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Are Jobs Available for Disadvantaged Workers in Urban Areas?

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Abstract

We use data from surveys of employers and households in four metropolitan areas to predict the degree of job availability for various types of disadvantaged workers, such as minorities, high school dropouts, and welfare recipients. We conduct simulations in which we "match" workers to jobs on the basis of skill, spatial, and racial characteristics of each. Our results show that roughly 9 to 17 percent of actual or potential jobseekers are likely to have difficulty finding work, even in tight labor markets. Simulated mismatch rates for disadvantaged workers are considerably higher. We conclude that disadvantaged workers face quite limited job availability, at least in the short run. The wages and benefits for jobs available to these workers are also quite low.

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I. INTRODUCTION

Are jobs available to everyone who wants to work? Many academic and policy debates over the nature and causes of unemployment and poverty turn on the answer to this question. For instance, Wilson (1987, 1996) has argued that the lack of jobs in inner cities has contributed to the social dislocations that have occurred there. In contrast, Mead's arguments (1992) regarding work requirements and government paternalism implicitly (or explicitly) assume that work is available to almost anyone who seeks it.

The contentious welfare reform debate of the mid-1990s also centers around the same question. The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 includes work requirements and time limits on recipiency. It does not, however, require governments to provide employment of last resort, based on the assumption that most recipients can find work in regular private or public sector jobs (albeit at low wages).

As critical as this question is, however, the evidence either for or against the assumption of adequate job availability is not very convincing.[1] Although some (e.g., Mead, 1996) have interpreted recent drops in the welfare caseload as indicating widespread job availability, they actually provide little clear evidence one way or the other.[2]

In this paper, we provide new evidence on the issue of job availability. We use data from both the *demand* and *supply* sides of the labor market and calculate the degree of job availability facing specific groups of disadvantaged workers, such as blacks, high school dropouts, and welfare recipients.

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[1]For arguments that job availability will not be a serious problem for most welfare recipients, even though wages will be low, see Burtless (1995) and Blank (1995). For a more skeptical view, see Holzer (1996b) and Bane (1997).

[2]There is little evidence on the employment experiences of those leaving the rolls (or who otherwise would have joined them), especially at any point in time. Also, most states have not yet been required to place the most disadvantaged recipients in jobs (McMurrer et al., 1997).

We compare what employers have told us about the characteristics of available jobs—their skill requirements, location, and racial composition of their firms—with what metropolitan residents have told us about their own labor market skills and experiences. We then conduct simulations in which we "match" as many workers as possible to available jobs under a variety of assumptions. The fraction of actual or potential jobseekers within each group who can be "matched" determines our measure of the degree of job availability for the group.

Like any simulation exercise, our approach is limited because we cannot analyze observed market outcomes. On the other hand, we can predict the degree of job availability that those outside the labor force, such as welfare recipients, are likely to face when they enter it. Because we use actual data from the demand side of the labor market, in conjunction with labor supply data, we also generate a better prediction of the effects of various demand-side characteristics on the likely outcomes of workers than is typically derived from supply-side data sources (e.g., censuses or Current Population Surveys).[3] To test whether our simulations generate reasonable results, we compare predicted outcomes with those observed for workers in the labor force.

We begin by briefly reviewing the relevant labor market concepts and the previous empirical literature. We then describe our data and methodology and present results. We find that a substantial fraction of jobseekers, especially among disadvantaged groups (such as high school dropouts, minorities, and welfare recipients), will face limited job availability in the short run. We close with some implications for public policy and for future research.

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[3]Demand-side effects on employment outcomes of individuals in supply-side data are usually estimated by the effects of proxies measured for the local geographic area (measured by Metropolitan Statistical Area or state), such as average employment growth, unemployment rates, or industrial composition. See, for instance, Freeman (1991), Hoynes (1996), and Bound and Holzer (1996). Instead, we use data from individual employers.

II. LABOR MARKET CONCEPTS AND PREVIOUS LITERATURE

Since the early 1970s, the real earnings and employment levels of less-educated workers have deteriorated both in real terms and relative to those of more-educated workers. This combination suggests that labor demand has shifted away from these workers, for reasons that include technological changes, growing international trade, and other factors (e.g., Levy and Murnane, 1992; Danziger and Gottschalk, 1995).

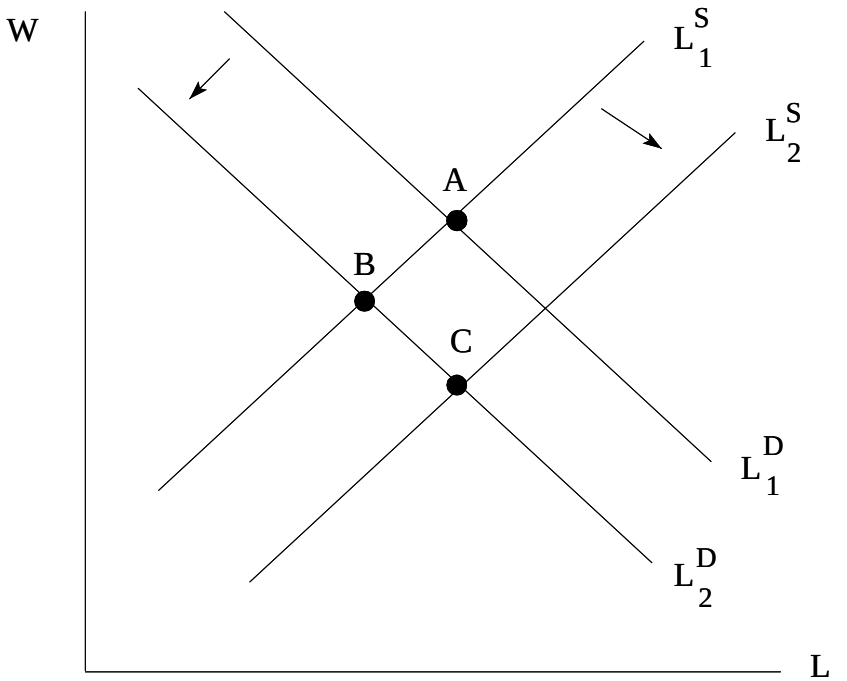
There are, however, two possible interpretations of the declining employment rates of the less-educated, both of which are consistent with shifts in labor demand. These are illustrated in Figure 1. The first possibility, depicted in panel A of the figure, is that the labor market is "clearing," or "in equilibrium," and less-skilled workers are simply *choosing* to work less in response to the declining wages they are offered. The market equilibrium has shifted from point A to point B, with both wages and employment declining as the labor demand curve for the less-educated shifts down along a fixed labor supply curve. Any outward shift (or increase) in the supply of such labor, such as is expected due to the legislation requiring long-term welfare recipients to search for work, will cause the labor supply curve of the less-educated to shift outward and the market equilibrium to move to point C. Though wages would then be even lower than at point B, everyone who searches for work would find a job.[4]

The alternative possibility is that the diminished demand for less-skilled labor has to do with limited job availability because of downward rigidity in wages. This is illustrated in panel B of Figure 1. Wages are somewhat higher than in the market-clearing case, but with employment declining even more

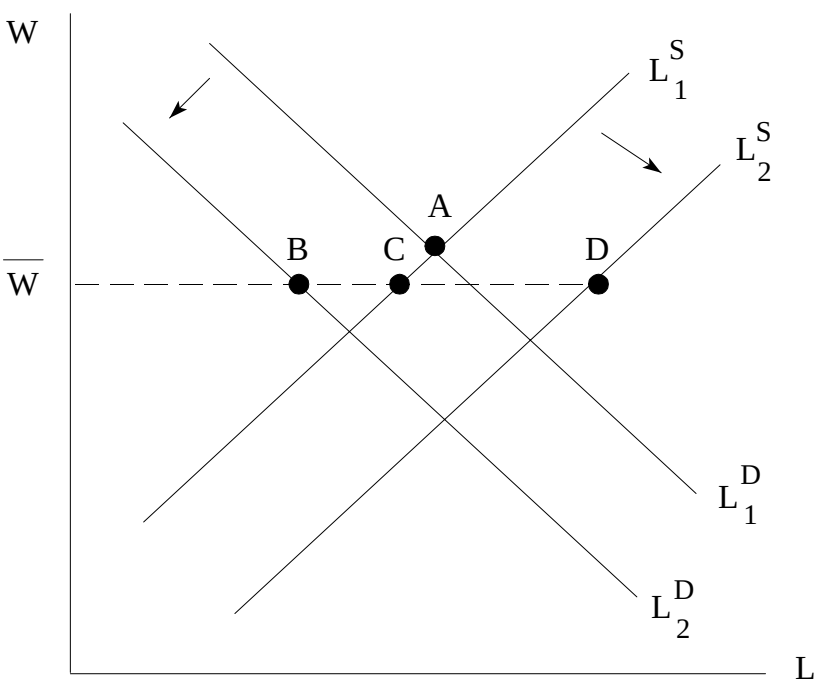
[4]In this case, unemployment will exist only insofar as people need time to search for their most attractive job offers; in other words, only "frictional" unemployment would exist, which would presumably be short-term.

FIGURE 1
Demand and Supply Shifts in Low-Wage Labor Markets

A. Market in Equilibrium



B. Market with Rigid Wages



in response to the same decline in labor demand. An excess supply of workers, measured by BC in the diagram, results when wages are downward rigid and do not fall to market-clearing levels.[5]

In this case, the labor market would not clear and would be in "disequilibrium." Unemployed workers will "queue" for available jobs, and some may experience lengthy durations of joblessness. An increase in labor supply of less-skilled workers would further add to the excess supply of labor, causing the number of unemployed workers to rise to BD, with wage rates still at $\overline{W}$. Compared to panel A, wages are higher but employment is lower.

The type of unemployment shown for low-wage workers in panel B of Figure 1 can exist even though the labor market is tight and unemployment rates are low for other workers. In this case, the overall labor market would be characterized by "structural" or "mismatch" unemployment. This implies a deficiency in the quantity of labor demanded (relative to its supply) in some particular labor markets, even though demand is stronger in others.[6] This case is distinct from unemployment created by "deficient aggregate demand," as occurs in recessions, when limited job availability characterizes a wide range of labor markets.

Of course, less-skilled workers are not a homogeneous group. Some will no doubt find jobs at wages above the minimum; others will have trouble finding employment even at or near the minimum wage. What fractions of less-educated jobseekers fit into each category? Is job availability particularly limited for disadvantaged workers, such as minorities and/or welfare recipients? Is this a problem even when the aggregate labor market is tight? We address these questions below by providing evidence on the rates of "mismatch" unemployment for various groups of jobseekers.

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[5]The causes of downward wage rigidities include minimum wage laws and unions. But in many cases, employers choose to pay wages above the market-clearing levels (or "efficiency wages"), perhaps because it helps attract, motivate, and/or retain better workers (e.g., Katz, 1986; Campbell and Kamlani, 1997).

[6]The particular labor markets, and the "mismatches" that exist between them, can be based on differences across workers and firms in skills, geographic location, etc.

Previous Empirical Evidence

Most economic analyses of these issues have focused at the *aggregate* level and are based on estimated relationships between vacancy, unemployment, and/or inflation rates. For instance, Abraham (1983) and Holzer (1989, 1996b) document that unemployment rates are generally higher than job vacancy rates during all phases of the business cycle. This suggests that, *at any moment in time*, not enough jobs are available for everyone who seeks one, and workers must queue for available jobs. The durations of unemployment for most workers, however, are fairly short—so most move through this queue rather quickly (Clark and Summers, 1982).

On the other hand, a small fraction of the unemployed, especially blacks, experience lengthy durations (perhaps 6 months or more), even when aggregate unemployment is low. This suggests that workers at the "back of the queue" cannot gain employment within a short time. Unfortunately, aggregate unemployment and vacancy data provide little evidence on the causes of long durations and whether they reflect limited job availability and "mismatch" or supply-side factors, such as high reservation wages or low search effort among jobseekers.

An alternative approach to measuring the job availability estimates a "natural rate of unemployment" or "non-accelerating inflation rate of unemployment" (NAIRU), using aggregate data on price inflation and unemployment rates. The notion here is that inflation will be stable only when the aggregate supply of and demand for labor are in balance, and that some unique rate of unemployment exists at which that appears to be true. The unemployment at that point can be "frictional" and/or "structural" in nature, but it will not represent deficiencies in aggregate demand.

Many have estimated the current NAIRU to be in the range of 5 percent. However, both theoretical and empirical questions remain (e.g., Blanchard and Katz, 1997), especially because unemployment fell below 5 percent in 1997 without any increase in inflation. Even if valid for the aggregate economy, NAIRU estimates provide little evidence on the extent to which particular groups

(such as minorities or unskilled workers) face limited job availability, and thereby experience "structural unemployment," even when the aggregate labor market is in balance.[7]

A different approach is to conduct a *micro*-level analysis of either the demand or supply side of the labor market and attempt to distinguish job availability from worker choices as determinants of unemployment (or nonemployment) among particular groups. For instance, Holzer (1986) and Petterson (1997) analyze the effects of relative labor *supply* shifts on unemployment among young blacks by estimating the effects of self-reported reservation wages on the differences in unemployment durations between young whites and blacks. Both find relatively higher reservation wages (compared to market wages) among blacks, but most of the racial difference in unemployment is not explained by these supply factors.[8]

Other recent micro-level studies focus on the *demand* side of the labor market in inner-city areas. For instance, Holzer (1996b) finds few jobs (among those that have been recently filled by employers) available to those with limited basic skills (e.g., reading/writing, arithmetic, computer use, and ability to interact with customers) or job-related skills (e.g., specific experience or previous training in the job). Newman and Lennon (1995) report 14 applicants for each job opening in a few fast food restaurants in

[7]The same would be true of other attempts to estimate "disequilibrium" components of unemployment rates using econometric techniques with aggregate data (e.g., Quandt, 1988; Neumark and Wascher, 1995). These papers use "endogenous switching regression" models in which some markets are in equilibrium and some are not; an equation based on whether wages or prices are at market-clearing levels is used to determine which case holds for any given year or local area.

[8]Holzer (1986) finds that racial differences in reservation wages can account for 30 to 40 percent of the racial differences in unemployment durations and somewhat smaller portions of differences in unemployment rates. Petterson (1997) fails to find any relationship between these measures using updated data, although the estimated effects of reservation wages in these equations are likely to be downward-biased. Also, the notion that reservation wages for many of these workers are higher than their market wages is implicit in Juhn's (1992) analysis of labor market withdrawals in response to declining wages, although the availability of work at these wages is assumed rather than demonstrated.

Harlem in the early 1990s. These findings are only suggestive, however, because neither study analyzes data on both the supply and demand sides of the labor market.[9]

A few recent papers do compare both sides of the labor market, using data on the characteristics of available jobs and less-educated workers, particularly welfare recipients. Bloomquist et al. (1988) use the average educational attainment of workers in detailed occupations to determine the extent to which *vacant* jobs in those occupations might be available to welfare recipients. Kleppner and Theodore (1997) use the average skill content of jobs, as measured by the Dictionary of Occupational Titles, to determine the extent to which welfare recipients might face a "job gap."[10] Although our analysis is similar, our data provide better information for matching individual workers to available jobs, based on more detailed characteristics of each.

In sum, the evidence to date on the extent of job availability for unskilled workers has been plagued by the inadequacy of macro-level models and a paucity of appropriate micro-level data.

III. COMPARING THE DEMAND FOR AND SUPPLY OF WORKERS: DATA AND METHODOLOGY

We use data from both the household and employer surveys in the Multi-City Study of Urban Inequality (MCSUI) for Atlanta, Boston, Detroit, and Los Angeles. The household survey was administered to between 1,600 and 4,000 adults in each of the four metropolitan areas in samples that overrepresent minorities residing in low-income neighborhoods. The employer survey was administered

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[9]Holzer (1996b) does not compute the numbers of workers with very poor skills who are actually seeking these jobs, and Newman and Lennon (1995) do not determine the number of applications filed by each jobseeker, which is needed for determining the actual ratio of jobseekers to jobs.

[10]Both studies determine a low cutoff point (somewhat arbitrarily) for average education or skill that classifies an *entire* occupation as accessible to recipients. Bloomquist et al. (1988) then use a predicted aggregate vacancy rate (based on an aggregate relationship between unemployment and vacancies) to determine the actual number of jobs available in an occupation. Kleppner and Theodore (1997) use job hire rates by industry that are matched to occupational categories using occupation-by-industry matrices. Therefore, the numbers of jobs in the relevant occupational categories are measured quite loosely in both cases.

by phone to 800 employers in each of the four areas. Both sets of surveys were administered between 1992 and 1994.[11]

We analyze the availability of jobs to various groups of workers, particularly the "disadvantaged." To do this, we simulate how the labor market "matches" workers to jobs along a variety of relevant dimensions. For every establishment in the employer survey, we have extensive data on its *most recently filled jobs*. A weighted sample of these jobs constitutes a fairly representative sample of the jobs that are available in local labor markets over a period of several months.[12]

The appropriate group of workers to whom these jobs should be matched is a sample of a*ctual or potential jobseekers*—i.e., those who have recently sought work or who might do so in the near future. We define this sample as anyone who has searched for work within the past month, worked on the current job for a year or less, or who is currently not employed and does not self-identify as a homemaker, a student, a disabled person, or a retired worker.

The proportions of our sample of jobseekers who were employed, unemployed, and out of the labor force at the time of the survey are .64, .23, and .13, respectively; thus, most of those being matched are actual rather than potential jobseekers. Our sample of potential jobseekers includes many welfare recipients and others who have been out of the labor force but who are widely viewed as "able to work" and may be doing so now or very soon.[13]

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[11]More details on sampling, response rates, etc. can be found in Holzer (1996b). Sample weights that have been generated for each data source will be used in all calculations below.

[12]Because some firms hire much more frequently than others, a sample of one hire per firm may underrepresent firms that hire frequently. Because the sample of employers has already been size-weighted, large firms that hire many workers are heavily represented in the sample. Establishments that hire a lot because of high turnover are not overrepresented, since we care about the underlying number of jobs that are available. Establishments that hire many workers in response to net employment growth will, however, be underrepresented here. The median length of time that elapsed between the time of the last hire and the survey date is 2 months, but the mean is 6 months. Roughly 90 percent of the jobs in the sample were filled within a year of the survey date.

[13]The household survey was administered between 1992 and 1994. At the time of the survey, roughly 20 percent of those out of the labor force whom we include in our sample were welfare recipients, while over 60 percent reported some work experience in the preceding 5 years. Since that time, cuts in various benefit programs

Our sample of jobseekers constitutes about 44 percent of all respondents in the household survey who are under age 65. This corresponds closely to the percentage of the labor force that loses/leaves employment and therefore seeks work in any given year.[14] Also, each jobseeker appears just once in the sample, as does each job; multiple spells of each are therefore not considered here.[15]

We treat both the skill requirements of jobs and the skills of workers as predetermined; the analysis is thus in the spirit of short-run "matching" models of the labor market (e.g., Davidson, 1990). Wages and benefits on jobs are assumed to be fixed as well, also consistent with a short-run model. Furthermore, *we assume that the aggregate labor market is in balance*, as appears to have been the case in most metropolitan areas between 1995 and 1997. If this is not the case (especially during recessions), our results will provide "lower-bound" estimates of the fraction of workers who will have difficulty finding jobs. We also ignore "frictional" problems—i.e., the unemployment that results from the time that it takes for workers and jobs to become "matched" to each other.

Thus, we focus on measuring only "structural" unemployment that might characterize disadvantaged workers even in tight labor markets. Although our model is short-run in nature, the labor market problems that limit their employability could persist for long periods of time.

Our simulations match workers and jobs along three dimensions that are considered as barriers to work for the disadvantaged: *skills, race,* and/or *space* (Wilson, 1987; Holzer, 1994) . We do not consider the effects of individually chosen characteristics, such as reservation wages or job search methods and intensity, on the likelihood that a jobseeker will gain employment.

(such as welfare, food stamps, and Supplemental Security Income), as well as much tighter labor markets, have no doubt drawn many of those individuals back into the workforce. Impending work requirements and time limits on welfare and food stamp recipients will likely continue this trend over the next several years.

[14]Anderson and Meyer (1994) report that 42 percent of workers in each year experience some permanent job turnover. Some of these people leave the labor force but are replaced by those entering (or reentering); therefore the percentage of people seeking work in any year should be quite similar.

[15]These multiple spells should have no effects on the outcomes that we calculate since they likely "net out" across the two sides of the labor market.

Our simulation distributes workers and jobs across matrices based on skills, race, and/or space, allowing for interactions between a variety of dichotomous characteristics on both sides of the market.[16] We apply the simulation in two ways, each based on a different configuration of the underlying matrix; variations of each have also been explored. In each simulation, workers are matched to as many jobs as possible across the cells of the demand-side matrix. In the end, some workers go unmatched and some jobs go unfilled.

An Illustration

A simple example illustrates this method. In Figure 2 we present a 2-by-2 hypothetical matrix of skills and race, where skill is defined by "high" versus "low" for both sides of the market and race by "black" versus "nonblack." Some jobs are not accessible to black workers (and are therefore considered "nonblack" only) due to reasons of space and/or discrimination. Jobs and workers are distributed as shown across the cells of each matrix. If the distributions of workers and jobs across these cells were identical, no mismatch at all would occur.

Because we assume that the labor market balances in the aggregate, we are only concerned with the *percentages* of workers and of jobs in each category, not with the raw numbers. Thus, the percentages sum to one in each matrix. This choice is warranted conceptually and is also consistent with data availability.[17] Furthermore, workers can only flow in the directions indicated by the arrows if they

[16]The interactions across the different dimensions are critical, since obvious correlations exist between these characteristics (especially among workers). For instance, unskilled workers are also more likely than skilled workers to be black and to lack their own cars. To do the matching separately (and then sum across the three dimensions) would be equivalent to assuming that skill, spatial, and racial characteristics are independent of one another. We suspect that this sum might dramatically overstate the extent of mismatch.

[17]As noted above, the absolute number of jobs available at any moment need not equal the number of jobseekers for the labor market to be in balance, so comparing absolute levels of jobs and people would be misleading. Data availability issues also support this choice, since we do not have data on the actual numbers of new hires in each establishment with such detailed job characteristics. Our size-weighted sample of one new hire per establishment approximates the correct sample but is more appropriate for considering the relative composition of newly available jobs than their exact numbers.

FIGURE 2
Labor Demand, Supply, and Mismatch: An Example

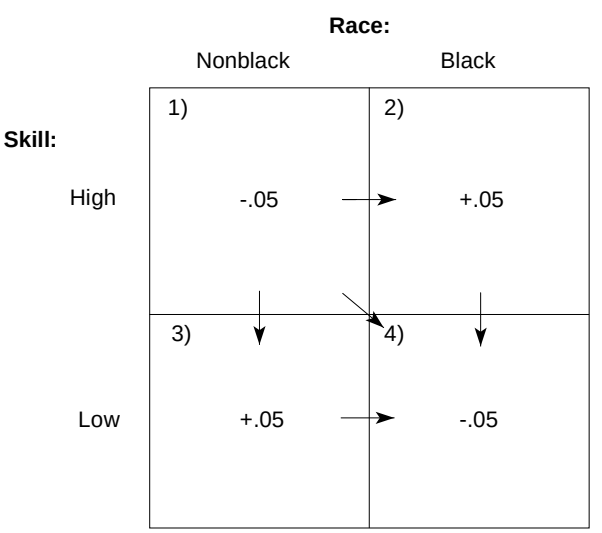
Initial Supply

Skill:	Race: Nonblack	Race: Black
High	1) .25	2) .25
Low	3) .25	4) .25

Initial Demand

Skill:	Race: Nonblack	Race: Black
High	1) .30	2) .20
Low	3) .20	4) .30

Initial "Mismatch" and Potential Supply Flows



Note: "Mismatch" is measured as Initial Demand above.

choose to, or must, do so—namely, more-skilled workers can flow from higher to lower skill jobs, and nonblack workers can flow from jobs that are not accessible to blacks to those that are accessible, but flows cannot occur in the reverse directions.

If we assume that workers will first seek out jobs within their "own" cells, there would initially be surpluses of workers over jobs in cells 2 and 3 and shortages of workers in the others. In the absence of worker flows, 10 percent of workers would be unmatched, as would 10 percent of jobs.[18] But surplus workers in cells 2 and 3 could easily flow to excess jobs in cell 4, thereby reducing the degree of mismatch to just 5 percent of workers and jobs.

Exactly which 5 percent of workers are left without jobs in this hypothetical case would depend on assumptions regarding who competes effectively with whom for the remaining jobs in cell 4.[19] Furthermore, overall mismatch rates will fall if less-skilled and/or black workers can flow to unfilled higher skill and/or white jobs, at least after the more-skilled workers have been placed. On the other hand, it is also possible that highly skilled workers who reside in one location (e.g., suburbs) might initially choose jobs in other locations (e.g., downtown areas), thus eliminating potential jobs for those who live close to those jobs; if the latter do not, in return, have access to jobs located closer to the residences of commuters, overall mismatch rates would rise.[20]

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[18]By definition, the surplus of workers will always equal the absolute value of the shortage of jobs, as quantities in both sets of cells must sum to 100 percent.

[19]For instance, if more-skilled and/or white workers "dominate" less-skilled or black workers even when the latter are considered "qualified," unemployment will be concentrated among the latter. On the other hand, these groups might compete equally for jobs in which all are considered "qualified," although some are "overqualified." In the latter case, the same overall unemployment will be spread more equally across groups. In economics jargon, the question is who can be considered a "substitute" for whom.

[20]Suburban workers with relatively high skills and/or access to all jobs might choose to seek employment in the inner city because wages are higher there or because the best jobs in the field happen to be located there, as might be the case with large hospitals, law firms, or other institutions in a metropolitan area.

Thus, these assumptions regarding where workers seek jobs and whom employers prefer among job candidates can have important effects on predicted rates of job availability overall and for specific groups.

Implementing the Simulations

We briefly describe our methods for simulating the "matching" process. A detailed description of our procedures is presented in the Appendix. To operationalize this simulation, we specify measures of skills, race, and space that are available in our data from both sides of the labor market. For space, we specify whether or not jobseekers have access to automobiles while they search, or whether they must rely on public transit; we then specify whether or not employers are located near public transit stops. For race, we specify whether jobseekers are black and whether firms currently employ any blacks. Female gender or Hispanic ethnicity are not treated here as barriers to employment per se, although we calculate separate mismatch rates for these categories of workers below.[21] Any disadvantages that black jobseekers experience relative to other ethnic groups, especially immigrants who might benefit from stronger job search networks or preferences by employers (Kirschenman and Neckerman, 1991), will be captured in our black/nonblack racial categorization.

For skills, we specify the following: (a) the educational attainment of jobseekers and the educational requirements of jobs, (b) the occupational experience or training of jobseekers and the occupational requirements of jobs, and (c) whether jobseekers have performed each of a set of basic

[21]These choices are made at least partly to simplify the analysis and partly because the evidence suggests greater discrimination in *employment* (as opposed to wages) against blacks (especially black men) than against other minorities or women (Holzer, 1996b; Kirschenman and Neckerman, 1991). To the extent that women, and especially Hispanics, face employment difficulties because of skills or spatial problems, our calculations will reflect those problems.

The assumption that blacks face no hiring discrimination in companies where at least some blacks are currently present is also questionable; however over 60 percent of these establishments are large (e.g., with 100 or more employees) and/or report using Affirmative Action. The evidence suggests less employment discrimination against blacks at such establishments (Holzer and Neumark, 1996; Holzer, 1997).

cognitive/social tasks on a recent job and whether each task is required in newly filled jobs. Task performance and requirements are represented either as a sum across categories (in Method I below) or as a set of combinations in which some tasks (e.g., reading/writing and arithmetic) are treated as more difficult than others (e.g., customer contact or computer use, in Method II). Either way, both "hard" and "soft" skills (Moss and Tilly, 1995) are captured to some extent by these skill categories.[22]

All jobseekers and newly filled jobs are allocated across the 124 cells of matrices that reflect these different characteristics. We then allocate workers to jobs through a set of "matching" algorithms that specify various jobseeker and employer search patterns. The jobseeker choices include where they seek work initially and where they flow if they do not get their initial choices. The employer choices include preferences across the different groups of workers who might simultaneously compete for a more limited number of jobs in a given cell.

Jobseekers flow across job cells according to these search rules until they are either "matched" or have exhausted their job-matching possibilities (in which case they are "mismatched"). The percentages of jobseekers (as well as jobs) in the latter situation are then calculated for the overall sample and for particular demographic subgroups. Though many simplifying assumptions are needed to keep the analysis tractable, we test the sensitivity of our results by using general algorithms that embody different assumptions about the matching process.

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[22]"Soft" skills are often described as social/verbal skills and attitudes toward work. These are partly captured through our use of customer contact as a skill requirement and by having clerical/sales jobs (where such skills are presumably quite important) as a distinct occupational category. Because "soft skills" and race appear to be highly correlated in the perceptions of employers (Moss and Tilly, 1995), our racial categories should capture some of these effects as well.

IV. RESULTS

Summary Data

We first present summary data on the characteristics of workers seeking jobs and on the jobs that are available to them. Table 1 presents data on the skills of workers and on whether or not car transportation is available to them. Skills are measured along three dimensions—educational attainment, occupation category of current/most recent job, and task performance on that job. The latter two are presented only for workers who are not college graduates. Tabulations on worker task performance are also presented two ways: across categories based on the numbers of tasks performed (0–1, 2, 3–4) and on combinations based on performance of reading/writing and/or arithmetic. These results are presented for all jobseekers in column 1, and then separately by race in columns 2, 3, and 4, and by gender in columns 5 and 6. All means are sample-weighted and sample sizes are presented in the last row. Results are pooled across the four metropolitan areas.

About 30 percent of all workers in the sample are college graduates; only 12 percent are high school dropouts. Among those who are not college graduates, more than 40 percent have performed 3–4 tasks on jobs, including reading/writing and arithmetic. About 20 percent have been employed in professional, managerial, or technical occupations. On the other hand, about one-fourth of these workers have performed only minimal (0–1) numbers of tasks, with neither reading/writing nor arithmetic included among them, and have occupational experience only in laborer/service jobs or not at all.

Among blacks and especially Hispanics, skill levels along all dimensions are lower than among whites. There are more high school dropouts among blacks than among whites by relatively small amounts, but more among Hispanics than whites or blacks by a considerable amount (Hauser and Phang, 1993). College graduation rates among both groups of minority jobseekers are lower than among whites. Task performance and occupational status among blacks and Hispanics who are not college graduates are

TABLE 1
Worker Skills and Transportation, Total and by Race/Gender

Skills	All	By Race: White	By Race: Black	By Race: Hispanic	By Gender: Male	By Gender: Female
Education:						
College	.301	.363	.190	.236	.348	.252
High school/GED	.575	.563	.699	.466	.541	.611
High school dropout	.124	.074	.112	.298	.111	.137
Tasks of Noncollege Graduates:						
0–1 task	.283	.215	.280	.442	.318	.252
2 tasks	.282	.275	.351	.377	.263	.299
3–4 tasks	.435	.510	.370	.180	.418	.452
Reading/writing and arithmetic	.423	.484	.340	.295	.485	.367
Reading/writing only	.127	.116	.178	.179	.087	.163
Arithmetic only	.189	.212	.203	.087	.185	.193
Neither	.260	.188	.276	.439	.242	.277
Occupations of Noncollege Graduates:						
Professional/managerial/technical	.186	.236	.126	.112	.182	.189
Clerical/sales	.310	.332	.324	.233	.154	.448
Craft/operative	.219	.192	.116	.174	.395	.063
Laborer/service	.251	.218	.356	.341	.239	.260
No occupation	.034	.022	.076	.140	.029	.040
Transportation:						
Car available	.868	.937	.650	.760	.883	.856
No car available	.132	.063	.350	.240	.117	.144
Number in sample	2,547	952	927	668	1,082	1,465

also weaker than among whites. For instance, roughly half of white jobseekers without college have performed most tasks, including both reading/writing and arithmetic. Comparable rates among blacks and Hispanics are 37 and 34 percent and 18 and 30 percent, respectively. The percentages of workers with little task performance are from 19 to 22 percent among whites but about 28 percent among blacks and 44 percent among Hispanics. Those with low (or no) occupational experience are comparably higher among the minorities.

Though not shown in Table 1, significant variation is seen in skill attainment, both overall and by race, across the four metropolitan areas. For instance, jobseekers in Atlanta and Boston are more highly educated than are those in Detroit and Los Angeles.[23] The high concentration of Hispanics and immigrants in Los Angeles reduces the overall educational attainment of the workforce there. Omitting Los Angeles observations raises the educational attainment and skills in the overall sample by a few percentage points in each category. The high concentrations of blacks in Atlanta and Detroit do not lead to similarly low levels of educational attainment, since blacks in Atlanta are more highly educated than those in Detroit.[24] These differentials in attainment across metropolitan areas affect our estimates of the relative rates of job availability and "mismatch" across these areas.

Although skill differentials across racial groups are evident, such differentials across gender groups are ambiguous. Males have somewhat higher educational attainment than females. Men are somewhat less likely to have performed large numbers of tasks but are somewhat more likely to have performed both reading/writing and arithmetic. Women are concentrated in clerical/sales jobs, where

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[23]Roughly 37 percent of jobseekers in Atlanta and Boston have college degrees, while this is true of just 21 to 24 percent in Detroit and Los Angeles. High school dropouts constitute 5 to 12 percent of jobseekers in each area except Los Angeles, where they account for 23 percent.

[24]Thirty-one percent of black jobseekers in our Atlanta sample have college degrees, while this is true of just 12 to 16 percent of jobseekers in the other metropolitan areas.

most skills (including customer contact and computers) are used extensively, and also in the service jobs. These gender differentials in task performance also appear within each racial group (Holzer, 1996b).

The data in Table 1 show that nearly seven-eighths of all workers have access to automobiles when traveling to work. This is more true of whites than minorities, with only 6 percent of the former and 24 to 35 percent of the latter limited to public transit or other modes of transportation.

To what extent do specific groups of "disadvantaged" jobseekers, such as high school dropouts and/or welfare recipients, lack these skills and transportation options? In Table 2 we present data comparable to those that appear in Table 1, but only for jobseekers who are high school dropouts, welfare recipients (defined here as females who are receiving "public assistance"), or both. For each of these groups, we present the data for all jobseekers and then separately by race.

The results of Table 2 show that disadvantaged jobseekers, especially minorities, are much more likely than others to have low skill attainment. Among all high school dropouts, 55 to 59 percent report little task performance on previous jobs, and only about 26 percent have ever been employed in a white-collar occupation. Overall, welfare recipients are somewhat more highly skilled than are dropouts; about three-fourths have graduated from high school, and just a quarter to a third have little significant task performance. But minorities on welfare have much lower skill attainment than do white welfare recipients, and the skill levels observed among welfare recipients who are also dropouts are very low.[25] Their access to automobile transportation is also quite limited. Since minorities and high school dropouts on welfare are more likely to be long-term recipients, they are representative of many recipients who will be required to enter the labor market by time limits or work requirements over the next several years.[26]

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[25]Sample sizes are very small for whites on welfare, especially among those who are also high school dropouts. Yet the pattern of results we observe for whites versus minorities in this table is consistent across the various subsamples that we use.

[26]Pavetti (1995) notes that 63 percent of welfare recipients with at least 5 years on the rolls are high school dropouts, and over half are black or Hispanic.

TABLE 2
Worker Skills and Transportation: High School Dropouts and Welfare Recipients

	High School Dropouts			Welfare Recipients			Welfare Recipients Who Are High School Dropouts		
Skills	All	White	Black/ Hispanic	All	White	Black/ Hispanic	All	White	Black/ Hispanic
Education:									
College	.000	.000	.000	.130	.131	.129	.000	.000	.000
High school/GED	.000	.000	.000	.620	.637	.613	.000	.000	.000
High school dropout	1.00	1.00	1.00	.240	.232	.258	1.00	1.00	1.00
Tasks of Noncollege Graduates:									
0–1 task	.548	.490	.597	.280	.129	.356	.440	.295	.449
2 tasks	.311	.307	.357	.322	.487	.334	.457	.581	.443
3–4 tasks	.141	.203	.046	.398	.382	.310	.103	.124	.108
Reading/writing and arithmetic	.193	.235	.126	.419	.429	.318	.099	.123	.104
Reading/writing only	.063	.025	.137	.142	.162	.152	.172	.167	.146
Arithmetic only	.152	.183	.097	.105	.259	.100	.156	.336	.143
Neither	.591	.557	.639	.334	.150	.430	.512	.374	.607
Occupations of Noncollege Graduates:									
Professional/managerial/technical	.071	.134	.027	.047	.082	.036	.004	.000	.007
Clerical/sales	.192	.251	.108	.372	.605	.280	.344	.558	.245
Craft/operative	.274	.218	.198	.085	.096	.062	.200	.210	.109
Laborer/service	.382	.372	.484	403	.139	.508	.340	.147	.480
No occupation	.081	.026	.184	.093	.078	.116	.111	.085	.158
Transportation:									
Car available	.703	.818	.485	.612	.789	.662	.339	.496	.305
No car available	.297	.182	.515	.328	.211	.338	.661	.504	.695
Number in sample	578	98	480	463	52	323	161	17	144

How do these levels of skill attainment and access to transportation compare with those required on newly available jobs? Table 3 presents data similar to those in the first two tables, but for the *demand* rather than *supply* side of the labor market—i.e., for characteristics and requirements of newly available jobs rather than of workers.

About one-fourth of new jobs require college degrees, and about one-fifth are available to workers without high school diplomas or GEDs. But among the jobs that do not require college, over half require the performance of 3–4 tasks, and about a third require both reading/writing and arithmetic on the job. About two-fifths require previous experience or training in a white-collar job. Finally, a large majority of jobs are available to those without automobiles.

In comparison with results reported on worker skills in Table 1, those on skills demanded by employers in Table 3 indicate that average educational requirements on jobs are lower than average educational attainment among jobseekers overall. Average task and occupation-specific experience requirements on noncollege jobs, however, are somewhat higher than what we observe among noncollege jobseekers. Thus, an inability to perform certain tasks and the lack of job-specific experience or training would contribute to the difficulties that some jobseekers have in being matched to jobs; these difficulties will be most pronounced among disadvantaged groups such as welfare recipients and especially high school dropouts. Although transportation difficulties should not contribute to mismatch problems in the aggregate, they might confound the problems of unskilled or minority workers whose access to jobs is already limited by their low skill levels.

Of course, even low-skill workers who succeed in finding employment can still be plagued by other impediments, such as low wages and limited fringe benefits. Indeed, unemployment rates of unskilled workers have declined dramatically in recent years, especially relative to those in other industrial countries, but wages earned by these workers in the U.S. have also declined more rapidly than those earned by less-educated workers abroad (Gottschalk and Smeeding, 1997).

TABLE 3
Skill and Transportation Requirements of Newly Filled Jobs

Education:	
College	.242
High school/GED	.539
High school dropout	.219
Tasks of Noncollege Graduates:	
0–1 task	.238
2 tasks	.228
3–4 tasks	.535
Reading/writing and arithmetic	.327
Reading/writing only	.263
Arithmetic only	.150
Neither	.260
Occupations of Noncollege Graduates:	
Professional/managerial/technical	.102
Clerical/sales	.292
Craft/operative	.156
Laborer/service	.106
No occupation	.346
Transportation:	
Car required	.377
No car required	.623
Number in sample	2,598

In Table 4 we present median starting hourly wages paid on new jobs by the employers surveyed. We also present the percentages of these jobs that provide health benefits. These data are for categories of jobs defined by skill or transportation, as in the previous tables.[27]

As expected, jobs requiring a college degree pay substantially more than those requiring only high school—$14.39 versus $8.40 per hour. These data are consistent with those reported in the literature on rising wage inequality (Danziger and Gottschalk, 1995). Although median wages on jobs requiring high school start at $8 to $9 per hour, those that do not require high school pay just over $6. Low wages are also reported in jobs that require few tasks or little occupational experience or training. Furthermore, a significant fraction of these jobs (about 25 percent) are part-time rather than full-time, further limiting the earnings potential of those who obtain them.[28]

Finally, many low-skill jobs provide no health insurance to workers or their families. For instance, almost half of jobs for high school dropouts (or of those that do not require reading/writing or arithmetic) provide no insurance to other family members of the employee, and about one-third do not provide coverage for the workers.

These data confirm that, even if many unskilled workers are able to find employment, many will do so only in jobs with low wages and benefits (Blank, 1995; Burtless, 1995). Poverty rates among these workers will no doubt continue to be high in many cases.[29]

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[27]Most employer interviews were administered in 1993, although some were conducted in late 1992 or early 1994. The wage results can thus be interpreted as being in 1993 dollars.

[28]We define part-time work as anything less than 35 hours per week. Of course, most of those working in part-time jobs do so voluntarily, although the rates of involuntary part-time work have been rising over time among men (Blank, 1997).

[29]The availability of the Earned Income Tax Credit and Medicaid for low-wage workers with families will ease the hardships associated with work at these jobs.

TABLE 4
Median Hourly Starting Wages and Availability of Health Benefits in Newly Filled Jobs

Requirements	Median Wages	Health Benefits for: Worker	Health Benefits for: Family
Education:			
College	$14.39	.914	.831
High school/GED	8.40	.809	.702
High school dropout	6.31	.637	.526
Tasks of Noncollege Graduates:			
0–1 task	6.88	.765	.642
2 tasks	7.20	.708	.611
3–4 tasks	8.44	.778	.672
Reading/writing and arithmetic	10.87	.826	.711
Reading/writing only	8.36	.735	.641
Arithmetic only	8.49	.764	.677
Neither	6.44	.682	.558
Occupations of Noncollege Graduates:			
Professional/managerial/technical	10.21	.872	.722
Clerical/sales	8.36	.775	.678
Craft/operative	8.49	.814	.704
Laborer/service	.00	.760	.640
No occupation	6.20	.681	.581
Transportation:			
Car required	8.15	.784	.698
No car required	8.64	.801	.694

Mismatch Rates

In Table 5 we present our simulated percentages of overall mismatch between workers and jobs. Results are presented for the four Metropolitan Statistical Areas (MSAs) separately and for pooled samples. Because of the unique characteristics of the labor market in Los Angeles (as noted above), the pooled results are also shown with observations from Los Angeles excluded.

We present calculations for the two different matching methods: Method I matches workers and jobs according to a matrix based on skills (the number of tasks), spatial location/transportation, and race; different tasks are treated as substitutes for one another. Method II replaces spatial factors and education levels below college in the matrix with an expanded set of task performance combinations.

The results of Table 5 show overall mismatch rates of 9.4 to 17.1 percent—in other words, we expect that 9 to 17 percent *of actual or potential jobseekers do have difficulty finding any available job during a period of search* and that employers have difficulty filling a similar percentage of jobs. If we omit Los Angeles from the pooled sample, the mismatch rate range is 7 to 16 percent. The lower estimates are obtained using Method I, where the different tasks are treated as substitutes for one another. Method II, which assumes that reading/writing of paragraphs and arithmetic might be less easily learned on the job than computer use or customer contact, generates a greater degree of simulated mismatch.

The overall mismatch rate rises somewhat when we do not allow less-skilled workers to compete equally with more-skilled workers on jobs requiring less skill, and it also rises somewhat when we allow workers to initially seek jobs outside their race/transportation cells in proportion to where such jobs exist. But, overall, the results are relatively robust across our different assumptions of how the matching process operates. Simulated mismatch rates, using Method I and averaged across the four metropolitan areas, are in the range of 9 to 13 percent when we incorporate these different assumptions into our algorithms.

TABLE 5
Percentage Mismatched: Workers and Jobs

	Method I	Method II
Atlanta	.072	.155
Boston	.045	.121
Detroit	.093	.195
Los Angeles	.166	.214
Average of four MSAs	.094	.171
Average, excluding Los Angeles	.070	.157

How do these implied mismatch rates compare with observed joblessness? Can we reconcile these findings with observed aggregate unemployment rates that have been below 5 percent nationally (and in these MSAs) during much of 1997? Our results cannot be compared directly to aggregate unemployment rates because our sample is limited to jobseekers, who constitute under half of all labor force participants. We also include "potential" jobseekers (13 percent of our sample) who are currently out of the labor force. If potential job seekers have much higher mismatch rates than do labor force participants, then our results are consistent with observed aggregate unemployment rates of 5 percent or less.[30]

We test this proposition by computing mismatch rates for jobseekers separately by their current employment/labor force status. Since we cannot identify exactly which individuals in a cell will be mismatched at any point in time, we can only approximate mismatch rates for these different groups, and differences across groups in mismatch rates will be biased downward by measurement error.[31] Nevertheless, these approximations generate mismatch rates that look quite reasonable when using Method I.[32] Our mismatch rates (excluding Los Angeles) by labor force status are .06, .11, and .18 for the

[30]If mismatch accounts for 2 to 3 percentage points of aggregate unemployment, this would be comparable to 4 to 7 percentage points among jobseekers who are currently in the labor force. To generate average mismatch rates among jobseekers of .07 to .16 (excluding Los Angeles), mismatch among those out of the labor force would have to be in the range of roughly 7 to 40 percent using Method I and much higher using Method II.

[31]In other words, we may know that 50 percent of the jobseekers in a cell are mismatched, but not which individuals in that cell will get the jobs and which will not. Our method of approximation involves allocating different groups of individuals (e.g., the employed versus the nonemployed) across cells of the matrix and then applying the mismatch rate simulated for that cell to all individuals allocated there. A weighted average of mismatch rates across the cells for each group then generates the approximate mismatch rate for that group. But by assuming the same mismatch rate for all individuals in a cell, and not taking into account unobserved differences across individuals in the cell that might be correlated with group membership (in this case, employment status), the approximations are likely to cause downward biases in our estimates of differences in mismatch between groups. Only when the groups in question correspond to the actual characteristics used to match workers and jobs (i.e., education, occupation, race, etc.) will the mismatch rates for these groups be measured more accurately.

[32]The approximations using Method II (which generate mismatch rates of roughly .13 for those in the labor force) are too high.

employed, the unemployed, and those out of the labor force, respectively The average mismatch rate of .07 for those in the labor force is thus consistent with the aggregate unemployment rate.

An alternative approach compares our simulated mismatch rates with durations of unemployment and nonemployment experienced by working-age groups (especially nonstudents and males) in the population. If we assume that individuals facing high probabilities of mismatch will experience lengthy spells of unemployment (for labor market participants) or nonemployment (for those unemployed or out of the labor force), then our mismatch rates should be comparable to the percentages of the relevant groups who experience long spells without work.[33]

In fact, Murphy and Topel (1987) and Juhn et al. (1991) report dramatic increases in the fractions of prime-age males with lengthy durations of nonemployment during the 1970s and 1980s, mostly concentrated among those in the bottom 10 to 20 percent of the wage distribution—e.g., high school dropouts. Indeed, the rates and durations of nonemployment implied by Juhn et al. among prime-age males are quite consistent with the results presented in Table 5.[34]

We found large differences in mismatch rates across the different metropolitan areas. Mismatch rates in Atlanta and Boston appear relatively low, while in Detroit and especially Los Angeles they are higher, even when these markets are in aggregate balance. These differences are most likely due to the

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[33]See Clark and Summers (1982) for a discussion of the differences between unemployment and nonemployment durations.

[34]Juhn et al. (1991) report roughly 5.7 weeks of nonemployment per year among prime-age males, for a rate of about 11 percent at any point in time. They also report that 69 percent of nonemployment is accounted for by those whose spells are longer than half a year. Thus, 7.6 percent of the male population is in a very long spell at any moment, and the percentage of all workers who experience such a spell in any year would be about 10 percent (as the average durations of such spells are 39 weeks, or three-fourths of a year). Furthermore, wages and employment rates among the less-educated have continued to deteriorate since the late 1980s (Mishel and Bernstein, 1996); and the data reported by Juhn et al. also do not include those for workers below age 25. Thus, the percentage of the overall male population that currently experiences spells of more than 6 months could be as high as 15 percent. At least some of these lengthy spells no doubt represent supply-side factors, including physical disabilities, alternative income sources, and unwillingness to accept available low-wage jobs. If one-quarter to one-half of the total (i.e., 4 to 8 percentage points) represents lack of job availability, these numbers would be quite consistent with our simulated mismatch rates (for the less than half of the population in our sample of jobseekers).

relatively higher educational attainment among workers in Atlanta and Boston than among workers in Detroit and Los Angeles The percentage of workers who are dropouts is especially pronounced in Los Angeles due to the higher concentration of Hispanics there. The educational attainment of blacks in Atlanta is also considerably higher than in Detroit, likely reflecting a relative out-migration of young educated blacks from Detroit and an in-migration to Atlanta over the past few decades.[35] Data from the 1990 Census also indicate that racial segregation is somewhat lower in Atlanta (Frey and Farley, 1993), perhaps contributing to (or reflecting) less spatial mismatch and/or racial discrimination there.

If job availability is more limited for disadvantaged workers in Detroit and Los Angeles than in Atlanta and Boston due to structural factors, relative unemployment rates in the former MSAs should be higher over an extended period of time. This is exactly what we find: throughout most of the 1980s and 1990s, annual unemployment rates in Detroit and Los Angeles exceeded those in Atlanta and Boston. Some shifts in the relative rankings of unemployment rates among the four areas occurred over this period, no doubt reflecting other factors (such as the strength of the local economy, migration rates, etc.) affecting local unemployment.[36] The high unemployment rate among Hispanics (as well as blacks) in Los Angeles is also consistent with this finding.[37]

How is any overall amount of mismatch between workers and jobs distributed across various skill, race, and transportation categories? In other words, who are the workers not placed into any jobs

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[35]Bound and Holzer (1996) show that young, educated blacks migrated as frequently in response to shifting local labor demand as did young, educated whites in the 1980s, and that the rate of growth in labor demand in Atlanta was considerably higher than in Detroit during that decade.

[36]For most of the 1980s, the unemployment rate in Atlanta exceeded that in Boston and unemployment in Detroit exceeded that in Los Angeles. During the 1990s, the relative rankings within each pair have been reversed, as the coastal economies weakened while the Midwest boomed and Atlanta enjoyed the economic effects of the Olympics. During the early to mid-1990s, unemployment rates averaged about 4 to 5 percent, 5 to 6 percent, 7 percent, and 10 percent in Atlanta, Boston, Detroit, and Los Angeles, respectively. Only in 1996–97 did the unemployment rate in the Detroit MSA begin to approach those in Atlanta and Boston, while rates in the Midwest generally fell below those of all other regions.

[37]The unemployment rates of non-Hispanic whites, blacks, and Hispanics in Los Angeles in 1990 were 4.8 percent, 12 percent, and 10.1 percent, respectively.

and what are the jobs that are most difficult to fill? Under both methods, most workers who are mismatched are those who can do only 0–1 task per job. Workers with previous experience or training in blue-collar or service jobs also account for the majority of the mismatched persons. *None of the mismatched jobs in our simulations require college degrees*, since there is an adequate supply of college-educated labor relative to jobs that require these credentials. In contrast, virtually all mismatched jobs require 3–4 tasks, and many require clerical/sales experience.

Mismatched workers and jobs are split fairly evenly between those having/requiring high school and those that do not, although the proportions accounted for by workers who are dropouts are significantly lower using Method I.[38] As for racial and transportation factors, a majority of mismatched workers are nonblacks with cars; of course, these are also the characteristics of the vast majority of workers. In relative terms, black workers (and/or those without cars) are most likely to be mismatched, as our results indicate below.

Table 6 presents simulated mismatch rates for workers by race or gender, and by education and/or welfare status within each. Results presented in part A are calculated using Method I; those in part B, using Method II. Results are presented separately by MSA and are pooled across samples that include or exclude Los Angeles.

Overall mismatch rates are lower among males than among females.[39] But blacks and Hispanics have much higher rates of mismatch, and thus face lower job availability, than do whites, even controlling for educational attainment. High school graduates are much more likely to obtain jobs than are high school dropouts. For both dropouts and welfare recipients, mismatch rates are very high, particularly among minorities. For instance, in the total sample, white welfare recipients have a

[38]These results are available in more detail from the authors.

[39]Mismatch rates by gender vary somewhat within skill groups. For instance, female high school graduates are less likely than their male counterparts to be mismatched, but these females are more likely than males to be in this educational category (relative to college graduates).

TABLE 6
Lack of Job Availability for Various Worker Groups:
Percentage of Each Group That Is Mismatched

	Atlanta	Boston	Detroit	Los Angeles	Total	Total, Excluding Los Angeles
A. Method I						
Black/Hispanic						
Total	.114	.177	.179	.245	.179	.157
High school graduates	.144	.141	.152	.162	.150	.146
High school dropouts	.376	.354	.501	.444	.419	.410
Welfare recipients	.351	.190	.283	.237	.265	.275
White						
Total	.055	.028	.063	.066	.053	.049
High school graduates	.084	.026	.058	.082	.063	.056
High school dropouts	.181	.171	.222	.396	.242	.191
Welfare recipients	.155	.094	.091	.147	.122	.113
Male						
Total	.050	.043	.086	.166	.086	.060
High school graduates	.069	.063	.087	.137	.089	.073
High school dropouts	.187	.247	.346	.414	.299	.260
Female						
Total	.092	.047	.099	.166	.101	.079
High school graduates	.128	.026	.076	.119	.087	.077
High school dropouts	.436	.205	.308	.466	.353	.316
Welfare recipients	.297	.129	.202	.163	.196	.209

(table continues)

TABLE 6, continued

	Atlanta	Boston	Detroit	Los Angeles	Total	Total, Excluding Los Angeles
B. Method II						
Black /Hispanic						
Total	.199	.369	.292	.293	.288	.287
High school graduates	.251	.379	.263	.272	.291	.298
High school dropouts	.645	.491	.636	.462	.559	.591
Welfare recipients	.495	.401	.415	.258	.392	.437
White						
Total	.120	.089	.168	.063	.110	.126
High school graduates	.193	.124	.184	.099	.150	.167
High school dropouts	.298	.308	.411	.441	.365	.339
Welfare recipients	.293	.152	.161	.143	.202	.187
Male						
Total	.117	.113	.209	.208	.162	.146
High school graduates	.170	.204	.238	.228	.210	.204
High school dropouts	.210	.377	.548	.413	.387	.378
Female						
Total	.167	.132	.182	.217	.175	.160
High school graduates	.243	.125	.166	.190	.181	.178
High school dropouts	.427	.343	.466	.516	.438	.412
Welfare recipients	.433	.244	.306	.177	.290	.328

mismatch rate of 12.2 percent under Method I, and white dropouts, a rate of 24.2 percent. Comparable numbers for blacks/Hispanics are 26.5 percent for welfare recipients and 41.9 percent for dropouts. Rates are substantially higher for all these groups using Method II. The omission of Los Angeles from the sample actually increases some estimates of mismatch for minorities, since blacks constitute the overwhelming majority of minorities outside of Los Angeles, and they appear to have higher rates of mismatch in many cases than do Hispanics from Los Angeles.

These results suggest that a large percentage of high school dropouts or welfare recipients will have difficulty finding work. Indeed, current actual employment rates among young high school dropouts are extremely low, especially among blacks.[40] Our predictions that up to 20 percent of white and 40 percent of minority welfare recipients will not find work bear striking similarity to the roughly 30 percent of welfare recipients who permanently fail to work under a variety of different circumstances and interventions.[41]

Comparing results across the different metropolitan areas generates some additional findings. Minorities, dropouts, and welfare recipients have higher mismatch rates than whites and/or high school graduates in each metropolitan area. The variance across areas in simulated mismatch rates for whites, and for high school graduates of any racial group, is not very high; in contrast, it is the disadvantaged groups who bear the brunt of "mismatch" unemployment and who are most sensitive to variations across areas in market structure or demographics.

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[40]In 1995, the labor force participation and unemployment rates of nonenrolled, 16–24-year-old high school dropouts were 63.2 and 21.5 percent, respectively, implying an employment rate of just 49.6 percent (U.S. Department of Labor, 1996). Among nonblacks and blacks, the employment rates are approximately 53 and 28 percent, respectively. These rates combine those for males and females, and the latter are no doubt influenced by childbearing and welfare recipiency. These data imply that the employment rates for young nonblack and black males (after adjusting for the likely differences by gender in participation rates) are approximately 60 and 40 percent, respectively.

[41]For data on the employment rates over a 10-year period of anyone on welfare at the beginning of this period, see Burtless (1995); for evidence on the employment rates of recipients in fairly successful programs, such as the GAIN-Riverside program, see Maynard (1995). These figures generally do *not* include those welfare recipients who are often exempt from employment programs due to disabilities, substance abuse problems, etc.

Blacks overall do relatively well in Atlanta, where residential segregation is somewhat less severe than in Detroit and other northern metropolitan areas (Holzer, 1996a). Black dropouts and welfare recipients do very poorly in Detroit, a highly segregated metropolitan area that has experienced significant industrial job loss over the past few decades.

To what extent do the specific demand-side barriers considered (i.e., skills, transportation, and race) account for the rates of mismatch? The data in Tables 1 through 3 suggest that task performance and occupation-specific skills are the major contributors to mismatch problems for these groups. Indeed, analysis of the characteristics of workers actually hired into these jobs confirms this result (Holzer, 1996b).

To obtain further evidence on this question, we recalculated the mismatch rates with various categories of jobs and workers "collapsed." For instance, we ran one set of simulations in which no distinct categories were used for task performance; in another set, no categories were used for occupational experience or training. Since we collapsed these categories one by one, we can compare across the calculated mismatch rates and infer the extent to which each barrier is responsible for job availability problems.

These results confirmed what was suggested by the summary data of Tables 1 through 3, namely that ability to perform tasks is the primary determinant of overall mismatch. When the task categories were collapsed, simulated mismatch rates fell by roughly three-fourths using Method I and even more with Method II. Occupation-specific experience or training requirements accounted for much of the remaining aggregate mismatch. In contrast, educational attainment and spatial access (and even race) had little effect on simulated mismatch rates overall, although they clearly had some effect on the distribution of overall mismatch across racial/education groups. In other words, spatial factors and racial barriers generated more mismatch among black employees and less among white employees.

Discussion

It is important to acknowledge possible biases in our simulations of "mismatch" or job availability, both upward and downward. For instance, in analyzing spatial imbalances, we assume that any establishment within one-half mile of a public transit stop is accessible to anyone without a car, without considering the difficulty of getting to that transit stop or other space-related problems (relating to information, distance from central city, perceptions of hostility, etc.). We also assume that (1) there is no discrimination against blacks in hiring at any establishment that currently employs at least some blacks in noncollege positions and there are no other employment barriers (whether caused by discrimination, child care problems, etc.) facing other minority groups or women; (2) a GED is the equivalent of a high school diploma to employers requiring the latter; (3) the tasks that can be performed by people who do not work are the same as those with similar demographic characteristics who do work; and (4) most important, the overall numbers of jobs and workers are comparable when the overall market is in balance. The last assumption is clearly incorrect during recessions or any time when local labor markets have a fair amount of "slack." All of these assumptions may have led to our overpredicting job availability for less-educated workers. The underrepresentation of some members of disadvantaged groups, such as young black males, in our household sample should also tend to reduce our computed mismatch rates.[42]

In contrast, other assumptions may have led us to underpredict job availability. For instance, we assume that employer skill requirements are fixed and that a credential that is "strongly preferred" is equivalent to one that is "absolutely necessary." This may not be true, especially if the willingness of employers to hire minorities or less-educated workers into jobs requiring various credentials or tasks

[42]An "undercount" of black males exists in the Census and in most other micro-level data sets.

rises in a tight market (e.g., Freeman, 1991).[43] We may even understate the degree of market tightness that can exist at the peak of the cycle (as in 1997) when we posit equal overall *numbers* of jobseekers and jobs and look only at the distributions of each across various categories. But an excess of jobs over workers in the aggregate or in major sectors is unlikely to persist for long without generating inflation.[44]

It is also possible that a higher percentage of low-skill jobs exists than we measured. For instance, our sampling procedure weighted establishments by current *employment*, rather than new hires. As noted above, we counted each high-turnover job that generates several new hires per year as just one job, even though it may *temporarily* employ several low-skill workers in that year. Establishments experiencing net employment growth are also underrepresented, although this could lead to either an upward or downward bias in skill requirements. Other types of establishments are underrepresented as well. For instance, the high mismatch rates in Los Angeles, presumably attributable to the higher percentages of less-educated Hispanics and Asians there, might be upward-biased to the extent that we had difficulty including establishments from the informal and/or "ethnic" economies in our sample of employers.[45]

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[43]Of the requirements listed for high school diplomas or occupational experience, roughly half are listed as "absolutely necessary" while the rest are "strongly preferred." Employers might be willing to forgo the latter in a tight market. But this is unlikely to be true in the very important area of task performance; as noted in the Appendix, we count tasks as required if they are used daily instead of less frequently.

[44]Some of the "potential jobseekers" we consider might not be very active searchers, even if they are counted as being in the labor force, due to the availability of unemployment insurance or other means of support (Rosenfeld, 1977; Katz and Meyer, 1990). Thus, an excess of available jobs over people actively seeking them could exist in the aggregate or in major sectors, although such excess demand should result in wage inflation. Furthermore, anecdotal reports of high job vacancy rates during 1997, if accurate, are just as consistent with our "mismatch" results as with an "excess labor demand" interpretation.

[45]This might have occurred because at least some of these establishments do not list phone numbers in directories, have owners or managers who do not speak English well, or have a greater distrust of answering formal questions in a survey.

Perhaps most important, our measures of workers' abilities to perform tasks are based on their having done so on a previous job. Previous work may not accurately reflect current abilities, especially with regard to tasks such as computer use where learning on the job is possible.

On the other hand, the rates of return to the performance of these skills rose substantially during the 1980s and remain high today (Murnane et al., 1995; Holzer, 1996b); it is unclear why workers would choose to forgo these returns if they are capable of performing these tasks. Furthermore, poor cognitive skills have been observed among large proportions of disadvantaged groups, such as long-term welfare recipients (Burtless, 1995; O'Neill and O'Neill, 1997; Pavetti, 1997), and employment rates for women with poor skills have been extremely low, regardless of whether they are on welfare.[46] Our finding that significant percentages of jobseekers, especially in the disadvantaged groups, cannot perform the tasks demanded by current jobs seems quite plausible in light of these results.

Overall, we cannot measure the net effect of all of the potential upward or downward biases. Relative to current aggregate unemployment rates, our simulated mismatch rates look comparable (at least using Method I), and the striking similarities between our estimates and those of nonemployment durations among less-educated workers also lead us to believe that the net bias is probably not large. Given this uncertainty, we interpret our estimates as the first results of a new analytical exercise rather than as the final word on this topic.

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[46]Pavetti (1997) finds that over half of the women who have *ever* been on welfare during a 10-year period score in the bottom quartile of the Armed Forces Qualifying Test score distribution, and one-third score in the bottom decile; these numbers are no doubt higher for those currently on welfare, where those with long spells will be overrepresented. Furthermore, roughly 60 percent of welfare recipients who have had very little labor force activity over this period (i.e., who have been employed less than one-fourth of the time) fall in the bottom decile. Finally, Pavetti finds low employment rates (i.e., under 50 percent) even for those who have very low test scores but have not been on welfare.

V. CONCLUSIONS

Are jobs available for all workers who seek them, especially among the disadvantaged? This question has been at the heart of many academic and public policy debates about poverty and welfare, but little solid evidence has been available to date to help answer it.

In this paper, we compare the characteristics of actual or potential jobseekers with those of available jobs in four metropolitan areas. We simulate a labor market process by which workers are "matched" to jobs on the basis of the skills, location/transportation, and racial characteristics of each. We then calculate the percentage of each that are "mismatched," which reflects the percentages of workers who have difficulty finding work and of jobs that are difficult for employers to fill.

We find roughly 9 to 17 percent of actual and potential jobseekers will have difficulty finding work in the short term. The mismatch rates vary across metropolitan areas, with Atlanta and Boston having lower rates than Detroit and Los Angeles.

Black workers, high school dropouts, and welfare recipients appear to have the greatest difficulty finding work. The mismatches are mostly caused by difficulties these workers have in gaining jobs that require large numbers of tasks or occupation-specific skills. Furthermore, our calculations suggest that up to 20 percent of white and 40 percent of minority welfare recipients face limited job availability in the short term (even without considering problems such as physical/emotional disabilities or substance abuse). Furthermore, to the extent that many less-skilled workers do find jobs, many of the jobs have high turnover rates, pay very low starting wages, and offer few benefits.

These simulations required us to make a large number of assumptions. We tested the sensitivity of our results to several and found them to be fairly robust. We also found our results to be consistent with data on nonemployment rates and durations.

Many of the workers who are "mismatched" will not face permanent unemployment, nor will the unfilled jobs be permanently vacant. Over time, new job openings will become available that should generate at least some job opportunities for these individuals. But, at a minimum, we expect lengthy durations of nonemployment for workers and vacancies for jobs in these cases.

Both workers and employers have potential ways of adjusting their behaviors in response to a lack of available jobs or workers, especially over the medium or long run. For instance, workers can (and do) migrate to local areas with tighter labor markets, or they can obtain more education or job training. Similarly, employers can reduce their hiring requirements, recruit more heavily (especially in more distant locations), provide more remedial training, or generate more jobs in response to the surplus of workers (perhaps at lower wages). Nevertheless, the costs in the short run to the workers who cannot easily find jobs might be considerable.

Are the simulated high mismatch rates for welfare recipients consistent with recent evidence of declining caseloads and rising employment in the wake of the 1996 welfare reform legislation? The dramatic drops in caseloads, especially in the context of tight labor markets nationwide, have led to optimism about the ability of our economy to absorb these workers (e.g., Mead, 1996; *Detroit Free Press*, 1997). To date, however, we have little evidence on the actual labor market experiences of those leaving the rolls, or even on the unemployment rates of those who have been successfully placed into jobs at least once. Previous evidence has indicated that unemployment rates *at any point in time* are quite high for participants in "welfare-to-work" programs, even though most gain employment at some point (Maynard, 1995). Furthermore, the individuals who are hardest to employ have generally not yet entered the labor market (McMurrer et al., 1997), and the current tightness of labor markets will certainly not last indefinitely.

These factors are all consistent with our estimates, which suggest that most welfare recipients are potentially employable, even though a substantial minority (30 to 40 percent overall) are not. The group

that will have difficulty finding work is likely larger than the 20 percent of recipients whom the new federal law allows states to exempt from 5-year time limits. Our estimates are also consistent with those of other researchers who have found similar percentages of recipients to be unemployable because of personal handicaps and limitations. Those who find work will often be plagued by high turnover and/or low wages and benefits in their jobs.[47]

To the extent that welfare recipients and others lack the skills currently demanded by employers, and that these skill deficiencies are primarily responsible for the observed rates of mismatch, public policies should concentrate on improving education and job training for the disadvantaged over the long term. The unfilled jobs in our simulations do not require college degrees but instead involve basic cognitive or social task performance and/or occupational experience (primarily in clerical or sales jobs). These jobs could potentially be accessible to disadvantaged workers who receive better education or job training.

As O'Neill and O'Neill (1997) and others have emphasized, preventing dependency by improving the cognitive skills of disadvantaged young people is likely to be a more successful strategy than trying to dramatically raise the skills of those who have already "failed" in the classroom and job market. "School-to-work" programs that provide young people with the relevant occupational experience and training for available jobs could play an important role as well.

Our results also suggest some role for transportation and job placement assistance to deal with spatial imbalances in the labor market, and for improved enforcement of Equal Employment Opportunity (EEO) laws to overcome racial discrimination. Although these problems do not account for much of the overall mismatch, they put less-educated blacks at a disadvantage relative to comparable whites.

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[47]The greater ability of welfare recipients to find work, the greater will be the displacement of other less-skilled workers who must compete with them for jobs, causing lower wages and/or employment among the latter as well. Holzer (1996a) calculates potential losses of employment and/or earnings for these other workers of 7 to 10 percent.

Transportation assistance and strengthened EEO enforcement would improve the relative standing of black workers, even if they did not dramatically reduce the overall rate of structural unemployment.

Furthermore, our results suggest that many currently disadvantaged workers will likely face limited job availability in the short term. This will be particularly true in some geographic areas (i.e., those with relatively high unemployment, or with large concentrations of welfare recipients and low-income minorities) and at some points in time (i.e., during cyclical downturns). Thus, a need will continue for job-creation efforts by the government, either through subsidies to the private sector or through public-service employment.[48] In addition, the low wages of disadvantaged workers, and their need for services such as child care, medical care, and transportation assistance, must also be addressed.[49]

Finally, we need further research on issues of short-term job availability facing disadvantaged workers. Some can be accomplished with the types of data on workers and jobs used in this study, while other approaches will be developed as new categories of data appear (such as matched longitudinal data on employers and workers). A better understanding of how workers adjust to a lack of job availability in the long run (in terms of their migration, training, and other choices), and of employer responses to lengthy vacancy durations, is critical as well.

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[48]See Katz (1996) and Danziger and Gottschalk (1995) for discussions of these options.

[49]In this vein, Phelps (1997) has argued for wage subsidies for disadvantaged workers, which would raise both their employment levels and their wages.

APPENDIX

Simulation Methods

The matching simulations begin by allocating workers and jobs to matrices based on the skill, spatial, and racial characteristics of each. To proxy for the racial and spatial characteristics of employers and workers, we specify whether an establishment currently employs any blacks (in its noncollege jobs), and whether it is accessible to workers without cars. Employers were asked how far their establishment is located from the nearest public transit stop. If it is within a half mile of a stop, we assume that it is accessible by public transit.[50] On the supply side, we note whether or not workers have access to automobiles when they search or work, and whether or not they are black.

Our measures of skills focus on three characteristics: (1) education, (2) occupation-specific experience or training, and (3) performance of various cognitive/social tasks. Educational requirements include whether or not the employer requires college or high school degrees. Occupation-specific requirements include whether or not the job requires previous experience in the relevant line of work or some type of skill certification from previous vocational training.[51]

For workers, we consider whether or not they have college or high school diplomas and whether or not they report any work experience or training in the relevant occupation.[52] Work experience is

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[50]See Holzer and Ihlanfeldt (1996) for evidence that establishments located nearer to public transit are more likely to hire blacks. A transportation-based definition of spatial access will miss other sources of mismatch, such as the limited information that inner-city workers might have about suburban employers. Our measure of public transit captures only its proximity to employers, without capturing how difficult or time-consuming it might be for an inner-city resident to reach that employer by public transit. Nonetheless, a transportation-based measure is preferable to those based on arbitrarily drawn municipal boundaries. Furthermore, any other sources of difficulties that blacks have in gaining access to jobs will be at least partly captured by the racial composition of the firm.

[51]Education, experience, or training is each considered "required" if the employer stated that it was "absolutely necessary" to be hired. A response of "strongly preferred" indicates that some candidates might be hired who lack the particular credential, especially in tight labor markets. We inquired separately about the educational attainments of workers hired into these jobs. Almost 95 percent of those hired met the stated educational requirements, and workers were much more likely to be overeducated than undereducated (relative to requirements).

[52]We treated GEDs as equivalent to high school diplomas, since most employers who require a high school diploma indicated that they would hire someone with a GED. Evidence to the contrary (e.g., Cameron and

measured by the occupation of their current or most recent job, while training may have occurred at any time in the past. We categorize the occupations into four broad groups—professional/managerial, clerical/sales, craft/operative, and laborer/service—as well as a fifth category of jobs requiring (and people reporting) no experience or training.[53]

The cognitive/social tasks performed on jobs are: (a) direct contact with customers (in person or over the phone), (b) reading or writing of paragraph-length material, (c) use of arithmetic, and (d) use of computers. We consider whether or not each is required on jobs or used by workers on a daily basis.

We use two different simulation methods for matching workers to jobs, based on two different underlying matrices of skills/race/space. The primary difference between them is that one places less emphasis on task performance, and more on educational attainment and spatial location, than does the other. In the first approach (Method I), we simply sum over the number of tasks used daily (which varies from 0 to 4), and create three categories based on this sum: 0–1, 2, and 3–4. In the second (Method II), we generate twelve combinations of particular skills, with reading/writing and arithmetic given more priority than customer contact and computer use. The combinations are then ranked in terms of skills used or required.[54]

Heckman, 1993) is based on the wages earned by workers rather than on employer willingness to hire them.

[53]Given the small sample sizes in each data set, narrower occupational definitions would generate a greater amount of mismatch that would be an artifact of the data since many more cells on both sides of the market would be unmatched. Our broad categories compensate for the fact that we only observe one previous job per person in defining the relevant work experience. The categories used here group together people and jobs of roughly comparable skill level, so that experience or training in one occupation suggests an individual's ability to obtain it in another occupation. Finally, the number of occupational categories had to be limited to keep the number of cells at a manageable level.

[54]The twelve combinations, in order of skills required or used, are defined as follows: four broad categories are based on use of both reading/writing and arithmetic, reading/writing but not arithmetic, arithmetic but not reading/writing, or neither; then within each of these categories, jobs can require (or workers can be skilled in) both computer use and customer contact, one or the other, or neither. The ranking of reading/writing and arithmetic over the others is based on the notion that computer use is frequently taught on the job to people without previous experience, while customer contact on these jobs earns workers no wage premium (Holzer, 1996b) and also appears to be more easily "learnable" than the other skills.

Thus, Method I treats all tasks the same (and assumes that a person who can perform one task can perform any job that requires only one task), whereas Method II allows for nonsubstitutability, which may be more realistic. That is, a worker who has never held a job which required arithmetic is considered ineligible for a job that requires this task, even if he has performed two other tasks, such as customer contact or reading/writing. Because Method II requires more task categories, we collapse other dimensions of skill, race, and space. Therefore, we do not distinguish high school graduation/dropping out and spatial location/automobile use in this method.[55]

Workers were asked about their task performance on their current or most recent job, based on the same task list used with the employers. These questions were asked only of those reporting a recent job. We therefore *predicted* task performance for each person not reporting them, based on their race, gender, education, and age. These predictions were only needed for about 7 percent of the sample.[56] Also, the task and occupation-specific requirements are specified only for people without (and jobs not requiring) college degrees; we assume that college graduates can obtain jobs that require college or professional/managerial jobs not requiring a college diploma.

Taken together, these categories yield matrices with 124 cells for each method; the dimensions of the matrices are summarized in Appendix Figure 1. In Method I, we have 3 job tasks x 5 occupations x 2 educational categories (high school versus no high school) plus 1 cell (for college graduates without regard to tasks or occupation), thus generating 31 skill categories x 2 spatial (accessible or not accessible by public transit) x 2 racial (firm has or does not have black workers) categories. These are computed

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[55]Our decision to eliminate these categories in Method II was based on empirical results from summary statistics and from simulations using Method I indicating that these categories contribute little to overall rates of mismatch.

[56]The predictions are based on regressions in which various measures of task performance are the dependent variables and the demographic variables listed above are the independent variables. These predictions are likely to be upward-biased, because nonemployed people are likely to have unobserved characteristics that are worse than those of comparable employed people. To fit the continuous predicted values into the categories used in the matrices, we round the predicted values to their nearest integers.

APPENDIX FIGURE 1
Categories Used to Define Matrices for Simulations: Method I versus Method II

	Method I	Method II
Skills		
Education	College	College
	Noncollege	Noncollege
	High school/GED	
	No high school/GED	
Noncollege occupations		
	Professional/managerial/technical	Professional/ managerial/technical
	Clerical/sales	Clerical/sales
	Craft/operatives	Craft/operatives
	Laborer/service	Laborer/service
	None	None
Noncollege tasks		
	Count:	Combinations:
	0-1	RW; A; CO and CU
	2	RW; A; CO or CU
	3-4	RW; A
		RW; CO and CU
		RW; CO or CU
		RW
		A; CO and CU
		A; CO or CU
		A
		CO and CU
		CO or CU
		None
Race		
	Black	Black
	Nonblack	Nonblack
Space		
	Car	N/A
	No car	

Note: "RW," "A," "CO," and "CU" refer to reading/writing of paragraphs, arithmetic, computer use, and customer contact, respectively.

separately for jobs and for workers in each of the four metropolitan areas.[57] For Method II, we have the same number of cells in the matrix, with twelve task categories but none for educational attainment below college or for space/transportation.

Throughout the analysis, we assume that workers have no access to jobs that require higher skills than they have, but less-skilled and more-skilled workers compete equally for jobs where both are qualified. We also assume that, *conditional on meeting skill requirements*, nonblack workers can obtain jobs in any establishment, whereas blacks can obtain jobs only in establishments with at least some current black employees. In addition, those with cars can obtain jobs in any establishment in Method I, whereas those without cars can obtain jobs only in any establishments accessible by public transit.

In our simulations, workers initially seek employment in some subset of the jobs to which they have access; if they do not obtain these jobs, they flow to other cells with comparable skill requirements that are accessible to them, and then to those that require just a bit less skill, etc., until they are matched to jobs. The first workers matched are thus the most skilled. For instance, in Method I workers with college degrees are first matched to jobs requiring college. If all of them are not matched, the remaining ones flow to cells requiring only a high school degree in the professional/managerial category with 3–4 tasks, then to those with 2 tasks, etc. A similar process then occurs for workers with only high school degrees who can do 3–4 tasks in each occupational category. Those people with occupational experience who do not get placed at any task level within their current occupation then flow to the category with no occupational requirements but with high school required and with the highest level of tasks that they can perform. High school graduates who are not matched to any job requiring high school then flow to the highest task jobs that they can handle in the relevant occupational category among jobs not requiring

[57]Workers cannot move easily across metropolitan areas in the short run, so we did not pool data across the four areas. We treat intermetropolitan locational differences as yet another spatial dimension, in addition to the intrametropolitan ones discussed. For evidence of the difficulties that black or less-educated workers have in relocating across metropolitan areas in response to demand shifts, see Bound and Holzer (1996).

high school until as many as possible are placed. Finally, workers without high school degrees are placed in jobs not requiring high school, following a similar pattern to the one described above. Similar flows are specified in Method II across task and occupational categories.

For each method, we have calculated mismatch rates in which we relax some of the assumptions embodied in the basic simulation. For instance, all workers initially seek employment in the cells in which they are located in the basic simulation, but in other variations we allow people to pursue jobs for which they are qualified wherever they are located.[58] We also assume initially that blacks or less-educated workers have no access at all to certain jobs, but in other cases we allow those workers to have access to the more restricted jobs once all qualified whites or more-educated workers have been placed.

[58]This assumption generates more commuting behavior among suburban workers, of the type we observe in the data.

References

Abraham, Katherine. 1983. "Structural/Frictional vs. Demand Deficient Unemployment: Some New Evidence." *American Economic Review* 73: 708–724.

Anderson, Patricia, and Bruce Meyer. 1994. "The Extent and Consequences of Job Turnover." *Brookings Papers on Economic Activity—Microeconomics*, pp. 177–248.

Bane, Mary Jo. 1997. "Welfare as We Might Know It." *American Prospect*, no. 30, January-February, pp. 47–53.

Blanchard, Olivier, and Lawrence Katz. 1997. "What We Know and Do Not Know about the Natural Rate of Unemployment." *Journal of Economic Perspectives* 11: 51–72.

Blank, Rebecca. 1995. "Outlook for the U.S. Labor Market and Prospects for Low-Wage Entry Jobs." In *The Work Alternative*, eds. D. Nightingale and R. Haveman. Washington, DC: Urban Institute Press.

———. 1997. "Contingent Work in a Changing Labor Market." In *Demand-Side Strategies for Low-Wage Labor Markets*, eds. R. Freeman and P. Gottschalk. New York: Russell Sage Foundation.

Bloomquist, Leonard, Leif Jensen, and Ruy Teixeira. 1988. "Too Few Jobs for Workfare to Put Many to Work." *Rural Development Perspectives* 5: 8–12.

Bound, John, and Harry Holzer. 1996. "Demand Shifts, Population Adjustments, and Labor Market Outcomes During the 1980's." Working Paper, National Bureau of Economic Research.

Burtless, Gary. 1995. "The Employment Prospects of Welfare Recipients." In *The Work Alternative*, eds. D. Nightingale and R. Haveman. Washington, DC: Urban Institute Press.

Cameron, Stephen, and James Heckman. 1993. "The Nonequivalence of High School Equivalents." *Journal of Labor Economics* 11: 1–47.

Campbell, Carl, and Kunal Kamlani. 1997. "The Reasons for Wage Rigidity: Evidence from a Survey of Firms." *Quarterly Journal of Economics* 112: 759–789.

Clark, Kim, and Lawrence Summers. 1982. "The Dynamics of Youth Unemployment." In *The Youth Labor Market Problem: Its Nature, Causes, and Consequences*, eds. R. Freeman and D. Wise. Chicago: University of Chicago Press.

Danziger, Sheldon, and Peter Gottschalk. 1995. *America Unequal*. New York: Russell Sage Foundation.

Davidson, Carl. 1990. *Recent Developments in the Theory of Involuntary Unemployment*. Kalamazoo, MI: W. E. Upjohn Institute for Employment Research.

Detroit Free Press. 1997. "Welfare Rolls Slashed, Many People Find Jobs." August 12.

Freeman, Richard. 1991. “Employment and Earnings of Disadvantaged Young Men in a Labor Shortage Economy.” In *The Urban Underclass*, eds. C. Jencks and P. Peterson. Washington, DC: Brookings Institution.

Frey, William, and Reynolds Farley. 1993. “Latino, Asian and Black Segregation in Multi-Ethnic Metro Areas: Findings from the 1990 Census.” Working Paper, Population Studies Center, University of Michigan.

Gottschalk, Peter, and Timothy Smeeding. 1997. “Cross-National Comparisons of Earnings and Income Inequality.” *Journal of Economic Literature* 35: 633–687.

Hauser, Robert, and Hanam Samuel Phang. 1993. “Trends in High School Dropout among White, Black, and Hispanic Youth., 1973 to 1989.” Discussion Paper no. 1007-93, Institute for Research on Poverty, University of Wisconsin–Madison.

Holzer, Harry. 1986. “Reservation Wages and Their Labor Market Effects for Black and White Male Youth.” *Journal of Human Resources* 21: 157–177.

———. 1989. *Unemployment, Vacancies, and Local Labor Markets*. Kalamazoo, MI: W. E. Upjohn Institute for Employment Research.

———. 1994. “Black Employment Problems: New Evidence, Old Questions.” *Journal of Policy Analysis and Management* 13: 699–722.

———. 1996a. “Employer Demand, AFDC Recipients, and Labor Market Policy.” Discussion Paper no. 1115-96, Institute for Research on Poverty, University of Wisconsin–Madison.

———. 1996b. *What Employers Want: Job Prospects for Less-Educated Workers*. New York: Russell Sage Foundation.

———. 1997. “Why Do Small Establishments Hire Fewer Blacks than Large Ones?” Discussion Paper no. 1119-97, Institute for Research on Poverty, University of Wisconsin–Madison.

Holzer, Harry, and Keith Ihlanfeldt. 1996. “Spatial Factors and the Employment of Blacks at the Firm Level.” *New England Economic Review*, May/June, pp. 65–82.

Holzer, Harry, and David Neumark. 1996. “Are Affirmative Action Hires Less Qualified? New Evidence from Employer-Employee Data.” Working Paper, National Bureau of Economic Research.

Hoynes, Hilary. 1996. “Local Labor Markets and Welfare Spells: Do Demand Conditions Matter?” Working Paper, National Bureau of Economic Research.

Juhn, Chinhui. 1992. “Decline of Male Labor Market Participation: The Role of Declining Market Opportunities.” *Quarterly Journal of Economics* 107: 79–121.

Juhn, Chinhui, Kevin Murphy, and Robert Topel. 1991. “Why Has the Natural Rate of Unemployment Increased over Time?” *Brookings Papers on Economic Activity*, no. 2, pp. 75–126.

Katz, Lawrence. 1986. “Efficiency Wages: A Partial Evaluation.” In *NBER Macroeconomics Annual,* vol. 1, ed. S. Fischer, pp. 235–275. National Bureau of Economic Research.

———. 1996. “Wage Subsidies for the Disadvantaged.” Working Paper, National Bureau of Economic Research.

Katz, Lawrence, and Bruce Meyer. 1990. “The Impact of the Potential Duration of Unemployment Benefits on the Duration of Unemployment.” *Journal of Public Economics* 41: 45–72.

Kirschenman, Joleen, and Katherine Neckerman. 1991. “We’d Love to Hire Them But . . .” In *The Urban Underclass,* eds. C. Jencks and P. Peterson. Washington, DC: Brookings Institution.

Kleppner, Paul, and Nikolas Theodore. 1997. “Work after Welfare: Is the Midwest’s Booming Economy Creating Enough Jobs?” Office for Social Policy Research, Northern Illinois University.

Levy, Frank, and Richard Murnane. 1992. “U.S. Earnings Levels and Earnings Inequality: A Review of Recent Evidence and Proposed Explanations.” *Journal of Economic Literature* 30: 1333–1381.

Maynard, Rebecca. 1995. “Subsidized Employment and Non-Labor Market Alternatives for Welfare Recipients.” In *The Work Alternative,* eds. D. Nightingale and R. Haveman. Washington, DC: Urban Institute Press.

McMurrer, Daniel, Isabel Sawhill, and Robert Lerman. 1997. “Welfare Reform and Opportunity in the Low-Wage Labor Market.” Washington, DC: The Urban Institute.

Mead, Lawrence. 1992. *The New Politics of Poverty: The Nonworking Poor in America.* New York: Basic Books.

———. 1996. “The Decline of Welfare in Wisconsin.” *Wisconsin Policy Research Institute Report* 9(3): 1–46.

Mishel, Lawrence, and Jared Bernstein. 1996. *The State of Working America*. Armonk, NY: M.E. Sharpe.

Moss, Philip, and Chris Tilly. 1995. “Soft Skills and Race.” Working Paper, Russell Sage Foundation.

Murnane, Richard, John Willett, and Frank Levy. 1995. “The Growing Importance of Cognitive Skills in Wage Determination.” Working Paper, National Bureau of Economic Research.

Murphy, Kevin, and Robert Topel. 1987. “The Evolution of Unemployment in the United States: 1968–1985.” In *NBER Macroeconomics Annual,* vol. 2, ed. S. Fischer, pp 11–57. National Bureau of Economic Research.

Neumark, David, and William Wascher. 1995. “Minimum Wage Effects and Low-Wage Labor Markets: A Disequilibrium Approach.” Working Paper, National Bureau of Economic Research.

Newman, Katherine, and Chauncy Lennon. 1995. “Finding Work in the Inner City: How Hard Is It Now? How Hard Will It Be for AFDC Recipients?” Mimeographed, Columbia University.

O'Neill, David, and June O'Neill. 1997. *Lessons for Welfare Reform*. Kalamazoo, MI: W. E. Upjohn Institute for Employment Research.

Pavetti, LaDonna. 1997. "How Much More Can They Work? Setting Realistic Expectations for Welfare Mothers." Washington, DC: The Urban Institute.

———. 1995. "Questions and Answers about Welfare Dynamics." Washington, DC: The Urban Institute.

Petterson, Stephen. 1997. "Are Young Black Men Really Less Willing to Work?" *American Sociological Review* 62: 605–613.

Phelps, Edmund. 1997. *Rewarding Work: How to Restore Participation and Self-Support to Free Enterprise*. Cambridge, MA: Harvard University Press.

Quandt, Richard. 1988. *The Econometrics of Disequilibrium*. New York: Blackwell

Rosenfeld, Carl. 1977. "Job Search of the Unemployed, May 1976." *Monthly Labor Review* 100(11): 39–43.

U.S. Department of Labor. 1996. *Employment and Earnings*. February, p. 167.

Wilson, William J. 1987. *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*. Chicago: University of Chicago Press.

———. 1996. *When Work Disappears: The World of the New Urban Poor*. New York: Alfred Knopf.