Neighborhood Economic Development and Local Working: The Effect of Nearby Jobs on Where Residents Work*

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Abstract: Decreased earnings and employment rates are not the only effects of job loss in lower-income urban neighborhoods. A reduction in the proportion of residents of a neighborhood who work near the neighborhood, or the "local working rate," is another important effect to consider. Local working is likely to have positive impacts on quality of life and social capital, benefits that are not captured by earnings and employment rates. These impacts include decreased commuting and the development of information-rich local employment networks. Analysis of 1990 journey-to-work census data for the Chicago area shows that physical job proximity is found to be the principal determinant of local working. Also, the proportion of neighborhood residents who are black negatively and strongly affects the local working rate. A principal implication is that job-creating neighborhood economic development may have local working benefits. Black neighborhoods may have lower local working rates because of residents' ability to obtain good jobs with large employers or in the public sector, and such jobs are not located near these neighborhoods. More research is needed to explain this phenomenon.

Key words: neighborhood, economic development, commuting, urban employment, spatial mismatch.

Much of the literature on the effect of job proximity on residents of lower-income urban neighborhoods has focused on employment rate and earnings outcomes (e.g., Holzer and Ihlanfeldt 1996; Kain 1992). Despite significant debate within the literature, most recent research suggests that the effects of job proximity on employment rates are likely to be significant but probably not as substantial as the effects of the skills and race of the worker. Yet, job decentralization has impacts beyond decreased earnings and employment rates and adversely affects a wide range of social institutions and the overall quality of life in lower-income urban neighborhoods (Wilson 1987, 1996). One likely benefit of job proximity is the ability of residents to work within or near their neighborhood, a phenomenon I call "local working," which has a variety of potential benefits, including decreased commuting, the formation and improvement of neighborhood-based job networks, and even neighborhood economic growth, as some firms prefer neighborhood-based work forces.

Given the benefits of local working to urban neighborhoods, especially to lower-income and working-class areas, more needs to be known about the general determinants of this phenomenon. The availability of nearby jobs is assumed to be a major factor, but the magnitude of this effect is unclear. Moreover, other neighborhood characteristics, including the occupations of residents, the nature of nearby jobs, race, and gender, may affect local working. This paper first discusses the importance of local working as an individual and community good and then uses journey-to-work data for the Chicago area to determine the

* Therese McGuire, David Merriman, Joseph Persky, and Wim Wiewel provided important suggestions on earlier drafts of this paper. I would also like to thank Susan Hanson and three anonymous referees for their close attention and helpful comments.

principal factors affecting the local working rate of an urban neighborhood.

Skills, Race, Neighborhood, and Commuting in Urban Areas

Research indicates that higher-skilled workers tend to commute farther than lower-skilled workers. Simpson (1987) finds that higher-skilled workers conduct more spatially expansive job search strategies and that submetropolitan labor market differences are more important to lower-skilled workers. Rees and Schultz (1970) find that higher-skilled workers are more likely to travel more than 24.2 kilometers to work and less likely to travel less than 4 kilometers. This research, together with Granovetter's (1992) finding that higher-skilled workers rely more heavily on weak-tied networks of geographically dispersed occupational contacts, suggests that submetropolitan space may be most relevant for low- and moderate-skilled workers.

Beyond the effects of skill levels, a number of researchers have asserted that job search and employer recruitment techniques differ across neighborhoods or social classes and are important determinants of the employment prospects and outcomes of urban residents. Women have generally been found to commute shorter distances than men (Madden 1981; Hanson and Pratt 1995). Research on the commuting patterns of racial and ethnic minorities suggests that their commuting behavior varies in systematic ways from that of white commuters. For example, McLafferty and Preston (1991) find that the commutes of black and Hispanic women are as long as those of black and Hispanic males, while the commutes of white females are generally found to be shorter than those of white males. Kirschenman and Neckerman (1991) argue that employers consider the residential location of applicants for lower-skilled jobs important in employment screening procedures, sometimes to the detriment of residents of minority or lower-income neighborhoods. To the extent that employer attitudes vary by employer location, they are likely to have an effect on the commuting patterns of workers living in these areas.

Theodore and Carlson (1996) and Hanson and Pratt (1995) argue that the labor markets of lower-income urban residents are highly localized, with both firms and residents focusing their job search and recruiting on nearby areas. From a resident survey, Theodore and Carlson (1996) find that 40 percent of workers living in a low-income neighborhood on the South Side of Chicago work within 4.8 kilometers of the neighborhood (an area not including the central business district). From a survey of 38 representative businesses in the same area, they find that 50 percent of the firms report that three-quarters or more of their employees reside in the neighborhood. An additional 20 percent of firms report that between 50 and 75 percent of their employees live in the neighborhood. The authors note that retail and neighborhood-oriented service firms tend to employ many neighborhood residents, while manufacturers and financial and real estate service firms employ fewer local residents.

Some of the geographic tightness found between employers and workers in lower-skilled occupations is due to forced social and physical isolation, but there also appears to be some preference by both workers and firms for such close geographic relationships. Firms can benefit from nearby sources of workers, and workers prefer to avoid long commutes and may be more familiar with the working conditions at local companies.

Local Working as an Individual and Community Good

After accounting for variations in the quality of jobs over urban space, local working should be seen as an individual good. It is especially beneficial for part-time working parents, who attend to their children after school, for example. For low-paid workers, including youth, the hardship

of longer commutes is not as strongly outweighed by earnings as it is for higher-paid workers. This is evidenced by the significant negative effects of commuting time on the employment rates of youth (Ihlanfeldt 1992). Thus, longer commutes may lead to more tenuous labor force connections. Decreased commuting among neighborhood residents can also have community-wide benefits or externalities.[1] Wilson (1987) argues that youth depend more on neighborhood and social networks to find work, and O'Regan and Quigley (1996) find that the employment prospects of youth are tied to those of their parents and their neighborhood environment. Women are also likely to benefit disproportionately from local working, as evidenced by their generally shorter commutes (Hanson and Pratt 1995; Simpson 1992). Felsenstein, Persky, and Wiewel (1997) suggest that decreased commuting resulting from local job creation should be viewed as a "neighborhood spillover" benefit of such activity.

Beyond the benefits to the individual that can be valued in terms of time or out-of-pocket costs, local working has other benefits, often based in a context of neighborhood or community. Local working may promote the development of job networks among nearby firms and neighborhood residents. Firms may begin to use neighborhood networks to identify new job candidates and may work with local community-based organizations to recruit workers. Hanson and Pratt (1992) find that workers use informal, personal contacts to match their preferences with those of potential employers and to identify what becomes known locally as "a good place to work." Residents of neighborhoods with high local working rates have access to better job information than residents of neighborhoods with few residents working nearby, because they can develop more reliable job information networks regarding local firms. The opinion of a worker on a particular employer located far away cannot be corroborated because no one else from the neighborhood works there, and information on good places to work is scarce and unreliable. In the long run, then, residents of neighborhoods with high levels of local working gain an advantage in access to jobs.

Beyond the effects on the employment of residents, local working might entail benefits to firms who desire a neighborhood-based labor force. Hanson and Pratt (1995) suggest that some firms prefer to locate in neighborhoods or parts of cities in order to tap local workers, and that such firms are often relatively place-bound due to fear of losing existing connections to neighborhood residents. Rees and Schultz (1970) argue that employers prefer workers who live near the workplace. In particular, firms often prefer workers from nearby areas because short commutes are expected to reduce absenteeism problems. Given such behavior, local working can be seen as affecting economic growth or stability in a neighborhood, helping to retain or attract firms that prefer neighborhood work forces. Beyond identifying a stable and easily accessible work force, workers may accept lower wages to work near their homes, thus providing local firms with lower-cost labor. Firms that become dominant local employers might even exercise some monopsony powers in setting wage rates.[2]

[1] While the issue differs significantly from that discussed here, there has been substantial policy interest in the overall commuting levels of large metropolitan areas due especially to the associated problems of congestion, travel times, and pollution. A good deal of research has been done examining the extent to which intraurban imbalances between jobs and housing result in higher commuting levels. See Giuliano and Small (1995), Giuliano (1991), and Cervero (1989).

[2] Local working benefits may reduce the reservation wages of residents finding local work. On the other hand, if a high local working level is caused by a strong demand for labor in the nearby area, as is hypothesized below, wages may be bid up, putting upward pressure on wages. Thus, the predicted response of rela-

Firms and residents alike may benefit from local working because they develop a larger set of common interests, ensuring better relations among competing users of land and neighborhood resources. When the local firm needs to expand its operation, residential neighbors with no stake in the company may be prone to object because of concerns over increased congestion or other effects. But when a firm has significant numbers of employees in the neighborhood, residents are more likely to be understanding and supportive of such developments. Common interests, in turn, can lead to alliances that might be used to garner political attention from local government or to work on problems such as crime and the physical deterioration of a neighborhood. Thus, high local working may be an important component of social capital that cannot be measured outside the neighborhood context. Coleman (1988) suggests that social capital can have positive effects on human capital investments, while Lynn (1994) argues that an area's social capital can be a significant factor in its economic development prospects. Thus, if local working does have positive effects on a neighborhood's social capital, it may lead to indirect benefits in the form of local job opportunities and resident human capital, thus improving the overall employment prospects of residents.

Local Working and Community Economic Development Policy

In the United States, a variety of public policies have attempted to increase or maintain nearby employment opportunities in lower-income urban neighborhoods. The value of local working to neighborhoods, especially low- and moderate-income areas, is partially manifest in such place-based community economic development efforts that seek to create and retain neighborhood-area jobs for the benefit of neighborhood residents.

One primary policy arena that often includes higher local working as an objective is the support of community development corporations (CDCs) that work on commercial and industrial development. While CDCs have been more active in developing housing in recent years, many have focused some or all of their efforts on commercial activity (Vidal 1995). While their motives often include creating jobs for the unemployed, CDCs also work to create and identify nearby jobs for neighborhood residents, even those currently employed elsewhere. In my own survey of eight community economic development organizations in Chicago whose primary, proximate objectives include creating and retaining jobs in targeted neighborhoods, I find that all of them include increasing the proportion of residents working in or near the neighborhood among their ultimate objectives.

A current, neighborhood-targeted economic development policy, the federal empowerment zone program, contains as a major objective creating jobs in distressed urban areas for the employment of residents of these areas. Tax incentives are provided to firms in targeted neighborhoods for each neighborhood resident they employ (U.S. Department of Housing and Urban Development 1994). Firms are given credit for any resident they employ, regardless of whether the resident was previously employed. Other bonding and tax incentives are also tied to the recipient firm employing a substantial number of zone residents. Thus, the program has the implicit goal of increasing the proportion of empowerment zone residents working in the zone.

Proponents of community economic development policies often see themselves as advocates of what Ladd (1994) calls place-based-people policies. By treating individuals and households independently from the communities in which they live, people-oriented policies tend to discount the positive effects of place and community

tive wages to high local working rates is somewhat ambiguous.

on the individual (Bolton 1992). If policies encourage people to leave their communities, they may impose an unseen cost on both the individual and his or her community. Wilson (1987) makes this point in suggesting that desegregation policies imposed costs on black communities by unleashing a pent-up demand by black middle-class households for nonblack neighborhoods. Similarly, policies aimed at helping residents of low-income neighborhoods to find employment in distant parts of the metropolitan region, without any concern for the quality of life in these neighborhoods, may exacerbate the spatial and social isolation of lower-income households, who remain in the neighborhood with few employment opportunities. This is not to argue that such programs are inherently misguided, but rather that they may require complementary efforts to improve the quality of life in distressed neighborhoods. Hughes (1989) argues for complementing job mobility policies with increased crime prevention programs in lower-income neighborhoods. Assisting residents to find job opportunities outside the neighborhood may be an important and necessary task, but building a stronger network of residents who are employed locally—if it is feasible—may also bring important benefits to neighborhood residents.

Developing a Model of Local Working

In order to estimate the significance of the effects of job proximity and characteristics of neighborhood residents on local working, I develop a model using aggregate, small-area journey-to-work data on jobs, residents, and commuting. Relying on these data, the model aggregates the place of work behavior of individuals into residential zones. Generally, small-area detail on places of work are not available from regular sources of individual-level data such as the Census Bureau. Many researchers have utilized individual-level data available from sources such as the Public Use Microsample and have had only large-scale information on job locations or have used proxies such as commute times. The advantage of such approaches is that they directly model individual behavior and not aggregations of individual behavior, avoiding any ecological fallacy. At the same time, these approaches typically do not address job proximity in a rigorous and direct fashion. Moreover, the policies of particular concern here are place-based, so that the local working behavior of neighborhoods is of interest.

The effect of job proximity on neighborhood local working should be especially strong in expansive and densely populated metropolitan areas with significant traffic congestion, such as Chicago, where commute times can be substantial. In the nine-county Chicago area, approximately 11 percent of workers commuted at least one hour each way to their jobs in 1990, another 11 percent commuted at least 45–59 minutes, and 23 percent commuted from 30 to 44 minutes.[3] Job search costs may also pose significant barriers to employment across metropolitan space, especially in racially and economically segregated urban areas. In these areas, the knowledge of jobs in distant locations may be scarce, especially for lower-skilled workers. Moreover, racial discrimination by employers may be confounded with spatial segregation, with employers in nonminority areas preferring nonminority employees, either based on their own discriminatory preferences or on those of their customers or residential neighbors. The latter may be particularly relevant in retail and consumer service industries.

Even if intraurban space posed no barriers to job search or place of work, neigh-

[3] Based on 1990 Census Transportation Planning Package, CTPP-1, U.S. Census Bureau (1993). The CTPP Urban Element for Chicago includes Cook, DuPage, Lake, McHenry, Kane, Kendall, Grundy, Will, and Kankakee counties, all in Illinois.

borhoods near more jobs would tend to have higher local working rates, simply because of the presence of more local job opportunities. Given that job search and commuting costs increase with distance, local working rates are expected to be even more sensitive to the number of nearby jobs than if no spatial barriers existed.

In simplest form, neighborhood local working might be expected to increase as the number of jobs within a nearby job catchment area rises. A spatial model that assumes a circular job catchment area of radius d from the neighborhood is shown in Figure 1. The impact of nearby jobs on local working also depends on the number of residents of nearby areas who compete for those same jobs. Thus, more persons living in the catchment area increases the competition neighborhood residents face for these jobs. For example, if 1,000 jobs and 500 residents in the labor force lie within three kilometers of neighborhood A, while 1,000 jobs and 20,000 residents lie within three kilometers of neighborhood B, residents of neighborhood A would be expected to have greater access to nearby jobs than those of neighborhood B. Much of the competing labor force in the surrounding area is likely to live closer to many of the nearby jobs than do neighborhood residents. This suggests that the key measure of a neighborhood's accessibility to nearby jobs is not the number of jobs alone, but the ratio of jobs to the number of persons in the labor force within radius d—the nearby jobs-to-labor-force ratio. A neighborhood with a nearby jobs-to-labor-force ratio of one-half, for example, would be expected to offer fewer nearby job opportunities to neighborhood residents than a neighborhood with a nearby jobs-to-labor-force ratio of two. It is assumed that only the residents within the radius d compete for the jobs within radius d. The local working rate is defined by

$$w_i = c_{i(d)}/e_i, \tag{1}$$

where w_i = the local working rate of neighborhood i; $c_{i(d)}$ = the number of residents in neighborhood i who work within a radius, d; and e_i = the number of employed residents in neighborhood i. The model for local working is, in turn, given by

$$w_i = \alpha + \beta(J_{i(d)}/R_{i(d)}), \tag{2}$$

where $J_{i(d)}$ = number of jobs within a certain radius, d, of neighborhood i; $R_{i(d)}$ = number of persons in the labor force living within a certain radius, d; and $\beta > 0$ is expected.

In neighborhoods with very low jobs-to-labor-force ratios, the local working rate should be low. As nearby job opportunities increase, those preferring to work nearby or those who are highly transportation- or information-constrained—especially part-time workers and youth—will quickly seek out nearby jobs. As the jobs-to-labor-force ratio increases, however, there will be fewer residents who seek and have not already found nearby work, so the local working rate will increase more slowly. Thus, at high levels of jobs-to-labor-force ratio the local working rate will increase more slowly than at low levels, and at even higher levels it will reach a plateau. An appropriate function for such a model is a

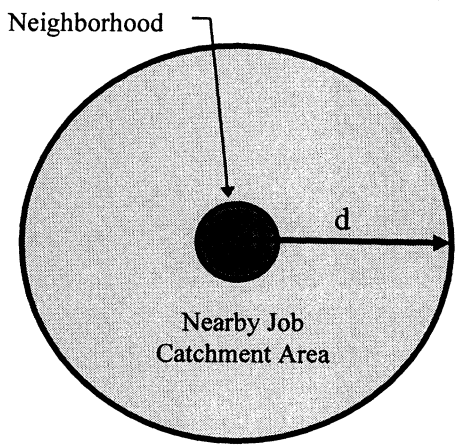

Figure 1. The basic geographic scheme for nearby job catchment area surrounding a neighborhood.

logarithmic form:[4]

$$w_i = \alpha + \beta \log(J_{i(d)}/R_{i(d)}) + \hat{\gamma}(x_{1i},\ldots x_{ki}), \quad (3)$$

where $x_{1i},\ldots x_{ki}$ is a vector of characteristics of neighborhood i residents, nearby jobs, and occupational similarity between the two; and $\beta > 0$ is expected.

The set of additional local working determinants, $x_1,\ldots x_k$, is drawn from the literature on employment and job search reviewed above. Factors affecting local working should include measures of the average occupational level of residents; the similarity between occupations of the nearby jobs and the occupations of the neighborhood labor force; the race, ethnicity, age, and gender of residents; access to automobiles; and the proportion of adults enrolled in school of any sort. Given the literature suggesting that higher-skilled workers conduct more spatially expansive job searches than lower-skilled workers (Rees and Schultz 1970; Simpson 1992), occupational level is expected to be a significant determinant of local working. A weighted average occupational level for employed residents was calculated, with the weights being the numbers of employed residents in the occupation and the occupational grade being the 1990 average hourly wage for all metropolitan workers in the occupation. The Public Use Microsample of the 1990 Census for the Chicago area was used, with workers classified into 14 occupational categories.

In addition to the occupational level of residents, the occupational match between nearby jobs and residents may be an important determinant of local working. Neighborhoods where there is greater similarity between the occupations of residents and nearby jobs are expected to see higher levels of local working. A standard dissimilarity index, ranging from 0 to 1, is calculated using 14 occupational categories to compare the occupational mix of nearby jobs to that of employed residents.

Because of the importance of social networks in job search and the potential for employment discrimination, the race and ethnicity of residents are also included as independent variables. Neighborhoods with more youth are expected to have higher local working because youth face transportation constraints and tend to work part time. The proportion of workers who are women is also expected to increase local working, because women—at least white women—tend to work closer to home than men (Hanson and Pratt 1992, 1995; Simpson 1992; White 1977). Automobile access is expected to have a negative effect on local working, because it may lower job search barriers and commuting costs.[5] Neighborhoods with many adults enrolled in school are likely to contain many residents working at nearby colleges and universities, resulting in higher local working rates. Finally, the distance of the neighborhood from the central business district (CBD) is used to help capture unmeasured differences in neighborhoods, such as in resident skills. Monocentric models of residential choice typically predict that higher-income households live farther from the CBD (Fujita 1989).

Choosing the Neighborhood Area and Nearby Job Radius, *d*

The model presented in Equation (3) and illustrated in Figure 1 requires two

[4] Curve-fitting plots were performed to test alternative specifications, and regressions were run on those appearing to be good fits. Curve fitting identified logarithmic, linear, and quadratic forms of the jobs-to-labor-force variable as reasonable fits, and the logarithmic form obtained best goodness of fit results in regressions. Logistic and other s-curve forms did not exhibit good curve-fitting behavior and were not estimated.

[5] There may be a problem of simultaneity between automobile access and local working. Local working may reduce one's tendency to buy a car, although the causality would seem to run more strongly in the other direction.

types of geographic units. First, the smaller residential neighborhood zone must be chosen. Because the model incorporates both labor supply and labor demand factors, and because resident characteristics, including race and skills, vary greatly over relatively small distances, a small zone is most appropriate. Moreover, to ensure adequate variances for independent variables, a large number of observations is required. The lower limit is determined primarily by maintaining sufficient population in each observation to permit the characterization of zones across a wide variety of features (e.g., employment status, industry, occupation, enrollment) and by the minimum disaggregation level of the available data. In the primary data set used here, the Census Transportation Planning Package for Chicago, the smallest unit is a half-mile-by-half-mile (0.8-kilometer-by-0.8-kilometer) area, commonly called a quartersection, which I adopt as the residential zone.

Adopting a job catchment area that is substantially larger than the zone itself mitigates problems of reverse causality—that is, the possibility that high local working rates might actually result in more jobs in an area. If the zone and job catchment areas were similarly sized, then the direction of causality between the jobs-to-labor-force ratio and local working would be unclear. Using a job catchment area much larger than the zone reduces the simultaneity problem and the jobs-to-labor-force ratio can be viewed as essentially independent of local working.

This research uses a job catchment radius consistent with current neighborhood economic development policies to best inform such policies. Most neighborhood-targeted economic development efforts serve areas on the order of 13 to 65 square kilometers. For example, the federal empowerment zone program limits zone areas to 51.8 square kilometers. The eight urban empowerment zone areas designated in 1994 range from 11.4 to 50 square kilometers in area, with those in the larger cities ranging from 19.7 to 50 square kilometers (Great Cities Institute 1996). Assuming a job catchment area that is circular, a range of 13 to 65 square kilometers implies a radius of 2 to 4.6 kilometers. Given this range and the 0.8 kilometer grid of quartersections, I adopt a 3.2 kilometer (two mile) radius around each residential zone. The geographic units adopted capture the labor supply differences among urban neighborhoods, provide many degrees of freedom for statistical calculations, recognize the radial nature of surrounding labor markets, mitigate concerns about the direction of causality, and are consistent with neighborhood economic development policy.

Data

The data used to estimate the model of Equation (3) come from the 1990 Census Transportation and Planning Package (CTPP) Urban Element for Chicago. The CTPP, which is derived from the 1990 Census long form survey of the population, provides information on residents and job holders aggregated at small geographic levels (U.S. Bureau of the Census 1993).[6] In the case of Chicago, the CTPP data are aggregated at the residential quartersection level, which is used as the residential zone for estimating Equation (3). From the CTPP, a data set was constructed for a large, central portion of the Chicago metropolitan area (pictured in Figs. 2 and 3), including most of the older parts of the region. For every residential zone in the

[6] Data were compiled by the Census Bureau from the long form of the decennial census, including places of work. Where place of work was not identifiable, workplaces were allocated by the Census Bureau based on the distribution of known workplaces, while controlling for means of transportation, travel time, and industry. The exclusion of outlying suburban areas from the study area obviated problems with unallocated workplaces, which occur when fewer than 70 percent of workplaces in an area are able to be geocoded (U.S. Bureau of the Census 1993).

study area, variables describing jobs and residents within 3.2 kilometers of the zone are calculated. All quartersections with centroids lying within 3.2 kilometers of the residential zone are considered to fall within the 3.2 kilometer "circle" of Figure 1. In actuality, the catchment area is not a perfect circle, but is a circular agglomeration of 49 square quartersections, including the residential zone.

In order to develop a working data set for estimating the model of Equation (3), four types of data set reduction were necessary. First, observations in which there was insufficient population to calculate variables of concern (e.g., occupational dissimilarity) were omitted, accounting for the largest reduction. Then those observations lying within 3.2 kilometers of the perimeter of the total data set, and cases which were within 3.2 kilometers of the central business district (in order to gauge the effects of neighborhood jobs) were omitted. Finally, the data set was reduced to eliminate a small number of split quartersections bisected by municipal borders. These observations are not given unique geographic positions in the data set. The resulting data set consists of 1,629 observations.

Variables describing residential characteristics for each of the zones were created, as well as variables describing jobs and residents in the labor force within three kilometers of the zone. The included zones represent a substantial portion of the Chicago metropolitan area population, especially of the older central city and inner suburbs. Residents of these zones who are in the labor force constitute almost 80 percent of the labor force in the study area and 50 percent of the labor force in the nine-county Chicago metropolitan area.

Descriptive statistics for the dependent variable and independent variables used to estimate Equation (3) are provided in Table 1. The spatial distribution of local working for the data set is illustrated by Figure 2. Many of the zones with high local working rates, exceeding the mean of 16 percent plus one standard deviation (24 percent), are clustered in western Cook County, around O'Hare Airport, and a cluster of north suburban neighborhoods. Joliet, an edge city southwest of Chicago, also has very high local working rates.

The independent variable of primary interest is the nearby jobs-to-labor-force-ratio—the number of jobs within 3.2 kilometers of the zone divided by the number of persons in the labor force who live within 3.2 kilometers of the zone. This is the principal measure of spatial access to nearby jobs. Figure 3 illustrates the jobs-to-labor-force ratios for zones in the data set. The jobs-to-labor-force ratio varies from 0.02 to 4.74, with a mean of 0.77, a median of 0.65, and a standard deviation of 0.47. High jobs-to-labor-force levels are found in the northwest suburbs surrounding O'Hare Airport, many western Cook and Dupage County suburbs, and a cluster of north suburban zones. In some of these areas, such as most of Dupage County, nearby job densities are not as high as in many central city zones, but relatively low population densities result in much higher jobs-to-labor-force ratios than in most central city zones.

The correlation between local working and the jobs-to-labor-force ratio is positive, as expected by the model in Equation (2), with a coefficient of 0.4199. This can be seen by comparing Figures 2 and 3. Most of the areas with very high jobs-to-labor-force ratios also have high local working rates; similarly, most areas with low jobs-to-labor-force ratios have low local working rates.

Results

Table 2 presents the results of an ordinary least squares (OLS) estimation of Equation (3).[7] The coefficient on the jobs-

[7] Results for alternative specifications were calculated with similar results, although the magnitude of the jobs-to-labor-force term

Table 1

Summary Statistics for Dependent and Independent Variables

Variable Description	Variable Name	Mean	Median	Standard Deviation
Portion of employed zone residents working within 3.2 kilometers of zone	Local working rate	0.16	0.16	0.08
Jobs within 3.2 kilometers/ labor force within 3.2 kilometers	Jobs-to-labor-force ratio	0.77	0.65	0.47
Log of jobs-to-labor-force ratio	Log of jobs-to-labor-force	–0.40	–0.42	0.54
Occupational level index for employed residents	Occupational level	10.81	10.80	0.89
Occupational dissimilarity between employed residents and nearby jobs	Occupational dissimilarity	0.19	0.19	0.06
Proportion of residents who are black	Proportion black	0.18	0.01	0.33
Proportion of residents who are Hispanic	Proportion Hispanic	0.08	0.03	0.15
Proportion of residents age 16–64 who are under 25	Working-age residents under 25	0.19	0.18	0.06
Proportion of residents in the labor force who are female	Female labor force	0.46	0.46	0.05
Proportion of residents age 18–64 enrolled in school	Adult enrollment	0.13	0.12	0.05
Proportion of households without access to automobile	Proportion without car	0.13	0.07	0.14
Distance from Chicago CBD in kilometers	Kilometers from CBD	25.12	22.77	11.72

to-labor-force term is positive and significant at $p = 0.01$. Also presented are the standardized coefficients (β-values) for each independent variable, which indicate the change in the dependent variable resulting from a standard deviation change in the independent variable. At the mean of the jobs-to-labor-force variable (log), –0.40, a standard deviation increase in this variable results in a 4 percentage-point increase in local working. The other variables whose variances contribute the most to local working include proportion black, adult enrollment, and working-age persons under 25. All variables are significant at $p = 0.10$ or less except for proportion Hispanic and female labor force.

Before examining the results of the regular OLS regression too closely, it is important to consider potential problems of heteroscedasticity and spatial autocorrelation, both of which are common to the sort of data used here. Aggregated, cross-sectional analyses often suffer from problems of heteroscedasticity, which can result in biased estimators of the variance of estimated parameters. The White test presented in Table 2 indicates likely heteroscedasticity. Diagnostic plots not included here show that error variances increase as the jobs-to-labor-force ratio increases and as the proportion black declines. MacKinnon and White (1985) have developed a covariance matrix for OLS estimates that is robust to heteroscedasticity. The results of the adjusted White OLS estimation using these estimates are presented in Table 2.

varies across specifications, as would be expected. The logarithmic specification has slightly better explanatory power than the alternatives, including a linear and quadratic form. A more complex logistic form was not directly tested due to its poor performance in curve-fitting plotting exercises due primarily to the lack of any concave response at low jobs-to-labor-force values.

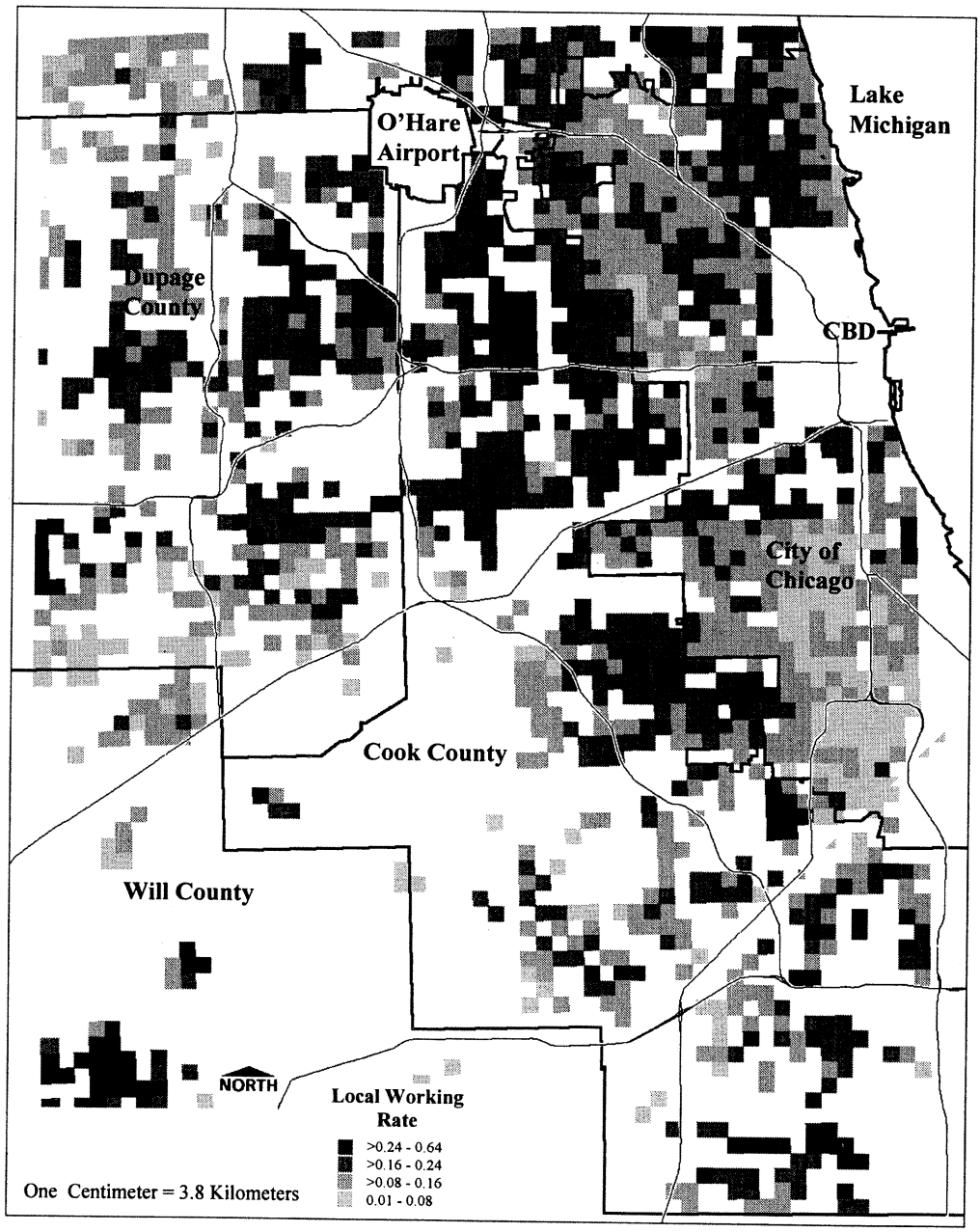

Figure 2. Local working rate as of March 1990 for Chicago area quartersections in the data set.

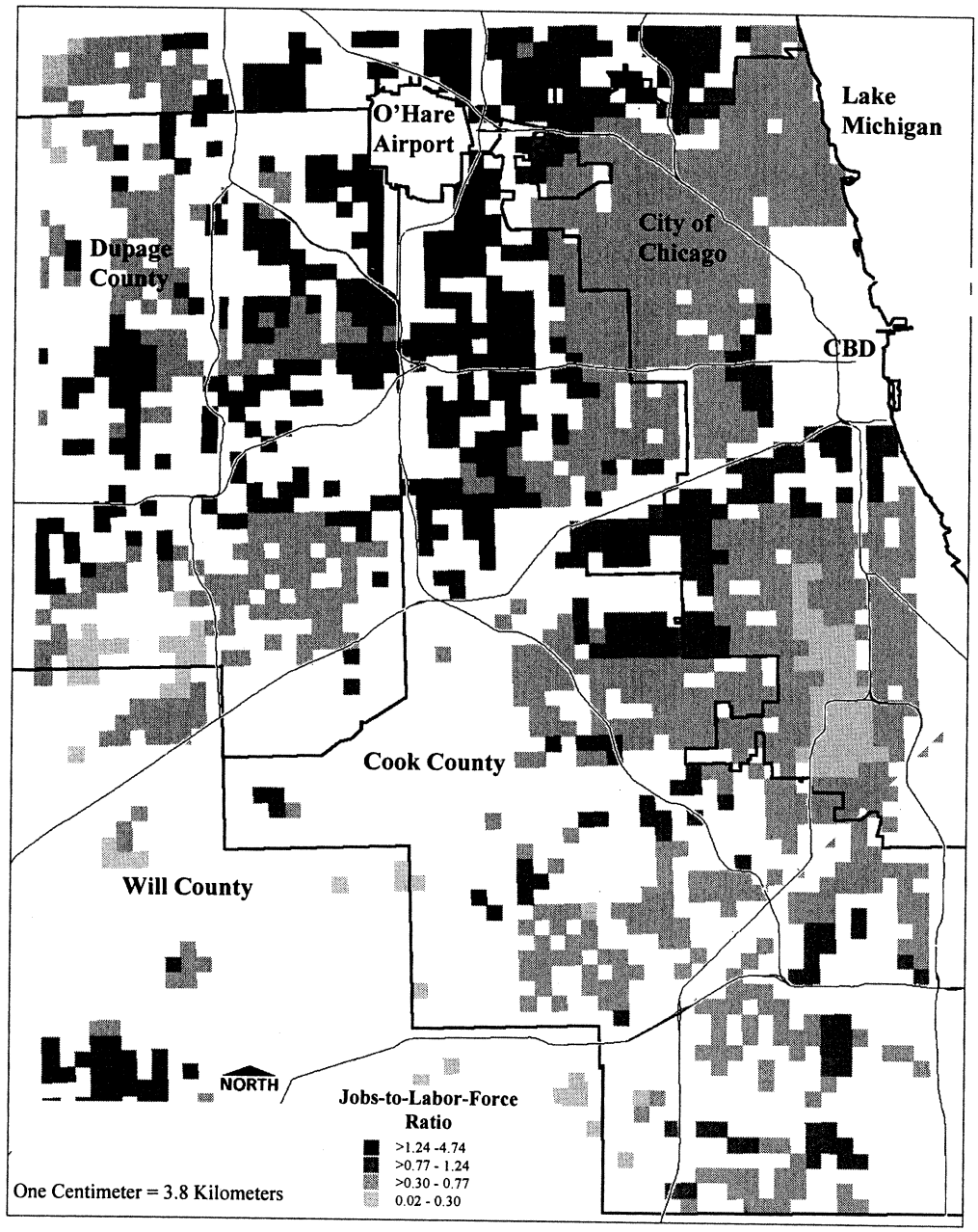

Figure 3. Jobs-to-labor-force ratio as of March 1990 for Chicago area quartersections in the data set.

Coefficients are not presented, because the adjusted White estimation only affects the standard errors, not the parameter estimates. The only consequential effect on the significance of variables is that kilometers from CBD becomes insignificant.

Intraurban data are also susceptible to problems of spatial autocorrelation. This problem occurs when the errors in the equation for spatially related observations are more similar than unrelated observations. For example, the errors of a pair of nearby observations may be more similar than those of more distant pairs. Indeed, given the nature of the jobs-to-labor-force variable, some degree of autocorrelation among OLS residuals is certainly likely. This is confirmed, and reported in Table 2, by a highly significant Kelejian-Robinson test for spatial error, which is more robust than the more familiar Moran's I test, and a Lagrange Multiplier test for spatial lag (Anselin 1992, 26-10–26-13).

Two common forms of spatial autocorrelation, spatial error and spatial lag, are of concern. A spatial error specification is appropriate when the error term is expected to be correlated with error terms for nearby observations. Ignoring this form of autocorrelation does not affect the consistency of estimators, but does affect their efficiency (Anselin 1988, 108–109). Given the large size of the data set here, a consistent estimator is sufficient. On the other hand, ignoring a spatial lag form of correlation, in which the dependent variable is

Table 2

Results of OLS and Adjusted White OLS Estimation of Neighborhood Local Working Rate (Equation (3) with the Local Working Rate Measured from 0.00 to 1.00)

			Variance Estimation			
			OLS		Adjusted White OLS	
Independent Variable	Coefficient	β-Value	Standard Error	t-Value	Standard Error	z-Value
Log (jobs-to-labor-force ratio)	0.073874	0.4896	0.003164	23.35	0.003524	20.96 ***
Resident occupational level	–0.007274	–0.0798	0.002854	–2.56	0.003109	–2.34 **
Occupational dissimilarity	–0.058632	–0.04502	0.028017	–2.09	0.029848	–1.96 **
Proportion black	–0.062199	–0.2536	0.008077	–7.70	0.007495	–8.30 ***
Proportion Hispanic	0.011469	0.0210	0.015436	0.74	0.014901	0.77
Female labor force	0.051109	0.0299	0.416159	1.23	0.043929	1.16
Working-age residents under 25	0.12903	0.0925	0.039572	3.26	0.045324	2.85 ***
Adult enrollment	0.28009	0.1689	0.040291	6.95	0.057402	4.88 ***
Proportion without car	0.037224	0.0642	0.019025	1.96	0.019599	1.90 *
Kilometers from CBD	0.000355	0.0513	0.000185	1.91	0.000266	1.33
Constant	0.194722		0.038782	5.02	0.043145	4.55 ***
R^2	0.3739					
Adjusted R^2	0.3700					
White Test (DF = 65)	371.32 ***					
Kelejian-Robinson (DF = 11)	3122.80 ***					
Robust Lagrange Multiplier	12.21 ***					
N	1,629					

* Significant at below 0.10.
** Significant at below 0.05.
*** Significant at below 0.01.

correlated with the dependent variable of nearby observations, results in inconsistent, biased estimators. The spatial lag model includes a spatially lagged dependent variable as an independent variable, so that Equation (3) is modified:

$$\omega_i = \alpha + \rho\omega_i + \beta\log(J_{i(d)}/R_{i(d)}) + \hat{\gamma}(x_{1i},\ldots x_{ki}), \quad (4)$$

where ω_i is a spatially lagged value of local working; and ρ is the spatial autoregressive coefficient, and expected to be positive; and $\beta > 0$ is expected. The spatially lagged variable, ω, is calculated by averaging the values of local working of nearby observations. Nearby observations are defined by a contiguity matrix, in which all pairs of observations within 3.2 kilometers of each other are indicated.

For large data sets, Anselin (1988, 81–87; 1992, 28-1–28-7) provides an instrumental variables approach for estimating Equation (4). The contiguity matrix is used to derive lagged values of each independent variable, and then those variables are used as instruments for the lagged dependent variable, ω. Table 3 presents the results of the two-stage least squares (2SLS) results for estimating Equation (4) with all lagged independent variables used as instruments. The results are similar to those of Table 2, but the coefficients of the independent variables are now significantly smaller, and a substantial autoregressive coefficient is found (0.65). In particular, accounting for spatial autocorrelation reduces the coefficient on the jobs-to-labor-force term by more than one-half. The significance levels of several variables are affected and are now based on a standard normal distribution and not on the Student t distribution used in OLS. Thus, z-values are used to determine significance levels. The variable proportion without car is no longer significant. Resident occupation level and occupational dissimilarity are now significant at $p = 0.10$, and not at $p = 0.05$.

While the effect of the jobs-to-labor-force term is still relatively large, a standard deviation increase in the variable results in an increase in local working of slightly more than one-fifth of a standard deviation, or 1.7 percentage points, rather than the 4 percentage-point effect found through OLS estimation of Equation (3). After accounting for spatial autocorrelation, most independent variables remain significant, at least at the $p = 0.10$ level. Of the two race and ethnicity variables, only proportion black is significant, and its effect on local working is negative. The magnitude of the effect is substantial. A standard deviation increase in the proportion black decreases local working by 1.5 percentage points. Moreover, an all white neighborhood has a local working rate that is 4.4 percentage points higher than an equivalent all black neighborhood. This comparison is important because many African Americans live in highly segregated, predominantly black neighborhoods.

It is not entirely clear why black neighborhoods have lower local working rates. African Americans may tend to work farther from their neighborhoods due to relatively better opportunities elsewhere. The environment for small businesses in many black neighborhoods has certainly deteriorated over the last 40 years, so there are likely to be fewer employment opportunities at local, black-owned establishments, which disproportionately hire African Americans (Bates 1993). Perhaps more importantly, relatively better opportunities may have developed outside of black neighborhoods, with gains in employment in the public sector and among larger employers, both of which tend to be located in the central business district and areas not near black neighborhoods. In examining hiring patterns in four large urban areas, Holzer (1996) finds that larger employers, which are disproportionately located in central cities, tend to hire African Americans at substantially higher rates than small firms, which are disproportionately located in suburban areas. At the same time, African Americans may find it hard to penetrate the hiring networks

Table 3

Results of Instrumental Variable (2SLS) Spatial Lag Model
(Equation (4) with the Local Working Rate Measured from 0.00 to 1.00)

Independent Variable	Coefficient	β-Value	Standard Error	z-Value
Lagged local working rate[a]	0.651609		0.065949	9.88 ***
Log (jobs-to-labor-force ratio)	0.031402	0.208119	0.005061	6.20 ***
Resident occupational level	–0.003995	–0.043214	0.002426	–1.65 *
Occupational dissimilarity	–0.045970	–0.035301	0.023695	–1.94 *
Proportion black	–0.044065	–0.179642	0.007064	–6.24 ***
Proportion Hispanic	–0.001422	–0.002606	0.013101	–0.11
Female labor force	0.026793	0.015689	0.035230	0.76
Working-age persons under 25	0.155571	0.111479	0.033526	4.64 ***
Adult enrollment	0.24842	0.149827	0.034176	7.26 ***
Proportion without car	0.012040	0.020770	0.016267	0.74
Kilometers from CBD	–0.000021	–0.003074	0.000161	–0.13
Constant	0.054461		0.065949	1.52
Measures of fit[b]				
Pseudo R^2	0.4598			
Correlation squared	0.3494			
N	1,629			

[a]Spatially lagged values of all independent variables are used as instruments for the "lagged local working rate." For each variable, the spatially lagged values are the average of the values for observations within 3.2 kilometers of the observation. The lag calculation uses a binary contiguity matrix (Anselin 1992).

[b]A traditional R^2 is not applicable to the instrumental variables approach (Anselin 1988, 1992). The first measure is equal to the ratio of the variance of predicted values of the dependent variable to the observed values of the dependent variable. The second is equal to the square of the correlation between the predicted and observed values. Neither of these values are directly comparable to the OLS R^2 measure.

* Significant at below 0.10.

** Significant at below 0.05.

*** Significant at below 0.01.

used by existing, non-black-owned, smaller firms near their neighborhoods, and these firms may be more prone to racial discrimination and less affirmative in their minority hiring than larger firms in other areas. This argument runs counter to Kain (1968) and others, who suggest that firms located in black neighborhoods were less likely to discriminate.

Another substantial factor in determining local working is the adult enrollment rate. A standard deviation increase in this variable results in a 1.2 percentage-point increase in local working. In areas with many adults enrolled in college, or even high school, residents will tend to work locally, often at a nearby educational institution.

The occupational index of employed residents has a significant, negative effect on local working, consistent with Simpson (1992), who argues that higher-skilled workers conduct more spatially expansive job searches. Neighborhoods with higher average occupational levels experience lower local working rates, other things being equal. Similarly, higher dissimilarity between the occupations of residents and nearby jobs will also result in lower local working, as predicted.

Other significant variables include the proportion of working-age persons who are under age 25 (positive as expected), which has a sizable impact on local working. Youth are expected to work more in nearby jobs for several reasons. They often seek

part-time work, and commuting and job search costs make finding work elsewhere prohibitively expensive.

The finding that the proportion of the labor force that is female is not significant is surprising given the literature suggesting that women commute shorter distances than men. But some of the differences commonly found are related to occupational and income variations, which are controlled for here (Madden 1981; Hanson and Pratt 1990). Moreover, the gender-based commuting differentials have not been confirmed for minority urban residents (McLafferty and Preston 1991). While the use of aggregate data may be concealing some gender effect, the small magnitude of the coefficient suggests that, after controlling for occupation and race, gender is not a major determinant of local working.

Conclusions

Decreases in earnings and employment rates are not the only effects of job loss on lower-income urban neighborhoods. Changes in where neighborhood residents work are likely to have significant impacts on quality of life and social capital that are not fully captured by earnings and employment rates. I have argued that local working is an individual and, in the aggregate, a community good. Higher local working rates are likely to yield benefits, including decreased commuting, the improvement of neighborhood-based job networks, and even neighborhood economic growth. These benefits are especially important to neighborhood youth and parents with young children, for whom substantial commuting poses a major burden.

Despite the importance of local working to lower-income urban neighborhoods, little has been known about the degree to which different neighborhood characteristics, including occupational levels, race, and the presence of local jobs, contribute to workers obtaining jobs near their neighborhoods. The findings here corroborate the notion that physical job proximity is a major determinant of local working. After accounting for spatial autocorrelation, a standard deviation increase in the jobs-to-labor-force ratio from the average of 0.77 raises the local working rate by 1.5 percentage points. A somewhat larger effect, of 2.8 percentage points, is found by using a quadratic specification. The effect is nonlinear, so that, at smaller initial levels, the predicted response is larger.

I also find that predominantly black neighborhoods experience low local working rates, even after adjusting for job proximity. Other things being equal, going from an all white neighborhood to an all black neighborhood reduces the local working rate by 4.4 percentage points—a sizable drop. After controlling for occupational mix and other factors such as race, the proportion of a neighborhood's labor force that is female does not have a significant impact on local working. These last two findings suggest that race may be a more powerful factor than gender in determining spatial, neighborhood-level place-of-work patterns, at least in urban areas with substantial black populations. Finally, while a better match between job and resident occupations increases local working, the relative magnitude of this effect is modest.

A principal implication of these findings is that job creation policies targeting low-income neighborhoods may have significant local working benefits. An increase in local working is likely if job creation does not adversely affect other determinants of local working, such as the occupational match between residents and jobs or the number of youth in the area. Local working benefits will accrue disproportionately to youth, those working part time, and those who are less mobile. Moreover, local working may be associated with a variety of other benefits, including those stemming from strong resident-employer relationships in a neighborhood. These benefits are in addition to the positive impact that local job creation may have on the employment rates of lower-income residents, particularly those who are less mobile and youth.

Given the nonlinear nature of the jobs-to-labor-force effect and the low levels of local working in black neighborhoods, black neighborhoods may disproportionately benefit from increases in nearby jobs. One possible explanation for black neighborhoods' low local working rates, which are not fully accounted for by low jobs-to-labor-force ratios, is that nearby jobs may be of relatively low quality. Another potential cause is a higher level of discriminatory hiring practices among nearby firms than among employers in the central business district or elsewhere. More research is needed to understand the low rates of local working in lower-income, predominantly black neighborhoods.

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