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TRANSPORTATION POLICY OPTIONS FOR EMPLOYED RURAL WOMEN

Prepared by

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Final Draft Report
July 1992

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This study was funded by the University Transportation Centers Program of the U.S. Department of Transportation, and the Iowa Department of Transportation. The results and views expressed are the independent products of university research and are not necessarily concurred in by the funding agencies.

Acknowledgements

We would like to thank the ten members of our project advisory committee for their help and enthusiasm; we appreciate the time they spent on this project. 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; Al Baker of Cedar Rapids' paratransit service, LIFTS; Pat Marshall of the IBEW; Linda De Wolf of St. Lukes' Hospital; Kathy Forcht, of AEGON USA; Lynn Avant of the United Way of Storey County; Pat Hougan of Heartland Senior Services; Joan Alsop of Prairie Fire, Des Moines; and Charlotte Nelson and Jane Shockemoelf, both of the Iowa Commission on the Status of Women.

We are 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. David Forkenbrock played a crucial role in the initiation of this project and throughout the course of our research.

The University Transportation Centers Program of the United States Department of Transportation and the Iowa Department of Transportation provided the support that made this project possible; this is gratefully acknowledged.

Mary Losch of the Iowa Social Science Institute was responsible for the smooth completion of the telephone survey; we are grateful for her advice and assistance. John Fuller was an unfailing source of good advice and many documents. Cathy Young and Norm Foster of the Public Policy Center provided invaluable help with the questionnaire construction and graphics.

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

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Executive Summary

I. The Study Purpose

Rural-based women's labor force participation has expanded rapidly in the past decade, and has become indispensable for the maintenance of rural communities. The labor markets offering the widest range of jobs and best job rewards to rural residents are those in metropolitan areas. However, metropolitan jobs entail long work trips that impose commuting time and cost burdens on women employees, who frequently have time-consuming domestic responsibilities and earn consistently lower wages than men.

This study examines rural-based women in four eastern Iowa counties, analyzing their work experiences and commuting patterns as a basis for policy recommendations that could reduce 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 in terms of 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 costs for women 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 the

transportation problems directly (the provision of public transit service, and the expansion of ride-sharing and van-pooling), and those that address the location and nature of employment.

II. Labor Market Structure

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

Cedar Rapids is by far the most healthy of the metropolitan areas; it has retained the volume of jobs it had in 1979, although shifts have occurred between employment sectors, with manufacturing and the finance / insurance / real estate 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 as a result of economic restructuring in the region, and 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

Comparisons were drawn between women in home-based paid employment, in part- and full-time non-home-based employment, and those not in the waged labor force.

Transportation was found to be a contributing but not the primary factor in the decision whether or not to participate in the non-home-based labor force, and some relatively transportation-disadvantaged groups of respondents were identified.

Amongst non-home-based workers, the metropolitan / non-metropolitan location of employment was found to be the most important factor differentiating between part- and full-time work status, seasonality, and the receipt of 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 the manufacturing, finance / insurance / real estate and transportation and distribution sectors; sales, service and clerical workers were much more likely to be employed in non-metropolitan jobs.

IV. Commuting Patterns

Significant relationships were found between trip length, job characteristics and occupational and industrial sector, supporting the previous chapter's findings about the effect of metropolitan / non-metropolitan job location. However, the relationship between trip length and hourly pay rates was complex and non-linear, even after controlling for the education and experience of respondents and whether or not they received 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.

Most respondents travelled to work alone in a car, while slightly less than the 1980 national average reported ride-sharing (18.2 percent). Ride-sharers 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 was available; those with higher cost burdens were much more likely to respond positively.

V. Explaining Women's Commuting Choices

Respondents' evaluation of a selection of job attributes suggested the existence of a dichotomized labor force - between full-time, moderately well-paid workers who are most concerned about benefits, pay and security, and less concerned about convenience of location, and predominately part-time less regular workers who value convenience of location above benefits, pay and security.

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

- *a relatively younger group with lower 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 higher 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.*

Logistic regression was used next to construct a more solid explanation for longer work trips; no linear relationship with pay rates could be detected, but women who received health benefits were three times more likely to commute longer distances. 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

The discussion of policy options focussed on those that would overcome the "friction of distance" for rural women workers by easing their commuting burdens, versus economic development strategies that would decentralize jobs to rural locations.

Two transportation-related options were considered - expanding public transit services in rural areas, and expanding ride-sharing or van-pooling programs.

Experience with similar initiatives elsewhere was reviewed. We concluded that:

- *the small number of potential users (and high levels of household mobility in the study area) suggested that there is no justification for expanding existing rural public transit services; a more viable alternative would be the establishment of a transportation brokerage service within the existing Regional Transit Authorities to serve the small number of new labor force entrants and intermittent users for whom public transit would be attractive.* ✓

- *Ride-sharing was seen as 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.* ✓

The economic development strategies reviewed offered little potential for decentralizing better quality jobs. Experience elsewhere seems to indicate that rural areas would not be well equipped to compete with metropolitan areas for jobs in faster growing or high technology sectors. Metropolitan labor markets will probably continue to offer rural residents a better choice of jobs than will non-metropolitan areas.

VI. Conclusions and Policy Recommendations

The integration of the findings from the telephone survey and the analysis of labor market structure offered the following insights:

- *The metropolitan jobs that women were most likely to commute to were in sectors that are declining in the Cedar Rapids MSA (with the exception of transportation and distribution, which employed only a small proportion of respondents). This was a rational decision, given the higher hourly pay available and the greater likelihood of receiving benefits in metropolitan jobs in these sectors.*
- *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 non-metropolitan locations. This is a rational decision when we consider the significantly higher hourly pay they received in non-metropolitan jobs in those sectors, the fact that they were unlikely to receive benefits no matter where they worked, and the greater resistance these respondents expressed towards commuting.*

Thus, we concluded that:

- *Only some rural-based women workers 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 experienced women workers;*
- *Lower labor force participation rates among this group of women will have severe effects on the well-being of many rural households, and affect the viability of smaller rural communities.*

The policy recommendations are drawn from our discussion in chapter six. We argued there that:

- *Ride-sharing and van-pooling offer the best solution for the commuting burdens identified amongst our survey respondents - while there may be some difficulty in expanding these programs to serve part-time employees and those working in small firms, the strategy 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 is one incremental change that may be warranted.*

Chapter One

Introduction

Problem definition

Rural economic restructuring during the post war period has diversified the employment opportunities of the rural labor force; a majority of rural workers are now engaged in non-agricultural sectors. The rural midwest in particular has offered employers a relatively highly educated low cost workforce, 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 increases in women's labor force participation rates; rural women now have participation rates very similar to those of urban women.

The kinds of jobs available to rural residents fall into two broad categories - metropolitan and non-metropolitan. Metropolitan labor markets tend to offer more stable jobs with higher pay and better benefits, while non-metropolitan jobs are more often part-time or seasonal, and of a narrower range of types. Research on rural development has concluded that rural areas are differentiated by their access to metropolitan locations; rural counties adjacent to metropolitan areas have had better job growth rates and lower unemployment rates than more remote rural counties (Deaver 1992).

But while metropolitan jobs offer better returns to rural residents, they also impose quite substantial commuting costs. The choice for employees (and in particular women employees)

becomes one between underemployment in a narrow local labor 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. The labor force choices of women are shaped by the trade-off between better rewards and higher commuting costs, but we may expect that these choices are also mediated by the human capital of individuals (their education and experience), their sector of specialization within the labor force, and the extent of their domestic responsibilities.

There is little prospect for expansion in the rates of male labor force participation in the rural midwest, but labor economists project that female labor force participation rates may increase to an upper limit close to 75 percent. However, increasing participation rates will require more careful consideration of the constraints that women presently face on entering the paid workforce. The traditional notion of constraints arising from greater domestic and childcare responsibilities suggested a solution of flexible work days, and more use of part-time or shift-work patterns. As critics pointed out, this does little to reduce the burden of domestic work - it focusses instead on shifting the daily burden around. Better provision of child-care (and elderly care) does help reduce the absolute time burden for women, but it imposes new costs of household maintenance that further reduce the contribution women's lower wages make to the household.

One important constraint that is particularly relevant to rural women workers is the cost and time burden imposed by commuting to work, but it has received little attention in current rural research. We begin with the assumption that women assume distinctive commuting burdens when they enter the labor force: firstly, the vast majority of women workers have family

responsibilities and domestic roles that constrain the time available for commuting; and secondly, women as a whole earn consistently lower wages than men as a whole, and thus the costs of commuting consume a proportionately higher fraction of their earnings. One component of a strategy to sustain and expand labor force supply in the next decade must be based on reducing the constraint represented by commuting time and money costs.

Currently, most rural workers rely on individual car travel for the journey to work, especially in regions like the midwest where car ownership rates are high. However, this need not eliminate consideration of other options. Rural public transit has been used successfully for work-trips, especially for lower income workers. Ride-sharing and van-pooling are under-utilized strategies, for which incentives now exist in current Clean Air legislation that mandates states reduce individual car-travel by the end of the decade. Local decentralized employment opportunities can also enable greater use of walking and bicycle trips.

However, no one option will be suitable for all or most workers. 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.

A secondary research aim is to identify the disincentive that 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 under-employed. If the permanent female labor force is to expand in the future, we need to understand the barrier that transportation poses to non-participants 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 wage earning work force.

The research questions

The research questions addressed in this study can be summarized as follows:

- *(1) How do commuting costs vary between different forms of labor force participation (defined in terms of occupational sector, part- or full-time status, or location of job)?*
- *(2) 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?*
- *(3) How important a disincentive is commuting costs for women engaged in home-based paid work, or who choose not to participate in the wage labor force?*
- *(4) Based on the above questions, 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 questions seek to explain the relationship between commuting choices and labor force participation choices. 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. In general, the most important distinguishing features

are found to be the metropolitan / non-metropolitan location of jobs, the industrial and occupational sector of employment, human capital attributes of labor force participants (education and job experience), reported evaluations of different job attributes, and the structure of work (whether it is part- or full-time, seasonal, with regular or irregular hours).

It is interesting to note that the labor force participation choices analyzed here showed little relationship to domestic responsibilities (defined in terms of marital status and presence of young children). This is significant because many earlier studies of women's employment have assumed that domestic and childcare responsibilities play an important role in both the form of labor force participation and commuting patterns. While this may have accurately represented employment and commuting choices in the 1970s, social norms and expectations (and the commercialization of many domestic functions, such as childcare) have changed substantially over the past decade and we can no longer assume they play a dominant role for all women.

The policy questions

The distinctions we are able to draw among different categories of current and potential women workers enable us to provide different explanations of the commuting choices women make. This analysis feeds into an assessment of policy options that differentiates between different forms commuting barriers. Policy options discussed fall into two main categories: those that address the transportation problems directly, and those that address the location and nature of employment. For most women, the two sets of issues are directly related. Women with very low commuting costs often are trapped in low-paying local jobs with little potential for advancement, while better jobs usually entail much higher commuting costs; for some

unfortunate workers, low-paying unstable jobs are combined with high commuting costs. Policy solutions need to integrate both aspects of the commuting / labor force participation problem.

An effective policy response to the issues that are the focus of this study will have important spin-off effects for other policy areas. Firstly, current Clean Air legislation requires states to reduce the number of single-driver commuters over the next decade; ride-sharing, employer participation in solutions to the individual commuting problem, and the exploration of appropriate scale rural public transit options will all address this policy area.

Secondly, current initiatives in welfare reform emphasize the establishment of "workfare" programs that will increase the independence of welfare recipients and help break the "cycle of poverty" identified by critics of welfare programs. Effective workfare programs must address the barriers to employment that poor women face if they are to be empowering rather than punitive, and programs must be appropriately directed to the specific populations they affect. While job-training and childcare assistance are the most obvious components of such an approach, poor rural women face the additional barrier of commuting that requires a private automobile; for many, this would be an insurmountable start-up cost. An effective workfare program for rural welfare recipients must include policy that improves (or enables) mobility. The policy options outlined in this study seek to contribute to the solution of mobility problems.

The study area

The research questions address the commuting patterns of rural-based women workers in regions which have undergone economic restructuring and some job growth over the 1980s. Rural workers participate not only in rural based jobs, but also in contiguous metropolitan labor

markets which draw workers from surrounding areas. These sub-regions have been important locuses of economic development in the 1980s especially in the midwest. The study area includes four contiguous rural counties in east central Iowa, located north of Cedar Rapids, south and east of Waterloo, and west of Dubuque, as shown in Figure 1.1. The area offers two sorts of labor market options: local decentralized employment, and three contiguous metropolitan regions with differing degrees of economic health, with a range of employment options for rural residents. Almost all residents of the four study area counties are within 50 miles of Cedar Rapids.

Cedar Rapids is by far the most healthy of the metropolitan areas; it has retained the volume of jobs it had in 1979, although shifts have occurred between employment sectors, with manufacturing and the finance / insurance / real estate sectors losing jobs, and the service and retail sectors gaining jobs. Even in the midst of the 1991-1992 recession, Cedar Rapids' jobless rate was much lower than the national average, and metropolitan employers draw a substantial proportion of their workforce from outside Linn County. On the other hand, Waterloo and Dubuque suffered large employment and population losses in the late 1970s and early to mid-1980s as a result of economic restructuring in the region, and offer far fewer job opportunities for rural residents.

A summary of population change in the four county region, and its surrounding metropolitan areas is provided in Figure 1.2. Like the state, which lost 4.7 percent of its population during the 1980s, the four rural counties have also declined. 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 comparable to other rural areas in the state, which

Figure 1.1. Study Area

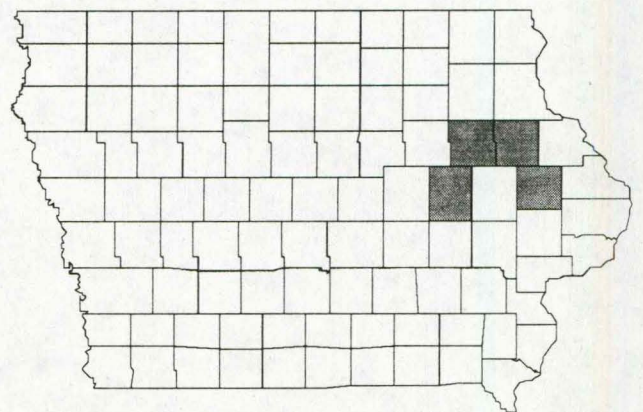
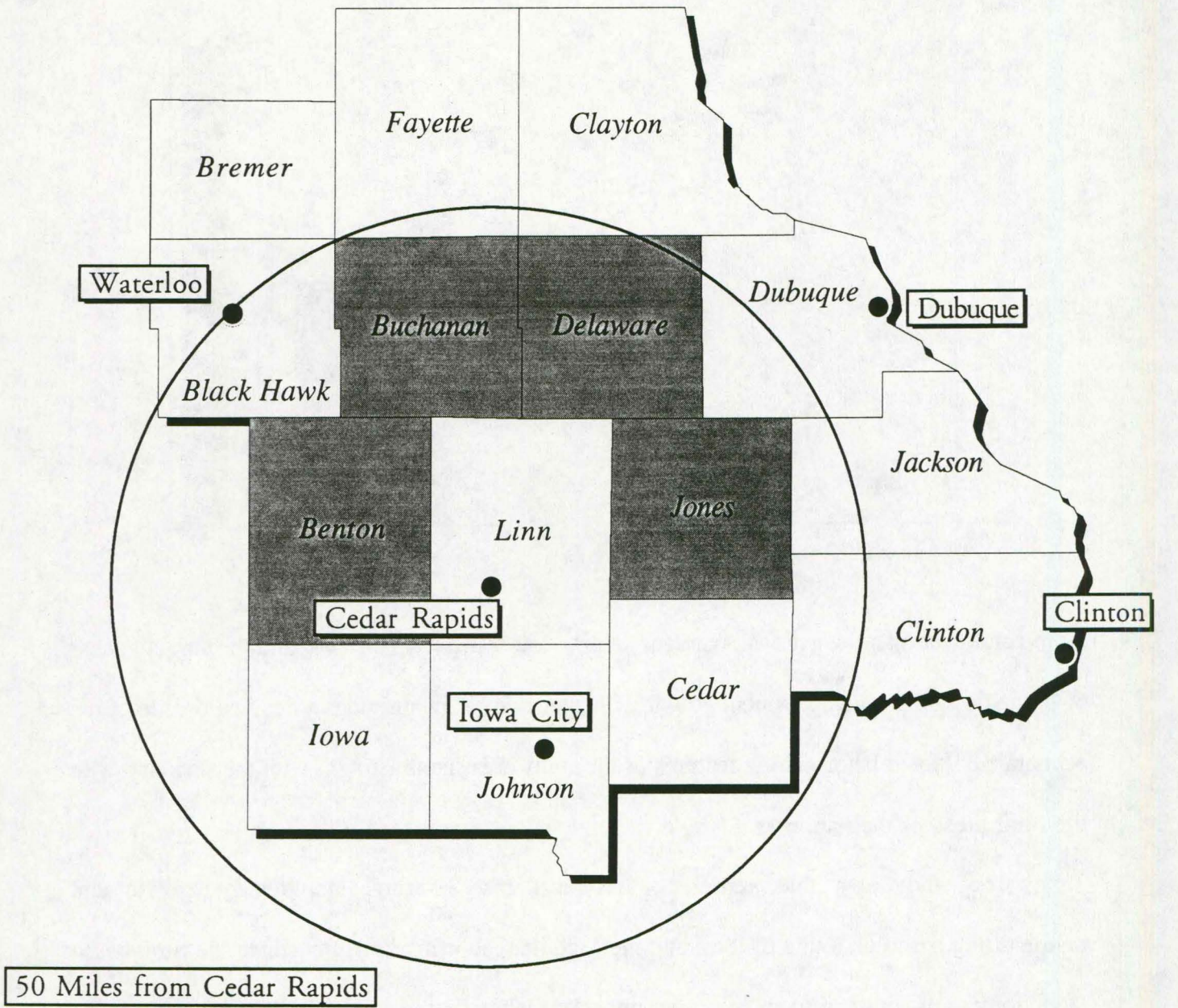
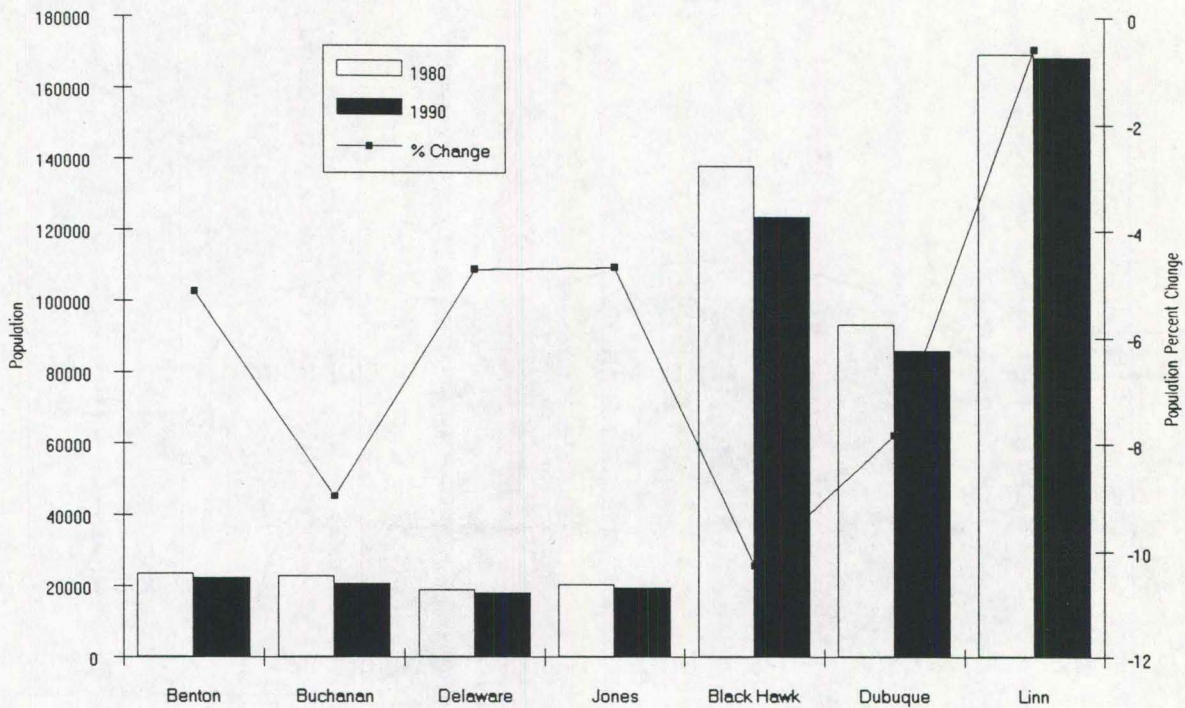


Figure 1.2
Population Change in the Study Area and Surrounding Metropolitan Counties



are much lower than the national average, helping lower the costs of labor and the attractiveness of the region for new employment growth. Chapter two below provides a detailed profile of the economic base and labor market features of the study area, contrasting it with the state and with the rural areas of the nation as a whole.

The study area thus represents a typical case of rural employment growth and restructuring based on a mix of local and metropolitan labor markets, for which the rural-based labor force will continue to represent an important labor supply source in the next decade.

The survey

The majority of our research findings are based on a survey which was conducted for us, in September of 1991, by the University of Iowa's Social Science Institute. This was a random-digit-dialling telephone survey of 646 households in the rural areas (places less than 2,500) of the four eastern Iowa counties. The response rate from qualified households (that is, those containing a woman between the ages of eighteen and sixty-five) was very high at 73 percent; the overall response rate was 59 percent.

The survey instrument (a hardcopy version of which is provided in appendix one - a slightly modified electronic version was used for the interviews) was divided into six separate, but not sequential, sections. The first section (Parts B and D of the hardcopy survey) focussed on the respondent's current - September - job (industrial sector, occupation, earnings, benefits, the regularity of work, and whether supplementary jobs were also worked), and then their March 1991 job. Respondents were also asked to rank the importance of various potential job attributes. The second section (Part E) provided information on women not in the labor force, and explored reasons for their non-participation. The third section (Part F) looked at the unemployed and the characteristics of their previous jobs. Respondents were also asked to rank the importance of various potential job attributes. The fourth section (Part G) concerned homeworkers, their occupation, earnings, and the reasons they preferred working at home. Section five focused on commuting patterns: the place of work, the mode of transportation, the costs of transportation. The final section covered a range of basic 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, thus ensuring comparability with the national survey.

Structure of the report

Chapter two reviews previous research on rural employment and compares the study area employment and economic structure with that 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.

The analysis of the survey data is presented in three chapters. Chapter three discusses the demographic profile of the survey respondents, comparing them to respondents to the Current Population Survey conducted by the US Bureau of the Census in March 1989. The following sections of the chapter focus on respondents who were engaged in home-based paid work or who reported that they were not in the labor force currently. The importance of transportation costs in the decision not to participate in the non-home-based labor force, and the job rewards of home-based paid workers, are examined here, answering the first of our research questions:

- *How important a disincentive is commuting costs for women 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 employees, comparing metropolitan and non-metropolitan employees and job structures.

Chapter four focusses on the 333 survey respondents who were currently 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 in terms of occupational sector, part- or full-time status, or location of job)?*

The cost and time burdens that commuting entails for different groups of employees are analyzed next, comparing the length of work trips required by different jobs. The final section of the chapter analyzes modal choice, and explores the potential for policy solutions based on rural public transit provision and ride-sharing or van-pooling.

The final analytic chapter (chapter five) develops an explanatory model of commuting behavior and an empirical model of the differences among three principal groups of women workers, answering 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, conclusions are drawn from our 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 each of the two categories of policy responses outlined above - transportation-related issues, and job-location / job-quality issues. The viability of transit service provision, and of ride-sharing or van-pooling schemes are examined under the first set of options. Local economic development policy, location incentives and employment programs are discussed under the second set of options. The applicability of each set of policy options to the study area is assessed, as a basis for more general conclusions about policy appropriate to rural women workers in similar labor markets.

The final chapter (chapter seven) 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. The policy recommendations are presented, based on the analysis of the survey, the study area labor market, and the alternatives discussed in chapter six.

Chapter Two

Gender and Employment

While national rates of female labor force participation began to increase rapidly during the 1960s and 1970s, participation rates for women in rural areas have increased most rapidly only over the past decade. There are a number of reasons for this. The farm crisis of the early 1980s helped accelerate a transformation of rural employment opportunities and the gender structure of the farm household. Family farms have become much more dependent on off-farm earnings in this decade, and women's labor force participation is now crucial for the well-being of family farm households. However, rural areas are not predominantly composed of farming households. The majority of rural residents are in fact employed in non-agricultural sectors. Rural women from non-agricultural households have entered the labor force in part because of the increasing availability of non-agricultural employment, but they have also been pushed by very similar dynamics to those that have pushed urban-based women into the labor force: the need to maintain and improve the household's standard of living in the face of the erosion of "head-of-household" wages. This chapter focuses on the relationship between gender and the changing economic structure of rural America, focussing specifically on the study area examined in this report. This chapter is divided into two parts: the first summarizes current scholarly thinking on the role of gender in changes in the rural economy, and the second is an empirical summary of industrial and employment change in the study area.

Section One: Rural Employment and the Employment of Women

The midwestern rural economy has changed substantially over the past two decades. The farm credit crisis of the early 1980s and the concentration in agricultural holdings has undercut the basis for many farm-related and non-farm employment sectors, as demand for farm inputs has changed and the service area for consumer and retail goods has shrunk. However, employment in back-office business service functions and some manufacturing employment has expanded, attracted to the rural midwest in part by generous economic development incentives and in part by the presence of a relatively skilled, well-educated but lower cost labor force. Non-metropolitan areas became attractive locations for corporations anxious to cut labor costs in the late 1970s and 1980s; many routinized and fairly "deskilled" jobs were relocated to rural labor markets over this period, taking advantage in part of simultaneous rapid declines in agricultural and related employment. So, too, rural labor markets became more integrated into, and therefore more similar to, urban labor markets. 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 relying predominately on the low wage nature of their labor force, suffered significant disinvestment in this period.

However, employment growth in the rural areas of the midwest indicates that low wages per se 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 sub-sectors in more mature phases (Bloomquist 1988). Nevertheless, there is some evidence that the rural manufacturing sector is more "headless" than the urban sector: that is, more routine tasks and component production processes appear to be highly concentrated in rural areas (Bloomquist 1988, 54). Specifically, there are fewer managers, professional and technical workers, sales and clerical employees but more operatives in rural than in urban areas.

Parts of the rural midwest have also experienced significant growth in producer services, often seen as the most desirable of all service sector jobs. Developments in communication and telecommunication technology have enabled various component activities within individual producer activities to decentralize to suburban and rural locations. In this context, Noyelle (1983) has argued that the clerical processing facilities of large businesses, especially insurance and banking, may be increasingly attracted to rural locations. As with manufacturing, routine operations which have been successfully deskilled can be distributed to lower wage and more industrially flexible regions. One study of suburban female workers in backoffice producer service facilities, found that such suburban women offered considerable advantages over traditionally located central city labor, viz. qualitatively higher levels of education (or at least education in white suburban schools), better labor discipline with comparatively limited wage demands or general 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 backoffice workers. Bokemeier, Sachs and Keith (1983) suggest that this has indeed occurred. The result is likely to be an occupational distribution in rural producer services broadly similar to that found in rural manufacturing: a relatively "headless" labor force with

occupational specialization in more routine production jobs. The major difference is the higher level of female participation in producer services.

A large proportion of the new jobs created in rural areas over this period have been in sectors that have traditionally had predominantly female workers. Within these sectors, and indeed within innovative manufacturing sectors, women have tend to be concentrated in occupational categories of lesser status than men. Partly as a result of this the earnings of women are lower than men: however, even within equivalent occupational categories, men in rural manufacturing earn considerably more than women (\$16,971 on average as opposed to \$11,841 in 1986) (Bloomquist 1988, 71).

The growth in the number of "female" jobs has been accompanied by fairly rapid increases in the labor force participation rates of women in rural areas, so that by the late 1980s participation rates of rural and urban women were very similar. The most marked change here was in the off-farm labor force participation of farm-based women. 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 7 percent as part-time workers, compared to a 4 percent rise in the number of non-farm rural women who worked at home. In a study of small towns in Nebraska, Semyonov (1983) found that female labor force participation is closely related to occupational segregation; that is, low status job opportunities tend to be concentrated in communities with large proportions of women in the labor force. Female labor force participation tends to increase in towns located further from urban centers, characterized by manufacturing job opportunities (Semyonov 1983).

Women's work and the rural household economy

Off-farm wages have become increasingly important for many farm families, and women's off-farm labor force participation has accounted for a large proportion of the increase. In 1978, all farm families received 56 percent of their income from non-farm sources (USDA 1979); by 1982, this proportion had risen to 60 percent (USDA 1985, 17). However, non-farm sources were especially important for small farms. Small farm households (where annual farm sales amounted to less than \$5,000) received 90 percent of their income from off-farm sources in 1978 (USDA 1979). By 1985, farms with sales less than \$40,000 lost income, so that off-farm income for these families made up more than 100 percent of income (USDA 1986). Although the situation of farm households still in farming had improved by 1987, off-farm income still made up 95 percent of total income for farms with sales less than \$40,000. Farm women have begun to assume a major part of the family maintenance responsibility; Godwin and Marlowe (1989) found that the average proportion of family income contributed by farm women's off-farm employment was substantially greater than that of employed non-farm married women. However, as Clark (1991) points out, the farm population makes up only a fraction of the rural and non-metropolitan population; nine out of ten non-metropolitan residents were employed in non-agricultural sectors. Both farm- and non-farm-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 investment (i.e., skills, experience and education). They identify important disparities in labor force experiences by gender - women workers have more limited earnings

and mobility potential, and women workers overall show less variance in earnings and stability (Tickamyer and Bokemeier 1988). As indicated earlier in this chapter, 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, minimum job security and limited job mobility (Beck, Horan and Tolbert 1978; Morrissey 1982).

In a study of the source of the earnings gap between metropolitan and non-metropolitan women and men workers, McLaughlin and Perman (1991) conclude that differences in returns to human capital explain the largest component of the metropolitan / non-metropolitan wage gap for both women and men, and that this effect increased (for white workers) between 1977 and 1987. They conclude that labor market structure (existence of a locally dominant industry, sectoral specialization, and labor supply and demand) plays an important part in determining returns to labor (McLaughlin and Perman 1991, 360). The importance of labor market structure is evident in other research on women in labor markets. For instance, Bokemeier, Sachs and Keith (1983) report that non-metropolitan women workers tend to be concentrated in peripheral industries and to report higher unemployment rates than other women; 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 - non-metropolitan towns tend to show high levels of occupational segregation (Rogers and Goudy 1981). As Bokemeier and Tickamyer (1985) argue, the occupational and industrial structure of local labor markets is the crucial determinant of women's conditions of work and pay. Thus, although employment opportunities have expanded for women in the rural midwest, rural women workers

continue to be disadvantaged workers as a result of underemployment, low returns to education and experience, a narrower range of jobs (and thus promotion opportunities), and lower pay even after taking into account differences between urban and rural costs of living.

Section Two: Industry, Occupation, Employment and Labor Force Participation

In this section we examine the changing employment structure of the study region. We begin by documenting overall employment trends in the study area 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 females by their place of work.

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

A simple method of summarizing industrial change in the four counties is to compare their industrial indices of employment growth to those of the state and nation. Table 2.1 presents such indices for the 1979-1988 period based on *County Business Patterns* data.¹ Unlike the nation, Iowa saw almost no employment growth over the 1979-1988 period (the index was very slightly positive at 100.33 in 1988). Moreover, the employment performance of the four county study area (Benton, Buchanan, Delaware and Jones) was, with the exception of Buchanan, considerably worse than that of the state. Of the two major metropolitan labor markets for

¹ 1988 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.

Table 2.1
Indices of Employment by Division, USA, Iowa and Study Area

	1979= 100	1988							
		USA	Iowa	Benton	Buchanan	Delaware	Jones	Black- hawk	Linn
Agriculture etc	100	163	137	171					197
Mining	100	77	85						33
Construction	100	107	67	90	97	42	51	59	77
Manufacturing	100	90	84	80	148	86	73	53	81
Transportation	100	114	98	93	104	88	80	65	123
Wholesale trade	100	115	91	90	91	94	89	76	100
Retail trade	100	124	103	79	97	75	97	96	123
FIRE	100	129	119	105	105	108	97	100	89
Services	100	150	126	155	128	92	110	116	126
Nonclassifiable	100	286	95						130
TOTAL	100	118	100	93	110	84	88	79	100

residents in these counties, Blackhawk county performed very badly and Linn saw no change in its overall employment position.²

Insofar as manufacturing is concerned, the state, three of the study area counties and both big urban labor markets (especially Blackhawk county) lost jobs. Buchanan was again the exception here with a 1988 manufacturing employment index of 148. The 1980s saw a large increase in the number of service workers in the United States, partly offsetting the decline in manufacturing: indeed, the nation had one and a half times as many service workers in 1988 as 1979. Services also grew in the state, but more slowly than the nation. Delaware county actually lost service jobs, Jones saw some small service sector growth, Buchanan grew slightly faster

² We excluded the Dubuque MSA from our analysis because so few of our respondents (3) commuted there for employment.

than the state, while Benton outperformed the nation. The state and all the study area counties lost wholesale jobs. Benton, Buchanan and Delaware saw some gain in finance, insurance and real estate (FIRE), but growth was poor and much smaller than the state's or the nation's. Retail and construction are two sectors most clearly consumer driven. Thus, given the sharp decline in population in the study area, and in the case of retail, the consolidation of shopping opportunities in fewer and larger urban communities, it is entirely unsurprising that both these sectors lost jobs in the four county region.

Overall then, and with the modest exception of Buchanan county, the employment performance of the study area was dismal. Insofar as the major urban labor markets are concerned, Blackhawk county lost jobs in all but FIRE and services, and Linn county did much better, especially in services, retail and transportation. In accordance with this, our survey found that the majority of work-based commuting to metropolitan areas was to Cedar Rapids and not to Waterloo.

In order to pinpoint the study area's employment strengths and weaknesses, we performed a shift-share analysis at the SIC Division level over the same time period (1979-1988). The shift-share technique allows the precise measurement of the impacts of industrial structure (called the "industrial shift" term) and overall industrial growth (called the "national share" term) on employment change. The technique is also useful in providing a measure of the extent to which growth in a region is not the result of industrial mix or overall industrial expansion, but the result of local factors, such as an unusually good business climate for a particular industry (the residual or the "regional shift" term).

Table 2.2 presents the results of a shift-share analysis (using the basic Ashby equations) of the four study area counties. Iowa was used as the base region in this analysis, that is, the four study area counties were compared to Iowa, not to the entire USA. Summary line results are given in the three last rows of the table. Note that the summation of national share, industry shift and regional shift does not quite equal actual total employment change because of some missing data. Nevertheless, the overall effect of this missing data on the analysis is negligible. Notice that the national share terms are very slightly positive indicating the impact of weak employment growth at the state level. The counties were in a slow growth state and therefore their national share terms, although positive, were tiny.

The analysis clearly indicates that compared to the state, and with the partial exception of Buchanan, all counties were performing very poorly over the 1979-1988 period. The industrial shift of all the counties, including Buchanan, was negative, indicating a poor mix of industries (that is, specialization in slow growth or declining industries) in each of these counties. In all counties the predominant source of the negative industrial shift was construction, manufacturing and wholesale. As would be expected, services provided the major positive component of the industrial shift.

The regional shift term is particularly important since it gives some idea of how local economies are performing once the effects of industrial mix and overall state growth rates have been removed. It tells something of county comparative advantage. Regional shifts in Benton, Delaware and Jones were all negative, indicating very poor county performance. In Benton and Delaware, retail was the major source of the negative regional shift. Retail was negative in

Jones, but less so than manufacturing which was the major source of the negative shift there. Note also Delaware and Jones' very large negative shift in services.

Retail also showed negative growth in Buchanan. In other respects, Buchanan was the major exception to the above pattern: it recorded a net positive regional shift, this mainly the result of a strong positive shift in manufacturing and to a lesser extent construction. Overall then, all counties did very poorly in retail, two (Benton and Jones) did very poorly in services, one (Jones) did poorly in manufacturing, and one (Buchanan) did very well in manufacturing. Compared to the state, the four county study region did very poorly. Within the study region, only Buchanan had a positive regional shift, and this was mainly the result of an increase in manufacturing. The industrial mix was uniformly bad. The region provided very poor employment opportunities over the 1979-1988 period.

Table 2.2
Shift-share Analysis of Employment Change, 1979-1988

1979-1988	Benton			Buchanan			Delaware			Jones					
	NS	IS	RS	NS	IS	RS	NS	IS	RS	NS	IS	RS			
Agriculture		0.0	5.1	4.9	*	*	*	*	*	*	*	*	*		
Mining	*	*	*		*	*	*	*	*	*	*	*	*		
Construction		0.9	-85.7	59.8		0.9	-91.3	82.4		1.0	-95.6	-71.3	0.6	-62.4	-30.2
Manufacturing		2.8	-140.0	-34.8		1.6	-78.7	305.1		3.1	-152.2	23.2	3.6	-180.9	-113.7
Transportation		0.6	-4.1	-9.5		0.5	-3.2	8.7		0.4	-2.9	-12.6	0.7	-4.5	-36.1
Wholesale		1.7	-47.9	-7.8		1.5	-42.8	-0.7		1.2	-34.0	9.8	1.6	-45.4	-11.2
Retail		3.4	32.1	-251.6		3.1	29.2	-58.3		3.1	29.1	-268.2	2.9	27.1	-53.1
FIRE		0.7	40.0	-28.7		0.7	35.8	-26.4		0.5	29.6	-17.2	0.5	27.8	-32.3
Services		1.4	111.6	124.0		1.4	108.5	7.1		1.7	128.8	-169.5	2.0	153.5	-95.5
Nonclassifiable	*	*	*		0.1	-1.9	*		0.1	-0.8	*		0.1	-1.4	*
National Share		11.6				9.8				11.0			12.0		
Industrial Shift			-88.9				-44.3				-97.9			-86.2	
Regional Shift				-143.7				317.8				-505.8			-372.1

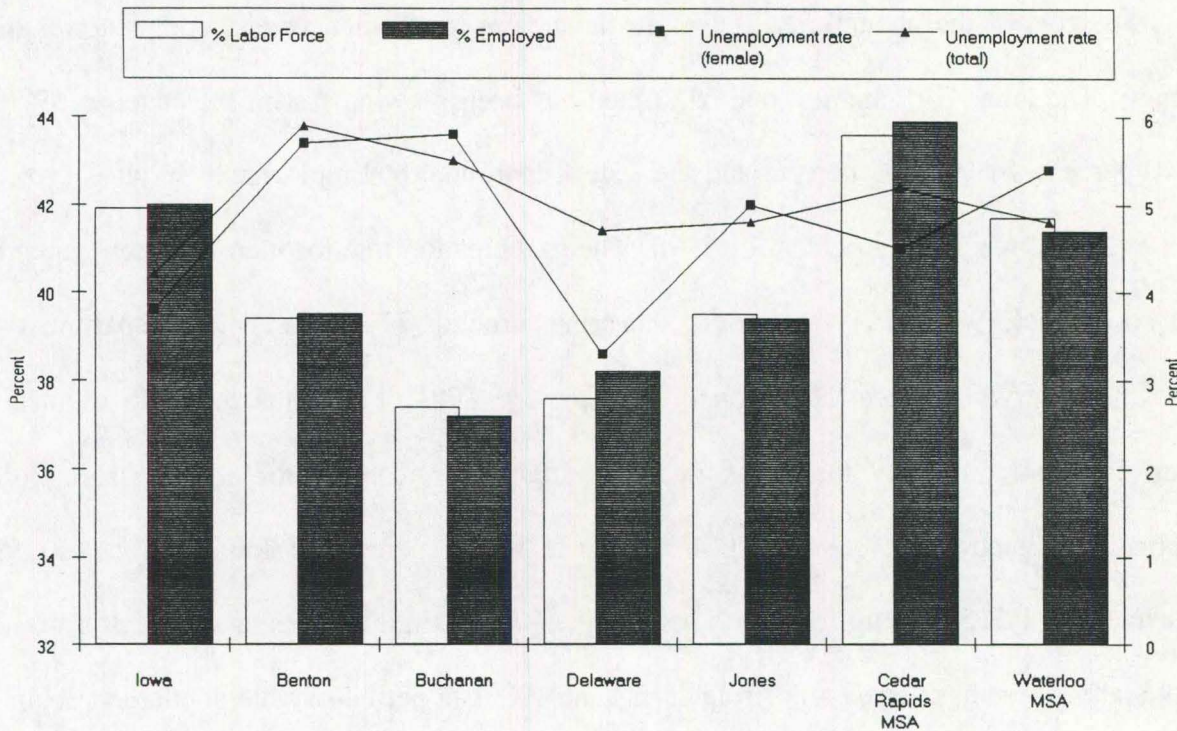
Source: County Business Patterns.

Labor force participation and employment

In 1990, women made up 42 percent of the Iowa labor force and the Iowa employed, but only 38 percent of the unemployed (unemployment rates for women were therefore lower than for men). The labor participation rate of women has been growing fast in the state: in 1970 it was 40 percent, in 1989 63 percent and the state Department of Employment Services projects that it will have reached 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, *Iowa Condition of Employment 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 women should make up 49 percent of Iowa's estimated 1996 employment of 1,515,000, up from 36.5 percent in 1970. Overall then, the movement of women into the labor force has played a key role during the 1980s (a period of state population decline) in the continued expansion of Iowa's labor force.

In the rural counties of the study area the labor force and those employed showed a higher proportion of males than the state as a whole, and in the cases of Buchanan and Jones the unemployment rates for women were actually higher than those for men (see Figure 2.1; Department of Employment Services, *Affirmative Action Data for Iowa 1991*). Labor force participation projections are undertaken for Service Delivery Areas (SDAs) not counties. Benton and Jones county are part of SDA 10, which also includes Johnson, Linn, Iowa and Washington counties. Delaware is part of SDA 8, which also includes Dubuque county. Buchanan is part of SDA 7 along with Blackhawk, Bremer, Butler, Chickasaw and Grundy counties. SDAs 7, 8 and 10 all include significant metropolitan populations. Labor force participation rate projections for 1996 indicate that SDAs 7 and 8 total participation rates and female only participation rates will

Figure 2.1
Women as a Percent of the Labor Force and the Employed,
and Unemployment Rates, 1990



continue to be well under the state average: in the case of female rates, about 6 and 4 percentage points respectively. SDA 10, which includes two Metropolitan Statistical Areas, will be above the state average.³ The figures presented in Table 2.2 suggest that the female labor participation rates of Benton and Jones county will be significantly below the rest of SDA 10. 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.

³ These projections come from Iowa Department of Employment Services (1992) *Iowa Population and Labor Force Projections 1993 1996*, 5. These projections are not directly comparable to those in *Iowa Condition of Employment 1991* used above.

Occupation and industry

Occupational and industrial breakdowns for the study area, rural Iowa, and for urban and rural America (in 1989) are provided in Table 2.3 below. Please note that these data are not directly comparable - they refer to different populations, and there are some differences between the CPS's and our definition of employed females. The data should therefore be used for only the broadest of comparative purposes.

There are some startling differences between the rural US and the four county study area. Our survey found far fewer women employed in the retail sector (or in the technical, sales and administrative support occupations) than either rural America or rural Iowa. In part, this reflects overall employment trends in the four county region: the retail trade actually suffered a large employment decline area over the 1980s in the study area. On the other hand, our survey found a far greater proportion of workers in the service industry (43.5 percent) than in the rural US (19.7 percent), but a smaller proportion than in rural Iowa (48.2 percent). As the earlier table of employment indices indicated, service employment grew more slowly over the 1979-1988 period in the four county region than the state.

Notice however, that there were fewer study area women in service *occupations* than in rural Iowa or rural America. The reason for this is the occupational distribution of jobs within the service *industry*. Two-thirds of service industry workers in our sample were employed in professional or related services, just under 10 percent in professional services and the rest in personal, and entertainment and recreational services. As a result, it appears that a large number of women who were classified to the service *industry* were also classified to managerial and professional specialty *occupations*.

Table 2.3
Industry and Occupation of Employed Females in the Urban and Rural US (1989),
Rural Iowa (1989) and the Study Area (1991)

Occupation	US Urban	US Rural	Iowa Rural	Study Area
Farming, forestry and fishing	0.4	3.1	2.17	2.1
Managerial and professional specialty	27.2	21.8	24.29	35.4
Technical, sales and administrative support	45.2	41	39.69	32.4
Service	17.5	19.2	22.99	14.7
Precision, production, craft, and repair	2.1	2.8	2.82	0.9
Operators, fabricators, and laborers	7.7	12.2	6.94	14.1
Total	100	100	100	100
Industry	US Urban	US Rural	Iowa Rural	Study Area
Agriculture, forestry and fisheries	0.9	5.2	3.5	4.5
Mining	0.3	0.4	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
FIRE	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	100	100	100

Sources: Data for study area from survey sample, for Iowa, calculated from 1989 CPS tapes, and for urban and rural USA, Department of Commerce (1989).

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.

One further trend is worth noting. More women were involved in manufacturing in the sample and in rural Iowa (this appears to reflect manufacturing job opportunities in Cedar Rapids, see below). As a result, the study area had significantly more women in the operators, fabricators and laborers occupations than did rural Iowa. In summary:

- *There were considerably fewer retail workers in the study area.*

- *Although the study area had fewer service industry workers than did rural Iowa, it had many more than the rural US. The sample showed a distinct concentration in professional services.*
- *There were more female manufacturing workers in the study area.*

Occupation, industry and place of work

Cedar Rapids, Waterloo and all other places provide sectorally and occupationally quite distinct labor markets for the respondents to our survey (see Table 2.4). Of those who commuted to Waterloo, almost two-thirds were in executive, managerial, professional or administrative positions. Of the rest most worked in other services. A much higher proportion of respondents who commuted to Waterloo were involved in other service occupations. It should be noted that the actual number of respondents working in Waterloo was small and our sample here may be unrepresentative of the population commuting there. In the case of Cedar Rapids, there was some concentration in manufacturing activities (machine operators, assembly workers, and technicians) and in executive, managerial and professional occupations. Of those who commuted elsewhere (in all but three cases, these were women who commuted to non-metropolitan areas), there were fewer in executive, managerial and professional occupations, and more in sales occupations.

Conclusion

Women have played an increasingly significant part in the labor force in rural Iowa over the past decade, concurrent with a period of significant economic restructuring. Economic change in the study area is comparable with trends identified at the larger regional level, with declines in manufacturing employment being offset to some extent by increases in service sector

Table 2.4
Industrial and Occupational Distribution of Employed Respondents by Place of Work

Industry	Percent	Cedar Rapids (%)	Waterloo (%)	Other places (%)
Agriculture, forestry,	4.5		8.3	6.1
Construction	1.5	2.3		1.3
Durable goods	15.3	17.4		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		2.6
Retail trade	9	7	8.3	10
Finance, insurance,	6.3	8.1	8.3	5.7
Business and	4.2	4.7	8.3	3.9
Personal services including	7.5	4.7		8.7
Entertainment and	3	1.2		3.5
Professional and	29	29.1	41.7	27.9
Public Administration	6.9	2.3		8.7
Total	100	100	100	100
Occupation	Percent	Cedar Rapids (%)	Waterloo (%)	Other places (%)
Executive and management	15.6	20.9	16.7	14
Professional specialty	20.1	22.1	8.3	19.7
Technicians	7.8	10.5		7.4
Sales	6.9	4.7		8.3
Administrative support	17.7	15.1	41.7	16.6
Private household service	2.7	1.2		3.5
Protective services	0.9	1.2		0.9
Other services	11.1	8.1	25	11.4
Precision production, craft	0.9	1.2		0.9
Machine operator, assembly	7.8	10.5		7
Handlers, laborers	6.3	4.7		7.4
Farming, forestry	2.1		8.3	2.6
Total (n=333)	100	100	100	100

employment, which is 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. Metropolitan adjacency appears to benefit the study area in that it offers residents access to Cedar Rapid's relatively stable job market: however, sharp declines in employment in Waterloo (and Dubuque) suggest (as was borne out in the responses to our telephone survey) that these two metropolitan areas offer few labor market opportunities to rural residents.

Chapter Three

Labor Force Participation

The previous chapter discussed macro-level changes in the economic structure of the rural midwest and in our study area, and changes in the employment opportunities available to women in those regions. Although employment opportunities have expanded for women in the rural midwest, rural women workers continue to be disadvantaged workers as a result of underemployment, low returns to education and experience, a narrower range of jobs (and thus promotion opportunities), and lower pay even after taking into account differences between urban and rural costs of living (McLaughlin and Perman 1991; Bokemeier and Tickamyer 1985; Little 1991). These labor market characteristics form the context within which women make decisions about participating in the labor force. Decisions are also influenced by the relatively longer distances that rural women must travel to poorer quality jobs, and the absence of subsidies in the form of public transit. Long work trips represent not only an economic disadvantage but also a significant time burden, given the range of household tasks for which women continue to bear responsibility. The commuting patterns of our employed respondents are the subject of chapter four.

This chapter focusses 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. 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 in the labor force or not?*

The issue of commuting is addressed only in reference to the first two groups examined, assessing the extent to which perceived transportation costs influence the decision not to participate in the non-home-based (traditional) labor force.

The 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. Respondents not in the labor force and the home-based and non-home-based labor force participants are compared. Section two examines respondents who are not in the labor force in more detail. A distinction is drawn between potential and unlikely recruits to the labor force, and the role of transportation barriers in discouraging labor force participation is analyzed. Home-based workers are the focus of section three; 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 non-home-based workers' participation in the labor force. This section answers the following questions:

- *Are different occupational and industrial sectors characterized by significant differences in job rewards, work patterns or "human capital" attributes?*
- *How do metropolitan labor markets differ from local labor markets in our study area?*

Section One: Demographic Profile

Labor force participation rates were very similar between the two samples - 59.3 percent of our study area respondents were currently active in the waged labor force, compared to 58.66 percent of the CPS sample. Unemployment rates were slightly higher in our sample (3.4 percent compared to 2.04 percent), in part accounted for by the fact that 1991 was a recession year. Similar proportions of women were in part-time employment - 30 percent of those currently employed in our sample, compared to 31.26 percent of current labor force participants in the CPS sample. The CPS does not collect data on home-based wage workers, but this group constituted 12.8 percent of current participants in our sample.

The education levels of the two samples were approximately similar, although a lower proportion of our respondents were college graduates or had post-graduate degrees, while more had some other form of tertiary education (see Table 3.1). The age distribution of our sample showed slightly fewer younger respondents than the CPS sample; this may result from the fact that we only interviewed one woman from each household, whereas the CPS collects data on every household member.

Car ownership rates amongst the sample were high as might be expected given the lack of any alternative viable means of transportation for most rural dwellers. Only two percent of households did not have a car available, and the majority (86.6 percent) had two or more vehicles in their household. Almost all respondents (96.7 percent) had a current drivers' license; the majority of those without drivers' 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 5 years), and 80 percent of respondents' cars were ten years

Table 3.1
Comparison of Household Survey and Current Population Survey Samples

	Household Survey	C.P.S.
Currently employed	59.3	58.66
Unemployed	3.4	2.04
Part-time	30.0	31.26
Education:		
some high school	9.52	8.65
high school grad	49.45	56.13
some college	30.89	20.60
college grad	6.24	10.06
postgraduate	3.90	4.56
Age:		
18 to 19	1.85	2.95
20 to 24	5.21	10.92
25 to 34	25.38	25.99
35 to 44	27.56	22.53
45 to 54	15.46	14.56
55 to 64	14.28	14.73
65 to 70	10.25	8.32

old or less. We may conclude that the sample population has a high level of personal mobility, especially compared to a national study that estimated only 39 percent of married working women have a car available to them exclusively (Michelson 1983, 50).

Differences in labor force participation rates and modes are expected to be affected by the demographic characteristics of respondents. This section compares 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.

Chi square analysis of these four groups of respondents 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 elderly respondents (over 65) were not in the labor

force, while a high proportion of women between the ages of 25 and 55 (76 percent) were in waged employment. Home-based work was most often chosen by women between the ages of 25 and 45.

Table 3.2
Demographic Profile by Labor Force Participation

	Not in labor force	Home-based workers	Non-home- based workers		X ²	sig.
			Part-timers	Full-timers		
% with children	30	79.6	67	59.3	82.37	.000
% living on farms	39.5	44.9	31.9	31.3	5.91	.116
Education:					37.33	.000
not hs grad	15.3	-	7.8	6		
hs grad	51.3	53.1	53.9	43.8		
some college	26.8	34.7	29.6	35.5		
college grad	4.6	10.2	4.3	8.3		
postgraduate	1.9	2	4.3	6.5		
Age:					192.3	.000
18 to 24	6.2	6.1	7	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		

Women who chose home-based work were far more likely to have children under the age of 18; interestingly, women who were not in the wage labor force were least likely to have children at home (only 30 percent of them did, compared to 50.2 percent of respondents over-

all). When we exclude women who are unlikely to have children at home because they were retired, this finding remains intact; only 42.4 percent of non-retired non-participants in the labor force had children. Significant differences were found between the number of part- and full-time employees who had children at home, although both groups were still more likely to have children than were non-elderly non-participants. Home-based workers were slightly more likely than other respondents to be married, with women not in the labor force more likely to be widowed (again, mostly as a result 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 only non-retired respondents are considered, this group constitutes 14.1 percent of non-participants. However, three-quarters of those with a post-graduate qualification were in non-home-based employment, and those with more than high school education were more likely to be full-time employees. A surprising number of home-based workers had high educational levels - 46.9 percent had some tertiary education or a college qualification, compared to 40.9 percent of the sample overall. Home-based workers were also far more likely to live on a farm than other respondents; women employed in the wage labor force were least likely to be farm dwellers, with just under a third of them farm-based, and no differences discernible by part- or full-time status.

There were significant differences in household income by respondents' labor force status. Table 3.3 summarizes the household income distribution of each group within the sample. 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

Table 3.3
Household Income by Labor Force Participation

	Not in labor force	Home-based workers	Non-home-based workers	
			Part-timers	Full-timers
Less than \$10,000	25.9	0	15.5	2.7
\$10,000 to \$20,000	27.9	27.8	19	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	1.7	0

$X^2 : 86.57$

significance: .000

respondents in the non-home-based labor force. Respondents in the non-home-based labor force were more likely to live in households with annual incomes of more than \$50,000 (17.1 percent), compared to just 4.1 percent of respondents not in the labor force. Full-time employees were much more likely to live in wealthier households. It is clear that women's labor force participation has a substantial impact on household economic well-being.

While the majority of respondents (95 percent) had a car available to them daily, nearly ten percent of those not in the labor force did not have this level of access, and 6.9 percent did not have a current driver's license. The greatest difference in transportation resources was in the age of car available - nearly one third of those not in the labor force or in part-time employment had a car in the highest age quartile (over eight years old) compared to less than one in five non-

Table 3.4
Household Transportation Resources

	Not in labor force	Home-based workers	Non-home-based workers		X ² or F	sig.
			Part-timers	Full-timers		
% with car avail. daily	90.9	98	96.6	98.6	30.14	.000
Mean car age	5.93	5.7	6.7	5	3.57	.014
% with car over 8 yrs	31.3	26.1	32.7	17.3	20.04	.018

home-based full-time workers. Part-time workers had noticeably fewer transportation resources than home-based workers.

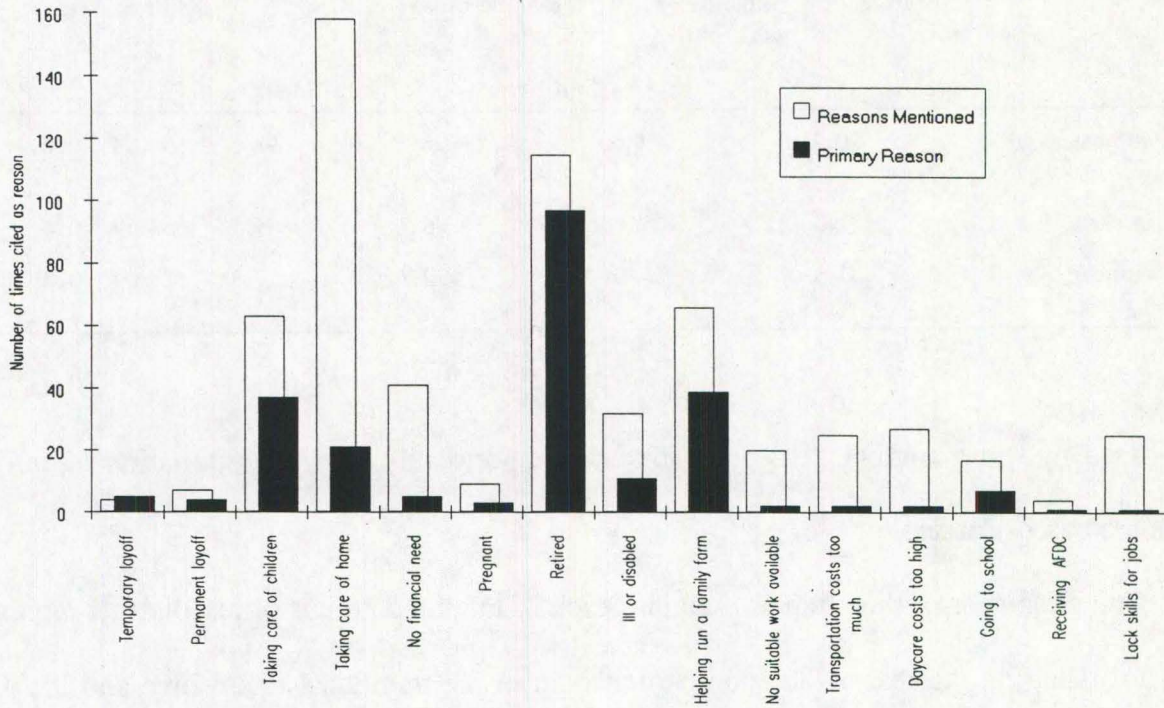
The remainder of this chapter examines each of the three groups of respondents in more detail, focussing on the reasons for non-participation in the traditional labor force and the job characteristics of labor force participants.

Section Two: Women Not in the Labor Force

The basic characteristics of women who were not in the labor force were summarized in the previous section of this chapter. This is an important sub-group, because some of these respondents constitute potential future labor force entrants. This section focusses on the explanations given for not being in the labor force; these constitute the set of constraints which employers must overcome to attract new entrants.

Figure 3.1 presents the major reasons for respondents not being in the labor force, distinguishing between primary reasons and all reasons mentioned. By far the most important

Figure 3.1
Reasons for Not Being in the Labor Force



primary reason given was "taking care of dependents", and this reason combined with "taking care of home" was 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 are retired, who are engaged in running a family business or farm or who have no financial need as their primary reason will probably have few incentives to take up waged labor. The remainder of the respondents can all be assumed to be potential entrants who could be attracted to 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 able to take up non-home-based

employment given the right conditions (chief among which would be availability of specialized transportation).

The respondents not in the labor force were divided into two groups on the basis of these considerations - one group of those for whom incentives to enter the labor force would be irrelevant, and one group of those who might be attracted into the labor force in the future. We compared the two groups of non-participants along a number of dimensions to develop a better understanding of the differences between potential and unlikely labor force recruits. A high proportion of "potential" participants (57.1 percent) had children under eighteen; they were much more likely than other non-participants to be younger than 55 years, with nearly half younger than 35 years of age. The majority (85.5 percent) of potential participants had a high school diploma or some college, 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 non-participants to name transportation costs as a reason for not being in the labor force, with 16.7 percent naming transportation as a reason. Although only a small number of non-labor force participants mentioning transportation as a reason did not have access to a car or a driver's license (three and four respectively) and most (68 percent) lived in households with two or more cars, 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 - only 25.1 percent of non-labor force participants mentioning transportation as a barrier had a car of median age (five years) or less.

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

Section Three: 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 increasing 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, 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) have expanded.

Home-based work can offer the flexibility and (potentially) the autonomy women lack in the regular work-force; however, its benefits can be overestimated, as it does not eliminate childcare responsibilities and usually earns 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 leads to 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 piece-work basis (Christiansen 1985, 55; Gringeri 1991). Home-based work is seen as advantageous by employers, who cite short turn-around times for piecework, reduced personnel turnover, increased productivity and accuracy, and reduced expenditure for overheads such as office space, peak hour computer usage, and employee "downtime" (Christiansen 1985, 55).

Significantly, more than half (57 percent) of respondents who were engaged in home-based work also had jobs outside the home; thus, only a small proportion of employed respondents (5.4 percent) was engaged in home-based work exclusively. Nevertheless, home-based work is a supplementary source of earnings that could only otherwise 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.

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- or other dependent-care (25 percent of home-based workers). Farm-related work, clerical, data processing or professional freelance work, and sales activities accounted for the remainder of occupations. The majority of home-based workers (77 percent) were self-employed, as we might expect given the kinds of work respondents engaged in.

Child- or dependent-care workers were most likely to be self-employed (91.7 percent) and to have children. As mentioned above, home-based workers were more likely than other

Table 3.5
Home-Based Work Type

	n (%)	Mean Hourly Pay \$	%Self-employed
Child or Dependent Care	12 (25)	2.65	91.7
Clerical or Freelance	8 (16.7)	3.22	71.4
Arts & Crafts	14 (29.2)	4.04	78.6
Sales	6 (12.5)	5.48	66.7
Farm-related Work	8 (16.7)	2.70	75.0
Total		3.51	77.0

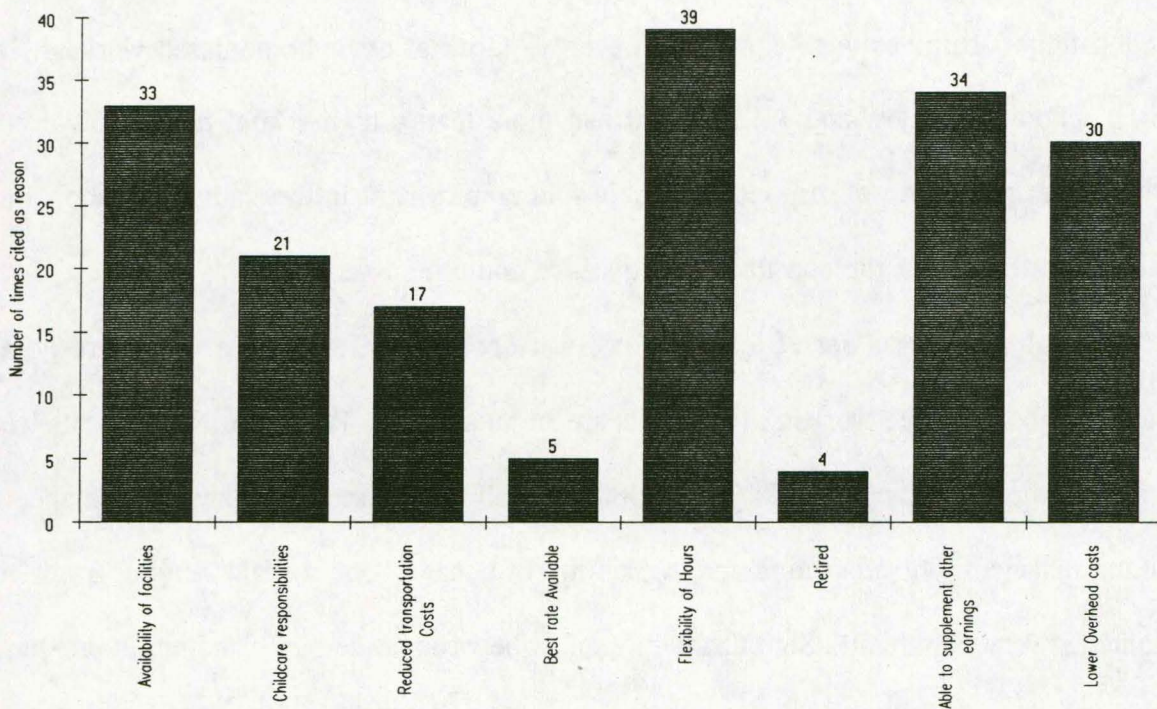
respondents to have children under 18, although this was less evident for women involved in farm-related work. Only sales and farm-related workers were more likely to live on a farm; child- and dependent-care workers were less likely to be farm-based.

Home-based work is an effective strategy to reduce the time and cost burdens that commuting imposes, but cost savings may not necessarily be compensated for when hourly earnings rates are compared. Hourly pay rates did differ by type of work (as shown in Table 3.5), although no statistically significant relationship was found. Overall, home-based workers earn substantially less per hour than respondents who work outside the home - the average is \$3.51 per hour, compared to \$7.48 for non-home based workers. Child-care and farm-related workers earn substantially below the average for home-based workers, while sales and "arts and crafts" workers earn more than the average. However, even home-based sales workers receive hourly pay rates substantially lower than do sales workers in the regular workforce (\$5.48 per hour compared to \$7.94 per hour). For all other occupations, home-based employment imposes significant costs in foregone earnings. This disparity is especially

significant given the similarity in educational levels of home-based and non-home-based workers discussed in section two above.

Self-employed workers tend to earn less on average than those who work for an employer (\$3.54 compared to \$4.13) and those for whom home-based work is the sole source of income earn slightly more than those with another job. There is no significant relationship between hourly pay rate and educational level - in fact, the highest-earning category of home-based

Figure 3.2
Reasons for Choosing Home-Based Work



respondents were those with only a high school diploma.

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 3.2). Reduced

transportation costs were important for 35.4 percent of home based respondents. Respondents that named transportation costs as an important reason for working at home 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- 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 to them 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 hypothesize that this group of respondents would find employment in the traditional labor force more attractive if some of the constraints on distance could be overcome.

The evaluations of a set of job attributes were compared for women who were home-based and non-home-based workers; the results are summarized in Table 3.6. Respondents were asked to rate the importance of six job attributes - job status, security, pay, convenience of commuting distance, job satisfaction and availability of benefits - on a scale ranging from "not important" to "very important". Significant differences between home-based and non-home-based workers are evident in Table 3.6.

Non-home-based workers were twice as likely to value job status as were home-based workers, and more than 50 percent more likely to value benefits and pay. As might be expected, home-based workers were 50 percent more likely to value low commuting distance than were

Table 3.6
Evaluations of Job Attributes, Home-based and Non-home-based Workers

Job Status	Not Important	Moderate Importance	Very Important
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

non-home-based workers. The two groups were closest on their evaluation of job satisfaction and 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 solely employed in home-based work would find traditional employment opportunities more attractive if transportation barriers could be alleviated.

Section Four: Non-Home-Based Workers

This section analyzes the occupational and industrial distribution of respondents employed in non-home-based jobs, tracing the relationships between occupational sector, job rewards, work patterns, job location and "human capital" attributes.

Job rewards are defined in terms of pay (presented as an hourly rate to standardize the effect of different work patterns) and receipt of health or retirement benefits.¹ It has been suggested that the new delineation of poor and non-poor workers is between those who receive health benefits and those who don't; 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- or full-time status, regularity of work hours from week to week, seasonality (number of months worked in the year) and number of days worked per week. As more women have entered the labor force, flexibility of work patterns has increased; substantial numbers of our respondents work "non-standard" hours, which has implications for their commuting burdens and for transportation policy options.

Human capital attributes are defined in two ways - length of tenure with current employer, and level of education. An alternative measure of work experience calculates the

¹ Detailed definitions of the calculation of hourly pay rates and other variables are provided in Appendix Two

length of time an individual can be assumed to have been in the labor force, by subtracting years of education (plus six) from the individual's age. While this has some features to recommend it in that workers with valuable experience have not necessarily been with the same employer continuously, in the case of women re-entering the labor force or women making a career change it can be a misleading indicator when used alone as a measure 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 preference to the measure of total estimated experience.

Chi square analysis and analysis of variance was performed for a range of variables by occupational and industrial sectors, defined in eight categories. Table 3.7 summarizes some key characteristics of jobs in each occupational sector. Service and sales occupations are, unsurprisingly, the least likely to offer health and retirement benefits, the most likely to require or offer irregular or flexible hours, and the most likely to employ part-timers. 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 part-timers, while executives, technicians and skilled blue-collar workers were more likely to be full-time and employed regular hours from week to week (there was no difference for professionals or less-skilled blue collar workers).

No significant difference was 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 occupational category. Professionals and technicians were most likely to have a four-year qualification or more, while clerical workers were likely to have some

Table 3.7
Job Attributes by Occupation and Industry

	% Receiving Health Benefits	% Receiving Retirement Benefits	% Part-time	% Working Regular Hours	Mean Hourly Pay	% Seasonal
Occupational Sectors and Selected Job Characteristics						
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	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	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
X ² or F-score	28.88	32.22	29.29	15.39	0.91	21.03
sig.	.000	.000	.000	.030	.497	.003
Industrial Sectors and Selected Job Characteristics						
Agriculture	35	21.1	40	50	8.72	15
Manufacturing	69.7	60.9	21.5	78.8	6.7	18.2
Transport/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/Ins/Real Est.	60	57.1	17.1	77.1	7.97	8.6
Personal Services	20	20	62.9	57.1	7.86	14.3
Professions	47.9	63.2	34.4	67.7	7.7	32.6
Public Administration	20.8	54.2	37.5	58.3	7.56	16.7
X ² or F-score	41.93	37.76	24.5	22.25	0.41	22.92
sig.	.000	.000	.000	.002	.895	.001
Total	48.5	50.9	34.4	65.5	7.5	18.4

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 more likely to have lower levels of 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 occupational or industrial sector. Workers in clerical occupations were notably better rewarded

than those in executive or managerial occupations, being more likely to receive health and retirement benefits and higher hourly pay rates, despite the greater proportion who were part-timers. This suggests that respondents in executive and managerial occupations were concentrated in lower level more feminized jobs within the occupation. 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 and unskilled blue collar employees. It is interesting to note further that while education levels were significantly related to occupational categories, this was not necessarily reflected in hourly pay rates by occupation.

One of the most important distinguishing variables to emerge from our analysis was the metropolitan - non-metropolitan location of jobs. As Table 3.8 shows, a higher proportion of metropolitan employees were in the manufacturing, transportation and distribution, business services and professional industries. Non-metropolitan employees were more likely to be in retail, personal services and public administration sectors. Occupational breakdowns showed similar profiles, with traditional "pink collar" occupations (sales, service and clerical) concentrated in non-metropolitan locations.

Job structures differed significantly by metropolitan / non-metropolitan location. Non-metropolitan jobs were nearly twice as likely as metropolitan jobs to be part-time, and non-metropolitan employees were much less likely to receive health (and to some extent retirement) benefits. Hourly pay also showed significant differences by location of job.

We explored the relationship between hourly pay and industrial / occupational sector further, breaking down sectors by metropolitan or non-metropolitan job location. There was substantial variation in the direction of change between sectors, although no statistically

Table 3.8
Metropolitan and Non-metropolitan Industrial Sectors

Sector	Metro-politan	Non-met-ropolitan	Mean hourly pay, metropoli-tan jobs	Mean hourly pay, non-metro-politan jobs
Construction/agriculture	3	7.3	5.43	9.37
Manufacturing	24.8	17.7	7.68	6.26
Transportation & distribution	11.9	6.5	8.83	7.08
Retail	6.9	9.9	4.72	6.77
FIRE, business services	12.9	9.5	7.98	7.96
Personal services	5	12.9	4.55	8.22
Professional	31.7	27.6	7.3	7.88
Public administration	4	8.6	4.17	7.75

X²: 15.78 F-score: .370
sig. .027

significant relationship was detected. Respondents in executive or managerial, service and skilled blue collar occupations had higher hourly rates of pay in metropolitan jobs, while sales, clerical and unskilled blue-collar workers received lower rates of pay in metropolitan jobs. The breakdown by industry (in Table 3.8) showed similar divergence - respondents in manufacturing, and transport and distribution, increased their rates of pay in metropolitan locations; there was no change for employees in the finance / insurance / real estate and business services sectors, and 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 sectoral employees in non-

metropolitan locations (it should be noted that service occupations are not equivalent to the personal service industry). However, few of these differences were statistically significant, given the wide variations in numbers of workers by metropolitan / non-metropolitan split. The only sectors for which a t-test did reveal a significant difference in mean hourly pay by job location was for retail trade (two-tailed probability of .041) and the sub-sector of non-durable manufacturing (2-tailed probability of .007); two-way analysis of variance identified no significant relationship.

When we controlled for human capital attributes of workers, these results improved somewhat (the three-way analysis produced an F-score of 1.826, significance of .05). The analysis suggested the following explanations for the variance observed: i) workers in professional occupations with higher educational qualifications earned more in metropolitan than in non-metropolitan jobs; ii) experienced technicians earned more in metropolitan than non-metropolitan locations; iii) service occupations were dichotomized, with those with higher educational qualifications earning more in metropolitan jobs and those with fewer qualifications earning more in non-metropolitan jobs; iv) more experienced sales workers earned more in non-metropolitan locations than they did in metropolitan jobs; v) clerical workers with higher educational qualifications earned more in non-metropolitan than metropolitan jobs; and vi) skilled blue collar workers received better rewards for longer job tenure in metropolitan jobs than in non-metropolitan jobs. The analysis discussed here is messy (and a few categories have one or no observations), but may be more reflective of job market dynamics for that reason.

We may conclude that the metropolitan labor market appears to be more attractive only for workers in particular industrial sectors - notably, in finance /insurance /real estate, business

services, manufacturing, and transport and distribution, where higher "human capital" attributes receive better job rewards. More "feminized" industrial sectors and occupations (such as clerical or technical support occupations, retail, personal services and public administration industries) offer better returns to "human capital" attributes in non-metropolitan 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. Of particular note are the higher rates of seasonality and part-time employment in the service, clerical and unskilled blue collar sector, and the relatively low remuneration to women in higher status white collar executive and managerial and skilled blue collar occupations compared to other occupational and industrial categories. We may conclude that metropolitan labor markets offer a wider range of jobs in non-feminized sectors, with better job rewards.

This finding raises the final issue to be discussed in this section - the extent of under-employment among non-home-based labor force participants. "Underemployment" refers to jobs that are part-time and/or less than full year employment. Underemployment may be preferred by some workers and some kinds of jobs (for instance, teaching or agricultural employment) may be necessarily seasonal in their structure. It is impossible to ascertain 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. The significant differences in household income between part-time and full-time workers discussed in the first section of this chapter suggest that many 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 non-metropolitan locations) are more likely to employ part-time workers. Table 3.7 also differentiated between full-year and part-year employees, showing a significant relationship between seasonality and occupational and industrial sector. Professional, clerical, service and unskilled blue-collar workers were more likely than the population as a whole to be employed less than full-year. Among industries, only professional sector workers were likely to be seasonal (probably representing the high proportion of employees in education, which is likely to be seasonal). Retail employees were unlikely to be seasonal, but this probably reflects the timing of the survey - September is unlikely to be a peak retail-employment season. No relationship was detected between seasonality, availability of health and retirement benefits or hourly pay, again probably reflecting the high proportion of seasonal employees in the professional sector. When we exclude seasonal workers in professional industries, some relationship with health benefits is evident (only 30 percent of seasonal employees receive health benefits, significant at the .05 level) and a weak relationship with hourly pay emerges (80 percent of seasonal workers earn less than \$6.75 an hour, compared to 58.7 percent of all workers, significant at the .1 level). Overall, 43.3 percent of non-professional 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 non-metropolitan locations. We may

speculate that non-professional sector seasonal workers and a proportion of part-time workers represent an "underemployed" set of labor force participants that may have incentives to expand their labor force participation in the future.

Conclusion

This chapter has described the demographic characteristics of survey respondents, differentiating between those employed in the non-home-based and home-based labor forces, and those not in the wage labor force. Educational level was found to be the most important variable distinguishing between participants and non-participants 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 either non-home-based workers or those not in the labor force. Non-participants 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, reflecting the contribution that women's earnings make to household income. As expected, home-based workers earned significantly less on an hourly basis than non-home-based workers overall.

Reasons reported for not being in the labor force and for being engaged in home-based work suggested that domestic responsibilities were the most important reason for this choice (excluding respondents who were retired), although no significant differences in domestic responsibilities were found between participants in the non-home-based labor force and non-participants. Differences in domestic responsibilities were detected between part-time and full-time employees and those in the home-based versus no-home-based labor force. The presence

of children under eighteen appears more likely to influence the choice of job structure than the choice between participation and non-participation (however, its importance is not clear given that only just less than 60 percent of full-time workers have children at home).

Transportation costs were a contributing but not primary reason for a substantial minority of respondents who 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 transportation, the analysis did highlight a small group of relatively transportation-disadvantaged respondents among potential labor force participants and amongst part-time employees. Intermittent access to a car, and older and thus less reliable transportation defines disadvantage here rather than absolute lack of resources.

Workers in metropolitan jobs were more likely to be full-time, full-year employees and to receive better job rewards (defined as hourly pay rates and receipt of health and retirement benefits) than employees in non-metropolitan locations, but only in some occupations and industries. Potentially "under-employed" respondents were more likely to be in the non-metropolitan labor market. However, the better job rewards obtained by metropolitan employees must be balanced against their longer work trips, to develop a fuller understanding of the role of commuting in labor force participation choices. The following chapter focusses on respondents employed outside the home, describing their commuting patterns and analyzing the problems and constraints experienced by current commuters in some detail.

Chapter Four

Commuting Patterns

The previous chapter examined the structure of respondents' participation in the labor force, distinguishing between women not in the labor force and home-based and non-home-based workers. Conclusions were drawn about the disincentive commuting represents to potential labor force participants, and about the modes of labor force participation among employed survey respondents. This chapter examines the commuting patterns of respondents who do participate in the non-home-based work force, and assesses the cost and time burdens that commuting imposes. Modal choice is examined, and the potential for alternatives to individual car travel for cost- and time-burdened respondents is assessed. The following chapter develops an explanatory model of commuting distance, and integrates the policy related research findings.

In chapter one it was argued there is a close connection between the structure of 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 exhibit greater occupational segregation 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 do men (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 do men, 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). A comparison of metropolitan and non-metropolitan male and female workers concludes that variations in job structure between metropolitan and non-metropolitan areas accounted for just over twenty percent of the earnings gap; differences in the rate of return to human capital characteristics and to job attributes became more important in explaining the earnings gap between metropolitan and non-metropolitan women workers between 1977 and 1987 (McLaughlin and Perman 1991). Employment opportunities for residents of rural counties adjacent to metropolitan areas are thus more rewarding than those available to residents of more remote rural counties, but better jobs require substantially longer commuting distances (Fuguitt 1991). These arguments are supported by the survey findings discussed in the previous chapter, which demonstrated that metropolitan employees earn substantially higher hourly pay and are more likely to receive health and retirement benefits than workers in non-metropolitan jobs (although differences were detected by sector of employment).

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 studies have 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).*
- *A number of recent studies have concluded that women have shorter journeys to work than men because they receive fewer increments in pay for each additional mile travelled, holding human capital characteristics constant (Wekerle and Rutherford 1988; McLafferty and Preston 1991; Dubin 1991); consequently, women have weaker incentives to commute long distances.*

- *An alternative explanation advanced for women's shorter journeys to work is that while they are segregated in particular occupations and industries, female-dominated sectors are distributed more evenly through residential areas, while the sectors in which men are likely to work tend to be concentrated in particular locations (Hanson and Johnston, 1985).*

- *Findings of shorter work trip lengths do apply to comparisons between white urban men and women, but studies that have compared black, hispanic and white men and women indicate that black and hispanic women travel further to work than either white women or men, although their rates of pay are consistently lower (McLafferty and Preston 1991; Cooke and Shumway 1991).*

No systematic studies of rural women's commuting patterns have been identified, but the last of the findings listed here suggests that patterns of commuting that are well-documented among white urban women and men may not necessarily be evident amongst other groups of workers. This research attempts to expand our understanding of women's travel behavior by focussing on rural women in a relatively stable job market.

Previous research on women's travel patterns has tended to focus on comparisons between male and female commuters. While this is useful in making the point that women's travel patterns differ from those of men, it tends to treat women workers as an undifferentiated group (with exceptions notable in the work of Rosenbloom (1987) and Hanson and Johnston, (1985)). 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 head-of-household's

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, linking these patterns with the occupation and employment data discussed in the previous chapter. We begin with a profile of commuting distance and time for workers from different occupational and industrial sectors, and go on to profile commuting patterns by metropolitan or non-metropolitan job location, 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. Again, these proportional measures of the impact of commuting are linked to specific occupational and industrial sectors, the work patterns and job rewards of respondents, and their "human capital" attributes.

The third section of the chapter examines modal choice in the context of this analysis, focussing on current and potential ride-sharers and respondents' receptivity to public transit. The concluding section provides a preliminary set of answers to the following policy questions:

- *What implications does the assessment of the relative importance of time and cost burdens for different groups of respondents have for defining policy goals?*
- *How does propensity to use public transit, and the potential viability of transit service, differ amongst groups of women workers with similar characteristics?*
- *What is the current extent of car-pooling among different groups of respondents, and how could its potential be better used to reduce cost burdens?*

Section One: Commuting Patterns

The household transportation resources of the sample respondents were described in the previous chapter. Results indicate a high level of personal mobility, with 95 percent of respondents having a car available daily, and 96.7 percent with current drivers' licenses. The commuting patterns reported by our survey respondents demonstrate a broad similarity to the travel times reported for residents of the study area in the 1980 Census, as shown in Table 4.1. The comparison presented in Table 4.1 suggests that our survey respondents were more likely to have longer work trips in 1991 than were all heads of household in the study area in 1980. This is significant, because most heads of household are male; the difference may suggest one of three things:

- *travel times are higher for residents of rural places (smaller than 2,500);*
- *travel times have increased for all employed residents of the study area over the past decade;*
- *the tendency of urban women to have shorter work trips than urban men is not evident in rural counties.*

Unfortunately, until the 1990 Census of Population data on travel patterns is available, we cannot determine the source of the observed difference. Nevertheless, the data do support our speculation that commuting distances have become more significant for our study population.

This section outlines the distribution of commuting distances and times for all survey respondents by metropolitan and non-metropolitan location of job. Differences in commuting patterns are analyzed by occupational and industrial sector, by work patterns (regularity of hours

Table 4.1
Travel-to-Work Time, Study Area Sample and 1980 Census of Population

Counties	Minutes				
	< 10	10-19	20-29	30-44	> 45
Benton	35.48	18.90	12.13	18.79	14.70
Buchanan	34.69	27.46	10.63	15.04	12.17
Delaware	39.28	31.86	9.02	6.64	13.19
Jones	42.90	25.09	9.05	9.51	13.45
Average	38.09	25.83	10.21	12.50	13.38
Black Hawk	22.54	46.59	20.94	7.95	1.97
Dubuque	25.44	41.35	15.51	8.57	3.52
Linn	19.53	46.31	20.44	9.71	4.01
Sample	32.20	14.90	26.90	13.20	12.40

Source: Census of Population, 1980 and telephone survey data.

and part- or full-time status) and by "human capital" attributes.

Commuting patterns by metro/non-metro job location

There was substantial variation in the distances travelled by respondents. Table 4.2 shows percentile distributions and means of miles travelled and time spent travelling for employed respondents. Clearly, the most important determinant of distance and time travelled is the metropolitan / non-metropolitan location of the job. Table 4.2 also shows the mean distances travelled by respondents employed in the Cedar Rapids MSA, the Waterloo and Dubuque SMSAs, and in non-metropolitan locations. Although the mean time travelled by non-metropolitan employees is lower than for metropolitan respondents, there is still substantial

variation in travel times - 23.7 percent of non-metro employees travel more than the overall mean distance.

Table 4.2
Distribution of Distance and Length of Work Trips

Percentile	Miles	Minutes
10th	1.0	3
25th	3.0	7.8
50th	15.0	20.0
75th	22.0	30.0
90th	35.0	45.0
Mean	15.4	20.3
Cedar Rapids	24.5	31.6
Waterloo/Dubuque	30.7	38.7
Non-metropolitan	10.9	14.8

Commuting pattern by occupational and industrial sector

Analysis of variance showed some significant differences (at the .05 level) in trip length amongst occupational sectors (see Table 4.2). Skilled blue collar workers (who were employed mainly in Cedar Rapids) had substantially longer mean work trips; the only other occupational group that had a mean trip length longer than the overall mean were professionals. Sales, clerical, unskilled blue-collar and service workers all had low mean trip lengths.

Similar relationships were evident in the analysis of variance by industrial sector (significant at the .001 level). Employees in the manufacturing and professional sectors had

Table 4.3
Commuting Patterns by Occupational Sector

Occupation	Mean Miles	Mean Time	% in Metro Job Locations	% in Lowest distance Quartile	% in Highest Distance Quartile
Executive	15.81	21.06	38.5	21.2	28.8
Professional	17.97	24.5	33.3	16.7	28.8
Technician	15.08	19.81	34.6	11.5	19.2
Sales	11.04	15.87	17.4	47.8	13
Clerical	12.03	16.71	30.5	37.3	20.3
Service	13.82	18.08	26.5	38.8	24.5
Skilled Blue Collar	22.38	24.41	34.5	3.4	34.5
Unskilled Blue Collar	14	19.45	17.2	20.7	24.1
X ² or F-score	2.45	2.00	7.27	40.33	
sig.	.019	.054	.401	.006	
Industry	Mean Miles	Mean Time	% in Metro Job Locations	% in Lowest distance Quartile	% in Highest Distance Quartile
Agriculture	8.6	16	15	55	10
Manufacturing	20.15	24.47	37.9	7.6	37.9
Transport/Wholesale	17.74	19.63	44.4	33.3	25.9
Retail	13.43	17.27	23.3	33.3	20
Finance/Ins/Real Est.	12.4	17.77	37.1	37.1	20
Personal Services	11.97	17.54	14.3	28.6	11.4
Professions	17.17	22.52	33.3	16.7	30.2
Public Administration	8.79	14.79	16.7	43.5	8.7
X ² or F-score	3.80	2.22	15.77	53.05	
sig.	.001	.032	.027	.000	

longer average trip lengths, while those in sectors that might be expected to employ a high proportion of sales, clerical and services workers (public administration, finance/insurance/real estate, retail, and personal services) had shorter trip lengths.

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 (both hourly pay and benefits) would be likely to commute longer distances. Previous research has also addressed the impact of "human capital" attributes - experience and education - on propensity to commute long distances; it has been hypothesized that workers with higher "human capital" attributes will travel further to work because additional job rewards will justify the additional miles travelled. Table 4.4 summarizes differences in trip length by work patterns, job characteristics and "human capital" attributes.

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

Table 4.4 also shows a non-linear relationship between trip length and hourly pay - respondents earning moderately good pay (\$6.75 to \$9.50 an hour) travelled much further on average than those earning more than \$9.50. The relationship was significant at the .05 level (with an F-score of 2.34). Analysis of the variance in hourly pay rates by category of distance travelled indicated a similar non-linear relationship between the two (with an F-score of 3.34,

Table 4.4
Commuting Patterns by Job Characteristics and Human Capital Attributes

	Mean Miles	Mean Time	% in Metro Job Locations	% in Lowest distance Quartile	% in Highest Distance Quartile
Job Characteristic					
Part-time Workers	12.0	16.3	19.3 ^{***}	33.3	18.4 [*]
Regular Work Hours	16.1	20.9	32.6	20.6	26.1
Health Benefit Receipts	19.6 ^{***}	25.2 ^{***}	44.7 ^{***}	13.7	37.3 ^{***}
Metropolitan Workers	25.6 ^{***}	32.8 ^{***}		0	58.4 ^{***}
Income: <\$4.25	11.8 [*]	16.9	23.9	29.9	16.4
\$4.25-\$6.75	15.2	20.0	22.0	24.4	23.2
\$6.75-\$9.50	19.6	24.3	33.3	14.8	29.6
>\$9.50	14.6	19.2	31.0	36.2	31.0
Human Capital					
Highschool or less, less than med. tenure	13.8 ^{**}	18.7 ^{**}	17.5 ^{**}	23.8	15 ^{**}
Highschool or less, more than med. tenure	13.3	17.5	27.3	34.3	21.2
More than highschool, less than med. tenure	20.6	26.3	42.9	10	40
More than highschool, more than med. 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

Sig.: ^{***} < .01; ^{**} < .05; ^{*} < .10.

Table 4.5
Variation in Hourly Pay Rates by Distance of Commute

Commute Distance	Mean Hourly Pay	Median Hourly Pay
Less than three miles	\$9.29	\$5.86
3 to 15 miles (2nd quartile)	\$6.46	\$4.87
15 to 21.5 miles (3rd quartile)	\$6.62	\$6.22
More than 21.5 miles	\$7.47	\$6.94
Overall Mean	\$7.48	

significant at the .05 level). Hourly pay rates were highest for women who worked closest to home, declining for women who worked around the median distance from home, and rising somewhat to the mean value for women who worked furthest from home, as indicated in Table 4.5. 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.

We explored this relationship in more detail using two-way analyses of variance, controlling for human capital attributes and receipt of health benefits (shown in Table 4.6). The relationship remains the same; hourly pay rates were higher for respondents in all human capital categories who worked closer to home, declining somewhat around the median and rising for all except those in the lowest human capital category furthest from home. When we controlled for the effect of health benefits on hourly pay rates by length of work trips, it was evident that for jobs with the shortest work trips, hourly pay rates were highest for those not receiving health benefits (the majority of local workers). As length of work trips increases, hourly pay rises faster for workers receiving health benefits, while it decreases for those not receiving health

Table 4.6
Analysis of Variance in Pay Rates (\$) by Length of Work Trip

	Commuting distance (miles)			
	less than 3	3 to 15	15 to 21.5	greater than 21.5
Human Capital:				
i. less than h.school, less than med.tenure	7.9	5.21	5.66	5.4
ii. less than h.school, more than med.tenure	7.78	6.3	6.67	7.55
iii. more than h.school, less than med.tenure	11.29	5.63	7.56	6.76
iv. more than h.school, more than med.tenure	11.65	9.72	6.58	9.71
	F-score		sig.	
Explained	1.928		0.021	
Interaction	0.495		0.877	
	Commuting distance (miles)			
	less than 3	3 to 15	15 to 21.5	greater than 21.5
Receipt of Health Benefits:				
Yes	8.83	7.85	7.63	8.21
No	9.44	5.8	5.05	4.02
	F-score		sig.	
Explained	2.741		0.009	
Interaction	1.299		0.275	

benefits. It is likely that some of the apparent discrepancy in pay rates by distance is attributable to hourly pay compensating for benefits in local job markets.

The relationships suggested here were explored further using three-way analyses of variance including health benefits and human capital in the same analysis; unfortunately, there were too few cases in each of the resulting categories to draw firm conclusions and the results are not included in Table 4.6. However, the patterns evident in Table 4.6 remained; for all except those in the lowest human capital category, recipients of health benefits received higher hourly pay rates furthest from home, while pay rates for those who did not receive health benefits declined for respondents in all human capital categories (main effects F-score of 3.64, significance of .001, with no significant interaction among the three variables).

The patterns evident in these analyses of variance are complex and non-linear. One explanation 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 this is reflected in their higher hourly pay rates, while those working furthest from home are more likely to have less than median tenure. There are two probable explanations for this difference:

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

Both explanations are supported by research on household 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; analysis of respondent evaluations of job attributes discussed in the following chapter provide support for the second explanation.

Given the non-linear nature of the relationship indicated by these analyses, it was unsurprising that our initial correlation analyses revealed no significant relationship between the two variables. Logarithmic transformations of either or both of the variables did not improve these findings. Controlling for the two variables used here (health benefits and human capital) did not produce an R^2 higher than .09. Our next step was to apply other multivariate methods

to the relationship between distance travelled and hourly pay rates; this is discussed in detail in the following chapter.

Section Two: Assessing the Cost and Time Burdens of Commuting

Two sets of proportional measures were developed to estimate the relative burden commuting imposes on women workers; daily costs were expressed as a proportion of daily pay, and daily time spent commuting was expressed as a proportion of the length of the workday. These proportional measures enable more detailed analysis of the distribution of commuting burdens by the respondent characteristics discussed above.

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). Answers varied widely as calculated on a cost per mile basis. A second more stable measure of cost was used in the analysis, based on a standard total, including direct and indirect costs such as insurance and wear-and-tear, of \$0.21 per mile. If respondents reported they travelled to work regularly with at least one other person, these costs were halved. Monetary costs were further broken down in our analysis to distinguish between absolute costs, and daily commuting costs as a proportion of daily income. This last variable allowed us to isolate the relative importance of commuting costs to individuals.

As with monetary costs, we differentiated between absolute time spent commuting and time spent commuting as a proportion of the time spent working. The second variable gives us a better estimate of the burden commuting time imposes on overall 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 work (the so-called "double shift") and who may experience time constraints more acutely. Time also corrects for differences between metropolitan and non-metropolitan workers who, as a result of congestion, may travel the same distance in different amounts of time .

Monetary cost burden

Monetary cost burdens were substantially higher than perceived out-of-pocket cost burdens when a common standard of \$0.21 per mile was used. A quarter of all respondents still spent less than 2.2 percent of daily pay on travel costs, but the highest quartile spent 20 percent or more of their daily pay commuting. The median was 10.3 percent. Cost burden categories were constructed on the basis of these quartiles. There was a rough correspondence between categories of perceived costs and actual costs that serve as the basis of analysis here.

There was a significant relationship between cost burden and occupational and industrial sector. Women in the retail industry were dichotomized - they were more likely to be either very high or low cost burdened workers than were respondents in other occupational categories. Women in the finance/ insurance/ real estate, business services and public administration industries tended to have low cost burdens, while those in manufacturing and in personal services were more likely to have high cost burdens. Table 4.7 summarizes cost and time burdens by industrial sector.

There was little relationship between cost burden and work patterns (as shown in Table 4.8). It is interesting that there was no discernible relationship with full- or part-time

status. Even though part-time employees have shorter work trips than full-time employees, commuting represented a similar cost burden when standardized by daily pay rates. Recipients of health benefits were more likely to have high cost burdens (there is a certain spuriousness though in 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 length of tenure rather than by educational qualifications. This supports the argument made in the previous section - that longer job tenure is more likely to be associated with shorter work trips, and thus lower commuting cost burdens.

Metropolitan workers were more likely to have high cost burdens; interestingly, non-metropolitan employees with high cost-burdens showed some similarities to metropolitan workers

Table 4.7
Industrial Sector and Commuting Cost Burden

	Mean Cost Burden	%in Lowest Cost Burden quartile	%in Highest Cost Burden Quartile
Agriculture	5.96	50	8.3
Manufacturing	15.97	5.9	33.3
Transport/Wholesale	13.02	33.3	14.3
Retail	13.98	33.3	33.3
Finance/Ins/Real Est.	9.61	39.3	10.7
Personal Services	19.26	29	45.2
Professions	15.24	13	24.7
Public Administration	7.49	42.1	5.3
X ² or F-score	2.428	56.93	
sig.	.020	.000	

Table 4.8
Job and Human Capital Characteristics and Commuting Cost Burden

	Mean Cost Burden	%in Lowest Cost Burden Quartile	%in Highest Cost Burden Quartile	X ²	sig.
Part-time Workers	14.67	28.9	26.8	3.38	.33
Regular Work Hours	14.55	18.4	25.9	9.28	.025
Health Benefit Receipts	15.04	14.3	29.4	12.57	.005
Metropolitan Workers	22.18	0	43.3	60.27	.000
Human Capital:				21.81	.009
Highschool or less,less than med.tenure	16.46	19.7	36.6		
Highschool or less,more than med.tenure	12.14	28.2	20.5		
More than highschool,less than med.tenure	17.84	11.3	26.4		
More than highschool,more than med.tenure	10.28	32.8	17.2		

in the same cost burden category. They tended to be in the manufacturing, professional or personal services industries, and were more likely than average to be full-time workers (56.8 percent). Their hourly pay was lower than that for employees in metropolitan locations, with three-quarters earning \$6.07 or less; they were also slightly less likely than the population as a whole to receive health benefits (45.9 percent). A high proportion of cost-burdened non-

metropolitan 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 experience in the job.

We may conclude that the group of respondents most affected by commuting cost burdens are those with less than median job tenure, in services, manufacturing or professional industries. Metropolitan employees are more likely to have higher time and cost burdens, but a proportion of non-metropolitan employees with lower "human capital" attributes in specific sectors are also affected. Health benefits compensate for the commuting cost burden of some (but not all) of these employees.

Time Burdens

The distribution of time burdens amongst our respondents showed some similarity with the distribution of cost burdens, although there was no relationship to income and a stronger relationship to receipt of benefits, especially health insurance. Time burdens were concentrated among women in metropolitan jobs.

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

As expected, there was substantial though not complete overlap between respondents who were cost-burdened and those who were time-burdened; 63.1 percent of those who were severely

time-burdened also had severe cost burdens, while 80 percent of those who had the lowest time burdens also had the lowest cost-burdens. There was no apparent relationship between time burden and presence of children or marital status; this finding is interesting given earlier studies of women's transportation patterns that hypothesized that women worked closer to home because short commuting distances allow them to fulfill their domestic responsibilities. Age had no apparent relationship with severity of time burden.

Table 4.9
Time Burden and Industrial Sector

	Mean Time Burden (% of work day)	%in Lowest Time Burden Quartile	%in Highest Time Burden Quartile
Agriculture	6	50.0	15.0
Manufacturing	9	10.6	31.8
Trans- port/Wholesale	8	29.6	22.2
Retail	7	30.0	16.7
Finance/Ins/Real Est.	7	40.0	20.0
Personal Services	8	22.9	22.9
Professions	9	17.7	30.2
Public Adminis- tration	6	37.5	16.7
X ² or F-score	1.575	35.38	
sig.	.142	.025	

There was a significant relationship between category of time burden and industrial sector as shown in Table 4.9 (at the .05 level). Respondents with very low time burdens were more likely to be in the finance/ insurance/ real estate industries, or in public administration or

agriculture. Those with the most severe burdens were more likely to be in manufacturing or professional industries. This is similar to the relationship noted above between cost burdens and industrial sector.

Location of job was significantly related to time burden; 34.2 percent of women in non-metropolitan employment had very low time burdens (compared to 2.3 percent of metropolitan workers) while nearly half (47.7 percent) of Cedar Rapids employees had severe time burdens. However, non-metropolitan employment did not have similar effects for all women; 34.1 percent of severely time-burdened women work in non-metropolitan locations.

Time burden was related to our summary human capital variable (significance .011). Two thirds of women with more than a high school diploma but less than four years experience with an employer had a time burden higher than the median, while women with no more than a high school diploma but more than four years experience were more likely to bear a time burden less than the median (57.1 percent). These results are summarized in Table 4.10.

There was some relationship between time burden and days worked per week, but not the one expected. It was anticipated that many commuters who travel long distances would attempt to compensate by travelling fewer days for longer working days, but none of our most severely time-burdened respondents worked fewer than four days a week, and a small proportion worked six or seven days. However, those with the lowest time burdens were more likely to work six or seven days a week than other respondents. It is apparent that 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

Table 4.10
Job and Human Capital Characteristics and Commuting Time Burden

	Mean Time Burden (% of work day)	%in Lowest Time Burden Quartile	%in Highest Time Burden Quartile
Part-time Workers	8	25.4	23.7
Regular Work Hours	8	20.6	25.7
Health Benefit Receipts	1**	17.4***	34.2***
Metropolitan Workers	13**	3.0*	53.5*
Income: <\$4.25	7	31.3	20.9
\$4.25-\$6.75	8	22.0	25.6
\$6.75-\$9.50	9	14.8	27.8
>\$9.50	8	22.4	25.9
Human Capital:	**	*	*
Highschool or less,less than med.tenure	8	18.8	20
More than highschool,less than med.tenure	7	34.3	19.2
Highschool or less,more than med.tenure	10	11.4	35.7
More than highschool,more than med.tenure	8	29.8	27.4
Domestic Role:	*		
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

Sig.: *** < .01; .01 < * < .05.

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 is an interesting finding, because conventional analyses of trip length assume that increased

pay is the principal item commuters trade off against distance. The relationship between income and distance travelled is explored in more detail in the following chapter.

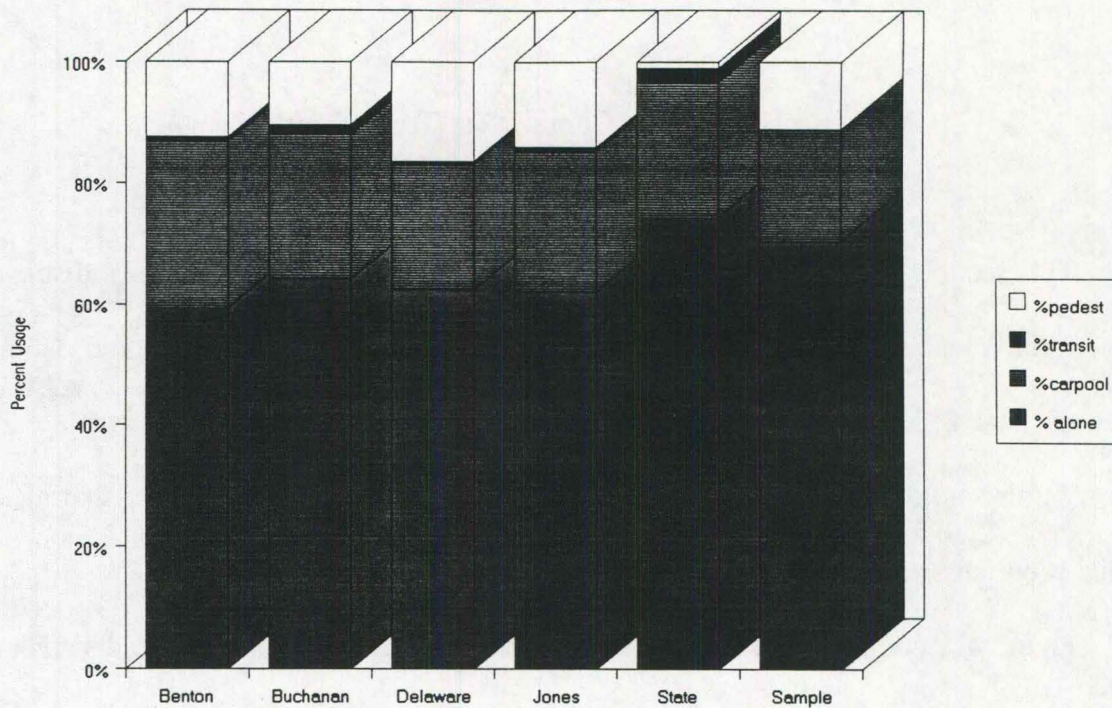
Section Three: Commuting Travel Modes

This section discusses the modes of transportation used for the work trip, distinguishing between individual car trips, shared trips, and pedestrian or bicycle transportation. Commuting modes are analyzed by location of job, occupational and industrial sector, and income. The size of firm is also noted, as this has policy implications for the viability of ride-sharing or van-pooling programs.

Figure 4.1 compares the modal split reported by our respondents with that reported by the 1980 Census of Population. Our sample was chosen from the rural portions of the study area counties, so no use of public transit was reported. The most interesting feature of this figure is the lower rates of car-pooling amongst the sample respondents (18.2 percent), and the higher proportions travelling alone in a car (70.3 percent). Again, until the 1990 Census data are available it is unclear whether this reflects a trend over the past decade (from an era of higher gas prices to lower ones) or whether it is a finding specific to employed rural women.

Chi square analysis of the relationship between commuting mode and a range of other characteristics showed that metropolitan employees were more likely to rideshare than non-metropolitan employees - nearly 25 percent of metropolitan employees reported ridesharing, compared to 15.3 percent of workers in other locations. Three quarters of those who reported ridesharing as their most common mode were full-time workers (compared to 62.2 percent of

**Figure 4.1
Commuting Modes**



those who drove alone) and the majority of ride-sharers (85 percent) worked regular hours, compared to 62 percent of those who drove alone. There was a significant relationship between travel mode and benefits - two-thirds of ride-sharers received health and/or retirement benefits. Receipt of benefits for those who drove alone was similar to the population as a whole, while those who walked or cycled 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.

Half our respondents (49.8 percent) reported they combined work trips with household errand trips at least weekly, with similar percentages combining either child-related (18.9 percent) or household errand trips (21.9 percent) daily. Interestingly, there was no significant

relationship between travel mode and dual purpose trips. Of those combining either child- or household-errand trips with work trips daily, 21.7 percent were ride-sharers, though very few were pedestrians or cyclists. This is significant because an objection often raised against ridesharing is that it assumes single purpose work trips. 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 ride-sharers, though ride-sharing only constituted 18.2 percent of work trips. There was a significant relationship (at the .01 level) between work trips mode and income; ride-sharers were more likely to earn near median income (72.9 percent earned between \$4.25 and \$9.50 an hour) while those who drove alone were more likely to earn very high (more than \$9.50 and hour) or low (less than \$4.25) hourly pay. In part, these differences can be accounted for by the metropolitan / non-metropolitan job split.

Ride-sharers 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 ride-sharers had time burdens in the upper quartile of the distribution.

Receptiveness to Public Transit

A surprising number of respondents claimed they would be willing to use public transit for their journey to work if it was available - a total of 51.3 percent of employed respondents. More than two thirds of respondents reporting ride-sharing said they would use public transit if it was available, while 53.5 percent of individual car users would consider using transit.

There are significant problems with using survey replies as a basis for expanding public transit service - many of the rural transit providers we contacted had little success expanding

services to the general public for work trips, as discussed in chapter six. 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 it than respondents overall (71.2 percent compared to 51.3 percent); in fact, all except those in the lowest cost-burden category were more willing than average to consider using transit. There were also strong positive relationships with time spent travelling and distance travelled. Respondents working in metro areas were much more likely to be willing (75 percent) than those employed in non-metro locations, although a surprising number of the latter (41.3 percent) would be in favor of transit. Interestingly, there was no significant relationship with occupation or industry (despite the fact that 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 attached to job convenience as a value, but not in the direction one might expect. Those who attach moderate importance to convenience were more likely to be willing to use transit than those who place a high value on convenience. It is likely that this is a result of the fact that women who seek to minimize travelling 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 job convenience were only slightly less likely to be willing to use transit than were respondents as a whole (49.1 percent).

Overall, the time and cost burdens imposed by commuting, and the related issue of job location, appeared to be the most important predictors of willingness to use transit.

Size of Firm

The final issue of importance for modal choice is the size of firms for which respondents worked. Work-based ride-sharing or van-pooling is generally perceived to be easier to organize and more likely to be 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 by location of job. The median firm size for those employed in Cedar Rapids was 225 employees, with 58.1 percent working in firms with more than 100 employees. For those employed in non-metropolitan locations, median firm size was 15, and only 18.4 percent of non-metropolitan 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). Average firm size for full-time workers and for those with regular work hours 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 for those receiving health benefits was 754 employees, 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 ride-sharing or van-pooling viable.

Conclusion

A broad correspondence was suggested 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 following chapter explores this relationship in more detail, in order 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 non-metropolitan 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 the metropolitan jobs held by survey respondents tend to be concentrated in particular occupational and industrial sectors, which do not reflect the overall job mix in those metro areas 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 non-metropolitan 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 non-metropolitan locations.

We may conclude that metropolitan adjacency offers rural residents better jobs only in some sectors (manufacturing, and business and professional services predominately); metropolitan adjacency offers few incentives to employees in more traditionally "pink collar" sectors.

This supports 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 thus women choose from a range of similar jobs distinguished only by distance from home. Their research was conducted at the intra-metropolitan level; these findings extend this explanation to refine our understanding of the metropolitan / non-metropolitan job split.

Specific groups of rural women do experience quite substantial commuting cost and time burdens. As expected, metropolitan employees were far more likely to have high cost and time burdens, although a significant minority of burdened commuters were non-metropolitan 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 when travelling is standardized by workday length and daily pay. There is some evidence that high cost and time burdens are traded off against health insurance benefits, but this is not the case for part-timers, few of whom receive job-related benefits.

A potentially significant finding is that 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 amongst employees with burdensome work trips. Significantly, respondents with the longest job tenure tended to have shorter than average work trips.

The policy implications of these commuting patterns were explored in the discussion of commuting modes. Two main alternatives were explored - ride-sharing, and the potential for

public transit service. Relatively high levels of ride-sharing were found amongst metropolitan employees; respondents in metropolitan jobs in general tended to work full-time, regular hours for large firms, suggesting that ride-sharing options could be expanded further amongst this group of commuters, who are also the most likely to be cost-burdened. Ride-sharing was as likely to occur with co-workers as with family members, and it was found that ride-sharing did not rule out multipurpose work trips involving child-related or household errand trips.

Cost-burdened commuters and metropolitan employees were very receptive to considering alternative modes and responded positively to a question about public transit. These results should be interpreted with care, given that almost no respondents would be captive commuters and that transit trips would lengthen work trips that are already long. Nevertheless, the receptivity to alternatives to individual car travel should be taken as a positive sign contradicting assumptions about consumer preferences for individual travel.

Chapter Five

Explaining Women's Commuting Choices

No linear relationship was found between work trip length and hourly pay in the previous chapter's discussion of commuting patterns. While we were able to describe differences in commuting patterns attributable to metropolitan and non-metropolitan job location and assess the time and cost burdens commuting imposed on different groups of respondents, we were not able to provide a satisfactory explanation of commuting choice. Furthermore, our descriptive analyses of employed respondents suggested that commuting decisions varied substantially between respondents, but we were not able to identify a systematic basis for that variation. A more precise delineation of the reasons some respondents choose to commute longer distances than others, and how commuting burdens differ between well-defined groups of respondents, is needed to refine the tentative conclusions drawn about policy alternatives.

The first section of this chapter attempts to develop a model of the factors that are most important to respondents' decisions to commute significant distances. We begin this analysis with an examination of the attitudinal questions asked in the survey about which job attributes were most important to respondents. Six job attributes were defined - job security, satisfaction, status, benefits, pay, and convenience of location. Respondents' ratings of the importance of these job attributes are analyzed to determine the trade-offs women make between commuting options. An interesting feature that emerges from the preliminary analyses in the previous chapter and the first section of this chapter is the existence of distinct groups of respondents with different work

patterns, job reward structures, "human capital" attributes, and evaluations of job characteristics. In section two of this chapter we explore these differences further, using cluster analysis to highlight the underlying structure that earlier analyses suggested exists. Three distinct sets of respondents emerge, and the groupings are analyzed to discern differences in patterns of labor force involvement and commuting behavior.

Subsequently, we go on to 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?*

Section One: 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 that enter into the choice of job. Our survey instrument asked respondents to rank the importance of each of six job rewards on a scale of one to five. The job rewards were defined as: status, security, pay, convenience of location, satisfaction, and provision of benefits. We analyzed the relationship between the importance attributed to different rewards and the human capital characteristics, family responsibility, job characteristics and work patterns of our respondents.

Table 5.1
Respondent Evaluation of Job Rewards

	percent rating attributes "very important":					
	Status	Security	Pay	Convenience	Satisfaction	Benefits
Full-time workers	61.1	91.2	77.9	44.2	89.4	74.7
Part-time workers	59.8	77.2	69.3	58.8	82.5	51.8
Hourly Pay:						
less than \$4.25	76.9	89.6	67.2	50.7	88.1	56.7
\$4.25 to \$6.75	57.3	79.3	70.7	52.4	80.5	68.3
\$6.75 to \$9.50	51.9	92.6	83.3	37	87	77.8
more than \$9.50	61.4	81	79.3	48.3	91.4	70.7
Human Capital:						
high school/less, less than median exp.	65.8	85	70	61.3	87.5	62.5
high school/less, more than median exp.	59.6	83.8	72.7	49.5	85.9	64.6
more than h.school, less than median exp.	58	87.1	82.9	38.6	85.7	68.6
more than h.school, more than median exp.	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	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	64.2

The variable associated with the most significant differences 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, while part-time workers placed greater value on convenience of job location, as shown in Table 5.1. Regular workers (working the same times each week) were more likely to value benefits, pay, and job satisfaction than irregular workers; respondents

working short weeks (less than four days a week) were less likely to value job security and job status. This is consistent with the expectation that "career" employees cannot choose to work flexible or shorter hours without jeopardizing their security and prospects for advancement.

Differentiating respondents by category of hourly pay revealed significant (but non-linear) relationships with the evaluation of job satisfaction (with those earning low to moderate pay less likely to value job satisfaction highly) and with the evaluation of the availability of benefits (with those in the moderate to high pay category most likely to value benefits highly). Although the relationship was not significant, respondents in the moderate to high pay category were least likely to value convenience of location highly. There was a close correspondence between pay and benefits, with those receiving benefits valuing both pay and benefits highly, and higher paid workers valuing benefits highly. Respondents receiving benefits were more likely to value job security highly; respondents not receiving benefits were more likely to value convenience.

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 convenience of job location. There was very little variation in the value placed on different rewards that was explicable by marital status or the existence of children, contrary to our expectation that single women or parents would place greater value on pay, benefits and security. It is clear that married women and women without children are just as likely to see themselves as important contributors to household well-being as women who do not share responsibility with another breadwinner, or who have responsibility for children.

An overall picture begins to emerge of a dichotomized labor force - between full-time, moderately well-paid workers who are most concerned about benefits, pay and security, and less concerned about convenience of location, and predominately part-time less regular workers who value convenience of location above benefits, pay and security. This apparent dichotomization is explored further using cluster analysis in the following section of this chapter. Interestingly, family responsibilities and human capital variables appeared to have little relationship with the division between the two categories. There were few discernible differences in the degree to which workers valued job status. We can conclude from this preliminary discussion of job rewards that minimizing commuting distance is a contributing factor for women who decide to work in the local labor force, and for those whom we identified as "underemployed" in chapter three.

Section Two: Distinguishing Groups of Respondents

Our next step was to explore further the apparent differences among the survey respondents along a number of common dimensions. We chose to use a highly empirical technique to explore the divisions that might exist among groups of women workers. Cluster analysis groups cases into a pre-determined 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 variables chosen (Everitt 1974). Variables are standardized into Z-scores to ensure that each variable has the same power in the differentiation

process, though variables with a greater range will of necessity have more impact on the results (Affifi and Clark 1984).

Cluster analysis was performed with different combinations of variables and numbers of clusters to explore 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 match - using two clusters reduced the F-scores obtained for some variables, and using more than three clusters produced additional disproportionately small groups (with less than five cases). Visual inspection of scatter plots of the standardized variables used in the analysis 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:

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

Cluster Groupings

Table 5.2 summarizes the group profiles defined by our cluster analysis on six standardized variables. The scores in the table represent proportions of standard deviations above or below the mean scores for that variable; the standardized income score is of the natural log of hourly income, because hourly pay rates introduced too wide a variation to enable significant levels of discrimination by any other variables.

Table 5.2
Cluster Groupings Obtained

Variable	Group 1	Group 2	Group 3	F-score
Experience	-.3641	-.0819	.4388	27.72
Schooling	-.4384	-.1220	.5453	45.98
Log Income	-.6630	.1225	.7870	109.69
Convenience	.3378	-.6499	-.2125	22.52
Benefits	-.0869	-1.035	.3769	36.71
Security	.2460	-2.305	.3364	332.08
N	158	37	138	

The first group of respondents are characterized by low human capital attributes - they have 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 are two thirds of a standard deviation below the mean of the natural log of hourly pay rates. The values they place on benefits and job security are close to the mean, but the value they place on convenience of job location is 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 to trade off convenience of job location than other workers. This is also the largest of the groups identified, with 158 respondents.

Group two is smaller than the other groups, with human capital attributes and income close to the mean for employed respondents, but group members rate all three job characteristics included here of much lower importance than do other respondents. We may speculate that this group is willing to trade off convenience of job location for hourly income rates that are slightly higher than the mean, but members place a lower value on benefits and security.

Group three could be characterized as high-paid, high-skilled workers who value benefits and job security more than other respondents, and are 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 were found with variables not used to cluster the groups, suggesting that the empirical model developed here 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, while group three 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 non-metropolitan areas (75.3 percent and 81.1 percent respectively), while group three were more likely to be metropolitan workers (39.9 percent).

Table 5.3
Job Characteristics by Cluster Groupings

	Group 1	Group 2	Group 3	X ² or F- score	sig.
% part-time	39.2	67.6	19.6	38	(.000)
% regular hours	63.3	43.2	73.9	12.48	(.002)
% receiving health benefits	36.1	27	68.1	41.44	(.000)
% receiving retirement benefits	39.2	16.2	71.7	55.63	(.000)
% in metropolitan jobs	24.7	18.9	39.9	10.61	(.005)
Mean hourly pay (\$)	4.4	7.43	11.33	53.57	(.000)

There was a strong significant relationships between group membership and part- or full-time status. Nearly 40 percent of group one members were part-time employees, but more than two thirds of group two members were part-timers, while eighty percent of group three members were full-time employees. 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 (significance of .000) was detected between group membership and turnover - 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 large majority of group two members received no benefits.

Groups were also differentiated by age, although the relationship was only significant at the .1 level; group one workers were most likely under 34 while group two and three members

were more likely to be older than 45. In part, 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), while 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 eighteen at home. A strong significant relationship was evident between cluster group membership and household income (significant at the .000 level). More than two thirds (68.4 percent) of group one members and 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), while approximately one third (34.2 percent) of group three members were in this household income category.

While groups one and two appear to have some similarities in types of job held, their commuting characteristics distinguish them. Group two members, given their greater likelihood of part-time employment, have work trips much shorter than the mean. Although Group one members travel just less than the mean, (and, as we saw, are more likely to value convenience highly) they have the highest cost burden of any group. They also have 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, reported willingness to use public transit and propensity to ride-share showed little variation (except for Group two members, whose shorter work trips probably do not justify ride-sharing).

Table 5.4
Commuting Characteristics by Cluster Groupings

	Group 1	Group 2	Group 3	X ² or F-score	sig.
Mean work trip (miles)	14.08	10.32	18.04	5.966	(.003)
Mean cost burden(%)	17.05	12.13	10.78	6.148	(.002)
Mean time burden	0.08	0.08	0.09	0.96	(.384)
Mean car age	6.34	6.86	4.42	9.569	(.000)
% receptive to transit	51.4	50	52.5	0.807	(.960)
% ridesharing	18.1	10.8	20.3	3.974	(.409)

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 be part-time, irregular less committed workers who find the best balance 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, but although their work trips are somewhat shorter they are more burdensome proportionately. At present, the proportion of this group that rideshares is similar to the sample mean; however, as nearly two-thirds of them work regular hours and a slightly smaller proportion work full-time, many more members of this group may find ride-sharing an attractive option.

Group one members have similar "human capital" attributes to the group of potential labor force participants identified in chapter three. The high commuting cost burdens experienced by this group provide further explanation of the commuting disincentive that may keep many current non-participants out of the labor force. Policy that attempts to expand labor force participation amongst rural women must address the commuting burdens of this group of current and potential workers. The high value placed on job security by this group of respondents indicates that labor force participation is important to them and to the well-being of their families.

Section Three: A Model of Commuting Behavior: Health Benefits and Work Site Location

In this section we present two models of commuting behavior. Both these models 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 distance travel-to-work patterns by women in the study area.

A large proportion of the demographic data collected in the telephone survey was recorded categorically or ordinally. In some cases this 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 importantly, the distributional assumptions of multiple linear regression cannot be sustained using some of our survey data, particularly that

concerning demography. In the following series of analyses, the logistic regression technique is used to analyze commuting patterns. Logistic regression is most commonly used in the medical field but is recently 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 ($X_{1...p}$). 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:

$$\text{probability of membership of group } I = \frac{1}{1 + \exp[-(\alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p)]}$$

In the following analyses, women in the sample were assigned to various commuting groups based on 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 of the various groups. Practically, this meant that individuals were classed as either long distance work commuters or short distance work commuters. Demographic, wage, work and other commuting variables were then used to predict membership of long or short distance commuting groups. Independent variables in the various equations were selected either because of their theoretical importance 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: HBR2, indicating whether or not health benefits were provided by employers, and LOCATS2D, indicating whether or not the employment was in one of the three metropolitan areas.

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

The constant and independent variables were all significant at .0001 and the equation correctly categorized just under 79 percent of all individuals as either long or short distance commuters. Long distance commuters were 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 (the constant e raised to the power of β) provides one of the simplest ways of interpreting the results of logistic regression. The odds ratio for HBR2 was 3.1363, indicating that women who received health benefits from employers were about three times more likely to be long distance work commuters than women who do not receive health benefits. LOCATS2D had an odds ratio of 12.1608, indicating that women who work in metropolitan areas were 12 times more likely to be long distance commuters than non-metropolitan women workers; thus long distance commuting to other rural job locations does not appear to be a common occurrence.

Before discussing an alternative model a number of points needs be made. HBR2 and LOCATS2D were consistently prominent in almost all of the models developed. Given the geography of the area concerned, it is entirely unsurprising 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 other rural job sites. Thus the model highlights the very close relationship between metropolitan employment and long distance work commuting for rural women.

The prominence of 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 increased work commute distance for greater income. Using various measures of income and the commute distance, we found no evidence in any of our equations to support this contention. On the contrary, female workers in the study area appeared to regard health benefits rather than income as a much more potent incentive for increased work-based commuting. In some equations we replaced or combined HBR2 with variables indicating the presence of other work benefits, both material and psychic - retirement benefits, job security, job status - with generally poor results. In order to test whether our findings concerning health benefits and commuting were not spurious, in some equations we replaced HBR2 with a series of variables which attempted to capture respondents' rankings of various "potential" job attributes: increased status, increased earnings, improved security, greater work satisfaction, and the presence of benefits. Of these, only the benefits variable (ARVAL6) 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 commute for rural women.

As indicated in the previous chapter, 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 commute of male and female household members. Models were built which included a number of variables summarizing domestic demography. Variables included such things as 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 particularly interesting measure of relative domestic role since it provides an estimate of the overall 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 which includes a wider set of those variables of theoretical interest. Of the new variables in this equation, three concern work-patterns: PTRD2 indicates part-time work, REGS1 the regularity of work hours, and OTJOBS whether a second job is worked. Our assumption here was that those in full time employment, or those who worked regular hours, or those without a second job, would be more likely to travel further. HPRATS is calculated hourly earnings and ROCCS2D is an eight category occupational variable. The eight categories enter the equation as deviation contrasts: that is, the effect of each category of the variable (except one) is compared to the overall effect. The four transportation variables used were: TRANX117, TRANX118, TRANX119, and CARAGE. The first three

Table 5.5
Probability of Long Distance Commuting

Variable	Beta	Standard Error	Exp(Beta)
HBR2	2.2351**	.4689	9.3470
PTRD	.3634	.4594	1.4382
LOCATS2D	2.5606**	.4549	12.9435
REGS1D	.0048	.4069	1.0048
TRANX117	.3593	.4815	1.4323
TRANX118	-.0684	.4487	.9338
TRANX119	.6132	1.1853	1.8464
ROCCS2D			
ROCCS2D(1)	-.1411	.4521	.8684
ROCCS2D(2)	.6465	.4306	1.9088
ROCCS2D(3)	.5255	.6494	1.6914
ROCCS2D(4)	-.7729	.7375	.4617
ROCCS2D(5)	-1.1317*	.4881	.3225
ROCCS2D(6)	.0159	.4764	1.0160
ROCCS2D(7)	.6493	.5851	1.9142
CARAGE	-.0434	.0484	.9576
HPRATS	-.0666	.0491	.9355
HUMCAP			
HUMCAP(1)	.9960	.6095	2.7074
HUMCAP(2)	.2903	.5762	1.3369
HUMCAP(3)	1.3979*	.5945	4.0467
OTJOBS1	-.2132	.6812	.8080
DOMROL			
DOMROL(1)	-.7724	.6285	.4619
DOMROL(2)	-.1405	.6491	.8689
DOMROL(3)	.0795	.5043	1.0828
CONSTANT	-2.2236*	.9036	

Significance: ** < .01, * < .05.

indicated the regularity with which work trips were combined with child trips, 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. CARAGE was the age of the car used for work commuting. Since most respondents had licenses and had a car available for their use, the age of the car seemed to be the most important constraint on long distance travel. DOMROL and HUMCAP were two demographic variables: the former was an index of domestic responsibilities based on household type and number of children, and the latter was an index of human capital based on individual work experience and education. Both used indicator contrasts: in other words, the effect of each category was compared to the effect of the last category. In this case the last categories contained those who had the most domestic responsibilities or the most human capital.

The model classified 81 percent of respondent correctly: the various measures of goodness of fit suggest that the model summarized the data well. Note however that only HBR2 and LOCATS2D feature significantly and prominently in the equation. ROCCS2D(5), those in administrative support occupations, and HUMCAP(3), those with more than a high school education but less than median length job tenure, were also statistically significant. Those who were not administrative support (clerical) workers were three times more likely to be long distance work commuters.¹ Those with more than high school education but less than median job tenure were much more likely than those with both more than high school education and more than median job tenure, to be long distance work commuters. As our earlier analysis of variance indicated, women in clerical occupations tended to travel less far to work, and those

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.

with good education but who had not worked at their job for long also travelled further to work, especially so when compared to those who had worked at their jobs for a long period.

The models clearly indicate that women who receive health benefits were much more likely to travel further to work. Women who work in metropolitan locations were also likely to travel further. We believe that part of the explanation for this is that metropolitan areas provide much more diverse labor markets, and in some instances are therefore much more attractive for rural women.

Conclusion

This chapter has explored the relationship between work trip length 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 differentiated 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 were predominately 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 provide further explanation of 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 were not able to discern a linear relationship between work trip length and hourly pay rates, we were able to 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-based 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 this have an effect on their willingness to commute longer distances?

We may note further that while fewer members of the cluster group identified as cost burdened received health and retirement benefits than did respondents as a whole, they placed an average value on availability of benefits in the job evaluation questions. 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

The research findings outlined in the previous three chapters have identified a range of different commuting patterns, work patterns and job reward structures. Rural women do not share a common set of transportation and employment problems; our research was aimed at highlighting the diversity of work experience and commuting patterns in the study population. As we argued in the introduction to this report, policy responses that treat target populations as an undifferentiated whole are bound to provide ineffectual solutions to policy problems.

Perhaps the most important distinguishing feature was individuals' trade-offs between longer work trips and jobs with better rewards. While no linear relationship was identified between hourly pay rates and length of work trip, we have shown that receipt of health benefits provides a sound explanation for longer work trips. Respondents who value employer-provided health benefits are more willing to travel longer distances than those for whom health benefits are less important. Thus, although local jobs provide higher hourly pay rates for almost all categories of respondents than did more distant jobs, local jobs were much less likely to provide benefits. Significant differences in length of job tenure were identified between metropolitan and non-metropolitan workers, especially amongst cohorts with better educational qualifications. We speculated that while some respondents (especially more highly educated ones) are more likely to choose jobs with benefits over conveniently located jobs, they are also more likely to change

jobs more frequently. Employee turnover rates may be increased among respondents with longer work trips.

A further distinguishing feature is that non-metropolitan jobs were much more likely to be part-time or seasonal than those in metropolitan locations, and were more likely to be available in traditionally "feminized" occupational sectors. Holders of non-metropolitan jobs and home-based workers were also much more likely to see long work trips as a disadvantage. While the extent of under-employment in non-metropolitan locations (and the lower household incomes associated with under-employment) suggests that many current workers could be attracted into full-time full-year employment, two main barriers to expanding employment were identified:

- *part-time and home-based workers were more likely to have children at home, and thus greater domestic responsibilities;*
- *although the vast majority of respondents were mobile, commuting was perceived as a disadvantage by many non-metropolitan workers, who were willing to sacrifice benefits and pay for convenient job location.*

Transportation was a contributing but not a primary reason given for non-participation in the labor force by potential participants. We did identify a small group of relatively transportation-disadvantaged non-participants, most of whom had some access to a vehicle, but one which was far more likely to be older and thus less reliable.

We have thus identified a variety of ways in which work trip length affects labor force participation decisions. Policy alternatives that address the issue fall into two main categories: i) those that minimize the friction of distance by providing less-costly and more reliable alternatives to individual car travel; ii) those that minimize the friction of distance by decentralizing better quality jobs to non-metropolitan locations. This chapter examines current experience

and research on the policy options available under each of these categories, and assesses their viability as solutions to the range of commuting problems identified amongst the study area sample population.

Section one of this chapter examines the alternatives offered by some form of rural transit provision, outlining experience elsewhere with transportation brokerage agencies, coordinating social service agency and volunteer transportation services, and integrating private transportation providers through the use of subsidies to specific clients. Although the high rates of car ownership and household mobility among the survey respondents, and their relatively long work trips to dispersed job sites suggest that public transit will not play an important role in the commuting patterns of current employees, we did identify a small group of relatively transportation disadvantaged potential labor force participants for whom supportive transportation services would be valuable.

Ridesharing and van-pooling organized at either the workplace or the community level offers a more viable alternative for a large proportion of those we identified as cost-burdened. Section two examines existing research on ridesharing and van-pooling and evaluates the applicability of programs in the study area. While ridesharing or van-pooling would not be appropriate for all cost-burdened commuters, expanding existing use of these strategies would serve a large proportion of those in need.

Section three examines the potential offered by the second broad strategy - overcoming the friction of distance by decentralizing better quality jobs to non-metropolitan locations. Successful rural development strategies used elsewhere are examined, and their applicability to the study area is assessed.

Section One: Public Transit Service Provision

Rural transit provision faces a number of constraints. Passenger transportation services in rural areas have decreased steadily as a result of the post-World War II rise in car ownership, and more rapidly subsequent to the deregulation introduced in the Bus Regulatory Reform Act of 1982 which addressed the profitability problems of intercity bus companies. A study of bus service to small towns in Iowa conducted two years after the Bus Regulatory Reform Act indicated that two thirds of the responding locations had lost service as a result 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 only available in a minority of communities. The sparseness of rural settlement, the dispersal of job sites, and the time and distance constraints involved may imply that no form of public transportation for any but captive populations would really be viable.

Local paratransit providers who have attempted to expand services into surrounding rural areas to serve the general public and commuters have encountered resounding apathy from their target markets.¹ Transit trips are inevitably more time consuming than individual car trips, and thus less attractive for non-captive riders with relatively lengthy work trips. Conventional public transit services for low density low ridership regions are more likely to require extensive subsidies, and the burden falls on local communities given the dearth of federal funding for rural

¹ Advisory committee members described two such 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 in rural Linn county that would serve commuters. The meetings generated almost no response, identifying only one potential user. The other example is from 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.

transportation programs (Burkhardt 1981). However, it is also possible that more innovative and cost effective options may be explored to provide work-trip alternatives for occasional users and the non-elderly, non-handicapped transportation disadvantaged rural residents. Alternatives that have been discussed elsewhere include integrating rural public transit service with mail carrier service, along the lines of the "postal bus" concept used in a number of 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, the number of absolutely transportation disadvantaged current or potential workers is small, but there are many gradations in disadvantage which may be addressed by intermittent use of support options.

Transportation brokerage services represent an approach based not on service provision but on understanding and accommodating actual demand for transportation services by specific target groups (Schreffler 1985). Transportation brokerage services fulfill three main functions - they locate areas of surplus and need, resolve potential barriers and market imperfections, and finally consummate the sale or transaction. A rural transportation broker may thus be involved in identifying existing volunteer or agency-based services, ridesharing and vanpooling opportunities (either work-based or community-based) and other potential "surpluses" such as the mail van or school bus, or private taxi. Clients would be matched with available services on an individual basis. Organizing agreements with these various existing services and administering subsidies for riders in need (for instance, using a voucher system for low-income new entrants to the labor force) would resolve barriers and address market imperfections. This approach is

distinct from requirements for "coordination" of services in that it focusses on the needs of specific users and makes the best use of available resources.

Despite the problems identified in developing and sustaining a rural public transit system, a number of examples of general access transit services in comparable rural areas with a ridership composed partly of the low income general public were identified. Many of them were based on the co-ordination of pre-existing services or private providers, and many were able to operate without very large public subsidies. The remainder of this section compares a range of rural transit systems that serve the general public as well as the elderly and disabled, focussing on the types of services they incorporated, the population served, and the type of service provided. It should be noted that this is a very selective set of transit systems, based largely on a Department of Transportation report (DOT 1987) and coverage in recent issues of *Community Transportation Reporter*. However, we believe the cases reviewed here reflect a range of appropriate examples of how service can be delivered to rural communities.

The most common way in which rural transit services were established was through the co-ordination and extension of existing special-purpose services, such as elderly or disabled transportation. Public-private ventures have been successfully established in many rural counties, using existing bus, taxi or school bus services combined with public sponsorship and administration. Although the majority of services are provided to the elderly or disabled, all of the systems described here serve a proportion of non-elderly, non-disabled riders. A diverse range of counties offer coordinated transit services, many of them with population densities similar to the area of our study.

Table 6.1 summarizes the characteristics of the transit services identified. The scale of services ranges from single counties, to small groups of contiguous counties, to coordinated service for very large regions. The Missouri-based OATS system began as an effort by the local chapter of the American Association of Retired Persons (AARP) to coordinate elderly service in rural counties, but by the mid-1980s 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 a total of 1,200 volunteers), raise matching funds to purchase new vehicles, and manage dispatching and scheduling.

The transit systems discussed here were chosen not only by similarity with the study area but also by clientele. Although rural transit is commonly seen as serving special populations, in particular clients of human service agencies, the ridership profiles of the systems summarized in Table 6.1 show a range of users, many serving quite substantial portions of non-elderly, non-disabled passengers. As with urban public transportation systems, the majority of passengers are female - RIDES reports a female/male ratio of 75/25, while Hill Country Transit reports 70 percent female, and Endless Mountains Authority estimates female ridership at close to 80 percent of passengers. Although we can assume at least part of this split is a result of the higher proportion of elderly women compared to elderly men, all three systems transport appreciable proportions of general public riders; the gender difference is a reflection of a well-documented feature of urban transportation systems, where approximately 65 percent of riders are female.

As a result of the high proportion of elderly users, most trips were made to senior centers or other services, but employment accounted for around ten percent of trips made by Hill

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	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

Notes: (a) Kern River Valley RTS; (b) Lamont system; (c) Mojave system

Table 6.2
Level and Types of Service Provided by Rural Transit Systems

System	Types of service	Cost per vehicle mile	Passengers/ vehicle miles	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 (KRV-RTS)	0.1 (KRV-RTS)	\$6.05 (KRV-RTS)
	Three fixed routes to city, and demand-responsive local service (Lamont)	\$1.33 (Lamont)	0.2 (Lamont)	\$5.86 (Lamont)
	Fixed route morning service, demand-responsive afternoon service (Mojave)	\$2.75 (Mojave)	0.5 (Mojave)	\$5.49 (Mojave)
Hawaii County Transit System	Fixed route service (twice daily in most areas) provided by a single private operator Paratransit and Dial-a-Ride service coordinated by human service agencies, to serve clients and general public	\$1.73	0.6	\$2.74
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			

Country and Endless Mountain, and for 31 percent of RIDES trips. These examples suggest that rural transit that is available to the general public can play a larger role in work-related commuting, especially for women workers.

Most of the rural systems used a mixture of fixed route and some form of demand-responsive service which could be adapted to serve a range of clients. Table 6.2 shows that while passenger per mile ratios are much lower than for urban systems, costs per vehicle mile were not necessarily excessive. Here, the mix of volunteer, public and private participants had the greatest effect. Contracts with private providers often resulted in cost savings because private providers assumed costs of "down-time" and dispatching, and often paid lower wages to drivers than public systems, but private sector participation did not necessarily provide the best balance between costs per passenger and level of service.

Study Area Characteristics

Given the examples outlined above, what potential is there in the study area to use existing public transit services for work trips by potential labor force participants with less reliable means of individual travel? The study area population density ranges between 31 and 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 which are not widely used by any except the elderly and disabled populations.

Information on existing services was obtained from the three Regional Transit Authorities that serve the study area counties. Detailed breakdowns of mileage travelled was obtained for

the first quarter of 1992; in all cases, usage by the general public (non-elderly non-disabled) was negligible to non-existent. Similar types of services are provided in each county - a mixture of demand-responsive service for elderly and disabled rural residents (sometimes with biweekly or weekly scheduled trips), and fixed route subscription service for disabled clients travelling daily to a county-based work activity or job training center. Benton, Buchanan and Delaware county services are provided by the county, while a non-profit agency (JETS) serves Jones county. In the other three counties, volunteer services were also available to supplement elderly transportation. 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 a base of existing transit resources which could provide supportive transportation to new labor force entrants or to occasional users working in non-metropolitan locations. While the volunteer services available for a fee to the public charged the full costs of transportation (\$0.25 a mile) there are other mechanisms through which subsidies could be provided for those in need. Vouchers have been used successfully in systems which use private sector transportation (for instance, the Canon City subsidized taxi program) and could be incorporated into workfare programs with little extra administrative burden. Transportation brokerage services (assumed perhaps by Regional Transit Authorities) offer a potentially effective way of matching needy commuters with available transport options.

As our earlier analyses have indicated, the potential users of public transit services are few in number, and do not justify any structural changes in the way that public transportation is currently provided. Given the types of work trips identified from the telephone survey, it is

unlikely that public transit would attract many current commuters. Nevertheless, our survey did identify a small group of potential and very localized labor force participants who could expand their employment opportunities if they had more reliable means of mobility. 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.

Section Two: Employer Involvement in Ridesharing and Car-pooling

Employer involvement in commuting has grown over the past decades as more firms have suburbanized, commuting distances for workers have increased and public transit options have not kept pace with these spatial changes. Employers have typically been involved in subsidizing individual car travel by providing free or below-market priced parking, but new strategies have emerged in response to pressures on individualized transportation systems. In high-growth metropolitan regions pressures have been placed on employers by zoning, growth control and air pollution restrictions, and by employers' recognition of the problems posed by traffic congestion (Valdez and Wang 1989; Flynn and Glazer 1989). Access to relatively low wage labor markets has been another consideration in some regions that has involved employers directly in the provision of transportation services to employees (Fox 1986).

Employer involvement in transportation can take a number of different forms, ranging from direct subsidies to provision of administrative support to disseminating information provided by a public agency. The main types of employer involvement include:

- *Provision of vans for van-pooling, providing maintenance and administration and organizing cost recovery which may or may not include a subsidy;*
- *Supporting employee-initiated van-pools, where vehicles are owned or leased by employees, and some administrative assistance is provided;*
- *Providing information from regionwide ridesharing agencies or ridesharing coordinators for employee-organized car-pooling;*
- *Controlling the supply and price of parking provided to employees; and*
- *Cooperation among employers to provide either feeder service from existing public transit terminals or direct provision of transportation, most commonly where suburban employers transport low-waged inner city residents to suburban job locations.*

Most research on employer involvement in Transportation Demand Management (TDM) programs has focussed on congested high growth metropolitan areas, but a nationwide survey of 160 private employers with some ridesharing involvement identified 10.1 percent who were located in rural areas or small towns, suggesting that the benefits of ridesharing are not confined to employers located in congested areas (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). This is supported by other findings that ride-sharing programs are more likely to exist at firms with more than 100 employees (Booth and Waksman 1985). Interestingly, over 35 percent of work trips made to small town and rural locations in the survey were composed of car-pooling or van-pooling, compared to 25 percent of work trips to suburban and CBD locations. These rates are higher than the national average - according to the 1980 Census, 19.7 percent of work trips nationally are made by car- and van-pool. This finding reflects the effect of respondents'

involvement in ride-sharing activities, and suggests that current ride-sharing levels could be increased with more active employer sponsorship.

Wegmann (1989) uses the national survey to analyze the cost-effectiveness of employer ride-sharing programs. The results of his analysis provide important conclusions for the policy options discussed in this section. Cost effectiveness is analyzed by comparing the costs of operating a vanpool program, transit incentive program, or ridesharing matching service, the administrative costs involved in overseeing a ridesharing program, and costs of providing parking.

Parking is the most commonly provided form of transportation subsidy, with 78 percent of survey respondents providing free parking and a further 10 percent subsidizing employee parking costs. However, parking shortages were reported by 33 percent of respondents, including 32 percent of employers in urban non-CBD locations, and 18 percent of employers in rural locations. Over half of the employers experiencing parking shortages 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 represent an additional major capital commitment, but the cost varied widely depending on geographic location.

Ridesharing costs varied substantially by degree of employer involvement. Administrative costs of employee or third party operated vanpools were estimated at an annual average of \$4.50 per employee, while the administrative costs of van-pool programs organized by the employer were estimated at \$889 per van per year. Non-administrative costs of van-pools operated by employers varied by the level of subsidy provided. A total of 58 firms operated van pools, 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 (5 percent of van pool operators) tax credits were used to cover some operating costs. Of those firms that subsidized operation of the van pool, the average subsidy was \$1,283 per van per year; over all employees, this represents a subsidy of \$12.35 per year per employee.

The cost-effectiveness of employer-operated van pools also varies according to program management. In a comparison of two California-based aerospace companies, Torluemke and Roseman (1989) found substantial differences in van pool viability and numbers of employees using the program that could be attributed to management decisions. Where van capital costs were amortized over the real useful life of the van (rather than a standard period of four years) fares could be kept low enough to serve employees with a twenty to forty mile one-way commute, even though the company using this option had fewer employees. Where vans were retired after only four years of service, fares were too high to attract many medium range commuters and were only used for long distance commuting (more than forty miles one way).

The majority of respondents to the employer survey reported by Wegmann (84 percent) felt ridesharing was cost effective; the major other benefits perceived were identified as good public relations (70 percent), reduced absenteeism (59 percent), reduced employee tardiness (53 percent), and ability to retain valued employees (40 percent).

Firms with active ridesharing programs were far more likely to perceive the programs as cost-effective, compared to firms without ridesharing programs (at a rate of three to one), the majority of which reported they were unable to judge. It is likely that many employers without ridesharing programs are simply unacquainted with the potential benefits they may offer,

especially when compared to the (often unrecognized) financial commitment represented by the provision of free parking. Wegmann's analysis also demonstrates that ridesharing programs have wider applicability in a range of geographic locations, as the benefits and cost-effectiveness findings are not restricted to firms in congested urban locations.

A common problem that proposals for ridesharing programs encounter is the perception that commuters are unwilling to participate in the program. A study of the employees of a large suburban employment center in Southern California found approximately 90 percent of employees travelled to work alone (Glazer and Curry 1987, 9), much higher than the national average. The most common reasons reported for not ridesharing were: prefer freedom of driving alone (43 percent); might need car due to overtime (42 percent); need car for business (32 percent); run other errands *en route* (30 percent); and irregular working hours (26 percent) (Glazer and Curry 1987, 12).

Wegmann's analysis was focussed on employers' experience of ridesharing. Booth and Waksman (1985) analyze the results of a workplace survey of commuters in rideshare programs at five National Rideshare Demonstration sites (Atlanta, Cincinnati, Houston, Portland OR and Seattle) to provide a profile of commuters who use rideshare options. At four of the five sites, ridesharing proportions were similar to the national average (19.7 percent), but in Houston the proportion was 26 percent - the authors speculate that this reflects the lower availability of public transit in Houston.

The authors report that women workers were more likely than men to use ridesharing (Booth and Waksman 1985, 34). Although there was no clear relationship between income and propensity to rideshare, at all sites except Portland employees with household incomes below

\$15,000 (1982 dollars) were more likely to carpool. Automobile ownership provided a closer correlation with modal choice, with ridesharers more likely to have more than zero but less than one car per employed household member. Cost was the most important reason given for ridesharing, although other considerations such as unavailability of public transit, convenience, travel time and schedule requirements were also reported.

Firm size was closely related to rideshare choice, with the mode 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, while ridesharers had an average work trip distance of nearly 15 miles. Full-time workers were also more likely than part-time workers to rideshare. While flexible or variable work hours were found to decrease the likelihood of ridesharing with co-workers, flexibility was found to increase the likelihood of ride-sharing with family members (Booth and Waksman 1985, 36).

Employers at the five sites were also surveyed; less than one-third offered ride-sharing 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 by eliminating parking subsidies, rather than by offering additional subsidies to transit users and ridesharers.

Ridesharing and van-pooling is most commonly observed as a workplace-based or home-based strategy. However, ridesharing and van-pooling may also be organized at the community level. Brunso and Hartgen (1983) report on the results of a neighborhood ridesharing demonstration project in four residential communities in the Albany, NY area. Neighborhood-

based coordinators were used to market the program and set up the carpools. Brunso and Hartgen conclude that "In comparison with employer-based coordinators, neighborhood coordinators were equally effective 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 van-pool programs offer an apparently more viable alternative to reliance on individual car travel. Although most research on ridesharing and van-pooling has focussed on Transportation Demand Management (TDM) programs in very congested metropolitan regions, ridesharing and van-pooling are viable and beneficial options even where congestion is not a pressing problem. The following conclusions can be drawn from the research reviewed here:

- *Van-pooling and ridesharing are viable options in a range of metropolitan, suburban and small town or rural locations;*
- *Larger firms or concentrations of firms in business, retail or industrial parks offer the best conditions for organizing ridesharing or van pooling programs, but programs can also be implemented effectively at the community level;*
- *Flexitime and part-time work patterns reduce the likelihood of work-based ridesharing, but they increase the likelihood of home-based ridesharing;*
- *The large majority of employers involved directly or indirectly in ridesharing or van-pooling programs found them to be cost-effective (especially when compared to the costs of employer-provided parking) and to offer a range of non-quantifiable 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.*

Ride sharing or van-pooling could be incorporated into an area-wide transportation brokerage system, combined with back-up services using existing paratransit and private taxi service.

Study area

Table 6.3
Distribution of Rural-Based Female Employees of Metropolitan Firms

		% distribution of rural female employees coming from same ZIP code.			
		Number of rural female employees working in same firm living in same ZIP code :			
Sector	% rural female employees	2 or less	3 to 5	6 to 10	more than 10
FIRE	20.0	22.4	30.4	47.2	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

Chapter four assessed the potential for ride-sharing among survey respondents. We concluded that many of the most cost-burdened respondents identified could be served by a well-organized set of ride-sharing or van-pooling programs. Cost-burdened employees were more likely to work in metropolitan locations and large firms, and tended to have regular hours. A majority were full-time employees.

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 6.3 shows that with the exception of one firm, the majority of rural-based employees lived in zip-codes where more than ten other employees of the same firm also lived.

While some employers reported that informal ride-sharing programs had once been quite common (in the early 1980s) interest levels had dropped off. None of the employers had current active ride-share programs. However, more active marketing of ride-sharing on a regional basis could provide a viable alternative to individual car travel for many rural-based employees and contribute substantially to lowering the commuting cost burdens identified in our survey, with minimal outlay from employers. The benefits to be obtained - reduced pressure to expand parking spaces, reduced employee turnover, and potential ability to attract employees from a wider rural hinterland - provide a strong argument in support of ridesharing initiatives.

Section Three: Rural Development

Thus far, this chapter has focused on ways in which the work trip mobility of rural women could be enhanced. We argued that such enhancement was necessary if rural women were to enjoy improved access to more diverse urban labor markets, and a reduced proportional commuting cost burden. In this section we focus on the same issue but from a different angle: we ask, instead of reducing commuting burdens, does it make sense to bring jobs to rural

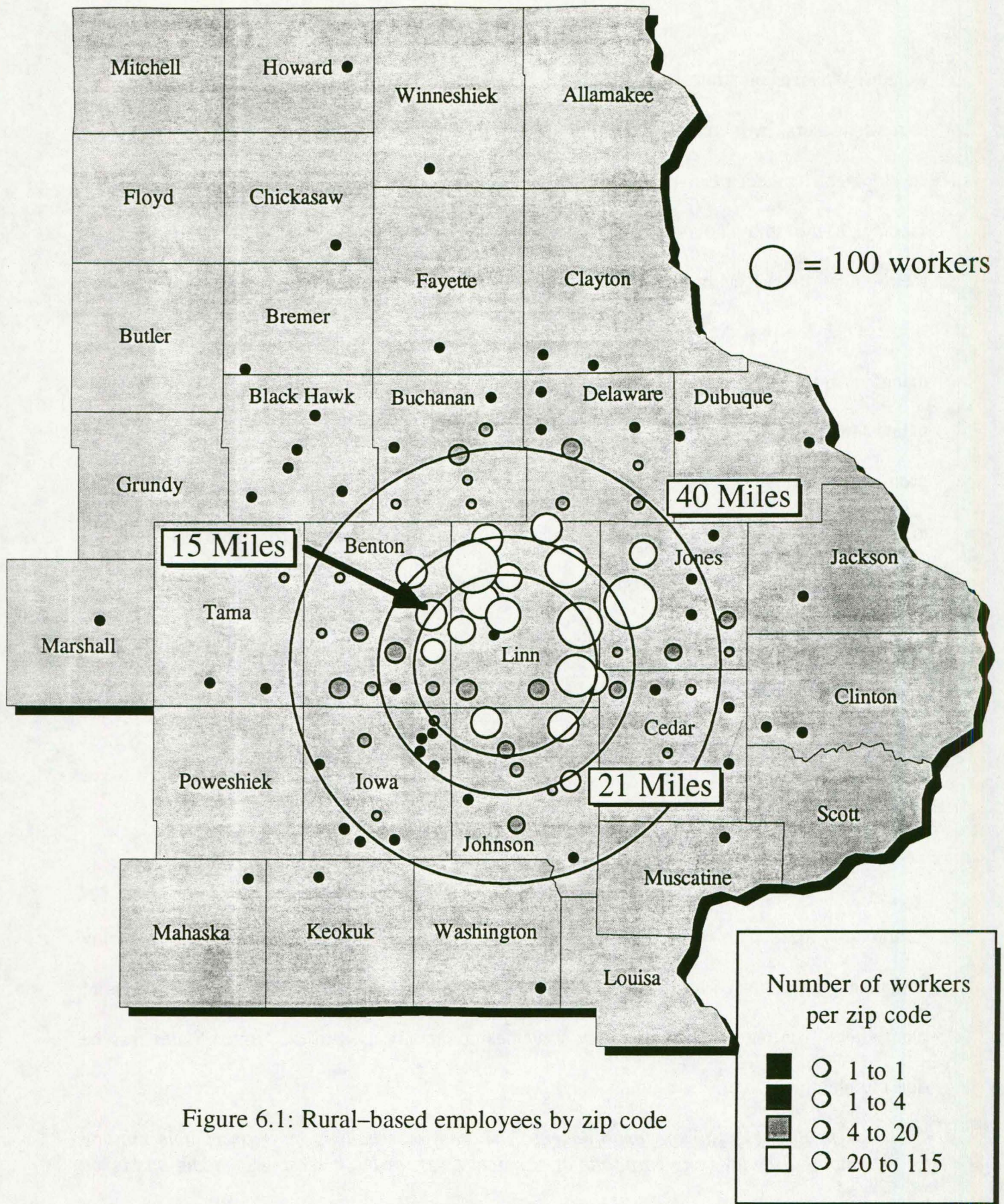


Figure 6.1: Rural-based employees by zip code

women? We focus on strategies that aim to increase labor force participation and increase returns to rural workers, by increasing the supply of jobs in non-metropolitan areas. A number of rural development strategies can be identified; these are reviewed below, and their potential applicability in the study area (and the potential they offer for improving the quality of non-metropolitan jobs) is assessed.

Over the past decade, and partly as a consequence of the farm crisis and the decline of manufacturing, there has been growing academic and policy interest in rural economic development. Much of the focus of recent rural economic development policy has been on how best to promote the demand for rural labor. Supply-side strategies have focused on attracting new plants to rural areas, by providing various sorts of capital, infrastructure or labor subsidies to relocating firms, by reducing corporate taxes, or by improving the quality of labor (Eisinger 1987). Other strategies, sometimes called demand-side, have focussed on promoting indigenous business entrepreneurship, especially in technologically advanced sectors, or in sectors with export potential.

Supply-side economic development policy

Economic development policy in both urban and rural regions of the United States has traditionally focused on supply-side strategies. Policy measures have usually been aimed at luring new plants to designated locations, usually by reducing the factor costs associated with potential plant sites. Three broad sorts of policy strategies commonly used in the United States may be distinguished:

- (1) *Business Climate Improvement*: The state or locality's business climate may be improved by lowering corporate or personal taxes, or by increasing spending on higher

education, or by changing the legal structure of labor bargaining (Right-to-Work laws being an example of the latter).

● *(2) Business Recruitment: Businesses are recruited to the state or locality by advertising the virtues of the state or locality in the site location and general business presses, and by actively recruiting firms at various overseas "trade and business development" offices, or by "poaching" firms from other states or localities.*

● *(3) Incentive Package Arrangement: A particular site is made attractive by lowering the costs of doing business at that site: in this case a state or locality may offer low interest loans or grants to a prospective business, may offer to improve road or rail access, to train or otherwise subsidize labor, or may offer a property tax abatement; utilities may offer energy at discounted prices.*

In Iowa, as in most states without very large metropolitan areas, the state has major responsibility for maintaining the business climate. Both the state and localities recruit for new plant, and although a relocation package is usually arranged at the local level, many of the incentives in such packages are either provided by the state or are regulated by state law. Three important examples of such incentives in Iowa are:

● *The RISE (Revitalize Iowa's Sound Economy) Immediate Opportunity program 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.*

● *The CEBA (Community Economic Betterment Account) provides state funds for business grants and loans so as to lower the overall costs of investment in Iowa. Localities may then compete for these funds and offer them as part of their overall recruitment package.*

● *TIF (Tax Increment Financing) funds may be used as a way of providing low-cost funds for site improvements. In this case, a TIF district is declared, TIF bonds issued, and are retired by the increments to future tax revenues generated by the site improvement. In the case of TIFs, the state does not provide the funds, which are raised on the private bond market, but regulates the designation of TIF districts.*

A firm recruited to a site in Iowa may be offered any one or combination of these and the myriad of other incentives available. The central issues insofar as the argument of this report

is concerned are: (1) how successful have supply-side economic development strategies been? (2) do supply-side strategies offer a way to decentralize jobs to rural areas, thus reducing the friction of distance experienced by rural women and potentially increasing the labor market choices open to them?

There is growing consensus in the economic development literature that the performance of much traditional supply-side policy has been poor. The literature is massive and a comprehensive summary is impossible here - nevertheless, three broad points can be made:

- *The impact of states and localities' attempts to improve their business climates is unclear. In the area where the most work has been done, the majority of survey and econometric evidence suggests that state and local tax reductions have no or negligible effect on state or local employment or business activity levels (see summary Eisinger, 1988, 211). Some recent evidence however suggests that taxes do play some role in affecting business growth (see Bartik, 1991, appendix 2.2; Blair and Premus 1987). Taxes, and incentives generally, are thought to be more important in influencing location decisions at smaller geographical scales in the final stages of a plant site search (Eisinger 1988, 232).*

In the related area of state business climate surveys (published in Inc., for example), studies suggest that while these appear to have an important influence on the economic decisions of state legislators, there is little empirical evidence showing a relationship between state business climate rank and state business activity (Skoro 1988).

- *Excepting the recruitment of foreign firms, the recruitment of plants from other localities is generally believed to produce zero net positive employment effects from the national standpoint, since one locality's recruitment gain is simply another's loss (Guskind 1990). Moreover, the local positive employment benefits are likely to be quite small since most workers are mobile and will therefore find employment elsewhere at a similar wage (Forkenbrock et al 1990). Bartik (1991) has recently argued that there may be relatively large positive sum benefit if the recruiting locality suffers high unemployment.*

- *Although generalizable work evaluating various specific business incentives is still in its infancy, the majority of studies of the industrial location decision suggest that firms locate mostly on the basis of market access, labor costs and skills, and access to inputs. Economic development incentives seldom rank as an important reason in industrial location decisions (Liner and Ledebur 1987; Luger 1987; Schmenner 1982). Evaluations of specific incentive programs naturally show wide diversity in attributed program benefits.*

Overall, our understanding of recruitment incentives is contradictory and fragmentary, but far from positive. There are recent assessments of incentives available in Iowa (see, for example Forkenbrock et al 1990 on RISE, and Novak and Wulf 1989 on CEBA) but these do not directly address the issue of the effectiveness of these incentives as recruitment tools, so it is difficult to say whether recruitment incentives have worked better here than elsewhere.

Supply-side strategies and rural areas

While recruitment is the leading strategy for generating jobs in rural counties (Rubin, 1986; Ottensmeyer, Humphrey and Erickson, 1987), rural areas face some special recruiting problems. Rural areas, by definition, lack the urbanization economies of metropolitan areas and find it difficult to recruit plants which rely on urbanization economies. Put simply, rural areas' labor, service and input markets tend to be less diverse than their urban competitors and thus lack those sectors, functions, and occupations which rely on urbanization economies. 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. Thus rural areas also tend to have proportionally fewer high end occupations than do urban areas.

Rural areas may nevertheless be attractive to some firms, particularly to those wanting a non-unionized, conservative, hard-working labor force, and not relying on agglomeration economies. Confirming this, Finsterbusch and Kuennen (1992) have recently found that recruitment by rural areas can be successful. But the success of rural recruiting says nothing of the quality and diversity of jobs created in rural areas. Our argument here is simply that even where supply-side recruitment of firms to rural locations is successful, urban areas provide

greater diversity of employment opportunity and, because of that diversity, may provide better jobs for rural job seekers. Our discussion of commuting patterns in chapters four and five appears to confirm this: women travelled further to jobs which provided benefits. Thus improving access to those urban labor markets should, where it is technically feasible, play as important a role in rural economic development strategies as recruiting jobs to rural locations.

Demand-side economic development policy

Largely as a result of the perceived failures in supply-side policy, there has been growing interest in what some have inappropriately labelled "demand-side policy". Demand-side policy is usually associated with such instruments as public venture capital funds, product development funds, various sorts of dedicated revolving loan funds (RLFs), and export trading companies (ETCs). Demand-side policy, since its focus is on entrepreneurship and export, is thought to suffer few of the zero-sum problems usually associated with supply-side recruitment incentives. As venture and product development funds self-consciously target high technology sectors for aid, demand-side policy funds are also thought to provide good jobs in growing industrial sectors. However, the record of public venture and product development funds is poor (Eisinger 1991; Fisher 1990). State ETCs appear to have performed badly, though other aspects of state export promotion have done much better (Egan 1989). RLFs cover a range of quite diverse policy instruments; there are little comprehensive data on their effectiveness.

In rural areas the two central demand-side concerns have been whether rural entrepreneurship is constrained by failures in rural capital markets, and whether rural areas, traditionally home to America's more peripheral manufacturing sectors, can indeed attract and sustain core

technological industries. Insofar as capital markets are concerned, the issue is whether the lack of venture capital in rural America, for instance, is a result of gaps in the venture capital market (which should be filled by a public fund) or whether the lack merely reflects the dearth of industrial innovation in rural areas (Fisher 1989). The latter raises the high technology potential issue. In the most comprehensive study of high technology industry in rural America, Glasmeier (1991) is cautiously optimistic, but admits rural high tech is often in slower growing sectors than urban high tech and that rural high tech is often mature in the product life-cycle sense.

Our conclusions concerning demand-side policy are much like those concerning supply-side policy. Evaluation of the policy instruments is still in its infancy; what evaluation exists suggests serious performance problems with some important demand-side policy instruments. Moreover, rural industry is more mature and occupationally less diverse than urban industry. Creating jobs in rural areas, either through demand- or supply-side instruments can be accomplished - creating a diverse range good jobs there is much more difficult. Thus improving access to metropolitan jobs should rate as highly on the policy agenda as demand- or supply-side economic development policy instruments.

Conclusion

There are two central reasons why labor force participation, especially that of women, is important to rural economic development:

- *Rural households tend to be poorer than non-rural households. One way of increasing rural household income is to expand the labor force participation of household members. 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 (they are often part-timers who only work some of the year), and thus earn less than they could. Household income could be increased by removing what barriers exist to full-time regular employment.

●The rural population in the four county study region (as well as Iowa and the nation) is declining and aging. Thus, increased labor force participation by people traditionally excluded from or marginal within the rural workforce should be encouraged. Indeed, it is possible that the supply of such labor may be important for the future competitiveness of rural areas. (It may also have an impact on the supply, and thus cost, of labor in adjacent metropolitan areas. Parts of the Cedar Rapids economy, for instance, appear to rely quite heavily on female workers from the city's rural hinterland.)

The first reason focuses on the positive effect on rural household income. The second focuses on the salutary impact of increased participation on the supply of labor and thus the rural economy and community. Of course historically, rural women have been having precisely these impacts on the rural economy and the rural household. 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 it must be emphasized again that this is not the only, or necessarily most significant, barrier.

This chapter has assessed two policy options that seek to reduce the commuting burdens that some rural-based women workers bear. We concluded that ride-sharing and van-pooling strategies would be beneficial to many workers with long work trips, and could be effectively implemented in the study area and in similar regions. Public transit service extension suffers from a number of well-documented problems. In particular, the long work trips, relatively scattered settlement patterns and high rates of personal and household mobility found amongst survey respondents suggested that the market for transit service could not be significantly

expanded. 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 which would deal with specific clients.

The economic development policy options discussed in the final section of the chapter offer no clear prescription for the expansion of labor market opportunities at the local level. Rural locations tend to be most attractive for firms in the mature stage of the product cycle and less attractive for those industries that have shown the most potential for growth and high quality technologically skilled jobs. Some commentators have argued that it is precisely these sectors that will find off-shore locations most attractive (Clarke 1991; Deavers 1992) and that rural regions will experience further attrition rather than employment growth. Consumer-oriented sectors (retail and services) have tended to centralize in larger places as the consumer population has become more mobile and rural regions have lost population. This trend was certainly evident in our discussion of the study area in chapter two.

Consequently, we cannot conclude that decentralizing better quality jobs is likely to occur in response to policy interventions (at least, not on a large scale). We are led instead to the conclusion that the most appropriate and viable policy options are those that can reduce the disincentive that commuting represents for both current and potential labor market participants, and expand the labor market choices of rural-based workers by lowering transportation costs borne by individuals. Within this category of policy approaches, expanding both community- and workplace-based ride-sharing and van-pooling represents the most appropriate alternative.

Chapter Seven

Conclusions and Recommendations

This report has analyzed the labor market and commuting choices of rural women in four Eastern Iowa counties. This chapter concludes our analysis by drawing together the findings of our telephone survey, our analysis of the study area's labor market structure, and our discussion of policy options. The chapter addresses the following questions:

- *What does the discussion of labor market participation and commuting patterns enable us to conclude?*
- *What conclusions can be drawn from the discussion of labor market structure in the study area?*
- *How do the labor market participation and commuting patterns identified fit into our understanding of the area labor market?*
- *What are the policy implications of these findings?*

What does the discussion of labor market participation and commuting patterns enable us to conclude?

1. Respondents were willing to commute further for jobs in specific sectors (executive and managerial, skilled blue collar and professional occupations, in the manufacturing, transport and distribution, finance / insurance / real estate and business services sectors) which appeared to offer better rates of pay in metropolitan locations and were more likely to offer benefits. Many of the respondents willing to commute these longer distances had higher educational qualifications, but tended to have shorter than median job tenure.

2. Respondents in the technician, sales, clerical and unskilled blue collar occupations, 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 non-metropolitan locations, and were no more likely to receive health benefits if they commuted to jobs in metropolitan locations. The few employees in those sectors in metropolitan jobs tended to have very high commuting cost burdens in relation to daily pay. Respondents in these sectors tended to have lower educational qualifications. Cluster analysis identified a large group of relatively younger women, with lower "human capital" attributes, employed predominately in those sectors, who felt convenience of job location was very important. They had many demographic similarities with the group of potential labor force participants discussed in chapter three, and we speculated that their labor force experiences are similar to those the group of potential labor force participants would have were they to enter the labor force.

What conclusions can be drawn from the discussion of labor market structure in the study area?

We need to place the understanding of labor force participation within the context of the metropolitan / non-metropolitan labor markets within which these decisions are taken. We drew the following conclusions about the area labor market:

1. The non-metropolitan portions of the study area have seen a general decline in employment, especially in manufacturing (with the exception of Buchanan county) and retail; however, non-metropolitan locations have seen some growth in the finance / insurance / real

estate sectors and in services. Female unemployment rates are higher than or close to the average in all of the rural counties except Delaware.

2. Waterloo has seen the most dramatic declines in employment in all sectors (apart from weak growth in services) and is not an important employment location for most rural residents.

3. Cedar Rapids has had stable employment overall, but employment in manufacturing and in the finance / insurance / real estate sectors has declined, while more jobs have been created in retail, services and transportation and distribution. Unemployment rates for women in the MSA are lower than the average.

How do the labor market participation and commuting patterns identified fit into our understanding of the area labor market?

1. The metropolitan jobs that women were most likely to commute to were in sectors that are declining in the Cedar Rapids MSA (with the exception of transportation and distribution, which employed only a small proportion of respondents). This was a rational decision, given the higher hourly pay available and the greater likelihood of receiving benefits in metropolitan jobs in these sectors.

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 non-metropolitan locations. This is a rational decision when we consider the significantly higher hourly pay they received in non-metropolitan jobs, the fact that they were unlikely to receive benefits no matter where they worked, and the greater resistance these respondents expressed towards commuting.

What can we conclude from these findings?

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) while non-metropolitan jobs retain their relative attractiveness. The first and most important point to make is that *only some rural women workers are willing to commute to metropolitan jobs.*

Under what conditions might the rational decision underlying this choice change? As we have seen, female unemployment rates are higher in three of the four rural counties than they are in Cedar Rapids. Women's wages represent an important component of household income, and thus make an important contribution to the economic viability of rural communities. Although the service sector (and to some extent the finance / insurance / real estate sector) have shown some growth in the four rural counties, trends indicate that employment opportunities in those counties are declining overall, especially in retail. Will stagnant non-metropolitan 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 employees, and which impose the highest relative cost burdens on those who commute long distances to jobs in 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 experienced women workers.* This may have severe effects on the well-being of many rural households, and thus the viability of smaller rural communities.

It is also possible that the inability to attract new recruits to the labor force in specific sectors in metropolitan regions will force employers to provide more attractive rewards. Sales and service sector jobs are tied to consumer markets, so decentralization of employment is not an option; in retail at any rate, the historical trend has been towards greater concentration in larger central places. Apart from increases in job rewards, ameliorating the disincentive to commuting will help sales and service sector employers attract a sufficient labor force from surrounding non-metropolitan areas. Lowering commuting cost burdens will contribute to improving the labor market choices and rewards of rural women, and thus 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 rural residents and metropolitan jobs. We concluded that ride-sharing or van-pooling could be a beneficial and cost-effective alternative for larger employers with a higher proportion of full-time employees who worked regular hours. Many of our current long-distance commuters fit this description, and we concluded that ride-sharing could be significantly expanded to serve current metropolitan commuters. But would ride-sharing 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 smaller firms and are more likely to be part-timers or to work irregular hours. However, two additional points need to be considered here.

1. Although sales and service employers are often small firms, firms in these sectors are often clustered in "central place" locations to offer consumers a convenient choice or to take

advantage of intra-firm linkages. Thus, although a firm may have few employees, it may be located in a work site (such as a shopping mall, strip development or downtown) with a very large number of employees.

2. Part-time work in these sectors is frequently used to deal with peak periods of consumer demand, which is usually synchronized at the work site (for instance, four to eight pm peaks at shopping malls), and may not represent a real barrier to co-ordinating commuting times with similar workers. Irregular hours present more of a problem, although as was mentioned in chapter six flexible work hours offer more potential for home-based ride-sharing. Thus, ride-sharing or van-pooling need not be ruled out as viable methods of reducing commuting burdens. We noted the much greater willingness expressed by commuters with high relative cost burdens to explore alternatives to individual car travel, and speculated that the cost savings available through ride-sharing schemes would make those options attractive to many cost-burdened employees.

The potential offered by a transportation brokerage service that would match new labor force entrants or intermittent users with available transportation resources in the region, should not be ignored. In particular, if brokerage services (based in the RTAs) could be combined with a voucher system (for either regular or emergency use) this could give many relatively transportation-disadvantaged workers the security or assistance they need to either enter the labor market or to change their job location.

Our discussion of economic development options in chapter six suggested that rural community development may be more reliably based on expanding access to adjacent metropolitan labor markets, rather than on the expectation of large scale employment decentral-

ization. While local economic development efforts have produced rewards (in the form of new jobs and improved local tax bases) and should not be abandoned, good occupations within high growth industrial sectors are most closely tied to the amenities of more urban locations. Furthermore, many of the sectors exhibiting the greatest recent growth in the study area are tied to larger consumer markets and tend to concentrate in central places; decentralizing these jobs is not a realistic option. Although it is possible that non-metropolitan counties may continue to attract certain sorts of job growth in the future (despite the attractions of off-shore locations for these functions), the strategy that will contribute most to expanding the labor force opportunities available to rural women (and thus contribute to the viability of rural households and communities) is one that focusses on overcoming the friction of distance between the residential amenities of rural counties and the stable labor markets of metropolitan areas.

An issue that our policy options do not claim to address is that of the time burdens experienced by some rural-based women workers. Both ride-sharing and public transit options will extend the length of the daily commute somewhat, and as noted above decentralization promises job growth mainly in sectors that do not currently attract large numbers of metropolitan commuters. One option that has been suggested to alleviate commuting time burdens is that of flexible work hours, such as 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, it could be argued that longer work days would merely exacerbate the practical consequences of relatively long commutes; assuming that the daily domestic responsibilities of employed women are relatively inflexible, having an additional "free day" may not compensate for having approximately two hours less time at home four days of the week. It is unclear how public

policy can alleviate the time burden commuting imposes; in this case, the distribution of domestic responsibilities within the household (or the increasing commercialization of domestic functions) is more likely to provide solutions to the problem.

This study has sought to present a coherent picture of the way in which gender interacts with local spatially specific labor markets to produce a set of labor market choices for rural women. We have examined the different balances struck between job rewards, human capital attributes and commuting cost and time burdens, and the choices women make on the basis of this interplay. Our intention here was to focus on the diversity of labor market experience and labor market choices, and to delineate policy that would best contribute to expanding women's employment choices. After a decade of growth in labor force participation, it is clear that women's contribution to the household and the rural community economy is crucial; expanding women's choices in the labor market will be central to future rural development initiatives.

Appendix One

RURAL WOMEN'S TRANSIT DRAFT QUESTIONNAIRE

-PREFACE-

FILTERS:

1. Do you live in a town with a population of more than 2,500 people?
y/n
2. Are there any women between the ages of 18 and 70 living in your household?
y/n
3. Please may I speak to the woman between 18 and 70 who has had a birthday most recently?

Part A: Employment Status

a1. Have you done any work for pay since October 1990?
y/n

[if no, skip to PART E]

a2. Are you currently employed and earning income?
y/n

[if no, skip to PART E]

a3. Do you do any work for pay in your own home?
y/n

[if yes, skip to PART G]

Part B: Current Job

"I'd like to ask you a series of questions about the job you have presently, from which you earn the most wages."

b1. What industry do you work in, or what does the company you work at do?

1. agriculture, forestry, and fisheries

[farming, state park service, horticulture, hunting]

2. mining

[natural gas extraction, coal mining]

3. construction

4. durable goods manufacture

[lumber and wood products, machinery, electrical equipment or supplies, tools, furniture, appliances, transportation equipment, professional and photographic equipment, clocks, sports equipment]

5. non-durable goods manufacture

[food, clothing, textiles, paper and printing, chemicals, rubber, plastic, leather and petroleum products]

6. transportation, communications and public utilities

[railroads, bus, taxi, trucking, warehousing, postal service, water and air transport, radio and TV, telephone and other communication service, utilities and other sanitary services]

7. wholesale trade

8. retail trade

[includes eating and drinking establishments, and mail order houses]

9. finance, insurance and real estate

[banking, real estate law, realtors, security and commodity brokers, investors]

10. business and repair services

[advertising, building services, commercial research, development and testing labs, personnel supply services, computer and data processing, protective services, automotive, electrical and miscellaneous repair services]

11. personal services including private households

[hotels and motels, laundry and garment services, beauty shops, funeral service, shoe repair, dressmaking]

12. entertainment and recreation services

[movie theatres, bowling alleys]

13. professional and related services

[health facilities, legal services, schools and colleges, daycare, social services, museums, religious organizations, engineering, architectural and surveying services, accounting, auditing and bookkeeping services]

14. public administration

[justice, public safety, public finance and taxation, state and local government offices]

b2. What is your main occupation at your place of work?

1. executive, administrative, and managerial
[including accountants and auditors, underwriters, personnel and labor relations specialists, purchasing agents and buyers, inspectors]
2. professional specialty
[engineers, architects, surveyors, scientists, health professionals, teachers, social workers, lawyers and judges, writers, artists, entertainers and athletes]
3. technicians and related support
[lab technicians, dental hygienists, radiologists, engineering technicians, computer programmers, legal assistants, air traffic controllers]
4. sales
[realtors, insurance and investment advisors, advertising, cashiers, demonstrators, auctioneers]
5. administrative support, including clerical
[supervisors, computer operators, secretaries, receptionists, travel agents, clerks, bookkeepers, telephone operators, mail carriers and clerks, dispatchers, insurance adjusters and investigators, bill collectors, bank tellers, teachers' aides, proofreaders]
6. private household services
[private child care, household cleaners]
7. protective services
8. other service
[food preparation and serving, dental assistants, nurse aides, cleaning and building services, barbers, cosmetologists, ushers, transportation attendants, non-private childcare workers]
9. precision production, craft and repair
[mechanics, repairers of mechanical, electrical and electronic goods, locksmiths, construction trades, electricians, carpenters, mining occupations, precision metal working, woodworking, textiles, apparel and furnishing, butchers, bakers, power plant operators, inspectors and testers]
10. machine operators, assemblers and inspectors
[machine operators in metalwork, woodwork, textile, apparel and furnishing, food processing, welders, painters, production inspectors]
11. transportation and material moving
[truck drivers, busdrivers, locomotive operators and conductors, ships captains and sailors, crane operators, excavating machine operators]
12. handlers, equipment cleaners, helpers and laborers
[helpers to construction trades, garbage collectors, stevedores, stock handlers and baggers, garage and service station occupations]
13. farming forestry and fishing
[farm operators and managers, farm workers, nursery workers, gardeners, animal caretakers, graders, sorters and inspectors of agricultural produce]
14. armed forces

b3. How long have you been employed with this company or in this business?
months
5 years or more

b4. How many months of the year are you employed at this job, counting paid vacations as employed time?
12 months
9, 10 or 11
6, 7 or 8
3, 4 or 5
1 or 2

b5. Do you ever work less than 35 hours a week at this job, excluding vacation days or sick leave?
y/n

if yes: **b5i.** How many months of the past year did you work less than 35 hours per week at this job?
12 months
9, 10 or 11
6, 7 or 8
3, 4 or 5
1 or 2

b6. Do you work the same hours and same days each work week?
y/n

if yes: **b6i.** Could you tell me when you begin and end work each day of your usual work week:

Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday

if no: **b6ii.** What is the average number of hours you work each day?
b6iii. What is the minimum number of hours you work each day?
b6iv. What is the maximum number of hours you work each day?
b6v. What is the average number of days you work each week?
b6vi. What is the minimum number of days you work each week?

b6vii. What is the maximum number of days you work each week?

b7. Are you self-employed in this job?

y/n

if yes:

b7i. Was your gross annual income from this business in 1990 greater than or less than -----?

- \$6,000 or less
- \$6,000 to \$12,000
- \$12,000 to \$18,000
- \$18,000 to \$24,000
- \$24,000 to \$36,000
- more than \$36,000

skip to b9

b8. How often do you receive a paycheck?

b8i. Is your gross ----- pay greater than or less than?
weekly:

- \$125 or less
- \$126 to \$250
- \$250 to \$375
- \$375 to \$500
- \$500 to \$750
- \$750 or more

biweekly:

- \$250 or less
- \$250 to \$500
- \$500 to \$750
- \$750 to \$1000
- \$1000 to \$1500
- more than \$1500

Monthly:

- \$500 or less
- \$500 to \$1000
- \$1000 to \$1500
- \$1500 to \$2000
- \$2000 to \$3000
- more than \$3000

b9. Do you receive health benefits from this job?

b10. Do you receive retirement benefits from this job?

b11. How many people are employed at the place where you work?

Part C: Commuting Patterns

c1. Where is your job located?

Cedar Rapids / Marion

Waterloo / Cedar Falls

Dubuque

Other -----

c2. What is the approximate distance between your home and the location of this job?

---- miles

c3. How long does it take you in minutes to travel one way between your home and this job?

c4. How do you usually travel to work? Do you travel ----- ?

y/n

alone in a car

in a car with another employee

if yes:

c4i. are you part of a formal car- or van-pool?

in a car with another family member

if yes:

c4ii. are you part of a formal car- or van-pool?

c4iii. does the other family member have a driver's license?

in a car with another person who is not a family member and who does not work at your place of employment

if yes:

c4iv. are you part of a formal car- or van-pool?

employer-provided transport

if yes:

c4v. do you pay for this service?

y/n

if yes:

c4vi. how much do you pay for this transport? "Use the most convenient time periods to estimate costs".

per day

weekly

monthly

taxi

if yes:

c4vii: how many times a week do you usually take taxis?

c4viii: how much does a one-way trip cost you?

public transportation

if yes:

c4ix: what sort of public transportation do you use?

scheduled service on regular route

unscheduled door to door service

service for disabled persons

c4x: how often do you use this service?

c4xi: how much do you pay for this service? "Use the most convenient time periods to estimate costs".

per day

weekly

monthly

if no:

c4xii. to your knowledge, is there public transportation available on the route you travel at the time of day you travel?

y/n

if yes:

c4xiii: do you know how much this transportation costs per trip?

if no:

c4xiv. if there was public transportation available, would you use it?

y/n

by foot or bicycle

c5. How much do you estimate you spend each month on gas, parking, and/or transit fares to commute to this job?

c6. Do you combine your trip to work with trips ----- daily / weekly / occasionally / never?

taking children to or from school or daycare
household shopping or errands
leisure or social activities

Part D: Supplementary Jobs

d1. Were you employed in this job in March 1991?

y/n

d2. Do you have any other job outside the home currently?

y/n

if no: skip to d7

d3. Where is this second job located?

Cedar Rapids / Marion

Waterloo / Cedar Falls

Dubuque

Other -----

d4. What is the approximate distance between your home and the location of this job?

---- miles

d5. How long does it take you in minutes to travel one way between your home and this job?

d6. Do you work the same hours and same days each work week?

y/n

if yes: d6i. Could you tell me when you begin and end work each day of your usual work week:

Sunday

Monday

Tuesday

Wednesday

Thursday

Friday

Saturday

if no: d6ii. What is the average number of hours you work each day?

d6iii. What is the minimum number of hours you work each day?

d6iv. What is the maximum number of hours you work each day?

- d6v. What is the average number of days you work each week?
d6vi. What is the minimum number of days you work each week?
d6vii. What is the maximum number of days you work each week?

d7.if yes to Q d1:

Were you employed in March 1991?

y/n

if yes: go to PART J and K

d7i. Did you have any other job in March 1991?

"I need to estimate how you value the time you spend commuting to your job. To do this, I want to ask you two evaluative questions. The first deals with the importance of each of a number of possible improvements in working conditions."

d8. How would you rate the importance of each of the following improvements in work conditions on a scale of 1 to 5, with 5 being very important and 1 being unimportant?

an increase in job status (for example, you are promoted to a position where you supervise more people)

an increase in job security (for example, your employer signs a five year employment contract with you and guarantees there will be no lay-offs)

a 10% increase in pay

a decrease in the distance or time you commute (for example, your employer opens a branch office only ten minutes from your home, or allows you to do work at home)

an increase in job satisfaction (for example, you are assigned to a project you have a personal interest in)

an increase in benefits (for example, you are given full health, pension and insurance coverage and subsidized daycare or afterschool care for your dependents)

d9. Thank you. I'd like to ask you a similar question from the opposite point of view. How would you rate the importance of each of the following changes in work conditions, on a scale of 1 to 5, with 5 representing a sacrifice you would be least willing to make, and 1 being unimportant to you?

a decrease in job status (you are demoted to a less responsible position)

a decrease in job security (your employer puts you on a temporary basis)

a 10% decrease in pay

an increase in the distance or time you commute (your office or plant moves, so where once you may have commuted 30 minutes, you now have to commute and hour)

a decrease in job satisfaction (you are assigned to a repetitive, low-skill task)

a decrease in benefits (you lose your health insurance and pension scheme)

d10. Do you have any other comments about how important commuting time and costs are for you?

SKIP TO PART H

Part E: Not in the Labor Force

e1. Have you looked for work in the past month?

y/n

if yes: skip to PART F: UNEMPLOYED

e2. Do any of the following reasons for not currently working outside the home apply to you?

[y/n]

temporary layoff or unpaid leave of absence

if yes: I'd like to ask you some questions about the job you have been laid off / taken leave of absence from [skip to PART B]

laid off work permanently

if yes: skip to PART F

taking care of children or elderly relatives

taking care of home

no financial need to work outside the home

pregnant

retired

ill or disabled

helping run a family farm or business

no suitable work available

transportation to work costs too much or is not available

daycare for children costs too much or is not available

going to school

receiving AFDC or FAP assistance

lack skills for available jobs

SKIP TO PART H

Part F: UNEMPLOYED

f1. In what industry were you last employed, or what did the company you were last employed by do?

1. agriculture, forestry, and fisheries
2. mining
3. construction
4. durable goods manufacture
5. non-durable goods manufacture
6. transportation, communications and public utilities
7. wholesale trade
8. retail trade
9. finance, insurance and real estate
10. business and repair services
11. personal services including private households
12. entertainment and recreation services
13. professional and related services
14. public administration

f2. What was your main occupation in your last job?

1. executive, administrative, and managerial
2. professional specialty
3. technicians and related support
4. sales
5. administrative support, including clerical
6. private household
7. protective services
8. other services
9. precision production, craft and repair
10. machine operators, assemblers and inspectors
11. transportation and material moving
12. handlers, equipment cleaners, helpers and laborers
13. farming forestry and fishing
14. armed forces

"I need to estimate how you valued the time you spent commuting to your job. To do this, I want to ask you two evaluative questions. The first deals with the importance of each of a number of possible improvements in working conditions."

f3. How would you rate the importance of each of the following improvements in work conditions on a scale of 1 to 5, with 5 being very important and 1 being unimportant?

an increase in job status (for example, you are promoted to a position where you supervise more people)

an increase in job security (for example, your employer signs a five year employment contract with you and guarantees there will be no lay-offs)

a 10% increase in pay

a decrease in the distance or time you commute (for example, your employer opens a branch office only ten minutes from your home, or allows you to do work at home)

an increase in job satisfaction (for example, you are assigned to a project you have a personal interest in)

an increase in benefits (for example, you are given full health, pension and insurance coverage and subsidized daycare or afterschool care for your dependents)

f4. Thank you. I'd like to ask you a similar question from the opposite point of view. How would you rate the importance of each of the following changes in work conditions on a scale of 1 to 5, with 5 representing a sacrifice you would be least likely to make, and 1 being unimportant to you?

a decrease in job status (you are demoted to a less responsible position)

a decrease in job security (your employer puts you on a temporary basis)

a 10% decrease in pay

an increase in the distance or time you commute (your office or plant moves, so where once you may have commuted 30 minutes, you now have to commute an hour)

a decrease in job satisfaction (you are assigned to a repetitive, low-skill task)

a decrease in benefits (you lose your health insurance and pension scheme)

f5. Do you have any other comments about how important commuting time and costs are for you?

SKIP TO PART H

Part G: Homework

g1. What sort of work do you do in your home?

childcare

assembly of goods or components

clerical or bookkeeping services

data entry

sewing or repair services

baking or catering

crafts or arts

telephone sales and selling

other sales and selling

professional freelancing

farm-related work (such as raising chickens or farm book-keeping)

other

g2. How many hours do you work at this occupation in a typical week?

g3. Are you self-employed in this occupation?

y/n

if yes:

g3i. Was your gross annual income from this business in 1990 greater than or less than -----?

\$6,000 or less

\$6,000 to \$12,000

\$12,000 to \$18,000

\$18,000 to \$24,000

\$24,000 to \$36,000

more than \$36,000

g4. Are you paid an hourly rate for this work?

y/n

if yes:

g4i. Into which of the following categories does your gross hourly rate of pay fall?

\$5.00 or less

\$5.01 to \$7.50

\$7.50 to \$10.00

\$10.01 to \$20.00

\$20.00 and above

if no:

g4ii. are you paid on a piecework basis?

y/n

if yes:

g4iii. into which of the following categories would you estimate your hourly rate of pay falls?

\$3.50 or less

\$3.50 to \$5.00

\$5.01 to \$7.50

\$7.50 to \$10.00

\$10.01 to \$20.00

\$20.00 and above

if no: **g4iv.** how often do you receive a paycheck?

g5. Do any the following reasons for working at home apply to you?

y/n

availability of facilities

childcare or other dependent care responsibilities

reduced transportation costs

no other work available at this rate

flexibility of hours or fits in with other responsibilities

ill or disabled

retired

able to supplement other earnings

can cut overheads by running business from home

g6. Is this your only source of earnings?

y/n

if no: skip back to PART B.

"I need to estimate how you might value the time spent commuting to a job outside the home. To do this, I want to ask you two evaluative questions. The first deals with the importance of each of a number of possible improvements in working conditions."

g7. How would you rate the importance of each of the following improvements in work conditions on a scale of 1 to 5, with 5 being very important and 1 being unimportant?

an increase in job status (for example, you are promoted to a position where you supervise more people)

an increase in job security (for example, your employer signs a five year employment contract with you and guarantees there will be no lay-offs)

a 10% increase in pay

a decrease in the distance or time you commute (for example, your employer opens a branch office only ten minutes from your home, or allows you to do work at home)

an increase in job satisfaction (for example, you are assigned to a project you have a personal interest in)

an increase in benefits (for example, you are given full health, pension and insurance coverage and subsidized daycare or afterschool care for your dependents)

g8. Thank you. I'd like to ask you a similar question from the opposite point of view. How would you rate the importance of each of the following changes in work conditions on a scale of 1 to 5, with 5 representing a sacrifice you would be least likely to make, and 1 being unimportant to you?

a decrease in job status (you are demoted to a less responsible position)

a decrease in job security (your employer puts you on a temporary basis)

a 10% decrease in pay

an increase in the distance or time you commute (your office or plant moves, so where once you may have commuted 30 minutes, you now have to commute an hour)

a decrease in job satisfaction (you are assigned to a repetitive, low-skill task)

a decrease in benefits (you lose your health insurance and pension scheme)

g9. Do you have any other comments about how important commuting time and costs are for you?

Part H: General Questions

h1. How many cars, trucks or motorbikes are there in your household?

h2. Do you have a driver's license?

y/n

h3. How many other members of your household have driver's licenses?

h4. How often do you have a vehicle available for your use?

daily / weekly / occasionally / never?

if daily or weekly:

h4i. How old is the vehicle?

h5. Would you describe your present place of residence as a farm?
y/n

h6. Did your household receive \$5,000 or more in farm income in 1990?
y/n

"Thank you very much for your help. I have a few final questions that will help us categorize your response better."

h7. I need to know your age group. Are you older than --- or younger than --- ?

18-19

20-24

25-29

30-34

35-39

40-44

45-49

50-54

55-59

60-64

65-70

h8. Do you have any children under 18 living at home?
y/n

if y:

h8i. How many children do you have under the age of six?

h8ii. How many children do you have between the ages of six and eighteen?

h9. Are you currently going to school full-time?
y/n

h10. What is the highest grade of school or years of college you have completed?

grade 8 or less

grade 11 or less

grade 12

two years of technical school or less

more than two years of technical school

three years of college or less

four years of college

more than four years of college

h11. What is your current marital status?
single (never married)
divorced
widowed
separated
married (including living together)

h12. I need to know your household's income bracket. Was your total household income for 1990 greater than or less than --- ?
less than 0 (loss)
positive income less than 5,000
between 5,000 and 10,000
between 10,000 and 15,000
between 15,000 and 20,000
between 20,000 and 25,000
between 25,000 and 30,000
between 30,000 and 40,000
between 40,000 and 50,000
between 50,000 and 75,000
between 75,000 and 100,000
over 100,000

h13. Do you receive any income from payments provided by the Aid to Families with Dependent Children program (AFDC), now known as Family Assistance Payments?
y/n

if yes:

h13i. When did you first begin receiving such payments?
months
5 years or more

Thank you very much for your assistance. If you would like to receive a summary of the results of our survey, you may write to the following address:
Heather MacDonald
347 Jessup Hall
University of Iowa
Iowa City, IA 52242

PART J: PRIMARY JOB IN MARCH

"I'd like to ask you the same series of questions about the job you had in March from which you earn the most wages."

[same questions as part b]

PART K: COMMUTING PATTERN IN MARCH

[same questions as part c]

final: return to Q d7i

Appendix Two Variable Definition

Industry: The initial 14 coded values for this variable were recoded into 8 categories, collapsing together similar industrial sectors. This was done because there were too few cases in many sectors for meaningful analysis.

Original 14 categories:

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

Recoded 8 categories:

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

Occupation: The initial 14 coded values for this variable were recoded into 8 categories, collapsing together similar occupational sectors. This was done because there were too few cases in many sectors for meaningful analysis.

Original 13 categories:

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

Recoded 8 categories:

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

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 pay check (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. Then 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 these were then converted to years of age. For ease of analysis, age was recoded into six categories.

Age categories:

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

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