Public Housing Assistance, Public Transportation, and the Welfare-to-Work Transition

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Abstract

Using data for welfare recipients who left the Temporary Assistance for Needy Families program during 1996 in Cuyahoga County (Cleveland), Ohio, the authors compare the determinants of labor market outcomes across three classes of housing assistance: those who receive a certificate or voucher, those who reside in a traditional public housing project, and those who reside in a Section 8 housing project. The statistical model includes spatially based measures of job opportunities for welfare recipients as well as measures of access to those opportunities.

As might be expected, the authors' analysis reveals that welfare exiters living in housing projects (either public or Section 8) are more spatially concentrated in Cleveland than those not receiving housing assistance, whereas those receiving certificates and vouchers are more spatially dispersed. Even so, welfare exiters receiving certificates and vouchers are employed closer to their homes, spend less time commuting to work, have superior public transit connections to their jobs, and generally have greater access to job openings relative to those who live in housing projects or receive no assistance. This evidence is consistent with the notion that certificate and voucher recipients have the spatial and economic flexibility in residential choice and that they exercise this choice to reduce commuting distance and time.

In statistical models explaining various labor market outcomes, the authors do not find much difference among recipients of the three types of housing assistance. Without statistical controls for general neighborhood conditions, all three types of housing assistance are negatively related to the level of earnings. However, this finding disappears when statistical controls for general neighborhood conditions (poverty rate) are included in the model. This suggests that the lower earnings often attributed to housing assistance are actually a neighborhood-based effect.

Residents of either type of housing project are more likely to return to welfare and will spend more time on welfare following their initial exit. In contrast, recipients of certificates or vouchers are less likely to return to welfare and spend less time on welfare following their initial exit. Finally, regardless of model specification, the authors find no impact of job access on any of the six outcomes. However, they do find that holding a driver's license strongly improves employment, earnings, and earnings growth but has no effect on recidivism.

These findings suggest that certificates and vouchers afford their holders great flexibility in responding to their economic situation (whatever that may be) than is available to either those living in housing projects or those with no housing assistance at all.

Because the most recent welfare reforms emphasize work, myriad studies of labor market outcomes for welfare recipients have been undertaken. This article examines the determinants of labor market outcomes for welfare recipients who left the Temporary Assistance for Needy Families (TANF) program during 1996 in Cuyahoga County, Ohio. We compare the determinants of labor market outcomes for welfare recipients who receive various types of public housing assistance with those who do not.[1] The models presented focus on spatial determinants of labor market outcomes by including measures of both job opportunities for welfare recipients and access to those opportunities.

The spatial mismatch in the labor market is a confluence of several factors, including the increasing surburbanization of low-skill job opportunities, the concentration of welfare recipients in inner-city areas, and reliance on public transportation. These factors may all inhibit the potential success of welfare reform policies. The U.S. Department of Housing and Urban Development (HUD) has already implemented programs such as Bridges to Work to address these problems on a limited basis. The federal government has provided grants to state and local governments to implement special transit programs targeted for welfare recipients, and the Ohio State Legislature has approved the use of funds from the "welfare windfall"[2] to encourage local transit agencies to provide such additional services. However, little statistical evidence exists on the relative importance of job access in determining the labor market success of former welfare recipients.

Of particular interest for housing policy is the intersection of public housing assistance and spatially related aspects of residential location such as job access. Because welfare recipients who live in public housing communities or Section 8 housing are more likely to be spatially concentrated than other welfare recipients, their degree of job access may differ from that of welfare recipients not living in public housing. Conversely, welfare recipients who also receive certificate or voucher assistance possess a degree of mobility that might give them an advantage in the labor market. This study uncovers the different levels of job access and their influence on the labor market outcomes of those who receive public housing assistance and those who do not.

We find that welfare leavers living in public or Section 8 housing projects are more concentrated in cities than those not receiving housing assistance, whereas those receiving certificates and vouchers are more spatially dispersed outside cities. Despite this spatial dispersion, welfare leavers receiving certificates and vouchers are more likely to be employed closer to their homes, have shorter estimated commutes, be better connected to their first jobs by direct bus routes, and have easier access to more job openings compared with those who receive project-based or no assistance. Welfare leavers living in project-based housing (of both types) also have slightly better conditions than do their counterparts not receiving housing assistance. In the discussion that follows, we will

examine the details of this analysis of space, job access, and housing assistance and how it influences labor market and welfare assistance outcomes.

Background

This article brings together two strands of literature to examine outcomes for welfare recipients focusing on job access: studies of welfare leavers and studies of spatial mismatch. Previous studies of welfare leavers have mostly ignored the potential role of job access, and most research on spatial mismatch has not directly addressed the labor market prospects of the predominantly female and single-parent population of welfare recipients with little previous labor market experience. Our analysis of these strands applies to both welfare recipients in general and welfare recipients in public housing in particular. Although a number of existing studies complement this work, none duplicate the types of measures of job access employed here.

Studies of Welfare Leavers

Many states and locales are conducting surveys of welfare leavers or tracking them with administrative records (see aspe.hhs.gov/hsp/leavers99/index.htm). In other work, we are monitoring welfare leavers in the Cleveland area using survey data (Coulton and Bania, 1999; Coulton et al., 2000; Bania, Leete, and Coulton, 2001) and administrative data (Coulton, Verma, and Guo, 1996; Coulton and Verma, 1999). The present study has adopted definitions of the leaver population that are similar to those used in most of these studies. Although employment success is a primary focus of these studies, they do not appear to include job access measures as predictors of success.

Access to Opportunities, a study directed by Michael Rich at Emory University, is focusing on spatial access to jobs for low-skill workers in four cities, including Cleveland (Bania, Coulton, and Leete, 2000). In particular, the study examines how welfare agencies, public transportation authorities, and other agencies in these cities are trying to overcome the spatial barriers to employment. Thus it is a comparative case study of regions that does not include surveys of welfare recipients or efforts to model the effects of labor market access on individuals.

Although they do not explicitly focus on welfare recipients, two other well-known studies—the Project on Human Development in Chicago Neighborhoods and the Los Angeles Family and Neighborhood Survey—conduct a detailed social and economic examination of many neighborhoods using survey, administrative, and observational data. These studies, however, do not contain measures of job access for low-skill workers, nor do they focus on welfare leavers as a study group.

Spatial Mismatch

Kain (1968) was the first to propose what is now known as the spatial mismatch hypothesis. He suggested that residential segregation and the resulting distance to suburban jobs, lack of transportation, and social barriers inhibited the labor market success and residential mobility of racial minorities. Early research aimed at testing this hypothesis suffered from a number of empirical shortcomings (for reviews, see Holzer, 1991; Ihlanfeldt, 1992; and Kain, 1992). However, more recent studies have established that spatial mismatch is most likely an economically significant factor in reducing the labor market access of inner-city residents, particularly racial minorities and teenagers (Ihlanfeldt and Sjoquist, 1990, 1991; Ihlanfeldt and Young, 1996).

Other recent empirical studies have suggested a relationship between distance from available jobs and the labor market difficulties of current welfare recipients (for example,

Ihlanfeldt and Sjoquist, 1990; Burtless, 1995) and of disadvantaged populations more generally (see Kain, 1992, and Ihlanfeldt and Sjoquist, 1998, for comprehensive summaries). African-American inner-city residents may either be discriminated against by employers in mostly White suburbs or face higher commuting and information costs to access suburban job openings, reducing the likelihood that they will seek, gain, or retain employment there. In the Cleveland-Akron consolidated metropolitan statistical area (CMSA), such factors could restrict job access for the 44 percent of Aid to Families with Dependent Children (AFDC) recipients who are African American and live in the city of Cleveland.[3]

In the absence of discrimination in housing markets, inner-city welfare recipients may still have difficulty relocating closer to suburban job growth owing to the cost of suburban housing. In principle, nondiscriminating suburban employers seeking workers could move their establishments to the inner city to be near large pools of inexpensive labor. However, such a move would be inconsistent with the increasing suburbanization of employment. One reason for suburbanization may be that employers, especially retailers and other service establishments, will not distance themselves from their suburban customers. Space constraints and fear of inner-city crime may also limit employers' ability or willingness to relocate. Suburban employers could provide transportation for inner-city workers; however, this would raise the cost of inner-city workers for employers, who may already be able to draw on a plentiful supply of inexpensive labor locally.

Thus spatial mismatch may limit job accessibility for inner-city welfare recipients whether or not racial discrimination in employment or housing is a factor. The effect may be particularly strong for individuals who rely on public transportation, as do 52.2 percent of public assistance recipients in the Cleveland area and 42.1 percent of public assistance recipients nationally.[4] For these individuals, commutes are longer, time schedules are constrained, and trip lengths are more variable, particularly when mode changes or transfers are involved. Therefore, the labor market for these individuals may be circumscribed relative to the whole CMSA labor market. Job access measures quantify the extent to which this is the case.

A number of different interpretations of the spatial mismatch hypothesis have developed over time. Glaeser (1996) distinguishes between strong and weak forms of the hypothesis. The strong form relates minority employment problems to physical distance from jobs and related transportation barriers, whereas the weak form suggests that for these employment problems, physical distance is only a proxy for social distance. In this view, residential segregation reflects social segregation, isolation, and the concentration of social problems in the neighborhood (Wilson, 1987). These factors have come to be known as neighborhood effects. Although the first type of spatial mismatch could be addressed with an aggressive public transportation policy, neighborhood effects could be effectively dealt with only through residential integration—by either changing where people live or who their neighbors are. Empirical work seems to demonstrate that there is some truth to both forms of the spatial mismatch hypothesis. Some researchers have found evidence for the strong form (Holzer and Ihlanfeldt, 1996), whereas others find evidence for the weak form (O'Regan and Quigley, 1996; Cutler and Glaeser, 1997).

Since Kain (1968) first put forth the hypothesis, the conditions that might foster spatial mismatch have, if anything, become more extreme. Since the 1970s, American cities have experienced continued decline in central-city manufacturing employment and rising suburban service-sector and retail employment (Kasarda, 1989). Residential segregation by race has not diminished (Ellwood, 1986; Bashi and Hughes, 1997). Furthermore, in an era of welfare-to-work transitions motivated by federal and state welfare reforms, the issue of spatial mismatch has taken on renewed importance among policymakers. The

success of welfare reform in combating poverty hinges on the ability of welfare recipients to find and retain jobs in the private sector. A number of scholars have suggested that spatial separation from jobs is among the important obstacles that welfare recipients face in seeking employment (Osterman, 1991; Rosenbaum, 1995). Blumenberg and Ong (1998a, b) show that living in a job-rich residential area reduces welfare usage, increases employment and earnings, and reduces commuting time among current and former welfare recipients.

Welfare recipients may be particularly affected by spatial mismatch because they are more residentially concentrated in the inner city than the general population or even the poor (Kasarda, 1980; Bania, Leete, and Coulton, 1998). Furthermore, although the automobile is the most widely used means of commuting for the population at large (Ong, 1996), Taylor and Ong (1995) show that the employment opportunities of inner-city residents are restricted by their greater reliance on inadequate public transportation.

Kasarda (1983) suggested that residency in public housing was one factor that was likely to restrict residential mobility among inner-city African Americans and to isolate urban African Americans from suburban job opportunities. In an analysis of the Gautreaux program in Chicago, which used Section 8 subsidies to move low-income African-American families from city public housing to suburban apartments, Rosenbaum and Popkin (1991) found higher employment rates for individuals who were relocated to the suburbs. The Gautreaux program provides exceptional evidence for the strong form of the spatial mismatch hypothesis because movers originally came from the same social environment as those who remained and received no special job training or job search assistance as part of the program.

Although studies of the Gautreaux program provide some insight into the effects of housing subsidies versus housing provision, they do not look explicitly at welfare recipients (who often enter the labor market with the constraints of limited recent job experience and childcare needs). They also do not juxtapose the outcomes of those who do and do not receive housing assistance. This study examines these factors in the context of welfare reform and the associated need to promptly employ former welfare recipients.

Data and Methods

To conduct our analysis, we used three main data sets. The universe for our study was drawn from data files on those exiting welfare during 1996. These data were drawn from administrative files maintained by the Cuyahoga Work and Training Agency, which is responsible for administering the TANF program in Cuyahoga County. For each person exiting welfare during 1996, we requested wage record data covering quarterly employment status and earnings from the first quarter of 1994 to the second quarter of 1997. The Ohio Bureau of Employment Services (OBES) collects these data as part of its administration of the state unemployment compensation program. Finally, we obtained a data file from Cuyahoga Metropolitan Housing Authority (CMHA), which is the local public housing authority for Cuyahoga County. This data file covers everyone who lived in public housing between October 1, 1991, and July 1, 1997. Because CMHA data covered only traditional public housing projects, we turned to HUD for housing assistance records for Section 8 project residents and recipients of certificates and vouchers. This data file covers people who received housing assistance from October 1, 1995, to March 31, 1997.

Several additional files supplemented these data sets. Building on previous research, we used data that measure the location and number of skill-appropriate job openings for welfare recipients. In addition, we used data on commutes to work by travel mode and

the location of public transit routes to construct various measures of job access. Finally, we used driver's license data from the Ohio Bureau of Motor Vehicles as a proxy for automobile access.

TANF Data

We obtained Income Maintenance Files (IMF) from the Cuyahoga Work and Training Agency. These are administrative data files, updated monthly, that contain information on people and assistance groups participating in public assistance programs such as TANF, the Food Stamp program, and Medicaid. The files contain basic demographic variables as well as information about program benefits and the home address of each recipient. We compiled monthly data files for the period from July 1992 to June 1997.

For this study, we used the monthly IMF tapes[5] for Cuyahoga County to identify all 17,891 adult welfare recipients who exited welfare during 1996. We restricted our attention to people participating in what was known at the time as the state's regular Aid to Dependent Children program for single-parent families (ADC-R). Following a commonly adopted practice (see aspe.hhs.gov/hsp/leavers99/admin.htm#II), we defined a "leaver" as a person who was on TANF for 1 month followed immediately by 2 consecutive months off the program. For example, members of the January 1996 exit cohort were on TANF during the month of December 1995 but off the program during both January and February 1996. We defined an "exit" as at least 2 months off cash benefits for two reasons. First, IMF data for a given month do not include recipients whose benefits have been approved toward the end of the month. This leads to 1-month gaps in benefits records when in fact benefits were received. Second, a 1-month gap in benefits frequently occurs because of administrative delays rather than a decision to leave welfare.[6]

We further limited our sample to people age 18 years and over at the time of their exit. Our definition was based on individuals; that is, any person leaving TANF was included in our study regardless of the status of the other members of that person's assistance group. For example, a person over the age of 18 who left welfare would be included in our exit cohort regardless of whether his or her children remained on TANF. In addition, our study examines the first exit from welfare during 1996. Therefore, a person who exited early in 1996, returned to TANF, and then exited again later in 1996 would be included in our sample only for the first exit.

For each person in our exit cohort, we constructed several variables from the IMF data. These include the history of welfare receipt from January 1994 to the month of exit as well as the use of TANF from the month of exit until June 1997. Using this information, we constructed measures of past reliance on welfare and computed rates of welfare recidivism. In addition, for each person who left welfare, we extracted his or her home address at the month of exit. We used geocoding software (Geographic Data Technology's Matchmaker 2000) to assign geographic variables to each street address. In this case, we recorded the census tract as well as latitude and longitude. Our analysis file also included basic demographic variables such as age, race, and gender as well as household characteristics such as the number and age of children in the household. Unfortunately, information about the recipient's level of education is missing from the IMF data of the recipient.

Wage Record Data

Employment data from OBES were obtained for each recipient who left welfare in 1996. The preexit data cover the period from the second quarter of 1994 to the time of exit. The

postexit data cover the period from exit to the second quarter of 1997, resulting in two to six quarters of postexit employment and earnings. The IMF data contain the Social Security number (SSN) for each person on welfare. We provided a list of SSNs to OBES and requested matching data from the wage record data files. OBES maintains wage record data files, which contain information on quarterly employment and earnings. The data are collected by OBES as part of its administration of the Ohio Unemployment Insurance system. Almost all employers in Ohio are covered by the program and report the employment and earnings of their workers to the state.[7] In particular, employment status and earnings are reported for each job that an individual holds during each quarter of the year. No further information on hours or weeks of employment during that quarter is available. We define a person as employed if his or her earnings in a given quarter exceeded $100. The first quarter of exit is defined as the quarter in which cash assistance ends.[8]

Information on the spatial location of the place of work is also derived from administrative sources. Because the IMF data provide each exiter's home address in the month of exit, we can compute both distance and commuting time between home and the workplace. Information on job locations is derived from the employment location addresses reported in the OBES data file. The accuracy and availability of this data are also somewhat problematic. Although this address ought to identify the actual employment location, the headquarters location of the employer or their accounting firm is sometimes reported. This results in employer locations that are erroneously reported and are sometimes outside northeastern Ohio or out of state. In addition, some employer addresses are incorrectly recorded or spelled and cannot be assigned (geocoded) to a latitude, longitude, and census tract location. Thus employer location is not available for 44 percent of the first jobs held by former welfare recipients.

All addresses used in our analysis are assigned (geocoded) to a specific latitude and longitude using geographic information system software and data files. Distances between any two points are computed as straight-line distances. Locations are assigned to census tracts based on their latitude and longitude.

Housing Assistance Data

CMHA provided us with a data file containing a complete roster of persons living in public housing units in Cuyahoga County from October 1991 to July 1997. The CMHA data include the SSNs for all residents, their home addresses, the names of their housing projects, and the dates they moved into and out of public housing. Using the SSN as the common identifier, we were able to merge this file with the IMF and wage record data. CMHA was unable to provide us with data on certificate and voucher recipients.

HUD's Office of the Assistant Secretary for Policy Development and Research provided a matched data file covering three types of housing assistance: traditional public housing projects, Section 8 housing projects, and certificates and vouchers. We sent HUD a file of identifiers (name, date of birth, and SSN), and HUD matched these against its housing assistance records.[9] Of 17,872 records submitted to HUD, we received matches for 1,182 records (6.6 percent). The HUD files include dates of admission as well as transaction dates for events such as income recertification, so it was possible to match the months of housing assistance with the months of exit from welfare. We created variables covering three types of housing assistance from the CMHA and HUD files. To determine which welfare leavers lived in a public housing project, we used data from both the CMHA and HUD files. The HUD file was used to determine which welfare leavers were recipients of vouchers as well as which lived in Section 8 housing projects.

Job Openings by Skill Level and Location

Although this research focuses on the welfare recipients and public housing residents residing in Cuyahoga County, the labor market available to them is most appropriately viewed as the entire eight-county Cleveland-Akron CMSA. Thus our estimates of job openings encompass the larger region. We prepared our estimates of the number and location of projected job openings using three steps. First, we determined the occupations for which the majority of welfare recipients are likely to be qualified. Second, we estimated the expected number of job openings within these occupations. Third, we allocated these openings to the geographic locations (for example, ZIP codes) of the industries in which they are expected to occur. Following these steps, we produce estimated job openings by skill level and ZIP code. In this section, we describe the general approach to developing estimates of entry-level job openings.[10]

Identifying Low-Skill Occupations. Starting with data from the 1990 5-percent Public Use Micro Sample (1990 PUMS), we reduced the 407 census occupation classifications to a more manageable set by identifying three categories of occupations with relevant skill and educational requirements: entry-level occupations (those requiring 11 or 12 years of education and less than 6 months of job-specific training), short-term training occupations (those requiring a high school diploma and 6 to 12 months of additional education or training), and long-term training occupations (requiring 1 to 3 years of postsecondary education or training). However, in this article we focus on available job openings in entry-level and short-term training occupations.

We assigned occupations to these categories on the basis of occupational skill content and the distribution of actual educational attainment for those holding jobs in a specific occupation. We used two measures of occupational skill content: the general educational development (GED) and the specific vocational preparation (SVP) scores developed by the U.S. Department of Labor in its *Dictionary of Occupational Titles.* These scores are idealized measures of the training and skills deemed necessary to perform a particular occupation competently. In addition, we measured actual worker education levels in each occupation using data from 1990 PUMS on the education levels of workers living in the Cleveland-Akron CMSA. Using factor analysis, we combined the three measures of occupations (GED, SVP, and the first quartile level of education) into a single skill content index. Occupations were ranked by this index and classified into entry-level, short-term training, and long-term training occupations.

Projections of Job Openings by Occupation. Projections of the expected number of annual openings by occupation for the years 1995–2005 were obtained from OBES. Annual job openings came from two sources: the annual growth projections for each occupation and the expected number of net annual replacement openings. These projections forecast changes in equilibrium employment, anticipating normal labor force growth.

Geographic Locations of Industries and Job Openings. The geographic location of existing employment by industry can be identified using data from the U.S. Census Bureau's data file County Business Patterns.[11] Employment by industry by ZIP code was then converted to employment by occupation by ZIP code using average occupational staffing levels (derived from the 1990 PUMS for the Cleveland-Akron CMSA) for a given industry. Anticipated job openings at each skill level were then estimated for each ZIP code by allocating job openings in a specific occupation in proportion to the existing geographic distribution of employment in that occupation.

Measures of Job Access

A key issue in implementing policies to promote the transition from welfare to work is the degree to which welfare recipients have adequate access to jobs. In previous research (Coulton, Leete, and Bania, 1999; Leete, Bania, and Coulton, 1999), we found that at least 55 percent of welfare recipients living in Cleveland do not have access to an automobile. Welfare recipients living in the suburbs have somewhat better access to automobiles (perhaps as high as 65 percent), but the percentage without it is still significant. Therefore, it is important to consider access to jobs through multiple transit modes.

Three factors determine the degree of job access for welfare recipients: the mode of transport to work (that is, private automobile or public transit), the geographic distribution of skill-appropriate job openings, and the commuting time from the homes of welfare recipients to potential workplaces.

Alternative Approaches to Measuring Job Access

Measuring the availability of jobs in a geographic context is at once vitally important and quite difficult. Assuming that the skills required on a job match those held by a job seeker, the ease of obtaining a job still depends on a number of elements. Most important, a flow of information must be present to bring worker and employer together, the distance that must be traveled to apply for and commute to a job must be reasonable, and the probability of being hired must be sufficiently high. The probability of being hired, in turn, depends on the number of individuals competing for a job and the extent to which discrimination is practiced. Studies have used various measures of job access to try to capture these elements; each measure has different strengths and weaknesses (see Ihlanfeldt and Sjoquist, 1998).

Many job access measures used in the past have been limited by both data constraints and computing capacity. One of the simpler measures computed as a proxy for job access for residents of a given neighborhood is the average commuting time or distance traveled to work for the currently employed residents of that neighborhood. However, this measure is flawed because currently employed workers often choose their housing after they became employed. For example, high-income workers may choose to move to outlying suburbs to enjoy a different type of housing and neighborhood. Thus average commutes from higher income neighborhoods are longer, and these neighborhoods appear to have poor job access despite the relatively high incomes of their residents.

The best direct measure of job accessibility is the number of nearby job vacancies, because this reflects actual openings that are available to job seekers. However, vacancy data are relatively difficult to obtain. In place of job vacancy data, many analysts have used measures of employment levels. Although employment levels are correlated with job vacancies that arise from turnover, they do not indicate openings that are created by new job growth. Defining how “near” job opportunities are is similarly tricky. One can use simple distance calculations, such as the straight-line distance between two places, or—based on the distances involved and proximity to roads, freeways, and public transit routes—one can estimate commuting times for various modes of transportation. Although straight-line distances are easiest to calculate, approaches based on commuting time more accurately reflect job access (see Leete and Bania, 1999).

One issue in constructing these measures is how to capture the effect of competition among job seekers for job vacancies. Having 100 job vacancies in an area has different implications for job access when 50 individuals are seeking employment than when

1,000 individuals are seeking employment. Ihlanfeldt and Sjoquist (1998) suggest that the appropriate measure is job vacancies per worker in an area. Ideally, vacancies per job seeker are more directly related to success in finding employment. However, the number of job seekers is more difficult to measure than the number of employed workers.

Another problem is defining the geographic area within which competition for jobs occurs. Regional labor markets are generally defined by the boundaries of metropolitan areas. It makes little sense to measure job access over larger geographic areas. Job openings in one portion of a state are unlikely to be of use to job seekers in another area if the jobs are beyond reasonable commuting distance (Kleppner and Theodore, 1997). Carlson and Theodore (1997) attempt to define competition for jobs within each subregion. However, in our view, the difficulty of conceptualizing the areas in which seekers compete for jobs makes the interpretation of such studies problematic.

Defining job vacancies per worker (or per job seeker) within any subregion, however, implies that competition for jobs exists only among individuals in the subregion. The smaller the area for which the measure is calculated, however, the more problematic this assumption becomes. Job seekers living on a particular city block compete with seekers living on the next block, and the same is true for larger multiblock neighborhoods. However, it is difficult to determine the geographic level in the metropolitan area at which this kind of job competition stops.

Commuting Times by Mode

For this study, we employed a methodology that extrapolates travel time by mode from the 1990 census (Bania, Leete, and Coulton, 1998). We measured job access as the number (or percentage) of skill-appropriate job openings that can be reached in a commute (on a given mode) of a specific time length.

A special tabulation of the long form on the 1990 census called the Census Transportation Planning Package (CTPP) provides information about commuters by place of work and residence as well as commuter flows, including commuting times, for location pairs. For some metropolitan areas, geographic detail is provided at the Traffic Analysis Zone (TAZ) level; for others, it is provided at the census tract level. In the Cleveland area, TAZs are, on average, slightly smaller than tracts; Cuyahoga County has 663 TAZs and 499 census tracts. TAZs cannot easily be converted into tracts or vice versa. Rather, TAZs are defined as collections of census blocks that sometimes correspond to tract boundaries, but often are either larger than or smaller than tracts.

The CTTP provides the commuting time by mode and by time of day for each TAZ (or tract) pair. However, because the data are actual, self-reported commuting times, they represent only the actual commutes of employed people, not all the possible commutes that employed people could undertake. However, our method extrapolated the actual data to fill in many of the missing data cells in the metropolitan area. Using the reported tabulations from the 1990 census, we regressed commuting time from between each TAZ pair on characteristics of the journey between the origin and destination point. We ran separate models for travel by automobile and public transit. We then used the regression model to estimate the travel time between all TAZ pairs in the metropolitan area for automobile travel and in Cuyahoga County for public transit travel.

We combined the information on the location of skill-appropriate job openings with the commuting-time data to form alternate measures of job access and commuting times. We measured job access via public transit by computing the number of skill-appropriate job openings that can be reached from a given census tract within a commute of 30, 40, and

50 minutes. For those welfare recipients who find jobs, we also computed the straight-line distance between their homes and their workplaces as well as the expected commuting time by automobile or public transit, estimated as discussed previously.

Driver's License Data

A final source of data used in this research is driver's license data obtained from the Ohio Bureau of Motor Vehicles. We used this information to determine whether each of the 1996 welfare leavers did or did not have a driver's license. However, the data available to us were for late 1997 and thus only an approximate measure of driver's-license holders at the time of their exit from welfare in 1996. In fact, we are interested in whether an individual has access to a private automobile for commuting to work or must rely exclusively on public transit. Possession of a valid driver's license is only a rough proxy for automobile access.

Descriptive Analysis

In examining the labor market outcomes for welfare recipients on exiting welfare, we used six different labor market outcomes to measure success and self-sufficiency by welfare leavers in the study period:

- *Employment propensity* is the probability of finding employment in the quarters immediately following exit from welfare. Following common practice, we established a minimum earning level of $100 per quarter as an indication of employment status. We tracked individuals for between two and six quarters following exit. For persons leaving welfare in early 1996, we had six quarters of postwelfare employment data, but for persons leaving in late 1996 we had only two quarters. Because our welfare leaver cohorts were measured monthly and our employment data were measured quarterly, the first quarter following exit may be coincidental with the month of exit. For example, for January, February, and March 1996 leavers, the first quarter of 1996 was considered to be the first quarter following exit from welfare.
- *Length of employment* following exit was measured as the percentage of quarters that an individual was employed between exit and the second quarter of 1997.
- *Mean quarterly earnings* were computed for all persons who left welfare and for the limited subset of persons who found employment following their exit. Because OBES wage record data do not measure hours worked, an hourly wage could not be computed. In statistical models, we used the natural log of mean quarterly earnings as the dependent variable.
- *Average increase in quarterly earnings* was measured as the difference in earnings between the first quarter following exit and the second quarter of 1997, divided by the number of elapsed quarters.
- *Recidivism* was measured for all persons exiting welfare in 1996 by tracking their participation in public assistance programs for the 12 months following their initial exit. Thus recidivism to welfare was the probability of returning to welfare at any time during this 12-month period. We identified a return to welfare in any given month as the receipt of nonzero cash benefits.
- *Time on welfare* was measured as the percentage of the subsequent 12 months spent on welfare following a person's initial exit.

Several factors affect the ability of a welfare leaver to work continuously and to stay off of welfare. Becoming employed is the result of job search processes, whereas remaining employed is a function of the ongoing demands of the job and any related commute.

Earnings are a function of both continued employment and wage levels. Welfare recidivism is related to some combination of all these factors. Exhibit 1 shows the means for these six factors, or outcome measures, as well as for various individual, housing, and transportation characteristics, including age, race, the number of children in various age categories, welfare and earnings history, job access measures, public housing assistance, public housing history, and neighborhood poverty rates.

During 1996, a total of 17,872 persons aged 18 years and over exited the ADC-R program. Among the 1996 leavers, 5 percent lived in public housing projects at the time of exiting welfare, 3 percent lived in Section 8 project-based housing, and 1 percent received a voucher or certificate. Another 4 percent lived in public housing projects at some time between 1991 and 1997 but not at the time of their exit from welfare. Their average age at the time of exit was close to 29 years; the average number of children aged 4 years or younger in an assistance group was 0.93. Sixty-seven percent of leavers were African American, whereas another 7 percent were from another non-White race or ethnic group. The mean proportion of months spent on welfare between July 1992 and the time of exit was 64 percent. Quarterly earnings between the second quarter of 1994 and the time of exit averaged $773. Fifty-seven percent of leavers had a driver's license. The average poverty rate in the home census tract at the time of exit was 44 percent.

When differences in outcomes and characteristics exist among the various categories of housing assistance, we generally found that the residents of public housing projects and Section 8 housing projects were similar to one another, whereas the certificate and voucher recipients were most similar to those without housing assistance. Those receiving public housing assistance were more likely to be African American (94 percent for public housing projects, 90 percent for Section 8 housing projects, and 80 percent for voucher or certificate recipients) than leavers not receiving housing assistance (65 percent). Those living in public housing projects and Section 8 housing projects had spent more time on welfare in the past than had those leavers not receiving housing assistance. It is not surprising that those living in public and Section 8 housing projects lived in census tracts with higher poverty rates (77 and 71 percent, respectively) compared with those without housing assistance (41 percent). However, certificate and voucher recipients lived in census tracts that had slightly lower poverty rates (39 percent). Those who lived in public and Section 8 housing projects were slightly less likely to hold a driver's license (50 and 51 percent, respectively) compared with those without housing assistance (57 percent) or those with certificates and vouchers (56 percent). For most other characteristics, those with and without public housing assistance at welfare exit were similar.

Overall, welfare leavers during this period had both high employment and welfare recidivism rates. Although 72 percent became employed in the quarters immediately following their exit, slightly more than a third returned to welfare during the first 12 months following exit. Surprisingly, welfare recidivism rates were slightly higher among those who became employed following exit (39 percent) than among those who did not become employed (33 percent). This may be an indicator that those who did not work exited welfare as a result of other, more permanent changes in their lifestyle such as marriage.

Outcomes vary somewhat among those who did and did not receive public housing assistance. Employment rates and the percentage of quarters employed varied only slightly among the categories of housing assistance. However, those who lived in public and Section 8 housing projects had lower mean quarterly earnings and considerably more welfare recidivism than did their counterparts outside public housing. Among residents of public and Section 8 housing projects, we found that 48 and 51 percent, respectively, returned to welfare during the study period compared with 36 percent of those without any type of housing assistance. Recipients of certificates and vouchers had a much lower recidivism rate of 30 percent.

Exhibit 1

Means for 1996 Welfare Leavers, Age 18 and Older, Cuyahoga County, Ohio

Variable	All Leavers (*n* = 17,872)	Type of Housing Assistance at Exit: None (*n* = 16,409)	Public Housing Project (*n* = 823)	Vouchers and Certificates (*n* = 138)	Section 8 Project-Based Housing (*n* = 502)	Employed After Exit: Yes (*n* = 12,824)	Employed After Exit: No (*n* = 5,048)
Status after exit							
Employed (%)	0.72	0.72	0.74	0.74	0.74	1.00	0.00
Quarters worked (%)	0.53	0.53	0.54	0.53	0.54	0.74	0.00
Quarterly earnings ($)	1,363	1,372	1,269	1,348	1,243	1,899	—
Quarterly earnings increase ($)	74	76	43	75	42	102	—
Returned to AFDC (%)	0.37	0.36	0.48	0.30	0.51	0.39	0.33
Months receiving AFDC (%)	0.23	0.22	0.32	0.18	0.34	0.23	0.22
Status at exit							
Age (years)	29.3	29.4	29.3	29.5	28.4	28.7	30.8
Race/ethnicity (%)							
African American	0.67	0.65	0.94	0.80	0.90	0.70	0.60
Other	0.07	0.07	0.03	0.00	0.03	0.05	0.10
Children on assistance (*n*)							
Ages 0–4	0.93	0.92	1.10	0.79	0.91	0.87	1.07
Ages 5–9	0.42	0.42	0.50	0.52	0.45	0.44	0.38
Ages 10–17	0.41	0.41	0.39	0.49	0.32	0.42	0.37
Months on AFDC, July 1992–exit (%)	0.64	0.63	0.80	0.63	0.75	0.64	0.64
Average quarterly earnings, 1994Q2–exit ($)	773	780	638	906	704	983	238
Have driver's license (%)	0.57	0.57	0.50	0.56	0.52	0.61	0.44
Entry-level jobs accessible by bus (*n*)							
In 30 minutes	736	724	945	676	790	722	771
In 40 minutes	1,876	1,856	2,176	1,875	2,024	1,865	1,904
Census tract poverty rate, home (%)	0.44	0.41	0.77	0.39	0.71	0.43	0.45
In public housing (%)	0.05	0.00	1.00	0.00	0.00	0.05	0.04
Weeks in public housing, Oct. 1991–Dec. 1995 (*n*)	7.66	2.87	104.04	8.05	6.02	7.74	7.46
In public housing Oct. 1991–June 1997 (%)	0.08	0.04	1.00	0.09	0.08	0.08	0.07
Receiving certificate or voucher (%)	0.01	0.00	0.00	1.00	0.00	0.01	0.01
In Section 8 project-based housing (%)	0.03	0.00	0.00	0.00	1.00	0.03	0.03

Note: Means are shown for all 1996 leavers, separately for leavers who do and do not receive public housing assistance at the time of exit, and separately by whether they gained employment in the postexit study period.

Spatial Differences Related to Public Housing Residency

By definition, residency in housing projects imposes particular spatial locations. In Cuyahoga County, virtually all of the welfare leavers who were also residents of public and Section 8 housing projects resided within the borders of the city of Cleveland, whereas this was true for only two-thirds of their counterparts who either received certificates and vouchers or who received no housing assistance at all.[12] This locational specificity implies certain spatial constraints on searching for employment or commuting to work once employed.

In the descriptive analysis below, we make comparisons between residential locations and the location of the first job following exit for welfare leavers. As was discussed earlier, although employer addresses were available with the wage record data, they did not properly geocode for 44 percent of the first jobs held by employed leavers. To investigate how representative the geocoded sample is of the entire sample, we computed the means of various characteristics for the matched and nonmatched records. As can be seen in exhibit 2, those with missing job information earned considerably less, relied more on postexit welfare assistance, and were more likely to have young children than those for whom job location information was available. The two groups, however, varied less along other dimensions.

Exhibit 2

Means by Availability of First-Job Location Information, Employed 1996 Welfare Leavers, Age 18 and Older, Cuyahoga County, Ohio

	Status of First-Job Location Information	
Variable	**Missing (*n* = 7,138)**	**Available (*n* = 5,686)**
Employed leavers (%)	56	44
Status after exit		
Quarters worked (%)	65	85
Quarterly earnings ($)	1,519	2,377
Quarterly earnings increase ($)	73	139
Returning to AFDC (%)	42	35
Months receiving AFDC (%)	26	19
Status at exit		
Age (years)	28.3	29.3
Race/ethnicity (%)		
African American	71	69
Other	5	6
Children on assistance (*n*)		
Ages 0–4	0.93	0.79
Ages 5–9	0.42	0.47
Ages 10–17	0.39	0.46
Months on AFDC, July 1992–exit (%)	65	63
Average quarterly earnings, 1994Q2–exit ($)	874	1,121
Have driver's license (%)	59	64
Entry-level jobs accessible by bus (*n*)		
In 30 minutes	712	734
In 40 minutes	1,860	1,872
Census tract poverty rate, home (%)	43	43
In public housing (%)	4.6	5.0
Weeks in public housing, Oct. 1991–Dec. 1995 (*n*)	7.6	7.9
In public housing Oct. 1991–June 1997 (%)	7.7	8.0
Receiving certificate or voucher (%)	0.9	0.7
In Section 8 project-based housing (%)	3.0	2.8

Exhibit 3 shows the location of residence and first job by type of housing assistance. Compared with those without housing assistance, the residents of public and Section 8 housing projects were much more likely to live in Cleveland, whereas certificate and voucher holders were slightly more likely to live in the suburbs. Exhibit 4 shows the distribution of first-job location by type of housing assistance and location of residence. Among those who lived in Cleveland, the distribution of first-job location was remarkably similar, with the exception of individuals holding certificates or vouchers. Such individuals were much more likely to find their first job in Cleveland than all other welfare leavers. For residents of suburban Cuyahoga County, the pattern was less clear, probably because of the small numbers of individuals with housing assistance who resided in the suburbs. Exhibit 5 shows outcomes for employed welfare leavers by location of residence and location of first job. The most striking difference is that those who worked in Cleveland had higher average quarterly earnings regardless of where they lived. Although it is not shown in the exhibit, this pattern persisted when the data were broken down by type of housing assistance.

We also investigated other measures of distance from home to work for those who did and did not receive housing assistance. Exhibits 6 and 7 show the commuting times from home to the location of the first postexit job and the estimated bus commuting time.[13] Urbanites found work somewhat closer to their homes but were more distant from suburban job opportunities than their suburban counterparts. Residents of Cleveland with any type of housing assistance who found work in the city lived slightly closer to those jobs than did their counterparts without housing assistance. Among those who lived in Cleveland and worked in the suburbs, residents of public and Section 8 housing projects lived farthest from their workplace, whereas certificate and voucher recipients lived closest to their workplace. Exhibit 7 displays bus commuting times between home and the first postexit job by location of residence and first job and by type of housing assistance. In general, not much variation existed across the various subgroups. Certificate and voucher recipients who lived in Cleveland and worked in the suburbs had shorter bus commuting times than any other group, but those who worked in Cleveland had longer bus commuting times than other welfare leavers.

Exhibit 8 shows an additional measure of home-to-work transit connections: the percentage of individuals whose home and first-job locations were connected by a single direct bus route. Among those with some type of housing assistance, certificate and voucher recipients had the most direct bus connections to their workplaces. This held true for all certificate and voucher recipients who resided in Cleveland regardless of their workplace. Sixty-three percent of those who found work in the city had a direct bus route to work compared with only 25 percent of those that found work in the suburbs. These transit connections were also very good for those who resided in the city, lived in public and Section 8 housing projects, and found work in Cleveland, probably because of the central location of many housing projects. Surprisingly, former welfare recipients without housing assistance living outside the city had significantly better bus connections: 45 percent of suburbanites were directly connected to their workplace whether they worked in the city or close-in suburbs.

Residential Mobility

For individuals facing poor job access, three potential (if costly) solutions exist: changing jobs to shorten their commute, switching to a faster mode of transportation (for example, from public transit to a private automobile), and changing their residence. This section investigates the extent to which individuals pursue the third option to overcome barriers to work. We compare the percentage of employed exiters who move by their initial

Exhibit 3

Location of Residence and First Job, by Type of Housing Assistance at Exit for Employed 1996 Welfare Leavers, Cuyahoga County, Ohio

	No Housing Assistance		Public Housing Project		Vouchers and Certificates		Section 8 Project-Based Housing	
Location	***n***	**%**	***n***	**%**	***n***	**%**	***n***	**%**
Residence								
City of Cleveland	7,918	70.8	543	93.3	63	65.6	308	86.0
Cuyahoga County suburbs	3,268	29.2	39	6.7	33	34.4	50	14.0
First job								
City of Cleveland	2,382	45.8	148	52.3	24	58.5	81	50.9
Cuyahoga County suburbs	2,150	41.3	103	36.4	9	22.0	54	34.0
Outside Cuyahoga County	671	12.9	32	11.3	8	19.5	24	15.1

Exhibit 4

Distribution of First-Job Location, by Type of Housing Assistance at Exit and Location of Residence, for Employed 1996 Welfare Leavers, Cuyahoga County, Ohio (%)

	City of Cleveland Residence				Residence Outside of City			
First-Job Location	**No Housing Assistance**	**Public Housing Project**	**Vouchers and Certificates**	**Section 8 Project-Based Housing**	**No Housing Assistance**	**Public Housing Project**	**Vouchers and Certificates**	**Section 8 Project-Based Housing**
City of Cleveland	52	54	73	53	32	29	40	40
Cuyahoga County suburbs	36	35	18	36	53	48	20	28
Outside Cuyahoga County	12	11	9	12	15	24	40	32

Exhibit 5

Outcomes for All Employed 1996 Welfare Leavers, by Location of Residence and First Job, Cuyahoga County, Ohio

First-Job Location	*n*	%	Quarters Working (%)	Average Quarterly Earnings ($)	Average Quarterly Earnings Growth ($)	Welfare Recidivism (%)	Months Returned to Welfare (%)
City of Cleveland residence							
City of Cleveland	2,044	52	85	2,437	144	37	19
Cuyahoga County suburbs	1,425	36	85	2,291	131	37	20
Outside Cuyahoga County	467	12	81	1,875	72	36	21
Residence outside of city							
City of Cleveland	491	33	85	2,861	198	30	17
Cuyahoga County suburbs	780	52	87	2,490	129	28	15
Outside Cuyahoga County	235	16	85	2,210	116	27	15

Exhibit 6

Straight-Line Distance Between Home and First Job of 1996 Leavers

	Public Housing Residents			Certificates and Vouchers			Project-Based Section 8			Non-Public Housing Residents		
Location of First Job	All	City of Cleveland	Cuyahoga County Suburbs	All	City of Cleveland	Cuyahoga County Suburbs	All	City of Cleveland	Cuyahoga County Suburbs	All	City of Cleveland	Cuyahoga County Suburbs
All workers	6.1	6.1	6.0	4.7	4.1	6.6	6.2	6.1	7.3	6.4	6.1	7.1
City	3.4	3.3	5.8	4.6	3.6	8.2	3.9	3.6	6.1	4.4	4.0	6.4
Cuyahoga County suburbs	7.8	7.9	7.0	4.8	5.9	1.6	8.6	9.0	5.7	6.7	7.1	6.0
Outside Cuyahoga County	20.7	22.7	0.9	0.0	0.0	0.0	16.2	14.9	22.8	18.8	19.4	17.6

Exhibit 7

Bus Commute Time Between Home and First Job of 1996 Leavers Who Became Employed (%)

	Public Housing Residents			Certificates and Vouchers			Project-Based Section 8			Non-Public Housing Residents		
Location of First Job	All	City of Cleveland	Cuyahoga County Suburbs	All	City of Cleveland	Cuyahoga County Suburbs	All	City of Cleveland	Cuyahoga County Suburbs	All	City of Cleveland	Cuyahoga County Suburbs
All workers	36.5	36.0	44.2	34.3	35.7	29.6	37.1	36.6	40.1	38.1	37.5	39.5
City	30.8	30.3	41.6	34.6	35.1	33.0	32.8	31.7	41.9	34.3	33.4	38.0
Cuyahoga County suburbs	45.0	45.0	45.9	33.2	37.9	19.2	44.2	45.3	37.5	42.1	43.2	40.3

Exhibit 8

Direct Bus Route Available Between Home at Exit and First Job of 1996 Leavers Who Became Employed, by Residence and Job Location (%)

	Public Housing Residents			Certificates and Vouchers			Project-Based Section 8			Non-Public Housing Residents		
Location of First Job	All	City of Cleveland	Cuyahoga County Suburbs	All	City of Cleveland	Cuyahoga County Suburbs	All	City of Cleveland	Cuyahoga County Suburbs	All	City of Cleveland	Cuyahoga County Suburbs
All workers	37.1	36.6	43.8	48.3	55.0	33.3	34.3	32.2	47.4	35.5	32.3	43.3
City	49.3	50.0	33.3	54.5	62.5	33.3	48.7	47.1	60.0	43.4	43.0	44.8
Cuyahoga County suburbs	20.6	17.2	50.0	28.6	25.0	33.3	15.1	10.9	42.9	27.1	17.6	43.0

residential location, by the location of their first job, and by their initial commute. We also examine earnings and employment stability by mover status.[14]

Of course, residential moves are expensive and dependent on finding new housing that is affordable and that provides reasonable access to work. As we have shown elsewhere, housing in the Cleveland area that is near areas of high job growth (primarily suburban areas) is seldom affordable (Coulton, Leete, and Bania, 1999). Furthermore, African Americans may face significant racial discrimination in trying to move out of city neighborhoods to those near areas with high job growth. Nevertheless, we believe that examining the possible role of residential moves is important as a background to understanding how those leaving welfare for work cope with spatial barriers.

Information on the spatial location of home and work is also derived from administrative sources. An individual's home address is available on the public assistance files for any month in which they receive cash benefits, Medicaid, or food stamps. This analysis compared the home and work locations when the leaver first became employed and again after a residential move did or did not occur. Both of these points in time could be in any of the four quarters following exit from welfare. The first quarter following exit is defined as the quarter in which cash assistance ended.[15] If no home address data were available for the 3 months of the first exit quarter, we used the address for the preceding month in which cash benefits were last received.[16] This method yielded fairly reliable and comprehensive home address data for the first quarter following exit. Home addresses for the remaining quarters were available only if an individual had returned to the welfare rolls during those quarters or was receiving transitional Medicaid or food stamp assistance. Thus the address data for these subsequent quarters were available only for this particular subsample.

Information on job locations was derived from the employment location addresses reported in the OBES data file, but the accuracy and availability of these data were problematic. Sometimes the address reported was not the actual employment location but the location of the employer's headquarters or accounting firm. This resulted in employer locations that were sometimes outside northeastern Ohio or even out of state. In addition, some employer addresses were incorrectly recorded or spelled and could not be assigned (geocoded) to a latitude, longitude, and census tract location. Thus employer location was not available for approximately one-third of the jobs held by former welfare recipients.

As discussed earlier, addresses used in this analysis were geocoded to a specific latitude and longitude using geographic information system software and data files, and distances between any two points were computed "as the crow flies," in straight lines. Locations were assigned to census tracts based on their latitude and longitude.

Our analysis was limited to the 12,696 leavers who became employed sometime in the first year following their exit from welfare. Because we were looking at residential moves and their effect on the distance to work, this analysis was limited further to those who had locations for both home and work at a minimum of two points in time. Because of limitations on the availability of home and job address data, our analysis was conducted for a maximum of 7,312 working welfare leavers. Depending on the availability of a particular variable, sample sizes sometimes fell below this level.

We examined those welfare leavers who became employed in the first year following their welfare exit and who either did change their residence ("movers") or did not ("nonmovers") during the first year after they obtained their first job. Moving behavior among this group of individuals was remarkably stable. Exhibit 9 shows that 21 percent of these working leavers moved. The rate was the same for those who resided in the city and

Exhibit 9

1996 Welfare Leavers Changing Residences, by Residence and First-Job Location and Distance to Work, Cuyahoga County, Ohio

	Location of Residence During First Quarter Working (%)		
Job Status	**All**	**City**	**Suburbs**
All	21	21	21
Job location			
City	21	21	23
Suburbs	20	21	20
Distance to work (miles)			
0–1	18	19	15
1–3	21	21	21
3–5	21	20	22
5–10	20	21	20
10–15	25	24	27
15–20	20	21	17
20+	20	21	17

those who resided in the suburbs and varied only slightly among suburban residents by the location of their first job. Those working in the city were slightly more likely to move than those working in the suburbs (23 and 20 percent, respectively).

There was slightly more variation when the propensity to move was examined by the distance from home to work for the first job (before any move). Those living less than 1 mile from their workplace had a somewhat lower propensity to move; this finding was particularly true for suburban residents. Both urban and suburban residents with commutes of 10 to 15 miles had a somewhat higher propensity to move (24 and 27 percent, respectively), but those with very long commutes (more than 15 miles) did not.

We also examined the extent to which city dwellers moved to the suburbs and vice versa. Exhibit 10 shows the percentage of movers who initially resided in each location and their moving destinations; 74 percent of movers initially lived in the city of Cleveland, with the remainder living in the suburbs of Cuyahoga County. These percentages mirrored the distribution of welfare leavers overall. Suburban residents were more likely to move into the city than vice versa. Among city-dwelling movers, only 17 percent moved to the suburbs, whereas the remaining 83 percent moved within the city. Among suburban movers, 51 percent moved to the city and the remaining 49 percent stayed in the suburbs.

From the above data, one might surmise that those who commute longer distances are slightly more likely to move. This supposition lends support to the idea that moving can be used as a means to overcome commuting barriers. However, this question can be addressed more directly by looking at whether residential moves actually lead to shorter commutes. Exhibit 10 shows distances from home to work before and after residential moves. These distances, again, were calculated as straight lines. However, actual commuting times, whether by public transit or private automobile, are strongly related to these distances. In fact, residential moves did not uniformly decrease or increase commuting times for these welfare leavers. Overall, 53 percent of moves among all city residents resulted in a longer distance traveled to work, whereas 47 percent of moves reduced the distance. The average distance-reducing move led to a commute that was 3 miles shorter. The average distance-increasing move led to a commute that was 3.3 miles longer. When city residents moved to the suburbs, 64 percent of their commutes became

Exhibit 10

Effect of Residential Moves of 1996 Welfare Leavers on Commuting Distance to Work, Cuyahoga County, Ohio

Variable	All (*n* = 1,498)	City of Cleveland Residence			Cuyahoga County Suburbs Residence		
		All (*n* = 1,114)	Moving Within City (*n* = 920)	Moving to Suburbs (*n* = 194)	All (*n* = 384)	Moving to City (*n* = 197)	Moving Within Suburbs (*n* = 187)
Percentage of movers	100	74	61	13	26	13	12
Commuting distance (miles)							
Before	6.4	6.1	5.9	7.0	7.2	7.0	7.4
After	6.9	6.7	6.5	7.8	7.5	6.8	8.4
Distance-reducing moves (%)	47	47	49	36	50	54	45
Commuting distance (miles)							
Before	8.1	8.0	7.8	9.0	8.6	9.1	7.9
After	5.1	5.1	5.1	5.3	5.0	5.2	4.6
Distance-increasing moves (%)	53	53	51	64	50	46	55
Commuting distance (miles)							
Before	5.0	4.7	4.7	4.9	5.9	4.7	7.1
After	8.3	7.8	7.5	8.6	9.9	8.5	11.2

Note: Percentages may not add to totals because of rounding.

Exhibit 11

Average First-Year Earnings of 1996 Welfare Leavers, by Moving Status and Quarters Worked, Cuyahoga County, Ohio ($)

		Quarters Worked (*n*)			
Moving Status	**All**	**1**	**2**	**3**	**4**
All	6,985	907	2,952	6,437	10,468
Movers	6,145	939	2,563	5,305	9,499
Nonmovers	7,205	898	3,056	6,726	10,720

longer. The exception to this pattern was for suburban residents who moved to the city; in this group, the majority of moves (54 percent) shortened the commute to work substantially, by nearly 4 miles.

These results are somewhat surprising given the popular expectation that overcoming barriers in the welfare-to-work transition would mean following jobs to the suburbs. In fact, the most extensive use of commute-reducing moves is in the opposite direction: suburban residents moving into the city. However, this finding is consistent with the geographic dispersion of home and work in suburban areas. Because commutes are uniformly longer for suburban residents, one might expect more commute-reducing moves in that population.

The ultimate goal of welfare reform is creating successful labor market outcomes for former welfare recipients. The next set of exhibits shows how outcomes vary for movers and nonmovers. Exhibit 11 examines average annual earnings in the first year following welfare exit by moving status. Exhibit 12 depicts the number of employers that an individual has in the first year following welfare exit. Because both of these measures are very sensitive to the number of quarters an individual has worked, the figures are shown separately by quarters of work in the first year following welfare exit. Earnings were almost uniformly lower for movers than nonmovers. Movers also have more employers. These results indicate that movers experience more employment instability, but the data examined here were insufficient to infer the source of that instability. Job changing may be related to lower earnings because of the increased time out of work that it can entail or because of some personal or job characteristic that is related to both job instability and lower earnings. Furthermore, many factors could jointly lead to a decision to move and change jobs, including a decision to decrease one's commute. Nevertheless, the relationship among lower earnings, greater job instability, and moving ought to be treated as a possibly cautionary note by those thinking of residential moves as a solution to welfare-to-work transportation problems.

Exhibit 12

Number of Employers in First Year by Moving Status and Quarters Worked, Cuyahoga County, Ohio

		Quarters Worked (*n*)			
Moving Status	**All**	**1**	**2**	**3**	**4**
All	2.0	1.1	1.6	1.9	2.4
Movers	2.1	1.1	1.7	2.1	2.6
Nonmovers	2.0	1.1	1.6	1.9	2.4

Models of Labor Market Outcomes

The preceding descriptive analysis showed that, on average, welfare leavers with vouchers or certificates live closer to their jobs than other leavers. Also, welfare leavers with housing assistance or who live in the city are more likely to become employed in the city, live closer to their jobs, and have better transit connections. These tendencies are slightly stronger for residents of housing projects than for urban welfare leavers without housing assistance. We have also shown that urban residents are less likely to become employed in the suburbs and are generally more distant from suburban opportunities.

These findings are consistent with the basic premise of the spatial mismatch hypothesis, which suggests that spatial barriers (such as physical distance) to significant employment opportunities may reduce the ability of inner-city residents to either find or retain jobs. In addition, spatial barriers may also indicate disrupted information flows that inhibit the ability to find a job. Racial discrimination and segregation may also play a role. If the spatial mismatch hypothesis is correct, then one might expect it to have particularly significant implications for residents of public housing projects owing both to their tendency to be spatially concentrated in the inner city and to the racial segregation that often occurs there. However, one might expect recipients of certificates and vouchers to not necessarily face the same constraints and to thus fare somewhat better in the labor market. In this section, we use regression analysis to consider the factors that contribute to postwelfare outcomes. For each of the six outcome measures defined above, we estimated a series of regression models. These are ordinary least squares models in the case of continuous dependent variables.[17] In the case of the two dichotomous dependent variables (*welfare recidivism* and *employment*), the comparable model is formulated as a logistic regression. These models follow the general form

$$\textit{outcome} = ß_0 + ß_1\ \textit{demographic characteristics} + ß_2\ \textit{welfare history} + ß_3\ \textit{earnings history} + ß_4\ \textit{housing assistance} + ß_5\ \textit{job access} + ß_6\ \textit{driver's license} + ß_7\ \textit{neighborhood poverty rate},$$[18]

where *demographic characteristics* includes age, race, and number of children in three distinct age groups; *welfare history* measures the percentage of months on welfare between July 1992 and the last month before exit; and *earnings history* is measured as the average quarterly earnings from the fourth quarter of 1994 to the last full quarter before welfare exit. The variable *housing assistance* is a vector of binary dichotomous variables indicating whether an individual has received various types of housing assistance (public housing projects, Section 8 housing projects, and certificates and vouchers) at the time of welfare exit. *Job access* is a measure specific to residential census tract (at time of welfare exit) and indicates the number of projected entry-level jobs that can be reached in a given time period. For those who had access to an automobile, we used the number of projected entry-level jobs that can be reached in a 20-minute commute. For those who did not have automobile access, we used the number of entry-level job openings that could be reached in a 40-minute public transit commute.[19] *Driver's license* is a binary dichotomous variable indicating whether an individual possesses an Ohio driver's license—we take this as a proxy for access to an automobile. *Neighborhood poverty rate* is derived from the 1990 census for the census tract of residence at the time of exit.

Four versions of the model are shown in exhibits 13 through 18; each exhibit contains the results for one of the six outcome measures taken as the dependent variable. In each of the exhibits, the Model 1 column presents a base model that includes the demographic characteristics, welfare history, earnings history, job access, and driver's license variables but no variables representing public housing status. With the exception of the equation explaining average quarterly earnings growth (exhibit 16), the demographic variables are

strongly significant in most cases and show the generally expected signs. Outcomes generally improve (that is, leavers have more jobs, higher earnings, and lower rates of recidivism) with increasing age and with past earnings history and are worse for those with more young children. Again, with the exception of the equation explaining average quarterly earnings growth (which has very little explanatory power), the equation R^2s are in the range expected for cross-sectional equations explaining labor market outcomes—between 0.05 and 0.25.[20]

In the base model (as in most others), the variables measuring public transit job access are statistically insignificant and close to zero. On the other hand, the driver's license variable turns out to be positive and statistically significant in explaining employment and earnings outcomes. However, the driver's license variable is not statistically significant in either of the recidivism equations.

In the Model 2 column of each exhibit, we estimate an alternate base model that excludes the job access by public transit and driver's license variables but includes the indicators for the housing assistance variables. Across all the equations, the coefficients on the set of demographic characteristics, welfare history, and earnings history are quite stable relative to the base model. In the employment equations (exhibits 13 and 14), the effect of having housing assistance is statistically insignificant. In the earnings equation (exhibit 15), the effect of housing status is negative and statistically significant at least at the 10-percent level (or at the 5-percent level for Section 8 project-based housing assistance). The magnitude of the effect of Section 8 and public housing projects is quite similar, whereas the certificate and voucher effect is more strongly negative. However, the differences among the three coefficients are not statistically significant at the 5-percent level.[21] Housing assistance status does not affect the earnings growth, but it does affect recidivism. Living in a public or Section 8 housing project increases the recidivism rate, whereas holding a certificate or voucher has the opposite effect (exhibit 17), although the latter effect is significant only at the 10-percent level. The same pattern holds in the equation explaining the percentage of months on welfare following the initial exit (exhibit 18).

We further investigated these results for public housing residency by including the additional job access and driver's license variables in the equations. In the Model 3 column of each exhibit, we reestimated the models with the housing assistance, job access, and driver's license variables. Again, we found that across all the equations, the coefficients on the set of demographic characteristics, welfare history, and earnings history are quite stable relative to the base model. In addition, the coefficients and pattern of statistical significance on the job access and driver's license variables were virtually identical to the models presented in the Model 1 column. The same is true for the coefficients and the patterns of statistical significance of the housing status indicators estimated in the Model 2 column. Thus the measured effect of housing status seems to hold regardless of whether geographically specific job-access measures or individuals' access to automobiles is included in the model.

It may be that the effect of housing assistance reflects general neighborhood conditions. To test this possibility, we included the 1990 poverty rate by census tract level in the model in a final equation in the Model 4 column of each exhibit. The coefficient on the poverty rate has the expected sign in all six equations and is highly significant in five of them. Including the poverty rate does not affect the estimated coefficients on the demographic characteristics, welfare history, earnings history, job access, or driver's license variables; however, the results for the housing assistance variables are somewhat altered. In the earnings equation (exhibit 15), the negative effect of housing assistance largely disappears, with the exception of a marginally significant negative effect (10 percent) of

Exhibit 13

Probability of Employment of 1996 Welfare Exiters After Exit, Age 18 and Older, Cuyahoga County, Ohio (Coefficient Estimates (SE))

	Model							
Variable	**1**		**2**		**3**		**4**	
Intercept	0.4204*	(0.230)	0.4497**	(0.216)	0.4292*	(0.230)	0.4335*	(0.230)
Demographics								
Age	–0.0082	(0.014)	–0.0012	(0.014)	–0.0081	(0.014)	–0.0082	(0.014)
Age squared	–0.0006***	(0.000)	–0.0007***	(0.000)	–0.0006***	(0.000)	–0.0006***	(0.000)
Race/ethnicity								
African American	0.1139**	(0.045)	0.0836**	(0.043)	0.1062**	(0.046)	0.1114**	(0.048)
Other	–0.3280***	(0.076)	–0.3607***	(0.073)	–0.3299***	(0.076)	–0.3247***	(0.077)
Number of children								
Ages 0–4	–0.1734***	(0.020)	–0.1979***	(0.019)	–0.1746***	(0.020)	–0.1743***	(0.020)
Ages 5–9	–0.0339	(0.030)	–0.0477*	(0.029)	–0.0349	(0.030)	–0.0347	(0.030)
Ages 10–17	0.1020***	(0.031)	0.0825***	(0.030)	0.1020***	(0.031)	0.1022***	(0.031)
Welfare history	0.8003***	(0.063)	0.8329***	(0.060)	0.7925***	(0.063)	0.7945***	(0.063)
Earnings history	0.0016***	(0.000)	0.0017***	(0.000)	0.0016***	(0.000)	0.0016***	(0.000)
Housing assistance								
Public housing			0.1263	(0.091)	0.1554	(0.095)	0.1617*	(0.097)
Certificates and vouchers			–0.1015	(0.215)	–0.1129	(0.233)	–0.1138	(0.233)
Project-based Section 8			–0.0357	(0.113)	–0.0258	(0.118)	–0.0205	(0.119)
Job access								
By bus (nondrivers) (40 min)	–0.00004	(0.000)			–0.00004	(0.000)	–0.00004	(0.000)
By car (drivers) (20 min)	–0.00004	(0.000)			–0.00004	(0.000)	–0.00006	(0.000)
Driver's license	0.4545***	(0.084)			0.4535***	(0.084)	0.4533***	(0.084)
Neighborhood poverty rate							–0.0240	(0.070)
n	16,917		17,872		16,917		16,917	

Note: SE = standard error.
*P = .10, **P = .05, ***P = .01, statistically significant by ordinary least squares linear regression model.

Exhibit 14

Percentage of Quarters 1996 Welfare Leavers Worked After Welfare Exit, Age 18 and Older, Cuyahoga County, Ohio (Coefficient Estimates (SE))

	Model							
Variable	**1**		**2**		**3**		**4**	
Intercept	0.3725***	(0.034)	0.3969***	(0.032)	0.3735***	(0.034)	0.3785***	(0.034)
Demographics								
Age	0.0035*	(0.002)	0.0046**	(0.002)	0.0036*	(0.002)	0.0034*	(0.002)
Age squared	–0.0002***	(0.000)	–0.0002***	(0.000)	–0.0002***	(0.000)	–0.0002***	(0.000)
Race/ethnicity								
African American	0.0338***	(0.007)	0.0288***	(0.007)	0.0330***	(0.007)	0.0393***	(0.007)
Other	–0.0349***	(0.012)	–0.0426***	(0.012)	–0.0352***	(0.012)	–0.0288**	(0.012)
Number of children								
Ages 0–4	–0.0441***	(0.003)	–0.0490***	(0.003)	–0.0442***	(0.003)	–0.0438***	(0.003)
Ages 5–9	–0.0008	(0.004)	–0.0020	(0.004)	–0.0010	(0.004)	–0.0008	(0.004)
Ages 10–17	0.0125***	(0.004)	0.0086**	(0.004)	0.0125***	(0.004)	0.0128***	(0.004)
Welfare history	0.1112***	(0.009)	0.1212***	(0.009)	0.1102***	(0.009)	0.1128***	(0.009)
Earnings history	0.0002***	(0.000)	0.0002***	(0.000)	0.0002***	(0.000)	0.0002***	(0.000)
Housing assistance								
Public housing			0.0129	(0.013)	0.0180	(0.014)	0.0260*	(0.014)
Certificates and vouchers			–0.0334	(0.031)	–0.0284	(0.033)	–0.0293	(0.033)
Project-based Section 8			–0.0077	(0.017)	–0.0031	(0.017)	0.0039	(0.017)
Job access								
By bus (nondrivers) (40 min)	–0.000005	(0.000)			–0.000005	(0.000)	–0.000003	(0.000)
By car (drivers) (20 min)	–0.00001	(0.000)			–0.00001	(0.000)	–0.00001	(0.000)
Driver's license	0.0972***	(0.012)	0.0970***	(0.012)	0.0972***	(0.012)		
Neighborhood poverty rate							–0.0295***	(0.010)
n	16,929		17,884		16,932		16,933	
Adjusted R^2	0.211		0.197		0.211		0.211	

Note: SE = standard error.
*Significant at .10, **significant at .05, ***significant at .01, by ordinary least squares linear regression model.

Exhibit 15

Log Average Quarterly Earnings of 1996 Welfare Leavers After Exit, Age 18 and Older, Cuyahoga County, Ohio (Coefficient Estimates (SE))

	Model							
Variable	**1**		**2**		**3**		**4**	
Intercept	5.03***	(0.136)	5.23***	(0.131)	5.02***	(0.136)	5.04***	(0.136)
Demographics								
Age	0.09***	(0.009)	0.09***	(0.009)	0.09***	(0.009)	0.09***	(0.009)
Age squared	0.00***	(0.000)	0.00***	(0.000)	0.00***	(0.000)	0.00***	(0.000)
Race/ethnicity								
African American	0.07***	(0.025)	0.06**	(0.024)	0.08***	(0.025)	0.11***	(0.026)
Other	0.21***	(0.047)	0.20***	(0.047)	0.21***	(0.047)	0.25***	(0.048)
Number of children								
Ages 0–4	–0.12***	(0.012)	–0.13***	(0.012)	–0.12***	(0.012)	–0.12***	(0.012)
Ages 5–9	0.03*	(0.016)	0.04**	(0.016)	0.03*	(0.016)	0.03**	(0.016)
Ages 10–17	0.01	(0.016)	–0.01	(0.016)	0.01	(0.016)	0.01	(0.016)
Welfare history	0.07**	(0.034)	0.10***	(0.034)	0.08**	(0.035)	0.09***	(0.035)
Earnings history	0.00***	(0.000)	0.00***	(0.000)	0.00***	(0.000)	0.00***	(0.000)
Housing assistance								
Public housing			–0.09*	(0.047)	–0.09*	(0.047)	–0.05	(0.048)
Certificates and vouchers			–0.19*	(0.110)	–0.19*	(0.115)	–0.20*	(0.114)
Project-based Section 8			–0.12**	(0.059)	–0.10*	(0.059)	–0.07	(0.060)
Job access								
By bus (nondrivers) (40 min)	–0.00001	(0.000)			–0.000003	(0.000)	0.00001	(0.000)
By car (drivers) (20 min)	–0.00003	(0.000)			–0.00003	(0.000)	–0.00002	(0.000)
Driver's license	0.37***	(0.045)			0.37***	(0.045)	0.37***	(0.045)
Neighborhood poverty rate							–0.15***	(0.036)
n	12,203		12,836		12,206		12,207	
Adjusted R^2	0.204		0.186		0.205		0.206	

Note: SE = standard error.
*P = .10, **P = .05, ***P = .01, statistically significant by ordinary least squares linear regression model.

Exhibit 16

Average Quarterly Earnings Growth of 1996 Welfare Leavers After Exit, Age 18 and Older, Cuyahoga County, Ohio (Coefficient Estimates (SE))

	Model							
Variable	**1**		**2**		**3**		**4**	
Intercept	–60.06	(82.487)	–21.05	(78.581)	–65.67	(82.573)	–56.34	(82.620)
Demographics								
Age	6.24	(5.214)	6.65	(5.122)	6.47	(5.217)	6.24	(5.216)
Age squared	–0.03	(0.081)	–0.04	(0.079)	–0.04	(0.081)	–0.03	(0.081)
Race/ethnicity								
African American	13.11	(14.858)	7.73	(14.200)	16.30	(15.004)	29.39*	(15.731)
Other	51.84*	(28.430)	53.31*	(27.878)	52.24*	(28.436)	66.41**	(28.888)
Number of children								
Ages 0–4	4.89	(7.273)	2.17	(7.100)	4.90	(7.280)	5.81	(7.285)
Ages 5–9	–18.45*	(9.539)	–17.89*	(9.355)	–18.09*	(9.543)	–17.63*	(9.542)
Ages 10–17	–5.53	(9.567)	–7.23	(9.333)	–5.58	(9.570)	–4.83	(9.572)
Welfare history	–89.47***	(20.840)	–84.68***	(20.435)	–86.86***	(20.933)	–81.40***	(21.021)
Earnings history	0.02***	(0.006)	0.02***	(0.006)	0.02***	(0.006)	0.02***	(0.006)
Housing assistance								
Public housing			–27.15	(27.892)	–33.49	(28.679)	–17.05	(29.283)
Certificates and vouchers			–3.25	(66.124)	–56.54	(69.403)	–57.63	(69.385)
Project-based Section 8			–33.31	(35.200)	–31.01	(35.977)	–15.58	(36.399)
Job access								
By bus (nondrivers) (40 min)	0.007	(0.010)			0.008	(0.010)	0.012	(0.011)
By car (drivers) (20 min)	0.012	(0.011)			0.013	(0.011)	0.015	(0.011)
Driver's license	55.35**	(27.155)			56.03**	(27.159)	56.81**	(27.153)
Neighborhood poverty rate							–60.79***	(22.013)
n	12,203		12,811		12,175		12,174	
Adjusted R^2	0.008		0.007		0.008		0.009	

Note: SE = standard error.
*P = .10, **P = .05, ***P = .01, statistically significant by ordinary least squares linear regression model.

Exhibit 17

Probability of 1996 Welfare Leavers' Return to Welfare After Exit, Age 18 and Older, Cuyahoga County, Ohio (Coefficient Estimates (SE))

	Model							
Variable	**1**		**2**		**3**		**4**	
Intercept	–2.6244***	(0.219)	–2.6061***	(0.208)	–2.5910***	(0.219)	–2.6601***	(0.220)
Demographics								
Age	0.1044***	(0.014)	0.1031***	0.014)	0.1035***	(0.014)	0.1055***	(0.014)
Age squared	–0.0019***	(0.000)	–0.0019***	(0.000)	–0.0019***	(0.000)	–0.0019***	(0.000)
Race/ethnicity								
African American	0.4750***	(0.041)	0.4386***	(0.039)	0.4485***	(0.041)	0.3744***	(0.043)
Other	0.1446**	(0.072)	0.1365*	(0.070)	0.1386*	(0.072)	0.0618	(0.073)
Number of children								
Ages 0–4	0.1612***	(0.018)	0.1628***	(0.018)	0.1615***	(0.018)	0.1568***	(0.018)
Ages 5–9	0.0996***	(0.025)	0.0948***	(0.025)	0.0983***	(0.025)	0.0967***	(0.025)
Ages 10–17	–0.0217	(0.026)	–0.0153	(0.025)	–0.0188	(0.026)	–0.0225	(0.026)
Welfare history	0.5046***	(0.055)	0.5136***	(0.054)	0.4782***	(0.056)	0.4481***	(0.056)
Earnings history	–0.0001***	(0.000)	–0.0001***	(0.000)	–0.000***	(0.000)	0.0000***	(0.000)
Housing assistance								
Public housing			0.2509***	(0.074)	0.2516***	(0.076)	0.1559**	(0.078)
Certificates and vouchers			–0.3553*	(0.189)	–0.3473*	(0.200)	–0.3365*	(0.200)
Project-based Section 8			0.4123***	(0.093)	0.4236***	(0.095)	0.3417***	(0.096)
Job access								
By bus (nondrivers) (40 min)	0.00002	(0.000)			0.00001	(0.000)	–0.00001	(0.000)
By car (drivers) (20 min)	0.00003	(0.000)			0.00002	(0.000)	0.00001	(0.000)
Driver's license	–0.0503	(0.072)			–0.0548	(0.072)	–0.0575	(0.072)
Neighborhood poverty rate							0.3518***	
n	16,917		17,908		16,917		16,917	

Note: SE = standard error.
*P = .10, **P = .05, ***P = .01, statistically significant by ordinary least squares linear regression model.

Exhibit 18

Percentage of Months 1996 Welfare Leavers Returned to Welfare After Exit, Age 18 and Older, Cuyahoga County, Ohio (Coefficient Estimates (SE))

	Model							
Variable	**1**		**2**		**3**		**4**	
Intercept	–0.0680**	(0.031)	–0.0578**	(0.029)	–0.0613**	(0.031)	–0.0690**	(0.031)
Demographics								
Age	0.0129***	(0.002)	0.0123***	(0.002)	0.0128***	(0.002)	0.0130***	(0.002)
Age squared	–0.0002***	(0.000)	–0.0002***	(0.000)	–0.0002***	(0.000)	–0.0002***	(0.000)
Race/ethnicity								
African American	0.0764***	(0.006)	0.0684***	(0.006)	0.0703***	(0.006)	0.0606***	(0.007)
Other	0.0156	(0.011)	0.0157	(0.011)	0.0143	(0.011)	0.0045	(0.011)
Number of children								
Ages 0–4	0.0271***	(0.003)	0.0268***	(0.003)	0.0271***	(0.003)	0.0264***	(0.003)
Ages 5–9	0.0146***	(0.004)	0.0131***	(0.004)	0.0141***	(0.004)	0.0139***	(0.004)
Ages 10–17	–0.0046	(0.004)	–0.0036	(0.004)	–0.0040	(0.004)	–0.0045	(0.004)
Welfare history	0.0960***	(0.009)	0.0959***	(0.008)	0.0900***	(0.009)	0.0860***	(0.009)
Earnings history	–0.00001***	(0.000)	–0.00001***	(0.000)	–0.00001***	(0.000)	–0.00001***	(0.000)
Housing assistance								
Public housing			0.0618***	(0.012)	0.0640***	(0.012)	0.0516***	(0.013)
Certificates and vouchers			–0.0521*	(0.028)	–0.0428	(0.030)	–0.0414	(0.030)
Project-based Section 8			0.0929***	(0.015)	0.0935***	(0.015)	0.0828***	(0.016)
Job access								
By bus (nondrivers) (40 min)	0.000004	(0.000)			0.000002	(0.000)	–0.0000004	(0.000)
By car (drivers) (20 min)	0.00001	(0.000)			0.00001	(0.000)	0.000004	(0.000)
Driver's license	–0.0132	(0.011)			–0.0142	(0.011)	–0.0144	(0.011)
Neighborhood poverty rate					0.0455***	(0.009)		
n	16,929		17,884		16,932		16,933	
Adjusted R^2	0.043		0.047		0.047		0.048	

Note: SE = standard error.
*P = .10, **P = .05, ***P = .01, statistically significant by ordinary least squares linear regression model.

holding a certificate or voucher. The previous result for recidivism does not change; that is, living in a public housing project or a Section 8 housing project increases recidivism, whereas recipients of certificates or vouchers have lower recidivism rates, although the effect is only marginally significant (10 percent). Thus it appears that general neighborhood conditions (as measured by the census tract poverty rate) rather than housing assistance status are responsible for the negative effect on earnings. However, even after controlling for neighborhood conditions, we found that housing assistance continues to have an effect on recidivism. Those who live in project-based housing are more likely to return to welfare, whereas those who hold certificates or vouchers are less likely to return. We find a similar effect with respect to the percentage of time on welfare following the initial exit.

Job access does not have the expected effect on any of the outcomes measured. However, access to an automobile does positively affect the probability of finding employment, the length of employment following exit from welfare, the level of earnings, and the growth rate of earnings. The effects are stable across various specifications and in some cases are substantial. For example, the earnings equation indicates that those with a driver's license earn 37 percent more than those without a license. We also estimate that holding a driver's license increased the percentage of quarters worked by nearly 10 points. Neither job access nor holding a driver's license seemed to affect recidivism.

These empirical results are subject to some caveats and limitations. First, some misclassification of those who do and do not receive public housing assistance is likely. Second, there is the potential for omitted variables relating to personal characteristics.

Misclassification Error. One possible source of error is in the classification of receipt of housing assistance obtained from our matches between administrative data sets on welfare leavers and those provided by the local public housing authority (the Cuyahoga Metropolitan Housing Authority) and the U.S. Department of Housing and Urban Development (HUD). On the basis of those matches, we found that 5 percent of welfare leavers resided in public housing projects at the time of exit, 1 percent received certificates or vouchers, and 3 percent lived in Section 8 project-based housing. The remainder of the sample received no housing assistance at the time of welfare exit.

There are two possible types of misclassification. Welfare leavers not receiving housing assistance might be mistakenly coded as receiving assistance, and those receiving housing assistance might be coded as not receiving it. Because of housing authority records that are incomplete or not updated on schedule as well as the difficulties in making certain matches between files, we suspect that we may have a significant number of errors of the second type—mistaken classification of the assisted as nonassisted.

Either type of misclassification error introduces a conservative bias when estimating the differences in outcomes attributable to the receipt of housing assistance for two reasons.[22] First, any true differences in the means of the two groups are more difficult to observe because the data for the truly assisted and truly unassisted are commingled. In our case, this effect was dampened to some extent because members of a relatively small group were being misclassified as members of a relatively large group. Thus even if a relatively large share of the truly unassisted were misclassified and placed with the assisted population, they would be unlikely to have as much of an effect on the means of that large group.

The second implication of the misclassification is that the standard errors of the coefficient estimates on the variables indicating housing assistance are likely to be inflated compared with what they would be without the misclassification. The variance of a dichotomous variable is a function of the overall sample *n* and of the proportions of each

group. If the measured proportion of individuals falling into one group is smaller than the actual proportion, the estimated variance of the sample population will be smaller than the true variance, which inflates estimates of the standard error and makes finding a statistically significant coefficient more difficult. To the extent that we do observe significant differences in outcomes between those who are and are not receiving housing assistance, it is in spite of the effects of misclassification.

Omitted Variables. The data used in this study lack the richer controls for individual characteristics such as education, lifetime work experience, and mental or physical disability status that are available on some other data sets and are typically included in labor market outcome equations. Although we view the various forms of public housing assistance and the possession of a driver's license as factors that may influence one's labor market outcomes, it is possible that these factors themselves are highly correlated with a number of other personal characteristics that strongly influence outcomes. For example, those with a low literacy level, certain physical or mental disabilities, or a history of alcohol or substance-abuse problems (which could result in license suspension) might be less likely to have a driver's license and also less likely to achieve self-sufficiency in the labor market. Similarly, those receiving housing assistance have experienced significant past poverty, which itself may indicate personal factors that have hampered their attempts to become self-sufficient.

Although a number of these controls are missing from our models, we have included variables controlling for 4 years of welfare receipt history and 2 years of past earnings history (before welfare exit) to serve as proxies for these factors. We are fairly confident that these histories are correlated with and capture much about the individual characteristics that are not precisely measured in our models. With these history controls, the estimates on the housing assistance and driver's license variables should better reflect factors relating functionally to housing assistance and driver's license possession.[23]

Summary and Implications

This study presents one of the few clear pictures of the spatial relationship between home and work for welfare leavers and how the receipt of housing assistance influences that picture. In Cuyahoga County, Ohio, we found that welfare leavers living in public or Section 8 housing projects are more concentrated in cities than those not receiving housing assistance, whereas those receiving certificates and vouchers are more spatially dispersed outside cities. Despite this spatial dispersion, however, welfare leavers receiving certificates and vouchers are more likely to be employed closer to their homes, have shorter estimated commutes, be better connected to their first jobs through direct bus routes, and have easier access to more job openings compared with those who receive project-based or no assistance. This evidence suggests that certificate and voucher recipients have the spatial and economic flexibility to locate either close to their work or to areas where they wish to seek work.

In our multivariate analysis, we sought to determine whether factors associated with spatial job access or with types of housing assistance have a determining influence on various labor market and welfare assistance outcomes. We found that living in Section 8-assisted projects and public housing projects generally has an influence on the outcomes similar to that of receiving certificates and vouchers.

Initially, without controlling for general neighborhood conditions, we found that any type of housing assistance is negatively related to the level of earnings. These results were robust, whether or not we included measures of job access and an individual's possession

of a driver's license. This negative impact of housing assistance, however, largely disappeared when we included even the simplest measure of general neighborhood conditions—the poverty rate—as an independent variable. This finding suggests that the lower earnings often attributed to housing assistance itself are actually a neighborhood-based effect.

In looking at rates of return to welfare assistance, we found that residents of public and Section 8 housing projects are more likely to return and spend more time on welfare following their initial exit, even after controlling for job access, driver's license status, and neighborhood poverty rate. By contrast, holders of certificates or vouchers are less likely to return and spend less time on welfare following their initial exit. These strongly opposing results for the different types of housing assistance suggest that perhaps the spatial limitations of project-based housing might generate different outcomes than the relative freedom of housing choice associated with certificates and vouchers. Although these programs have different spatial implications, the estimated effects are not proxying for spatial access to jobs and job opportunities, which are independently controlled. In fact, regardless of model specification, we found that job access had no impact on any of the six outcomes. However, we did find that holding a driver's license strongly improves employment, earnings, and earnings growth but has no effect on the rate of recidivism.

At first glance, the results relating different types of housing assistance to earnings levels and welfare recidivism seem contradictory. This is particularly true if one views earnings as an intermediate outcome that influences the probability of returning to welfare. In other research, however, we have found some evidence that the factors contributing to employment outcomes are different from the factors contributing to recidivism (Bania, Leete, and Coulton, 2001). Thus we suspect that somewhat different processes determine total earnings and welfare recidivism outcomes for welfare leavers. Taken together with these findings, this might suggest that certificates and vouchers afford their holders greater flexibility in responding to their varying economic situations than is available to either those living in housing projects or those with no housing assistance at all.

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Notes

1. We use *public housing assistance* to refer to traditional public housing projects, Section 8 housing projects, and certificates and vouchers.
2. One of the essential components of welfare reform at the federal level is the payment of block grants to states in support of TANF programs. Because these payments do not depend on the size of the caseloads, falling welfare caseloads have created a financial surplus, which some have termed the "welfare windfall."
3. Author's calculation from county administrative data. (Nationally, 37.4 percent of the AFDC caseload is African American; Committee on Ways and Means, 1994).
4. We calculate these figures from the 1990 5-percent Public Use Micro Data Sample (1990 PUMS). The PUMS defines public assistance income as "Supplemental Security Income, AFDC, or other public assistance or public welfare payments."
5. The IMF tapes were the only data source available to the county in 1996. An important limitation of this data source is that it is a "point-in-time" extract created on or about the 23rd day of each month. This file has been found to have approximately 3–4 percent fewer individuals in a given month than other data sources. Thus our estimates of welfare leavers may be lower than the true number of people leaving public assistance in any given month.
6. Nevertheless, this definition of welfare exit does miss a few individuals who truly chose to leave or became ineligible for welfare for a 1-month period.
7. Workers who are self-employed or work "off the books" are not reported in this database.
8. For example, if cash benefits are received in January, but not in February or March, we define the first quarter of 1996 as the first quarter following welfare exit.
9. A record was considered a match if at least two of the three identifiers were matched. Our file of identifiers was matched against the Tenant Rental Assistance Certification System and Multifamily Tenant Characteristics System files for March 1997. This file includes data records for the previous 18 months.
10. More details can be found in our previous work (Leete and Bania, 1995, 1999; Bania and Leete, 1998; Bania, Leete, and Coulton, 1998; Coulton, Leete, and Bania, 1999).
11. Data from state-level ES-202 reports, derived from employer unemployment insurance records, can also be used for this purpose.
12. There are a few public and Section 8 housing projects outside the city borders. In this sample of welfare leavers, however, we only have data on 39 residents of public housing projects outside Cleveland, 50 residents of Section 8 housing projects outside Cleveland, and 33 individuals with certificates and vouchers outside Cleveland. Because of the small sample size, we do not report on the characteristics and outcomes of these individuals separately.

13. For the bus commute time measure, we have data only for job locations within Cuyahoga County.
14. We did not break this analysis down further by type of housing assistance because the sample sizes would become too small for meaningful analysis.
15. For example, if cash benefits are received in January but not in February or March, we define the first quarter of 1996 as the first quarter following welfare exit.
16. This is only the case if an individual receives their last cash benefits in the last month of a quarter and receives no cash benefits or transitional Medicaid or food stamp assistance in the following quarter (their first quarter following exit).
17. The employment rate in this sample of leavers is approximately 72 percent over the period studied. In the case of equations estimating earnings and earnings growth, estimated only on the employed sample, one would ideally control for sample selection bias via a Heckman correction. However, our data here are inadequate to properly specify such a model. In other work (Bania, Leete, and Coulton, 2001), we show that family structure factors as well as pregnancy and health status are important to determining employment propensity in this population.
18. $ß_0$–$ß_7$ are estimated coefficients in the regression equation.
19. As a benchmark, we use the 1990 PUMS to determine that the median automobile-based commute in the Cleveland metropolitan area was slightly longer than 20 minutes and that the median public-transit commute was slightly less than 40 minutes. We tested various measures of alternative commute times based on job access: 10, 20, 30, and 40 minutes for automobile-based commutes and 10, 20, 30, 40, 50, 60, 70, and 80 minutes for public-transit-based commutes. The regression results are obtained under these alternative measures are virtually the same as the results reported.
20. Or in the case of logistic regressions, *c* statistics in the range of 0.62 to 0.80.
21. In fact, the only significant difference (at the 10-percent level) is between the coefficient on public housing project residents and certificate and voucher recipients and in column (2) of the earnings equation (exhibit 15). The estimated differences in columns (3) and (4) are not statistically significant.
22. To keep things simple, we discuss the impact of classification error as if there are only two groups: those with housing assistance and those without. However, the ideas discussed can be extended to the four-group case with similar results.
23. An alternative method to deal with this problem involves estimating a first-difference equation for individuals whose housing assistance status changed during the course of the study. First-differencing would eliminate the effect of any time invariant factors (including unobservables) and would allow us to get a fairly clean estimate of the effect of housing status. Unfortunately, the number of individuals in each housing assistance category who entered or left housing assistance is too small to support such an analysis.

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