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# Black Employment Opportunities: The Role of Immigrant Job Concentrations

Jim Baird

BLACK EMPLOYMENT OPPORTUNITIES:

THE ROLE OF IMMIGRANT JOB CONCENTRATIONS

by

JIM BAIRD

Under the Direction of Robert Adelman

ABSTRACT

Recent, post-1980, immigration patterns have had a dramatic effect on U.S. labor markets, leading to considerable debate about the impact of immigration on native-born black workers. This research examines immigrant and black labor markets, across metropolitan areas, using Public Use Microdata and Summary File data from Census 2000 to generate low, mid, and high classifications of immigrant and black occupations based on socio-economic index (SEI). Multivariate findings indicate that the effect of recent immigration on black labor market outcomes differs by occupational level. Competition for low-skilled jobs is identified for native-born blacks in low-level jobs while a "bump-up" effect is identified for blacks in mid-level jobs. For example, production occupations with low language and skill requirements are shown to be contested among the groups. On the other hand, service and administrative functions emerge as bump-up mechanisms that create opportunity for black workers who amass the human capital required of these occupations. Thus, the ramifications of immigration for native-born blacks are shown to be quite different for low- and mid-SEI jobs.

INDEX WORDS: Immigrants, Native-born black workers, Occupational odds ratios

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# DEDICATION PAGE

This thesis is dedicated to my mother, Jean Audrey Baird, as a symbol of the value she placed on learning. Her sacrifices made college a possibility for me and ingrained the importance of educational attainment; her youthful spirit exemplified that it wasn't too late to pursue the degree culminated by this work. Thanks Mom. I wish you were here to lead the celebration.

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# CHAPTER 1: INTRODUCTION

During the last two decades of the twentieth century, new immigration patterns have altered American life by redefining the ethnic and cultural make-up of the U.S. population (Castles and Miller 2003; Heer 1996). These changes have had a dramatic and visible effect on U.S. labor markets, often leaving workers marginalized. Many consider immigration to be the primary cause of the new labor economy rather than perceiving other economic processes as dominant forces. Misconceptions and complexity have led to contentious debate among the public at large and to a lack of consensus among scholars. Much of the confusion regarding immigrants and labor markets is due to complex, and often counterintuitive, real world economic behavior that is not adequately explained by classic economics models. For example, the laws of supply and demand state that an increase in the supply of low-skilled labor, such as that provided by migrant workers, will reduce the jobs and wages offered to low-skilled workers (Kaufman and Hotchkiss 2003). Further, common sense suggests that the quantity of available jobs is limited; therefore an influx of low-skilled labor is expected to increase unemployment. Because native-born blacks are overrepresented in low-skilled jobs, reduced wages and higher unemployment are expected among black workers. Primarily as a result of these factors, considerable study has been conducted on the subject.

## *Statement of Purpose*

A large body of sociological literature exists regarding the relationship between immigration and native-born labor market outcomes (e.g., Borjas, Freeman, and Katz

1996; Card 1990; Filer 1992; Logan, Alba, and McNulty 1994; Moss and Tilly 2001; Waldinger 1996, 1997). The typical finding is that immigration does not negatively affect native-born wages and unemployment. Disagreement centers upon the effects of native-born labor market participation and whether or not there is an impact specifically on low-wage, low-skilled native-born outcomes, issues that seem to have captured the imagination of researchers working in this area.

However, very little research explores the potential positive relationship between immigrant and native-born labor markets. The question of whether or not immigrant labor market supply creates immigrant labor market demand has been addressed in the immigrant enclave literature (see Light and Rosenstein 1995; Portes 1995; Rosenfield and Tienda 1999), however the possibility that immigrant supply actually creates native-born job opportunities has only recently been raised (see Adelman et al. 2005; Bean, Van Hook, and Fossett 1999; Linton 2002). This thesis focuses on the relationship between immigration and native-born black workers, an appropriate starting point because both immigrants and blacks tend to overlap in lower-wage jobs. My research further explores this relationship by building on recent research and by directly investigating the parallel relationship between immigrant and black job concentrations within U.S. metropolitan areas.

***Research Objectives and Questions***

The research objective for this thesis is to provide a systematic analysis of the interrelationships that exist across metropolitan areas between black and immigrant concentrations within the labor force. Because labor market characteristics vary among metropolitan areas, these areas are the appropriate level of analysis for assessing the

associations that exist between occupations in which immigrants and blacks are concentrated. For example, how do recent immigrants in low-level occupations affect native-born blacks in similar low-level jobs? What is the relationship across a sample of metropolitan areas? What metropolitan areas have the strongest and weakest association between these groups? What occupational categories form the foundation of the relationship? In pursuit of this objective, four research questions are addressed.

The primary research question that I pose is: Does a positive relationship exist between lower-level jobs in which immigrants are overrepresented (concentrated) and middle-class jobs in which blacks are concentrated? Such a relationship between job concentrations is suggested in the literature because immigrants create economic activity (Friedberg and Hunt 1995) that necessitates incremental administrative (e.g., scheduling, billing) and service (e.g., bus drivers, government clerks) jobs (Adelman et al. 2005; Rosenfeld and Tienda 1999). To a large extent, these administrative and service jobs (e.g., postal workers) require English proficiency and many require Civil Service credentials. Blacks are well positioned for these middle-class jobs, leading to the possibility of a "bump up" effect among blacks in areas of high immigrant concentrations where higher wage opportunities replace low-wage jobs for blacks and where immigrants are largely limited to low-wage jobs. Exploring this relationship between immigrant job concentrations and black occupational concentrations is the primary focus of this work. I add additional breadth by assessing low, mid, and high-level concentrations for both immigrants and blacks for a total of nine relationships under investigation.

Several further, secondary, research questions are also addressed. First, are there particular metropolitan areas where the relationship is stronger, and, if so, what are the

characteristics of these metropolitan areas? Second, is this effect more pronounced in metropolitan areas that are considered “global cities” where the literature shows a coexistence of high salary white-collar jobs with low-wage service sector jobs (Sassen 2000, 2001)? Third, do cities with higher levels of disadvantage (i.e., poverty, unemployment, and female heads of-household) impact the effect? Finally, where immigrant and black occupational classifications are related, what specific jobs contribute to the relationship and what explanatory insight does their analysis provide?

## CHAPTER 2: REVIEW OF THE LITERATURE

Considering public opinion on immigration, Butcher (1998:149) notes "the effect of immigration on the labor-market outcomes of the native born has historically been the most contentious issue surrounding the debate about [immigration]." The impact of immigration on native-born workers clearly constitutes the majority of the literature on the economics of immigration. Much of the research focuses on cross-sectional studies of the primary immigration centers: Los Angeles, New York City, and Miami. A few studies consider the entire U.S. economy (e.g., Borjas 1999) and several longitudinal (e.g., Johannson and Weiler 2004) and qualitative (e.g., Waldinger 1997) studies complement the main body of work.

### *Immigration Literature Background*

Massey (1995:633) identifies three major phases of twentieth century immigration: (1) the classic era of mass European immigration that occurred from 1901 to 1930; (2) a long hiatus where immigration was minimal from 1931 to 1970; and (3) a new regime of substantial non-European immigration from 1970 to the present. The classic era was an extension of nineteenth century inflows that began in 1880 and brought approximately 28 million Europeans to the United States. In contrast to America's founders and those that comprised the population during its first century, these immigrants were primarily Southern and Eastern European instead of Northern and Western European.

The classic era immigrants fueled the U.S. industrial revolution, providing necessary labor and stimulating significant economic growth. These new Americans, for the most part, began their time in the New World as economically disadvantaged,

afforded only the least desirable jobs. However, over time they, or their descendants, moved up in income and status, sometimes equaling or surpassing the earnings of pre-1880 "white" Americans. The upward mobility of classic era immigrants, or that of second and third generations, was in part due to the labor union movement, which gained strength during this period (Lichtenstein 2002).

The long hiatus was not a complete elimination of immigration, but a dramatic reduction due to the enactment of laws that restricted the number of immigrants allowed to enter the United States. During the forty-year period, 7.4 million people immigrated to the United States, but their point of origin shifted from Europe to the Americas. The hiatus created an environment for the cultural assimilation of the classic era population, in part due to a lack of a constant influx of ethnic rejuvenation via new immigrants. The hiatus may have also provided time for an economic equilibrium to be obtained (Massey 1995). In any case, a massive wave of immigrants was not only absorbed by the U.S. economy, it provided the impetus for the economy to grow. Over the long run, jobs did not disappear, wages did not decline, and labor force participation did not decrease; the opposite occurred.

Castles and Miller (2003) characterize the new immigrants, those from the new regime, as being the product of the age of migration. The percentage of foreign-born residents in the United States has increased from 4.7% of the population in 1970 to 11.2% in 2000, and comprises higher percentages of the workforce. Immigration's impact on the workforce is growing; in the 1970s the foreign-born added 2.5 million people to the workforce (LaLonde and Topel 1991), but during the 1980s and 1990s the foreign-born added 13 to 15 million employees (Carmarota 1997). The new immigrants are

predominantly Hispanic and Asian in origin and are entering the country at a legal rate now exceeding one million people per year. The new immigrants' educational levels follow a differentiated bimodal distribution, with a smaller group that is highly educated and skilled and a dominant group that is uneducated and unskilled. Further, they differ dramatically from the classic era immigrant in ethnic origin and in the fact that there does not appear to be a reduction in their inflow similar to the long hiatus described above (Friedberg and Hunt 1995; U.S. Census Bureau 2002).

***Economic Impacts of the New Immigration***

The starting point for much of the research on the economic impacts of the new immigration concerns whether immigrants and native workers are substitutes or complements in the labor market. This conceptual issue originates from classic economic labor market theory, which predicts that substitute sources of labor create a competitive situation that lowers wages and that complementary sources of labor do not compete in the labor market (Kaufman and Hotchkiss 2003). Since many of the new immigrants are lower skilled and because blacks are disproportionately lower skilled, much of the literature focuses on the extent to which immigrants and blacks are substitutes in the labor market and whether black labor market outcomes are compromised by immigration.

One of the landmark studies of immigration labor market effects is David Card's (1990) research on the impact of the Mariel boatlift on the Miami labor market (see also Portes and Stepick 1993). In April 1980, Fidel Castro declared that Cubans were free to emigrate to the United States from the port of Mariel. Between May and September 1980, approximately 125,000 Cubans made the ninety-mile voyage to Florida. Half of the Cuban immigrants settled permanently in Miami, creating a near instantaneous seven

percent increase in the Miami labor supply. Good fortune created a natural experiment with available data from the April 1980 Census, a relatively large Current Population Survey (CPS) Miami sample of 1,200, and a CPS questionnaire that separately identifies Cubans. Furthermore, at the time, Miami had the largest U.S. foreign-born population (35.5 percent) and a significant black population (17.3 percent).

Card (1990:255) finds "first, that the Mariel immigration had essentially no effect on the wages or employment outcomes of non-Cuban workers in the Miami labor market. Second, and perhaps even more surprising, the Mariel immigration had no strong effect on the wages of other Cubans." He offers two theories for how this was possible. First, he argues, is the high number and relative growth of industries that use low-skilled labor, such as apparel and textiles, agriculture, and services, in the Miami area. These industries may uniquely position Miami to absorb a sudden influx of low-skilled labor. A second possibility, one that the data more directly support, is that fewer native-born workers migrated to Miami because of the Mariel immigration. In other words, normal migration flows into Miami may have been reduced because of job competition occurring as a result of the Mariel influx. This allowed the Miami labor market to better absorb the Mariel workers. Miami had a pre-Mariel annual population growth rate of 2.5 percent compared to 3.9 percent for the rest of Florida. Post-Mariel, the Miami rate dropped to 1.4 percent while the rest of Florida maintained a 3.4 percent rate (Card 1990). This indicates that labor markets may react on a larger scale than the bounds of the local level (see Borjas 1999).

A potential weakness in Card's work is that he considers only wages and unemployment and does not consider labor market participation rates.[1] In the case of Card's Mariel research, it is possible that native workers became discouraged and dropped out of the labor force (Johannson and Weiler 2004). As non-participants in the labor force, these "drop-outs" are not included in data depicting reduced wages or unemployment.

Filer (1992) and Frey (1999) support Card's thoughts that native workers may avoid, or out-migrate from, an area of concentrated immigration. Filer notes a "strong relation between the arrival of immigrants in a local labor market and the mobility patterns of native workers" (1992:267), particularly those with lower skills and education levels. His data show differences in the response of native-born white workers and native-born black workers to the labor market pressures of immigration. Filer suggests that white workers may respond by moving out of an area experiencing an influx of immigrants, choosing to bear the cost of increased mobility, while blacks tend to choose, or be forced by discriminatory barriers, to stay in the same location and deal with the costs of a temporarily worsened labor market. Rather than conclude that blacks are disproportionately affected by immigration, he proposes that the difference may be understood in terms of spatial mobility. Along similar lines, Frey (1999) suggests that lack out-migration from areas of immigrant concentration have created a reverse black

[1] Unemployment and participation rates are different classifications defined by the CPS. The CPS performs monthly interviews of approximately 60,000 households, the 'household survey,' to categorize the population into five categories. The non-institutional population consists of the total population less those in institutions such as prison, mental hospitals, or the military. The 'household survey' determines the quantity of people not in the labor force based on whether a respondent is unable to take a job or has not looked for work in the last four weeks. People are considered unemployed only if they have sought a job in the past four weeks. The CPS considers the labor force as consisting of only the employed and the unemployed. If a person becomes discouraged, even temporarily (4 weeks or more) from finding work, they are considered a non-participant in the labor force (Kaufman and Hotchkiss 2003).

migration, away from the north and west, back to the south.

Research that considers the different scale, ranging from the local level to the national level, that the labor market impact of immigration can be studied is found in the work of George Borjas. He has been a major figure in this area of research for the past two decades. In his 1992 study for the National Bureau of Economic Research (NBER), he notes that the concentration of immigrants in a relatively few destination cities such as Los Angeles, New York City, and Miami, has led to considerable research on the effects of immigration on the U.S. native labor market. Along with Freeman, he concludes "these studies, for the most part, find an insignificant correlation between the presence of immigrants in a locality and the earnings of natives in that locality" (Borjas and Freeman 1992:11). Thus, early research conflicts with classic economic theory by providing empirical data showing minimal effects of immigration on native labor markets (Altonji and Card 1991; Card 1990; Grossman 1982; LaLonde and Topel 1991).

Borjas (1993:217) asserts that the research up to that point, buoyed by the availability of rich data sets and advancement in econometrics, points to "a consensus on both the direction and magnitude of the labour market impact of immigration." He claims that neither theory nor empirical evidence support any other conclusion than that immigrants have negligible, if any, significant or substantive effect on native earnings or employment levels in the U.S. labor market.

Borjas (1995) further solidifies his position, theorizing that immigrants were not substitutes for low-skilled native workers, but complements with non-interchangeable skills in the production process. If, for example, immigrant workers have a comparative advantage in agricultural production, then native workers are freed to pursue higher-

skilled jobs. He suggests that a situation would then be created in which employers must compete for resources in the native labor market resulting in higher wages for native workers. Borjas (1995:35) argues,

> The overwhelming consensus of the literature seems to be that immigrants and practically all native groups are, at worse, very weak substitutes in production. It is fair to conclude that the cross-city correlations have not established a single instance in which the earnings of US-born workers have been strongly and adversely affected by the increase in the supply of immigrants.

However, by 1999, Borjas was offering a different interpretation of the issue. He raised several pertinent issues in *Heaven's Door* that bear directly on the research in this thesis. First, he concluded that the issue of immigrant impacts on native-born workers must be viewed at the national level (i.e., a spatial correlation approach) because native-born workers do move away or avoid economic areas with high immigrant densities. But, whether or not native workers avoid high immigration areas remains controversial and Borjas admits, "it is worth noting that we still do not fully understand *why* the spatial correlation approach fails to find [significantly negative] effects" (Borjas 2003:1370).

Borjas (1998, 1999) also highlights a disproportionate effect of immigration on blacks that is new to his work. He cites two reasons why blacks are likely to be negatively affected. One, since the new immigrants are likely to be low skilled, they tend to compete most directly with black workers. Two, since the benefits of immigration, in the form of lower wages and capital accumulation, accrue to employers, and since blacks are underrepresented in terms of capital and business ownership, they have less to gain from immigration. He contradicts previous empirical evidence on this issue, but gives credibility to the long-standing belief that blacks and immigrants are competitors.

Borjas' (2003) latest work concludes that taking both skill level and experience as a criterion for identifying immigrant and black competitors in the labor market provides a

more accurate view of the situation. He (2003:1336) suggests that "by using the insight that both schooling *and* work experience play a role in defining a skill group—one can make substantial progress in determining whether immigration influences the employment opportunities of native workers." His analysis predicts a three to four percent decline in native-born wages when immigration, comprised of individuals with similar education and experience, increases by ten percent in an area.

***Additional Literature***

Beyond the defining work of Card and Borjas, studies conducted to assess the impact of immigration on U.S. labor markets fall into three primary categories: (1) impact on native wages, (2) employment opportunity effects, and (3) occupational distribution. Studies of the impact on native wages are typically directed to local or regional labor markets such as cities or states. This research generally finds negligible effects on native wages (Altonji and Card 1991; Borjas, Freeman and Katz 1996; Grossman 1982; LaLonde and Topel 1991). Critics (see Steinberg 2005) counter that the areas under study are not spatially closed markets; workers and capital easily move beyond the area of study allowing native workers to relocate away from immigration centers and capital to relocate into immigration centers. These movements may equalize wages and cause area-based studies to miss the immigration impact. On the other hand, some researchers investigate larger geographical areas, such as Borjas, Freeman and Katz's (1996, 1997) national analyses. However, investigating a larger area necessarily assumes that labor markets react instantaneously (e.g., using national census data assumes that labor market changes are reflected in a set of data that is simultaneously

collected from all metropolitan areas). These studies are open to criticism that their assumption of instantaneous labor market reactions is unreasonable (Linton 2002).

A variant on the wage-impact research are studies that assess employment opportunity effects such as unemployment rates. Again, most conclude that immigrants have little or no impact on native employment, including low-wage, low-skill sectors (Altonji and Card 1991; Card 1990; Winegarden and Khor 1991). These studies have the same limitations and criticisms, such as a failure to account for the complexities of time and space, as discussed above for wage-based studies. Only recently has work assessing employment opportunity effects considered the potential of a positive effect; one in which immigration results in the creation of improved jobs for native-born workers (Adelman et al. 2005; Linton 2002).

The third type of research examines immigrant's occupational distribution. These studies generally focus on the complementary nature of immigrant and native jobs. By showing that the two groups occupy different labor market sectors, implications are deduced regarding the level of competition. The results of these types of studies are inconclusive. Most of this research assumes that labor supply and labor demand operate independently (i.e., increased supply acts to decrease wages and increased demand acts to increase wages, but these effects are mutually exclusive). This does not allow for the possibility of a synergistic effect between labor supply and labor demand such that immigration increases the relative size of labor market sectors in local markets (Camarota 1997; Light and Rosenstein 1995; Moss and Tilly 2001). In other words, immigration into a locality may increase the number of jobs in that locality and wages will be

determined by an interaction between the wage effects of labor supply and labor demand (Linton 2002).

***Foundational Research for this Proposal***

Two studies are particularly relevant to this thesis. First, Linton (2002) addresses the issue of interdependent supply and demand by investigating the effect of immigration on the 1990 composition of metropolitan labor markets and on the change in metropolitan labor force size from 1980 to 1990. She finds that "There is a clear, positive association between the relative size of a metropolitan area's immigrant population and the size of the immigrant job sector [i.e., jobs in which immigrants are overrepresented by at least a factor of two]" (2002: 66-67). Moreover, that cities with significantly larger immigrant populations have proportionally larger immigrant job sectors suggests that immigrants create particular types of jobs and that supply creates demand, supporting a relationship between supply and demand. She further concludes that immigration contributes to the economy due to the differences between immigrant and native populations. This difference is supported by the concentration of immigrants in specific labor market sectors.

Linton's work provides interesting empirical data to indicate that supply does in fact create demand in labor markets. Her study is limited to changes within jobs characterized as being within the immigrant sector. However, it raises the question of whether immigrant supply creates labor demand in non-immigrant sectors. Rosenfeld and Tienda (1999) consider occupations from which immigrants are largely excluded, finding that jobs such as postal clerk, security guard, and teacher are positions disproportionately

filled by blacks, suggesting the possibility of occupational upgrading for blacks earning low wages.

Second, Adelman et al. (2005), by combining wage-impact and occupational distribution approaches, although finding a significant negative relationship with black labor force participation and black poverty, determine that the quantity of recent immigrants positively affects black median earnings and specific types of jobs in which blacks are highly represented. They also investigate the types of jobs in which blacks fair well in both high and low immigration areas. Their results indicate a duality in which, in areas of high immigration, blacks are underrepresented in lower-skill jobs, but are over-represented in 'better' occupations such as office and administrative support. These findings support a variation on supply and demand interaction concepts, where an increased supply of low-skilled labor creates an increase in demand for a somewhat higher (e.g., administration vs. janitorial) labor sector. Thus, a 'bump-up' in employment outcomes for blacks is observed, in which new, higher paying jobs become available as the result of recent immigration (see also Rosenfield and Tienda 1999).

***Theoretical Framework***

Most of the research regarding the impact of immigration on native labor markets is based on classic economic theories of substitution and complementarities of workers within a supply and demand framework. Studies seek to determine the extent to which the skills and/or desirability of immigrant workers either substitutes for, or complements, the skills, and/or desirability, of native workers. If the two types of workers are substitutes in the labor market, the theory predicts that an influx of immigrant workers will create a surplus supply within the labor market that will depress wages and increase

unemployment. If, on the other hand, the two are complements, there will not be negative consequences affecting wages, and unemployment will not increase in the labor market (Kaufman and Hotchkiss 2003).

Although classic economic theory is very limited in how well it predicts real-world labor market outcomes, it remains the dominant foundational framework in use today for immigration studies. Econometrics uses statistical techniques to improve the usefulness of classic economic theory as a predictor (Kennedy 1998) and has been applied extensively to immigration research (see Borjas 1993, 1995, 1998, 1999, 2003). Census data have also been extensively mined in studies of the economic impact of immigration. In essence, econometrics and other analyses of census data represent techniques that are used to augment classic economics, but are theoretically framed in classic economic theory. Some research (see Light and Rosenstein 1995; Linton 2002) moves beyond classic economic theory by considering effects other than complementarity and substitution, such as joint or interdependent outcomes like the "bump-up" effect (Adelman et al. 2005).

Sociologically, the currently relevant theories fit within a political economy conflict perspective. Traditional Marxist (Castells 1985b) and world systems (Portes and Walton 1981) theories dominate this area. Both view immigration as an integral facet of a worldwide capitalist system that is characterized by inequality and domination. In this framework, migration supports the system by providing low-cost labor in the receiving country and, in the sending country, relieves political pressure, at a cost of continued dependence on leading economic countries (Heisler 1999).

Heisler (1999: 623), while noting that immigration "has been the focus of increased attention and the literature is growing in leaps and bounds, practitioners and scholars interested in this topic continue to bemoan its prevailing theoretical paucity." She groups the numerous models of immigration incorporation, within the structural/conflict perspective, under the title of enclave theory. Enclave theories are primarily concerned with inequality and competition within the economic market. Competition for jobs is considered the impetus that excludes the weakest ethnic or racial groups leading to highly segmented labor markets. Enclave theory is based on a premise that there are winners and losers in the labor market outcomes that result from immigration. This dominant theory would be expected to result in labor markets in which either low-skilled immigrants or low-skilled native workers are excluded or marginalized through unemployment or low wages. Empirical data support some aspects of enclave theory, but fail to demonstrate that the theory fully captures the economic realities of immigration. While this thesis uses the conflict perspective as a starting point, and accepts Heisler's (1999) enclave theory as defining the minimal theory that has been developed in this area, I also explore the possibility that immigrant and native-born black labor market outcomes are not a zero-sum game.

# CHAPTER 3: DATA AND METHODS

The primary focus of this research is the relationship between lower-level occupations in which immigrants are overrepresented (concentrated) and low- and middle-level jobs in which blacks are concentrated. Competition between the two groups in lower wage/status occupations is frequently predicted and largely refuted in the literature (see Altonji and Card 1991; Borjas and Freeman 1992:11; Card 1990; Grossman 1982; LaLonde and Topel 1991), yet there is sufficient uncertainty to warrant additional analysis of the implications of low-skilled immigrants on native-born blacks. Further, the ramifications of low-level immigrant concentrations on middle-level black job opportunities is just beginning to be explored in the literature and thus requires additional study.

This latter relationship between job concentrations is suggested because immigrants create economic activity (Friedberg and Hunt 1995) that necessitates incremental administrative (e.g., scheduling, billing) and service (e.g., bus drivers, government clerks) job functions and has been indicated in prior research (Adelman et al. 2005; Rosenfeld and Tienda 1999). Because these administrative and service jobs require English proficiency and many require Civil Service credentials (e.g., postal workers), many native-born blacks are well positioned for these middle-class jobs. This leads to the possibility of a “bump up” effect among blacks in areas of high immigrant concentrations where higher wage opportunities replace low-wage jobs for blacks and where immigrants are largely limited to low-wage jobs. Such a bump up is of particular interest for its potential to provide blacks, who have the necessary education, to obtain jobs that pay somewhat higher wages and often offer health insurance. Rather than the possibility of

competition for low-level jobs, or worse, a “leap frog” effect where immigrants fare better in the labor force than native-born blacks, clarification of a bump up effect would suggest nominal, but obtainable opportunities for black workers. It is the exploration of this potential relationship between immigrant job concentrations (IJCs) and black occupational concentrations (BOCs) that is at the center of this research.

The methodological starting point is the determination of the proportional size of the IJCs and BOCs, for a sample of 150 metropolitan areas (MAs), in each of three levels (low, mid, and high socio-economic status). For purposes of this study, blacks are native-born individuals that identify as black (one-race) on the census questionnaire and immigrants are all foreign-born individuals that entered the United States during 1980 or after. The concentration proportions then are used as variables in multivariate analyses that depict the relationship between the job concentrations as well as MA characteristics and controls. For example, the relationship between the mid-BOC and the low-IJC is assessed to investigate the effect of low-level immigrant concentrations on overrepresentations of mid-level black occupations across metropolitan areas. The additional variables are grouped by MA characteristic as those involving labor force, disadvantage, and global city attributes. These are described in detail below.

Two different sets of Census 2000 data must be used to obtain information about individuals and their occupations, and those occupations at the metropolitan level of analysis. Summary Files (SFs) are used to obtain metropolitan level data, but do not produce the occupational detail necessary for this study. On the other hand, Public-Use Microdata Sample (PUMS) data, based on long-form census surveys that are conducted on a sample basis, do provide detailed occupational information. For this study, PUMS

data are used to establish which job categories are overrepresented, for blacks and immigrants, within each of the metropolitan areas. The overrepresented occupational categories are then consolidated, based on socio-economic prestige, into low, middle, and high job classifications. The result is three black and three immigrant concentrations that indicate the proportion of the population in each MA that work in each occupational classification. For example, a low-IJC of 0.426 for El Paso denotes that 42.6% of those sampled are employed in low-level jobs in which immigrants are overrepresented in El Paso. The three BOCs are then the dependent variable in separate OLS regression analyses in which the independent variables are either the IJCs or variables extracted from SFs. In other words, the concentrations derived from individual-level PUMS sample data are assumed to represent the proportion in the entire MA.

***PUMS Data and Methods***

Because data delineating the proportion of immigrants and blacks employed in jobs that have an occupational overrepresentation of either immigrants or blacks within the MA are not directly available in the SFs, these measures are computed with PUMS data (see Linton 2002). More specifically, data are used from the 2000 Integrated Public Use Microdata Series (IPUMS), compiled by researchers at the Minnesota Population Center (Ruggles et al. 2003).[2]

First, PUMS data are used to determine which of thirty-one job categories are overrepresented by blacks or immigrants in each MA in the analysis. The thirty-one categories are an expansion of twenty-one categories used by the U.S. Census Bureau to

[2] Of note, PUMS data are not available for six of the 150 MAs used in this analysis due to guidelines that prohibit the collection of data in geographical areas that are too small to guarantee anonymity for those completing the census long form. For this reason, Burlington, VT, Charleston, WV, New London, CT, Pittsfield, MA, Portsmouth, NH, and Wheeling, WV were eliminated, making the final sample 144 MAs.

aggregate the 496 (excluding agriculture and military) occupational codes that are tracked. The fundamental approach to grouping of the occupations used by the Census Bureau is maintained in this analysis, but categories that include occupations of different statuses are further divided such that they can be classified as high, medium, or low socioeconomic status. For example, where the Census Bureau groups lawyers, judges, paralegals, and legal support personnel into the same category (Legal Occupations), these are sub-divided into high and mid-level Legal Occupations in this analysis. Continuing this example, Lawyers (identifier 210-see Appendix) and Judges, Magistrates, and Other Judicial Workers (211) have a Duncan Socio-Economic Index (SEI) of 93 (see below). Paralegals and Legal Assistants and Miscellaneous Legal Support Workers each have an SEI of 44. Leaving these four occupations in the same category would provide insufficient differentiation and blur the lines between mid-level and high-level legal workers, necessitating an additional category.

The Duncan SEI provides a measure of occupational status, on a scale of one to one-hundred, based upon the income level and educational attainment associated with each occupation (Duncan 1961).[3] The SEI values for the 496 occupations tracked by the Census Bureau range from 8 to 93. An analysis of the SEI for each identified occupation was conducted with two related objectives. The first goal was to provide a systematic basis for assessing the jobs within the categories and separating those with too wide a range of SEIs into multiple categories. The second goal was to provide an equivalent basis for assigning the new job categories to one of the three classification levels. Each of

[3] Each decennial census uses different occupational classifications; however, a common classification scheme is used that references the 1950 census classifications. The Duncan index provides SEI data for the 1950 occupations, whereas more recent measures of occupational status do not. Because an occupational

the 496 occupations were rank-ordered by SEI and, as a first cut, divided into three equal groups. The dividing lines between high and middle and between middle and low status jobs was then adjusted slightly to assure that similar type occupations were in the same group. For example, the break-point between high and middle was established with 53 in the middle and 54 in the high, allowing all technician occupations to fall in the middle classification and all professional occupations to fall in the high classification. Using the same approach, the break between middle and low was set such that occupations with an SEI of 22 or less were in the low classification and those between 23 and 53 were in the middle classification. The result was 151 occupations in the high, 175 in the middle, and 170 in the low classification that provide face validity in that the resultant classifications represent an occupational grouping that meets common perceptions of job status.

The three SEI classifications were then analyzed, similarly to the Legal Occupations example above, by listing all of the SEI ratings within each category. My goal was to have as few categories as possible (such that small MA samples would be useable) while maintaining categories that were comprised mostly of the same SEI classification.[4] This highlighted ten categories that had an SEI range or distribution that indicated that the category needed to be sub-divided, resulting in a reasonable trade-off between the number of categories and the SEI homogeneity of the categories. The final distribution was 31 categories: 12 high, 11 mid, and 8 low. The thirty-one occupational categories and the associated ranking as high, mid, or low socioeconomic status are shown in Table 3.1. The appendix lists the individual jobs that are grouped into each

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status study for 2000 census classifications is not available, using the older Duncan index is the only alternative.

[4] Sub-dividing the occupations into more than 31 categories does not provide sufficient cases in each group for many MAs, therefore additional granularity is not possible using PUMS data.

occupational category and denotes the corresponding census identification.

For each occupational category, I calculated odds ratios to determine immigrant overrepresentation and black overrepresentation as is shown in Table 3.2 (for a detailed explanation of the application of odds ratios, see Lim [2001] and Rosenfeld and Tienda [1999]). These odds ratios indicate the relative frequency of members of a group in a specific occupation (versus those in all other occupations) compared to the relative frequency of non-members of that group who hold that same occupation (versus those in all other occupations). An odds ratio equal to or greater than 1.5 designates an occupational category as being part of either the immigrant or black job concentration for a particular MA. For each overrepresented occupational category (odds ratio > 1.5), the number of blacks or immigrants in the category as a proportion of the total number of blacks or immigrants in the MA is calculated. This provides a BOC or IJC for each overrepresented occupational category.

In order to calculate the odds ratios for each MA, IPUMS file extractions are defined that select on variables as follows:

1. Age is used to select only members of an MA who are working age (i.e., sixteen or older and sixty-five or younger).
2. Employment status is used to select only members of an MA who are labor force participants (i.e., employed and unemployed participants).
3. Birthplace is used to select those who are foreign-born in determining the IJCs and to select blacks that are native-born in determining the BJCs.
4. Year of immigration is used to select foreign-born Hispanics and Asians that immigrated recently (i.e., 1980 and after).

5. Race is used to determine a member of white, non-Hispanic black and Asian groups.
6. Hispanic is used to determine a member of the Hispanic group.

144 samples are extracted from the IPUMS and used to compute the odds ratios. The size of each job category that is overrepresented, for blacks or immigrants, by an odds ratio of 1.5 or higher is then summed to create six job concentrations, three each (low, mid, and high) for blacks and immigrants; forming the BOCs and IJCs.

***Summary File Data and Methods***

The six concentrations are calculated for each of 144 MAs, a stratified, random sample of Metropolitan Statistical Areas and Primary Metropolitan Statistical Areas as defined by the 2000 census. The sample is stratified based on region and population size, resulting in a sample that represents the regional distribution of U.S. MAs.[5] The sample includes all 50 MAs with a population of one million or more persons. One hundred additional MAs are then randomly selected from the remaining MAs, with a population between 80,000 and 1,000,000. As noted above, Burlington, Charleston, New London, Pittsfield, Portsmouth, and Wheeling were then eliminated from the sample due to insufficient PUMS data, resulting in the 144 MA sample. The MAs in the final sample are listed in Table 4.3.[6]

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[5] The 2000 Census indicates that the Northeast comprises 21% of all MAs while the Midwest, South, and West include 21%, 38%, and 20% respectively (Adelman et al. 2005). The 144 MAs in this sample include 19%, 25%, 37%, and 19% respectively.

[6] The PUMS data for several MAs is based on a somewhat different geographical area than the SF data due to confidentiality requirements for the long-form on which PUMS data is based. For some MAs, occupational odds ratios are based on different populations than the summary file data used in the multivariate analysis. Approximately twelve MAs have large enough differences to warrant concern. However, these MAs were checked during the outlier diagnostics and not found to be problematic. As a result, it was decided to keep these MAs in the analysis in the interest of including all possible data.

The relationship between the IJCs and BOCs, across MAs, are investigated in a multivariate regression analysis context with the three BOCs as the dependent variables and the three IJCs as the primary independent variables of interest. Control variables (e.g., labor force participation) are determined based on theory and empirical research found in the relevant literature. The additional metropolitan-level data and variables come from a pre-existing data set based on SFs from Census 2000 (see Adelman et al. 2005; Jaret, Reid, and Adelman 2003; Reid et al. 2005). Three nested models are generated for each of the three BOCs (dependent variables), comprised of variables that are grouped into those involving labor market, disadvantage, and global city characteristics.

***Dependent variables*.** The dependent variables are the low-BOC, mid-BOC, and high-BOC, continuous variables measured as proportions.

***Independent variables*.** The main independent variables of interest are the low-IJC, mid-IJC, and high-IJC, continuous variables stated as proportions. Control variables are used for theoretical reasons, and for a more complete understanding of the relationship between the BOCs and the IJCs. These variables are used to generate three nested OLS regression models for each BOC. Model 1 predicts each BOC while including only the IJCs and labor force control variables on the right-hand side of the equation. Model 2 adds economic disadvantage variables and Model 3 adds variables that are indicative of a global city. Control variables are defined as follows:

1. Black labor force participation: the number of blacks aged sixteen or older that are categorized as in the labor force. From Census 2000 Summary File 3 (SF 3) Detailed Table P150B.

2. Asian labor force participation: the number of Asians aged sixteen or older that are categorized as in the labor force. From Census 2000 Summary File 3 (SF 3) Detailed Table P150D.
3. Hispanic labor force participation: the number of Hispanics aged sixteen or older that are categorized as in the labor force. From Census 2000 Summary File 3 (SF 3) Detailed Table P150H.
4. The percentage change in the foreign-born population from 1990 to 2000. Census 2000 Summary File 3 (SF 3) – Sample Data – Table DP-2: Profile of Selected Social Characteristics and Census 1990 Summary File 3 (SF 3) – Sample Data – Table DP-2: Social Characteristics: 1990.
5. Percent black in-migration (1995-2000): the percentage of the MA population (2000) that was in a different MA than in 1995. From Census 2000 Summary File 4 (SF 4) – Sample Data - PCT50. Residence in 1995 for the population 5 years and over – MSA/PMSA Level: Black or African American alone.
6. Percent black not high school graduate: the percentage of the MA's black population, aged 25 and over, which do not have a high school degree. Census 2000 Summary File 3 (SF 3) - Sample Data – Detailed Table P148B. Sex by Educational Attainment for the Population 25 Years and Over (Black or African American Alone).
7. Median Age: the median age of the MA population. DP-1. Profile of General Demographic Characteristics: 2000 Data Set: Census 2000 Summary File 1 (SF 1) 100-Percent Data.

8. Disadvantage index: an index calculated by adding the MA's percentage poverty (Census 2000 Summary File 3 (SF 3) – Sample Data – Table P87: Poverty Status by Age in 1999 [Detailed Tables]), percentage unemployment (U.S. Bureau (1993a), Table 33), and percentage female head-of-household (Census 2000 Summary File 3 (SF 3) Table P9).
9. Cost of living (First Quarter 2003): composite of cost factors such as housing, taxes, and food, expressed as an index against a national average of 100 (Sperling and Sandler 2004:71).
10. Percent professional services: percentage of the civilian labor force (age 16 and over) that is employed in the professional services sector. Census 200 Summary File 3 (SF 3) – Sample Data – Table GCT-P13: Occupation, Industry, and Class of Worker of Employed Civilians 16 Years and Over [Geographical Comparison Tables].
11. Percent low-service industries: percentage of the civilian labor force (aged 16 and over) that is employed in the service sector.[7] Census 2000 Summary File 3 (SF 3) - Sample Data – Table DP-3: Profile of Selected Economic Characteristics [Demographic Profiles].
12. Percentage change in service industry (1990-2000): the percentage change in the civilian labor force (aged 16 and over) that is employed in the service sector (see number 11 above).
13. Percent change in white labor force (1990-2000): the percentage change of the

[7] This variable is obtained by adding the percentages of an MA's civilian labor force that are employed in two service industry categories ("arts, entertainment, recreation, accommodation, and food services" and "other services, except public administration") (see Reid et al. 2005)

civilian labor force, aged 16 and over. Census 2000 Summary File 3 (SF 3) – Sample Data - Table P150I [Detailed Tables] and Table 43, U.S. Census Bureau 1993a for MAs whose boundaries did not change between 1990 and 2000.[8]

***Diagnostics***

In the multivariate analysis, standard errors are corrected using Long and Ervin's HC3 correction (2000) for heteroscedasticity. In an aggregate metropolitan level of analysis, heteroscedasticity results from larger MAs exhibiting smaller standard deviations than those exhibited by smaller MAs. This violates the homoscedasticity assumption for OLS regression and results in potentially misspecified standard errors. The HC3 correction compensates for both known and unknown heteroscedasticity and adjusts the standard errors accordingly (see Reid et al. 2005; Johnston and DiNardo 1997; Mesner and Blau 1987). The HC3 correction is the preferred method, as Reid et al. (2005: 768) note:

> The advantage of HC3 over weighted least squares regression, a more often used correction for heteroscedasticity, is that for the latter the source of the heteroscedasticity must be known and an appropriate functional correction must be available. HC3 corrects heteroscedasticity from both known and unknown sources.

In addition to the HC3 correction, OLS diagnostics were performed to validate the assumptions, beyond homoscedasticity, for OLS regression analysis, including multicollinearity, linearity, and outliers (Gujarati 1995). To assess multicollinearity, bivariate correlations were checked against a standard that they be less than 0.7. The only variables that were near this threshold were between the labor force participation variables, but they were at acceptable levels. Particular attention was paid to the three IJC

[8] MAs that added or dropped counties between 1990 and 2000 have been adjusted in the existing data set such that the 1990 boundaries match those of 2000. This required the use of additional data sources: Table

classifications, because it was desirable to include these as concurrent independent variables for ease in presenting the results. Tolerance values and variance inflation factors (VIFs) were well within acceptable levels. The VIFs for the IJC variables were all below three (Gujarati 1995).

Also, considerable attention was given to assessing outliers, including investigation of standardized residuals, studentized residuals, leverage, studentized deleted residuals, Dffit, and Cook's Distance. Several MAs stood out on scatterplots of standardized and studentized residuals, including Duluth, Denver, Dallas, Oakland, and San Diego. A leverage plot indicated New York City as an outlier with the most leverage. However, Cook's Distance suggested that even New York City was not a problem (<.35) as no cases approached 1.0. Even though Duluth was the largest outlier in terms of residual, its lack of leverage was verified by removing the case and noting that it made virtually no difference. Duluth was then included in the analysis. Further, larger residuals were less of a concern because the HC3 correction was being used.

Normality was confirmed by plotting residuals on an expected versus observed cumulative probability graph and noting the conformity to a straight line. Linearity was found to be acceptable by observing the randomness of the partial regression plots for each variable. Homoscedasticity was assessed using White's Test and found to not be problematic. However, the HC3 correction was performed to assure no problem with unknown sources of heteroscedasticity.

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30, U.S. Census Bureau 1993b, Tables 144 and 154, U.S. Census Bureau 1993c, and Tables 18, 20, and 30, U.S. Census bureau 1993d.

***Hypotheses***

Four primary hypotheses are tested as follows:

**Hypothesis 1**: MAs with larger low-IJCs will have larger mid-BOCs. In other words, a specific bump-up effect is expected to exist that increases the size of the mid-level black concentration (mid-BOC) when the low-level immigrant concentration (low-IJC) is increased. The case of low-wage immigrants creating mid-level black jobs is the situation that is expected to be pronounced in the current labor market due to the high number of immigrants in low-level jobs. Because administrative and clerical jobs are more likely to be generated by low-wage jobs (e.g., low-skill workers usually require more supervision and detailed scheduling), the low-IJC - mid-BJC relationship a key focus of this research. However, the relationship between all combinations of IJCs and BOCs will be tested.

**Hypothesis 2**: The size of a MA's low-IJC and the MA's low-BOC will not be significantly related. This hypothesis assesses the dominant literature that low-wage immigrant jobs and low-wage black jobs do not substitute for each other, but rather complement one another. A substitution effect will be evidenced by a low-BOC that decreases with an increase in the size of the low-IJC. If this relationship is not observed, it will indicate a complementary relationship between low-wage immigrant jobs and low-wage black jobs.

**Hypothesis 3**: MAs with higher levels of disadvantage will have smaller BOCs. This hypothesis assesses the effect of disadvantage factors, such as poverty and unemployment, on the size of black concentrations of jobs. Assuming that immigrant location patterns are influenced by instrumental economic factors, then IJCs will be lower in metropolitan areas with higher disadvantage. Further, areas with lower IJCs are

expected to have lower BOCs. It then follows that metros with higher disadvantage will have lower BOCs.

**Hypothesis 4**: MAs with higher global city characteristics will have larger BOCs. This hypothesis tests the role that global factors play as a predictor of black concentrations of jobs. Global cities generally attract immigrants to jobs in the low-wage service sector; therefore, a positive relationship is expected between global city factors and the BOCs.

**Table 3.1. OCCUPATIONAL CATEGORIES**

| | Occupational Category | SEI |
|---|---|---|
| 1. | Management Occupations | High |
| 2. | Business and Financial Operations Occupations | High |
| 3. | Computer and Mathematical Science Occupations | High |
| 4. | Architecture and Engineering Occupations | High |
| 5. | Life, Physical, and Social Science Occupations | High |
| 6. | Community and Social Services Occupations | High |
| 7. | Legal Occupations – High SEI | High |
| 8. | Legal Occupations – Mid SEI | Mid |
| 9. | Education, Training, and Library Occupations | High |
| 10. | Arts, Design, Entertainment, Sports, and Media Occupations – High SEI | High |
| 11. | Arts, Design, Entertainment, Sports, and Media Occupations – Mid SEI | Mid |
| 12. | Healthcare Occupations – High SEI | High |
| 13. | Healthcare Occupations – Mid SEI | Mid |
| 14. | Healthcare Occupations – Low SEI | Low |
| 15. | Protective Service Occupations – Mid SEI | Mid |
| 16. | Protective Service Occupations – Low SEI | Low |
| 17. | Food Preparation and Serving Related Occupations | Low |
| 18. | Building and Grounds Cleaning and Maintenance Occupations | Low |
| 19. | Personal Care and Service Occupations – Mid SEI | Mid |
| 20. | Personal Care and Service Occupations – Low SEI | Low |
| 21. | Sales and Related Occupations – High SEI | High |
| 22. | Sales and Related Occupations – Mid SEI | Mid |
| 23. | Office and Administrative Support Occupations | Mid |
| 24. | Construction and Extraction Occupations – Mid SEI | Mid |
| 25.. | Construction and Extraction Occupations – Low SEI | Low |
| 26. | Installation, Maintenance, and Repair Occupations | Mid |
| 27. | Production Occupations – Low SEI | Low |
| 28. | Production Occupations – Mid SEI | Mid |
| 29. | Transportation and Material Moving Occupations – High SEI | High |
| 30. | Transportation and Material Moving Occupation – Mid SEI | Mid |
| 31. | Transportation and Material Moving – Low SEI | Low |

**Table 3.2. CALCULATION OF ODDS RATIOS** *

| **Racial/Ethnic Group of Interest** | **Occupation of Interest** | **All Other Occupations** |
|---|---|---|
| Immigrants | $f_1$ | $f_2$ |
| Blacks | $f_3$ | $f_4$ |
| **All Others except group of Interest** | $f_5$ | $f_6$ |
| **Odds ratio for immigrant overrepresentation:** | $\frac{(f_1/f_2)}{(f_5/f_6)}$ | |
| **Odds ratio for black overrepresentation:** | $\frac{(f_3/f_4)}{(f_5/f_6)}$ | |

* This table is based on the description of odds ratios as calculated by Logan et al. (1994:700).

**Table 3.3. METROPOLITAN AREA SAMPLE**

| | | |
|---|---|---|
| Akron | Fresno | Orange Co. |
| Albany | Ft Lauderdale | Orlando |
| Albuquerque | Ft Wayne | Philadelphia |
| Allentown | Gary | Phoenix |
| Asheville | Grand Rapids | Pittsburgh |
| Atlanta | Greensboro | Portland |
| Atlantic City | Greenville | Providence |
| Austin | Harrisburg | Racine |
| Bakersfield | Hartford | Raleigh |
| Baltimore | Houston | Reno |
| Baton Rouge | Huntsville | Richmond |
| Beaumont | Indianapolis | Riverside |
| Bergen-Passaic | Jackson, MS | Rochester, MN |
| Biloxi | Jacksonville, FL | Rochester, NY |
| Binghamton | Jacksonville, NC | Sacramento |
| Birmingham | Jersey City | Salt Lake City |
| Bloomington | Kankakee | San Antonio |
| Bloomington-Normal | Kansas City | San Diego |
| Boise | Kenosha | San Francisco |
| Boston | Knoxville | San Jose |
| Bremerton | Lafayette | Savannah |
| Bridgeport | Lakeland | Scranton |
| Buffalo | Las Vegas | Seattle |
| Champaign-Urbana | Little Rock | Shreveport |
| Charleston, SC | Los Angeles | Sioux City |
| Charlotte | Louisville | South Bend |
| Chattanooga | Lubbock | Spokane |
| Chicago | Macon | Springfield, MA |
| Cincinnati | Madison | St Louis |
| Cleveland | Memphis | Stockton |
| Colorado Springs | Miami | Syracuse |
| Columbia | Milwaukee | Tacoma |
| Columbus | Minneapolis | Tallahassee |
| Corpus Christi | Mobile | Tampa |
| Dallas | Monmouth, NJ | Toledo |
| Davenport | Montgomery | Topeka |
| Dayton | Muncie | Trenton |
| Denver | Nashville | Tucson |
| Des Moines | Nassau | Tulsa |
| Detroit | New Haven | Vallejo |
| Duluth | New Orleans | Ventura |
| Dutchess County | Newark | Washington, DC |
| El Paso | Norfolk | West Palm Beach |
| Eugene | New York City | Wichita |
| Flint | Oakland | Wilmington, DE |
| Florence | Ocala | Wilmington, NC |
| Fort Walton | Oklahoma City | Worcester |
| Fort Worth | Omaha | Youngstown |

# CHAPTER 4: RESULTS AND DISCUSSION

The main results for this research consist of three OLS regression analyses, one each for the low-, mid-, and high BOC, followed by a detailed exploration of the metropolitan areas and specific occupational categories involved in the multivariate results. The outcomes of the regression analyses show relationships between black occupational concentrations and immigrant job concentrations, as well as between the BOCs and labor market, disadvantage, and global city variables. The significant relationships that are explored include associations between the mid-BOC and each of the three IJCs, between the low-BOC and the low and mid-IJCs, and between the low-BOC and three of the disadvantage variables. The results highlight competition among blacks and immigrants for some low-level jobs while other occupations appear to be complementary. However, overall, immigrant concentrations in low-skilled jobs tend to reduce the number of blacks who are employed in similar low-level occupations. Also, a bump-up effect is explored in which the mid-BOC is positively related to the low-IJC. Further, joint opportunities are shown to occur between the mid-BOC and the mid-IJC, in which blacks and immigrants gain entry into mid-level jobs via different paths. On the other hand, the high-BOC is found to be the smallest job concentration, indicating limited upward mobility for blacks.

## *Univariate and Descriptive Results*

Table 4.1 shows that the largest occupational concentrations are in the low classification for both blacks and immigrants, 0.227 and 0.267 respectively. Or, stated differently, 22.7% of blacks in the sample MAs are in low-SEI occupations that are

overrepresented for blacks.[9] For immigrants, the percentage is higher at 26.7%. In both cases, the low concentrations are dramatically higher than for the mid- and high-level concentrations. However, the mid- and high-concentrations are quite different for blacks and immigrants. In the high classification, immigrants are in overrepresented occupations at over twice the rate of blacks: 0.058 compared to 0.027. Based on supplementary analysis, this effect is primarily the result of well-educated Asians in professional positions, with relatively few Hispanics in similar positions. The opposite relationship exists in the mid-classification where blacks are over twice as likely as immigrants to be in overrepresented mid-level occupations: 0.059 compared to 0.028, respectively.

Table 4.2 highlights the occupational differences between the primary minority racial and ethnic groups in the United States. The top five occupations for each group are shown for the jobs in which a group is most prevalent on one hand, and least prevalent on the other, across all MAs. The top and bottom occupational categories are determined in a supplementary analysis that disaggregates the immigrant category into Asians, Hispanics, and others. Results are shown for Asians and Hispanics separately, and then for all immigrants combined. The top occupational categories are ones in which the highest percentage of those in the 144 MA sample are of a specific race or ethnicity. For example, the total number of blacks in low-SEI Healthcare, for all MAs, is taken as a percentage of all workers in low-SEI Healthcare. The five highest and the five lowest job categories are then listed for each group. In other words, this table depicts the most and least likely occupational categories that Asians, Hispanics, all immigrants, and blacks are found. Asians are more likely to be employed in high SEI occupations and less likely to

[9] Indicates representation in an occupational category that is at least 1.5 times the expected rate based on the racial composition of the MA's population

work in mid SEI occupations. However, Asians are also less likely to be employed in high SEI occupations such as legal and social service jobs (the sixth most underrepresented category and therefore not depicted in the table). They appear to be employed in science related fields to the exclusion of non-scientific high-level occupations (e.g., legal). Interestingly, high SEI legal positions are underrepresented for all groups: black, Asian, and Hispanic, making it stand out as the "whitest" occupational category with the highest barriers to entry for minorities. This table also shows Hispanics as likely to be in low SEI occupations and unlikely to enter high SEI jobs. Similarly, blacks are most likely to hold low SEI jobs and least likely to attain high SEI occupations.

A distinct pattern emerges in Table 4.2 indicating that both blacks and immigrants are overwhelmingly positioned in lower SEI jobs. These results raise the question of what similarities and differences exist in the patterns among metropolitan areas and occupational categories? Tables 4.3 and 4.4 delineate the MAs with the highest and lowest BOCs and IJCs, respectively, highlighting a wide range of concentrations among the various MAs in the sample. These tables highlight a dichotomy in the patterns, some of which indicate a national character to black and immigrant job concentrations, and other patterns that point to specific regional or metropolitan characteristics. The national view is supported by the number of metropolitan areas with very different characteristics seem to have similarly sized job concentrations. For example, Ventura, CA, Corpus Christi, TX, Bloomington, IN, and Rochester, MN have high-BOCs in the same range and Florence, AL, Omaha, NE, and Racine, WI have mid-IJCs of similar magnitude.

On the other hand, there are other patterns that seem to have attributes that are unique to areas within the United States.

Focusing on the BOC, as outlined in Table 4.3, black overrepresentation in high-level occupations occurs often in metropolitan areas which have relatively small black populations (e.g., Boise). Conversely, there are thirty-two MAs that have no high-level occupations in which blacks are overrepresented. Many of these areas with zero BOCs also have low relative black populations, thus suggesting different characteristics between MAs with lower black populations that have high-BOCs and those with non-existent high-BOCs. Along these lines, there is strong southern regional pattern to the areas with high-BOCs of zero. In contrast, no southern MAs are among those with the largest concentrations of blacks in high-level occupations. This distinction is so consistent that even Atlanta, often considered a "black Mecca," has no high occupational categories in which blacks are overrepresented. In short, on average, blacks do not experience upward mobility to the higher job categories in the South.

The limitations of the South are also evident in comparing the largest and smallest mid-BOCs in Table 4.3. There are no southern MAs in the top twenty largest mid-level concentrations for blacks, but the South is well-represented in the list of the smallest mid-BOCs. Again, black upward mobility, even to modest lower middle-class positions, is dramatically less evident in the South. Not surprisingly, southern MAs do have some of the largest BOCs in the low-level occupational categories.

Table 4.3 also depicts that large mid-BOCs are the most common in larger metropolitan areas, particularly large western MAs such as Los Angeles, San Diego, Oakland, Denver, and San Francisco. These are areas with large immigrant populations,

but not specifically areas with the largest IJCs (see Table 4.4). Interestingly, different large western MAs, including Fresno, Stockton, Bakersfield, and Orange County are among the largest low-IJCs, suggesting a pattern where mid-BOCs are juxtaposed with low-IJCs. The largest high-IJCs are also dominated by western MAs and a few large eastern MAs.

The list of MAs with zero high-level concentrations is longer for immigrants than for blacks. Table 4.4 indicates that there are 50 (out of 144) MAs with no high-level job categories overrepresented by immigrants (compared to 32 for blacks) and 58 MAs with no mid-level IJCs (compared to 7 for blacks). This may reflect less opportunity for immigrants, but must also be tempered by the fact that there are more metropolitan areas with little or no immigrant presence than there are with minimal black populations. On the other hand, immigrant concentrations are found in geographically diverse areas. For example, from Table 4.4, the largest low-IJCs occur in MAs from all regions, although dominated by western areas. The smallest low-IJCs occur predominantly in mid-size Midwest and Northeast metropolitan areas. Table 4.4 provides some insight into the current state of immigrant locations, at least as reflected by labor markets. Clearly immigrant concentrations exist beyond the generally accepted gateway cities (i.e., Los Angeles, New York, and Miami). If the data in Table 4.4 were plotted on a map, it would show that immigrant occupational overrepresentations are emanating from the Southwest and moving to the North and East.

Tables 4.5 and 4.6 provide further insight into the issue, showing that there are certain occupational categories that are overwhelmingly overrepresented by blacks or by immigrants. These tables rank order the thirty-one job categories by mean odds ratio for

the 144 MAs. For example, low-SEI Healthcare, such as nurse's aides, are overrepresented with blacks in 142 of 144 MAs. Across all MAs, blacks are overrepresented in low-SEI Healthcare by an average odds ratio of 4.94. In Savannah, Monmouth, and Bergen-Passaic the odds ratio is 11.38, 10.85, and 9.77 respectively. In other words, the relative frequency of blacks in low-SEI Healthcare (versus those in all other occupations) in these MAs is approximately ten times as high as the relative frequency of non-blacks in this job category (versus those in all other occupations). The second highest mean odds ratio, for blacks, is mid-SEI Transportation and Material Handling, which includes jobs such as bus drivers, mass transit workers, and crane operators. With an average odds ratio of 3.20, this type of work is overrepresented by blacks in 124 of the 144 MAs. Similarly, low-SEI Protective Service occupations, such as mass transit police, security guards, and campus police, are overrepresented in 126 of the 144 MAs with a mean odds ratio of 2.21. The lowest mean odds ratio, for blacks, is in high-SEI Legal occupations. These occupations, such as lawyers and judges, have an average odds ratio of 0.31. In other words, across all MAs, the relative frequency that blacks are lawyers and judges (versus those in all other occupations) is about one-third of the relative frequency of non-blacks in this job category (versus those in all other occupations). Even in metropolitan areas with the largest odds ratios, specifically Oakland (0.69), Minneapolis (0.64), and Los Angeles (0.61), have fewer blacks in high-SEI Legal occupations than even odds would indicate we should expect.[10] Similarly, high-SEI Healthcare occupations and Management occupations have an average odds ratio of 0.42. Blacks are also underrepresented in these areas. Table 4.5 clearly portrays

[10] MAs with fewer than ten individuals in a given occupational category are included in Tables 4.5 and 4.6 in the column counting the number of MAs with odds ratios greater than one, but disregarded in the column

that blacks are much more likely to have access to certain occupations, those with the highest mean odds ratios, and limited in their access to certain other jobs, those with the lowest mean odds ratios.

Table 4.6 outlines the same information for immigrants as Table 4.5 does for blacks. Immigrants are overrepresented with the highest mean odds ratio of 2.84, in low-SEI Production Operations. Jobs in this category include manufacturing assemblers, production helpers, and low-skilled machine operators. Immigrants are overrepresented in these occupations in 137 of the 144 MAs. The highest odds ratios are found in Nassau, Orange County, and New Haven with values of 6.25, 5.74, and 5.42 respectively. The second highest immigrant mean odds ratio is in the Building and Grounds Cleaning and Maintenance occupational category, at 2.54. This category includes low-skilled service jobs such as groundskeepers, maids, and janitors. Immigrants are overrepresented in this job category in 126 of the 144 MAs.

The third highest immigrant mean odds ratio, in Table 4.6, is 2.396 for high-SEI Computer and Mathematical Science occupations, which points to a key difference between the type of occupations that are overrepresented by immigrants and those that are overrepresented by blacks. The only high-SEI occupational category to have a mean odds ratio greater than one, for blacks, is Community and Social Services. Even this one category is debatable as a high-SEI category; the jobs, which include counselors, social workers, and clergy, require education commensurate with many high-SEI occupations, but salaries are more in line with mid-SEI occupations. Therefore, the only high-SEI attainment by blacks is one with lower financial rewards than most other high-SEI occupations. By contrast, immigrants have several high-SEI occupational categories in

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listing the MAs with the highest odds ratios.

which they are overrepresented, on average, across all MAs. In addition to Computer and Mathematical Science, these include Life, Physical, and Social Science, high-SEI Healthcare, and Architecture and Engineering. This suggests that the immigrant population is bifurcated by educational level with higher educated immigrants attaining high-SEI occupations that a much less accessible for blacks.

However, the lowest mean odds ratio for immigrants is in high-SEI Legal occupations (i.e., lawyers and judges), implying that immigrants do not pursue, or are excluded from, this occupational category (see Table 4.6). The mean odds ratio of 0.091 indicates that immigrants very rarely enter the legal profession. Slightly higher mean odds ratios are found in Boston (0.21), Washington, DC (0.15), and San Diego (0.15), but even these values are very low. The second lowest mean odds ratio (0.162) for immigrants is mid-SEI Protective Services, which includes jobs such as police, firefighters, and correctional officers. The third lowest mean odds ratio (0.247) for immigrant is mid-SEI Transportation and Material Moving, a job category that we have seen is one of the most overrepresented by blacks. This occupational category is an excellent example of jobs in which blacks and immigrants complement one another in the labor market as there is little competition among to two groups for these occupations.

Overall, these tables paint a picture where certain occupational categories seem to be over- or underrepresented across high numbers of MAs while distinctions between MAs are not immediately obvious. These descriptive data seem to indicate that social forces propelling racial/ethnic minorities into particular jobs are national while individual metropolitan characteristics seem to be less influential than the occupations themselves. The multivariate analysis that follows is designed to explore these relationships further.

***Bivariate and Multivariate Results***

Before addressing the multivariate results, the bivariate correlations are shown in Table 4.7. Bivariate correlations between the three BOC dependent variables and the three IJC independent variables indicate a weak, but significant, positive (.212) relationship between the size of the high-BOC and the mid-IJC. None of the three IJC variables are significantly correlated with the mid-BOC at the bivariate level. However, all three IJC variables are correlated with the low-BOC; there is a positive relationship with the high (.270) and mid (.224) IJC and a negative one with the low-IJC (-.268). These low-BOC associations are all significant.

These data demonstrate that several relationships of interest exist between black and immigrant job concentrations. These correlations suggest that a multivariate analysis may develop predictive and explanatory associations that will shed additional light on connections between minority occupational concentrations. It is the multivariate analysis that is of primary interest and is addressed next. Tables 4.8, 4.13, and 4.17 display three models for each dependent variable.

***Mid-BOC analysis*.** First, in Table 4.8, as hypothesized, there is a positive, moderately strong, and significant (B = .134, β = .230, p = .027) relationship between the low-IJC and the mid-BOC. Model 1 predicts that a one point increase in the size of the low-IJC will result in a 13.4% increase in the size of the mid-BOC when controlling for labor force variables. These data suggest that immigrants in low socioeconomic positions create higher socioeconomic jobs that are filled by blacks. Hypothesis 1 stated that MAs with larger low-IJCs will have larger mid-BOCs, which is shown to be the case in this analysis. This relationship is not statistically significant when disadvantage variables are

added, but is significant for Model 3 (p = .066), which includes disadvantage and global city variables.

Controlling for disadvantage characteristics diminishes the relationship between the mid-BOC and the low-IJC because of the variable that measures blacks without a high school education. Although this variable is not statistically significant, clearly it explains some of the variation in the mid-BOC that was attributed to the low-IJC in Model 1. Stated differently, by taking differences in the educational level of blacks out of the equation (i.e., controlling for), the significance (i.e., value of p) of the low-IJC is reduced (i.e., becomes statistically significant) compared to when black educational levels are not controlled for. This indicates that the relationship between the low-IJC and the mid-BOC is stronger in some MAs, and weaker in some MAs, depending on the percentage of blacks without a high school education. It suggests that the presence of a larger low-IJC does not correspond to a larger mid-BOC in areas where there are not sufficient numbers of blacks with adequate education to take advantage of the mid-level job opportunities. Additional research is required to better understand the effect of different educational levels on black middle-class job opportunities in areas with high low-level immigrant job concentrations. When global city variables are added in Model 3, the low-IJC is significant (p = .0661). Overall, then, these data support the presence of a “bump-up” effect.

Second, Table 4.8 shows a weak, positive, and significant relationship (B = .252, β = .139, p = .018) between the mid-IJC and mid-BOC. Model 1 predicts that a one point increase in the size of the mid-IJC will result in a 25.2% increase in the size of the mid-BOC when controlling for labor force variables. This relationship increases in strength

and significance as additional explanatory variables are added, suggesting that the relationship is based on variables other than disadvantage and global city characteristics. These results suggest the possibility that there is a synergistic effect between immigrants and blacks in mid-level occupational categories. The specific job categories involved are investigated later to provide further insight into this phenomenon of parallel mid-level minority opportunity.

Third, Table 4.8 also depicts a moderate, positive, and significant relationship (B = .252, $\beta$ = .254, p = .025) between the high-IJC and the mid-BOC. Model 1 predicts that a one point increase in the size of the high-IJC will result in a 25.2% increase in the size of the mid-BOC when controlling for labor force variables. This relationship holds across the three models as additional explanatory variables are added. Whether this is a "pull-up" effect, where immigrants in high-level occupations create opportunities for blacks in mid-level jobs, or a case where conditions are favorable to both the high-IJC and the mid-BOC cannot be determined with certainty by this analysis. However, the relationship of the mid-BOC with higher SEI job overrepresentation by immigrants indicates that MA characteristics are favorable to both the mid-BOC and the high-IJC. Again, these characteristics do not appear among the disadvantage and global factor variables of Models 2 and 3. The specific job categories involved are investigated later to provide further insight into this phenomenon of parallel minority opportunity for blacks in mid-level occupations and immigrants in high-level occupations.

To further explore the significant relationship between the mid-BOC and the low, mid and high-IJC, MAs were ranked by the size of their combined job concentrations (e.g., the sum of the low-IJC and mid-BOC, a number that indicates the relative

magnitude of the combined job concentrations). For example, Dallas ranks the highest as having a large low-IJC and a large mid-BOC with a combined job concentration of .756, indicating that 75.6% of blacks and immigrant workers in the area are overrepresented in these two occupational categories (see Table 4.9). The MAs of primary interest (the top 20 combined job concentrations) in investigating the relationships between the IJC and the mid-BOC are listed in Table 4.9. These lists depict the MAs that most exemplify each of the three relationships with the IJC that Table 4.8 highlights as significant. The top MAs for each situation are then analyzed in terms of the occupational categories that comprise the respective job concentrations as depicted in Table 4.10, Table 4.11, and Table 4.12. In other words, Table 4.8 delineates which relationships are of interest; Table 4.9 lists which areas exhibit the relationships of interest, and Tables 4.10 through 4.12 provide additional information for analyzing the relationships of interest.

Tables 4.10 through 4.12 also present a "typical MA profile" for MAs having the combined attributes of interest. For Table 4.10, the top 20 MAs exhibiting both larger mid-BOCs and low-IJCs were considered in terms of the specific occupational categories that are overrepresented by either blacks or immigrants. These occupational categories were then tallied and are included in the "typical MA profile" if the category was overrepresented in more than half of the highest ranked MAs for that attribute combination. These profiles give a fairly concise picture of the job categories that most frequently contribute to the significant relationships between job concentrations in the mid-BOC multivariate analysis.

The mid-level occupations shown in Table 4.10, in which blacks are overrepresented, consist of Office and Administrative Support, which includes billing and

posting clerks, dispatchers, payroll clerks, and postal service mail carriers and Transportation and Material Moving, which includes bus drivers, subway workers, and ambulance drivers. Other occupational categories that comprise bump-up positions that offer black opportunity are Healthcare-mid SEI (see Los Angeles and Kankakee in Table 4.10), which includes registered nurses, paramedics, and dental assistants, Personal Care and Service Occupations (see Kankakee and San Diego in Table 4.10), which includes transportation attendants and child care workers, and Protective Services–Mid SEI (see Los Angeles and San Diego in Table 4.10), which includes police and firefighters.

The primary types of jobs envisioned by the literature as bump-up positions are services. As immigrants concentrate, a demand is created for services to support the additional population. This research supports this expectation and outlines the specific mid-level job categories that are involved in Table 4.10: Transportation and Material Moving, Healthcare, Protective Services, and Personal Care and Services.[11] These job categories are comprised of jobs, such as bus drivers, mass transit operators, nurses, and police, which provide the services necessary to the functioning of society. Thus, this research supports the literature that predicts a bump-up in service occupations which blacks are well-positioned to fill.

However, this research also depicts Office and Administrative occupations as a key job destination for blacks involved in a bump-up effect. This idea has been suggested

[11] Community and Social Services was classified as a high SEI occupational category for this study based on the decision to use the Duncan Socioeconomic Index as the classification criteria. As a result, community service jobs such as social workers and clergy, which are overrepresented by blacks (mean odds-ratio of 1.73), are not a part of the statistical analysis of the relationship between the mid-BOC and the low-IJC. However, these jobs typically pay salaries that are more in line with other jobs that are classified in the mid-level occupational category and are arguably a part of the "bump-up" effect for blacks. If Community and Social Services occupations were included in the mid-level classification, the significance of the mid-BOC, low-IJC relationship would increase substantially in the multivariate analysis. The net effect is that the bump-up effect is understated in this research.

in the literature as arising from the need for administrative functions required to fulfill immigration requirements such as documenting the legality of workers (see Light and Rosenstein 1995, Waldinger 1996). The suggestion here is much different in that immigrant workers are envisioned as creating a demand for administrative and clerical functions related to the incremental work performed by immigrant workers employed in low-level jobs. For example, immigrants working for a firm that provides chemical lawn services perform work that needs to be scheduled, provide services that need billed and use chemicals that need to be procured. These are jobs that result directly from the work (direct labor in financial terms) performed by those occupied in low-level positions. This research, then, extends the literature by identifying administrative functions as an additional source of bump-up positions, along with the previously suggested service functions.

Mid-level occupations in which blacks are overrepresented fall into two broad categories based on how entrance to the occupation is achieved: jobs requiring civil service skills (e.g., postal workers, bus drivers, billing clerks) and jobs requiring specific vocational training (e.g., dental assistants, laboratory technicians, police). Arguably, demand for civil service skills and vocational skills increases where concentrated economic activity occurs, which can be facilitated by low-cost labor such as that provided by immigrants working in jobs represented by the low-IJC. Nationally, blacks are overrepresented in mid-level jobs in the areas of Transportation and Material Moving, Protective Services, and Office and Administrative Support (see Table 4.5), suggesting civil service skills as a primary means of upward mobility. However, focusing on areas where both the mid-level black concentration and the low-level immigrant concentration

are the highest highlights the possible role of vocational training as an additional upward path.

Of the MAs that exceed the mean size of the mid-BOC, about 59% of these also have low-level immigrant job concentrations that exceed the mean size of the low-IJC.[12] There is a distinct positive relationship between mid-level black opportunity and low-level immigrant activity in the labor force as shown in Table 4.8, Models 1 and 3. Further research is required to better understand the exact mechanisms that make this the case and to better identify explanatory variables associated with the relationship. This current research further solidifies the premise that there is a bump-up effect, that it represents an area of mutual opportunity between blacks and immigrants, and that there are likely specific kinds of training that best position blacks to take advantage of the opportunity.

In the relationship between the mid-BOC and the mid-IJC, 41.5% of the MAs with mid-level black concentrations above the mean mid-BOC have mid-level immigrant job concentrations above the mean mid-IJC (see Footnote 11). In other words, this relationship occurs in fewer MAs than the mid-BOC, low-IJC relationship. However, multivariately it is a significant, albeit weak, relationship that holds across the three models (see Table 4.8). The values for the unstandardized coefficients range from .252 for Model 1 to .277 for Model 3, indicating that the model predicts that a unit increase in the size of the mid-IJC will result in an approximate 26% increase the size of the mid-BOC when controlling for labor force participation and change in recent foreign-born.

Table 4.11 was developed to further investigate the significant relationship between the mid-BOC and the mid-IJC, depicting the top MAs in terms of combined

[12] Based on a complete listing of the 144 MAs and the respective BOCs and IJCs. The MAs with the twenty highest job concentrations and the twenty lowest job concentrations is shown in Table 4.3.

mid-IJC and mid-BOC. The occupations in which blacks are most often overrepresented are Office and Administrative Support and Transportation and Material Moving, the same occupations that surfaced in the relationship between the low-IJC and the mid-BOC. The only overrepresented mid-IJC occupation to be consistently present in large mid-BOC, mid-IJC MAs is mid-level Production Operations, such as machinists, welders, and semiconductor processors. These data suggest that the first area that recent-foreign-born immigrants demonstrate upward mobility from low-level occupations is within the production arena. These jobs entail specific skills, but are skills that may be able to be learned on-the-job without high English proficiency. For all MAs in this sample, the mean odds-ratio for immigrants, in mid-SEI Production Operations, is 1.374 compared to 0.83 for blacks (see Tables 4.5 and 4.6). Based on supplementary analysis, both Asians and Hispanics are more likely to be overrepresented in Production Operations than blacks, but the odds-ratio for Hispanics is 45% higher than that for Asians.

The profile also indicates that, in MAs with concentrations of skilled immigrant production operators, many of the expected low-level immigrant occupations are present. These include Food Preparation and Serving, Low-SEI Production, Building and Grounds Cleaning and Maintenance, Low-SEI Construction and Extraction, and Low-SEI Healthcare. The presence of both low- and mid-level production occupations suggests a manufacturing base in the MAs exhibiting larger combinations of mid-IJC and mid-BOC concentrations.

The mid-level occupations, shown in Table 4.11, in which blacks are overrepresented, consist of Office and Administrative Support, which includes billing and posting clerks, dispatchers, payroll clerks, and postal service mail carriers and

Transportation and Material Moving, which includes bus drivers, subway workers, and ambulance drivers. Also, another occupational category that provides black opportunity is Protective Services, such as police, firefighters and correctional workers.

The profile, then, for MAs with both large mid-level IJCs and BOCs, is one of immigrants overrepresented in skilled production jobs with a corresponding black overrepresentation in administration and service occupations. It is very similar to the profile for the low-IJC, mid-BOC combination addressed above as a bump-up effect, the difference being the emergence of a mid-IJC centered on production occupations. These results can be interpreted as a parallel bump-up effect, with blacks gaining in administrative and service occupations and immigrants gaining in production occupations. However, it is more likely that given the declining manufacturing phenomenon in the United States, skilled production occupations are not paying substantially higher wages than unskilled jobs and that mid-SEI production occupations may no longer be differentiated, in earnings, from low-SEI production operations. In this scenario, skilled production jobs can be viewed as an extension of the low-level classification with the mid-level administrative and service jobs occupied by blacks actually paying more and the net effect being additional evidence of a bump-up. Additional research that collects income data is required to better elucidate this point.

In the relationship between the mid-BOC and the high-IJC, 31.7% of the MAs with mid-level black concentrations above the mean mid-BOC have mid-level immigrant job concentrations above the mean high-IJC (see footnote 11). Therefore, this relationship occurs less frequently in the sample MAs than the mid-BOC, low-IJC or mid-BOC, mid-IJC relationships. In the multivariate results, however, it is a significant,

moderate relationship that holds positively across the three OLS regression models (see Table 4.8). The highest unstandardized coefficient, at 0.252, is in Model 1, with Model 2 and 3 at 0.204 and 0.248, respectively. Model 1 predicts that a one point increase in the size of the high-IJC will result in a 25.2% increase in the size of the mid-BOC when controlling for a variety of metropolitan characteristics.

Table 4.12 helps to interpret the significant relationship between the mid-BOC and the high-IJC by expanding the top MAs in terms of the combined size of the high-IJC and mid-BOC. The "typical MA profile" for this situation consists of immigrant overrepresentation in the following occupational categories: Education, Training, and Library; Computer and Mathematical Science; Life, Physical, and Social Science; and Healthcare – High SEI occupations. Each of these overrepresented job categories are in the high SEI classification. These occupational concentrations are indicative of MAs with a strong university presence. The most frequent occurrence of mid-level black overrepresentation is in Transportation and Material Handling – Mid (e.g., bus drivers and subway operators) and Sales – Mid SEI (e.g., retail salespersons, cashiers, and telemarketers). University systems certainly add to the need for services, perhaps partially explaining the elevated number of blacks in mid-level occupations. Further, students produce a transient population that necessitates public services, but they are not always counted in the area where those services are consumed, perhaps skewing the data. For example, the highest ranked MAs in this situation are disproportionately in the Midwest and West, suggesting declining manufacturing, and a source of low and mid-skill workers, overrepresented by blacks, to fill the demand for mid-SEI positions. The presence of declining manufacturing in this scenario is supported by low-SEI production

occupations in the typical profile. Thus, the profile takes shape as MAs with traditional university centers combined with recent declining manufacturing or low-cost manufacturing (e.g., electronics assembly). These MAs exhibit larger mid-level black concentrations; however this is not likely the result of a bump-up effect, where low-level immigrant jobs create black opportunities, or a "pull-up" effect, where high-level immigrant jobs create black opportunities. More likely, these MAs are indicative of cities where blacks have lost manufacturing sector jobs, but aided by a university presence have transitioned to similar SEI occupations in the service sector. Longitudinal research that explores the temporal aspects of the mid-BOC is recommended to better understand mid-SEI black concentrations within the context of declining manufacturing.

Summarizing the mid-BOC analysis, black attainment of mid-level occupations is the most evident in areas which have high overrepresentations of immigrants in low, mid, and high-SEI jobs. Whether there is a pull-up effect in which the presence of immigrants in the high-IJC directly creates a demand for mid-SEI black workers is debatable. However, the relationship can be expected to hold true in the population that blacks experience more mid-range mobility in areas with higher concentrations of immigrants. The jobs that blacks successfully fill in each of the three scenarios discussed above are those that are obtained with civil service and vocational skills. These skills seem to be the keys to advancing from low-SEI jobs to mid-level occupations, or to maintaining occupations within mid-SEI job categories.

***Low BOC analysis***. Table 4.13 indicates that, contrary to hypothesis II, there is a negative, moderate, and significant relationship ($B = -.254$, $\beta = -.312$, $p = .005$) between the low-IJC and the low-BOC. Model 1 predicts that a one point increase in the size of

the low-IJC will result in a 25.4% decrease in the size of the low-BOC when controlling for labor force variables. This relationship holds across the three models as additional disadvantage and global city variables are added.

These data suggest that immigrants and blacks in low socioeconomic positions do, in fact, compete for available jobs. In economic terms, immigrants and blacks are substitutes, as opposed to complements, when considering only low-SEI occupations. Hypothesis 2 stated that low-IJCs and low-BOCs will not be significantly related, an assertion based on a substantial literature deducing that immigrants do not have a negative effect on native-born black employment outcomes. However, while the strength of the negative relation in the current results declines somewhat with the introduction of disadvantage and global city variables, it remains significant and substantial across the three models. This finding is a major contradiction to parts of the literature.

In contrast, Table 4.13 indicates a strong, significant, and positive relationship (B = .631, $\beta$ = .250, p = .003) between the mid-IJC and the low-BOC. For example, Model 1 predicts that a one point increase in the size of the mid-IJC will result in a 63.1% increase in the size of the low-BOC. The effect is lower, but still strong in Models 2 and 3, where the unstandardized coefficients are .475 and .462 respectively. Clearly areas with larger mid-IJCs have larger low-BOCs and this result raises the question of whether immigrants are bypassing native-born blacks in terms of SEI. However, this significant relationship alone does not lead to this conclusion. Areas of high economic activity may lead to jobs for blacks in low-level jobs as well as mid-level jobs and immigrants in mid- and low-level jobs as well. The relationship between the mid-IJC and the low-BOC, in particular is explored further, below, in order to better assess these data.

The percent change in recent-foreign-born population is also significant in Model 1 and Model 3. For Model 1, a one standard deviation increase in recent foreign-born population is predicted to result in a 0.33 standard deviation increase in low-BOC. Thus, increasing populations of recent-foreign-born increase the size of the low black job concentration, but the positive effect is muted by competition for similar low-skill jobs, which results in a 0.312 standard deviation decrease in the low-BOC. In other words, there are opposing effects that highlight the difficulty of measuring the impact of immigrants on native-born black employment outcomes.

When disadvantage variables are added in Model 2 of Table 4.13, black educational levels, median age, and cost of living are significant. First, there is a strong, positive, and significant relationship between the low-BOC and the percentage of blacks who do not have a high school education. Higher levels of blacks with low educational levels results in larger low-level black job concentrations. The moderate relationship between the low-IJC and the low-BOC does not change as the result of adding disadvantage variables, including black educational level. This suggests that education plays a lesser role in the competition for low-skilled jobs. Educational levels, then, have been shown to be a factor in relationship between the low-IJC and the mid-BOC, but not the low-IJC and the low-BOC; a result that stresses the importance of at least a high school education in blacks being positioned for upward mobility into the mid-level occupations. In other words, the presence of immigrant job concentrations may result in higher numbers of mid-level opportunities for blacks, but these opportunities cannot be taken advantage of without sufficient education.

In Table 4.13, Model 2 also depicts moderate, negative, and significant relations between the low-BOC and median age and cost of living. MAs with higher median ages tend to have smaller low-level black occupational concentrations, indicating that areas with older populations have fewer blacks overrepresented in low-level jobs. This suggests that, as workers age, they move out of low-level occupations, either to occupational categories that are not overrepresented, to higher-level job categories, or by no longer participating in the labor market. Similarly, MAs with higher cost of living also have smaller low-BOCs. How the job concentrations are affected by disadvantage factors is an area for further study, however, these results show that indicators of MA disadvantage, higher black educational levels, higher cost of living, and higher median age, along with larger low-IJCs, are significant in predicting the magnitude of the low-BOC. Model 3 indicates that global city variables are not particularly useful in predicting or explaining the number of blacks who work in low-level occupations that have black overrepresentations.

The disadvantage index, at the center of hypothesis 3 is not supported. Hypothesis 3 stated that immigrants, and indirectly blacks, would be expected to avoid areas of disadvantage. This line of reasoning holds true with the negative relationship between the low-BOC and the cost of living variable, however, a similar relationship with the mid-BOC or high-BOC did not prove to be significant. Thus, hypothesis 3 is inconclusive and needs to be investigated further to better understand the relationship between metropolitan area disadvantage and occupational concentrations.

Because global cities typically have a higher cost of living, the above negative relationship between the low-BOC and Sperling and Sander's cost of living index raises

an interesting question about the role of blacks and immigrants in global cities, an area that could be the subject of further research. However, none of the four global city measures are significant in the low-BOC multivariate analysis. Therefore, hypothesis 4, which anticipated a positive relationship between global city variables and black occupational concentrations, based on an expected relationship between higher immigrant concentrations in global cities and complementary black concentrations, is not demonstrated. On the other hand, it is not explicitly rejected, suggesting that the hypothesis needs to be reoperationalized in future research.

To further explore the significant relationship between the low-BOC and the low and mid-IJC, MAs were ranked by the size of their combined job concentrations (e.g., the sum of the low-IJC and the low-BOC, a number that indicates the relative magnitude of the combined job concentrations). For example, Greensboro ranks the highest as having a large low-IJC and a large low-BOC with a combined job concentration of .878, indicating that 87.8% of blacks and immigrant workers in the city are in overrepresented in these two low-level occupational categories. The MAs of primary interest (the top 20 combined job concentrations) in investigating the relationships between the IJC and the low-BOC are listed in Table 4.14. These lists depict the MAs that most exemplify each of the two relationships with the IJC that Table 4.13 highlights as significant. The top MAs for each situation are then analyzed in terms of the occupational categories that comprise the respective job concentrations as depicted in Table 4.15 and Table 4.16. In other words, Table 4.13 depicts which relationships are of interest; Table 4.14 lists which areas exhibit the relationships of interest, and Tables 4.15 and 4.16 provide additional information for analyzing the relationships of interest.

Tables 4.15 and 4.16 also present a "typical MA profile" for MAs having the combined attributes of interest. For Table 4.15, the top 20 MAs exhibiting both larger low-BOCs and low-IJCs were considered in terms of the specific occupational categories that are overrepresented by either blacks or immigrants. These occupational categories were then tallied and are included in the "typical MA profile" if the category was overrepresented in more than half of the highest ranked MAs for that attribute combination. These profiles give a concise picture of the job categories that most frequently contribute to the significant relationships between job concentrations in the low-BOC multivariate analysis.

Table 4.15 shows a "typical MA profile" in which three of the five most overrepresented occupational categories are the same in each MA for both blacks and immigrants. Production Occupations – Low SEI, Building and Grounds Cleaning and Maintenance, and Transportation and Material Moving – Low SEI contain jobs that are potentially contested by blacks and immigrants. Interestingly, it varies from MA to MA as to whether the black or the immigrant concentration is higher (e.g., see Production Occupations for Greensboro (.243 immigrant versus .144 black), Greenville (.146 immigrant versus .209 black), Kankakee (.208 immigrant versus .117 black), Wilmington (.049 immigrant versus .095 black), and Racine (.137 immigrant versus .167 black). Other occupational categories seem to be based less on competition and more on other structural factors such as English language proficiency or recruiting networks. For example, on average, Construction and Extraction – Low SEI is dominated by immigrants and Healthcare – Low SEI is dominated by blacks. In any case, these results indicate considerable competition for low-skill jobs among blacks and immigrants,

although, as noted above, this effect is somewhat mitigated in areas where the foreign-born population is growing the fastest.

Table 4.16 outlines the "typical MA profile" for MAs that have the largest combined low-BOC and mid-IJC, as shown in Table 4.14. This profile is comprised of mid-SEI Production Occupations as the single mid-SEI job category in which immigrants are consistently overrepresented. In MAs that have the largest combined mid-IJC and low-BOC, production occupations seem to be a large enough job category to comprise large mid-level concentrations of immigrants. Therefore, a substantial manufacturing base is evident in these MAs. These are largely "sunbelt" cities and midwestern MAs with declining manufacturing where immigrants are attaining skilled production jobs that are traditionally considered to be mid-level in terms of SEI. In MAs with a low-BOC, mid-IJC scenario, immigrants appear to have captured skilled production jobs while blacks remain in unskilled production positions, suggesting an effect where immigrants "leapfrog" over blacks in the labor market. Thus, competition continues to be a major theme in the analysis of the low-BOC. Whether immigrants are able to achieve mid-SEI jobs due to hiring preferences over blacks, more effective networks, skill differences or other factors is not provided by this analysis. However, it is clear that production related jobs is the primary occupational category where immigrants are currently surpassing blacks, and thus indicates the area of focus for researching the leapfrog effect.

On the other hand, there is also black/immigrant occupational differentiation where competition is much lower, such as that evidenced by black overrepresentation in Healthcare – low SEI and immigrant overrepresentation in Construction and Extraction – low SEI. Thus, low-BOC situations have been shown where there are occupations in

which blacks and immigrants compete, with blacks being more overrepresented in some areas and immigrants in other areas, occupations in certain MAs where immigrants appear to be moving ahead of blacks, and others where blacks or immigrants seem to dominate with little competition. However, two competitive situations dominate: that where blacks and immigrants compete for low-level jobs, and that where blacks and immigrants compete with an apparent outcome in which immigrants have obtained higher SEI occupations.

In sum, the low-BOC analysis is marked by competition while the mid-BOC analysis is characterized by complements, particularly the bump-up effect. Although there is some overlap between the MAs that are in the top twenty MAs with a mid-BOC combination, as shown in Table 4.9, and the top twenty MAs with a low-BOC combination, as shown in Table 4.14, the majority of MAs are unique to one table or the other. This suggests the possibility of different MA characteristics, those that are complementary and those that are competitive. These differences are not explicitly captured in this analysis by disadvantage and global city variables, but research into other characteristics, or a refinement of these characteristics, may shed light on the underlying structure that acts to determine black and immigrant outcomes in the labor market.

***High-BOC analysis***. Table 4.17 presents the nested OLS regression analysis where the dependent variable is the high-level BOC. Although these models are not the focus of this research, they are included to provide insight into each of the possible combinations between black and immigrant concentrations. Of note is the fact that the high-BOC is the smallest occupational classification among the six classifications being investigated, and is approximately half the size of the high-IJC (see Table 4.1). None of

the IJCs have a significant relationship with the high-BOC and, as suggested by the adjusted $R^2$ of 0.045, Model 1 is of little predictive value. Model 1 does suggest that the factors that contribute to the highest levels of black upward mobility are different than the factors that drive immigrant concentrations. The attainment of high-BOC jobs does not seem to relate to immigrant job concentrations and the factors that produce immigrant concentrations.

Model 2 shows that percent black in-migration has a relatively strong, positive, and significant relationship with the high-BOC, indicating that blacks migrate to areas that provide opportunity. Further, based on Model 3, blacks in the highest status occupations are found in MAs with higher cost of living, likely because high-level jobs are more plentiful in high cost of living MAs. A third significant result is a somewhat surprising negative relationship with the percentage of the labor force employed in professional service occupations, a variable used as a global city indicator. It appears that black success occurs more in MAs that do not have this global city characteristic, yet are higher cost of living areas.

The MAs that have the largest high-BOCs are listed in Table 4.3. These MAs are generally not areas with large black populations. Table 4.3 also shows that there is not a lot of overlap between MAs that provide black opportunity at the mid-level and at the high-level. In fact, Atlanta, which ranks high in mid-BOC, has no occupations overrepresented by blacks in the high classification. There is no MA that can be pointed to as having both top mid-level black opportunity and top high-level black opportunity. This suggests that black upward mobility does not generally occur within the same area; the concentrations are more distributed and perhaps disconnected. Research more

specifically oriented to understanding black upward mobility, within an MA context, is required to better investigate this dynamic.

**Table 4.1. DESCRIPTIVE STATISTICS FOR 144 U.S. METROPOLITAN AREAS, 2000**

| **Dependent Variables** | **Mean** | **Std. Dev.** |
|---|---|---|
| Low Black Occupation Concentration | 0.227 | 0.105 |
| Mid Black Occupation Concentration | 0.059 | 0.075 |
| High Black Occupation Concentration | 0.027 | 0.028 |
| **Independent Variables** | | |
| Low Immigrant Job Concentration | 0.267 | 0.129 |
| Mid Immigrant Job Concentration | 0.028 | 0.041 |
| High Immigrant Job Concentration | 0.058 | 0.076 |
| % Change in Foreign Born, 1990-2000 | 127.4 | 102.5 |
| Asian Labor Force | 29767 | 69268 |
| Black Labor Force | 81549 | 137093 |
| Hispanic Labor Force | 81551 | 187797 |
| % Black w/o High School Education (>25 years old) | 24.520 | 6.492 |
| Cost of Living, Sperling and Sander (1Q2003) | 102.676 | 22.809 |
| Disadvantage Index | 29.717 | 6.233 |
| % Black In-migrants | 14.358 | 8.534 |
| % Labor Force in Low Skilled Service Occupations | 13.165 | 3.139 |
| % Labor Force in Professional Service Occupations | 13.393 | 5.356 |
| % Change in Low-Skilled Service Occs. (1990-2000) | 0.000 | 1.000 |
| % Change in White Labor Force (1990-2000) | 5.4984 | 15.347 |

**Table 4.2. OCCUPATIONAL CATEGORIES BY RACE/ETHNICITY**

**Asian Occupational Category Representation**

| Top Five Occupational Categories | Classification | Bottom Five Occupational Categories | Classification |
|---|---|---|---|
| Computer and Mathematical Science Occupations | High | Construction and Extraction – Low SEI | Low |
| Life, Physical, and Social Science Occupations | High | Construction and Extraction – Mid SEI | Mid |
| Personal Care and Service Workers - Low SEI | Low | Transportation and Material Moving – Mid | Mid |
| Production Occupations - Low SEI | Low | Legal-High SEI | High |
| Architecture and Engineering Occupations | High | Protective Service – Mid SEI | Mid |

**Hispanic Occupational Category Representation**

| Top Five Occupational Categories | Classification | Bottom Five Occupational Categories | Classification |
|---|---|---|---|
| Building and Grounds Cleaning and Maintenance | Low | Business and Financial Operations Occs | High |
| Construction and Extraction – Low SEI | Low | Healthcare - High SEI | High |
| Production Operations – Low SEI | Low | Computer and Mathematical Science Occs | High |
| Food Preparation and Serving Related Occupations | Low | Protective Service - Mid SEI | Mid |
| Transportation and Material Moving - Low SEI | Low | Legal-High SEI | High |

**Asian/Hispanic Occupational Category Representation**

| Top Five Occupational Categories | Classification | Bottom Five Occupational Categories | Classification |
|---|---|---|---|
| Building and Grounds Cleaning and Maintenance | Low | Transportation & Material Moving – Mid SEI | Mid |
| Production Occupations – Low SEI | Low | Transportation & Material Moving – High SEI | High |
| Construction and Extraction – Low SEI | Low | Legal-Mid SEI | Mid |
| Food Preparation and Serving Related Occupations | Low | Protective Service - Mid SEI | Mid |
| Transportation and Material Moving - Low SEI | Low | Legal-High SEI | High |

**Black Occupational Category Representation**

| Top Five Occupational Categories | Classification | Bottom Five Occupational Categories | Classification |
|---|---|---|---|
| Healthcare - Low SEI | Low | Legal-High SEI | High |
| Transportation and Material Moving – Mid SEI | Mid | Architecture and Engineering Occupations | High |
| Protective Service - Low SEI | Low | Arts, etc. - High SEI | High |
| Community and Social Services Occupations | Low | Healthcare - High SEI | High |
| Building and Grounds Cleaning and Maintenance | Low | Management occupations | High |

**Table 4.3. METROPOLITAN AREAS WITH THE HIGHEST AND LOWEST BOCS**

| High BOC | | Mid BOC | | Low BOC | |
|---|---|---|---|---|---|
| **Highest Concentrations:** | | **Highest Concentrations:** | | **Highest Concentrations:** | |
| Boise | 0.185 | Duluth | 0.416 | Sioux City | 0.499 |
| Duluth | 0.166 | Los Angeles | 0.329 | Greenville SC | 0.489 |
| Sioux City | 0.136 | San Diego | 0.301 | Rochester MN | 0.480 |
| Rochester MN | 0.120 | Oakland | 0.300 | Shreveport | 0.426 |
| Corpus Christi | 0.102 | Bloomington IN | 0.285 | Mobile | 0.403 |
| Ventura | 0.085 | Denver | 0.270 | Worcester | 0.399 |
| Bloomington IN | 0.072 | San Francisco | 0.265 | Racine | 0.397 |
| Binghamton | 0.061 | Dallas | 0.261 | Little Rock | 0.377 |
| El Paso | 0.058 | Washington DC | 0.259 | Charlotte | 0.374 |
| Bremerton | 0.056 | Atlanta | 0.225 | Savannah | 0.372 |
| Springfield MA | 0.055 | Spokane | 0.181 | Scranton | 0.371 |
| Worcester | 0.055 | Binghamton | 0.170 | Lubbock | 0.368 |
| Fresno | 0.050 | Corpus Christi | 0.153 | Macon | 0.367 |
| Dutchess Co. | 0.049 | Albuquerque | 0.152 | Biloxi | 0.365 |
| New Haven | 0.048 | Sioux City | 0.136 | Champaign | 0.361 |
| Albany | 0.045 | Lafayette IN | 0.136 | Montgomery | 0.356 |
| Boston | 0.042 | Kankakee | 0.129 | New Orleans | 0.351 |
| New York | 0.040 | El Paso | 0.126 | Memphis | 0.351 |
| Bloomington-Nor IL | 0.040 | Champaign | 0.122 | Rochester NY | 0.348 |
| Albuquerque | 0.039 | Bloomington-Nor IL | 0.116 | Columbia SC | 0.347 |
| **Lowest Concentrations:** | | **Lowest Concentrations:** | | **Lowest Concentrations:** | |
| Allentown | 0.000 | Colorado Springs | 0.000 | El Paso | 0.027 |
| Asheville | 0.000 | Dayton | 0.000 | Orange County | 0.035 |
| Atlanta | 0.000 | Greenville SC | 0.000 | Las Vegas | 0.040 |
| Baton Rouge | 0.000 | Huntsville | 0.000 | Vallejo | 0.046 |
| Birmingham | 0.000 | Mobile | 0.000 | Sacramento | 0.050 |
| Charleston SC | 0.000 | Monmouth-Ocean | 0.000 | San Antonio | 0.052 |
| Chattanooga | 0.000 | Worcester | 0.000 | Stockton | 0.065 |
| Cincinnati | 0.000 | Asheville | 0.004 | Springfield MA | 0.070 |
| Colorado Spr | 0.000 | Birmingham | 0.004 | Los Angeles | 0.081 |
| Eugene | 0.000 | Harrisburg | 0.004 | Riverside-SB | 0.082 |
| Flint | 0.000 | Knoxville | 0.004 | Jersey City | 0.084 |
| Florence AL | 0.000 | Memphis | 0.004 | Bergen-Passaic | 0.089 |
| Fort Worth | 0.000 | Charleston SC | 0.005 | Bakersfield | 0.090 |
| Greensboro | 0.000 | Lakeland | 0.005 | Atlantic City | 0.092 |
| Greenville SC | 0.000 | Macon | 0.005 | Washington DC | 0.099 |
| Harrisburg | 0.000 | Nashville | 0.005 | Tucson | 0.100 |
| Jackson MS | 0.000 | Phoenix | 0.005 | Fresno | 0.102 |
| Knoxville | 0.000 | Richmond | 0.005 | San Diego | 0.107 |
| Lafayette IN | 0.000 | Salt Lake City | 0.005 | New York | 0.112 |
| 13 others tied with | 0.000 | Chattanooga | 0.006 | San Jose | 0.112 |

**Table 4.4. METROPOLITAN AREAS WITH THE HIGHEST AND LOWEST IJCS**

| High IJC | | Mid IJC | | Low IJC | |
|---|---|---|---|---|---|
| **Highest Concentrations:** | | **Highest Concentrations:** | | **Highest Concentrations:** | |
| Wilmington, DE | 0.384 | Sioux City | 0.321 | Kankakee | 0.575 |
| Richmond | 0.377 | Florence AL | 0.138 | Greensboro | 0.555 |
| Bloomington-Normal | 0.293 | Omaha | 0.138 | Phoenix | 0.511 |
| Boston | 0.291 | Racine | 0.118 | Wilmington NC | 0.506 |
| Youngstown | 0.250 | Beaumont | 0.109 | Dallas | 0.495 |
| Macon | 0.229 | Atlantic City | 0.109 | Reno | 0.488 |
| Boise | 0.219 | Davenport | 0.107 | Fresno | 0.488 |
| Phoenix | 0.217 | Topeka | 0.105 | Fort Worth | 0.480 |
| Seattle | 0.195 | Boise | 0.102 | Stockton | 0.479 |
| Springfield, MA | 0.193 | Biloxi | 0.097 | Kenosha | 0.476 |
| Lakeland | 0.180 | South Bend | 0.090 | Las Vegas | 0.469 |
| Asheville | 0.180 | Oklahoma City | 0.080 | Bakersfield | 0.466 |
| Orange County | 0.177 | Kenosha | 0.080 | Orange County | 0.461 |
| Reno | 0.173 | Memphis | 0.076 | Ventura | 0.455 |
| Charlotte | 0.150 | Dallas | 0.075 | Austin | 0.451 |
| Norfolk | 0.139 | San Antonio | 0.075 | Wichita | 0.447 |
| Riverside | 0.138 | Corpus Christi | 0.074 | Tulsa | 0.444 |
| Muncie | 0.128 | Raleigh-Durham | 0.073 | Oklahoma City | 0.439 |
| Sacramento | 0.125 | Albuquerque | 0.073 | Racine | 0.431 |
| Gary | 0.124 | Kankakee | 0.069 | El Paso | 0.426 |
| **Lowest Concentrations:** | | **Lowest Concentrations:** | | **Lowest Concentrations:** | |
| Albuquerque | 0.000 | Akron | 0.000 | Albany | 0.000 |
| Asheville | 0.000 | Asheville | 0.000 | Knoxville | 0.000 |
| Atlanta | 0.000 | Bakersfield | 0.000 | Detroit | 0.029 |
| Atlantic City | 0.000 | Baltimore | 0.000 | Flint | 0.043 |
| Austin | 0.000 | Baton Rouge | 0.000 | Champaign | 0.044 |
| Bakersfield | 0.000 | Bergen-Passaic | 0.000 | Akron | 0.055 |
| Bergen-Passaic | 0.000 | Boston | 0.000 | Pittsburgh | 0.063 |
| Boise | 0.000 | Buffalo | 0.000 | Bloomington IN | 0.071 |
| Bremerton | 0.000 | Chattanooga | 0.000 | Baton Rouge | 0.074 |
| Bridgeport | 0.000 | Cincinnati | 0.000 | Bloomington-Nor IL | 0.083 |
| Charlotte | 0.000 | Cleveland | 0.000 | Toledo | 0.086 |
| Chicago | 0.000 | Colorado Springs | 0.000 | Buffalo | 0.086 |
| Colorado Spr | 0.000 | Dayton | 0.000 | Mobile | 0.090 |
| Dallas | 0.000 | Detroit | 0.000 | Fort Lauderdale | 0.097 |
| Denver | 0.000 | Duluth | 0.000 | Cincinnati | 0.099 |
| El Paso | 0.000 | Dutchess Co. | 0.000 | Florence AL | 0.103 |
| Fort Worth | 0.000 | El Paso | 0.000 | Cleveland | 0.103 |
| Fresno | 0.000 | Fort Lauderdale | 0.000 | Syracuse | 0.105 |
| Greensboro | 0.000 | Fort Wayne | 0.000 | Binghamton | 0.108 |
| 31 others tied with | 0.000 | 39 others tied with | 0.000 | Rochester NY | 0.120 |

## Table 4.5. MEAN BLACK ODDS RATIOS BY 31 OCCUPATIONAL CATEGORIES

| Occupation Category | Mean Odds Ratio* | Metropolitan Areas with Highest Odds Ratios** | # MAs w/ OR>1 |
|---|---|---|---|
| Healthcare - Low | 4.94 | Savannah (11.38), Monmouth (10.85), Bergen-Passaic (9.77) | 142 |
| Transportation and Material Moving - Mid | 3.20 | Savannah (25.60), Charlotte (10.45), Miami (8.89) | 124 |
| Protective Service - Low | 2.21 | South Bend (7.20), San Francisco (4.75), Chicago (4.10) | 126 |
| Building and Grounds Cleaning and Maintenance (Low) | 1.90 | Shreveport (4.11), Jackson (3.92), Baton Rouge (3.50) | 131 |
| Community and Social Service - High | 1.73 | Ventura (3.63), Wilmington, DE (3.39), Bergen-Passaic (2.88) | 132 |
| Production Operations - Low | 1.58 | Memphis (2.60), Raleigh (2.56), Charleston (2.49) | 135 |
| Transportation and Material Moving - Low | 1.58 | Jackson (3.47), Wilmington, NC (3.28), Tallahassee (2.99) | 110 |
| Personal Care and Service - Low | 1.50 | Ocala (3.34), Buffalo (2.67), Fresno (2.54) | 128 |
| Protective Services - Mid | 1.29 | Stockton (2.57), San Francisco (2.52), Youngstown (2.43) | 110 |
| Food Preparation and Serving (Low) | 1.24 | Lubbock (2.68), Jackson (2.55), Shreveport (2.33) | 104 |
| Personal Care and Service - Low | 1.23 | Lubbock (2.91), Bridgeport (2.34), Fresno (2.16) | 104 |
| Office and Administrative Support (Mid) | 1.12 | DC (1.63), Oakland (1.58), Dallas (1.57) | 101 |
| Sales - Mid | 1.04 | Binghamton (1.89), Champaign (1.89), Bloomington (1.72) | 69 |
| Healthcare - Mid | 0.97 | El Paso (2.51), NYC (1.77), Trenton (1.75) | 60 |
| Arts, etc. - Mid | 0.85 | San Diego (1.31), Pittsburgh (1.28), Detroit (1.02) | 34 |
| Transportation and Material Handling - High | 0.83 | Des Moines (1.55), San Jose (1.42), Wilmington, NC (1.34) | 34 |
| Production Operations - Mid | 0.83 | NYC (1.95), Oakland (1.61), Vallejo (1.49) | 42 |
| Education, Training and Library (High) | 0.79 | El Paso (1.33), Ocala (1.29), Jersey City (1.22) | 18 |
| Business and Financial Operations (High) | 0.78 | Bloomington-Normal (1.44), Harrisburg (1.35), Fresno (1.32) | 21 |
| Installation, Maintenance, and Repair Occupations (Mid) | 0.68 | Baton Rouge (1.45), Salt Lake City (1.35), Charleston (1.26) | 20 |
| Legal - Mid | 0.67 | San Jose (1.33), NYC (1.11), Ft Walton (1.09) | 14 |
| Construction and Extraction - Low | 0.67 | Orange Co. (2.05), Seattle (1.78), San Francisco (1.49) | 30 |
| Computer and Mathematical Science (High) | 0.56 | Ventura (1.60), Vallejo (1.06), Tacoma (1.05) | 13 |
| Construction and Extraction - Mid | 0.53 | San Jose (1.00), Ft Lauderdale (0.99), San Francisco (0.99) | 5 |
| Arts, etc. - High | 0.50 | Huntsville (1.03), Buffalo (0.99), Hartford (0.75) | 11 |
| Sales - High | 0.48 | Albuquerque (1.11), Colorado Springs (0.88), Jersey City (0.81) | 5 |
| Life, Physical , and Social Science (High) | 0.47 | Akron (1.15), Beaumont (0.89), Phoenix (0.84) | 11 |
| Architecture and Engineering (High) | 0.45 | Ventura (0.98), Providence (0.96), Orange Co. (0.94) | 5 |
| Management (High) | 0.42 | Orange Co. (1.01), Jersey City (0.97), San Antonio (0.68) | 6 |
| Healthcare - High | 0.42 | Orange Co. (0.87), San Antonio (0.84), Jersey City (0.80) | 1 |
| Legal - High | 0.31 | Oakland (0.69), Minneapolis (0.64), LA (0.61) | 5 |

* Mean for 144 Metropolitan Areas

** Metropolitan Areas with at least ten black workers in the PUMS occupation category

**Table 4.6. MEAN IMMIGRANT ODDS RATIOS BY 31 OCCUPATIONAL CATEGORIES**

| Occupational Category | Mean Odds Ratio* | Metropolitan Areas with Highest Odds Ratios** | # MAs w/ OR>1 |
|---|---|---|---|
| Production Operations - Low | 2.843 | Nassau (6.25), Orange Co. (5.74), New Haven (5.42) | 137 |
| Building and Grounds Cleaning and Maintenance (Low) | 2.540 | Phoenix (5.94), Reno (5.36), DC (5.31) | 126 |
| Computer and Mathematical Science (High) | 2.396 | Austin (7.98), Dallas (7.29), Atlanta (7.19) | 107 |
| Construction and Extraction - Low | 2.124 | Pittsburgh (7.55), Chattanooga (7.10), Akron (6.16) | 98 |
| Life, Physical , and Social Science (High) | 2.098 | Pittsburgh (10.80), Buffalo (8.91), Cleveland (8.07) | 84 |
| Food Preparation and Serving (Low) | 2.057 | Tulsa (3.64), Reno (3.59), San Francisco (3.38) | 133 |
| Healthcare - High | 1.837 | Pittsburgh (6.21), Syracuse (4.77), Buffalo (4.37) | 72 |
| Production Operations - Mid | 1.374 | Sioux City (7.45), Omaha (6.55), Des Moines (3.80) | 105 |
| Personal Care and Service - Low | 1.369 | Ocala (6.34), Cincinnati (3.93), Colorado Springs (3.20) | 82 |
| Transportation and Material Moving - Low | 1.273 | Kenosha (2.91), Fresno (2.52), Milwaukee (2.45) | 116 |
| Architecture and Engineering (High) | 1.033 | Akron (3.17), Detroit (2.91), Dayton (2.80) | 55 |
| Construction and Extraction - Mid | 0.842 | Columbia (2.84), Raleigh (2.78), Memphis (2.22) | 45 |
| Healthcare - Low | 0.792 | San Francisco (3.46), Ventura (2.87), Vallejo (2.70) | 41 |
| Education, Training and Library (High) | 0.756 | Lafayette (3.36), Champaign (3.20), Akron (3.05) | 27 |
| Arts, etc. - Mid | 0.749 | Tampa (0.94), Philadelphia (0.84), Boston (0.81) | 35 |
| Personal Care and Service - Low | 0.729 | Atlantic City (1.74), Ft Walton (1.50), Biloxi (1.43) | 27 |
| Sales - Mid | 0.726 | Bridgeport (2.46), Monmouth (1.57), DC (1.51) | 34 |
| Installation, Maintenance, and Repair Occupations (Mid) | 0.697 | Miami (1.51), New Orleans (1.26), Albuquerque (1.22) | 27 |
| Business and Financial Operations (High) | 0.637 | Bloomington (2.93), Akron (2.02), Cincinnati (1.86) | 18 |
| Healthcare - Mid | 0.538 | Jacksonville (1.33), Bergen-Passaic (1.28), Norfolk (1.21) | 12 |
| Sales - High | 0.515 | Balt. (0.94), Ft Lauderdale (0.92), Bergen-Passaic (0.89) | 16 |
| Office and Administrative Support (Mid) | 0.512 | Spokane (1.01, San Francisco (0.99), Bremerton (0.95) | 16 |
| Arts, etc. - High | 0.455 | St Louis (1.42), Monmouth (0.93), Kansas City (0.84) | 13 |
| Community and Social Service - High | 0.428 | St Louis (1.37), Jacksonville, FL (1.27), Tacoma (0.82) | 8 |
| Transportation and Material Handling - High | 0.421 | El Paso (1.17), Bergen-Passaic (0.81), Miami (0.72) | 17 |
| Management (High) | 0.406 | Cincinnati (1.04), Louisville (0.73), Ft Lauderdale (0.66) | 4 |
| Protective Service - Low | 0.375 | Hartford (1.49), San Francisco (1.09), Seattle (1.05) | 9 |
| Legal - Mid | 0.338 | DC (0.45), Boston (0.42), NYC (1.040) | 9 |
| Transportation and Material Moving - Mid | 0.247 | Jersey City (1.12), Bergen-Passaic (1.06), Orlando (0.97) | 7 |
| Protective Services - Mid | 0.162 | Tampa (0.43), Ft Lauderdale (0.32), San Francisco (0.23) | 2 |
| Legal - High | 0.091 | Boston (0.21), DC (0.15), San Diego (0.15) | 2 |

* Mean for 144 Metropolitan Areas

** Metropolitan Areas with at least ten immigrant workers in the occupation category

## Table 4.7. BIVARIATE CORRELATIONS

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) | (15) | (16) | (17) | (18) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) bjchigh | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (2) bjcmid | .355** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (3) bjclow | -.103 | -.289** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (4) ijchigh | -.017 | . 016 | .270** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (5) ijcmid | .212* | .097 | .224 | -.084* | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (6) ijclow | .033 | .109 | -.268** | -.663** | .230** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (7) lfasian | .021 | .416** | -.369** | -.205* | -.052 | .147 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (8) lfblack | -.119 | .186 * | -.162 | -.156 | -.081 | -.025 | .634** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (9) lfhisp | .026 | .388** | -.379** | -.275** | .039 | .255** | .851** | .570** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (10) cgrefb00 | -.126 | -.216** | .321** | -.153 | .194* | .313** | -.243** | -.036 | -.234** | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (11) bloeduc0 | -.141 | -.242** | .500** | .101 | .010 | -.231** | .167* | .075 | -.119 | .096 | --- | --- | --- | --- | --- | --- | --- | --- |
| (12) colsperl | .114 | .270** | -.462** | -.269** | -.167* | .146 | .607** | .217** | .371** | -.330** | -.260** | --- | --- | --- | --- | --- | --- | --- |
| (13) disad00 | -.119 | .027 | -.028 | .043 | -.003 | -.014 | .094 | .198* | .276** | -.304** | .300** | -.220** | --- | --- | --- | --- | --- | --- |
| (14) medage | -.042 | -.165* | .081 | -.121 | -.085 | -.229** | -.119 | -.079 | -.207* | .071 | .346** | .067 | -.273** | --- | --- | --- | --- | --- |
| (15) perrbi | .435** | .336** | -.127 | .142 | .017 | .077 | .167* | -.375** | -.137 | -.155 | -.497** | .022 | -.250** | -.247** | --- | --- | --- | --- |
| (16) lowsrv00 | -.053 | .015 | -.087 | -.089 | .084 | .113 | -.035 | -.065 | .029 | .028 | -.015 | -.125 | .137 | .047 | .119 | --- | --- | --- |
| (17) profser0 | -.114 | .213* | -.414** | -.316** | -.187* | .084 | .527** | .438** | .380** | -.159 | -.289** | .652** | -.207* | -.015 | -.198* | -.096 | --- | --- |
| (18) pwlfdiff | .121 | -.138 | .119 | -.066 | .140 | .124 | -.278* | -.187* | .267** | .401** | -.109 | -.265** | -.315** | -.065 | .188* | .204 | -.090 | --- |
| (19) srvchang | -.021 | .034 | .208* | .280** | .115 | -.330** | -.181* | -.101 | -.188* | -.105 | .037 | -.283** | .142 | .012 | .086 | .287** | -.282** | .093 |

* $p \leq .05$ ** $p \leq .01$ *** $p \leq .001$

**Table 4.8. MID BOC MULTIVARIATE RESULTS**

| | Model 1 (Labor Force) | Model 2 (Disadvantage) | Model 3 (Global City) |
|---|---|---|---|
| IJC-High | .252* | .204* | .248* |
| | (.254) | (.205) | (.250) |
| | [.111] | [.098] | [.111] |
| IJC-Mid | .252* | .268** | .277** |
| | (.139) | (.148) | (.153) |
| | [.105] | [.093] | [.104] |
| IJC-Low | .134* | .092 | .149† |
| | (.230) | (.157) | (.255) |
| | [.060] | [.071] | [.080] |
| Asians 16+ in the labor force | .000 | .000 | .000 |
| | (.371) | (.334) | (.343) |
| | [.000] | [.000] | [.000] |
| Blacks 16+ in the labor force | .000 | .000 | .000 |
| | (-.029) | (.127) | (.055) |
| | [.000] | [.000] | [.000] |
| Hispanics 16+ in the labor force | .000 | .000 | .000 |
| | (.054) | (.070) | (.073) |
| | [.000] | [.000] | [.000] |
| % Change in size of recent foreign born population, 1990-2000 | .000* | .000 | .000 |
| | (-.172) | (-.066) | (-.017) |
| | [.000] | [.000] | [.000] |
| % Black w/o high school (> 25 years old) | | .000 | .001 |
| | | (.005) | (.090) |
| | | [.001] | [.001] |
| Median age | | .004 | .005 |
| | | (.125) | (.160) |
| | | [.003] | [.003] |
| Cost of living, Sperling & Sandler (1Q2003) | | .000 | .000 |
| | | (.049) | (-.079) |
| | | [.001] | [.001] |
| Disadvantage index | | .001 | .001 |
| | | (.073) | (.094) |
| | | [.002] | [.001] |
| % Black in-migrants (1995-2000) | | .004* | .005** |
| | | (.448) | (.551) |
| | | [.002] | [.002] |
| % of labor force in low-skill service occs. | | | -.002 |
| | | | (-.070) |
| | | | [.001] |
| % of labor force in professional service occs. | | | .009† |
| | | | (.293) |
| | | | [.005] |
| % Change in low-skill service occs., 1990-2000 | | | .009 |
| | | | (.165) |
| | | | [.008] |
| % Change in white labor force (1990-2000) | | | -.001 |
| | | | (-.098) |
| | | | [.000] |
| Intercept | .005 | -.222 | -.398† |
| | [.021] | [.176] | [.208] |
| Adjusted $R^2$ | .210*** | .326*** | .358* |

† p ≤ .1  * p ≤ .05  ** p ≤ .01  *** p ≤ .001

Note: standardized coefficients in parentheses; standard errors in brackets.

## Table 4.9. RANKING OF METROPOLITAN AREAS BY COMBINED MID-BOC & IJC

**MAs with large high-IJC & mid-BOC**

Highest Combined Rank:

| | | |
|---|---|---|
| 1 | Bloomington IN | 0.578* |
| 2 | Duluth | 0.541 |
| 3 | Champaign | 0.506 |
| 4 | Muncie | 0.442 |
| 5 | Bloomington-Nor IL | 0.407 |
| 6 | Lafayette IN | 0.386 |
| 7 | Oakland | 0.358 |
| 8 | Los Angeles | 0.329 |
| 9 | San Diego | 0.301 |
| 10 | Binghamton | 0.284 |
| 11 | Denver | 0.270 |
| 12 | Pittsburgh | 0.266 |
| 13 | San Francisco | 0.265 |
| 14 | Dallas | 0.261 |
| 15 | Rochester MN | 0.260 |
| 16 | Washington DC | 0.259 |
| 17 | Akron | 0.235 |
| 18 | Flint | 0.227 |
| 19 | Atlanta | 0.225 |
| 20 | Spokane | 0.217 |

**MAs with large mid-IJC & mid-BOC**

Highest Combined Rank:

| | | |
|---|---|---|
| 1 | Sioux City | 0.457 |
| 2 | Duluth | 0.416 |
| 3 | Los Angeles | 0.370 |
| 4 | Dallas | 0.336 |
| 5 | San Diego | 0.334 |
| 6 | Bloomington IN | 0.305 |
| 7 | Denver | 0.304 |
| 8 | Oakland | 0.300 |
| 9 | Washington DC | 0.291 |
| 10 | San Francisco | 0.287 |
| 11 | Atlanta | 0.252 |
| 12 | Corpus Christi | 0.227 |
| 13 | Albuquerque | 0.225 |
| 14 | Kankakee | 0.198 |
| 15 | Binghamton | 0.193 |
| 16 | San Antonio | 0.189 |
| 17 | Spokane | 0.185 |
| 18 | Beaumont | 0.183 |
| 19 | Racine | 0.170 |
| 20 | Bloomington-Nor IL | 0.168 |

**MAs with large low-IJC and mid-BOC**

Highest Combined Rank:

| | | |
|---|---|---|
| 1 | Dallas | 0.756 |
| 2 | Los Angeles | 0.725 |
| 3 | Kankakee | 0.704 |
| 4 | Denver | 0.688 |
| 5 | San Diego | 0.656 |
| 6 | Oakland | 0.624 |
| 7 | Duluth | 0.616 |
| 8 | San Francisco | 0.581 |
| 9 | Atlanta | 0.569 |
| 10 | Kenosha | 0.564 |
| 11 | Greensboro | 0.561 |
| 12 | Stockton | 0.559 |
| 13 | Reno | 0.558 |
| 14 | El Paso | 0.552 |
| 15 | Fresno | 0.544 |
| 16 | Albuquerque | 0.536 |
| 17 | San Antonio | 0.527 |
| 18 | Washington DC | 0.517 |
| 19 | Phoenix | 0.516 |
| 20 | Wilmington NC | 0.513 |

* Combined concentration size for both classifications

# Table 4.10. LOW IJC/MID BOC ANALYSIS

**METROPOLITAN AREAS WITH HIGHEST RANK OF COMBINED LOW-IJC AND MID-BOC**

| IJC Overrepresentations | | BOC Overrepresentations | |
|---|---|---|---|
| **Occupational Category** | | **Occupational Category** | |
| ***Typical MA Profile: **** | | | |
| Construction and Extraction - Low SEI | | Healthcare - Low SEI | |
| Production Occupations - Low SEI | | Community and Social Services (high) | |
| Food Prep and Serving Related (low) | | Office & Administrative Support (mid) | |
| Bldg, Grounds Cleaning & Maint (low) | | Protective Service - Low SEI | |
| Trans and Material Moving - Low SEI | | Trans and Material Moving - Mid SEI | |
| Production Occupations - Mid SEI | | Trans and Material Moving - Low SEI | |
| | **IJC** | | **BOC** |
| ***Dallas:*** | | | |
| Construction and Extraction - Low SEI | 0.152 | Office & Administrative Support (mid) | 0.253 |
| Production Occupations - Low SEI | 0.102 | Trans and Material Moving - Low SEI | 0.085 |
| Food Prep and Serving Related (low) | 0.090 | Healthcare - Low SEI | 0.030 |
| Bldg, Grounds Cleaning & Maint (low) | 0.085 | Community and Social Services (high) | 0.016 |
| Trans and Material Moving - Low SEI | 0.066 | Protective Service - Low SEI | 0.013 |
| Production Occupations - Mid SEI | 0.038 | Trans and Material Moving - Mid SEI | 0.008 |
| Construction and Extraction - Mid SEI | 0.037 | | |
| ***Los Angeles:*** | | | |
| Production Occupations - Low SEI | 0.128 | Office & Administrative Support (mid) | 0.254 |
| Bldg, Grounds Cleaning & Maint (low) | 0.071 | Healthcare - Mid SEI | 0.047 |
| Trans and Material Moving - Low SEI | 0.071 | Protective Service - Low SEI | 0.033 |
| Food Prep and Serving Related (low) | 0.064 | Community and Social Services (high) | 0.029 |
| Construction and Extraction - Low SEI | 0.050 | Healthcare - Low SEI | 0.024 |
| Production Occupations - Mid SEI | 0.041 | Personal Care and Services - Low SEI | 0.024 |
| Healthcare - Low SEI | 0.012 | Protective Service - Mid SEI | 0.014 |
| ***Kankakee:*** | | | |
| Production Occupations - Low SEI | 0.208 | Healthcare - Low SEI | 0.117 |
| Trans and Material Moving - Low SEI | 0.139 | Production Occupations - Low SEI | 0.117 |
| Food Prep and Serving Related (low) | 0.109 | Healthcare - Mid SEI | 0.083 |
| Bldg, Grounds Cleaning & Maint (low) | 0.069 | Bldg, Grounds Cleaning & Maint (low) | 0.049 |
| Installation, Maint, and Repair (mid) | 0.059 | Community and Social Services (high) | 0.034 |
| Construction and Extraction - Low SEI | 0.050 | Personal Care and Services - Mid SEI | 0.028 |
| Healthcare - High SEI | 0.030 | Trans and Material Moving - Mid SEI | 0.012 |
| Arts, etc. - Mid SEI | 0.010 | Arts, etc. - Mid SEI | 0.006 |
| Computer and Math Science (high) | 0.010 | | |
| ***Denver:*** | | | |
| Construction and Extraction - Low SEI | 0.152 | Office & Administrative Support (mid) | 0.257 |
| Food Prep and Serving Related (low) | 0.108 | Trans and Material Moving - Low SEI | 0.081 |
| Bldg, Grounds Cleaning & Maint (low) | 0.084 | Healthcare - Low SEI | 0.031 |
| Production Occupations - Low SEI | 0.074 | Community and Social Services (high) | 0.020 |
| Construction and Extraction - Mid SEI | 0.034 | Protective Service - Low SEI | 0.015 |
| | | Trans and Material Moving - Mid SEI | 0.013 |
| ***San Diego:*** | | | |
| Bldg, Grounds Cleaning & Maint (low) | 0.111 | Office & Administrative Support (mid) | 0.236 |
| Production Occupations - Low SEI | 0.096 | Trans and Material Moving - Low SEI | 0.056 |
| Food Prep and Serving Related (low) | 0.087 | Personal Care and Services - Mid SEI | 0.031 |
| Construction and Extraction - Low SEI | 0.048 | Healthcare - Low SEI | 0.028 |
| Production Occupations - Mid SEI | 0.033 | Community and Social Services (high) | 0.026 |
| Healthcare - Low SEI | 0.013 | Protective Service - Low SEI | 0.023 |
| | | Protective Service - Mid SEI | 0.021 |
| | | Trans and Material Moving - Mid SEI | 0.013 |

* Based on overrepresentation of the job category in more than 50% of the highest ranked MAs.

# Table 4.11. MID IJC/MID BOC ANALYSIS

**METROPOLITAN AREAS WITH HIGHEST RANK OF COMBINED MID-IJC AND MID-BOC**

| IJC Overrepresentations<br>Occupation category | | BOC Overrepresentations | |
|---|---|---|---|
| | | ***Typical MA Profile: **** | |
| Production Occupations - Mid SEI | | Healthcare - Low SEI | |
| Food Prep and Serving Related (low) | | Office & Administrative Support (mid) | |
| Production Occupations - Low SEI | | Trans and Material Moving - Mid SEI | |
| Bldg, Grounds Cleaning & Maint (low) | | Community and Social Services (high) | |
| Construction and Extraction - Low SEI | | Protective Service - Low SEI | |
| Healthcare - Low SEI | | | |
| | **IJC** | | **BOC** |
| | | ***Sioux City:*** | |
| Production Occupations - Mid SEI | 0.321 | Production Occupations - Low SEI | 0.136 |
| Production Occupations - Low SEI | 0.179 | Healthcare - Low SEI | 0.136 |
| Food Prep and Serving Related (low) | 0.104 | Trans and Material Moving - Low SEI | 0.136 |
| Personal Care and Service - Low SEI | 0.038 | Business & Financial Operations (high) | 0.091 |
| Computer and Math Science (high) | 0.019 | Bldg, Grounds Cleaning & Maint (low) | 0.091 |
| | | Installation, Maint, and Repair (mid) | 0.091 |
| | | Arts, etc. - High SEI | 0.045 |
| | | Arts, etc. - Mid SEI | 0.045 |
| | | ***Duluth:*** | |
| Food Prep and Serving Related (low) | 0.125 | Sales - Mid SEI | 0.333 |
| Production Occupations - Low SEI | 0.050 | Bldg, Grounds Cleaning & Maint (low) | 0.167 |
| Management occupations (high) | 0.050 | Business & Financial Operations (high) | 0.083 |
| Computer and Math Science (high) | 0.025 | Education, Training, and Library (high) | 0.083 |
| Life, Physical, & Social Science (high) | 0.025 | Production Occupations - Low SEI | 0.083 |
| Healthcare - High SEI | 0.025 | Production Occupations - Mid SEI | 0.083 |
| Personal Care and Service - Low SEI | 0.025 | | |
| | | ***Los Angeles:*** | |
| Production Occupations - Low SEI | 0.128 | Office & Administrative Support (mid) | 0.254 |
| Bldg, Grounds Cleaning & Maint (low) | 0.071 | Healthcare - Mid SEI | 0.047 |
| Trans and Material Moving - Low SEI | 0.071 | Protective Service - Low SEI | 0.033 |
| Food Prep and Serving Related (low) | 0.064 | Community and Social Services (high) | 0.029 |
| Construction and Extraction - Low SEI | 0.050 | Healthcare - Low SEI | 0.024 |
| Production Occupations - Mid SEI | 0.041 | Personal Care and Service - Low SEI | 0.024 |
| Healthcare - Low SEI | 0.012 | Protective Service - Mid SEI | 0.014 |
| | | Trans and Material Moving - Mid SEI | 0.014 |
| | | ***Dallas:*** | |
| Construction and Extraction - Low SEI | 0.152 | Office & Administrative Support (mid) | 0.253 |
| Production Occupations - Low SEI | 0.102 | Trans and Material Moving - Low SEI | 0.085 |
| Food Prep and Serving Related (low) | 0.090 | Healthcare - Low SEI | 0.03 |
| Bldg, Grounds Cleaning & Maint (low) | 0.085 | Community and Social Services (high) | 0.016 |
| Trans and Material Moving - Low SEI | 0.066 | Protective Service - Low SEI | 0.013 |
| Production Occupations - Mid SEI | 0.038 | Trans and Material Moving - Mid SEI | 0.008 |
| Construction and Extraction - Mid SEI | 0.037 | | |
| | | ***San Diego:*** | |
| Bldg, Grounds Cleaning & Maint (low) | 0.111 | Office & Administrative Support (mid) | 0.236 |
| Production Occupations - Low SEI | 0.096 | Trans and Material Moving - Low SEI | 0.056 |
| Food Prep and Serving Related (low) | 0.087 | Personal Care and Services - Mid SEI | 0.031 |
| Construction and Extraction - Low SEI | 0.048 | Healthcare - Low SEI | 0.028 |
| Production Occupations - Mid SEI | 0.033 | Community and Social Services (high) | 0.026 |
| Healthcare - Low SEI | 0.013 | Protective Service - Low SEI | 0.023 |
| | | Protective Service - Mid SEI | 0.021 |
| | | Trans and Material Moving - Mid SEI | 0.013 |

** Based on overrepresentation of the job category in more than 50% of the highest ranked MAs.

# Table 4.12. HIGH IJC/MID BOC ANALYSIS

**METROPOLITAN AREAS WITH HIGHEST RANK OF COMBINED HIGH-IJC AND MID-BOC**

| IJC Overrepresentations<br>Occupation category * | | BOC Overrepresentations | |
|---|---|---|---|
| | | ***Typical MA Profile:*** ** | |
| Educ, Training, and Library (high) | | Production Occupations - Low SEI | |
| Computer and Math Science (high) | | Sales - Mid SEI | |
| Life, Physical, & Social Science (high) | | Trans and Material Moving - Mid SEI | |
| Healthcare - High SEI | | Bldg, Grounds Cleaning & Maint (low) | |
| | | Protective Service - Low SEI | |
| | | Healthcare - Low SEI | |
| | **IJC** | | **BOC** |
| | | ***Bloomington:*** | |
| Educ, Training, and Library (high) | 0.182 | Office & Administrative Support (mid) | 0.257 |
| Food Prep and Serving Related (low) | 0.071 | Production Occupations - Low SEI | 0.086 |
| Life, Physical, & Social Science (high) | 0.061 | Computer and Math Science (high) | 0.043 |
| Architecture and Engineering (high) | 0.03 | Community and Social Services (high) | 0.029 |
| Community and Social Services (high) | 0.02 | Protective Service - Low SEI | 0.029 |
| Legal-Mid SEI | 0.01 | Arts, etc. - Mid SEI | 0.014 |
| Arts, etc. - Mid SEI | 0.01 | Trans and Material Moving - Mid SEI | 0.014 |
| | | ***Duluth:*** | |
| Food Prep and Serving Related (low) | 0.125 | Sales - Mid SEI | 0.333 |
| Production Occupations - Low SEI | 0.05 | Bldg, Grounds Cleaning & Maint (low) | 0.167 |
| Management occupations (high) | 0.05 | Business & Financial Operations (high) | 0.083 |
| Computer and Math Science (high) | 0.025 | Education, Training, and Library (high) | 0.083 |
| Life, Physical, & Social Science (high) | 0.025 | Production Occupations - Low SEI | 0.083 |
| Healthcare - High SEI | 0.025 | Production Occupations - Mid SEI | 0.083 |
| Personal Care and Service - Low SEI | 0.025 | | |
| | | ***Champaign-Urbana:*** | |
| Educ, Training, and Library (high) | 0.238 | Sales – Mid SEI | 0.122 |
| Life, Physical, & Social Science (high) | 0.084 | Trans and Material Moving - Low SEI | 0.099 |
| Production Occupations - Low SEI | 0.044 | Food Prep and Serving Related (low) | 0.094 |
| Computer and Math Science (high) | 0.044 | Production Occupations - Low SEI | 0.068 |
| Healthcare - High SEI | 0.018 | Building, Grounds Cleaning & Maint | 0.051 |
| Legal-Mid SEI | 0.007 | Healthcare - Low SEI | 0.04 |
| | | Community and Social Services (high) | 0.034 |
| | | Protective Service - Low SEI | 0.009 |
| | | ***Muncie:*** | |
| Educ, Training, and Library (high) | 0.188 | Production Occupations - Low SEI | 0.209 |
| Building, Grounds Cleaning & Maint | 0.125 | Construction and Extraction - Low SEI | 0.05 |
| Management occupations (high) | 0.063 | Personal Care and Service - Mid SEI | 0.043 |
| Business and Financial (high) | 0.063 | Healthcare - Low SEI | 0.029 |
| Computer and Math Science (high) | 0.063 | Arts, etc. - High SEI | 0.022 |
| Trans and Material Moving - Low SEI | 0.063 | Personal Care and Service - Low SEI | 0.022 |
| | | Trans and Material Moving - Mid SEI | 0.022 |
| | | ***Bloomington-Normal:*** | |
| Business and Financial (high) | 0.146 | Sales - Mid SEI | 0.111 |
| Building, Grounds Cleaning & Maint | 0.083 | Building, Grounds Cleaning & Maint | 0.065 |
| Educ, Training, and Library (high) | 0.073 | Community and Social Services (high) | 0.025 |
| Healthcare - Mid SEI | 0.052 | Personal Care and Service - Low SEI | 0.025 |
| Computer and Math Science (high) | 0.031 | Healthcare - Low SEI | 0.02 |
| Architecture and Engineering (high) | 0.021 | Protective Service - Low SEI | 0.015 |
| Trans and Material Moving - High SEI | 0.01 | Trans and Material Moving - High SEI | 0.015 |
| Healthcare - High SEI | 0.01 | Trans and Material Moving - Mid SEI | 0.005 |

* Based on overrepresentation of the job category in more than 50% of the highest ranked MAs

**Table 4.13. LOW BOC MULTIVARIATE RESULTS**

| | Model 1 (Labor Force) | Model 2 (Disadvantage) | Model 3 (Global City) |
|---|---|---|---|
| IJC-High | .150 | -.051 | -.081 |
| | (.108) | (-.037) | (-.059) |
| | [.154] | [.133] | [.147] |
| IJC-Mid | .631** | .475* | .462* |
| | (.250) | (.188) | (.183) |
| | [.209] | [.190] | [.183] |
| IJC-Low | -.254** | -.228** | -.218* |
| | (-.312) | (-.279) | (-.268) |
| | [.089] | [.083] | [.086] |
| Asians 16+ in the labor force | .000† | .000 | .000† |
| | (-.140) | (.307) | (.305) |
| | [.000] | [.000] | [.000] |
| Blacks 16+ in the labor force | .000 | .000 | .000 |
| | (.023) | (-.115) | (-.114) |
| | [.000] | [.000] | [.000] |
| Hispanics 16+ in the labor force | .000 | .000* | .000* |
| | (-.094) | (-.305) | (-.299) |
| | [.000] | [.000] | [.000] |
| % Change in size of recent foreign born population, 1990-2000 | .000*** | .000 | .000** |
| | (.330) | (.226) | (.251) |
| | [.000] | [.000] | [.000] |
| % Black w/o high school (<25 years old) | | .009*** | .009*** |
| | | (.543) | (.539) |
| | | [.002] | [.002] |
| Median age | | -.010** | -.010** |
| | | (-.249) | (-.246) |
| | | [.003] | [.003] |
| Cost of living, Sperling & Sandler (1Q2003) | | -.001* | -.001* |
| | | (-.241) | (-.251) |
| | | [.001] | [.001] |
| Disadvantage index | | -.002 | -.003 |
| | | (-.137) | (-.150) |
| | | [.001] | [.002] |
| % Black in-migrants (1995-2000) | | .001 | .001 |
| | | (.054) | (.075) |
| | | [.001] | [.014] |
| % of labor force in low-skill service occs. | | | -.002 |
| | | | (-.072) |
| | | | [.005] |
| % of labor force in professional service occs. | | | -.001 |
| | | | (-.016) |
| | | | [.004] |
| % change in low-skill service occs., 1990-2000 | | | -.002 |
| | | | (.046) |
| | | | [.005] |
| % Change in white labor force (1990-2000) | | | -.001 |
| | | | (-.075) |
| | | | [.001] |
| Intercept | .234 | .553 | .570 |
| | [.027] | [.152] | [.184] |
| Adjusted $R^2$ | .326*** | .520*** | .517*** |

† p ≤ .1 *p ≤ .05 ** p ≤ .01 *** p ≤ .001 two-tailed test

Note: standardized coefficients in parentheses; standard errors in brackets.

**Table 4.14. RANKING OF METROPOLITAN AREAS BY COMBINED LOW-BOC & LOW-IJC AND MID-IJC**

**MAs with large low IJC & low BJC**

| Highest Combined Rank: | | |
|---|---|---|
| 1 | Greensboro | 0.878 |
| 2 | Greenville SC | 0.870 |
| 3 | Kankakee | 0.858 |
| 4 | Wilmington NC | 0.845 |
| 5 | Racine | 0.828 |
| 6 | Sioux City | 0.820 |
| 7 | Charlotte | 0.777 |
| 8 | Kenosha | 0.755 |
| 9 | Omaha | 0.739 |
| 10 | Reno | 0.712 |
| 11 | Oklahoma City | 0.702 |
| 12 | Jacksonville NC | 0.699 |
| 13 | Rochester MN | 0.697 |
| 14 | Grand Rapids | 0.685 |
| 15 | Little Rock | 0.680 |
| 16 | Fort Worth | 0.665 |
| 17 | Raleigh-Durham | 0.651 |
| 18 | Wichita | 0.649 |
| 19 | Phoenix | 0.648 |
| 20 | Shreveport | 0.645 |

**MAs with large mid IJC & low BOC**

| Highest Combined Rank: | | |
|---|---|---|
| 1 | Sioux City | 0.820 |
| 2 | Racine | 0.515 |
| 3 | Rochester MN | 0.498 |
| 4 | Greenville SC | 0.489 |
| 5 | Omaha | 0.477 |
| 6 | Mobile | 0.469 |
| 7 | Biloxi | 0.462 |
| 8 | Florence AL | 0.459 |
| 9 | Little Rock | 0.442 |
| 10 | Beaumont | 0.438 |
| 11 | Topeka | 0.430 |
| 12 | Memphis | 0.427 |
| 13 | Shreveport | 0.426 |
| 14 | Charlotte | 0.411 |
| 15 | Savannah | 0.403 |
| 16 | Worcester | 0.403 |
| 17 | Macon | 0.402 |
| 18 | Lubbock | 0.400 |
| 19 | Columbia SC | 0.399 |
| 20 | Des Moines | 0.382 |

* Combined concentration size for both classifications

# Table 4.15. LOW IJC/LOW BJC ANALYSIS

**METROPOLITAN AREAS WITH HIGHEST RANK OF COMBINED LOW-IJC AND LOW-BOC**

| IJC Overrepresentations | | BOC Overrepresentations | |
|---|---|---|---|
| **Occupation category** | | **Occupation category** | |
| | ***Typical MA Profile: **** | | |
| Production Occupations - Low SEI | | Healthcare - Low SEI | |
| Construction and Extraction - Low SEI | | Production Occupations - Low SEI | |
| Food Prep and Serving Related (low) | | Building, Grounds Cleaning & Maint | |
| Building, Grounds Cleaning & Maint | | Trans and Material Moving - Low SEI | |
| Trans and Material Moving - Low SEI | | Trans and Material Moving - Mid SEI | |
| | **IJC** | | **BOC** |
| | ***Greensboro:*** | | |
| Production Occupations - Low SEI | 0.243 | Production Occupations - Low SEI | 0.144 |
| Construction and Extraction - Low SEI | 0.104 | Trans and Material Moving - Low SEI | 0.094 |
| Food Prep and Serving Related (low) | 0.084 | Building, Grounds Cleaning & Maint | 0.050 |
| Trans and Material Moving - Low SEI | 0.083 | Healthcare - Low SEI | 0.035 |
| Building, Grounds Cleaning & Maint | 0.041 | Trans and Material Moving - Mid SEI | 0.006 |
| | ***Greenville:*** | | |
| Production Occupations - Low SEI | 0.146 | Production Occupations - Low SEI | 0.209 |
| Construction and Extraction - Low SEI | 0.106 | Trans and Material Moving - Low SEI | 0.104 |
| Food Prep and Serving Related (low) | 0.081 | Food Prep and Serving Related (low) | 0.075 |
| Building, Grounds Cleaning & Maint | 0.048 | Building, Grounds Cleaning & Maint | 0.069 |
| Computer and Math Science (high) | 0.029 | Healthcare - Low SEI | 0.032 |
| | ***Kankakee:*** | | |
| Production Occupations - Low SEI | 0.208 | Production Occupations - Low SEI | 0.117 |
| Trans and Material Moving - Low SEI | 0.139 | Healthcare - Low SEI | 0.117 |
| Food Prep and Serving Related (low) | 0.109 | Healthcare - Mid SEI | 0.083 |
| Building, Grounds Cleaning & Maint | 0.069 | Building, Grounds Cleaning & Maint | 0.049 |
| Installation, Maint, and Repair (mid) | 0.059 | Community and Social Services (high) | 0.034 |
| Construction and Extraction - Low SEI | 0.05 | Personal Care and Service - Mid SEI | 0.028 |
| Healthcare - High SEI | 0.03 | Trans and Material Moving - Mid SEI | 0.012 |
| Arts, etc. - Mid SEI | 0.01 | Arts, etc. - Mid SEI | 0.006 |
| | ***Wilmington, NC:*** | | |
| Construction and Extraction - Low SEI | 0.244 | Trans and Material Moving - Low SEI | 0.108 |
| Food Prep and Serving Related (low) | 0.11 | Production Occupations - Low SEI | 0.095 |
| Building, Grounds Cleaning & Maint | 0.073 | Building, Grounds Cleaning & Maint | 0.083 |
| Production Occupations - Low SEI | 0.049 | Healthcare - Low SEI | 0.053 |
| Construction and Extraction - Mid SEI | 0.043 | Trans and Material Moving - Mid SEI | 0.007 |
| Healthcare - Low SEI | 0.03 | | |
| | ***Racine:*** | | |
| Production Occupations - Low SEI | 0.137 | Production Occupations - Low SEI | 0.167 |
| Food Prep and Serving Related (low) | 0.137 | Healthcare - Low SEI | 0.096 |
| Trans and Material Moving - Low SEI | 0.118 | Trans and Material Moving - Low SEI | 0.083 |
| Production Occupations - Mid SEI | 0.118 | Building, Grounds Cleaning & Maint | 0.045 |
| Construction and Extraction - Low SEI | 0.039 | Architecture and Engineering (high) | 0.032 |
| Arts, etc. - High SEI | 0.02 | Personal Care and Service - Mid SEI | 0.026 |
| | | Trans and Material Moving - Mid SEI | 0.026 |
| | | Protective Service - Low SEI | 0.006 |

* Based on overrepresentation of the job category in more than 50% of the highest ranked MAs

# Table 4.16. MID IJC/LOW BJC ANALYSIS

**METROPOLITAN AREAS WITH HIGHEST RAND OF COMBINED MID-IJC AND LOW-BOC**

| IJC Overrepresentations | | BOC Overrepresentations | |
|---|---|---|---|
| **Occupation category *** | **IJC** | **Occupation category *** | **BOC** |
| | ***Typical MA Profile: ***** | | |
| Food Prep and Serving Related (low) | | Healthcare - Low SEI | |
| Production Occupations - Low SEI | | Production Occupations - Low SEI | |
| Construction and Extraction - Low SEI | | Building, Grounds Cleaning & Maint | |
| Production Occupations - Mid SEI | | Trans and Material Moving - Low SEI | |
| Computer and Math Science (high) | | | |
| Bldg, Grounds Cleaning & Maint (low) | | | |
| Trans and Material Moving - Low SEI | | | |
| | ***Sioux City*** | | |
| Production Occupations - Mid SEI | 0.321 | Production Occupations - Low SEI | 0.136 |
| Production Occupations - Low SEI | 0.179 | Healthcare - Low SEI | 0.136 |
| Food Prep and Serving Related (low) | 0.104 | Trans and Material Moving - Low SEI | 0.136 |
| Personal Care and Service - Low SEI | 0.038 | Business & Financial Operations (high) | 0.091 |
| Computer and Math Science (high) | 0.019 | Bldg, Grounds Cleaning & Maint (low) | 0.091 |
| | | Installation, Maint, and Repair (mid) | 0.091 |
| | | Arts, etc. - High SEI | 0.045 |
| | | Arts, etc. - Mid SEI | 0.045 |
| | ***Racine:*** | | |
| Production Occupations - Low SEI | 0.137 | Production Occupations - Low SEI | 0.167 |
| Food Prep and Serving Related (low) | 0.137 | Healthcare - Low SEI | 0.096 |
| Trans and Material Moving - Low SEI | 0.118 | Trans and Material Moving - Low SEI | 0.083 |
| Production Occupations - Mid SEI | 0.118 | Building, Grounds Cleaning & Maint | 0.045 |
| Construction and Extraction - Low SEI | 0.039 | Architecture and Engineering (high) | 0.032 |
| Arts, etc. - High SEI | 0.020 | Personal Care and Service - Mid SEI | 0.026 |
| | | Trans and Material Moving - Mid SEI | 0.026 |
| | | Protective Service - Low SEI | 0.006 |
| | ***Rochester, MN:*** | | |
| Food Prep and Serving Related (low) | 0.075 | Production Occupations - Low SEI | 0.280 |
| Production Occupations - Low SEI | 0.066 | Healthcare - High SEI | 0.120 |
| Computer and Math Science (high) | 0.066 | Building, Grounds Cleaning & Maint | 0.080 |
| Healthcare - High SEI | 0.057 | Trans and Material Moving - Low SEI | 0.080 |
| Life, Physical, & Social Science (high) | 0.057 | Healthcare - Low SEI | 0.040 |
| Building, Grounds Cleaning & Maint | 0.038 | Personal Care and Service - Mid SEI | 0.040 |
| Trans and Material Moving - Low SEI | 0.038 | Construction and Extraction - Mid SEI | 0.040 |
| Legal-Mid SEI | 0.009 | | |
| Arts, etc. - Mid SEI | 0.009 | | |
| | ***Greenville:*** | | |
| Production Occupations - Low SEI | 0.146 | Production Occupations - Low SEI | 0.209 |
| Construction and Extraction - Low SEI | 0.106 | Trans and Material Moving - Low SEI | 0.104 |
| Food Prep and Serving Related (low) | 0.081 | Food Prep and Serving Related (low) | 0.075 |
| Building, Grounds Cleaning & Maint | 0.048 | Building, Grounds Cleaning & Maint | 0.069 |
| Computer and Math Science (high) | 0.029 | Healthcare - Low SEI | 0.032 |
| | ***Omaha:*** | | |
| Production Occupations - Mid SEI | 0.136 | Production Occupations - Low SEI | 0.083 |
| Production Occupations - Low SEI | 0.118 | Trans and Material Moving - Low SEI | 0.083 |
| Food Prep and Serving Related (low) | 0.089 | Food Prep and Serving Related (low) | 0.078 |
| Construction and Extraction - Low SEI | 0.075 | Building, Grounds Cleaning & Maint | 0.063 |
| Trans and Material Moving - Low SEI | 0.066 | Community and Social Services (high) | 0.027 |
| Building, Grounds Cleaning & Maint | 0.052 | Healthcare - Low SEI | 0.020 |
| Trans and Material Moving - Mid SEI | 0.002 | Protective Service - Mid SEI | 0.015 |
| | | Protective Service - Low SEI | 0.012 |
| | | Arts, etc. - Mid SEI | 0.009 |
| | | Trans and Material Moving - Mid SEI | 0.003 |

** Based on overrepresentation of the job category in more than 50% of the highest ranked MAs

**Table 4.17. HIGH BOC MULTIVARIATE RESULTS**

| | Model 1 (Labor Force) | Model 2 (Disadvantage) | Model 3 (Global City) |
|---|---|---|---|
| IJC-High | .001 | -.018 | -.026 |
| | (.003) | (-.048) | (-.070) |
| | [.039] | [.048] | [.042] |
| IJC-Mid | .159 | .167 | .155 |
| | (.235) | (.248) | (.231) |
| | [.144] | [.126] | [.134] |
| IJC-Low | .005 | -.014 | -.018 |
| | (.021) | (-.063) | (-.082) |
| | [.023] | [.031] | [.035] |
| Asians 16+ in the labor force | .000 | .000 | .000 |
| | (.134) | (-.008) | (-.034) |
| | [.000] | [.000] | [.000] |
| Blacks 16+ in the labor force | .000 | .000 | .000 |
| | (-.162) | (..035) | (.088) |
| | [.000] | [.000] | [.000] |
| Hispanics 16+ in the labor force | .000 | .000 | .000 |
| | (-.049) | (.046) | (.090) |
| | [.000] | [.000] | [.000] |
| % Change in size of recent foreign born population, 1990-2000 | .000 | .000 | .000† |
| | (-.163) | (-.055) | (-.097) |
| | [.000] | [.000] | [.000] |
| % Black w/o high school (<25 yo) | | .001 | .000 |
| | | (.125) | (.054) |
| | | [.001] | [.001] |
| Median Age | | .001 | .001 |
| | | (.075) | (.108) |
| | | [.001] | [.001] |
| Cost of living, Sperling & Sandler (1Q2003) | | .000 | .000† |
| | | (.134) | (.261) |
| | | [.000] | [.000] |
| Disadvantage index | | .000 | .000 |
| | | (-.020) | (.017) |
| | | [.001] | [.001] |
| % Black in-migrants (1995-2000) | | .002* | .002* |
| | | (.532) | (.475) |
| | | [.001] | [.001] |
| % of labor force in low-skill service occs. | | | -.001 |
| | | | (-.134) |
| | | | [.001] |
| % of labor force in professional service occs. | | | -.003* |
| | | | (-.224) |
| | | | [.001] |
| % change in low-skill service occs., 1990-2000 | | | .000 |
| | | | (-.016) |
| | | | [.002] |
| % Change in white labor force (1990-2000) | | | .000 |
| | | | (.172) |
| | | | [.001] |
| Intercept | .028*** | -.052 | -.032 |
| | [.006] | [.065] | [.075] |
| Adjusted $R^2$ | .045* | .218** | .242* |

† $p \leq .1$ *$p \leq .05$ ** $p \leq .01$ *** $p \leq .001$ two-tailed test

Note: standardized coefficients in parentheses; standard errors in brackets.

# CHAPTER 5: CONCLUSION

This research has endeavored to clarify the relationship among immigrant and black outcomes in the labor market. It has done so by moving the immigrant/native-born black debate beyond the typical low-skill workers as substitutes or complements focus to a more comprehensive view of labor markets. By investigating the proportion of blacks and immigrants who are in occupations in which either blacks or immigrants are overrepresented, the concentrations in low, mid, or high classifications are assessed. The nine possible relationships between black and immigrant occupational classifications are analyzed in a multivariate context. Five of these relationships are significant, providing valuable results that add to the existing literature on the labor market outcomes of native-born blacks in the face of substantial immigration levels.

The significant relationships are summarized as follows. A negative relationship between low-level immigrant occupational concentrations and low-level black job concentrations is shown, which indicates that blacks and immigrants do compete for low-SEI jobs in some areas and that immigrant concentrations reduce the size of black concentrations where there is competition for low-skilled jobs. A positive relationship between mid-level immigrant concentrations and low-level black concentrations is depicted, which suggests that there may be an effect where immigrants leapfrog over blacks, particularly in areas with a manufacturing economic base. A positive relationship between low-level immigrant occupations and mid-level black jobs is delineated, which supports a bump-up effect in which immigrants working in low-level jobs generate mid-level jobs that well-positioned blacks can take advantage of. A positive relationship between mid-level immigrant and mid-level black concentrations is demonstrated, which suggest areas of parallel opportunity for blacks and immigrants. Finally, a positive

relationship is shown between high-level immigrant concentrations and mid-level black concentrations, also supporting a possible parallel upward mobility in some areas such as "rust-belt" university centers.

Overall, blacks have a higher likelihood of being overrepresented in mid-level occupations in areas that have higher numbers of immigrants in overrepresented low-, mid-, and high-level occupations. In other words, the presence of immigrants, whether in low, mid, or high SEI jobs, tends to increase the number of blacks in "middle-class" jobs; immigrants improve black's labor market outcomes in the middle occupational classification. This is partly due to economic factors, as discussed in Chapter 4, such as new immigrants creating additional demand for services. In metropolitan areas where there are higher immigrant overrepresentations, there are higher black overrepresentations in occupational categories that include jobs such as bus drivers, postal workers, nurses, and police. This finding solidifies emerging research (see Adelman et al. 2005 and Linton 2002) suggesting a bump-up effect based on the demand for services generated by immigrants and contradicts earlier research that finds black occupational status to be unrelated to the relative proportion of immigrants in a metropolitan area (e.g., see Frisbie and Neidert 1977).

This research also identifies a bump-up effect resulting from a need for increased administrative functions as new immigrants enter the labor market. Jobs, such as billing and posting clerks, dispatchers, and payroll clerks, within the office and administrative occupational category result from increased economic activity that occurs in areas with a source of low-cost labor, most often associated with immigrant workers. Blacks disproportionately fill these office and administrative jobs. Thus, there are two ways in which immigrant workers improve labor market outcomes for blacks; service and administrative related demand. In this research, then, I

extend the existing literature on the bump-up effect by detailing two different reasons for the bump-up effect, specifying an administrative factor and a service factor, as well as relating the bump-up effect to definitive occupational categories.

However, analyzing the bump-up effect also requires consideration of the social factors influencing labor markets. Investigating the mid-level jobs in which blacks are overrepresented depicts occupations in which entry is gained via civil service examinations or vocational/technical training (Boyd 1994). Civil service examinations test for verbal and written skills, the ability to work with people, and basic decision making; English proficiency is required. Native-born blacks are better positioned than immigrants to pass these tests and enter jobs in the public sector. Vocational/technical skills refer to training that is specific to a particular occupation. For example, a high school student can choose a technical track—as opposed to a college preparatory track—and leave high school prepared for jobs such as a mechanic or welder. Alternatively, they are also prepared for certificate or diploma programs, occupation specific training that requires less time than a standard four-year college degree, such as cosmetology, medical transcription, or dental assistant. These programs require English skills as well as occupation specific training. They are also more accessible to those who progress through the American school system. A generalization based on the type of jobs that native-born blacks and recent immigrants hold is that native-born blacks are much more likely to be in occupations that require civil service credentials or technical training.

Although the mid-level occupations that blacks are most likely attain represents a degree of upward mobility, they are not the best jobs available. These jobs might be considered to fall in the lower part of the middle-class, but do often provide health insurance and a higher wage than the lower SEI jobs. On the other hand, the relatively low representation of blacks in high-SEI

occupations is notable. The only high-SEI category in which blacks are typically overrepresented across a range of metropolitan areas is Community and Social Services, which is comprised of jobs that do not pay as well as other high-SEI occupations. On the other hand, blacks are grossly underrepresented in occupations that might be considered high status (e.g., high-SEI Legal, high-SEI Healthcare, Management, and Architecture and Engineering). Blacks appear to be structurally constrained from achieving positions in these high-status occupations. As a result, the focus in this analysis is more on mid-level jobs that seem to represent the currently achievable frontier for black upward mobility.

Entry into mid-level occupations, for native-born blacks, tends to occur in jobs that require either civil service or vocational/technical training. By contrast, immigrants who enter mid-level jobs do so predominantly in occupations that can be learned on the job (e.g., electronic production skills or masonry). The point of entry into mid-level occupations appears to be quite different for the two groups. The mid-level occupational classification, then, seems to be more complementary than competitive (i.e., there is a parallel opportunity for blacks and immigrants in the mid-level jobs). Also, based on blacks being in mid-level jobs at more than twice the rate of immigrants, "on-the-job training" appears to be a less effective path to mid-level occupations. In any case, this study lays the groundwork for further research into "middle-class" points of entry, regional or metropolitan differences in vocational/technical training or civil service success, or the effects of "on-the-job training" on specific labor market composition and wages. For example, are areas with high mid-immigrant concentrations experiencing declining wages as a result? Are there identifiable social factors which help to explain differences in the size of immigrant and black concentrations, particularly in the middle level? Is there a devaluing effect where immigrants learn mid-level jobs in which they are willing to work for lower wages?

Although this research finds a significant relationship between disadvantage variables and the low job concentrations, the study shows that disadvantage and global city characteristics (i.e., primarily economic criteria) are not key explanatory variables for mid-level job concentrations. Thus, there is opportunity for additional work in this area of research.

This research also presents compelling evidence of competition between blacks and immigrants for low-wage, low-skill jobs. This augments a substantial literature that addresses this issue, but contradicts the frequent position that there is little impact of immigration on native-born blacks. The multivariate analysis depicts the size of the low-level immigrant job concentration as second only to a lack of education in predicting the size of the low-level black occupational concentration. Metropolitan areas that have more low-level job categories in which immigrants are overrepresented have fewer categories in which blacks are overrepresented. I have identified the areas that are the most competitive and the specific job categories that are the most competitive. I extend the literature by investigating low-level occupations as a separate classification and by providing additional granularity of job categories than previous research. Results that indicate a negative relationship between low-level black concentrations and low-level immigrant concentrations provide evidence of unfavorable labor market outcomes for native-born blacks vying for low-skilled jobs. This should add to the long-standing debate and hopefully encourage additional work to illuminate the critical issue of increased black marginalization in the labor force as a result of higher levels of recent immigrants.

Certainly, an overarching theme of this analysis is the social organization that pervades U.S. labor markets (Semyonov et al. 2000). Many occupations are notable in the extent that they are overrepresented by one group or the other. For example, low SEI healthcare occupations, such as nursing and home-health aides, are consistently overrepresented by blacks. 142 out of

144 metropolitan areas have more blacks working in low-level healthcare jobs than would be expected based on their populations. Blacks are over six times more likely than immigrants to be employed in this occupational category. By contrast, immigrants are overrepresented within low-level construction jobs in 98 metropolitan areas and are over three times more likely than blacks to work in this occupational category. However, both blacks and immigrants are overrepresented in building and grounds cleaning and maintenance occupations and have a similar likelihood of working in this area. Some jobs are dominated by blacks, some by immigrants, and yet others seem to be competitive between the two groups. Thus, there are factors beyond political economic issues that influence the make-up of labor markets. These social factors, such as education, language, social networks, or local politics play important roles in understanding the relationships between black and immigrant occupational classifications (Elliott and Joyce 2004; Granovetter 1995; Hewitt 2004; Waldinger 1997).

In the case of education, there are situations in which mid-level jobs exist in areas with large immigrant occupational concentrations, but in some of these areas blacks cannot take advantage of these opportunities because of inadequate educational levels. A key point, in regard to the bump-up effect, is that a bump up exists only if black workers have the skills, typically either civil service or technical/vocations skills, to fill the available positions. In other words, lack of education or associated skills can be a structural limitation that constrains blacks in the labor market. This structural constraint is especially evident in the disparity between the size of high-SEI black concentrations and high-SEI immigrant concentrations. Immigrants are twice as likely as blacks to be overrepresented in high-level occupational classifications, suggesting limitations, primarily educational, that affect native-born blacks, but do not constrain recent foreign-born workers, though these are relatively small concentrations for both groups.

Language tends to act more as a structural constraint on immigrants. For example, they are most overrepresented in occupations such as Building and Grounds Cleaning and Maintenance or Construction and Extraction, which require minimal language skills. They are least overrepresented in Legal Occupations and Protective Services, which require significant use of the English language. Occupations where immigrants with lower educational levels are attaining upward mobility are mid-SEI Production Operations, jobs where advancement is possible without English being a critical skill. On the other hand, language, and associated skills engaging customers and providing public services, tends to favor native-born blacks, leading to overrepresentation in jobs that require civil service skills or healthcare occupations that demand an ability to communicate with patients. Thus, language acts as a structural constraint for both groups, acting in opposite ways, and leading to occupational categories that are highly over- or underrepresented by the two groups.

Social networks and hiring preferences also seem to establish structural constraints that limit blacks or immigrants access to certain occupations. For example, the overrepresentation of immigrants in low-SEI Construction and Extraction may be predicated upon hiring preferences in the construction industry and networks that provide immigrants with knowledge about job openings. By showing the relative size of black and immigrant job concentrations, both nationally and by metropolitan area, I provide a unique perspective for investigating the structural constraints which order labor markets in the United States and its metropolises. The pervasiveness of racial and ethnic dimensions in determining the composition of labor markets is confirmed in this study and should be recognized as an underlying factor in interpreting the results.

In summary, immigration seems to have different effects on native-born blacks in low-level and mid-level jobs. In low-level occupations, some types of jobs appear to be complements, such as low-SEI Healthcare which favors blacks over immigrants or low-SEI Construction and Extraction which favors immigrants over blacks. At the same time, in many jobs, such as low-SEI Production Occupations and Building, Grounds Cleaning, and Maintenance, immigrants are substitutes for native-born black workers (Waldinger and Lichter 2003). Situations in which immigrants are substitutes have a larger influence than those that are complementary in determining the presence of blacks in low-level jobs. In other words, a higher proportion of immigrants concentrated in low-level jobs results in an overall reduction of labor market outcomes for blacks in low-level jobs. On the other hand, concentrations of immigrants, whether in low, mid, or high occupational classifications, results in higher proportions of blacks in mid-level jobs. In this case, the presence of immigrants results in improved labor market outcomes for blacks. The net effect seems to be opportunities, a bump-up effect, for blacks that are positioned to take advantage of the situation with effective high school and technical school education while blacks without, or with inadequate, high school education will have even fewer opportunities due to immigration and may even be displaced by immigrant workers willing to accept lower wages. The bump-up effect occurs in two broad areas, service and administrative job functions, which result to varying degrees from low, mid, and high immigrant job concentrations. Poorer labor market outcomes for blacks are related primarily to low-level immigrant job concentrations. Thus, native born blacks experience the effects of post-1980 immigration in quite different ways, an insight that extends our understanding of black/immigrant labor market dynamics.

Twenty-first century policy implications are then also different for the two situations. On one hand, programs are required to help enable native-born blacks to enter mid-level occupations via educational initiatives that relate specifically to today's labor market. On the other hand, programs that address the reality of poorer outcomes for native-born blacks due to competition for low-level jobs must be developed. A lack of such initiatives will fail to capitalize on opportunities for black upward mobility while further marginalizing blacks in the labor market.

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# APPENDIX – OCCUPATIONAL CATEGORIES

| Occupational Category (Census 2000 identifiers) | | | SEI |
|---|---|---|---|
| I | Management occupations: (001-049 less 20, 21) | | High |
| | 1 | Chief executive | 68 |
| | 2 | General and Operations Managers | 68 |
| | 3 | Legislators | 66 |
| | 4 | Advertising and Promotions Managers | 72 |
| | 5 | Marketing and Sales Managers | 72 |
| | 6 | Public Relations Managers | 82 |
| | 10 | Administration Services Managers | 68 |
| | 11 | Computer and Information Systems Managers | 68 |
| | 12 | Financial Managers | 68 |
| | 13 | Human Resources Managers | 84 |
| | 14 | Industrial Production Managers | 68 |
| | 15 | Purchasing Managers | 77 |
| | 16 | Transportation, Storage, and Distribution Managers | 68 |
| | 22 | Construction Managers | 68 |
| | 23 | Education Administrators | 72 |
| | 30 | Engineering Managers | 68 |
| | 31 | Food Service Managers | 68 |
| | 32 | Funeral Directors | 59 |
| | 33 | Gaming Managers | 68 |
| | 34 | Lodging Managers | 68 |
| | 35 | Medical and Health Services Managers | 46 |
| | 36 | Natural Sciences Managers | 68 |
| | 40 | Postmasters and Mail Superintendents | 60 |
| | 41 | Property, Real Estate, and Community Association Managers | 32 |
| | 42 | Social and Community Service Managers | 68 |
| | 43 | Managers, All Other | 68 |
| II | Business and Financial Operations Occupations: (50-99 less 51) | | High |
| | 50 | Agents and Business Managers of Artists, Performers, and Athletes | 68 |
| | 52 | Wholesale and Retail Buyers, Except Farm Products | 72 |
| | 53 | Purchasing Agents, Except Wholesale, Retail, and Farm Products | 77 |
| | 54 | Claims Adjusters, Appraisers, Examiners, and Investigators | 66 |
| | 56 | Compliance Officers, Except Ag, Const, Hth, Safety, and Trans | 63 |
| | 60 | Cost Estimators | 68 |
| | 62 | Human Resources, Training, and Labor Relations Specialists | 84 |
| | 70 | Logisticians | 65 |
| | 71 | Management Analysts | 86 |
| | 72 | Meeting and Convention Planners | 68 |
| | 73 | Other Business Operations Specialists | 66 |
| | 80 | Accountants and Auditors | 78 |
| | 81 | Appraisers and Assessors of Real Estate | 62 |
| | 82 | Budget Analysts | 68 |
| | 83 | Credit Analysts | 68 |
| | 84 | Financial Analysts | 68 |
| | 85 | Personal Financial Advisors | 73 |
| | 86 | Insurance Underwriters | 66 |
| | 90 | Financial Examiners | 63 |
| | 91 | Loan Counselors and Officers | 68 |
| | 93 | Tax Examiners, Collectors, and Revenue Agents | 78 |
| | 94 | Tax Preparers | 68 |
| | 95 | Financial Specialists, All Other | 68 |

Appendix (continued)

| | | | |
|---|---|---|---|
| III | Computer and Mathematical Science Occupations (100 to 129) | | High |
| | 100 | Computer Scientists and Systems Analysts | 65 |
| | 101 | Computer Programmers | 65 |
| | 102 | Computer Software Engineers | 65 |
| | 104 | Computer Support Specialists | 65 |
| | 106 | Database Administrators | 65 |
| | 110 | Network and Computer Systems Administrators | 65 |
| | 111 | Network Systems and data Communications Analysts | 65 |
| | 120 | Actuaries | 81 |
| | 121 | Mathematicians | 65 |
| | 122 | Operations Research Analysts | 65 |
| | 123 | Statisticians | 65 |
| | 124 | Miscellaneous Mathematical Science Occupations | 81 |
| IV | Architecture and Engineering Occupations: (130-159) | | High |
| | 130 | Architects, Except Naval | 90 |
| | 131 | Surveyors, Cartographers, and Photogrammetrists | 48 |
| | 132 | Aerospace Engineers | 87 |
| | 133 | Agricultural Engineers | 87 |
| | 134 | Biomedical Engineers | 87 |
| | 135 | Chemical Engineers | 90 |
| | 136 | Civil Engineers | 84 |
| | 140 | Computer Hardware Engineers | 84 |
| | 141 | Electrical and Electronics Engineers | 84 |
| | 142 | Environmental Engineers | 87 |
| | 143 | Industrial Engineers, Including Health and Safety | 86 |
| | 144 | Marine Engineers and Naval Architects | 82 |
| | 145 | Materials Engineers | 82 |
| | 146 | Mechanical Engineers | 82 |
| | 150 | Mining and Geological Engineers | 87 |
| | 151 | Nuclear Engineers | 80 |
| | 152 | Petroleum Engineers | 85 |
| | 153 | Engineers, All Other | 87 |
| | 154 | Drafters | 67 |
| | 155 | Engineering Technicians, Except Drafters | 62 |
| | 156 | Surveying and Mapping Technicians | 48 |
| V | Life, Physical, and Social Science Occupations: (160-199) | | High |
| | 160 | Agricultural and Food Scientists | 80 |
| | 161 | Biological Scientists | 80 |
| | 164 | Conservation Scientists and Foresters | 48 |
| | 165 | Medical Scientists | 80 |
| | 170 | Astronomers and Physicists | 80 |
| | 171 | Atmospheric and Space Scientists | 80 |
| | 172 | Chemists and Materials Scientists | 79 |
| | 174 | Environmental Scientists and Geoscientists | 80 |
| | 176 | Physical Scientists, All Other | 80 |
| | 180 | Economists | 81 |
| | 181 | Market and Survey Researchers | 81 |
| | 182 | Psychologists | 82 |
| | 183 | Sociologists | 81 |
| | 184 | Urban and Regional Planners | 65 |
| | 186 | Miscellaneous Social Scientists and Related Workers | 81 |
| | 190 | Agricultural and Food Science Technicians | 53 |
| | 191 | Biological Technicians | 53 |
| | 192 | Chemical Technicians | 53 |

Appendix (continued)

| | | | |
|---|---|---|---|
| | 193 | Geological and Petroleum Technicians | 62 |
| | 194 | Nuclear Technicians | 62 |
| | 196 | Other Life, Physical, and Social Science Technicians | 53 |
| VI | Community and Social Services Occupations (200-209) | | High |
| | 200 | Counselors | 65 |
| | 201 | Social Workers | 64 |
| | 202 | Miscellaneous Community and Social Service Specialists | 64 |
| | 204 | Clergy | 52 |
| | 205 | Directors, Religious Activities and Education | 56 |
| | 206 | Religious Workers, All Other | 56 |
| VII | Legal-High SEI (210, 211) | | High |
| | 210 | Lawyers | 93 |
| | 211 | Judges, Magistrates, and Other Judicial Workers | 93 |
| VIII | Legal-Mid SEI (214, 215) | | Mid |
| | 214 | Paralegals and Legal Assistants | 44 |
| | 215 | Miscellaneous Legal Support Workers | 44 |
| IX | Education, Training, and Library Occupations: (220-259) | | High |
| | 220 | Postsecondary Teachers | 84 |
| | 230 | Preschool and Kindergarten Teachers | 72 |
| | 231 | Elementary and Middle School Teachers | 72 |
| | 232 | Secondary School Teachers | 72 |
| | 233 | Special Education Teachers | 52 |
| | 234 | Other Teachers and Instructors | 52 |
| | 240 | Archivists, Curators, and Museum Technicians | 68 |
| | 243 | Librarians | 60 |
| | 244 | Library Technicians | 44 |
| | 254 | Teacher Assistants | 65 |
| | 255 | Other Education, Training, and Library Workers | 52 |
| X | Arts, Design, Entertainment, Sports, and Media - High SEI (260-272, 280-283, 285) | | High |
| | 260 | Artists and related workers | 67 |
| | 263 | Designers | 73 |
| | 270 | Actors | 60 |
| | 271 | Producers and Directors | 68 |
| | 272 | Athletes, Coaches, Umpires, and Related Workers | 64 |
| | 280 | Announcers | 65 |
| | 281 | News Analysts, reporters, and Correspondents | 82 |
| | 282 | Public relations Specialists | 82 |
| | 283 | Editors | 82 |
| | 285 | Writers and Authors | 76 |
| XI | Arts, etc. - Mid SEI (274-276, 284, 286-296) | | Mid |
| | 274 | Dancers and Choreographers | 45 |
| | 275 | Musicians, Singers, and Related Workers | 52 |
| | 284 | Technical writers | 31 |
| | 286 | Miscellaneous Media and Communication Workers | 31 |
| | 290 | Broadcast and Sound Engineering Technicians and Radio Operators | 53 |
| | 291 | Photographers | 50 |
| | 292 | Television, Video, and Motion Picture Camera Operators and Editors | 50 |
| | 296 | Media and Communication Equipment Workers, all Other | |
| XII | Healthcare - High SEI (300, 301, 304-306, 312, 314-316, 321-326) | | High |
| | 300 | Chiropractors | 75 |
| | 301 | Dentists | 96 |
| | 304 | Optometrists | 79 |
| | 305 | Pharmacists | 82 |
| | 306 | Physicians and surgeons | 92 |

Appendix (continued)

| | | | |
|---|---|---|---|
| | 312 | Podiatrists | 58 |
| | 314 | Audiologist | 58 |
| | 315 | Occupational Therapists | 58 |
| | 316 | Physical Therapists | 58 |
| | 321 | Recreation Therapists | 58 |
| | 322 | Respiratory Therapists | 58 |
| | 323 | Speech-Language Pathologists | 58 |
| | 324 | Therapists, All Others | 58 |
| | 325 | Veterinarians | 78 |
| | 326 | Health, Diagnosing and Treating Practitioners, All Other | 75 |
| XIII | Healthcare - Mid SEI (303, 311, 313, 320, 330-332, 340, 341, 350-354, 362-365) | | Mid |
| | 303 | Dietitians and Nutritionists | 39 |
| | 311 | Physician Assistants | 46 |
| | 313 | Registered Nurses | 46 |
| | 320 | Radiation Therapists | 48 |
| | 330 | Clinical Laboratory Technologists and Technicians | 48 |
| | 331 | Dental Hygienists | 48 |
| | 332 | Diagnostic Related Technologists and technicians | 48 |
| | 340 | Emergency Medical Technicians and Paramedics | 48 |
| | 341 | Health Diagnosing and treating Practitioner Support Technicians | 48 |
| | 350 | Licensed Practical and Licensed Vocational Nurses | 22 |
| | 351 | Medical Records and Health Information Technicians | 44 |
| | 352 | Opticians, Dispensing | 39 |
| | 353 | Miscellaneous Health Technologists and technicians | 48 |
| | 354 | Other Healthcare Practitioners and Technical Occupations | 48 |
| | 362 | Physical Therapist Assistants and Aides | 38 |
| | 363 | Massage Therapists | 26 |
| | 364 | Dental Assistants | 38 |
| | 365 | Medical Assistants and Other Healthcare Support Occupations | 38 |
| XIV | Healthcare - Low SEI (360, 361) | | Low |
| | 360 | Nursing, Psychiatric, and Home Health Aides | 13 |
| | 361 | Occupational Therapist Assistants and Aides | 13 |
| XV | Protective Service - Mid SEI (370-385) | | Mid |
| | 370 | First-Line Supervisors/Managers of Correctional Officers | 39 |
| | 371 | First-Line Supervisors/Managers of Police and Detectives | 39 |
| | 372 | First-Line Supervisors/Managers of Fire Fighting and prevention Workers | 37 |
| | 373 | Supervisors, Protective Service Workers, All Other | 18 |
| | 374 | Fire Fighters | 37 |
| | 375 | Fire Inspectors | 29 |
| | 380 | Bailiffs, Correctional Officers, and Jailers | 34 |
| | 382 | Detectives and Criminal Investigators | 39 |
| | 383 | Fish and Game Wardens | 39 |
| | 384 | Parking Enforcement Workers | 34 |
| | 385 | Police and Sheriff's Patrol Officers | 39 |
| XVI | Protective Service - Low SEI (386-395) | | Low |
| | 386 | Transit and Railroad Police | 17 |
| | 390 | Animal Control Workers | 19 |
| | 391 | Private Detectives and investigators | 18 |
| | 392 | Security Guards and Gaming Surveillance Officers | 18 |
| | 394 | Crossing Guards | 8 |
| | 395 | Lifeguards and Other Protective Service Workers | 19 |
| XVII | Food Preparation and Serving Related Occupations: (400-419) | | Low |
| | 400 | Chefs and Head Cooks | 15 |
| | 401 | First-Line Supervisors/Managers of Food Preparation and Serving Workers | 68 |

Appendix (continued)

| | | | |
|---|---|---|---|
| | 402 | Cooks | 15 |
| | 403 | Food Preparation Workers | 15 |
| | 404 | Bartenders | 19 |
| | 405 | Combined Food Preparation and Serving Workers, Including Fast Food | 11 |
| | 406 | Counter Attendants, Cafeteria, Food Concession, and Coffee Shop | 17 |
| | 411 | Waiters and Waitresses | 16 |
| | 412 | Food Servers, Nonrestaurant | 11 |
| | 413 | Dining Room and Cafeteria Attendants and Bartender Helpers | 11 |
| | 414 | Dishwashers | 11 |
| | 415 | Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop | 15 |
| | 416 | Food Preparation and Serving Related Workers, All Other | 11 |
| XVII | | | |
| I | Building and Grounds Cleaning and Maintenance Occupations: (420-429) | | Low |
| | 420 | First-Line Supervisors/Managers of Housekeeping and Janitorial Workers | 9 |
| | 421 | Supervisors/Mgrs of Landscaping, Lawn Service, and Groundskeeping Workers | 41 |
| | 422 | Janitors and Building Cleaners | 9 |
| | 423 | Maids and Housekeeping Cleaners | 10 |
| | 424 | Pest Control Workers | 18 |
| | 425 | Grounds Maintenance Workers | 11 |
| XIX | Personal Care & Serv Wkrs - Mid SEI (430, 441, 442, 446, 454-455, 460, 462, 464-465) | | Mid |
| | 430 | First-Line Supervisors/Managers of Gaming Workers | 68 |
| | 441 | Motion Picture Projectionists | 43 |
| | 442 | Ushers, Lobby Attendants, and Ticket Takers | 25 |
| | 446 | Funeral Service Workers | 26 |
| | 454 | Tour and Travel guides | 26 |
| | 455 | Transportation Attendants | 31 |
| | 460 | Child Care Workers | 26 |
| | 462 | Recreation and Fitness Workers | 52 |
| | 464 | Residential Advisors | 26 |
| | 465 | Personal Care and Service Workers, All Other | 26 |
| XX | Personal Care and Service Workers - Low SEI (432, 434, 435, 440, 443, 450-453, 461) | | Low |
| | 432 | First-Line Supervisors/Managers of Personal Service Workers | 19 |
| | 434 | Animal Trainers | 6 |
| | 435 | Nonfarm Animal Caretakers | 18 |
| | 440 | Gaming services Workers | 19 |
| | 443 | Miscellaneous Entertainment attendants and Related Workers | 19 |
| | 450 | Barbers | 17 |
| | 451 | Hairdressers, Hairstylists, and Cosmetologists | 17 |
| | 452 | Miscellaneous Personal Appearance Workers | 17 |
| | 453 | Baggage Porters, Bellhops, and Concierges | 4 |
| | 461 | Personal and Home Care Aides | 13 |
| XXI | Sales - High SEI (470-471, 480-483, 492-493) | | High |
| | 470 | First-Line Supervisors/Managers of Retail Sales Workers | 68 |
| | 471 | First-Line Supervisors/Managers of Non-Retail Sales Workers | 68 |
| | 480 | Advertising Sales Agents | 66 |
| | 481 | Insurance Sales Agents | 66 |
| | 482 | Securities, Commodities, and Financial services Sales Agents | 73 |
| | 483 | Travel Agents | 60 |
| | 492 | Real Estate Brokers and Sales Agents | 62 |
| | 493 | Sales Engineers | 87 |

Appendix (continued)

| | | | |
|---|---|---|---|
| XXII | Sales - Mid SEI (472, 474-476, 484-485, 490, 494-496) | | Mid |
| | 472 | Cashiers | 44 |
| | 474 | Counter and Rental Clerks | 44 |
| | 475 | Parts Salespersons | 47 |
| | 476 | Retail Salespersons | 47 |
| | 484 | Sales Representatives, Services, All Other | 47 |
| | 485 | Sales Representatives, Wholesale and Manufacturing | 47 |
| | 490 | Models, Demonstrators, and Product Promoters | 35 |
| | 494 | Telemarketers | 47 |
| | 495 | Door-to-Door Sales Workers, News and Street Vendors, and Related Workers | 27 |
| | 496 | Sales and Related Workers, All Other | 47 |
| XXII I | Office and Administrative Support Occupations: (500-599) | | Mid |
| | 500 | First-Line Supervisors/Managers of Office and Administrative Support Workers | 68 |
| | 501 | Switchboard Operators, Including Answering Service | 45 |
| | 502 | Telephone Operators | 45 |
| | 503 | Communications Equipment Operators, All Other | 45 |
| | 510 | Bill and Account Collectors | 39 |
| | 511 | Billing and Posting Clerks and Machine Operators | 44 |
| | 512 | Bookkeeping, Accounting, and Auditing Clerks | 51 |
| | 513 | Gaming Cage Workers | 44 |
| | 514 | Payroll and Timekeeping Clerks | 44 |
| | 515 | Procurement Clerks | 44 |
| | 516 | Tellers | 52 |
| | 520 | Brokerage Clerks | 44 |
| | 521 | Correspondence Clerks | 44 |
| | 522 | Court, Municipal, and License Clerks | 44 |
| | 523 | Credit Authorizers, Checkers, and Clerks | 44 |
| | 524 | Customer Service Representatives | 44 |
| | 525 | Eligibility Interviewers, Government Programs | 44 |
| | 526 | File Clerks | 44 |
| | 530 | Hotel, Motel, and Resort Desk Clerks | 44 |
| | 531 | Interviewers, Except Eligibility and Loan | 44 |
| | 532 | Library Assistants, Clerical | 44 |
| | 533 | Loan Interviewers and Clerks | 44 |
| | 534 | New Accounts Clerks | 44 |
| | 535 | Order Clerks | 44 |
| | 536 | Human Resources Assistants, Except Payroll and Timekeeping | 44 |
| | 540 | Receptionists and Information Clerks | 44 |
| | 541 | Reservation and Transportation Ticket Agents and Travel Clerks | 60 |
| | 542 | Information and Record Clerks, All Other | 44 |
| | 550 | Cargo and Freight Agents | 22 |
| | 551 | Couriers and Messengers | 28 |
| | 552 | Dispatchers | 40 |
| | 553 | Meter Readers, Utilities | 44 |
| | 554 | Postal Service Clerks | 44 |
| | 555 | Postal Service Mail Carriers | 53 |
| | 556 | Postal Service Mail Sorters, Processors, and Processing Machine Operators | 44 |
| | 560 | Production, Planning, and Expediting Clerks | 44 |
| | 561 | Shipping, Receiving, and Traffic Clerks | 22 |
| | 562 | Stock Clerks and Order Fillers | 44 |
| | 563 | Weighers, Measurers, Checkers, and Samplers, Recordkeeping | 44 |
| | 570 | Secretaries and Administrative Assistants | 61 |
| | 580 | Computer Operators | 45 |

Appendix (continued)

| | | | |
|---|---|---|---|
| | 581 | Data Entry Keyers | 45 |
| | 582 | Word Processors and Typists | 61 |
| | 583 | Desktop Publishers | 61 |
| | 584 | Insurance Claims and Policy Processing Clerks | 44 |
| | 585 | Mail Clerks and Mail Machine Operators, Except Postal Service | 44 |
| | 586 | Office Clerks, General | 44 |
| | 590 | Office Machine Operators, Except Computer | 45 |
| | 591 | Proofreaders and Copy Markers | 44 |
| | 592 | Statistical Assistants | 44 |
| | 593 | Office and Administrative Support Workers, All Other | 44 |
| XXIV | | Construction and Extraction - Mid SEI (620-622,630-632,635-640,644-650,652-653,666-670) | Mid |
| | 620 | First-Line Supervisors/Managers of Construction Trades and Extraction Workers | 68 |
| | 621 | Boilermakers | 39 |
| | 622 | Brickmasons, Blockmasons, and Stonemasons | 27 |
| | 630 | Paving, Surfacing, and Tamping Equipment Operators | 24 |
| | 631 | Pile-Driver Operators | 24 |
| | 632 | Operating Engineers and Other Construction Equipment Operators | 24 |
| | 635 | Electricians | 44 |
| | 636 | Glaziers | 26 |
| | 640 | Insulation Workers | 32 |
| | 644 | Pipelayers, Plumbers, Pipefitters, and Steamfitters | 34 |
| | 646 | Plasterers and Stucco Masons | 25 |
| | 650 | Reinforcing Iron and Rebar Workers | 24 |
| | 652 | Sheet Metal Workers | 33 |
| | 653 | Structural Iron and Steel Workers | 34 |
| | 666 | Construction and Building Inspectors | 41 |
| | 670 | Elevator Installers and Repairers | 27 |
| | 672 | Hazardous Materials Removal Workers | 32 |
| XXV | | Construction and Extraction - Low SEI (623-626,633,642-643,651,660,671-694) | Low |
| | 623 | Carpenters | 19 |
| | 624 | Carpet, Floor, and Tile Installers and Finishers | 12 |
| | 625 | Cement Masons, Concrete Finishers, and Terrazzo Workers | 19 |
| | 626 | Construction Laborers | 8 |
| | 633 | Drywall Installers, Ceiling Tile Installers, and Tapers | 18 |
| | 642 | Painters, Construction and Maintenance | 16 |
| | 643 | Paperhangers | 10 |
| | 651 | Roofers | 15 |
| | 660 | Helpers, Construction Trades | 8 |
| | 671 | Fence Erectors | 8 |
| | 673 | Highway Maintenance Workers | 8 |
| | 674 | Rail-Track Laying and Maintenance Equipment Operators | 8 |
| | 675 | Septic Tank Servicers and Sewer Pipe Cleaners | 8 |
| | 676 | Miscellaneous Construction and Related Workers | 8 |
| | 680 | Derrick, Rotary Drill, and Service Unit Operators, Oil, Gas, and Mining | 10 |
| | 682 | Earth Drillers, Except Oil and Gas | 10 |
| | 683 | Explosives Workers, Ordinance Handling Experts, and Blasters | 11 |
| | 684 | Mining machine Operators | 10 |
| | 691 | Roof Bolters, Mining | 10 |
| | 692 | Roustabouts, Oil and Gas | 10 |
| | 693 | Helpers--Extraction Workers | 8 |
| | 694 | Other Extraction Workers | 8 |
| XVI | | Installation, Maintenance, and Repair Occupations: (700-769) | Mid |
| | 700 | First-Line Supervisors/Managers of Mechanics, Installers, and Repairers | 49 |
| | 701 | Computer, Automated Teller, and Office Machine Repairers | 36 |

Appendix (continued)

| | | |
|---|---|---|
| 702 | Radio and Telecommunications Equipment Installers and Repairers | 49 |
| 703 | Avionics Technicians | 36 |
| 704 | Electric Motor, Power Tool, and Related Repairers | 27 |
| 705 | Electrical and Electronics Installers and Repairers, Transportation Equipment | 27 |
| 710 | Electrical and Electronics Repairers, Industrial and Utility | 36 |
| 711 | Electronic Equipment Installers and Repairers, Motor Vehicles | 27 |
| 712 | Electronic Home Entertainment Equipment Installers and Repairers | 36 |
| 713 | Security and Fire Alarm Systems Installers | 44 |
| 714 | Aircraft Mechanics and Service Technicians | 48 |
| 715 | Automotive Body and Related Repairers | 19 |
| 716 | Automotive Glass Installers and Repairers | 19 |
| 720 | Automotive Service Technicians and Mechanics | 19 |
| 721 | Bus and Truck Mechanics and Diesel Engine Specialists | 19 |
| 722 | Heavy Vehicle and Mobile Equipment Service Technicians and Mechanics | 27 |
| 724 | Small Engine Mechanics | 18 |
| 726 | Miscellaneous Vehicle and Mobile Equipment Mechanics, Installers, & Repairers | 19 |
| 730 | Control and Valve Installers and Repairers | 27 |
| 731 | Heating, Air Conditioning, and Refrigeration Mechanics and Installers | 27 |
| 732 | Home Appliance Repairers | 27 |
| 733 | Industrial and Refractory Machinery Mechanics | 27 |
| 734 | Maintenance and Repair Workers, General | 27 |
| 735 | Maintenance Workers, Machinery | 15 |
| 736 | Millwrights | 31 |
| 741 | Electrical Power-Line Installers and Repairers | 49 |
| 742 | Telecommunications Line Installers and Repairers | 49 |
| 743 | Precision Instrument and Equipment Repairers | 36 |
| 751 | Coin, Vending, and Amusement Machine Servicers and Repairers | 32 |
| 752 | Commercial Divers | 27 |
| 754 | Locksmiths and Safe Repairers | 27 |
| 755 | Manufactured Building and Mobile Home Installers | 27 |
| 756 | Riggers | 27 |
| 760 | Signal and Track Switch Repairers | 44 |
| 761 | Helpers--Installation, Maintenance, and Repair Workers | 18 |
| 762 | Other Installation, Maintenance, and Repair Workers | 27 |
| XXVII | Production Occupations - Low SEI (771-775,783-785, 795-796, 801-802, 804,810,812, 820, 822, 830-834, 836, 840-842, 846, 851, 853-855,863-865, 871-874,880-881,885-886, 890, 892-896) | Low |
| 771 | Aircraft Structure, Surfaces, Rigging, and Systems Assemblers | 18 |
| 772 | Electrical, Electronics, and Electromechanical Assemblers | 18 |
| 773 | Engine and Other Machine Assemblers | 18 |
| 774 | Structural Metal Fabricators and Fitters | 18 |
| 775 | Miscellaneous Assemblers and Fabricators | 18 |
| 783 | Food & Tobacco Roasting, Baking, & Drying Machine Operators & Tenders | 18 |
| 784 | Food Batchmakers | 18 |
| 785 | Food Cooking Machine Operators and Tenders | 8 |
| 795 | Cutting, Punching, & Press Machine Setters, Opers, & Tenders, Metal & Plastic | 18 |
| 796 | Drilling & Boring Machine Tool Setters, Operators, & Tenders, Metal & Plastic | 18 |
| 801 | Lathe & Turning Machine Tool Setters, Operators, & Tenders, Metal & Plastic | 18 |
| 802 | Milling and Planning Machine Setters, Operators, Tenders, Metal and Plastic | 18 |
| 804 | Metal Furnace and Kiln Operators and Tenders | 17 |
| 810 | Molders & Molding Machine Setters, Operators, & Tenders, Metal & Plastic | 18 |
| 812 | Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic | 18 |
| 820 | Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic | 18 |
| 822 | Metalworkers and Plastic Workers, All Other | 18 |
| 830 | Laundry and Dry-Cleaning Workers | 15 |

Appendix (continued)

| | | |
|---|---|---|
| 831 | Pressers, Textile, Garment, and Related Materials | 15 |
| 832 | Sewing Machine Operators | 18 |
| 833 | Shoe and Leather Workers and Repairers | 12 |
| 834 | Shoe Machine Operators, and Tenders | 18 |
| 836 | Textile Bleaching and dyeing Machine Operators and Tenders | 18 |
| 840 | Textile Cutting Machine Setters, Operators, and Tenders | 18 |
| 841 | Textile Knitting and Weaving Machine Setters, Operators, and Tenders | 6 |
| 842 | Textile Winding, Twisting, & Drawing Out Machine Setters, Operators, & Tenders | 18 |
| 846 | Textile, Apparel, and Furnishings Workers, All Other | 18 |
| 851 | Furniture Finishers | 18 |
| 853 | Sawing Machine Setters, Operators, and Tenders, Wood | 5 |
| 854 | Woodworking Machine Setters, Operators, and Tenders, Except Sawing | 18 |
| 855 | Woodworkers, All Other | 18 |
| 863 | Miscellaneous Plant and System Operators | 10 |
| 864 | Chemical Processing Machine Setters, Operators, and Tenders | 18 |
| 865 | Crushing, Grinding, Polishing, Mixing, and Blending Workers | 18 |
| 871 | Cutting Workers | 18 |
| 872 | Extruding, Forming, Pressing, & Compacting Machine Setters, Opers, & Tenders | 18 |
| 873 | Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders | 17 |
| 874 | Inspectors, Testers, sorters, Samplers, and Weighters | 18 |
| 880 | Packaging and Filling machine Operators and Tenders | 18 |
| 881 | Painting workers | 18 |
| 885 | Cementing and Gluing Machine Operators and Tenders | 18 |
| 886 | Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders | 18 |
| 890 | Cooling and Freezing Equipment Operators and Tenders | 18 |
| 892 | Molders, Shapers, and Casters, Except Metal and Plastic | 18 |
| 893 | Paper Goods machine-Setters, Operators, and Tenders | 18 |
| 894 | Tire Builders | 18 |
| 895 | Helpers--Production Workers | 8 |
| 896 | Production Workers, All Other | 18 |
| XXVIII | Production Occupations - Mid SEI (770, 780-781, 790, 792-794, 800, 803, 806, 813-816, 821, 823-826, 835, 843-845, 850, 852, 860-862, 875-876, 883-886, 890-891) | Mid |
| 770 | First-Line Supervisors/Managers of Production and Operating Workers | 49 |
| 780 | Bakers | 22 |
| 781 | Butchers and Other Meat, Poultry, and Fish Processing Workers | 29 |
| 790 | Computer Control Programmers and Operators | 53 |
| 792 | Extruding & Drawing Machine Setters, Operators, & Tenders, Metal & Plastic | 23 |
| 793 | Forging Machine Setters, Operators, and Tenders, Metal and Plastic | 23 |
| 794 | Rolling Machine Setters, Operators, and Tenders, Metal and Plastic | 22 |
| 800 | Grinding, Lapping, Polishing, & Buffing Machine, Opers, & Tndrs, Metal & Plastic | 22 |
| 803 | Machinists | 33 |
| 806 | Model Makers and Patternmakers, Metal and Plastic | 44 |
| 813 | Tool and Die Makers | 50 |
| 814 | Welding, Soldering, and Brazing Workers | 24 |
| 815 | Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic | 22 |
| 816 | Lay-Out Workers, Metal and Plastic | 34 |
| 821 | Tool Grinders, Filers, and Sharpeners | 22 |
| 823 | Bookbinders and Bindery Workers | 33 |
| 824 | Job Printers | 49 |
| 825 | Prepress Technicians and Workers | 52 |
| 826 | Printing Machine Operators | 49 |
| 835 | Tailors, Dressmakers, and Sewers | 23 |
| 843 | Extruding & Forming Machine Setters, Opers, & Tndrs, Synthetic & Glass Fibers | 22 |
| 844 | Fabric and Apparel Patternmakers | 22 |
| 845 | Upholsterers | 22 |

Appendix (continued)

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|---|---|---|---|
| | 850 | Cabinetmakers and Bench Carpenters | 23 |
| | 852 | Model Makers and Patternmakers, Wood | 22 |
| | 860 | Power Plant Operators, Distributors, and dispatchers | 50 |
| | 861 | Stationary Engineers and Boiler Operators | 47 |
| | 862 | Water and Liquid Waste Treatment Plant and System Operators | 47 |
| | 875 | Jewelers and Precious Stone and Metal Workers | 36 |
| | 876 | Medical, Dental, and Ophthalmic Laboratory Technicians | 48 |
| | 883 | Photographic Process Workers and Processing Machine Operators | 42 |
| | 884 | Semiconductor Processors | 42 |
| | 890 | Cooling and Freezing Equipment Operators and Tenders | 22 |
| | 891 | Etchers and Engravers | 47 |
| XXIX | | Transportation and Material Moving - High SEI (900-904,920-924,931-933) | High |
| | 900 | Supervisors, Transportation and Material Moving Workers | 68 |
| | 903 | Aircraft Pilots and Flight Engineers | 79 |
| | 904 | Air Traffic Controllers and Airfield Operation Specialists | 69 |
| | 920 | Locomotive Engineers and Operators | 58 |
| | 923 | Railroad Brake, Signal, and Switch Operators | 42 |
| | 924 | Railroad Conductors and Yardmasters | 58 |
| | 931 | Ship and Boat Captains and Operators | 34 |
| | 933 | Ship Engineers | 88 |
| XXX | | Transportation and Material Moving - Low SEI (913-915,930,934-975) | Low |
| | 913 | Driver/Sales Workers and Truck Drivers | 15 |
| | 914 | Taxi Drivers and Chauffeurs | 10 |
| | 915 | Motor Vehicle Operators, All Other | 10 |
| | 930 | Sailors and Marine Oilers | 16 |
| | 934 | Bridge and Lock Tenders | 19 |
| | 935 | Parking Lot Attendants | 19 |
| | 936 | Service Station Attendants | 19 |
| | 941 | Transportation Inspectors | 18 |
| | 942 | Other Transportation Workers | 8 |
| | 950 | Conveyor Operators and Tenders | 19 |
| | 951 | Crane and Tower Operators | 21 |
| | 952 | Dredge, Excavating, and Loading Machine Operators | 24 |
| | 956 | Hoist and Winch Operators | 21 |
| | 960 | Industrial Truck and Tractor Operators | 18 |
| | 961 | Cleaners of Vehicles and Equipment | 8 |
| | 962 | Laborers and Freight, Stock, and Material Movers, Hand | 8 |
| | 963 | Machine Feeders, and Offbearers | 8 |
| | 964 | Packers and Packagers, Hand | 18 |
| | 965 | Pumping Station Operators | 8 |
| | 972 | Refuse and Recyclable Material Collectors | 8 |
| | 974 | Tank, Car, Truck, and Ship Loaders | 8 |
| | 975 | Material Moving Workers, All Other | 8 |
| XXXI | | Transportation & Material Moving - Mid SEI (911-912, 923, 926, 931, 934, 950-952. 956) | Mid |
| | 911 | Ambulance Drivers and Attendants, Except Emergency Medical Technicians | |
| | 912 | Bus Drivers | 24 |
| | 923 | Railroad Brake, Signal, and Switch Operators | 42 |
| | 926 | Subway, Streetcar, and Other Rail Transportation Workers | 34 |
| | 931 | Ship and Boat Captains and Operators | 34 |
| | 934 | Bridge and Lock Tenders | 34 |
| | 950 | Conveyor Operators and Tenders | 24 |
| | 951 | Crane and Tower Operators | 21 |
| | 952 | Dredge, Excavating, and Loading Machine Operators | 24 |
| | 956 | Hoist and Winch Operators | 21 |