
Of which, part-time	30.0	31.3
Unemployed	3.4	2.0
Education		
Some high school	9.5	8.6
High school graduate	49.5	56.1
Some college	30.9	20.6
College graduate	6.2	10.1
Postgraduate	3.9	4.6
Age		
18 to 19	1.8	3.0
20 to 24	5.2	10.9
25 to 34	25.4	26.0
35 to 44	27.6	22.5
45 to 54	15.5	14.6
55 to 64	14.3	14.7
65 to 70	10.2	8.3
n	646	687

SOURCES: Data for study area from survey sample; for rural Iowa, calculated from 1989 CPS tapes.

^a1991.
^b1989.

Chi-square analysis of the four groups of respondents (women who are not in the wage labor force, women who work at home for wages, and women who work outside the home for wages, either part-time or full-time) revealed significant differences along all demographic dimensions; some of the results are summarized in Table 3–2. As we may expect, a high proportion (89.8 percent) of respondents over 65 years old were not in the labor force, while a high proportion of women between the ages of 25 and 55 (76 percent) were. Home-based work was most often chosen by women between the ages of 25 and 45.

Women who chose home-based work were far more likely to have children under the age of 18; women who were not in the wage labor force were least likely to have children at home (30 percent, versus 50.2 percent of respondents overall). When we exclude women who are unlikely to have

children at home because they are retired, this finding remains intact: only 42.4 percent who were not in the labor force had children. Significant differences were found between the number of women working part-time and the number working full-time who had children at home, although both groups were still more likely to have children than were women under age 65 who were not in the labor force. Home-based workers were slightly more likely than other respondents to be married, and women not in the labor force were more likely to be widowed (again, mostly because of the age distribution).

There was a significant relationship between educational level and labor force participation. Nearly two thirds of respondents without a high school diploma were not in the labor force; when retired respondents are excluded, those without a high school diploma made up 14.1 percent of

Table 3–2. Demographic profile by labor force participation (percent)

	Not in labor force	Home-based workers	Non-home-based workers		χ^2
			Part-time	Full-time	
Household characteristics					
With children	30.0	79.6	67.0	59.3	82.38**
Living on farms	39.5	44.9	31.9	31.3	
Education					
					37.34**
Some high school	15.3	0	7.8	6.0	
High school graduate	51.3	53.1	53.9	43.8	
Some college	26.8	34.7	29.6	35.5	
College graduate	4.6	10.2	4.3	8.3	
Postgraduate	1.9	2.0	4.3	6.5	
Age					
					192.38**
18 to 24	6.2	6.1	7.0	7.1	
25 to 34	16.7	28.6	26.3	30.3	
35 to 44	11.2	42.9	34.2	35.5	
45 to 54	9.7	8.2	21.1	18.5	
55 to 64	22.1	10.2	7.9	6.6	
Over 65	34.1	4.1	3.5	1.9	
n	258	49	114	211	

SOURCE: Data for study area from survey sample.

NOTE: χ^2 significance denoted by: ** < 0.01; * < 0.05.

nonparticipants. However, three quarters of those with more than a high school education were employed outside the home, and they were more likely than others in the sample to be employed full-time. Surprisingly, a larger proportion (46.9 percent) of home-based workers than of the sample as a whole (40.9 percent) had some tertiary education or a college qualification. Home-based workers were also far more likely to live on a farm than were other respondents. Less than a third of women employed outside the home were farm dwellers, and no differences were discernible by part or full-time status.

There were significant differences in household income by respondents' labor force status (see Table 3–3). More than half (53.8 percent) of respondents not in the labor force lived in households earning \$20,000 or less annually, compared to 38.2 percent of all respondents and only 25.9 percent of respondents employed outside the home. Those employed outside the home were more likely to live in households with annual incomes of more than \$50,000 (17.1 percent) than were respondents not in the labor force (4.1 percent). Full-time employees were much more likely to live in households with higher annual incomes. Evidently women's labor force

participation has a substantial impact on a household's financial well-being.

While most respondents (95 percent) had a car available to them daily, nearly ten percent of those not in the labor force had no car available, and 6.9 percent did not have a current driver's license (see Table 3–4). The greatest difference in transportation resources was in the age of car available: of those not in the labor force and those employed part-time, nearly a third had a car in the highest age quartile (over eight years old), while less than 20 percent of those employed full-time had cars that old. Part-time workers had transportation resources that were more limited or of lower quality than did home-based workers.

Each of the four groups of respondents had a distinctive demographic profile. Those not participating in the waged labor force were more likely than other respondents to be between 25 and 44 years old or to have dependent children at home; they were more likely to have less education and to live in poorer households. Home-based workers were more likely than other respondents to live on a farm and have children at home; their age distribution was similar to that of non-home-based workers and their education levels were high. Part-time and full-time workers had similar age and education profiles, but part-timers were more likely to live in poorer households, to have dependent children, and to have less access to reliable transportation. The remainder of this chapter examines each group of respondents in more detail, focusing on the reasons for nonparticipation in the traditional labor force and on the job characteristics of labor force participants.

Women not in the labor force

Nonparticipants in the labor force are an important focus for discussion since some of them are potential future labor force entrants. Apparently nonparticipants are more likely than women who earn wages

Table 3–3. Distribution of household income by labor force participation
(percent)

Household income	Not in labor force	Home-based workers	Non-home-based workers	
			Part-time	Full-time
Less than \$10,000	25.9	0	15.5	2.7
\$10,000 to \$20,000	27.9	27.8	19.0	18.8
\$20,000 to \$30,000	27.2	27.8	34.5	26.8
\$30,000 to \$40,000	11.6	27.8	15.5	19.6
\$40,000 to \$50,000	3.4	11.1	8.6	9.8
\$50,000 to \$60,000	0.7	5.6	0	10.7
\$60,000 to \$70,000	1.4	0	1.7	4.5
\$70,000 to \$100,000	0	0	3.4	7.1
More than \$100,000	2.0	0	1.7	0
Total	100.0	100.0	100.0	100.0

SOURCE: Data for study area from survey sample.

NOTE: χ^2 score for household income by labor force participation was 86.57 (significant at $p < 0.01$).

Table 3-4. Household transportation resources by labor force participation
(percent unless otherwise indicated)

	Not in labor force	Home-based workers	Non-home-based workers		χ^2 or F
			Part-timers	Full-timers	
Car available daily	90.9%	98.0%	96.6%	98.6%	30.14**
Mean car age (years)	5.9	5.7	6.7	5.0	3.57†
Car over 8 years old	31.3%	26.1%	32.7%	17.3%	20.04*

SOURCE: Data for study area from survey sample.

NOTE: χ^2 significance denoted by: ** < 0.01; * < 0.05.

F-score significance denoted by: †† < 0.01; † < 0.05.

to live in poorer households; the need for more income may become an important incentive for labor force participation. This section focuses on the explanations respondents gave for not being in the labor force (see Figure 3.1), which represent a set of constraints that employers may have to overcome to attract new entrants.

Figure 3-1 distinguishes primary reasons for not being in the labor force from all reasons mentioned. When we exclude respondents who were retired or helping run a family farm or business, "taking care of dependents" and "taking care of home" were the reasons most frequently mentioned by respondents. Those respondents who have been temporarily or permanently laid off can be assumed to be willing future participants, as can those in school. Those who gave as their primary reason being retired, running a family business or farm, or having no financial need, probably have fewer incentives to take up waged labor.¹ We can assume that the remaining respondents could be attracted into the labor force under the right conditions. Ill or disabled workers are a special case; we did not collect sufficient detail on this group of respondents to enable us to determine which of the disabled group would be willing or

¹ For those engaged in running a family farm or business, this statement assumes that the farm or business will continue to provide an adequate household income; as argued earlier, many family farms depend upon off-farm income earned by at least one household member.

able to be employed outside the home under the right conditions, one of which would be availability of specialized transportation.

The respondents not in the labor force were divided into two groups: those for whom incentives to enter the labor force would be irrelevant and those who might be attracted into the labor force in the future. We compared these two groups on several dimensions to develop a better understanding of the differences between likely and unlikely labor force recruits. Most potential participants (57.1 percent) had children under age 18; however, a similar percentage of full-time workers and a higher percentage of part-time workers also had children under age 18. Potential participants were much more likely than other nonparticipants to be under 55 years old; nearly half were younger than 35. The majority (85.5

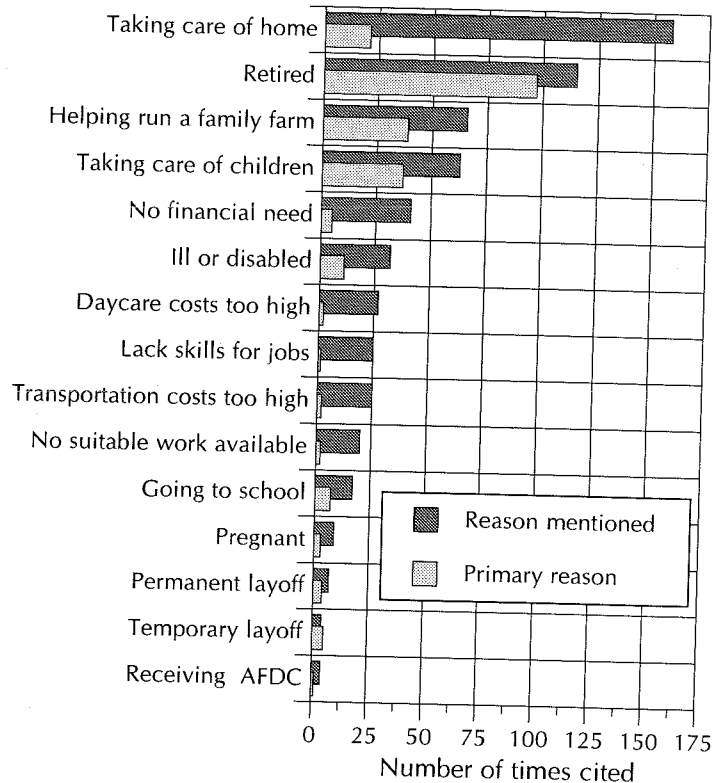


Figure 3-1. Primary and all reasons cited for not being in the labor force

SOURCE: Data for study area from survey sample.

percent) of potential participants had a high school diploma or some college education, but few (3.6 percent) were college graduates and the remainder (10.8 percent) had not graduated from high school.

Potential labor force participants were more likely than other nonparticipants to name transportation costs as a reason for not being in the labor force (16.7 percent). A small number of nonparticipants mentioning transportation as a reason did not have access to a car (three respondents) or a driver's license (four respondents), but most (68 percent) lived in households with two or more cars. Still, car availability was lower than for the sample population as a whole. Only 64 percent of those mentioning transportation as a barrier had a car available to them daily, compared to 95 percent of respondents overall. The age of the car available also differed significantly; 75 percent of nonparticipants who mentioned transportation as a barrier had a car more than five years old (the median car age for the sample).

We may conclude that this group of respondents, although small in number, is relatively transportation disadvantaged. Although transportation is not the primary reason potential workers do not enter the labor force, it is a contributing reason that policy needs to address if women's labor force participation rates and labor market choices are to grow in the future.

Home-based workers

Home-based work is one strategy that women have always used to combine wage-earning with domestic responsibilities. Recent technological advances such as sophisticated telecommunications networks and increased access to personal computers and fax machines enable automated office work to be decentralized into the home. In addition, as more women have entered the traditional labor force, there are more opportunities to commercialize home-based services such as child- and elderly-care in the home (in addition to crafts and domestic services such as sewing and baking).

Home-based work can offer the flexibility and the autonomy women lack in the regular work force; however, its benefits can be overstated, as it does

not eliminate child care responsibilities and usually provides much lower wages than other forms of work (Fethke and Willie-Sutton 1989). Home-based workers have reported in national surveys that they would rather work at home than not at all, but that combining home-based work and domestic responsibilities creates stress and social isolation and reduces opportunities for career advancement (Christiansen 1985, 57). Home-based assembly or manufacturing work has been criticized as leading to potentially unsafe working conditions, and the potential for violation of minimum wage, overtime, and child labor laws, especially when earnings are on a piecework basis (Christiansen 1985, 55; Gringeri 1991). Employers see home-based work as creating advantages for the firm, including short turnaround times for piecework, less personnel turnover, increased productivity and accuracy, and reduced costs for office space, peak hour computer usage, and employee "downtime" (Christiansen 1985, 55).

More than half (57 percent) of respondents who were engaged in home-based work also had jobs outside the home; only a small proportion of employed respondents (5.4 percent) were engaged in home-based work exclusively. Nevertheless, home-based work is a source of earnings that could otherwise only be obtained by a second job outside the home. This section examines the types of work our respondents perform at home, their domestic responsibilities (as indicated by children and marital status), the hourly pay rates of different types of work, and the reasons our respondents gave for choosing home-based work over other jobs.

As Figure 3-2 shows, the largest proportion (nearly 30 percent) of home-based workers described their occupation as "arts and crafts" (including activities like sewing and baking), closely followed by child care or other dependent-care services (25 percent of home-based workers). Farm-related work, clerical work, data processing, professional free-lance work, and sales activities accounted for the remainder of occupations. Most home-based workers (77 percent) were self-employed, as we might expect given the kinds of work respondents engaged in. Child care or dependent-care workers were most likely to be self-employed (91.7 percent)

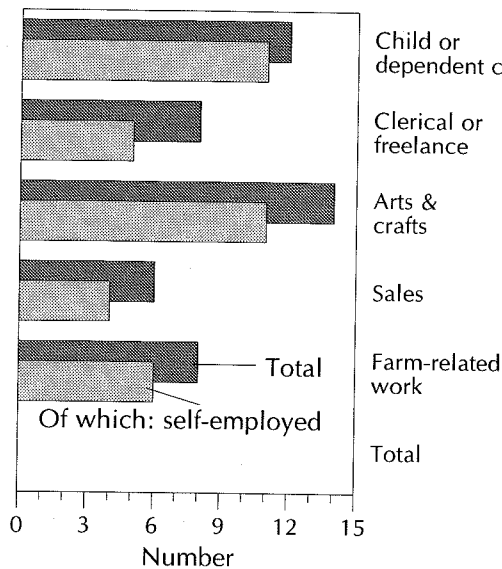


Figure 3-2 (a). Total and self-employed home-based workers, by type

SOURCE: Data for study area from survey sample.

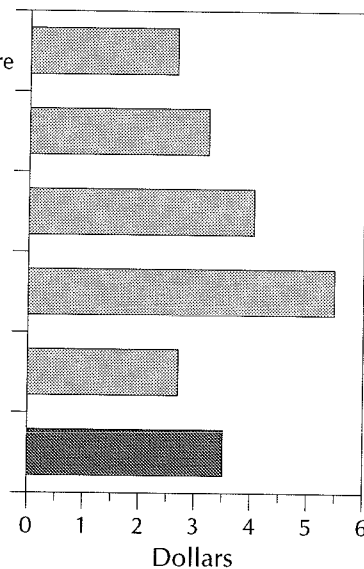


Figure 3-2 (b). Mean hourly pay for home-based workers, by type

SOURCE: Data for study area from survey sample.

workers discussed above. Hourly pay rates did differ by type of work (as shown in Figure 3-2 (b)), but no statistically significant relationship was found.

Self-employed workers tended to earn less on average than those who worked for an employer (\$3.54 compared to \$4.13), and those for whom home-based work was the sole source of income earned slightly more than those with another job. There was no significant relationship between hourly pay rate and educational level; in fact, the highest-earning category of home-based respondents were those with only a high school diploma.

and to have children. As was mentioned above, home-based workers were more likely than other respondents to have children under 18, although this was less evident for women involved in farm-related work. Only sales and farm-related workers were more likely to live on a farm; child care and dependent-care workers were less likely to be farm-based.

Home-based work is an effective strategy to reduce the costs in time and money that commuting imposes, but the savings may not compensate for the substantially lower hourly earnings of home-based work (an average of \$3.51 per hour versus an average of \$7.48 for non-home-based workers). Child care and farm-related workers earned substantially below the average for home-based workers, while sales and "arts and crafts" workers earned more than the average. However, even home-based sales workers received hourly pay rates lower than sales workers in the regular work force (\$5.48 per hour versus \$7.94 per hour). For all other occupations, home-based employment imposed substantial costs in foregone earnings, an especially striking disparity given the similarity in education of home-based and non-home-based

The reason most frequently given for working at home was the flexibility of hours, followed by ability to supplement earnings and availability of facilities (see Figure 3-3). Respondents who named transportation costs as an important reason for working at home (35.4 percent) were more likely to earn less than median hourly rates for home-based workers (66.7 percent earned less than the median) and were more likely to be in "arts and crafts" or child care and dependent-care occupations than were home-based workers as a whole. They were also more likely to be self-employed (88.2 percent) and to have only one source of earnings (76.5 percent). They did not lack transportation resources; all had driver's licenses, and all except one had a vehicle available daily. However, they did tend to come from low-to moderate-income households; those reporting household income were in households earning between \$10,000 and \$30,000 annually. Their educational attributes were similar, however, to those of other home-based workers: all were high school graduates, and 41.2 percent had more than a high school diploma. We may speculate that this group of respondents would find employment in

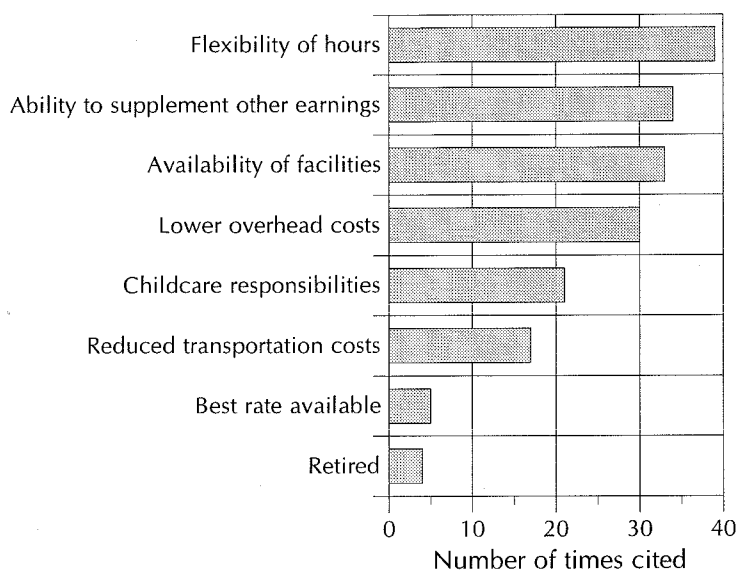


Figure 3-3. Reasons for choosing home-based work

SOURCE: Data for study area from survey sample.

the traditional labor force more attractive if some of the constraints on distance could be overcome.

The survey asked respondents to rate the importance of six job attributes on a scale from not important to very important; these attributes were job status, security, pay, convenience of commuting distance, job satisfaction, and availability of benefits. We analyzed the responses for home-based and non-home-based workers (see Table 3-5). Those employed outside the home were twice as likely as home-based workers to value job status highly; 50 percent more of those working outside the home valued benefits and pay highly. As might be expected, 50 percent more home-based workers placed a high value on short commuting distance. The two groups were closest on their evaluation of job satisfaction and job security, which received high ratings from a large majority of respondents.

The choice to work at home clearly reflects substantial differences in individual preferences, with

resistance to commuting an important factor for three quarters of home-based workers. Flexibility and autonomy are important reasons why women choose to work at home; cost savings (for overheads of self-employed individuals and for transportation) are taken into consideration by a number of respondents. However, home-based workers earn substantially less than those who work outside the home, and it is likely that some of those employed solely in home-based work would find traditional employment opportunities more attractive if transportation barriers could be lowered.

Respondents working outside the home

Employees in the traditional (non-home-based) labor force are frequently discussed as a single category, but our analysis reveals distinctions

Table 3-5. Evaluations of job attributes by location of employment (percent who rated each attribute as not, moderately, or very important)

	Not important	Moderately important	Very important
Job status			
Home-based	29.6	40.7	29.6
Non-home-based	11.8	27.3	60.9
Job security			
Home-based	7.4	22.2	70.4
Non-home-based	5.7	8.1	86.2
Pay			
Home-based	17.9	32.1	50.0
Non-home-based	8.7	16.5	74.8
Commuting			
Home-based	18.5	7.4	74.1
Non-home-based	19.5	31.2	49.2
Satisfaction			
Home-based	3.6	17.9	78.6
Non-home-based	3.0	10.2	86.8
Benefits			
Home-based	39.3	17.9	42.9
Non-home-based	19.2	14.4	66.4

SOURCE: Data for study area from survey sample.

among women workers. The first and most obvious is the distinction between part- and full-time employees which was briefly outlined in the demographic profile presented above. Other important differences are those between women working in metropolitan and nonmetropolitan job markets and between women in different occupational and industrial categories. This section traces the relationships between occupational sector, job rewards, work patterns, job location, and human capital attributes.

Job rewards are defined as pay (measured at an hourly rate to standardize the effect of different work patterns) and health or retirement benefits.² It has been suggested that the new delineation of poor and nonpoor workers is between those who receive health benefits and those who do not; the crucial role of health benefits in predicting longer journeys to work that our data suggests (discussed in Chapter Five) supports this argument.

Work patterns are defined as part-time or full-time status, regularity of work hours from week to week, seasonality (part-year work), and number of days worked per week. As more women have entered the labor force, work patterns have become more flexible; substantial numbers of our respondents worked nonstandard hours, which has implications for their commuting patterns and for transportation policy options.

Human capital attributes are defined in two ways: tenure with current employer and level of education. Another measure of work experience would be the length of time an individual can be assumed to have been in the labor force, calculated as the difference between the individual's age and her years of education (plus six). This measure has some features to recommend it; workers with valuable experience have not necessarily been with the same employer continuously. However, for women re-entering the labor force or making a career change, this measure can be misleading if it is the only indicator of labor force experience. Length of tenure with current employer measures experience and seniority in the specific job examined in this analysis, and is thus used in

² Detailed definitions of the calculation of hourly pay rates and other variables are provided in Appendix C.

preference to the measure of total estimated experience.

JOB CHARACTERISTICS BY OCCUPATIONAL AND INDUSTRIAL SECTOR

Chi-square analysis and analysis of variance were performed for a range of variables across eight occupational and eight industrial sectors. Some key characteristics of jobs in each occupational sector are summarized in Table 3–6. Service and sales occupations were, unsurprisingly, the least likely to offer health and retirement benefits, the most likely to require irregular hours (or offer flexible hours), and the most likely to offer part-time employment. Professionals, clerical personnel, skilled blue-collar workers, and technicians were slightly more likely than others to receive health and/or retirement benefits. Clerical workers were more likely to be employed part-time. Executives, technicians, and skilled blue-collar workers were more likely to be employed full-time with regular hours from week to week. (There were no differences in job structure between professionals or less-skilled blue-collar workers and respondents overall).

No significant differences were found between occupational categories and length of tenure with employer, but our other human capital variable—level of education—did exhibit a significant relationship with some occupational categories. Professionals and technicians were most likely to have a four-year qualification or more, while clerical workers were likely to have some post-high school education. Skilled blue-collar workers and sales workers were most likely to be high school graduates, while service workers and less-skilled blue-collar workers were likely to have less education than other occupational groups. Very similar patterns were detected in the analysis by industrial sector.

Interestingly, hourly rates of pay showed no significant relationship with either the occupational or industrial sector. Workers in clerical occupations were notably better rewarded than those in executive or managerial occupations; they were more likely to receive health and retirement benefits

Table 3–6. Selected job characteristics by occupation and industry
(percent unless otherwise indicated)

	Benefits received		Hours worked		Mean hourly pay (dollars)	Seasonal workers
	health	retirement	part-time	regular		
Total sample	48.5	50.9	34.4	65.5	7.51	18.4
Occupational sectors						
Executive	48.1	45.1	15.4	69.2	7.48	7.7
Professional	51.5	65.2	34.8	68.2	8.36	31.8
Technician	50.0	65.4	23.1	61.5	7.97	7.7
Sales	34.8	21.7	59.1	43.5	7.94	4.3
Clerical	64.4	60.3	39.0	69.5	8.39	22.4
Service	22.4	31.3	54.2	53.1	6.18	20.8
Skilled blue collar	71.4	67.9	17.2	86.2	6.07	10.3
Unskilled blue collar	41.4	35.7	34.5	65.5	6.43	24.1
χ^2 or <i>F</i> -score	28.88**	32.22**	29.29**	15.39*	0.91	21.03**
Industrial sectors						
Agriculture	35.0	21.1	40.0	50.0	8.72	15.0
Manufacturing	69.7	60.9	21.5	78.8	6.70	18.2
Transportation and wholesale	69.2	59.3	30.8	70.4	7.99	3.7
Retail	36.7	27.6	46.7	36.7	6.31	6.9
Finance, insurance, and real estate	60.0	57.1	17.1	77.1	7.97	8.6
Personal services	20.0	20.0	62.9	57.1	7.86	14.3
Professions	47.9	63.2	34.4	67.7	7.70	32.6
Public administration	20.8	54.2	37.5	58.3	7.56	16.7
χ^2 or <i>F</i> -score	41.93**	37.76**	24.5**	22.25**	0.41	22.92**

SOURCE: Data for study area from survey sample.

NOTE: χ^2 significance denoted by: ** < 0.01; * < 0.05. *F*-score significance denoted by: †† < 0.01; † < 0.05.

and earned higher hourly pay, even though a larger proportion were part-timers. These results suggest that respondents in executive and managerial occupations were concentrated in lower level, more feminized jobs within the category. It is also remarkable that skilled blue-collar workers received the lowest pay rates of any occupational category, although they were the most likely to receive health and retirement benefits and were more likely to be employed year round than were clerical, service, or unskilled blue-collar employees. Although education levels were significantly related to occupational categories, educational qualifications were not necessarily reflected in hourly pay rates by occupation.

Job location

One of the most important distinguishing variables to emerge from our analysis was location of jobs in metropolitan or nonmetropolitan areas. As Table 3–7 shows, a higher proportion of metropolitan employees were in the manufacturing, transportation and distribution, business services, and professional industries. Nonmetropolitan employees were more likely to be in the retail, personal services, and public administration sectors. Occupational breakdowns showed similar profiles, with traditional “pink-collar” occupations (sales, service, and clerical) concentrated in nonmetropolitan locations.

Table 3–7. Distribution of respondents, mean hourly pay, and health benefit coverage, by location of work-site and industry
(percent unless otherwise indicated)

Sector	Respondents		Mean hourly pay		Receive health benefits	
	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro
Agriculture	3.0	7.3	\$5.43	\$9.37	66.7	29.4
Manufacturing	24.8	17.7	\$7.68	\$6.26	88.0	58.5
Transportation and wholesale	11.9	6.5	\$8.83	\$7.08	100.0	42.9
Retail	6.9	9.9	\$4.72	\$6.77	71.4	26.1
Finance, insurance, and real estate	12.9	9.5	\$7.98	\$7.96	69.2	54.5
Personal services	5.0	12.9	\$4.55	\$8.22	40.0	16.7
Professions	31.7	27.6	\$7.30	\$7.88	56.3	43.8
Public administration	4.0	8.6	\$4.17	\$7.75	50.0	15.0
Total	100.0	100.0	\$7.27	\$7.56	71.3	38.5
χ^2 or <i>F</i> -score	15.78*		0.37		18.38*	24.23**

SOURCE: Data for study area from survey sample.

NOTE: χ^2 significance denoted by: ** < 0.01; * < 0.05. *F*-score significance denoted by: †† < 0.01; † < 0.05.

Job structures differed significantly by location. Nonmetropolitan jobs were nearly twice as likely as metropolitan jobs to be part-time and were much less likely to offer health (and to some extent retirement) benefits. Hourly pay showed no significant differences by location of job.

We explored the relationship between hourly pay and industrial or occupational sector further, breaking down sectors by metropolitan or nonmetropolitan job location. There was substantial variation in the direction of change between sectors, but no statistically significant relationship was detected. Respondents in executive or managerial, service, and skilled blue-collar occupations had higher hourly rates of pay in metropolitan jobs; sales, clerical, and unskilled blue-collar workers received better pay in nonmetropolitan jobs. In the breakdown by industry (in Table 3–7), there was no difference between job locations for employees in the finance, insurance, and real estate sector (FIRE) or in the business services sector. Respondents in manufacturing and in transport and distribution had higher rates of pay in metropolitan locations. All other industrial sectors had lower rates of pay in metropolitan locations. Few employees in the retail, personal services, and public administration sectors had jobs in metropolitan locations, but

those who did received much lower rates of pay than similar employees in nonmetropolitan locations.³ However, few of these differences were statistically significant, because the numbers of respondents in the metropolitan and nonmetropolitan categories varied widely. In only two sectors did a t-test reveal a significant difference in mean hourly pay by job location: retail trade ($p < .05$) and the subsector of nondurable manufacturing ($p < .01$).

The differential rewards of metropolitan job locations are far clearer when we consider receipt of health benefits. The availability of health benefits was different by sector, and the differences became even more pronounced when we differentiated between metropolitan and nonmetropolitan jobs in each sector. A chi-square analysis of proportions was performed to examine the significance of these differences. In the manufacturing, transportation and distribution, and retail sectors, metropolitan employees were significantly more likely to receive health benefits ($p < .05$); differences were not significant in other sectors.

It appears that metropolitan labor markets are more attractive only for workers in particular

³ It should be noted that service occupations are not equivalent to the personal service industry.

industrial sectors, notably in manufacturing and in transport and distribution, where greater human capital attributes receive better job rewards. More feminized industrial sectors and occupations (such as clerical or administrative support occupations, retail, personal services and public administration industries) offer better returns to human capital in nonmetropolitan locations, and relatively few workers in these sectors had jobs located in metropolitan areas. Although respondents in our study area were not as segregated by broad occupational group as are workers in some labor pools, the data support arguments presented in Chapter Two that a high proportion of women's jobs are part-time, involve flexible or irregular hours, and provide only a narrow range of job rewards for workers of different skill levels. It is noteworthy that, in the service, clerical, and unskilled blue-collar sectors, rates of seasonality and part-time employment are higher than in other occupational categories and that pay is relatively low in the higher status white-collar executive or managerial positions and in skilled blue-collar occupations. We may conclude that metropolitan labor markets offer better job rewards than nonmetropolitan markets mainly in nonfeminized sectors.

Part-time and seasonal employees

To what extent are non-home-based workers underemployed—that is, working part-time or seasonal jobs? Some workers may prefer underemployment, and some jobs (for instance, teaching or agricultural employment) may be necessarily seasonal in their structure. It is impossible to determine what proportion of workers who are employed part-time or seasonally would prefer to work more hours: national surveys of all workers suggest that 73 percent of part-time employees (both men and women, although women make up a larger proportion of part-timers) prefer part-time employment (Morrissey 1990). Nevertheless, part-time workers do represent a pool of potential recruits to full-time, full-year employment in some sectors. Since there are substantial differences in household income between part-time and full-time workers (discussed in the first section of this chapter), current part-time employees may have a strong incentive to expand their participation.

As we have already seen, some industrial and occupational sectors (particularly those concentrated in nonmetropolitan locations) are more likely to employ part-time workers. Table 3–6 distinguishes between full-year and part-year employees, showing a significant relationship between seasonality and occupational or industrial sector. Professional, clerical, service and unskilled blue-collar workers were more likely than the population as a whole to be employed less than year-round. Among industries, only professional sector workers were likely to be seasonal (probably representing the high proportion of employees in education, which is predominantly seasonal). Respondents employed in the retail sector were less likely than others to be seasonal. This finding probably reflects the timing of the survey; September is unlikely to be a peak retail-employment season, but it is likely to be a peak professional-employment season. No relationship was detected between seasonality and hourly pay or availability of health and retirement benefits, again probably reflecting the high proportion of seasonal employees in the professional sector. When we excluded seasonal workers in professional industries, some relationship with health benefits was evident (only 30 percent of nonprofessional seasonal employees received health benefits, significant at the .05 level) and a weak relationship with hourly pay emerged (80 percent of seasonal non-professional workers and 58.7 percent of full-year nonprofessional workers earn less than \$6.75 an hour, a difference significant at the .10 level). Overall, 43.3 percent of nonprofessional seasonal workers were part-timers. There was a significant relationship between seasonality and location of job: 80 percent of all seasonal workers were employed in nonmetropolitan locations. We speculate that nonprofessional seasonal workers and a proportion of part-time workers represent an underemployed group of labor force participants who may have incentives to expand their labor force participation in the future.

The location of jobs (in metropolitan or nonmetropolitan markets) is one of the most consistent features distinguishing part-time and full-time employees, job structure, and job rewards. This finding augments that reported by McLaughlin and Perman (1991) and highlights the complex

relationships between job location, occupational and industrial sector, and the human capital attributes of respondents. Overall, the evidence presented here suggests that metropolitan labor markets provide significantly better rewards only in those sectors where men traditionally predominate (in manufacturing and in transportation and distribution). For traditionally pink-collar sectors (personal services, retail, public administration), nonmetropolitan jobs provide better rewards than metropolitan ones and involve much lower commuting costs; as we might expect, metropolitan jobs in these sectors attract very few women workers from rural areas.

CONCLUSION

This chapter has described the demographic characteristics of survey respondents, distinguishing among those in the home-based labor force, those earning wages outside the home, and those not in the wage labor force. Educational level was found to be the most important variable distinguishing participants from nonparticipants in the labor force, rather than (as might be hypothesized) marital status or presence of children under eighteen. However, home-based workers were more likely to have children than women in either of the other categories. Those not in the labor force were more likely to live in poorer households, and full-time workers lived in wealthier households than part-timers or home-based employees. These differences reflect the contribution that women's earnings make to household income. Overall, home-based workers earned significantly less per hour than non-home-based workers.

When respondents who were retired were excluded from the analysis, domestic responsibilities were

the most important reason rural women gave for not being in the labor force and for being engaged in home-based work. But no significant differences in domestic responsibilities were found between those in the non-home-based labor force and those not participating in the labor force. Differences in domestic responsibilities were detected between part-time and full-time employees and between those in the home-based and non-home-based labor forces. The presence of children under eighteen appears more likely to influence the choice of job structure than the choice between participation and nonparticipation. However, the importance of this factor is not clear, since only slightly less than 60 percent of full-time workers have children at home.

Transportation costs were a contributing but not a primary reason why a substantial minority of respondents did not work outside the home. While the mobility of the sample population was extremely high (especially compared to national estimates) and very few had no access to a vehicle, the analysis did highlight a small group of relatively transportation-disadvantaged respondents who had only intermittent access to a car or had older and thus less reliable transportation.

Job location was an important factor: workers in metropolitan jobs were more likely to be full-time, full-year employees and to receive better job rewards (in hourly pay rates and in receipt of health and retirement benefits) than employees in nonmetropolitan locations, but only in some occupations and industries. Potentially underemployed respondents were more likely to be in the nonmetropolitan labor market. However, the better job rewards obtained by metropolitan employees must be balanced against their longer work trips.

CHAPTER FOUR

COMMUTING PATTERNS

Rural women's experiences in metropolitan and nonmetropolitan labor markets are not uniform; economic restructuring has differentiated the structure and rewards of jobs on the basis of both sectoral specialization and access to metropolitan labor markets. Metropolitan labor markets may offer more diverse job choices and better rewards than nonmetropolitan markets, but they do not do so for all women. Studies of rural residents have rarely addressed the commuting burden entailed by jobs in metropolitan locations. Longer work trips may be especially onerous for women, given the greater burden they generally bear in the domestic division of labor. Thus, a satisfactory answer to the question "Are all rural women better off in metropolitan labor markets?" must take into account the extent to which better rewards compensate for higher commuting costs.

This chapter examines the commuting patterns of respondents who participate in the labor force outside the home, again differentiating these patterns by occupational and industrial sector and by job structure and rewards. Proportional measures assess the cost and time burdens that commuting imposes on different categories of workers.

In Chapter One we argued that there is a close connection between labor force participation and commuting behavior. Existing research on women's participation in the labor force (discussed in Chapter Two) enables us to draw the following broad conclusions:

- Women workers are more occupationally segregated than men (that is, they are more likely to be employed in occupations and industries with a high proportion of female workers);
- Women receive fewer job rewards for increments of investment in human capital than men do (that is, women's pay increases less for the same increments of experience and education than does men's pay); and
- Women receive lower pay than men do, and lower pay is associated with gender segregation of the labor force.

Studies of rural women's labor force participation have concluded that women who work in more isolated job markets are more concentrated in segregated occupations and industries (Semyonov 1983). Other research has found that variations in job structure accounted for 20 percent of the earnings gap between metropolitan and nonmetropolitan workers (both male and female). Between 1977 and 1987, differences in the rate of return on human capital characteristics and job attributes became more important in explaining the earnings gap between metropolitan and nonmetropolitan women workers (McLaughlin and Perman 1991). Residents of rural counties adjacent to metropolitan areas have more rewarding job opportunities than those available to residents of more remote rural counties, but better jobs require

substantially longer commuting distances (Fuguitt 1991). Many of these conclusions are supported by the survey findings discussed in the previous chapter: metropolitan employees in some occupational and industrial sectors earn higher hourly pay than their counterparts in nonmetropolitan jobs, and in most sectors metropolitan workers are more likely to receive health and retirement benefits than workers in nonmetropolitan jobs.

Comparative research on men's and women's commuting patterns has produced the following conclusions:

- Although studies during the 1970s found some relationship between the length of the trip to work and women's domestic responsibilities (Ericksen 1977; Madden 1981; Fox 1983), more recent research has tended to reject the hypothesis that women choose more convenient job locations because of their home responsibilities (Hanson and Johnston 1985; Wekerle and Rutherford 1988; Gordon, Kumar, and Richardson 1989).
- Women have shorter journeys to work than men because they receive fewer increments in pay for each additional mile travelled, when human capital characteristics are held constant in the analysis (Wekerle and Rutherford 1988; McLafferty and Preston 1991; Dubin 1991; Simpson 1987); consequently, women have weaker incentives to commute long distances.
- Women have shorter journeys to work because the occupations and industries in which they are concentrated are distributed more evenly through residential areas, while the sectors in which men predominate tend to be concentrated in particular locations (Hanson and Johnston 1985).
- Studies have shown that urban white women travel shorter distances to work than white men, but other comparative studies have shown that black and Hispanic women travel further to work than do white men or women

and that their rates of pay are consistently lower (McLafferty and Preston 1991; Cooke and Shumway 1991).

We did not identify any systematic studies of rural women's commuting patterns, but the last finding above suggests that patterns of commuting that have been well documented for white urban women and men may not be evident among other groups of workers. A study of rural male manufacturing workers employed in a rural Illinois plant did not find the relationships usually hypothesized between earnings, socioeconomic status, job tenure, and work trip length (Clemente and Summers, 1975). Gender-specific disparities in distance travelled to work may not be as noticeable in rural areas. Comparisons between our survey respondents and 1990 census data for our study area (discussed below) suggest that rural women are as likely to travel long distances as are rural men.

Previous research on women's travel patterns has compared male and female commuters and made the useful point that women's travel patterns differ from those of men. However, this research treats women workers as an undifferentiated group.¹ While it is true that women as a whole experience substantial wage and other forms of discrimination in the job market when compared to men, the increasing numbers of women who have entered the labor market in recent decades and the restructuring that both urban and rural labor markets have undergone, suggest that the work experiences (and job rewards) of women workers have become more, not less, differentiated. Research designs that focus on comparisons between men and women frequently fail to grasp this diversity. Consequently, while we introduce some comparisons in the form of aggregate census data on the journey to work, our primary focus is on the distinctions that emerge between groups of women workers in our study area.

The first section of the chapter analyzes the commuting patterns reported by survey respondents and links these patterns with the occupation and

¹ Notable exceptions here include Rosenbloom (1987) and Hanson and Johnston (1985).

employment data discussed in the previous chapter. We begin with a profile of commuting distance and time for workers in metropolitan and nonmetropolitan job locations and then profile commuting patterns by occupational and industrial sectors, levels of job rewards, work patterns, and human capital attributes.

We develop our analysis further with two sets of proportional measures, one designed to capture the “cost burden” commuting imposes on women workers, the other designed to capture the non-monetary effects—the “time burden”—commuting imposes. These proportional measures are linked to specific occupational and industrial sectors, to the work patterns and job rewards of respondents, and to their human capital attributes. The concluding section of the chapter addresses the question of how metropolitan adjacency affects commuting patterns.

COMMUTING PATTERNS

As more rural women have joined the labor force, their work trips (almost always by car) have

lengthened. Here we outline the relationships between work trip length and location, structure, and rewards of jobs, and we assess the extent to which existing explanations of commuting choice (almost always developed for urban residents) apply to the labor force participants identified in the household survey.

First we compare commuting patterns reported by survey respondents with those reported for residents of the study area counties in the 1990 *Census of Population and Housing* (see Figure 4–1). Our survey respondents had average travel times slightly longer than the mean reported for the study area in the 1990 Census; they were also more likely to work in a metropolitan area. Since the Census data are for all non-home-based workers, the longer mean distance for women in our sample suggest that the women in the study area are not likely to have shorter work trips than men in our study area do, a pattern that differs from that found for urban women and men. Overall, travel times in the study area have increased since 1980, although slightly fewer people commute more than 45 minutes to work than was the case in 1980.

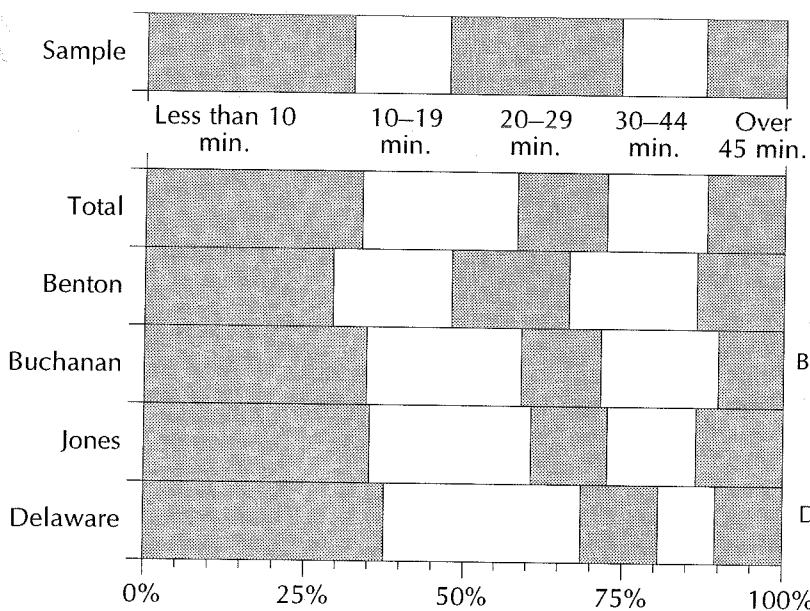


Figure 4–1 (a). Distribution of work trip lengths in the study area: sample responses versus 1990 Census

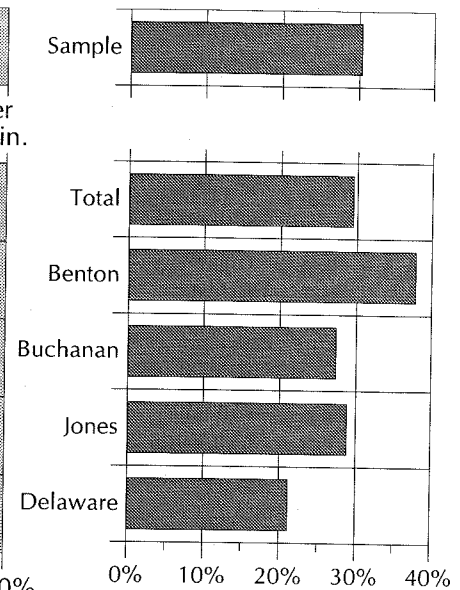


Figure 4–1 (b). Proportion of workers commuting to metropolitan areas: sample responses versus 1990 Census

SOURCE: Data for study area from survey sample; data for 1990 Census from 1990 *Census of Population and Housing* STF 3.

Commuting patterns by metropolitan/nonmetropolitan job location

The distances travelled by respondents in our survey varied substantially; Figure 4–2 shows the percentile distributions and means of miles traveled and time spent traveling for employed respondents. Figure 4–2 also shows the mean distances travelled by respondents employed in the Cedar Rapids MSA, the Waterloo and Dubuque MSAs, and in nonmetropolitan locations. Clearly, the metropolitan/nonmetropolitan location of the job is the most important determinant of distance and time travelled. Although on average nonmetropolitan employees spend less time commuting than do metropolitan employees, 23.7 percent of nonmetropolitan employees still travel more than the overall mean distance.

Commuting patterns by occupational and industrial sector

Given the relationship between occupational and industrial sector and job location identified in the previous chapter, we may expect significant differences in trip length by sector of employment. Analysis of variance revealed some differences (significant at the 0.05 level) in trip length among

occupational sectors (see Table 4–1). Skilled blue-collar workers (who were employed mainly in Cedar Rapids) had work trips substantially longer than the overall mean; of the other occupational group, only professionals had a longer than average mean work trip. Sales, clerical, unskilled blue-collar, and service workers all had short average trip lengths.

Similar relationships were evident in the analysis of variance by industrial sector (significant at the 0.001 level). Employees in the manufacturing and professional sectors had longer average trip lengths; employees had shorter work trips in sectors that might be expected to employ a high proportion of sales, clerical and service workers (public administration, finance, insurance, and real estate (FIRE), retail, and personal services).

Trip length and job characteristics

Again, the relationship between job structure and rewards, metropolitan/nonmetropolitan location and occupational and industrial sector identified earlier may be expected to be reflected in trip length differences. We might expect that part-time workers or those who work irregular hours would be less likely to commute longer distances, while

full-time regular workers and those receiving better job rewards (in terms of hourly pay and benefits) would be likely to commute longer distances. Previous research has also addressed how higher levels of human capital attributes—experience and education—are related to commuting distances; it has been hypothesized that higher job rewards for these workers will justify the additional miles travelled. Differences in trip length by work patterns, job characteristics and human capital attributes are summarized in Table 4–2.

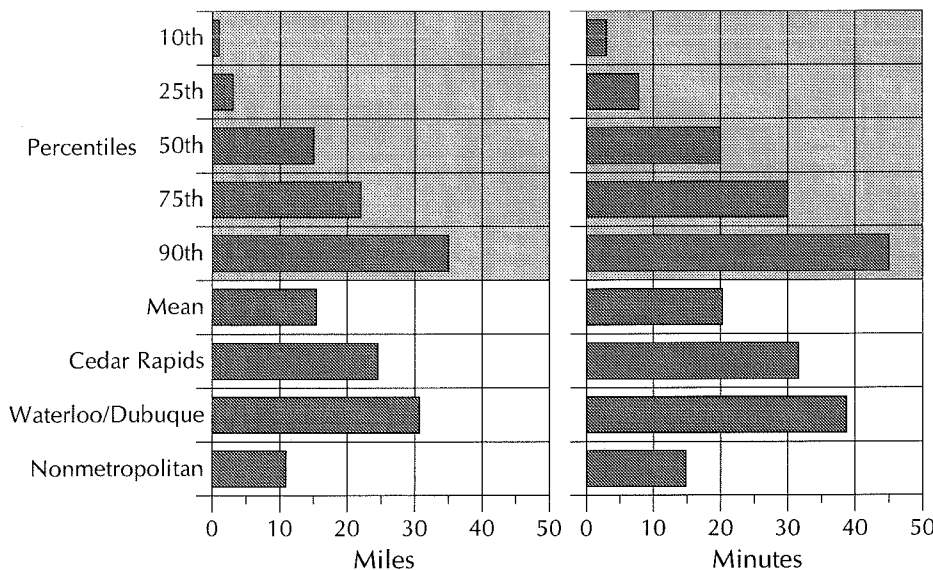


Figure 4–2 (a). Length of work trip in miles by percentile and work site location

Figure 4–2 (b). Length of work trip in time by percentile and work site location

SOURCE: Data for study area from survey sample.

Table 4-1. Commuting patterns by occupational and industrial sector
(percent unless otherwise indicated)

	Miles travelled (mean)	Travel time in minutes (mean)	In metro job location (percent)	Percentage in lowest distance quartile	Percentage in highest distance quartile
Occupation					
Executive	15.8	21.1	38.5	21.2	28.8
Professional	18.0	24.5	33.3	16.7	28.8
Technician	15.1	19.8	34.6	11.5	19.2
Sales	11.0	15.9	17.4	47.8	13.0
Clerical	12.0	16.7	30.5	37.3	20.3
Service	13.8	18.1	26.5	38.8	24.5
Skilled blue collar	22.4	24.4	34.5	3.4	34.5
Unskilled blue collar	14.0	19.4	17.2	20.7	24.1
χ^2 or <i>F</i> -score	2.45 [†]	2.00	7.27	40.33 ^{**}	
Industry					
Agriculture	8.6	16.0	15.0	55.0	10.0
Manufacturing	20.2	24.5	37.9	7.6	37.9
Transportation and wholesale	17.7	19.6	44.4	33.3	25.9
Retail	13.4	17.3	23.3	33.3	20.0
Finance, insurance, and real estate	12.4	17.8	37.1	37.1	20.0
Personal services	12.0	17.5	14.3	28.6	11.4
Professions	17.2	22.5	33.3	16.7	30.2
Public administration	8.8	14.8	16.7	43.5	8.7
χ^2 or <i>F</i> -score	3.80 ^{††}	2.22 [†]	15.77 [*]	53.05 ^{**}	

SOURCE: Data for study area from survey sample.

NOTE: χ^2 significance denoted by: ^{**} < 0.01; ^{*} < 0.05. *F*-score significance denoted by: ^{††} < 0.01; [†] < 0.05.

The most notable result here is the much longer mean distances travelled by workers receiving health benefits, 37.3 percent of whom have commuting distances in the highest quartile. Respondents with a high school education or less travelled slightly less than the mean; those with more than a high school education were strongly differentiated by tenure in their job. Employees with post-high-school education and less than four years tenure (the median for our sample) had much longer work trips than those with longer tenure. Possible reasons for this finding are discussed below.

One interesting (though not significant) relationship appears in the analysis of how domestic role

affects time spent commuting. Unlike earlier analyses (Fox 1983; Madden 1981; Ericksen 1977), our results indicate that women with children are slightly more likely to have longer work trips than those with no children. This result is true even for single parents, whom we may assume have the most domestic responsibilities; unfortunately, there are too few respondents in this category to draw firm conclusions about the impact that marital status and children have on work trips. We may also note that trip length differences do not appear related to the presence of a wage-earning spouse (and thus to choosing a residence with more than one job location in mind): single and married women who are childless travel almost identical average distances to work.

Table 4–2. Commuting patterns by job characteristics, human capital attributes, and domestic role
(percent unless otherwise indicated)

	Miles travelled (mean)	Travel time in minutes (mean)	In metro job location (percent)	Percentage in lowest distance quartile	Percentage in highest distance quartile
Job characteristic					
Part-time	12.0	16.3	19.3**	33.3	18.4*
Regular work hours	16.1	20.9	32.6	20.6	26.1
Health benefits recipients	19.6††	25.2††	44.7**	13.7	37.3**
Metropolitan workers	25.6††	32.8††	—	0	58.4**
Hourly pay below \$4.25	11.8†	16.9	23.9	29.9	16.4
between \$4.25 & \$6.75	15.2	20.0	22.0	24.4	23.2
between \$6.75 & \$9.50	19.6	24.3	33.3	14.8	29.6
over \$9.50 per hour	14.6	19.2	31.0	36.2	31.0
Human capital					
High school or less,					
less than median tenure	13.8††	18.7††	17.5**	23.8	15**
more than median tenure	13.3	17.5	27.3	34.3	21.2
More than high school,					
less than median tenure	20.6	26.3	42.9	10	40
more than median tenure	14.7	19.8	35.8	28.6	26.2
Domestic role					
Single, childless	13.2	18.0	33.3	27.3	24.2
Single, parent	18.2	26.8	42.3	26.9	42.3
Married, childless	13.3	18.2	30.1	29.0	19.4
Married, parent	16.4	20.8	28.5	22.3	25.7

SOURCE: Data for study area from survey sample.

NOTE: χ^2 significance denoted by: ** < 0.01; * < 0.05. F-score significance denoted by: †† < 0.01; † < 0.05.

Table 4–2 also shows a nonlinear relationship between trip length and hourly pay: respondents earning moderately good pay (\$6.75 to \$9.50 an hour) travelled much farther on average than those earning more than \$9.50 ($p < 0.05$; F-score = 2.34). Analysis of the variance in hourly pay rates by distance travelled indicated a similar nonlinear relationship between the two ($p < 0.05$, F-score = 3.34). Hourly pay rates were highest for women who worked closest to home, declining for women who worked about the median distance from home, and rising to the mean value for women who worked farthest from home (see Figure 4–3). Mean hourly pay rates were somewhat skewed by a few highly paid individuals who worked close to

their homes. When we compare median hourly pay for the distance quartiles, a much weaker but still curvilinear relationship is evident. The distribution of weekly and annual pay revealed precisely the same curvilinear relationships.

One explanation for these patterns may be found in differences in the length of job tenure. Women who work closest to home are much more likely to have been in their jobs more than four years, and their longer tenure is reflected in their higher hourly pay rates (see Table 4–3). Those working farthest from home are more likely to have less than median tenure. There are two probable explanations for these findings:

- employees who have longer tenure on the job are more likely to have moved their residence during their tenure and thus are more likely to have chosen a residence on the basis of their job location; or
- employees who work closer to home suffer less inconvenience from commuting and are more likely to stay in a conveniently located job.

Both explanations are supported by research on home/work choices (Madden 1981, 189) which found that length of job tenure decreased work trips for all groups, but especially for women. Hanson and Pratt (1988) extend this analysis by examining the relationship between home and work choices at the local level. Unfortunately, we are unable to test the first explanation because information on length of residence was not collected. Analyses of respondent evaluations of job attributes discussed in the following chapter provide support for the second explanation.

Since the analyses suggest that hourly pay and commuting distance are not linearly related, it was not surprising that our initial correlation analyses revealed no significant relationship between the two variables. Logarithmic transformations of either

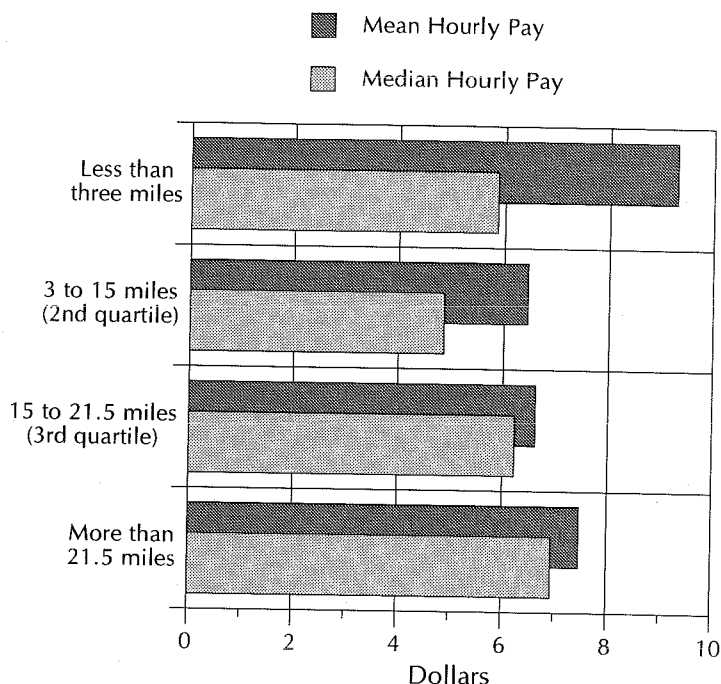


Figure 4-3. Mean and median hourly pay rates by work trip length

SOURCE: Data for study area from survey sample.

or both of the variables did not improve these findings. When we controlled for health benefits and human capital, the R^2 was no higher than .09. Our next step was to apply other multivariate methods to the relationship between distance travelled and hourly pay rates; the results are discussed in detail in Chapter Five.

Table 4-3. Distribution of hourly pay rates by length of work trip and human capital attributes (dollars)

QUARTILE:	Commuting distance (miles)			
	FIRST	SECOND	THIRD	FOURTH
	Below 3	3 to 15	15 to 21.5	Above 21.5
Human capital				
High school or less,				
less than median tenure	\$7.90	\$5.21	\$5.66	\$5.40
more than median tenure	7.78	6.30	6.67	7.55
More than high school,				
less than median tenure	11.29	5.63	7.56	6.76
more than median tenure	11.65	9.72	6.58	9.71

SOURCE: Data for study area from survey sample.

Thus far, our analysis of commuting patterns has indicated a structure as complex as that revealed in our earlier analysis of the relationship between job rewards and metropolitan/nonmetropolitan job location. The differentiation in trip length by occupational and industrial sector parallels the distribution by occupation and industry between metropolitan and nonmetropolitan job markets. It is not surprising that a nonlinear relationship exists between distance and hourly pay, given the disparities in job rewards by sector between labor markets. On the whole, however,

longer work trips are associated with individuals who have higher educational qualifications and with jobs that offer health benefits. Domestic responsibilities do not appear to influence work trip length as they did in the 1970s. A more rigorous explanation of these relationships will be presented in the next chapter.

ASSESSING THE COST AND TIME BURDENS OF COMMUTING

We now turn to the distribution of commuting costs for women workers in different sectors and job markets and explore the impact that these costs have on women employees. In Chapter Five we discuss our respondents' answers to attitudinal questions; here we analyze standardized proportional measures of impact and examine their distribution among various categories of employees.

Two sets of proportional measures were developed to estimate the relative burden commuting imposes on women workers: daily commuting costs, expressed as a proportion of daily pay, and daily time spent commuting, expressed as a proportion of the length of the workday. These proportional measures allow us to analyze in detail the distribution of commuting burdens by respondent characteristics.

Monetary costs were estimated in two different ways. In the survey, respondents were asked to estimate how much commuting to work cost them monthly in direct costs (gas, parking, or fares). Because answers varied widely on a cost per mile basis, we used in our analysis a more stable measure of costs: a standard total including direct and indirect expenditures such as insurance and wear and tear. If respondents reported they travelled to work regularly with at least one other person, costs were adjusted to reflect this. Monetary costs were further broken down in our analysis to distinguish between absolute costs and daily commuting costs as a proportion of daily income. The latter variable allowed us to isolate the relative importance of commuting costs to individuals.

Similarly, time costs were measured both in absolute time spent commuting and in time spent

commuting as a proportion of the time spent working. The second variable gives us a better estimate of the effect commuting time has on workday length, although we recognize that the relationship may not necessarily be linear. Time is an especially useful measure given our focus on women, who tend to bear a higher proportion of household responsibility (the so-called double shift) and who may experience time constraints more acutely. Time also corrects for differences between metropolitan and nonmetropolitan workers who, because of traffic congestion, may travel the same distance in different amounts of time.

Proportional cost burdens

Our proportional measure of monetary costs enabled us to balance job rewards in different sectors and locations against one dimension of the work trip and to draw firmer conclusions about differences among women employees. A quarter of all respondents spent less than 2.2 percent of daily pay on travel, but the highest quartile spent 20 percent or more of their daily pay commuting. The median was 10.3 percent. We constructed cost burden categories based on these quartiles and found a rough correspondence between categories of perceived costs and standardized costs that serve as the basis of analysis here.

There was a significant relationship between the monetary cost of commuting and occupational and industrial sector. Women in the retail industry were dichotomized: they were more likely to have either very high or low costs than were respondents in other occupational categories. Women in the FIRE industry, business services, and public administration tended to have low commuting costs, while those in manufacturing and in personal services were more likely to have high costs. Cost burdens by industrial sector are summarized in Table 4-4.

There was little difference in cost burdens between full-time and part-time workers or between employees working regular and irregular hours (see Table 4-5). Although part-time employees have shorter work trips than full-time employees, commuting represented a similar cost burden for both groups when standardized by daily pay rates.

Table 4-4. Commuting cost burden by industrial sector
(percent)

	Mean cost burden (percent of daily pay)	Percentage in lowest cost burden quartile	Percentage in highest cost burden quartile
Agriculture	6.0	50.0	8.3
Manufacturing	16.0	5.9	33.3
Transportation and wholesale	13.0	33.3	14.3
Retail	14.0	33.3	33.3
Finance, insurance, and real estate	9.6	39.3	10.7
Personal services	19.3	29.0	45.2
Professions	15.2	13.0	24.7
Public administration	7.5	42.1	5.3
χ^2 or <i>F</i> -score	2.43 [†]	56.93 ^{**}	

SOURCE: Data for study area from survey sample.

NOTE: χ^2 significance denoted by: ^{**} < 0.01; ^{*} < 0.05. *F*-score significance denoted by: ^{††} < 0.01; [†] < 0.05.

Recipients of health benefits were more likely to have high commuting cost burdens (however, we should note that benefits are not reflected in the income base on which cost burden is calculated). Human capital attributes were significantly related to cost burden, but the biggest discernible difference was by job tenure rather than by educational

qualifications. This result supports the argument made in the previous section that longer job tenure is more likely to be associated with shorter work trips and thus with lower commuting costs.

Metropolitan workers were more likely to have high cost burdens; however, metropolitan and

Table 4-5. Commuting cost burden by job and human capital characteristics
(percent)

	Mean cost burden (percent)	<i>F</i> -score	Percentage in lowest cost burden quartile	Percentage in highest cost burden quartile	χ^2
Employment characteristics					
Part-time workers	14.7		28.9	26.8	
Regular work hours	14.6		18.4	25.9	9.28 [*]
Health benefit recipients	15.0		14.3	29.4	12.57 ^{**}
Metropolitan workers	22.2	35.67 ^{††}	0	43.3	60.27 ^{**}
Human capital		4.03 ^{††}			21.81 ^{**}
High school or less,					
less than median tenure	16.5		19.7	36.6	
more than median tenure	12.1		28.2	20.5	
More than high school,					
less than median tenure	17.8		11.3	26.4	
more than median tenure	10.3		32.8	17.2	

SOURCE: Data for study area from survey sample.

NOTE: χ^2 significance denoted by: ^{**} < 0.01; ^{*} < 0.05.
F-score significance denoted by: ^{††} < 0.01; [†] < 0.05.

nonmetropolitan employees with high cost burdens had some similarities: their jobs tended to be in the manufacturing, professional, or personal services industries, and they were more likely than average to work full-time (56.8 percent). Nonmetropolitan workers with high commuting costs earned lower hourly pay than metropolitan workers, with three quarters earning \$6.07 or less; they were also slightly less likely than the sample as a whole to receive health benefits (45.9 percent received health benefits). A high proportion of cost-burdened nonmetropolitan employees (45.9 percent) fell into the lowest human capital category: those with no more than a high school diploma and less than four years tenure in the job.

We may conclude that the respondents most affected by commuting cost burdens are those with less than median job tenure, in service, manufacturing, or professional industries. Metropolitan employees are more likely to have higher than average cost burdens, but a number of nonmetropolitan employees with lower human capital attributes in specific sectors also have high cost burdens. Health benefits compensate for the monetary cost of commuting for some (but not all) of these employees.

Time burdens

The distribution of time burdens among our respondents showed some similarity with the

distribution of cost burdens, although time costs were not related to income and were more strongly related to receipt of benefits, especially health insurance. The greatest time burdens were concentrated among women in metropolitan jobs. The proportional measure we used expresses the time spent commuting as a percentage of time spent at work.

There was wide variation in time burdens. A quarter of our respondents spent 3.3 percent or less of their total workday commuting and the highest quartile spent 11.5 percent; the most-burdened five percent spent 20 percent or more of their workday length commuting. Time burden categories were calculated from these quartiles, and chi-square analysis was used to analyze the relationship between time burden category and other employee and job characteristics.

Respondents who were cost-burdened and those who were time-burdened overlapped substantially; 63.1 percent of those with high time costs for commuting also had high monetary costs, while 80 percent of those who had the lowest time costs also had the lowest monetary costs.

There was also a significant relationship (at the .05 level) between time burden and industrial sector (see Table 4–6). Respondents with very low time burdens were more likely to be in the FIRE sector, in public administration, or in agriculture. Those

Table 4–6. Commuting time burden by industrial sector (percent)

	Mean time burden (percent of work day)	Percentage in lowest time burden quartile	Percentage in highest time burden quartile
Agriculture	6	50.0	15.0
Manufacturing	9	10.6	31.8
Transportation and wholesale	8	29.6	22.2
Retail	7	30.0	16.7
Finance, insurance, and real estate	7	40.0	20.0
Personal services	8	22.9	22.9
Professions	9	17.7	30.2
Public administration	6	37.5	16.7
χ^2 or F-score	1.58	35.38*	

SOURCE: Data for study area from survey sample.

NOTE: χ^2 significance denoted by: ** < 0.01; * < 0.05. F-score significance denoted by: †† < 0.01; † < 0.05.

with the largest time burdens were more likely to be in manufacturing or professional industries. These results are similar to those noted above for the relationship between cost burdens and industrial sector.

Location of job was significantly related to time burden: 34.2 percent of women in nonmetropolitan employment had very low time costs, as did 3 percent of metropolitan workers. Nearly half (47.7 percent) of Cedar Rapids employees had severe time burdens. However, nonmetropolitan employment did not have similar time costs for all women: 34.1 percent of women with the longest commuting times worked in nonmetropolitan locations.

Time burden was related to human capital attributes. Of women with more than a high

school diploma but less than four years tenure on the job, two thirds had commuting times longer than the median; of those with no more than a high school diploma but more than four years job tenure, most (57.1 percent) had commuting times shorter than the median. Women with children under eighteen were more likely to spend a higher proportion of their day traveling, with single parents spending the greatest proportion of time. This finding is interesting in light of the hypothesis used in earlier studies that women choose jobs involving short commuting distances because of their domestic responsibilities. Age had no apparent relationship with severity of time burden. These results are summarized in Table 4–7.

There was some relationship between the proportion of time spent commuting and days

Table 4–7. Commuting time burden by job characteristics, human capital attributes, and domestic role (percent unless otherwise indicated)

	Mean time burden (percent of work day)	F-score	Percentage in lowest time burden quartile	Percentage in highest time burden quartile	χ^2
Job characteristic					
Part-time	8		25.4	23.7	
Regular work hours	8		20.6	25.7	
Health benefits recipients	10	17.149 ^{††}	17.4	34.2	23.36**
Metropolitan workers	13	92.962 ^{††}	3.0	53.5	114.23**
Hourly pay below \$4.25	7		31.3	20.9	
between \$4.25 & \$6.75	8		22.0	25.6	
between \$6.75 & \$9.50	9		14.8	27.8	
over \$9.50 per hour	8		22.4	25.9	
Human capital		4.296 ^{††}			21.30*
High school or less,					
less than median tenure	8		18.8	20.0	
more than median tenure	7		34.3	19.2	
More than high school,					
less than median tenure	10		11.4	35.7	
more than median tenure	8		29.8	27.4	
Domestic role		2.744 [†]			
Single, childless	8		27.3	21.2	
Single, parent	11		23.1	50.0	
Married, childless	7		30.1	18.3	
Married, parent	9		21.2	25.7	

SOURCE: Data for study area from survey sample.

NOTE: χ^2 significance denoted by: ** < 0.01; * < 0.05. F-score significance denoted by: ^{††} < 0.01; [†] < 0.05.

worked per week, but not the one expected. We anticipated that workers would compensate for long commuting distances by working fewer but longer working days. However, none of our most severely time-burdened respondents worked fewer than four days a week, and a small proportion worked six or seven days. On the other hand, those with the lowest time burdens were more likely to work six or seven days a week than were other respondents. Apparently flexible work scheduling is not widely used to compensate for long work trips; it is likely that this is a result of the occupational sectors in which respondents with longer work trips were concentrated. Manufacturing and professional jobs are less likely to employ part-timers or to offer irregular work hours, so there is little potential to adjust work hours to compensate for commuting time.

No significant relationship was found between time burden and either hourly or daily pay. This finding contradicts the assumption that commuters are most likely to trade higher pay for longer commuting distances. There did appear to be a relationship between time burden and receipt of health benefits, with those receiving benefits more likely to have higher time burdens. The relationship between income and distance travelled is explored in more detail in the following chapter.

The analysis of the respondents most burdened by longer work trips suggests that distinctive groups of employees bear disproportionate cost and/or time burdens. In particular, metropolitan workers overall had more burdensome work trips (as might be expected); however, a substantial minority of nonmetropolitan workers had high cost or time burdens, so we cannot assume that job location alone determines the impact work trips have on the individual.

CONCLUSION

Our analysis suggests a broad correspondence between job quality and work trip length when both hourly pay and benefits were taken into account, though no linear relationship between hourly pay and miles travelled could be discerned. The next chapter explores this relationship in more detail, to identify the incentives women have to

commute longer distances. Jobs in metropolitan locations entail longer commuting distances; they are more likely to offer benefits and better rates of pay than nonmetropolitan jobs but are less likely to offer flexible work schedules and variable work week lengths that might enable commuters to minimize travel time.

One interesting finding is that metropolitan jobs held by survey respondents tend to be concentrated in particular occupational and industrial sectors and do not reflect the overall job mix in those metropolitan areas that was outlined in Chapter Two. Rural residents appear to be willing to commute only to specific sorts of metropolitan jobs; although many metropolitan jobs are in the service, retail, and public administration sectors, rural residents employed in those sectors are more likely to have jobs in nonmetropolitan locations and as a result have much shorter work trips. The small number of service and retail employees who commute to metropolitan jobs have very high cost burdens compared to employees in the same sectors in nonmetropolitan locations. We may conclude that metropolitan adjacency offers rural residents better jobs only in some sectors (in manufacturing and in business and professional services predominantly); metropolitan adjacency offers few incentives to employees in more traditionally pink-collar sectors.

These results support Hanson and Johnston's (1985) explanation for women's shorter work trips. They argue that female-dominated jobs are distributed more evenly through residential areas and that women therefore choose from a range of similar jobs distinguished only by distance from home. Their research was conducted within metropolitan areas; these findings extend their explanation to the choice between metropolitan and nonmetropolitan jobs.

Specific groups of rural women do experience quite substantial commuting cost and time burdens. As we expected, metropolitan employees were far more likely to have high cost and time burdens, although a significant minority of burdened commuters were nonmetropolitan employees. Interestingly, they tended to be in occupational and industrial sectors similar to those of

metropolitan employees. Part-time workers were no less likely than full-time workers to bear time and cost burdens that were high as a proportion of hours worked daily or wages earned daily. There is some evidence that high cost and time burdens are traded off against health insurance benefits, but this is not so for part-timers, few of whom receive job-related benefits.

Cost- and time-burdened employees tend to have higher than median educational levels, but less than median job tenure; this finding may suggest higher turnover rates among employees with burdensome work trips. Respondents with the

longest job tenure tended to have shorter than average work trips.

Women with children under eighteen are more, not less, likely to have longer and more burdensome trips. This finding suggests that relationships detected in surveys conducted during the 1970s do not hold true to the same extent in the 1990s. The close relationship between household income and labor force participation discussed in Chapter Three suggests that women's domestic responsibilities have been restructured to focus on maintaining the family's standard of living, rather than maintaining traditional parenting roles.

CHAPTER FIVE

EXPLAINING WOMEN'S COMMUTING CHOICES

Clearly, conventional explanations of women's commuting patterns do not adequately mirror the relationships identified in our survey. Explanations that attribute women's shorter trip lengths to greater domestic responsibilities appear to have been undermined by the restructuring of family life and the economy that has occurred since the late 1970s. On the other hand, explanations linking trip lengths to pay rates have also been unsatisfactory; no linear relationship was found between work trip length and hourly pay in the previous chapter's discussion of commuting patterns. Indeed, comparisons between the work trip times of our survey respondents and those reported for employed study area residents in the 1990 *Census of Population and Housing* suggested that differences in work trip length identified between urban-based (white) men and women do not hold true in this area, and perhaps not in rural America as a whole.

Thus far we have described differences in commuting patterns attributable to metropolitan and nonmetropolitan job location, and we have assessed the costs in time and money that commuting imposed on different groups of respondents, but we have not provided a satisfactory explanation of commuting choice. Furthermore, our descriptive profiles of employed respondents have suggested that commuting decisions varied substantially across respondents, but we have not identified a systematic basis for that variation. We now seek a more precise delineation of why some respondents choose to commute longer distances

than others and how commuting burdens differ between well-defined groups of respondents, so that we can refine the very partial conclusions drawn thus far about labor market choice.

This chapter develops a model of the factors that influence respondents' decisions to commute significant distances. We first examine responses to the survey's attitudinal questions, which asked which of the following job attributes were most important to respondents: job security, job satisfaction, job status, benefits, pay, and shorter work trips. We analyze respondents' ratings of the importance of these job attributes to determine the tradeoffs women make between commuting options. From the preliminary analyses in the previous chapter and from the first section of this chapter, distinct groups of respondents emerge, with different work patterns, job reward structures, human capital attributes, and evaluations of job characteristics. In section two of this chapter we use cluster analysis to explore these differences further. Three distinct sets of respondents emerge, and the clusters are used to clarify the patterns of labor force involvement and commuting behavior within the sample.

Subsequently we develop an explanation of the incentives women have to commute long distances. Section three answers the following questions:

- To what extent can we detect a relationship between income and distance travelled to a job?

- What are the other inducements or incentives for women to commute longer distances?

Finally, we summarize our findings about the relationship between commuting choice and labor force participation.

DEFINING JOB REWARDS

We begin our analysis with the question, “How do women workers define job rewards?” In the previous two chapters, we defined job rewards in terms of pay and benefits. However, we recognize that women workers may take account of a variety of other factors in choosing a job. Our survey instrument asked respondents to rank on a five-point scale the importance of each of six job rewards: job status, job security, pay, shorter work

trip, job satisfaction, and provision of benefits. We analyzed the relationship between the importance attributed to different rewards and each of the human capital, family responsibility, job, and work pattern characteristics of our respondents.

The variable that showed the greatest difference in respondent evaluation was part- or full-time work status. Full-time workers were most likely to value pay, availability of benefits, and job security highly; part-time workers placed greater value on a shorter work trip (see Table 5–1). Those who worked a regular schedule were more likely to value benefits, pay, and job satisfaction than were workers on irregular schedules; respondents working short weeks (less than four days a week) were less likely to value job security and job status. These results are consistent with the expectation

Table 5–1. Respondent evaluation of job rewards by employment status, hourly pay, human capital characteristics and domestic role (percent)

	Proportion rating attribute “very important”					
	Job status	Security	Pay	Short commute	Job satisfaction	Benefits
Employment status						
Full-time	61.1	91.2	77.9	44.2	89.4	74.7
Part-time	59.8	77.2	69.3	58.8	82.5	51.8
Hourly pay						
below \$4.25	76.9	89.6	67.2	50.7	88.1	56.7
between \$4.25 & \$6.75	57.3	79.3	70.7	52.4	80.5	68.3
between \$6.75 & \$9.50	51.9	92.6	83.3	37.0	87.0	77.8
over \$9.50	61.4	81.0	79.3	48.3	91.4	70.7
Human capital						
High school or less,						
less than median tenure	65.8	85.0	70.0	61.3	87.5	62.5
more than median tenure	59.6	83.8	72.7	49.5	85.9	64.6
More than high school,						
less than median tenure	58.0	87.1	82.9	38.6	85.7	68.6
more than median tenure	60.2	89.3	75	46.4	88.1	70.2
Domestic role						
Single, childless	66.7	75.8	75.8	42.4	81.8	69.7
Single, parent	84.6	92.3	80.8	50.0	84.6	61.5
Married, childless	54.8	90.3	77.4	48.4	90.3	69.9
Married, parent	59.1	84.9	72.1	50.8	86.0	64.2

SOURCE: Data for study area from survey sample.

that career employees cannot choose to work flexible or shorter hours without jeopardizing their security and prospects for advancement.

We found significant (but nonlinear) relationships between hourly wages earned and the importance attached to job satisfaction (those earning low to moderate pay were less likely to value job satisfaction highly) and the importance attached to the availability of benefits (those in the moderate to high pay category were most likely to value benefits highly). Although the relationship was not statistically significant, respondents in the moderate to high pay category were least likely to set a high value on short work trips. The importance attached to pay and to benefits corresponded closely; those receiving benefits valued both pay and benefits highly, and those earning higher wages valued benefits highly. Respondents receiving benefits were more likely to value job security highly; respondents not receiving benefits were more likely to value short work trips.

The human capital attributes of respondents showed a significant relationship with only one job attribute: respondents with higher levels of education were more likely to value job security highly. Although the relationship was not significant, respondents with more than a high school education but less than median length of job tenure were more likely to value pay highly and less likely to value short work trips. Marital status and the presence of children in the family explained very little of the variation in the value placed on different rewards, contrary to our expectation that single women or parents would place greater value on pay, benefits, and security. Evidently married women are as likely to see themselves as important contributors to household well-being as are women who do not share responsibility with another breadwinner, and women without children under age 18 do not see their contribution differently from those who have responsibility for children.

The picture that begins to emerge is of rural women as a dichotomized labor force. On the one hand are full-time, moderately well-paid workers who are most concerned about benefits, pay, and security and less concerned about convenience of location. On the other are predominantly part-

time, less regular workers who value convenience of location above benefits, pay, and security. In the next section of the chapter, we use cluster analysis to explore this apparent dichotomization further. Interestingly, family responsibilities and human capital variables are not important factors differentiating the two categories, nor do workers in each category seem to value job status differently. We can conclude from this preliminary discussion of job rewards that minimizing commuting distance is a motivating factor for women who decide to work in the local labor force and for those whom we identified as underemployed in Chapter Three.

DISTINGUISHING GROUPS OF RESPONDENTS

We explored the apparent differences among the survey respondents along a number of common dimensions. We speculated that the nonlinear and rather complex relationships identified among commuting patterns, job structure and rewards, and occupational and industrial sectors may reflect a variety of relationships among the variables within the survey population.

We chose a highly empirical technique to explore the divisions that may exist among groups of women workers in our study area. Cluster analysis groups cases into a predetermined number of categories by minimizing the distance between within-group cases on all variables used to differentiate them while maximizing the distance between groups; it tests these groupings by performing simultaneous analyses of variance between the clusters of cases and the differentiating variables (Everitt 1974). Variables are standardized into Z-scores to ensure that each variable has the same power in the differentiation process, although variables with a greater range will inevitably have more impact on the results (Affifi and Clark 1984).

We performed the cluster analysis with different combinations of variables and different numbers of clusters to determine the best groupings of cases. The most parsimonious set of variables with the best ability to distinguish groups on the basis of variables not used to cluster cases included two "human capital" variables (length of employment and level of education), one income variable (the

natural log of hourly pay rates), and three job attribute evaluation variables (job security, receipt of benefits, and convenience of job location).

Three clusters provided the best grouping; two clusters reduced the F-scores obtained for some variables, and more than three clusters produced disproportionately small groups (less than five cases). Scatter plots of the standardized variables used to cluster the cases suggested that three clusters are discernible in the data, and the earlier analysis of the data presented above supported the assumption that the respondents are divided into three principal groups. The results were tested in two ways, as recommended by Everitt (1974):

- The data set was divided arbitrarily into two (by case number) and identical cluster analyses were performed on each half. The clusters identified remained intact, suggesting it is unlikely that groupings were based on spurious relationships.
- Chi-square analysis was performed to determine relationships between groupings and other variables that were not used to cluster cases; significant results were obtained for many variables.

Cluster groupings

The group profiles defined by our cluster analysis on the six standardized variables are summarized in Table 5–2. The scores in Table 5-2 represent proportions of standard deviations above or below the mean scores for that variable; for the standardized income score we used the natural log of hourly income, since hourly pay rates introduced a variation so wide that it prevented discrimination by any other variable.

The first group of respondents was characterized by low human capital attributes. They had less than the mean length of employment in their current job and less than the mean education level of the employed workers in our sample. Their income

scores were two thirds of a standard deviation below the mean of the natural log of hourly pay rates. The values they placed on benefits and job security were close to the mean, but the value they placed on short work trips was above the mean. We could describe this group crudely as low-paid, low-skilled workers for whom security and to some extent benefits are important, but who are less willing than other workers to trade off shorter work trips for these rewards. This was also the largest of the groups identified, with 158 respondents.

Group Two was smaller than the other groups, with human capital attributes and income close to the mean for employed respondents. But group members rated all three job characteristics as much lower in importance than did other respondents. We may speculate that this group was willing to trade off shorter work trips for hourly income rates that were slightly higher than the mean, but members placed a lower value on benefits and security.

Group Three could be characterized as high-paid, high-skilled workers who valued benefits and job security more than other respondents and were more willing than Group One workers to trade off commuting for better job rewards.

Chi-square analyses and analyses of variance were used to explore how well the clusters defined here held up when extraneous variables were introduced. A number of significant relationships

Table 5–2. Cluster groupings obtained

Variable	Group 1	Group 2	Group 3	F-score
Experience	-0.3641	-0.0819	0.4388	27.72 ^{††}
Schooling	-0.4384	-0.1220	0.5453	45.98 ^{††}
Log hourly pay	-0.6630	0.1225	0.7870	109.69 ^{††}
Short commute	0.3378	-0.6499	-0.2125	22.52 ^{††}
Benefits	-0.0869	-1.035	0.3769	36.71 ^{††}
Security	0.2460	-2.305	0.3364	332.08 ^{††}
n=	158	37	138	

SOURCE: Data for study area from survey sample.

NOTE: F-score significance denoted by: ^{††}< 0.01; [†]< 0.05.

were found with variables not used to cluster the groups, suggesting that the empirical model does have some explanatory component.

The clusters of respondents were significantly related to occupational sector, although no relationship with industrial sectors was apparent. Group One workers were more likely to be in service occupations or unskilled blue-collar occupations. Group Two workers were most likely to be in sales or service occupations, and Group Three members were least likely to be service workers, but more likely to be in professional specialty or clerical occupations. Groups One and Two were more likely to have jobs located in nonmetropolitan areas (75.3 percent and 81.1 percent respectively), while Group Three members were more likely to be metropolitan workers (39.9 percent), as shown in Table 5-3.

There was a strong, significant relationship between group membership and part- or full-time status. Part-time workers constituted nearly 40 percent of Group One and more than two thirds of Group Two, but only 20 percent of Group Three. While no significant relationship was detected between cluster membership and part-year employment, Group Two members were more likely to be employed part-year. As might be expected, a significant relationship ($p < 0.000$) was detected between group membership and job tenure: one third of Group One members but less than ten percent of Group Three members had been in their current jobs less than one year. More than two thirds of Group Three members received health and retirement benefits; Group One members were less likely than average to receive benefits, and the majority of Group Two members received no benefits.

Groups were also differentiated by age, although the relationship was significant only at the 0.10 level: Group One workers were most likely to be under 34, while Group Two and Three members were more likely to be over 45 years old. In part,

Table 5-3. Analysis of job characteristics by cluster groupings
(percent unless otherwise indicated)

	Group 1	Group 2	Group 3	χ^2 or F-score
Part-time	39.2	67.6	19.6	38.00**
Regular work hours	63.3	43.2	73.9	12.48**
Health benefits recipients	36.1	27	68.1	41.44**
Retirement benefits recipient	39.2	16.2	71.7	55.63**
Metropolitan workers	24.7	18.9	39.9	10.61**
Mean hourly pay (dollars)	\$4.40	\$7.43	\$11.33	53.57††

SOURCE: Data for study area from survey sample.

NOTE: χ^2 significance denoted by: ** < 0.01; * < 0.05.

F-score significance denoted by: †† < 0.01; † < 0.05.

this age breakdown may reflect the strong discriminating role played by length of tenure with same employer in the cluster analysis. Some relationship was also apparent between group membership and domestic role, although it was not significant. Group One members were more likely than other group members to be single parents (although single parents made up a very small proportion of our sample). Group Three members made up a larger portion of single women with no children at home and were slightly more likely than others to be married with no children under 18 at home. A strong significant relationship was evident between cluster group membership and household income ($p < 0.000$). More than two thirds (68.4 percent) of Group One members and more than three quarters (77.8 percent) of Group Two members lived in households with annual incomes less than \$30,000 (which is close to the median income for rural Iowa households). Only one third (34.2 percent) of Group Three members were in this household income category.

While Groups One and Two have some similarities in types of job held, Table 5-4 shows that their commuting characteristics distinguish them. Group Two members, who are more likely to be employed part-time, have work trips much shorter than the mean. Although Group One members travel slightly less than the mean (and, as we saw, are more likely to value shorter work trips highly), they bear the highest cost burden of any group. They also have

Table 5–4. Analysis of commuting characteristics by cluster groupings
(percent unless otherwise indicated)

	Group 1	Group 2	Group 3	χ^2 or F-score
Mean work trip (miles)	14.08	10.32	18.04	5.97 ^{††}
Mean cost burden	17.05	12.13	10.78	6.15 ^{††}
Mean time burden	8.0	8.0	9.0	0.96
Mean car age (years)	6.34	6.86	4.42	9.57 ^{††}
Receptive to transit	51.4	50.0	52.5	0.81
Ridesharing	18.1	10.8	20.3	3.97

SOURCE: Data for study area from survey sample.

NOTE: χ^2 significance denoted by: ** < 0.01; * < 0.05.

F-score significance denoted by: †† < 0.01; † < 0.05.

access to vehicles that are significantly older (and, we may speculate, less reliable) than the vehicles available to higher-earning Group Three members. Despite these differences in commuting patterns, the groups do not differ much in their reported willingness to use public transit, but Group Two members are less likely than the others to be involved in ridesharing, probably because of their shorter work trips. Modal choice is discussed in more detail in the following chapter.

The cluster analysis has highlighted a group of workers for whom commuting represents a significant cost burden. Group Two members appear to have effectively balanced job market rewards and work trip length; they tend to work part-time and irregular hours and find the best balance of job attributes in the local job market. Group Three members show high rates of labor force commitment and receive high rewards in return; these are “career employees” who are willing and able to make longer work trips in return for pay and benefits. Group One members have clearly not been able to strike a similar balance. The incentive these respondents have to commute longer distances is much lower than that for Group Three members and, although their work trips are shorter, they are more burdensome proportionately. At present, the proportion of this group that uses ridesharing is similar to the sample mean; however, as nearly two thirds of them work regular hours and about 60 percent work full-time, ridesharing could be an attractive option for many who do not now use it.

Group One members have human capital attributes similar to those of the potential labor force participants identified in Chapter Three. This group bears a high commuting cost burden, indicating the disincentive that may keep many nonparticipants out of the labor force. Policy that attempts to expand labor force participation among rural women must address the commuting burdens of this group of current and potential workers. Group One respondents place a high value on job

security, suggesting that labor force participation is important to them and to the well-being of their families.

The cluster analysis presented here has provided us with a basis for our claim that the nonlinear relationships among commuting patterns, job structure and rewards, and occupational and industrial sectors, mask relationships that shape different women’s commuting and labor force participation choices in different ways. Distinguishing among groups of rural-based women employees provides us with a sounder basis for our discussion of policy recommendations in the next chapter.

A MODEL OF COMMUTING BEHAVIOR: HEALTH BENEFITS AND WORK SITE LOCATION

In this section we present two models of commuting behavior, both of which attempt to explain why some women in the study area commute longer distances to work than other women. The results generally point to the importance of health benefits and the diversity of metropolitan labor markets in determining longer commuting distances by women in the study area.

Most of the demographic data collected in the telephone survey was recorded categorically or ordinally. In some cases this method helped maximize the response rate to embarrassing or difficult-to-answer questions. But it imposes certain

important statistical constraints on the models that can be built. Most important, the distributional assumptions of multiple linear regression cannot be sustained using some of our survey data, particularly the demographic data. In the following series of analyses, we use logistic regression, a technique most often used in the medical field but now finding increasing application in the social sciences. The fundamental assumption in logistic regression is that the natural logarithm of the odds of belonging to a particular population group (or logit) is linearly related to one or more independent variables ($X_1 \dots p$). However, no assumptions are made concerning the (normal) distribution of these independent variables; thus these variables may be discrete or continuous. The model can be written in a form similar to the multiple linear regression equation:

$$\ln(\text{odds}) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p$$

Notice however, that β coefficients of logistic regression models do not have the same interpretation as β coefficients in the standard multiple regression. The probability of belonging to a particular population group is then given as:

probability of membership

$$\text{of group } l = \frac{1}{1 + e^{-(\alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p)}}$$

In the following analyses, women in the sample were assigned to various commuting groups on the basis of the distance they travelled to work. Distance was calibrated both by time spent commuting and miles travelled. A range of models was then developed to predict membership in the various groups. In practical terms, this classification divided our respondents into long distance work commuters or short distance work commuters. Demographic, wage, work, and other commuting variables were then used to predict the membership of groups commuting long or short distances. Independent variables in the various equations were selected either because they were theoretically important or because statistical entry techniques suggested they were interesting.

In our most parsimonious and rigorous model, only two variables were included in the final

equation: health benefits (HBR2) and metropolitan location of employment (LOCATS2D).

$$\ln(\text{odds}) \text{ long commute} = -1.6973 + 1.1430 (\text{HBR2}) + 2.4982 (\text{LOCATS2D})$$

The constant and independent variables were all highly significant ($p < 0.0001$) and the equation correctly categorized just under 79 percent of all individuals as either long or short distance commuters. Long distance commuters were defined as those who travelled more than the median commute (15 miles), though we ran identical models, with generally consistent results, using various alternative time and distance definitions of long distance commuting. All other usual requirements of logistic regression model rigor were met. N was 328.

The odds ratio (e^β) provides one of the simplest ways of interpreting the results of logistic regression. The odds ratio for HBR2 was 3.136, indicating that women who received health benefits from employers were about three times more likely to be long distance work commuters than women who did not receive health benefits. The job location variable had an odds ratio of 12.161, indicating that women who worked in metropolitan areas were 12 times more likely to be long distance commuters than were nonmetropolitan women workers. Thus, long distance commuting to other job locations does not appear to be an important component of respondents' travel patterns.

Before discussing an alternative model, we should point out that health benefits and metropolitan location were consistently prominent in almost all of the models developed. Given the geography of the study area, it is not surprising that those women who travel to Cedar Rapids, Waterloo, and Dubuque should also be long distance commuters; what is surprising is that there is so little long distance commuting to rural job sites. Thus, the model highlights the very close relationship between metropolitan employment and long distance commuting for rural women.

The prominence of health benefits (HBR2) is in accordance with the findings reported earlier in this chapter. Nevertheless, these findings remain somewhat unusual and require further discussion

here. As indicated earlier, it is commonly assumed that workers will trade longer commuting distance for higher wage income. Using various measures of income and the commuting distance, we found no evidence in any of our equations to support this assumption. On the contrary, female workers in the study area appeared to regard health benefits as a much more potent incentive than income for longer commuting distance. In some equations we replaced or combined the health benefits variable (HBR2) with variables indicating the presence of other work benefits, both material and psychic (retirement benefits, job security, job status), but the results were generally poor.

In order to test whether our findings concerning health benefits and commuting were not spurious, in some equations we replaced the HBR2 variable with a series of variables that attempted to capture respondents' rankings of various potential job attributes: increased status, increased earnings, improved security, greater work satisfaction, and the availability of benefits. Of these, only the evaluation of benefits variable proved a statistically significant predictor of the long-distance commuting group. We thus feel reasonably certain that at least in the study region health benefits play an important role in determining the length of the work trip for rural women.

As the previous chapter indicated, domestic responsibilities (the "double shift") have traditionally been seen as an important constraint on the commuting behavior of women. Indeed, domestic responsibilities are often presented in the literature as the major reason for the discrepancy between the length of the work trip for male and female household members. We built models that had a number of variables summarizing domestic demography, including the presence of children at home, the presence of pre-schoolers at home, household type, various combined indices of domestic burdens, and the ratio of the respondent's earnings to total household income. We thought the latter variable would be a particularly interesting measure of relative domestic role, since it estimates the monetary importance of the respondent's employment within the household economy. The variable thus provides a measure of the significance of the respondent's job to the household. Again,

the results here were poor: the variables were insignificant and the models generally lacked rigor and predictive power.

Table 5-5 presents the results of a model that includes a wider set of those variables of theoretical interest than did the first model. Of the new variables in this equation, three concern work-patterns: part-time work (PTRD), the regularity of work hours (REGS1D), and whether a second job is worked (OTJOBS1). Our assumption here was that those who worked full time or who worked regular hours or who had no other job would be more likely to travel farther. We also included a variable for calculated hourly earnings (HPRATS) and an eight-category occupational variable (ROCCS2D). The eight categories entered the equation as deviation contrasts: that is, the effect of each category of the variable (except one) was compared to the overall effect. We entered four transportation variables. The first three (TRANX117, TRANX118, TRANX119) indicated the regularity with which work trips were combined with child-related trips, household errand trips, and social trips, respectively. Our assumption here was that the combination of other non-work trips with the work trip would generally constrain the length of the work commute. The fourth variable was the age of the car used for the work trip (CARAGE). Since most respondents were licensed drivers and had a car available for their use, the age of the car was the most important constraint on long distance travel. We entered two demographic variables: an index of domestic responsibilities based on household type and number of children (DOMROL) and an index of human capital based on individual work experience and education (HUMCAP). Both used indicator contrasts: in other words, the effect of each category was compared to the effect of the last (highest) category. In this case the last categories contained those who had the most domestic responsibilities or the most human capital respectively.

The model classified 81 percent of respondents correctly: the various measures of goodness of fit suggest that the model summarized the data well. Note however that only health benefits (HBR2) and job location (LOCATS2D) feature significantly and prominently in the equation. One occupational

Table 5–5. Probability of long distance commuting

Variable	β	Standard Error	e^{β}
HBR2	2.2351 ^{§§}	0.4689	9.3470
PTRD	0.3634	0.4594	1.4382
LOCATS2D	2.5606 ^{§§}	0.4549	12.9435
REGS1D	0.0048	0.4069	1.0048
TRANX117	0.3593	0.4815	1.4323
TRANX118	-0.0684	0.4487	0.9338
TRANX119	0.6132	1.1853	1.8464
ROCCS2D			
ROCCS2D(1)	-0.1411	0.4521	0.8684
ROCCS2D(2)	0.6465	0.4306	1.9088
ROCCS2D(3)	0.5255	0.6494	1.6914
ROCCS2D(4)	-0.7729	0.7375	0.4617
ROCCS2D(5)	-1.1317 [§]	0.4881	0.3225
ROCCS2D(6)	0.0159	0.4764	1.0160
ROCCS2D(7)	0.6493	0.5851	1.9142
CARAGE	-0.0434	0.0484	0.9576
HPRATS	-0.0666	0.0491	0.9355
HUMCAP			
HUMCAP(1)	0.9960	0.6095	2.7074
HUMCAP(2)	0.2903	0.5762	1.3369
HUMCAP(3)	1.3979 [§]	0.5945	4.0467
OTJOBS1	-0.2132	0.6812	0.8080
DOMROL			
DOMROL(1)	-0.7724	0.6285	0.4619
DOMROL(2)	-0.1405	0.6491	0.8689
DOMROL(3)	0.0795	0.5043	1.0828
CONSTANT	-2.2236 [§]	0.9036	

SOURCE: Data for study area from survey sample.

NOTE: Significance denoted by: §§ < 0.01; § < 0.05.

category, administrative support occupations [ROCCS2D(5)], and one human capital category, more than a high school education but less than median job tenure [HUMCAP(3)] also had a statistically significant relationship with commuting distance. Those who were not administrative support (clerical) workers were three times more likely to be long distance commuters.¹ Among those with more than high school education, respondents who had less than median job tenure

¹ If β is negative, the odds ratio will range between 0 and 1. The inverse of β then indicates the odds for those not belonging to the independent group.

were much more likely than the others to be long distance work commuters. These results are consistent with our earlier analyses; women in clerical occupations tended to travel less far to work, and those with higher educational qualifications but with shorter than median job tenure also travelled further to work, especially so when compared to those who had worked at their jobs for a long period.

The models clearly show that women who receive health benefits were much more likely to travel farther to work, as were women who work in metropolitan locations. We believe that part of the explanation is that metropolitan areas provide much more diverse labor markets, and therefore are sometimes much more attractive for rural women.

CONCLUSION

This chapter has explored the relationship between commuting distance and mode of labor force participation in greater detail than was possible in the previous two chapters. We were able to identify distinctive groups of respondents with different levels of commitment to the labor force and different access to job rewards. While individuals with higher levels of commitment (defined as likelihood of working full-time, full-year), longer job tenures, and higher educational qualifications had longer than average work trips, they also received much higher hourly pay and were far more likely to receive health and retirement benefits. Longer work trips were balanced by better job rewards for these respondents. The group of most concern here was comprised of predominantly younger individuals with lower educational qualifications and less than median job tenure who received low job rewards despite fairly long work trips. The labor force experiences of this group of respondents depict the barriers

faced by potential new recruits to the labor force discussed in Chapter Three. Labor force participation is clearly important for the economic well-being of these respondents' households, but commuting represents a sizeable burden or barrier.

While we did not discern a linear relationship between commuting distance and hourly pay rates, we did demonstrate with sufficient rigor a close relationship between work trip length and receipt of health benefits. This is a significant finding for policy approaches aimed at expanding labor force participation, especially in metropolitan labor markets like Cedar Rapids that draw on a pool of rural workers. It also raises questions about the impact of changes in health insurance at the

national level: if employees have access to a nationalized system of health insurance, will they be less willing to commute longer distances?

Group One, the cluster identified as most burdened by commuting costs, were less likely than our sample as a whole to receive health and retirement benefits, yet in responding to the attitudinal questions, members of Group One valued the availability of benefits about as highly as respondents in general did. It is likely that health benefits would provide an important incentive that would attract some members of this group of respondents into more extensive labor force participation; however, commuting still represents a sizeable barrier for these respondents.

CHAPTER SIX

POLICY OPTIONS

Reducing the commuting burden of rural women raises a difficult set of problems for policymakers. In rural areas, by definition, population density is very low and settlements are dispersed. A substantial proportion of rural residents must travel beyond their community to find employment suited to their skills and needs. Indeed, in some sectors, access to metropolitan labor markets is essential for workers who value pay and benefits. Although road investment and subsidies to keep gas prices low would benefit car users, here we focus on alternatives to individuals commuting long distances by car.

This chapter discusses two approaches to reducing commuting burdens for rural women workers. The first is an economic development-based set of strategies aimed at improving the options available in local job markets. The second set of strategies focuses on commuting modes, examining the potential of public transit and ridesharing to reduce the burden of solo car travel. We do not explore restructuring the work day or work week, because we found that women with the greatest domestic responsibilities were also most likely to have a longer distance to commute. This finding suggests that, for many of our respondents, fewer but longer working days would constitute an unreasonable burden.

First we review briefly the research on economic development and employment creation. The available evidence suggests that recruiting good

stable jobs to rural areas is a long-term strategy and that its success will depend on a range of extraneous variables, including the health of various sectors within the national economy, the outcome of current policy debates over the establishment of a North American Free Trade Area, employment restructuring, and changes in productivity. We conclude that, in the short to medium term at least, a substantial proportion of rural residents will continue to rely on the stable job markets and good job rewards available in some metropolitan areas. Our analysis of economic restructuring in the study area over the past decade and a half (presented in Chapter Two) supports this conclusion.

The remainder of the chapter focuses on the use of existing rural public transportation services for workers who are transportation disadvantaged and the potential for more carpooling or employer-sponsored vanpooling. We compare the commuting modes reported by our survey respondents and those reported for all residents of our study area in the 1990 *Census of Population and Housing*. We review experience with rural public transportation, carpooling, and vanpooling in other rural areas and then analyze how useful each of these modes might be to the different groups of commuters identified in our analysis. We attempt to answer the following policy-related questions:

- How does potential for transit use differ for different groups of women workers?

- What is the current extent of carpooling among different groups of respondents, and how could it be better used to reduce cost burdens?

Chapters Three through Five have identified a range of commuting patterns, work patterns, and job reward structures. Rural women do not share a single set of transportation and employment problems; our findings highlight the diversity of work experience and commuting patterns in the study population. Policies that do not differentiate groups within the target populations are bound to be ineffectual. Thus, the question posed at the beginning of this investigation—"How do the costs of mobility constrain or shape women's participation in the labor force?"—has a multi-faceted answer.

The most important aspect of the answer is the trade-off between longer work trips and jobs with better rewards—specifically, jobs with health benefits. We did not identify a linear relationship between hourly pay rates and length of work trip, but we did find that respondents who value employer-provided health benefits are more willing to travel longer distances than are those for whom health benefits are less important.

Other important aspects are that women who work in nonmetropolitan jobs are much more likely to have part-time or seasonal employment than are those in metropolitan locations; they are also more likely to work in traditionally female-dominated occupational sectors. Women who held nonmetropolitan jobs and home-based workers were also much more likely to see long work trips as a disadvantage. The extent of underemployment in nonmetropolitan locations (and the lower household incomes associated with underemployment) suggest that many current workers could be attracted into full-time full-year employment. However, we identified two barriers to expanding employment:

- Part-time and home-based workers were more likely than full-time workers to have children at home and thus to have greater domestic responsibilities that restricted their desire for full-time employment.

- Although the vast majority of respondents were mobile, commuting was perceived as a disadvantage by many nonmetropolitan workers, who were willing to sacrifice benefits and pay for shorter work trips.

A proportion of respondents who did not participate in the labor force named transportation as a contributing but not a primary reason for not participating. A small group of nonparticipants and part-time workers were identified as relatively transportation-disadvantaged; most of them had some access to a vehicle, but the vehicle was far more likely to be older and thus less reliable.

RURAL ECONOMIC DEVELOPMENT STRATEGIES

The analysis of labor market structure in Chapter Two identified some important recent trends with implications for rural women workers. Retail employment was centralizing quite rapidly, reducing job opportunities in nonmetropolitan locations, and little skilled manufacturing employment was available in nonmetropolitan locations (Brown 1980). The finance, insurance, and real estate sector (FIRE) and the business services sector had become somewhat decentralized, but job growth in the rural counties of the study area had not kept pace with job growth in the state as a whole. Although hourly pay rates in both metropolitan and nonmetropolitan labor markets differed substantially by sector, nonmetropolitan jobs were much more likely to be part-time or seasonal and were less likely to offer benefits. We concluded that more stable employment opportunities and better job rewards would continue to attract a substantial proportion of rural women to metropolitan job markets.

Over the past decade, partly because of the farm crisis and the decline of manufacturing employment in rural areas (Kale and Lonsdale 1987; Miller and Bluestone 1988), academics and policymakers have seen rural economic development as a means of reducing the differences between metropolitan and nonmetropolitan job markets (Lapping et al. 1989; Deavers 1992; Sears and Reid 1992). The question is whether these strategies can encourage the decentralization of enough stable jobs with

good rewards to serve rural residents in local job markets. Much policy in this area has focused on recruiting new plants to rural areas (Reeder and Robinson 1992). Communities have typically offered relocating firms various capital, infrastructure, or labor subsidies, lower corporate taxes, or higher quality labor (Eisinger 1988; Blair and Premus 1987; Stinson 1992). Other strategies, sometimes called "new-wave," have promoted local entrepreneurship, especially in technologically advanced sectors or in sectors with export potential (Eisinger 1991).

Rural areas face some special recruiting problems. By definition, they lack the agglomeration economies of metropolitan areas and are unlikely to recruit plants that rely on such economies. Put simply, the labor, service, and input markets in rural areas tend to be less diverse than those in urban areas, and thus they lack those sectors, functions, and occupations that rely on urbanization economies. As we argued in Chapter Two, rural areas tend to be concentrated in "peripheral" industrial sectors or in the manufacture of products at a more mature phase in their product life cycle. As a result, rural areas also tend to have proportionately fewer high-end occupations than do urban areas (McGranahan 1988; Porterfield 1990; Lidman and Weeks 1990).

Rural areas may nevertheless be attractive to some firms, particularly those that want a nonunionized, hard-working labor force and that do not rely on agglomeration economies. Finsterbusch and Kuennen (1992) argue that rural areas can be successful at recruiting firms. But successful recruiting does not necessarily create high quality jobs or diverse job opportunities. Even where economic development generates jobs in rural locations, urban areas will offer more diverse employment opportunity and, because of that diversity, may provide better jobs for rural job seekers.

"New-wave" strategies have focused on rural entrepreneurship and recruitment of technological industries. One set of strategies tries to resolve deficiencies in rural capital markets that may constrain rural entrepreneurship. These deficiencies may result from gaps in private capital markets,

which could then be filled by public funds, or they may merely reflect the dearth of industrial innovation in rural areas (Fisher 1989). The second possibility raises the question of whether rural areas can attract and sustain core technological industries. In the most comprehensive study of technological industries in rural America, Glasmeier (1991) is cautiously optimistic but concludes that rural high technology industries are more likely than urban high technology to be in relatively slow-growing sectors and to manufacture products whose life cycle is in the mature phase. As a result, these industries are occupationally less diverse than those in urban areas. Some commentators have argued that the technological sectors that predominate in rural areas are those most likely to find off-shore locations attractive and that as a consequence rural areas will experience further employment attrition rather than growth (Clarke 1991; Deavers 1992).

Rural economic development policies, whether traditional or new wave, are just beginning to be evaluated for their effectiveness in promoting demand for labor.¹ The results to date do not show conclusively that any of the options is more effective than the others. At this stage it seems safe to conclude that it is considerably easier to create jobs than to create a diverse range of good jobs. In the short term, it is not likely that policy interventions

¹ The literature here is massive and contradictory. For a good recent summary of the literature, including the problems with measurement and program evaluation, see Bartik (1991). In rural Iowa, the three most important economic development incentives are:

- RISE (Revitalize Iowa's Sound Economy) Immediate Opportunity program, which provides limited funds (raised from the state's gasoline tax) to cities and counties for the purposes of building or improving roads for new business recruits.
- CEBA (Community Economic Betterment Account), which provides state funds for business grants and loans so as to lower the overall costs of investment. Localities may then compete for these funds and offer them as part of their overall recruitment package.
- TIF (Tax Increment Financing) funds, which provide low-cost funds for site improvements.

There are recent assessments of these incentives (see, for example Forkenbrock et al. 1990 on RISE and Novak and Wulf 1989 on CEBA), but they do not directly address the issue of effectiveness, so it is difficult to say whether these recruitment incentives have worked better in Iowa than elsewhere.

will stimulate large-scale decentralization of better quality jobs. Instead, the most appropriate and viable policies in the short to medium term are those that can reduce the disincentives of commuting for both current and potential labor market participants. These options can expand the labor market choices of rural residents by lowering their transportation costs. Clearly, metropolitan job markets offer both the best prospects for future growth and the most valuable combination of job structure and rewards for workers committed to the full-time labor force.

PUBLIC TRANSIT SERVICE PROVISION

This section examines a number of options for rural transit, including transportation brokerage agencies, coordination of services provided by social service agencies and volunteer organizations, and integration of private transportation providers through subsidies to specific clients. Most of our survey respondents had access to dependable cars and travelled relatively long distances to dispersed job sites; these characteristics suggest that public transit will not play an important role in their commuting patterns. However, we did identify a small group of relatively transportation disadvantaged respondents, some who were in the labor force and some who were not, for whom supportive transportation services would be valuable.

As car ownership increased after World War II, passenger transportation service to rural areas declined steadily; service declined even more rapidly after the Bus Regulatory Reform Act of 1982, which deregulated intercity bus companies in an attempt to increase their profitability. A study of bus service to small towns in Iowa two years later indicated that two thirds of the responding locations had lost service because of deregulation (Due, Allen, et al. 1990, 83). Paratransit services provided by social service and voluntary agencies continue to serve clients' essential travel needs, but intercity public bus transportation is available in only a minority of communities. The sparseness of rural settlement, the dispersal of job sites, and the time and distance involved may mean that no form of public transportation would be viable for any but captive populations.

Local paratransit providers who have attempted to extend service to rural areas have encountered resounding apathy from the general public and commuters.² Transit trips are inevitably more time consuming than individual car trips and thus less attractive for noncaptive riders with relatively lengthy work trips. Conventional public transit services for low density, low ridership regions are likely to require extensive subsidies, and the burden would fall on local communities, since there is little federal funding for rural transportation programs (Burkhardt 1981). However, there may be more innovative and cost-effective options for occasional users and for those who are transportation disadvantaged but are neither elderly nor handicapped. These options include integrating rural public transit service with mail carrier service, along the lines of the "postal bus" used in many European countries (Adams 1981; Fleishman and Burns 1981), and integrating school bus service with general public transit (Fausch 1981; Kyte, Richardson, and McKean 1988). As our analysis of the survey responses showed, few current or potential workers have no personal car, but there are gradations in access to reliable transportation that may cause rural residents to use public transit intermittently.

Transportation brokerage services do not actually provide transportation; instead they investigate the demand for transportation services by target groups and attempt to accommodate that demand (Schreffler 1985). These brokerage services fulfill three main functions: they locate surplus transportation and need, they resolve potential barriers and market imperfections, and they consummate the sale or transaction. A rural transportation broker might identify services provided by volunteer organizations or social service agencies, ridesharing and vanpooling opportunities (offered by either employers or communities), and other potential "surpluses" such as the mail van, the school bus, or private

² Advisory committee members described two examples. The LIFTS paratransit service (operating in Linn County) held public meetings in late 1991 to gauge public interest in a regular fixed route service that would serve rural commuters. The meetings generated almost no response and identified only one potential user. In Story County, where the local paratransit service initiated morning and evening trips between Ames and a small town nearby, the service operated for some months with only one rider.

taxi. Clients would be matched individually with the most appropriate available service. The brokerage might resolve barriers and market imperfections by organizing agreements with existing services and by administering subsidies for riders in need (for instance, a voucher system for low-income entrants to the labor force). This approach differs from mere coordination of services in that it focuses on the needs of specific users and makes the best use of available resources.

General access transit services also operate successfully in some rural areas, despite the difficulties of sustaining rural public transit. Many of the systems we identified coordinated public services or private providers, and many operated without very large public subsidies. The remainder of this section describes and compares various rural transit systems that serve the low-income general public as well as the elderly and disabled. Information on these transit systems is drawn largely from a Department of Transportation report

(US DOT 1987) and coverage in recent issues of *Community Transportation Reporter*. We believe the cases reviewed here reflect a range of appropriate examples of how service can be delivered to rural communities.

Most of these rural transit services coordinated and extended special-purpose services, such as transportation for the elderly or disabled. Public-private ventures have been successfully established in many rural counties, combining bus, taxi, or school bus services with public sponsorship and administration. Although the majority of clients are the elderly or disabled, all of the systems described here serve some members of the general public. We chose these transit systems for the similarities of their service area to our study area and for the composition of their clientele. The ridership profiles summarized in Table 6-1 show a range of users, many serving quite substantial proportions of passengers who were neither elderly nor disabled. The counties in which the coordinated

Table 6-1. General public rural transit systems identified

System	Location	Population density	Annual passengers (000s)	Percent elderly	Percent disabled	Percent low income
Canon City Subsidized Taxi Program	Fremont County, Colorado, approx. 110 miles south of Denver	19	19.4	85	5	10
Kern County Rural Transit System	Southern California, approx. 110 miles north of Los Angeles	49	90	50 ^a 73 ^b 87 ^c	0	50 ^a 27 ^b 13 ^c
Hawaii County Transit System	Hawaii County, Hawaii	30	223	—	—	—
Sampson County Department of Social Services	Sampson County, North Carolina	52	2.4	—	—	—
Sweetwater County Transit Authority	Sweetwater County, south-central Wyoming	2.9	—	—	—	—
Endless Mountains Transportation Authority	Three counties in north-central Pennsylvania	41	168	56	5	41
Hill Country Transit	Nine counties (eight rural and one urban) around San Saba, Texas	32	181	77	7	19
RIDES Transportation Project	Four rural counties around Rosiclare, Illinois	37	—	18	39	43

^a Kern River Valley RTS.

^b Lamont system.

^c Mojave system.

transit systems are located differ in population density, but many have densities similar to the area of our study.

The characteristics of the transit services we identified are summarized in Table 6–1. The scale of services ranges from single counties to small groups of adjacent counties to very large regions. The Missouri-based OATS system began as an effort by a local chapter of the American Association of Retired Persons (AARP) to coordinate elderly service in rural counties; by the mid-1980s it had expanded to include service to the general public. Transit is coordinated within each of seven regions, and each region offers a different mix of services appropriate to local needs. Regional agencies organize volunteers (OATS is supported by 1,200 volunteers), raise matching funds to purchase new vehicles, and manage dispatching and scheduling.

These rural systems primarily serve female passengers: the RIDES program in rural Illinois reports that its ridership is 75 percent female; Hill

Country Transit in rural Texas, 70 percent female; and Endless Mountains Authority in north central Pennsylvania, nearly 80 percent female. Although the predominantly female ridership is partly due to a higher proportion of women in the elderly population, it is also a well-documented feature of urban transportation systems, where approximately 65 percent of riders are female.

Because of the high proportion of elderly users, most trips were made to senior centers or other services; however, employment accounted for around ten percent of trips made by Hill Country and Endless Mountain and for 31 percent of RIDES trips. These examples suggest that, if rural transit is available to the general public, it can play a larger role in work-related commuting than it does now, especially for women workers.

Most of the rural systems used a mixture of fixed route and demand-responsive service that could be adapted to serve a range of clients. Table 6–2 shows that passenger per mile ratios were much

Table 6–2. Level and types of service provided by rural transit systems

System	Types of service	Cost per vehicle mile	Passengers per vehicle mile	Cost per passenger
Canon City Subsidized Taxi Program	Contract with private taxi system, with subsidized coupons issued to eligible riders	\$0.50	0.46	\$2.00
Kern County Rural Transit System	Fixed route and route deviation service (KRV-RTS)	\$0.68	0.1 ^a	\$6.05 ^a
	Three fixed routes to city, and demand-responsive local service (Lamont)		0.2 ^b	\$5.86 ^b
	Fixed route morning service, demand-responsive afternoon service (Mojave)		0.5 ^c	\$5.49 ^c
Hawaii County Transit System	Fixed route service (twice daily in most areas) provided by a single private operator	\$1.73	0.6	\$2.74
	Paratransit and Dial-a-Ride service coordinated by human service agencies, to serve clients and general public			
Endless Mountains Transportation Authority	Mixture of mini-vans, mini-buses and volunteer vehicles with a computerized dispatch system provide demand-responsive transport	–	–	–
Hill Country Transit	Demand-responsive service, provided by 30 vehicles	–	–	–
RIDES Transportation Project	Demand-responsive service, provided by 17 vehicles	–	–	–

^a Kern River Valley RTS.

^b Lamont system.

^c Mojave system.

lower than for urban systems but that costs per vehicle mile were not necessarily excessive. Here, the mix of volunteer, public, and private providers had the greatest effect. Cost savings were often realized from contracts with private providers who assumed the costs of "downtime" and dispatching and often paid lower wages to drivers than public systems. Private sector participation did not necessarily provide the best balance between costs per passenger and level of service (Rosenbloom 1988).

STUDY AREA CHARACTERISTICS

What implications do the examples outlined above have for residents of our study area? Population density in the study area ranges from 31 to 34 persons per square mile, similar to the population densities in some of the rural regions discussed above. There is an existing network of public transportation services, many of which are available to the general public but are not widely used by any except the elderly and disabled populations.

We obtained information on existing services from the three Regional Transit Authorities that serve the study area counties; they provided detailed breakdowns of miles travelled for the first quarter of 1992. In all cases, ridership by the general public (nonelderly, nondisabled) was negligible or nonexistent. Similar services are provided in each county: demand-responsive service for elderly and disabled rural residents (sometimes with biweekly or weekly scheduled trips) and fixed-route subscription service for disabled clients traveling daily to a county work activity or job training center. In Benton, Buchanan, and Delaware counties, the county itself provides transportation services, and volunteer services were also available for the elderly; a nonprofit agency (JETS) serves Jones County. All services were by definition open to the general public, sometimes for a fee (especially where volunteer drivers and vehicles were used). However, service was provided only within the county, not to metropolitan areas.

The study area does have transit resources that could support entrants to the labor force and could be used occasionally by current workers commuting

to nonmetropolitan locations. While the volunteer services available to the public charged the full costs of transportation (\$0.25 a mile), other mechanisms could provide subsidies for those in need. Vouchers have been used successfully in systems that incorporate private sector transportation (for instance, the Canon City subsidized taxi program listed in Tables 6-1 and 6-2) and could be used in workfare programs with little extra administrative burden. Transportation brokerage services (provided perhaps by Regional Transit Authorities) could match needy commuters with available transport options.

None of our respondents used public transportation for commuting, but a surprising proportion of employed respondents (51.3 percent) claimed they would be willing to do so if public transportation were available. More than two thirds of respondents who shared rides and 53.5 percent of individual car users said they would consider using public transit for work trips. These responses are not sufficient grounds for expanding public transit service, since the rural transit providers we contacted had had little success extending services to the general public for work trips. Nevertheless, it is informative to examine which respondents tended to be more willing to consider public transit for their commuting trips.

We performed a simple chi-square analysis to determine the likely characteristics of transit-receptive workers. There was a strong positive relationship between actual cost burden and willingness to use transit. Respondents in the highest cost burden category were much more likely to be willing to use public transit than were respondents overall (71.2 percent versus 51.3 percent); only those in the lowest cost-burden category were less willing than average to consider using transit. There were also strong positive relationships with longer work trips. Respondents working in metropolitan areas were much more likely to be willing to consider public transit (75 percent) than were those employed in nonmetropolitan locations, although a surprising proportion of the latter (41.3 percent) would consider public transit. There was no significant relationship with occupation or industry (although time and cost burdens tend to be related to these

two variables) or with any measure of income. Human capital variables (age, education, length of employment) also showed no relationship.

There was a significant relationship between willingness to use transit and the importance respondents attached to short work trips, but not in the direction one might expect. Those who attached moderate importance to short work trips were more likely to be willing to use public transit than were those who placed a high value on shorter trips. There is a likely explanation: women who seek to minimize traveling in choosing a job are more likely to have low cost burdens and thus are less likely to need transit services. Respondents who placed little importance on short work trips were only slightly less likely to be willing to use transit than were respondents as a whole (49.1 percent vs. 51.3 percent).

Overall, the time and cost burdens imposed by commuting and the related issue of job location appear to be the most important predictors of willingness to use transit. However, we must conclude that the number of potential users of public transit services is small and does not justify any structural changes in the way that public transportation is currently provided. Given the types of work trips identified in the household survey, it is unlikely that public transit would attract many current commuters. Nevertheless, our survey did identify a small group of potential labor force participants and workers in very localized labor markets who could expand their employment opportunities if they had more reliable means of transportation. Small organizational changes within the existing transportation and welfare systems (the availability of vouchers to those in need, the introduction of brokerage services into RTAs) represent the most viable policy option for public transit in the study area and comparable regions.

RIDESHARING AND VANPOOLING

For many of those we identified as cost-burdened commuters, ridesharing and vanpooling may be viable alternatives. This section examines the research on these modes of commuting and evaluates programs adopted elsewhere for their applicability to our study area. A comparison of

our respondents with residents surveyed in the *1990 Census of Population and Housing* for our study area indicates that ridesharing or vanpooling could serve a large proportion of the cost-burdened commuters in the study area.

As more firms have moved to the suburbs and commuting distances for workers have increased, public transit systems have served a smaller segment of the work force. Employers have subsidized individual car travel by providing parking free or below market price. However, in high-growth metropolitan regions, employers have felt pressures to respond more innovatively. Zoning regulations, restrictions on growth and air pollution, and concerns about traffic congestion, have encouraged employers to subsidize other forms of transportation (Valdez and Wang 1989; Flynn and Glazer 1989). The need to reach relatively low-wage labor markets has also involved employers in direct provision of transportation to employees (Fox 1986).

Employers may involve themselves in employees' transportation decisions in a variety of ways, ranging from providing subsidies to providing administrative support to disseminating information from public agencies. The principal types of employer involvement include:

- providing vans, maintenance, and administrative support for vanpooling and organizing cost recovery that may or may not include a subsidy;
- supporting employee-initiated vanpools, in which vehicles are owned or leased by employees and employers provide some administrative assistance;
- providing information from regionwide ridesharing agencies or ridesharing coordinators for employee-organized carpooling;
- controlling the supply and price of parking for employees; and
- cooperating with other employers to provide feeder service from public transit terminals or to provide transportation directly, most

often to transport low-wage inner city residents to suburban job sites.

Most research on employer involvement in Transportation Demand Management (TDM) programs has focused on congested high-growth metropolitan areas. In a nationwide survey of 160 private employers with some ridesharing involvement, 10.1 percent of the employers were located in rural areas or small towns (Wegmann 1989). Firms responding to the survey tended to be larger than the national average, with an average of 3,000 employees per site for urban and suburban locations and 1,350 for small town or rural locations (Wegmann 1989, 89). Other research on ridesharing programs has found that they are more likely to exist at firms with more than 100 employees (Booth and Waksman 1985). The firms surveyed reported that over 35 percent of work trips to small town and rural locations were by car pool or vanpool, as were 25 percent of work trips to suburban locations and the central business district. Both of these rates are higher than the national average in the 1980 Census, which reported that 19.7 percent of all work trips were made by car pool and vanpool. In Iowa, 12.7 percent of work trips in 1990 were made by car pool and vanpool. The differences in these averages reflect the effect that employer involvement has on commuting patterns and suggest that ridesharing could be increased with more active employer sponsorship.

Wegmann (1989) analyzes the cost-effectiveness of the ridesharing programs identified in his study. He compares the costs of operating a vanpool program, transit incentive program, or ridesharing matching service, the administrative costs involved in overseeing a ridesharing program, and the costs of providing parking. The results of his analysis have important implications for the policy options discussed in this section.

Parking was the most commonly provided form of transportation subsidy, with 78 percent of survey respondents providing free parking and another ten percent subsidizing employee parking costs. However, parking shortages were reported by 33 percent of firms, including 32 percent of those in urban locations outside the central business district and 18 percent of those in rural locations. Over

half these employers provided free parking to employees (Wegmann 1989, 90). Average annual costs per space (including routine maintenance such as cleaning, resurfacing, and snow removal) were estimated to represent \$73.50 per employee. The costs of expanding parking facilities would represent a major capital commitment, but the cost varied widely by geographic location.

Ridesharing costs varied by degree of employer involvement. For vanpools operated by employees or third parties, the administrative costs were estimated at \$4.50 per employee per year; for vanpool programs organized by the employer, \$889 per van per year. The nonadministrative costs of vanpools operated by employers varied by the level of subsidy provided. A total of 58 firms operated vanpools, with an average of 23 vans per firm. Of these, 56 percent operated at break-even point or better, with 21 percent setting rider fares high enough to provide a positive net return to the firm. In some cases (five percent of vanpool operators) tax credits covered some operating costs. Of those firms that subsidized operation of the vanpool, the average subsidy was \$1,283 per van per year; when the cost is distributed over all employees, that figure represents a subsidy of \$12.35 per year per employee.

The cost-effectiveness of employer-operated vanpools also varies according to program management. In a comparison of two California aerospace companies, Torluemke and Roseman (1989) found that management decisions explained the substantial differences in the numbers of employees using the vanpool programs and in the programs' viability. In one firm, where capital costs were amortized over the useful life of the van, fares could be kept low enough to serve employees with a 20 to 40 mile one-way commute, even though this firm had fewer employees than the comparison firm. In the second firm, where vans were retired after only four years of service, fares were too high to attract many medium-range commuters and were used only for long distance commuting (more than 40 miles one way).

Wegmann reports that the majority of respondents to the employer survey (84 percent) felt ridesharing was cost-effective; other important benefits were

identified as good public relations (70 percent of respondents), reduced absenteeism (59 percent), reduced employee tardiness (53 percent), and ability to retain valued employees (40 percent).

Firms with active ridesharing programs were three times as likely to say ridesharing programs were cost-effective as were firms without such programs, most of whom said they were unable to judge. Employers without ridesharing programs may be unacquainted with the potential benefits they offer and may not recognize how much employee parking costs the firm. Wegmann's analysis also demonstrates that ridesharing programs are applicable in a range of geographic locations, since the benefits and cost-effectiveness findings are not restricted to firms in congested urban locations.

Proposals for ridesharing programs must demonstrate that commuters are willing to participate. A study of a large suburban employment center in southern California found that approximately 90 percent of employees travelled to work alone (Glazer and Curry 1987, 9), a much higher proportion than the national average. Respondents most commonly offered the following reasons for not ridesharing: they preferred the freedom of driving alone (43 percent); they might need the car to work overtime (42 percent); they needed the car for business (32 percent); they ran other errands *en route* (30 percent); and they worked irregular hours (26 percent) (Glazer and Curry 1987, 12).

Booth and Waksman (1985) constructed a profile of commuters who use rideshare options, drawing on a survey conducted at five National Rideshare Demonstration sites (Atlanta, Cincinnati, Houston, Portland, and Seattle). At four of the five sites, the proportion of commuters who shared rides was similar to the national average (19.7 percent), but in Houston the proportion was 26 percent. The authors explain the difference by noting that public transit is less available in Houston. Women workers were more likely than men to use ridesharing (Booth and Waksman 1985, 34), and ridesharers were more likely than other respondents to have less than one car per employed household member. Cost was the most important reason given for ridesharing, although respondents also mentioned

the unavailability of public transit, convenience, travel time, and schedule requirements. There was no clear relationship between income and propensity to rideshare, but at all sites except Portland employees were more likely to carpool if their household incomes were below \$15,000 (1982 dollars).

Firm size was closely related to rideshare choice, with the modal split higher at firms with more than 100 employees. Ridesharing was also a more likely choice as distance to work increased; average work trips overall were 12 miles, but ridesharers had an average work trip distance of nearly 15 miles. Full-time workers were also more likely than part-time workers to share rides. Those working flexible or variable hours were less likely to share rides with co-workers but more likely to share rides with family members (Booth and Waksman 1985, 36).

Employers at the five sites were also surveyed; less than one third offered ridesharing assistance, but a large majority of those employers reported that the benefits of rideshare assistance outweighed the costs, supporting the findings of Wegmann (1989) reported above. However, Mehranian et al. (1987) report that the most cost-effective way to promote ridesharing and transit usage is to eliminate parking subsidies rather than to offer additional subsidies to transit users and ridesharers.

Ridesharing and vanpooling are most commonly organized by employers or by workers themselves. However, communities may also organize ridesharing and vanpooling. In a demonstration project in the Albany, NY, area, neighborhood coordinators in four residential communities marketed a ridesharing program and set up the car pools. An evaluation concluded that these neighborhood coordinators were as effective as coordinators hired by employers "in the number of placements and in cost-effectiveness measures" (Brunso and Hartgen 1983, 26).

Although public transit services should not be ruled out as an option for rural commuters, ridesharing and vanpool programs seem to offer an even more viable alternative to individual car travel. Research has shown ridesharing and

vanpooling to be beneficial even where congestion is not a pressing problem. The following conclusions can be drawn from the research reviewed here.

- Vanpooling and ridesharing are viable options in a range of locations, including metropolitan, suburban, small town, and rural areas.
- Larger firms or concentrations of firms in business, retail, or industrial parks offer the best conditions for organizing ridesharing or vanpooling programs, but programs can also be implemented effectively at the community level.
- Flextime and part-time work patterns reduce the likelihood that rides will be shared with co-workers but increase the likelihood that they will be shared with others in the household.
- A large majority of employers involved directly or indirectly in ridesharing or vanpooling programs found that they were cost-effective (and lower in cost than employer-provided parking) and that they offered a range of nonquantifiable benefits such as reduced employee turnover.
- Women are more likely than men to participate in ridesharing programs; commuters

who travel longer than average distances were more likely to participate, with cost savings the most important reason given.

Ridesharing or vanpooling could be incorporated into an area-wide transportation brokerage system, combined with backup services using existing paratransit and private taxi service.

STUDY AREA

We identified some noticeable differences between survey respondents and respondents from the study area counties in the *1990 Census of Population and Housing*. Despite their high levels of mobility, survey respondents were more likely to carpool than Census respondents and less likely to drive alone (see Table 6–3). This difference was especially interesting because our respondents also reported slightly longer average work trips than those reported for all residents of our study area in the 1990 Census.

Chi-square analysis of the relationship between commuting mode and a range of other characteristics for our survey respondents showed that metropolitan employees were more likely to rideshare (25 percent) than were nonmetropolitan employees (15.3 percent). Three quarters of those who shared rides were employed full-time, as were 62.2 percent of those who drove alone. A larger proportion of ridesharers (85 percent) than of solo drivers (62 percent) worked regular hours.

Table 6–3. Modal split of journey to work for four rural counties, survey sample, total for study area, and state of Iowa, 1990
(percent unless otherwise indicated)

Mode used	Benton County	Buchanan County	Delaware County	Jones County	Survey sample	Total of four rural counties	State of Iowa
Car alone	77.12	79.54	75.79	75.28	70.30	76.98	78.73
Carpool	16.37	11.63	14.15	14.37	18.20	14.24	12.72
Transit	0.25	0.24	0.21	0.52	0.00	0.30	1.33
Bicycle or walk	5.30	7.97	9.05	8.95	10.80	7.66	6.70
Other	0.95	0.63	0.81	0.87	0.70	0.82	0.52
Total number of workers	9,125	7,633	6,815	7,501	333	31,074	1,233,314

SOURCE: Data for counties and state of Iowa from 1990 *Census of Population and Housing*, STF3; data for study area from survey sample.

There was a significant relationship between travel mode and benefits: two thirds of ridesharers received health and/or retirement benefits. Those who drove alone were about as likely to receive benefits as the overall population, but those who walked or cycled to work were less likely to receive benefits (one third received health benefits, and only 17 percent received retirement benefits). This result may be expected from our earlier finding that respondents working close to home were less likely to receive benefits.

Of our respondents, approximately seven percent carpooled with colleagues, seven percent with family members, and four percent with other adults. One objection often raised against ridesharing proposals is that they assume commuters do not combine their work trips with other errands. However, we found that the mode of travel was not significantly related to dual purpose trips. Of those combining either child-related or household-errand trips with work trips every day, 21.7 percent were ridesharers. Overall half of all respondents (49.8 percent) reported they combined work trips with household errands at least weekly.

A relationship was also evident between travel mode and number of cars in the household: 31.3 percent of respondents from one-car households were ridesharers, though ridesharing constituted only 18.2 percent of work trips. There was a significant relationship (at the 0.01 level) between work trip mode and income: ridesharers were more likely to earn near median income (72.9 percent earned between \$4.25 and \$9.50 an hour), and those who drove alone were more likely to earn very high (more than \$9.50) or low (less than \$4.25) hourly pay. In part, these differences can be accounted for by the metropolitan/nonmetropolitan job split. Ridesharers were far more likely than other workers to travel long distances to work; 65 percent travelled more than the median distance, and 40 percent of ridesharers had time burdens in the upper quartile of the distribution.

Ridesharing or vanpooling is generally perceived to be easier to organize in the workplace and to be more viable in firms with more than 100 employees.

The average size of firm for all respondents was 401 employees, but the median was just 35. Overall, 69.7 percent of respondents worked in firms with 100 or fewer employees. However, there were significant differences in firm size by location of job. The median firm size for those employed in Cedar Rapids was 225 employees, and 58.1 percent of respondents in that labor market worked in firms with more than 100 employees. For those employed in nonmetropolitan locations, median firm size was 15 and only 18.4 percent of employees worked in firms with more than 100 employees.

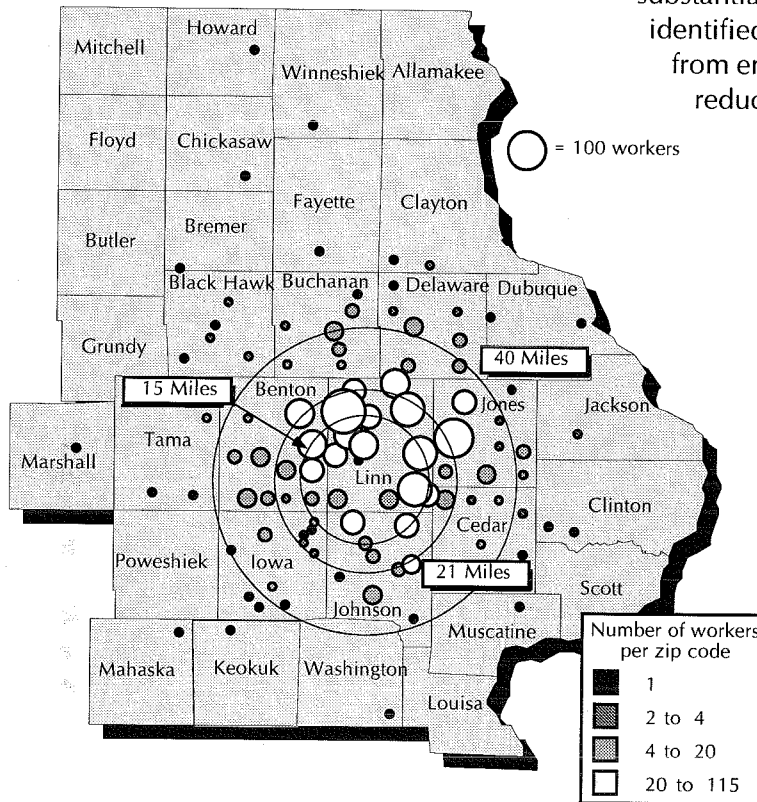
As might be expected, mean firm size increased rapidly with work trip length; for those in the highest quartile of trip length, firms were more than twice the average size (at 834 employees). For full-time workers and for those with regular work hours, average firm size was also larger than the overall mean, at 527 and 536 employees respectively. Firm size was also positively related to receipt of benefits; mean firm size was 754 employees for those receiving health benefits and 728 employees for those receiving retirement benefits.

We may conclude that respondents with the longest work trips are more likely to work in large firms and that employees of large firms are more likely to have the regular work hours and full-time status that make ridesharing or vanpooling viable. Although most respondents in the highest cost-burden category fit this profile of potential ridesharers, a minority of burdened commuters had jobs that were part-time or irregular, concentrated in the retail and personal services sectors. If an employee works irregularly scheduled or evening shift hours in a small firm in a nonmetropolitan location, she may have no realistic alternative to solo car travel. Where retail and service employees are clustered in metropolitan locations, some of the obstacles posed by small firm employment may be overcome by careful coordination (Fox 1986).

Finally, we assessed the potential for ridesharing or vanpooling at the work site. Data gathered from four large employers in Cedar Rapids (representative of the sectoral mix identified in our survey) showed that a substantial proportion of their female

employees travelled from outside the Cedar Rapids MSA. Figure 6–1 shows the spatial distribution of commuters to those firms, while Table 6–4 shows that, for three of the firms, most rural employees lived in zip codes where more than ten other employees of the same firm also lived.

Some employers reported that informal ridesharing programs had once been quite common (in the early 1980s) but that interest had dropped off. None of the employers had rideshare programs at the time of this study. However, if ridesharing were actively marketed regionally, it could represent a viable alternative to individual car travel for many rural residents. It could also substantially lower the commuting cost burdens identified in our survey, with minimal outlay from employers. The benefits to be obtained—reducing pressure to expand parking spaces, reducing employee turnover, and attracting employees from a wider rural area—provide strong arguments in support of ridesharing initiatives.



NOTE: The circles reflect the percentile distribution of work trip length identified in the survey. Half our employed respondents travelled 15 miles or less, three quarters travelled 21 miles or less, and ninety percent travelled 40 miles or less.

Figure 6–1. Rural-based female employees by zip code

Table 6–4. Distribution of rural-based female employees of four metropolitan firms, by sector and number of workers from same zip code (percent)

Sector of firm	Percentage rural female employees	Number of rural female employees working in same firm and living in same ZIP code			
		Two or fewer	Three to five	Six to 10	More than 10
Finance, insurance, and real estate	20.0	22.4	30.4	47.2	0.0
Health	25.7	10.0	13.4	18.4	58.2
Durable manufacturing	28.2	10.7	6.8	13.1	69.4
Defense-related manufacturing	32.0	7.3	15.8	17.6	59.3

SOURCE: Company personnel records.

CONCLUSION

Increasing participation in the labor force, especially women's participation, is important to rural economic development for two reasons:

- Rural households tend to be poorer than nonrural households (Brown and Deavers 1988; Galston 1992). Increasing the labor force participation of household members would increase household income. Effectively, this means increasing the participation of women, since the participation rate of men is unlikely to increase, indeed it may decrease, over the next decade. Our data also suggest that female participants in the rural labor force are often underemployed (in part-time or seasonal work) and thus earn less than they could. Household income could be increased by removing what barriers exist to full-time regular employment.
- In the four county study region (as well as in Iowa and the nation), the rural population is growing smaller and more aged. Thus, increased labor force participation by people traditionally excluded from or marginal within the rural work force may be important for the future competitiveness of rural areas (Lapping 1989). It may also have an impact on the supply, and thus the cost, of labor in adjacent metropolitan areas. (Parts of the Cedar Rapids economy, for instance, appear to rely quite heavily on female workers from adjacent rural areas.)

In sum, more participation by rural women in the labor force would have positive effects both on household income and on the rural economy and community. As Chapter Two indicated, women make up an increasing share of the rural labor force, and rural women are responsible for an increasing portion of the income of rural households. Nevertheless, there still are barriers

to the full participation of women in the rural labor force. One such barrier is transportation, though this is not the only barrier nor necessarily the most significant one.

This chapter has assessed two policy options for reducing the commuting burdens that some rural women bear. We concluded that ridesharing and vanpooling strategies would be beneficial to many workers with long work trips and that could be effectively expanded in the study area and in similar regions. Comparison with the *1990 Census* indicated that the women workers in our survey were more likely to carpool than study area residents as a whole. Examination of the results of the household survey revealed that ridesharing did occur with nonfamily members, and did not pose an insurmountable obstacle to combining work trips with household or child care trips.

Extending public transit service to rural areas raises many well-documented problems. In particular, the long work trips, relatively scattered settlement patterns and high rates of personal and household mobility among survey respondents suggested that the market for transit service could not be expanded significantly. However, some respondents would clearly benefit from a back-up service or initial assistance in commuting, and existing services could be used for this purpose with the assistance of a broker agency that would deal with specific clients.

Workers who had high commuting costs and those who worked in metropolitan areas were very receptive to considering alternatives to solo driving and responded positively to a question about public transit. These results should be interpreted with care, since almost no respondents would be captive commuters and public transit would lengthen work trips that are already long. Nevertheless, the respondents' receptivity should be taken as a positive sign, contradicting assumptions about consumer preferences for individual travel.

CHAPTER SEVEN

CONCLUSIONS AND RECOMMENDATIONS

Our study was conducted after a decade and a half in which employment restructuring had increasingly differentiated the integrated metropolitan and nonmetropolitan labor markets in our study area. Over the same decade and a half, the rural household economy (both farm and nonfarm) has also been substantially restructured. An increasing proportion of rural women have entered the waged labor force and sought employment in a job market that offers starkly differentiated choices.

Broad analyses of women's employment and the rural economy suggest that rural workers are better rewarded in metropolitan labor markets. However, our more detailed analysis of a restricted geographic region identified groups of women who differed significantly in the form of their participation in the labor market and in the trade-offs they made between longer work trips and the rewards of metropolitan employment. By highlighting the diversity among women workers, we developed a better base for assessing policy responses to the imbalance between jobs and population in rural regions.

This chapter draws together the findings of our telephone survey, our analysis of the study area's labor market structure, and our discussion of policy options. We address the following questions:

- What can we conclude from the discussion of labor market participation and commuting patterns?

- What can we conclude from the discussion of labor market structure in the study area?
- How do the labor market participation and commuting patterns we identified fit our understanding of the area labor market?
- What are the policy implications of these findings?
- What can we conclude from the discussion of labor market participation and commuting patterns?

The differences we identified between metropolitan and nonmetropolitan labor markets suggest that rural women are willing to commute farther for specific types of jobs (executive and managerial, skilled blue-collar, and professional occupations) in specific sectors (manufacturing, transport and distribution, finance, insurance, and real estate [FIRE], and business services). These occupations and sectors appeared to offer better rates of pay in metropolitan locations or were more likely to offer benefits. Many respondents who commuted these longer distances had educational qualifications higher than a high school diploma but tended to have shorter than median job tenure.

Respondents in the technician, sales, clerical, and unskilled blue-collar occupations, as well as respondents in retail, personal services, and public administration industries, were less likely to commute long distances to jobs in metropolitan

locations. They tended to earn more in nonmetropolitan locations and were no more likely to receive health benefits if they commuted to metropolitan locations. The few respondents who held metropolitan jobs in those sectors tended to have very high commuting costs in relation to daily pay. Respondents in these sectors tended to have lower educational qualifications. Cluster analysis identified a large group of younger women with lower human capital attributes, employed predominantly in those sectors, who felt shorter work trips were very important. Members of this cluster group employed outside their local areas were likely to be severely cost-burdened, a finding which suggests that this group is largely captive to a less satisfactory local labor market.

This cluster group had many demographic similarities with the group of respondents not in the labor force currently whom we identified as potential labor force participants. We speculated that these potential entrants would have experiences similar to those of the captive cluster if they were to enter the labor force.

Labor market structure in the study area

Women's decisions whether and how to participate in the labor market must be understood in the context of the metropolitan and nonmetropolitan job markets within which these decisions are made. We drew the following conclusions about the area labor market.

1. The rural study area has seen a general decline in employment, especially in manufacturing (except in Buchanan county) and in retail jobs, although it has seen some growth in the FIRE and service sectors.
2. The Waterloo and Dubuque metropolitan areas have seen dramatic declines in employment in all sectors (apart from weak growth in services); neither is an important employment location for most rural residents.
3. Cedar Rapids has had stable employment overall. Employment in manufacturing and in FIRE has fallen, but jobs have grown in retail services and in transportation and distribution.

Of the three metropolitan areas adjacent to our study area, Cedar Rapids is the only one in which economic restructuring has centralized more diverse job opportunities over the past decade and a half. Despite the increasing rates of female labor force participation in the rural counties, jobs have declined rather than grown in local rural job markets. If these trends continue unreversed, access to the Cedar Rapids labor market will become increasingly important for workers in all sectors, and especially important for workers in typically feminized, less stable sectors such as retail trade and personal services. The remainder of our discussion focuses on the Cedar Rapids MSA as the principal metropolitan job location.

Labor market participation, commuting patterns and the area labor market

1. Women were most likely to commute to metropolitan jobs in sectors that are declining in the Cedar Rapids MSA as well as the other two metropolitan areas. The exception was the transportation, distribution, and communication sector, which employed only a few respondents. Commuting longer distances to jobs in manufacturing, FIRE, and business services was a rational decision, since these sectors offered higher hourly pay than similar jobs in nonmetropolitan locations or were more likely to offer benefits. Metropolitan jobs in these sectors were also more likely to be full-time and full-year than were similar nonmetropolitan jobs.
2. Respondents tended not to commute to metropolitan jobs in sectors that have shown the most growth in Cedar Rapids; women in the personal services and retail industries were most likely to work in nonmetropolitan locations. This decision is also rational, since these women received significantly higher hourly pay in nonmetropolitan jobs in those sectors, were unlikely to receive benefits from such jobs no matter where they worked, and expressed more resistance than other respondents to commuting. Metropolitan jobs in these sectors were no more likely to be full-time and full-year than were similar jobs in nonmetropolitan

locations. Job structure thus also discouraged longer work trips.

What can we conclude from these findings?

First and most important, *only some rural women workers are willing to commute to metropolitan jobs*. Rural women with higher education levels will continue to provide a willing pool of labor for metropolitan jobs in sectors that offer better job rewards. Rural women will not provide a suitable labor pool for firms in the fastest growing sectors (retail and services) as long as nonmetropolitan jobs remain relatively attractive.

Under what conditions might the rational decisions which underlie this choice change? Women's unemployment rates are higher in three of the four rural counties than they are in the Cedar Rapids metropolitan area. Women's wages are an important component of household income and thus are important to the economic viability of rural communities. Although the service sector and to some extent the FIRE sector have shown some growth in the four rural counties, trends indicate that employment opportunities in those counties are declining overall, especially in retail businesses. Will stagnant rural job growth push more employees into the metropolitan job market? If so, most opportunities will be available in the retail and service sectors—the sectors that have shown the least ability to attract rural women and that impose the highest relative cost burdens on those who commute to metropolitan locations. Thus, *transportation costs may represent a substantial barrier to increasing (or even maintaining) the labor force participation rates of younger, less skilled, and less experienced women workers*. This barrier may have severe effects on the well-being of many rural households and thus on the viability of smaller rural communities.

If employers in specific sectors are unable to attract new recruits to the metropolitan labor force, however, those employers may have to provide more attractive rewards. Sales and service sector jobs are tied to consumer markets, so employment cannot be decentralized; in retail sales especially, the historical trend has been toward concentration in larger places. In addition

to offering better job rewards, reducing the disincentive of commuting will help sales and service sector employers attract a sufficient labor force from surrounding rural areas. Lowering commuting costs will help improve the labor market choices and rewards of rural women and the well-being of rural households.

What are the policy implications of these findings?

Chapter Six assessed the policy options available to overcome the “friction of distance” between the residential amenities of rural counties and the stable labor markets of adjacent metropolitan areas. In rural communities it may be more realistic to base economic development plans on better access to these metropolitan labor markets than on large-scale decentralization of jobs. Although local economic development has produced rewards (new jobs and improved local tax bases) and should not be abandoned, good jobs within high growth industrial sectors are most closely tied to more urban locations. Furthermore, those sectors that have grown most in the study area are tied to larger consumer markets and tend to concentrate in metropolitan places; these jobs will not decentralize. Although rural counties may continue to grow in certain types of jobs (despite the attractions of off-shore locations for the same jobs), overcoming the friction of distance to metropolitan job markets will contribute most to the work opportunities available to rural women (and will thus contribute to the viability of rural households and communities).

The analysis of commuting patterns suggested that, for larger firms with a higher proportion of employees working full-time and regular hours, ridesharing or vanpooling programs could be promoted as a beneficial and cost-effective means of attracting and retaining rural employees. Many of our current long-distance commuters work for such firms, and we concluded that ridesharing could expand to serve these respondents. But would ridesharing be a viable way to overcome the friction of distance for potential metropolitan workers in the sales and service sectors? Many sales and service workers are employed in small firms, and they are more likely to work part-time

or irregular hours. Two additional points need to be considered here.

1. Although sales and service firms are often small, they frequently cluster in locations that offer consumers a convenient choice or that allow linkages between firms. Thus, although a firm may have few employees, its site (a shopping mall, strip development, or downtown area) may have a very large number of commuters.
2. Part-time work in these sectors often coincides with peak periods of consumer demand, and those peak periods are usually the same throughout the work location (for instance, 4:00 to 8:00 P.M. at shopping malls). In those cases, part-time work may not represent a real barrier to ridesharing or vanpooling with other workers. Irregular hours do present a barrier to ridesharing with colleagues, although flexible work hours may offer more opportunity for home-based ridesharing. Those with high commuting costs were much more willing than others to explore alternatives to individual car travel, and ridesharing schemes offer cost savings that would make them attractive to many cost-burdened employees.

Despite the obstacles to widespread public transit service in rural areas, we identified small groups of relatively transportation-disadvantaged workers and potential workers who would benefit from some access to transit services. They would use transit services on a short-term basis, either to bridge the threshold investment required for a car or to provide a backup for older or less reliable cars. Our analysis did not identify a demand for transit large enough or permanent enough to justify an expansion of current public transit services. However, a review of programs elsewhere suggested that transportation brokerage services could match labor force entrants or those with intermittent need for transit to available transportation resources in the region. In particular, if brokerage services (based in the Regional Transit

Authorities) could be combined with a voucher system (for either regular or emergency use) they could give many relatively transportation-disadvantaged workers the security or assistance they need to enter the labor market or to change their job location.

Our policy options do not address the time burdens of rural commuters. Both ridesharing and public transit options will extend the length of the daily commute somewhat. Flexible work hours have been suggested as a means of reducing commuting time—for example, four-day work weeks with longer daily working hours. We found no evidence that those workers who are most severely time-burdened use this strategy. In fact, longer work days might merely exacerbate the consequences of relatively long commutes; if the daily domestic responsibilities of employed women are relatively inflexible, having an additional day off may not compensate for spending approximately two extra hours away from home four days of the week. It is unclear how public policy can alleviate the time burden commuting imposes; for women with domestic responsibilities, the problem is more likely to be solved by redistribution of those responsibilities within the household or by the trend toward increasing commercialization of domestic services.

This study has developed a coherent picture of the way in which gender interacts with local labor markets to produce a set of choices for rural women. We have examined a variety of balances struck between job rewards, human capital attributes, and commuting cost and time burdens. We focused on the diversity of labor market experience and labor market choices and delineated policy strategies that would best contribute to enlarging women's employment choices. After a decade of growth in women's labor force participation, it is clear that women make crucial contributions to the economy of the rural household and the rural community; enlarging their choices in the labor market will be central to rural development in the future.

APPENDIX A: QUESTIONNAIRE STRUCTURE

Filters

Employment status filters

Current job

- industry and occupation
- length of tenure
- part- or full-time, part- or full-year status
- regularity of work hours
- income category
- health and retirement benefits
- size of firm
- evaluation of job attributes

Commuting patterns

- location of job
- distance from home (miles and minutes)
- travel mode
- estimate of commuting cost
- multipurpose trips

Supplementary job

- location of job
- distance from home (miles and minutes)
- regularity of work hours

Not in labor force

- reasons for not participating in the labor force

Unemployed

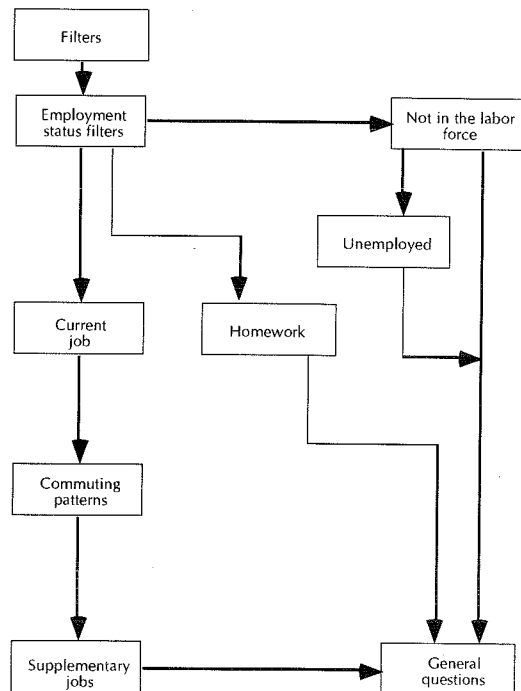
- industry and occupation of last job
- evaluation of job attributes

Homework

- type of homework
- hours and income categories
- reasons for working at home
- evaluation of job attributes

General questions

- household vehicles and drivers' licenses
- respondent access to vehicles
- farm residence
- age
- children (under 18 and under 6)
- education
- marital status
- household income categories
- public assistance



APPENDIX B: SHIFT-SHARE ANALYSIS

To chart the dynamics of employment decline, we performed several shift-share analyses on employment change in our rural survey counties. The state (Iowa) and the nation (U.S.) were used as alternative base regions. Analyses were undertaken for each year over the 1979-1989 period. The results presented in Table B-1 are for a single analysis of the 1979-1989 period.

The shift-share technique breaks net regional employment change into three component parts: growth due to employment trends in the base region (the "U.S. share" or "Iowa share"); growth due to the local sectoral mix ("proportional shift"); and growth due to local factors, such as a good local business climate ("differential shift"). The summary line results are aggregations over all sectors for each of these components.

With the nation used as the base region, the differential shift term was consistently negative. Overall, differential shifts accounted for a loss of 2,241 jobs in the study area. The proportional shift was also negative, accounting for a loss of a further 1,234 jobs. Most of the proportional shift losses were due to manufacturing. With Iowa used as the base region the situation in the study area counties appears to improve, but this is only because Iowa's employment performance was much worse than the nation's. Importantly, the summary line proportional and differential shifts were both negative no matter whether the state or the nation were used as the base region. The study area has specialized in sectors with poor employment performance and generally sectoral employment performance in the study area has been much worse than either that in the state or the nation.

Table B-1. Shift-share analyses of employment change in the study area, 1979-1989

	With U.S. as base			With Iowa as base		
	U.S. share term	Proportional shift term	Differential shift term	Iowa share term	Proportional shift term	Differential shift term
Agriculture	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Mining	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Construction	229	-136	-413	68	-352	-36
Manufacturing	759	-1,069	-17	225	-624	72
Transportation	147	-33	-141	44	14	-84
Wholesale trade	416	-74	-612	123	-270	-123
Retail trade	864	188	-1,381	256	58	-643
Fire, insurance, and real estate	166	67	-193	49	91	-100
Services	443	787	-449	131	645	5
Nonclassifiable	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Summary line share	3,025			895		
Summary line proportional shift		-1,234			-437	
Summary line differential shift			-2,241			-908

SOURCE: Calculated from *County Business Patterns* data for 1979, 1989.

NOTE: n.d. indicates nondisclosure of data.

APPENDIX C: VARIABLE DEFINITION

Industry: The initial 14 coded values for this variable were recoded into eight categories, collapsing together similar industrial sectors. This was done because there were too few cases in many sectors for meaningful analysis.

Original 14 categories:

Recoded eight categories:

agriculture, forestry, fishing	
mining	agriculture, forestry, fishing, mining & construction
construction	
durable goods manufacture	
nondurable goods manufacture	manufacturing (durable and non-durable)
transportation and communications	
wholesale trade	transportation, communications & wholesale trade
retail trade	retail trade
finance, insurance, and real estate	
business, repair services	finance, insurance, and real estate, and business and repair services
personal services	
entertainment, recreation services	personal, entertainment and recreational services
professional and related services	professional and related services
public administration	public administration

Occupation: The initial 14 coded values for this variable were recoded into eight categories, collapsing together similar occupational sectors. This was done because there were too few cases in many sectors for meaningful analysis.

Original 13 categories:

Recoded eight categories:

executive, administrative and managerial specialty	executive, administrative and managerial specialty
profession specialty	professional specialty
technicians, related support occupations	technicians, related support occupations
sales	sales
administration support, including clerical	administration support, including clerical
private household services	
protective services	protective, private household and other service occupations
other services	
precision production, craft workers	
machine operators, assembly workers	skilled blue collar (precision production and craft workers, machine operators and assemblers)
transportation, material moving	
handlers, equipment cleaners and laborers	unskilled blue collar (handlers, equipment cleaners and laborers)
farming, forestry, fishing	

Time worked: Respondents were asked whether they worked the same hours each week; if they did work regular hours, daily and weekly work time was calculated from their start and finish times each day; if they worked irregular hours, they were asked for the average, minimum and maximum hours worked each day and days each week. After checking against minimum and maximum values, averages were used for their daily and weekly work time.

Hourly pay: Data on net pay was collected as categories, to ensure a higher response rate. Respondents were asked how often they received a paycheck (weekly, bi-weekly or monthly), and were then asked what category of net income they fell into. This did provide us with a higher response rate (232 of the 333 non-home-based employees sampled provided us with income data) but introduced some unavoidable approximations into our analysis. Pay rates were converted to a weekly

basis (using \$125 pay increments for categories), and individuals within a category were assigned to the dollar value at the midpoint of that category. Weekly pay rates were converted to an hourly rate by dividing by time worked each week. Two kinds of hourly pay variables were used in the analysis—one based on the calculated rate, and one a categorization of hourly pay into four intervals.

Hourly pay categories:

Less than \$4.25
\$4.25 to \$6.75
\$6.75 to \$9.50
More than \$9.50

Household income: A similar method was used to collect data on household income. Respondents were asked what category of income best described their household's net annual income; through most of the analysis, we merely use these categories.

Age: Data on age was collected by asking for the respondent's birth date, and this was then converted to years of age. For ease of analysis, age was recoded into six categories.

Age categories:

1 thru 24	45 thru 54
25 thru 34	55 thru 64
35 thru 44	65 and higher

Education: Respondents were asked for the highest level of education achieved, and answers were organized in seventeen categories. Education levels were recoded into the following six categories, which are used for most of the analysis.

Education categories:

Less than a high school diploma
Graduated from high school
Some college or other tertiary education
College graduate (four year degree)
Post-graduate degree

Length of job tenure: Respondents were asked how many years and months they had worked for their current employer. Categories of length of tenure were also constructed using quartiles.

Human capital: A composite variable was constructed from respondents' education level and length of tenure in their current job. The categories were:

1. High school diploma or less, less than median (48 months) job tenure
2. High school diploma or less, more than median job tenure
3. More than a high school diploma, less than median job tenure
4. More than a high school diploma, more than median job tenure

Domestic role: A composite variable was constructed from respondents' marital status, and whether or not they had children under eighteen at home. The categories were:

1. Single / divorced / separated / widowed, with no children at home
2. Single / divorced / separated / widowed, with children under 18 at home
3. Married with no children at home
4. Married with children under 18 at home

Commuting distance: Respondents were asked how many miles they travelled one-way to work. Categories were also constructed, using quartiles of miles.

Commuting time: Respondents were asked how many minutes they travelled one-way to work. Categories were also constructed, using quartiles of minutes.

Commuting costs: Commuting costs were calculated on the basis of miles travelled; a standard rate of \$0.21 per mile was used for the round trip to work, but if a respondent reported that they usually rode with another person, this cost was halved. It should be noted that commuting costs reflect standard calculations for the cost of insurance, registration, and wear and tear—not just out-of-pocket costs. Out-of-pocket costs were obtained from respondents, and the distribution of costs corresponded with standardized costs, but the latter were used in preference. A categorical variable was also calculated, using quartiles of commuting costs.

Cost burden: This was a proportionate variable, calculated on the basis of round-trip commuting costs and net daily pay. Daily pay was obtained by dividing weekly pay by number of days worked each week (see **hourly pay** above). A categorical variable was also calculated, using quartiles of commuting cost burdens.

Time burden: This was also a proportionate variable, calculated on the basis of round trip time and hours worked each day. Round trip time was expressed as a percentage of time spent at work each day. A categorical variable was also calculated, using quartiles of commuting time burdens.

REFERENCES

- Adams, Dale E. 1981. Post-bus for rural passenger transportation and rural mail delivery: an idea whose time has come. In *Transit planning and management*. ed. National Research Council, Transportation Research Board, 76-79. Transportation Research Record 797. Washington, DC: National Academy of Sciences .
- Afifi, A.A. and Virginia Clark. 1984. *Computer-aided multivariate analysis*. Belmont, CA: Lifetime Learning Publications.
- Bartik, Timothy J. 1991. *Who benefits from state and local economic development policies?* Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.
- Beck, E.M., Patrick M. Horan, and Charles M. Tolbert II. 1978. Stratification in a dual economy: a sectoral model of earning determination. *American Sociological Review*. 43, 5: 704-720.
- Blair, John P. and Robert Premus. 1987. Major factors in industrial location: a review. *Economic Development Quarterly*. 1, 1: 72-85.
- Bloomquist, Leonard. 1988. Performance of the rural manufacturing sector. In *Rural economic development in the 1980's*. ed. Economic Research Service, 49-76. Rural Development Research Report Number 69. Washington, DC: United States Department of Agriculture.
- Bokemeier, Janet L. and Ann R. Tickamyer. 1985. Labor force experiences of nonmetropolitan women. *Rural Sociology*. 50, 1: 51-73.
- Bokemeier, Janet L., Carolyn Sachs, and Verna Keith. 1983. Labor force participation of metropolitan, nonmetropolitan, and farm women: a comparative study. *Rural Sociology*. 48, 4: 515-539.
- Booth, Rosemary and Robert Waksman. 1985. Analysis of commuter ridesharing behavior at five urban sites. In *Transportation for elderly and handicapped persons, paratransit, and ridesharing*. ed. National Research Council, Transportation Research Board, 33-40. Transportation Research Record 1018. Washington, DC: National Research Council.
- Brown, David L. 1980. Farm structure and the rural community. In *Structure issues of American agriculture*. ed. Economic Research Service, 283-287. Research Report 438. Washington, DC: United States Department of Agriculture.
- Brown, David L. and Kenneth L. Deavers. 1988. Rural change and the rural economic policy agenda for the 1980's. In *Rural economic development in the 1980's: prospects for the future*. ed. Economic Research Service, 1-28. Rural Development Research Report No. 69. Washington, DC: United States Department of Agriculture.
- Brunso, Joanna M. and David T. Hartgen. 1983. Community-based ridesharing: an overlooked option. In *Transportation innovations: ridesharing techniques and public-private cooperation*. ed. National Research Council, Transportation Research Board, 26-33. Transportation Research Record 914. Washington, DC: National Academy of Sciences.
- Burkhardt, Jon E. 1981. Rise and fall of rural public transportation. In *Rural public transportation: fifth national conference proceedings*. ed. National Research Council, Transportation Research Board, 2-5. Transportation Research Record 831. Washington, DC: National Academy of Sciences.
- Christensen, Kathleen E. 1985. Women and home-based work. *Social Policy*. 15, 3: 54-57.

- Clark, Thomas A. 1991. Capital constraints on nonmetropolitan accumulation: rural process in the United States of America since the 1960s. *Journal of Rural Studies*. 7, 3: 169-190.
- Clemente, Frank and Gene F. Summers. 1975. The journey to work of rural industrial employees. *Social Forces*. 54: 212-219.
- Cooke, Thomas J., and J. Matthew Shumway. 1991. Developing the spatial mismatch hypothesis: problems of accessibility to employment for low-wage central city labor. *Urban Geography*. 12, 4: 310-323.
- Deavers, Ken. 1992. What is rural? *Policy Studies Journal*. 20, 2: 183-189.
- Dubin, Robin. 1991. Commuting patterns and firm decentralization. *Land Economics*. 67, 1: 15-29.
- Due, John F., Benjamin J. Allen, Mary R. Kihl, and Michael R. Crum. 1990. *Transportation service to small rural communities: effects of deregulation*. Ames, IA: Iowa State University Press.
- Dunn, Edgar S. 1960. A statistical and analytical technique for regional science. *Regional Science Association*. 6: 15-23.
- Eisinger, Peter K. 1988. *The rise of the entrepreneurial state*. Madison: The University of Wisconsin Press.
- Eisinger, Peter K. 1991. The state of state venture capitalism. *Economic Development Quarterly*. 5, 1: 64-76.
- Ericksen, Julia A. 1977. An analysis of the journey to work for women. *Social Problems*. 24, 3: 428-435.
- Everitt, Brian. 1974. *Cluster analysis*. London: Social Science Research Council and Heinemann Educational Books.
- Finsterbusch, Kurt, and Daniel Kuennen. 1992. A look at business recruitment as a rural development strategy: some previous findings on business recruitment results in rural areas. *Policy Studies Journal*. 20, 2: 218-229.
- Fisher, Peter S. 1989. Risk capital and rural development. In *Towards rural development policy for the 1990's: enhancing income and employment opportunities*. ed. Congressional Research Service for the United States Congress, Joint Economic Committee, 130-148. Washington, DC: United States Government Printing Office.
- Fisher, Peter S. 1990. Connecticut's new product development corporation. In *Financing economic development*. eds. Richard D. Bingham, Edward W. Hill and Sammis B. White, 101-122. Newbury Park, CA: Sage Publications, Inc.
- Fleishman, Daniel and Imogene Burns. 1981. Can the postal bus play a role in providing rural transportation? In *Rural public transportation: fifth national conference proceedings*. ed. National Research Council, Transportation Research Board, 90-97. Transportation Research Record 831. Washington, DC: National Academy of Sciences.
- Flynn, Carolyn P. and Lawrence J. Glazer. 1989. Ten cities' strategies for transportation demand management. In *Ridesharing—transportation demand management*. ed. National Research Council, Transportation Research Board, 11-23. Transportation Research Record 1212. Washington, DC: National Academy of Sciences.
- Forkenbrock, David J., Thomas F. Pogue, Norman S.J. Foster, and David J. Finnegan. 1990. *Road investment to foster local economic development*. Iowa City, IA: University of Iowa, Public Policy Center.
- Fowler, Floyd J. Jr. 1984. *Survey research methods*. Beverly Hills, CA: Sage Publications, Inc.
- Fox, Marion B. 1983. Working women and travel: the access of women to work and community facilities. *Journal of the American Planning Association*. 49, 2: 156-170.
- Fox, Marion B. 1986. Faster journeys to suburban jobs. *Women and Environments*. 8: 15-18.
- Fuguitt, Glenn V. 1991. Commuting and the rural-urban hierarchy. *Journal of Rural Studies*. 7, 4: 459-466.
- Galston, William A. 1992. Rural America in the 1990's: trends and choices. *Policy Studies Journal*. 20, 2: 202-213.

- Glasmeier, Amy K. 1991. *The high-tech potential: economic development in rural America*. New Brunswick, NJ: Center for Urban Policy Research.
- Glazer, Lawrence J. and David A. Curry. 1987. A ridesharing market analysis survey of commuter attitudes and behavior at a major suburban employment center. In *Recent ridesharing research and policy findings*. ed. National Research Council, Transportation Research Board, 9-13. Transportation Research Record 1130. Washington, DC: National Academy of Sciences.
- Godwin, Deborah D. and Julia Marlowe. 1990. Farm wives' labor force participation and earnings. *Rural Sociology*. 55, 1: 25-43.
- Gordon, Peter, Ajay Kumar, and Harry W. Richardson. 1989. Gender differences in metropolitan travel behaviour. *Regional Studies*. 23, 6: 499-510.
- Gringeri, Christina. 1991. Economic restructuring and the domestic code: rural families working at home. Presentation at *The rural family, the rural community and economic restructuring*, conferencesponsored by the North Central Regional Center for Rural Development, the Iowa Council on Family Relations, and the Farm Foundation, Des Moines, April 10 - 11.
- Hanson, Susan, and Ibipo Johnston. 1985. Gender differences in work-trip length: explanations and implications. *Urban Geography*. 6, 3: 193-219.
- Hanson, Susan, and Geraldine Pratt. 1988. Reconceptualizing the links between home and work in urban geography. *Economic Geography*. 64, 4: 299-321.
- Holden, D.R., J.K. Swales and A.G. Nairn. 1987. The repeated application of shift-share: a structural explanation of regional growth? *Environment and Planning A*. 19, 9: 1233-1250.
- Iowa Department of Economic Development. 1991. *Statistical Profile of Iowa*. Des Moines, IA: Iowa Department of Economic Development.
- Iowa Department of Employment Services. 1991. *State of Iowa: condition of employment 1991*. Des Moines, IA: Iowa Department of Employment Services.
- Iowa Department of Employment Services. 1991. *Affirmative action data for Iowa, 1991*. Des Moines, IA: Iowa Department of Employment Services.
- Iowa Department of Employment Services. 1992. *Iowa population projections, labor force projections, 1993 and 1996*. Des Moines, IA: Iowa Department of Employment Services.
- Kale, Steven R. and Richard E. Lonsdale. 1987. Recent trends in U.S. and Canadian non-metropolitan manufacturing. *Journal of Rural Studies*. 3: 1-13
- Krummes, Daniel C. 1989. *Rural transit: an annotated bibliography*. Public Administration Series: Bibliography #P 2738. Monticello, IL: Vance Bibliographies.
- Kuhn, Sarah and Barry Bluestone. 1987. Economic restructuring and the female labour market: the impact of industrial change on women. In *Women, Households and the economy*. eds. Lourdes Beneria and Catharine R. Stimpson, 3-32. New Brunswick: Rutgers University Press.
- Kyte, Michael, Nancy Richardson, and Connie McKean. 1988. Coordination of public transit and school bus transportation programs: results of pilot projects in six Iowa communities. In *Transit issues and recent advances in planning and operations techniques*. ed. National Research Council, Transportation Research Board, 29-31. Transportation Research Record 1202. Washington, DC: National Academy of Sciences.
- Lapping, Mark B., Thomas L. Daniels, and John W. Keller. 1989. *Rural Planning and Development in the United States*. New York: The Guilford Press.
- Lidman, Russell M. and Gregory C. Weeks. 1990. Comment on "too few jobs for workfare to put many to work". *Rural Development Perspectives*. 6, 2: 36-37.
- Little, Jo. 1991. Theoretical issues of women's non-agricultural employment in rural areas, with illustrations from the U.K. *Journal of Rural Studies*. 7, 1 and 2: 99-105.
- Madden, Janice F. 1981. Why women work closer to home. *Urban Studies*. 18: 181-194.

- McGranahan, David A. 1988. Rural workers in the national economy. In *Rural economic development in the 1980's*. ed. Economic Research Service, 29-48. Rural Development Research Report Number 69. Washington: United States Department of Agriculture.
- McLafferty, Sara and Valerie Preston. 1991. Gender, race, and commuting among service sector workers. *Professional Geographer*. 43, 1: 1-15.
- McLaughlin, Diane K. and Lauri Perman. 1991. Returns vs. endowments in the earnings attainment process for metropolitan and nonmetropolitan men and women. *Rural Sociology*. 56, 3: 339-365.
- Mehranian, Maria, Martin Wachs, Donald Shoup, and Richard Platkin. 1987. Parking cost and mode choices among downtown workers: a case study. In *Recent ridesharing research and policy findings*. ed. National Research Council, Transportation Research Board, 1-5. Transportation Research Record 1130. Washington, DC: National Academy of Sciences.
- Michelson, William. 1983. *The impact of changing women's roles on transportation needs and usage*. Washington, DC: United States Department of Transportation.
- Miller, James P. and Herman Bluestone. 1988. Prospects for service sector employment growth in nonmetro America. In *Rural economic development in the 1980's*. ed. Economic Research Service, 135-158. Rural Development Research Report Number 69. Washington: United States Department of Agriculture.
- Morrissey, Elizabeth S. 1990. Poverty among rural workers. *Rural Development Perspectives*. 6, 3: 37-42.
- Morrissey, Marietta. 1982. The dual economy and labor market segmentation: a comment on Lord and Falk. *Social Forces*. 60, 3: 883-890.
- Nelson, K. 1986. Labor demand, labor supply and the suburbanization of low-wage office work. In *Production, Work, Territory: the geographical anatomy of industrial capitalism*. eds. Allen J. Scott and Michael Storper, 149-171. Boston: Allen & Unwin Inc.
- Novak, Carey E. and Douglas P. Wulf. 1989. *Analysis of the job creation and retention effects of the community economic betterment account (CEBA) program and community development block grant (CDBG) program*. Des Moines, IA: State of Iowa Legislative Fiscal Bureau.
- Noyelle, Thierry J. 1983. The rise of advanced services: some implications for economic development. *Journal of the American Planning Association*. 49, 3: 281-290.
- Ollenburger, Jane C., Sheryl J. Grana and Helen A. Moore. 1989. Labor force participation of rural farm, rural nonfarm, and urban women: a panel update. *Rural Sociology*. 54, 4: 533-550.
- Porterfield, Shirley. 1990. Service sector offers more jobs, lower pay. *Rural Development Perspectives*. 6, 3: 2-7.
- Reeder, Richard J. and Kenneth L. Robinson. 1992. Enterprise zones: assessing their rural development potential. *Policy Studies Journal*. 20, 2: 264-275.
- Rogers, David L., and Willis J. Goudy. 1981. Community structure and occupational segregation: 1960 and 1970. *Rural Sociology*. 46, 2: 263-281.
- Rosenbloom, Sandra. 1987. The impact of growing children on their parents' travel behavior: a comparative analysis. In *Working women and the aging: impact on travel patterns and transportation systems*. ed. National Research Council, Transportation Research Board, 17-25. Transportation Research Record 1135. Washington, DC: National Academy of Sciences.
- Rosenbloom, Sandra. 1988. Role of the private sector in the delivery of transportation services to the elderly and handicapped in the United States. In *Ridesharing and transportation for the disadvantaged*. ed. National Research Council, Transportation Research Board, 17-25. Transportation Research Record 1170. Washington, DC: National Academy of Sciences.
- Schreffler, Eric N. 1985. Transportation brokerage: key findings from crosscutting analysis. In *Transportation for elderly and handicapped persons, paratransit, and ridesharing*. ed. National Research Council, Transportation Research Board, 47-53.

- Transportation Research Record 1018. Washington, DC: National Academy of Sciences.
- Sears, David W. and J. Norman Reid. 1992. Rural strategies and rural development research: an assessment. *Policy Studies Journal*. 20, 2: 301-310.
- Semyonov, Moshe. 1983. Community characteristics, female employment and occupational segregation: small towns in a rural state. *Rural Sociology*. 48, 1: 104-119.
- Simpson, Wayne. 1987. Workplace location, residential location, and urban commuting. *Urban Studies*. 24: 119-128.
- Stinson, Thomas F. 1992. Subsidizing local economic development through tax increment financing: costs in nonmetro communities in southern Minnesota. *Policy Studies Journal*. 20, 2: 241-248.
- Tickamyer, Ann and Janet Bokemeier. 1988. Sex differences in labor-market experiences. *Rural Sociology*. 53, 2: 166-189.
- Torluemke, Donald A. and David Roseman. 1989. Vanpools: pricing and market penetration. In *Ridesharing—Transportation Demand Management*. ed. National Research Council, Transportation Research Board, 83-87. Transportation Research Record 1212. Washington, DC: National Academy of Sciences.
- United States Department of Agriculture, Economics, Statistics and Cooperative Service. 1979. *Structure issues of American agriculture*. Report 438. Washington, DC: United States Department of Agriculture.
- United States Department of Agriculture, Economic Research Service. 1985. *Economic indicators of the farm sector: farm sector review, 1984*. ECIFS 4-2. Washington, DC: United States Department of Agriculture.
- United States Department of Agriculture, Economic Research Service. 1986. *Economic indicators of the farm sector: farm sector review, 1985*. ECIFS 5-4. Washington, DC: United States Department of Agriculture.
- United States Department of Agriculture, Economic Research Service. 1988. *Economic indicators of the farm sector: farm sector review, 1987*. ECIFS 7-4. Washington, DC: United States Department of Agriculture.
- United States Department of Agriculture, Economic Research Service, and United States Department of Commerce, Bureau of the Census. 1990. *Residents of farms and rural areas: 1989*. Current Population Reports, Series P-20, No. 446. Washington, DC: United States Bureau of the Census.
- United States Department of Transportation. 1987. *Expanding the use of private sector providers in rural, small urban and suburban areas*. Washington, DC: United States Department of Transportation.
- Valdez, Roberta and Judy Wang. 1989. Comparison of transportation demand management market research study results and transportation management association development in three suburban activity centers. In *Ridesharing—transportation Demand Management*. ed. National Research Council, Transportation Research Board, 1-10. Transportation Research Record 1212. Washington, DC: National Academy of Sciences.
- Wekerle, Gerda R. and Brent Rutherford. 1988. The mobility of capital and the immobility of female labor: responses to economic restructuring. In *The Power of Geography*. eds. Jennifer Wolch and Michael Dear, 139-172. Boston: Unwin Hyman.
- Wegmann, Frederick J. 1989. Cost-effectiveness of private employer ridesharing programs: an employer's assessment. In *Ridesharing—Transportation Demand Management*. ed. National Research Council, Transportation Research Board, 88-100. Transportation Research Record 1212. Washington, DC: National Academy of Sciences.

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UNIVERSITY OF IOWA PUBLIC POLICY CENTER SELECTED PUBLICATIONS

Time Series Analysis of Transportation Safety Policy Changes: Evaluating the Impact of the Increased 65 mph Speed Limit on Rural Interstates in Iowa. For the U.S. Department of Transportation through the Midwest Transportation Center. 1993.

Tradeoffs Between Water Quality and Profitability in Iowa Agriculture. Prepared with support from the Northwest Area Foundation. 1993.

Transportation and Iowa's Economic Future. Prepared in conjunction with the Iowa Business Council, with support from the Iowa Department of Transportation, Northwest Area Foundation, and U.S. Department of Transportation. 1993.

Evaluation of the MediPASS (Medicaid) Managed Care Demonstration Project. Prepared with support from the Iowa Department of Human Services. 1992.

The Economic, Operating, and Infrastructure Impacts of Concentrated Truck Transport Service and Designated Commercial Highway Networks. For the U.S. Department of Transportation through the Midwest Transportation Center. 1992.

Labor Supply in Iowa: Policies for Economic Growth. Prepared in conjunction with the Iowa Business Council with support from the Northwest Area Foundation. 1991.

Dynamic Simulation Methods For Evaluating Vehicle Configuration and Roadway Design. For the U.S. Department of Transportation through the Midwest Transportation Center. 1991.

Road Investment to Foster Local Economic Development. For the U.S. Department of Transportation through the Midwest Transportation Center. 1990.

Transit-Related Joint Development in Smaller Cities: An Appraisal of Opportunities and Practice. For the U.S. Department of Transportation through the Midwest Transportation Center. 1990.

A Method to Prioritize Health Planning Technical Assistance to Rural Hospitals. Prepared for the Office of Rural Health, State of Iowa, with support from the Northwest Area Foundation. 1990.

Changing Hospital Licensure Policy to Maintain Health Care Access in Rural Iowa. Prepared for the Office of Rural Health, State of Iowa, with support from the Northwest Area Foundation. 1990.

A Computer-aided Decision Support System for Making Locational Decisions. For the U.S. Department of Transportation through the Midwest Transportation Center. 1990.

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THE UNIVERSITY OF IOWA
Public Policy Center
Iowa City, Iowa 52242