

Native Competition and Low-Skilled Immigrant Inflows*

Brian C. Cadena [†]
University of Colorado - Boulder

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Abstract

This paper demonstrates that immigration flows respond to differences in labor market conditions by documenting the systematic change in newly arriving low-skilled immigrants' location choices in response to exogenous supply increases among the US-born. In contrast to previous treatments of this question, this paper relies on an identifiable source of exogenous variation that alters the expected returns to entering a labor market. Using pre-reform welfare participation rates as an instrument for changes in native labor supply, I find that immigrant inflows shifted away from cities with more welfare leavers toward cities with smaller reform-induced supply shifts. In addition, the empirical methods I use improve upon previous immigrant location studies by explicitly allowing for unobserved city amenities that provide different values based on the immigrant's source country. The extent of the selection uncovered is substantial: for each additional native woman working in a city as a result of welfare reform, 0.8 fewer female immigrants choose to live and work there. These results provide direct evidence that selective location choices among immigrants tend to equilibrate labor market returns across geography.

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[†]E-mail: brian.cadena@colorado.edu

1 Introduction

Nearly twenty percent of working age adults living in the United States with no more than a high school education were born elsewhere.¹ These low-skilled immigrants come to the United States for a variety of reasons, but many choose to leave in search of labor market opportunities better than those in their home country.² This paper investigates how geographic differences in expected earnings within the United States influence newly arriving low-skilled immigrants' location decisions. Time series evidence suggests that potential immigrants, especially those entering the U.S. without authorization, consider their labor market prospects when deciding whether to enter the United States (Hanson and Spilimbergo 1999, McLaren 2006). Further, given that most of the costs of moving across national borders are fixed costs, it is reasonable to expect immigrants to be quite responsive to differences in expected earnings as they select a particular local labor market within the U.S. These selective location decisions have important consequences for the U.S. labor market, as a large supply of earnings-sensitive immigrants will tend to smooth out local shocks over the entire country and bring the labor market toward geographic equilibrium.³

To attempt to provide empirical support for this hypothesis, several studies have examined whether immigration flows are drawn disproportionately to areas with higher wage rates for their skill type.⁴ There are, however, two primary challenges to interpreting results

¹Authors tabulations of the 2000 five percent PUMS.

²Economists have long considered migration as an investment driven by differences in expected earnings (Sjaastad 1962). Borjas (1987) first developed the hypothesis that US labor markets should be especially attractive to immigrants at the low end of the skill distribution from countries with larger returns to skill. Although empirical evidence suggests that immigrants are more likely to be drawn from the middle of the skill distribution in their home country, they nevertheless tend to fall in the bottom portion of the U.S. skill distribution (Chiquiar and Hanson 2005).

³Sjaastad (1962) first proposed that earnings-motivated internal migration decisions may create this positive externality. Topel (1986) provided a formal treatment of the relationship between mobility costs and the persistence of geographic inequality. Borjas (2001) articulated the possibility that earnings-selective location decisions among new immigrants may eliminate the necessity for natives to incur the costs of moving.

⁴Examples include Bartel (1989), Borjas (2001), Kaushal (2005), and Jaeger (2007).

based on this approach, and they have proven difficult to overcome. First, measured geographic differences using native wage rates are unlikely to capture exogenous differences in the wages immigrants can expect. Instead, they may proxy for unobserved quality among native workers, or they may reflect unobserved local public goods and other location amenities (Roback 1982).⁵ Second, immigrants are new labor market entrants who value both the probability of finding employment and the expected wage conditional on securing a job. Focusing exclusively on wages therefore excludes a central component of the returns to joining and searching in a particular labor market.

In this paper, I overcome both of these difficulties by exploiting differently sized labor market shocks that affect both the employment probability and future wage dynamics. During the 1990s, a series of policy changes to the former Aid to Families with Dependent Children (AFDC) program created an exogenous labor supply shift. As a result of the altered policy environment, the employment rate among low-skilled native women in the target population increased by nearly fifteen percentage points. Moreover, the effect of welfare reform on the labor supply of natives was not equally distributed across cities. Instead, the increase in native female employment within a local labor market was primarily a function of the size of the population affected by the policy changes. With different benefit levels across states and important demographic differences across cities and states, the size of welfare caseloads varied dramatically prior to reform.

This variation in the size of supply shocks provides an ideal means of evaluating how strongly immigrants's location decisions respond to differences in local labor market conditions. The women entering the labor market as a result of welfare reform tend to work in the same types of jobs as newly arriving low-skilled immigrants, and the increase in labor supply among natives can therefore be viewed as an increase in the number of searching workers for

⁵Also, see Shimer (2001) for a critique of the method employed in Borjas (2001).

each vacancy that a new immigrant might hope to fill. This competition will therefore have a direct effect on the probability of finding employment in the short term, and it will place downward pressure on wages over the medium run. In addition, by focusing my analysis on differently-sized shocks that alter the present discounted value of entering each labor market, I am able to use a first-differenced specification to account for the existence of unobserved locational amenities.

My results provide strong evidence that immigrants respond to these labor market incentives. Comparing the geographic distribution of newly arriving immigrants in the 2000 census to that in the 1990 census, there is a marked shift away from cities with large welfare-reform induced shocks toward cities with fewer welfare leavers. Back of the envelope calculations suggest that each welfare leaver who becomes employed in a local labor market is offset by 0.8 fewer new female immigrants employed in that location.

I also present several additional pieces of evidence that support interpreting this relationship as the causal effect of labor market conditions on immigration flows. I include a number of additional control variables, including measures of potentially offsetting changes in demand and controls that allow for a secular increase in the dispersion of immigrants across the country. Each of these variables enters the model in the expected direction, yet the negative effect of the reform-induced supply shocks remains significant, both economically and statistically. Additionally, I repeat the entire analysis using the census surveys immediately prior to welfare reform. In a period with no major changes to the welfare system (the 1980s), a city's initial welfare participation rate is unrelated both to changes in native employment and to changes in immigrants' location decisions. Finally, I demonstrate that the negative relationship is strongest among immigrants who made their most recent move after the implementation of welfare reform, a result consistent with a causal interpretation.

The finding that local low-skilled immigration inflows are quite sensitive to labor market

conditions has important implications across several literatures. This paper contributes most directly to the literature concerned with the extent to which migration flows mitigate geographic labor market inequality. As predicted by theory, empirical studies find that internal migration tends to diffuse local labor market shocks and to equalize returns across space.⁶ Yet disaggregating internal migration flows by skill type reveals substantial heterogeneity. Minority workers and the less-educated have significantly lower mobility rates, and are thus disproportionately affected by local demand shocks (Bound and Holzer 2000). As suggested by the framework presented in Borjas (2001), therefore, the ability of earnings-sensitive immigrants to diffuse local shocks throughout the country presents a frequently overlooked benefit to allowing large numbers of low-skilled immigrants to enter US labor markets. A complete analysis of an optimal immigration policy should take account of the cost savings that low-skilled immigration creates by preventing low-skilled natives from incurring considerable moving costs.⁷

Additionally, a large literature has relied on geographic variation in the settlement pattern of immigrants to determine the effect of immigration on native labor market outcomes.⁸ On the whole, these studies reveal very similar changes in wage and employment outcomes for native workers, regardless of whether a location received large or small immigration inflows (Smith and Edmonston 1997). These results are surprising, given the extent to which immigration has altered the overall skill endowments in the national economy (Borjas, Freeman and Katz 1997, Borjas 2003). Although several mechanisms have been proposed

⁶As prime examples, see Topel (1986), Barro and Sala-I-Martin (1991) and Blanchard and Katz (1992).

⁷Of course, increasing the nation's endowment of low-skilled workers is likely to have an adverse effect on overall wages for this group. It is certainly possible that allowing large flows of low-skilled immigrants will, on net, have an adverse effect on low-skilled natives. Nevertheless, the findings in this paper suggest that focusing only on the costs of lower wages omits an important component of the other side of ledger.

⁸Card's (1990) influential paper found virtually no effect of the Mariel Boatlift on Miami's labor market. Additional examples of this general methodology include Altonji and Card (1991), Lalonde and Topel (1991) and Schoeni (1997).

to explain this discrepancy, none has found empirical support.⁹ The degree of selectivity identified in this paper suggests that these small differences across space may, in fact, reflect the equilibrium behavior of an immigrant population that successfully equalizes the returns to locating in any local labor market. Consistent with this interpretation, Card and Lewis (2007) document the diffusion of newly arriving Mexican immigrants over the 1990s. In contrast to prior cohorts, these immigrants tended not to cluster as tightly in traditional locations (i.e. California and Texas) and instead located in several cities that had previously seen very few Mexican immigrants. As in many previous studies, the authors find that natives in cities with larger “surprising” new inflows fared no worse than natives in other cities. Yet, these new destinations tended to have smaller relative numbers of former welfare recipients entering the labor market.¹⁰ Unfortunately, using previous settlement patterns as an instrument for current inflows may fail to address this endogeneity entirely, especially if those earlier flows resulted from serially correlated shocks to relative demand.

Finally, many studies use cross-geography comparisons to evaluate the effect of labor market policies. The results of this paper suggest that these types of research designs will tend to underestimate the effect of any policy susceptible to arbitrage by low-skilled immigrants. As one concrete example, Blank and Gelbach (2006) find little evidence that welfare leavers had any detrimental effect on the employment and wages of other potential labor market substitutes, e.g. low-skilled men. These somewhat surprising results are consistent with immigrants intentionally locating in areas with fewer women leaving the welfare rolls for

⁹One alternative, the “skating rink” hypothesis suggests that immigrant inflows are offset by native outflows. The empirical evidence, however, finds very little support for this hypothesis (Card and DiNardo 2000, Card 2001). Alternatively, local economies could adjust to their changing endowments by altering the mix of products they produce, but the empirical evidence again rules out this possibility (Lewis 2003).

¹⁰The cities the authors mention in the text as surprising are Houston, Dallas, Atlanta, Phoenix, Las Vegas, New York, Denver, Portland, Salt Lake City, Washington, DC, Seattle, Raleigh-Durham, Greensboro and Charlotte. Only New York, Seattle and Raleigh-Durham had pre-reform participation rates above the median.

employment. In general, future geography-based policy evaluation research should take account of selective immigration inflows as a potential confounding factor, even in the absence of significant internal migration among natives.

The remainder of the paper is organized as follows: the next section provides a conceptual framework for evaluating the role of labor market expectations in immigrants' location decisions and presents descriptive evidence detailing welfare reform's disparate geographic effect on native labor supply; Section 3 presents a discrete choice model and motivates the appropriate empirical methodology for estimation; Section 4 discusses the data sources and sample construction; Section 5 provides the main empirical results and additional robustness checks; the final section further discusses the implications of these findings for previous research and for future policy decisions.

2 Conceptual Framework

This section provides a framework for interpreting the subsequent empirical analysis. I begin by discussing the role of expected earnings in an immigrant's location decision, emphasizing that low-skilled immigrants are likely to enter U.S. labor markets as searching workers rather than having already secured employment. I then discuss the labor supply changes among native low-skilled women in response to welfare reform and how these are likely to affect the expected earnings of new immigrants.

2.1 Expected Earnings and Location Choice

Suppose that each metropolitan area in the United States offers an immigrant a level of utility from settling there: U_{isdt} . In this notation, i indexes individuals, s indexes the source region,

d denotes destinations (e.g MSAs) and t indexes time periods (e.g. census decades).¹¹ The immigrant's decision rule can be expressed in a straightforward way: she chooses to move to location j if and only if $U_{isjt} > U_{isdt} \quad \forall d \neq j$.

The central question is the extent to which relative labor market prospects affect the relative utility that each location offers, and thus the likelihood that an immigrant selects a particular location. To begin, I define the total labor market returns as the present discounted value of the stream of expected future earnings that a location offers. For concreteness, suppose that each worker inelastically supplies one unit of labor when employed. Then the expected earnings k periods after migrating depend on the probability of being employed (p^k) and the expected wage conditional on having found employment: $\mathbf{E}[w^k | p^k = 1]$. The total value of the stream of future income an immigrant with discount factor $\delta < 1$ expects to earn if she moves to location d in year t is thus:¹²

$$PDV_{dt} = \sum_{k=0}^T \delta^k (p_{dt}^k \cdot \mathbf{E}[w_{dt}^k | p_{dt}^k = 1]) \quad (1)$$

Notice that a location's wage rate is only one component of the total labor market returns it offers (Topel 1986). Several authors have used the wages of similarly-skilled workers as a measure of immigrants' expected earnings; yet very little attention has been paid to the probability of finding and maintaining employment (c.f. Bartel 1989, Borjas 2001, Kaushal 2005, Jaeger 2007). This frequent simplification is likely driven by data availability. In the absence of reliable data on the probability of finding employment or the length of initial unemployment spells, replacing expected earnings with prevailing wage rates may provide a

¹¹Because the data I will use do not provide information on potential immigrants who choose not to migrate, I model only the decision of where to locate conditional on deciding to move to the US. This simplification implicitly assumes that the relative utility of cities within the US is independent of the value of remaining at home.

¹²By omitting the subscript s , I am assuming that similarly-skilled workers from different source countries are perfect substitutes for each other.

reasonable approximation.

Yet, there are several reasons why focusing exclusively on wages is likely to mismeasure the actual returns as perceived by new immigrants. First, immigrants are, by definition, new entrants into a labor market. Although some may move to a city having already secured employment, most will begin their search upon arrival. Additionally, many immigrants (especially those who are unauthorized) enter the country with a relatively short expected time horizon (i.e. low T).¹³ From their perspective, the expected length of time spent unemployed is likely a primary component of each city's perceived monetary benefits. Moreover, if immigrants are risk-averse (rather than risk-neutral as modeled above), they will be more willing to trade off an increase in potential wages for a decrease in the risk of failing to secure employment. Finally, many low-skilled immigrants enter the US having paid large fixed costs (e.g. paying for a coyote or other transportation costs), likely leaving them with low levels of assets.¹⁴ Any resulting liquidity constraints may also increase the relative importance of the employment probability if new migrants must satisfy a period-by-period budget constraint rather than a lifetime one.

Despite these concerns, the correlation between wage rates and expected labor market returns is likely still positive. The above discussion suggests, however, that variation in labor market tightness may reduce the strength of this relationship, especially if wages and employment probabilities are negatively correlated. Ideally, then, one would identify labor market shocks that affect both the probability of finding employment and the conditional wage rate in the same direction. Using these shocks rather than changes in measured wages would ensure a clean prediction of how the location decisions of expected earnings-maximizing im-

¹³Munshi (2003) details the importance of network connections in facilitating these searches as well as the cyclical nature of migration, wherein the duration of most U.S. stays is relatively short.

¹⁴Orrenius and Zavodny (2005) find that the lowest-skilled Mexican workers do not migrate, consistent with migration requiring an up-front cost out of savings.

migrants should respond. In the following subsection, I present evidence that the policy changes comprising welfare reform provide a unique opportunity to do exactly this.

2.2 Welfare Reform and Native Labor Supply

Over the 1990s, several policy changes were implemented, each of which was designed to increase labor market participation among native women previously eligible for cash welfare benefits. I begin by discussing these changes and how their combined effect created incentives for many low-skilled native women to enter or remain in the workforce. I then provide empirical evidence that these reforms succeeded in substantially increasing the labor market attachment of the target population and that local welfare participation rates prior to reform reliably predict local increases in native female employment over the reform period. Finally, I discuss how these supply shifts should affect immigrants' earnings expectations.

The federal cash welfare system, first implemented in 1935, was originally designed to provide for the material needs of widows with dependent children. By the late 1970s, the demographic makeup of the welfare rolls had changed dramatically. Widows were covered by social security and rising rates of divorce and non-marital childbearing meant that most recipients were in families headed by divorced and never-married mothers. As greater numbers of married women worked, there was political pressure to increase employment among mothers on welfare. In the early 1990s, states were given expanded authority to secure federal waivers from AFDC program rules and in 1996 the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) ended the AFDC program.

After reform, cash assistance was no longer a federal entitlement program; seeking or participating in employment became a pre-condition for benefit receipt. Welfare offices implemented work support and "work first" programs to move women into the workforce. Welfare recipients are now subject to a sixty month lifetime limit (fewer at state discretion),

giving potential recipients an incentive to delay benefit receipt and search more intensely for employment opportunities before applying.¹⁵ Most states also reduced the rate at which benefits are taxed away as a recipient earns income, thus reducing disincentives to work. Concurrent expansions in the federal Earned Income Tax Credit gave single mothers additional financial incentives to work. Each of these policies was designed to increase employment and raise the return to work among women who, in the absence of reform, might have relied mainly on public assistance (Ellwood 2000). The cumulative effect of these reforms created the textbook definition of a labor supply shift - policy changes resulted in more low-skilled women willing to work at any given wage.

The empirical literature evaluating welfare reform supports the conclusion that these reforms increased employment among the target population. While any credible study of the effect of these changes includes essential controls for the role of the strong macroeconomy over the period in which reform was implemented, most studies (and especially evaluations of demonstration projects using random assignment) find that the policy changes had a significant effect on the labor force attachment of low-skilled women.¹⁶ Figure 1 uses data from the annual March Supplement to the Current Population Survey (CPS) and shows trends in the employment rate for women with at most a high school degree between the ages of eighteen and fifty-four living in large Metropolitan Statistical Areas (MSAs). They are classified according to marital status and parenthood.¹⁷ Employment among single mothers increased dramatically from 70 percent in 1993 to 84 percent in 2000. There was no similar increase among women in either of two comparison groups - married mothers or single women without children. In 1993, single mothers had an employment rate that was 12 percentage

¹⁵Grogger, Haider and Klerman (2003) find that as much as half of the decline in caseloads resulted from a decrease in the entry rate.

¹⁶For a careful review of the employment effects of welfare reform, see Blank (2002, pp.1139-1142).

¹⁷As closely as possible, this set of cities matches the consistent geographic areas described in Section 4.

points lower than that of single women without children; by 2000, their employment rate was 2 points higher. Additionally, the trends become quite similar after 2000, suggesting that the reforms created a roughly permanent increase in supply.

Even though many of the policy changes were implemented at the national level, pre-existing characteristics of MSAs led to significant geographic variation in the extent to which this reform affected native employment. Local labor markets whose welfare recipients represented a greater fraction of potential low-skilled workers experienced larger increases in low-skilled labor supply. As evidence of this relationship, consider Figure 2, constructed with the same annual CPS data as Figure 1. To create this figure, I rank each MSA based on the fraction of all low-skilled women receiving cash welfare from 1988 to 1992. I then select women from all years who live in MSAs that fall into the top or bottom quartile of this ranking.¹⁸ Although the levels are different, the time pattern of employment in both quartiles is quite similar prior to the mid-1990s. After that point, however, employment increased significantly for women in high participation cities. Employment among women in low participation cities, in contrast, remained roughly flat. By the end of the decade, the employment gap (on average eight to nine percentage points prior to reform) had essentially disappeared. Thus, the level of welfare participation prior to reform reliably predicts increases in native labor supply over the reform period.

How then, should these differential supply shifts affect the expected labor market returns of newly arriving immigrants? In the short run, requiring women to work or search for work will increase the competition for each vacancy, making it less likely that any new entrant will find employment in a given period. Eventually, the market will reach a new medium-run

¹⁸This figure takes the average over all women living in any city within a quartile. Each quartile contains 33 MSAs, and captures a roughly equal fraction of the sample population. A similar, though somewhat noisier pattern emerges when each MSA average contributes one observation to the quartile mean. The cutoffs for the bottom and top quintiles are around 5 and 10 percentage points, respectively.

equilibrium with more employed low-skilled workers working at lower wages. Welfare reform, therefore, provides exactly the type of shock that substantially alters the labor market returns of newly arriving immigrants. Local labor markets with more welfare leavers will become less attractive both because the probability of finding employment will fall and because of the downward pressure on wages. If immigration flows fail to offset the differential impact of welfare reform, one might expect that, in the long run, owners of capital will bring the market back into geographic equilibrium by directing investment toward areas with a higher return. If, on the other hand, newly arriving immigrants are sufficiently sensitive to near-term differences in expected earnings, they may manage to smooth out these disparate labor market shocks even without any change in behavior among native workers or capital owners.

Of course, immigrants are only likely to respond to these supply increases if welfare leavers represent a meaningful increase in competition for jobs that immigrants are likely to search for. Several descriptive facts suggest that this is the case. First, the population affected by welfare reform and the flow of new immigrants are of similar magnitudes. Welfare rolls fell by 2.3 million adults (from 3.8 to 1.5 million) between 1990 and 2000 (US Department of Health and Human Services 2007).¹⁹ Over that same time period 4.4 million low-skilled immigrants (male and female) entered the country (US Bureau of the Census 2007).

In addition, newly arriving immigrants and welfare leavers tend to work in similar jobs. Welch's (1999) index of congruence provides a useful measure of the degree of overlap in occupations and industries for various groups. This methodology has been used in the immigration literature to determine which groups of natives and immigrants should be considered close substitutes (e.g. Borjas 2003). The index is similar to a correlation coefficient and has a range from negative one to positive one.²⁰ A value of positive one indicates complete occu-

¹⁹Note that these figures may understate the number of women affected by reform as the caseload reached a peak of 4.4 million adults in 1994.

²⁰ The exact formula for two groups of workers k and l is $C_{kl} = \frac{\sum_j (p_{kj} - \bar{p}_j)(p_{lj} - \bar{p}_j)/\bar{p}_j}{\sqrt{(\sum_j (p_{kj} - \bar{p}_j)^2/\bar{p}_j)(\sum_j (p_{lj} - \bar{p}_j)^2/\bar{p}_j)}}$ with p_{kj}

pational overlap. Whenever one group is overrepresented in an occupation the other group is similarly disproportionately likely to work in that same occupation. A value of negative one implies the opposite relationship. Values near zero mean that the two groups overlap about as much as each group overlaps with the average worker.

Table 1 presents this index comparing single native women who are currently working but received welfare in the past year to eight other groups of workers based on gender, education and nativity. The data source and geographical selection criteria are the same used in the first two figures, although I only use years in which nativity questions were asked (post-1993). I classify both occupations and industries at the two-digit level.

These results suggest that women entering the labor force in response to welfare reform are very close substitutes for newly arriving female immigrants. The index for occupation is +0.73, while the index for industry is +0.54. Newly arriving immigrants are the closest group according to occupation and second only to other low-skilled native women in industry (+0.76). Although these calculations reveal significant occupational sorting by gender, low-skilled immigrant men compete with welfare leavers about as much as the average worker (industry and occupation values of -0.03 and -0.11 respectively). Overall, increases in labor supply among welfare leavers represent significant competition to newly arriving immigrants (and vice versa).

Despite this evidence, one may still find it unlikely that immigrant inflows would respond to these supply shocks. For example, many low-skilled legal immigrants enter on family reunification visas. These immigrants are likely quite inelastic in their location choices, and it would not be surprising if most never even consider a location other than the one where their family members live. Yet, immigration flows can still help equilibrate local labor markets, and p_{lj} representing the fraction of the two groups working in occupation j and \bar{p}_j representing the fraction of all workers in that occupation.

even if not every immigrant is willing to move to the location that offers the highest expected earnings. Rather, all that is necessary is a sufficiently large group of sufficiently mobile immigrants. Toward that end, one might expect unauthorized migrants to be especially earnings-sensitive given their willingness to risk apprehension in order to gain access to US labor markets, a hypothesis I address in the empirical analysis.

One final concern is whether immigrants are able to gather sufficient information about labor market prospects in order to make an optimal location decision. McLaren (2006) provides time-series evidence that border apprehensions are a reliable leading indicator of US economic growth, suggesting that unauthorized immigrants have access to information about the labor market and do not undertake the risky venture of crossing the border unless they are reasonably confident that they will find work. Selection across geography requires only a minor extension to this finding where potential immigrants have network contacts in different cities, each providing this type of information. Should that fail, there is also room for trial and error. Once immigrants have paid the fixed costs of moving to the US, they face substantially smaller marginal costs of acquiring more information on where it is easier to find work in addition to lower costs of actually moving again.

On the whole, the descriptive evidence presented in this section suggests that welfare leavers represent a substantial exogenous increase in labor market competition for newly arriving low-skilled immigrants. Further, geographic variation in pre-reform welfare participation induced substantial differences in the degree to which local labor markets were affected. These facts lead to a clear prediction: if newly arriving immigrants are sufficiently sensitive to geographic variation in the expected earnings a labor market offers, they will tend to select locations with fewer women entering the labor market as a result of welfare reform. The next section provides an empirical framework for evaluating this hypothesis.

3 Empirical Specification

Suppose that the overall utility a city provides can be expressed as a linear function of its expected labor market returns, other observable characteristics X_{sdt} , and an individual-specific unobserved error term. Then the total utility of a location is given by

$$U_{isdt} = \gamma PDV_{dt} + X_{sdt}\beta + u_{isdt}. \quad (2)$$

In order to estimate the parameters of this model, one needs to make an assumption about the distribution of the error terms. McFadden (1974) demonstrates that if each u_{isdt} is independently and identically distributed Type I extreme value, γ and β can be estimated consistently by running maximum likelihood conditional logit models on the individual-level data. This approach is commonly adopted by other authors in studies of the location choices of new immigrants (e.g. Bartel 1989, Kaushal 2005, Jaeger 2007). Yet the required assumption almost surely fails. In particular, there are most likely unobserved city attributes that have similar value to all immigrants from the same source region ($u_{isdt} = \eta_{sdt} + \epsilon_{isdt}$). These common error components present two challenges to estimation. First, assuming i.i.d. errors in the presence of these grouped unobserved components will vastly understate the standard errors and lead to incorrect inference. More importantly, if these unobserved factors are correlated with included attributes (including expected earnings), estimates of the value of these attributes will be inconsistent.

My empirical approach improves upon previous studies by explicitly modeling these unobserved components of the error term and taking steps to remove their influence on the parameter estimates. I employ an estimation strategy new to the immigration literature based on a method previously developed to examine workers' choices among health insurance options (Scanlon, Chernew, McLaughlin and Solon 2002). My exposition of the econometric

model closely follows the original. I first derive an expression relating the observed share of immigrants selecting a particular city to the observed and unobserved components of utility in any given time period. This approach acts as a non-linear analogue to the “group-level regression” solution to the Moulton problem of common error components (Moulton 1990). I then demonstrate how using data on immigrants’ choices from multiple time periods can net out the influence of any unobserved amenities that are constant over time. Finally, I discuss the importance of using identifiable exogenous variation to determine supply shocks affect immigrants’ location decisions.

Allowing for common unobserved city attributes yields a new representation of the utility offered by a city:

$$U_{isdt} = \gamma PDV_{dt} + X_{sdt}\beta + \eta_{sdt} + \epsilon_{isdt}. \quad (3)$$

Note that this general framework nests the possibility that $\eta_{sdt} = \eta_{dt} \quad \forall s$, i.e. that the unobserved city attributes have similar value to immigrants from all source regions. I will estimate models under both assumptions, but I use the most general form for exposition. Rather than assuming that the u terms are i.i.d., I make the much less restrictive assumption that the ϵ_{isdt} terms are distributed i.i.d. Type I extreme value. In other words, conditional on the observed attributes *and* any common omitted factors, the remaining individual-level errors are well-behaved. Given this assumption, the probability that an immigrant selects a given destination in time period t is

$$\pi_{sdt} = \frac{e^{\gamma PDV_{dt} + X_{sdt}\beta + \eta_{sdt}}}{D_{st}} \quad (4)$$

with

$$D_{st} = \sum_j e^{\gamma PDV_{jt} + X_{s jt}\beta + \eta_{s jt}}. \quad (5)$$

This expression closely parallels the probability arising in a conditional logit model with the addition of the unobserved group effects in both the numerator and denominator. In expectation, the share of newly arriving immigrants who select each destination will be equal to these choice probabilities. In practice, the observed shares will differ from the actual choice probabilities due to random sampling error. Let S_{sdt} represent the observed share of immigrants from source s selection location d in year t . Then

$$S_{sdt} = \pi_{sdt} + \nu_{sdt} \quad (6)$$

$$S_{sdt} = \frac{e^{X_{sdt}\beta + \eta_{sdt}}}{D_{st}} + \nu_{sdt} \quad (7)$$

Here ν_{sdt} is a mean-zero error term with variance that is inversely proportional to the number of observations within an st cell. Taking logs of both sides yields

$$\ln(S_{sdt}) = \ln(e^{\gamma PDV_{dt} + X_{sdt}\beta + \eta_{sdt}} + D_{st}\nu_{sdt}) - \ln(D_{st}). \quad (8)$$

Taking a first-order Taylor Series approximation around $\nu_{sdt} = 0$ gives

$$\ln(S_{sdt}) \approx \gamma PDV_{dt} + X_{sdt}\beta - \ln(D_{st}) + \eta_{sdt} + \frac{\nu_{sdt}}{\pi_{sdt}}. \quad (9)$$

An appropriately transformed version of the share of immigrants selecting a city will thus be approximately linear in the observed and unobserved attributes. Yet consistently estimating this model using cross-sectional data proves challenging. It is difficult to find an appropriate proxy for the total returns to becoming a searching worker in a labor market. As previously discussed, the wage rate is likely only weakly related to this complete concept. It is also quite unlikely that wages are uncorrelated with the error term, as high wage areas may

offer different sets of amenities than low wage areas. Similarly, one cannot use measures of competition for jobs, such as native participation rates, as these are endogenous to immigrant inflows.

Time differencing provides a potential solution to a portion of these challenges. Taking time differences will also remove the influence of any amenities that are fixed over time, and potentially improve the precision of estimated effects of labor market competition. The grouped error components can be partitioned into factors fixed over time ϕ_{sd} and factors specific to each time period ψ_{sdt} .

$$\eta_{sdt} = \phi_{sd} + \psi_{sdt} \quad (10)$$

The differenced specification is therefore:

$$\Delta \ln(S_{sd}) \approx \gamma \Delta PDV_d + (\Delta X_{sd})\beta - \Delta \ln(D_s) + \Delta \psi_{sd} + \Delta \frac{\nu_{sd}}{\pi_{sd}} \quad (11)$$

As discussed in the previous section, exogenous increases in native labor supply can serve as an excellent proxy for changes in the present discounted value of becoming a searching worker in a city. I therefore estimate a version of Equation (11) by instrumental variables, using changes in native female employment as a proxy for changes in total expected labor market returns and the welfare participation rate prior to reform as the excluded instrument. I include source-specific intercepts to account for the $\Delta \ln(D_s)$ terms. Note that one should not, in general, estimate a similar specification by OLS because measured changes in native employment are unlikely to capture only supply shifts. Instead, increases in demand for low-skilled labor will increase native employment while at the same time attracting more immigrants, inducing a positive bias.

Using this empirical strategy, I cannot estimate the effect of attributes of a destination

or source-destination pair that are fixed over time, including factors commonly considered such as distance and climate similarities. Additionally, parameter estimates for attributes with little variation over time would not be well-identified. Many other covariates used routinely in the literature fall into this latter category, including the location of previously-arriving immigrants and the geographic distribution of potential ethnic group-based network contacts. The inability to include these variables should not be considered a limitation of the model. Instead, an advantage of this approach is that it removes the influence of any observed or unobserved aspect of a destination or source-destination pair that is roughly constant across time.

I have motivated this estimation procedure as the appropriate methodology under the assumptions of a particular discrete choice model. It is worth noting, however, that previous work has used a very similar reduced-form specification even without this structural derivation. Borjas (2001) used the ratio of the share of newly arriving immigrants to the share of previously arriving immigrants as the dependent variable in his analysis of whether new immigrants respond to state differences in wages. Both his dependent variable and the one suggested by the discrete choice model roughly represent proportional differences in locations' immigrant share. Thus, even if the assumptions underlying this exact discrete choice model are violated, my chosen specification is very comparable with previous work and has an intuitive reduced form interpretation.

Yet there are distinct advantages to the approach I use. First, if the assumptions of the discrete choice model hold, then the parameters I estimate have a more structural interpretation. More importantly, the critique of using wages as a proxy for total labor market returns and the need for a source of exogenous variation do not depend on the underlying structural or reduced-form motivation. This paper represents an empirical advancement, therefore, as the first to provide a source of such variation and to exploit it using instrumental variables.

The next section provides information on the data I use to estimate these models, and the following section reports the results.

4 Data

The five percent Public Use Microdata Samples of the 1980-2000 decennial censuses provide the majority of the data for the analysis.²¹ I consider the location of newly arriving adult immigrants ages 18-54, with at most a high school degree, not living in group quarters. I classify a respondent as an immigrant if he/she is foreign-born and is either a non-citizen or a naturalized citizen. New immigrants are those who arrived in the US during the ten years prior to survey.²² I restrict the analysis to immigrants from the eleven source regions listed in Table 2.²³ This table shows the distribution of sources across all three waves of the census. This distribution has remained somewhat stable over the sample period with two exceptions: immigration from Mexico increased, while immigration from European countries decreased.²⁴

Table 3 provides some basic descriptive statistics for this population. In each census year, the total number of new immigrants is split almost evenly between women and men. Most new immigrants are married and very few live alone as household heads. These variables are quite similar across the different waves of the census, suggesting that changes in the locations these immigrants choose are unlikely due to household composition changes.

I consider the 156 largest MSAs within the continental US with a nonzero immigrant

²¹I obtained the data from the IPUMS project at the University of Minnesota Population Center <http://usa.ipums.org/usa/>

²²These immigrants may have previously lived in the United States, but the census question asks when the respondent arrived in the US “to stay”.

²³This eliminates less than three percent of the sample.

²⁴This pattern highlights the potential importations of accounting for source-specific amenities as the changing composition of immigrant inflows may have altered the geographical distribution even in the absence of any local labor market shocks. Empirically, accounting for this possibility only slightly alters the results.

population in all three census years as potential locations for newly-arriving immigrants. These cities had an adult population (18-54) of at least 150,000 in 1990.²⁵ For the basic results, I treat the η_{sdt} terms as constant across all source regions. The dependent variable in these specifications is the natural logarithm of the share of all new immigrants living in each city, calculated separately for each census decade. I use person-level weights to calculate these shares, which I calculate separately by gender.

The primary explanatory variable of interest is the change in the native female employment rate: the fraction of all women working positive weeks over the past year. The excluded instrument in the IV specifications is the welfare participation rate: the fraction of all women who received positive welfare benefits during the year prior to the survey. I also construct variables to measure a number of additional attributes (listed in Table 4) that immigrants may consider when deciding where to locate. I include information from two external data sources, as well as other variables directly calculated from the PUMS. I tabulate decade averages of the annual growth rate in employment as measured in the County Business Patterns data from 1980-2000.²⁶ This variable serves as a measure of the overall strength of the local labor market. Additionally, I have information on the welfare generosity of the state in which each MSA is located. PRWORA instituted a five-year waiting period for federally-funded welfare benefits for all immigrants arriving after the enactment of the law in August of 1996, and some states chose to use additional state funding to restore benefits to this group.²⁷ Although previous work has found that immigrants do not choose locations in order to take advantage of these differential benefit restorations (Kaushal 2005), I include these variables in some specifications for robustness.

²⁵The geographic boundaries of the MSAs change somewhat across waves of the census. I follow Card and Lewis (2007) and use state and county group codes to create consistent areas across the three census years. Ethan Lewis graciously provided programs to do so.

²⁶I aggregate these data from the county level to match the consistent geographic boundaries.

²⁷The full list is available in Zimmermann and Tumlin (1999).

Later specifications allow for the η terms to differ across each of the source regions listed in Table 2. For this specific set of results, I calculate the share of new immigrants in a city separately by source region. I eliminate from the entire panel any source-destination pair that contains no immigrants in any of the census years. The number of city-level observations varies by source regions, and the share of immigrants selecting each city will be more precisely estimated for those regions with more observations. To address the resulting heteroskedasticity, I weight each source-destination pair by the square root of the total number of observations from each source country. Because native female employment and welfare participation only vary at the MSA level, I report standard errors clustered by MSA in all specifications with multiple observations per city.

5 Results

Figure 3 displays the first-stage and reduced form results of a basic instrumental variables version of Equation 11. Each city contributes one equally weighted observation. The left panel plots the data used to fit the first stage regression, along with the fitted values. As hypothesized, cities with higher welfare participation prior to reform experienced greater increases in native female employment over the decade. Each percentage point increase in participation prior to reform led to a 0.35 percentage point increase in employment. The second panel shows the reduced form, and provides evidence consistent with the selective immigration hypothesis: Relative to immigrants arriving over the 1980s, female immigrants arriving during the 1990s were less likely to choose cities with large native populations entering the workforce as a result of welfare reform. Figures 4 and 5 show this relationship geographically. These maps demonstrate that the relationship is not driven by any particular region; instead, the pattern holds broadly across the entire country. In each figure

darker areas represent MSAs with values above than the median, and lighter areas represent areas with values below the median. Areas of the country not included in large MSAs are represented as white. The negative relationship is apparent when looking from map to map as cities turn from light to dark and vice versa.

The parameter estimates from this specification are given in the second column of Table 5. As expected given the figures, the first-stage is strongly significant (the F-statistic on the excluded instrument is well in excess of 10), and the resulting IV estimate is significantly negative. Interpreting the sign and statistical significance of these coefficients is straightforward. The magnitude can be interpreted as roughly the percentage change in the probability that an immigrant selects a given city.²⁸ The coefficient in column 2 thus says that a city experiencing a one percentage point larger than average welfare-reform-induced increase in native female labor supply saw roughly a twenty percent decrease in the probability that a female immigrant chose to locate there.

To contrast the IV results, the first column of the table shows the results from estimating this same equation without an instrument. This coefficient is substantially more positive, consistent with the hypothesis that omitted variables such as differential increases in local demand tend both to increase native employment and to attract newly arriving immigrants. This difference highlights the importance of identifying exogenous variation to determine the extent to which immigrants respond to changes in the expected value of entering a market as a searching worker.

Figure 6 shows the results of repeating this set of regressions using data from one decade prior. Importantly, neither the first stage nor the reduced form relationships hold in a

²⁸The percentage change in the choice probability resulting from a one unit change in the independent variable is $\frac{e^{\beta\Delta X}-1}{\Delta X}$, or approximately β for small changes in X . This interpretation provides the reduced form interpretation. Based on the discrete choice model, the change in the odds that a city is selected resulting from a one unit change in X is $p(1-p)\beta$. With small probabilities (the mean is 1/156), the difference between these two interpretations is minimal.

time period without a dramatic change to welfare policy (both point estimates are slightly negative, and neither is statistically significant). The lack of a first-stage relationship over this period rules out certain alternative interpretations of the employment increases over the 1990s. For example, suppose high welfare participation were indicative of poor labor market conditions and that the subsequent increases in labor supply were the result of negatively serially correlated shocks. The first-stage results over the 1980s provide no support for this hypothesis. Similarly, the lack of a reduced form relationship rules out the possibility of pre-existing trends away from cities with high welfare participation as an explanation for the changes in immigrant share seen over the period when the policy was implemented. This pair of results strengthens the credibility of interpreting the relationships shown in Figure 3 as resulting from immigrants avoiding labor market competition with welfare leavers.

The remainder of Table 5 adds additional control variables to help rule out alternative hypotheses. As a first alternative, suppose that high welfare participation cities also experienced larger general declines in job creation over the 1990s. In this case, these cities would have lost immigrant share even if immigrants did not react to the increases in native labor supply. Column 3 includes the change in the decade average annual employment growth rate as a means of controlling for this potentially omitted factor. This variable enters the model with the expected sign; the distribution of immigrants shifted away from cities with slowing employment growth and toward cities with improving growth. The parameter estimate for native female supply is not substantially affected, however, suggesting that the supply shocks created by welfare reform were roughly uncorrelated with the size of any concurrent demand shocks.

Alternatively, suppose that high participation cities also tended to be traditional locations for immigrants. If traditional locations became less popular for reasons unrelated to welfare reform then these cities would have lost immigrant share even in the absence of the policy-

driven labor supply increases. The specification in column 4 addresses this possibility. An immigrant arriving in the 1990s faced a very similar geographic distribution of previously arriving immigrants as did an immigrant arriving in the 1980s. The coefficient on the fraction of a city that was foreign-born in 1990, therefore, gives a good estimate of the difference in the value that these two groups of immigrants placed on selecting a traditional location. The estimate provides support for the diffusion hypothesis as the immigrant share enters with a negative coefficient. Yet the coefficient on native employment remains negative and significant. In fact, even though the point estimate decreases in magnitude, the inclusion of this variable increases the precision of the estimates substantially, yielding even stronger statistical significance.

The time differencing strategy effectively removes the influence of any unobserved city attributes that are fixed over time. Yet there may still be changes in unobserved city-level characteristics that are correlated with the reform-induced supply increases. One way to address this potential source of bias is to include a city's change in immigrant share among a group whose present discounted value of expected earnings should be relatively unaffected by welfare reform. To accomplish this, I include the change in the city's share of female immigrants with at least some college education. Consistent with the presence of unobserved factors, this variable enters with a positive sign and strong significance (column 5), but the coefficient of interest remains strongly negative.

The final column addresses the so-called "welfare magnets" hypothesis. Previous research contends that states with more generous welfare benefits attract larger inflows of eligible immigrants (Borjas 1999). Suppose that welfare reform essentially "turned off" these magnets, and, as a result, cities in generous states were no longer especially attractive to immigrants. This direct policy effect offers an alternative explanation for the losses in immigrant share that these cities experienced. To test this theory, in the last specification I include the max-

imum benefit level for a family of three in 1990. The positive coefficient on this variable is inconsistent with this alternative hypothesis. I also include dummy variables for whether a state restored each of four programs to post-reform legal immigrants using its own funds. The resulting coefficients are variable and mostly insignificant. These results are consistent with previous work finding no effect of these policy choices on immigrants' location choices (Kaushal 2005). The lack of evidence in favor of the welfare magnets hypothesis supports interpreting these patterns as selective migration in response to labor market competition.

5.1 Robustness Checks and Response Heterogeneity

Given the different degree of overlap in occupation and industry by gender seen in Table 1, one might expect female immigrants to respond more strongly to these supply shocks than would male immigrants. Table 6 examines this hypothesis and repeats each of the previous specifications using changes in the log of the low-skilled male immigrant share as the dependent variable. The broad pattern is quite similar to the results for women - nearly all the variables enter with similar signs. In the specifications with control variables, the point estimate of the negative effect of an increase in native female employment is somewhat smaller than for female immigrants, although the two coefficients cannot be statistically distinguished from each other.

There are several potential explanations for the similar coefficients in the male and female specifications. First, many male immigrants may make location decisions together with a spouse or other female family member. If the employment prospects are poor for one member, the entire unit may decide to go to an alternative location. Male immigrants considering dating or marriage prospects may respond to the choices made by women even if they are not already connected as one household. Second, although men and women on average work in different occupations, the expected male migration response to native welfare leavers depends

on which jobs the marginal male immigrant is likely to take. Suppose, for example, that men first look for employment in traditional male jobs such as construction or agriculture work, and take service jobs only when these first two alternatives are unavailable. Given a sufficient number of these marginal male workers, a response similar in magnitude to female workers is not unreasonable. Finally, if men are simply more earnings-sensitive in deciding where to locate, the measured male response to any given supply shock will be larger. Even if welfare reform created smaller increases in competition for men, a larger proportional male response would tend to offset the difference in observed displacement. This difference in elasticity could occur if women depend more heavily on the existence of network contacts in deciding where to locate, or if men have shorter time horizons.

Table 7 returns the focus to female immigrants, changing the dependent variable to source-specific immigrant shares. As discussed in Section 3, unobserved locational attributes are likely different depending on the source region. A changing mix of immigrant sources could lead to a different distribution of settlement patterns, even in the absence of immigrants responding to labor market incentives. This set of regressions addresses that concern by explicitly allowing the unobserved city attribute to vary for each source region. Each city may have as many as eleven observations, one for each source region identified in Table 2.²⁹ In columns (4) through (6), I replace the generic immigrant concentration variable from Table 5 with an analogous measure of whether the city was a traditional location for immigrants from the specific source region. The results through all specifications are quite similar to the results from Table 5. Even controlling for unobserved source-specific city attributes, these estimates support the conclusion that female immigrants chose cities with smaller native

²⁹I continue to impose the sample restriction of including only cities with nonzero measured immigrants in each time period. In order to include the change in high-skilled immigrant share as a control, these shares must also be non-empty. These restrictions explain why the total number of observations is less than $11 \cdot 156 = 1716$.

supply increases.

As discussed in Section 2, immigrants arriving without legal authorization are likely to be the most earnings-sensitive. Although the census data do not include an immigrant's visa status, examining the heterogeneity in responsiveness across source regions presents an opportunity to address this hypothesis. Table 8 lists the coefficient and standard error from running the specification in column 4 of Table 7 separately for each source population. The estimates are somewhat noisy, which limits the degree to which these differences allow for sharp conclusions. Nevertheless, the pattern of the point estimates suggests that the most earnings-sensitive migrants are the unauthorized, a finding consistent with interpreting the main results as the response of earnings-sensitive immigrants to changes in the expected value of becoming a searching worker.

Table 9 presents a final specification check. The native supply increases created by welfare reform occurred primarily in the latter half of the decade. If the labor market competition explanation is correct, women arriving early in the decade should be less affected, provided that their initial decision creates some inertia. To create this table, I estimate the specification from column 4 of Table 5 separately for three different groups. The first group consists of women who arrived prior to 1995 and who are currently living in the same MSA as in 1995. The second group includes all women who made their most recent location decision after 1995. This subsample contains both immigrants arriving in the US after 1995 and early arrivers who have subsequently changed MSAs. The final group consists only of the movers subsample. Because I do not have access to a measure of native female employment changes at this five-year interval, I report the reduced form coefficients. For reference, the reduced form coefficient from Table 5, column (4) that uses women arriving over the entire sample period is -0.065. Again, the results are consistent with the labor market competition explanation as the location decisions of later arrivers and internal movers are much more

negatively correlated with pre-reform welfare participation.

Taken as a whole, the results in this section provide strong support for interpreting the changing distribution of immigrants' locations as resulting from an optimal response to changes in expected earnings. One final question concerns the extent to which these changing location patterns effectively "undid" the labor supply shocks created by welfare reform. Figure 7 presents a back of the envelope calculation in response to this question, based on the IV regression results in Table 5, column 4. The x-axis measures the predicted increase in native female labor supply based on the first stage regression, expressed as a fraction of the low-skilled female population in 1990. The y-axis displays "extra" working female immigrants as predicted by the model, also measured as a fraction of the low-skilled female native population in 1990. The "extra" working immigrants variable is the difference between the predicted number of immigrants entering a city using actual welfare participation rates and the predicted number who would have entered if all cities had the same participation rate (the mean).³⁰ The slope of the linear regression line is -0.83 with a robust standard error of 0.12. On average, when a city experiences a native supply increase equivalent to one percent of its previous workforce, immigrants equivalent to 0.83 percent of the previous workforce choose alternative locations. This calculation suggests that changing immigration patterns effectively diffused the local supply shocks created by welfare reform throughout the country.

³⁰Specifically, this variable is $\frac{(e^{\widehat{\Delta \ln(S)}_{actual}} - e^{\widehat{\Delta \ln(S)}_{mean}})(S_{1990})(Imm_{2000})}{Pop_{1990}}$, where Imm_{2000} is the total number of new female immigrants who are in the labor force, $\widehat{\Delta \ln(S)}_{actual}$ is the fitted value from the regression, and $\widehat{\Delta \ln(S)}_{mean}$ is the fitted value replacing the actual participation rate with the mean, but leaving the other variables at their original values.

6 Discussion and Implications for Further Research

This paper provides evidence that immigrants function as labor market arbitrageurs, differentially selecting areas with better employment prospects. Welfare reform substantially increased the labor market participation of previous recipients, and immigrants tended to favor areas with smaller relative decreases in the present discounted value of becoming a searching worker. Additional evidence helps rule out a number of alternative explanations for this pattern, including pre-existing trends away from these cities, concurrent demand increases, a secular decline in the value of traditional locations, and other unobserved amenity changes valued similarly by immigrants of all skill levels similarly. After addressing each of these concerns, the data continue to provide support for interpreting these changing location patterns as evidence of expected earnings-sensitive selective migration among newly arriving low-skilled immigrants.

This finding has important implications beyond the specific context examined in this study. Selective immigration flows reduce geographic earnings inequality by helping to create a national labor market. This equilibrating function of large low-skilled immigration flows is especially valuable given the large barriers to moving among native born low-skilled workers. This benefit of immigration is seldom discussed in the policy debate, and future research providing an estimate of its magnitude would play an important role in determining the overall implications of this line of research for policy makers.

Further, this result presents an alternative explanation for the consistently small differences in native labor market outcomes between cities receiving large immigrant inflows and comparison cities. Although other authors have suggested that endogenous immigration flows could be responsible for this pattern, previous attempts to address this hypothesis directly have suffered from important limitations. This paper overcomes those challenges and

finds that the changing distribution of newly arriving immigrants offset a large proportion of differences in local labor supply increases. Future research should continue to explore the extent of immigrants' mobility in response to other exogenous labor market shocks. Given continued evidence that immigrants strongly react to changes in expected earnings when choosing where to locate, an alternative empirical strategy will be required to identify the precise effect of immigration on the native wage structure.

In fact, many authors use geographic variation to determine the effect of state policies and other factors on labor market outcomes. For the same reasons that researchers have long considered the potential for internal migration to contaminate this research design, they should begin to address the possibility that selective immigrant inflows threaten their identification strategy. This study reveals a substantial response of immigration flows to labor market incentives, and thus provides a potential alternative explanation for any surprising result in which policies or shocks created smaller than expected differences across locations.

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Figure 1: Employment Rates 1979-2005 Women, Age 18-54, HS Degree or Less

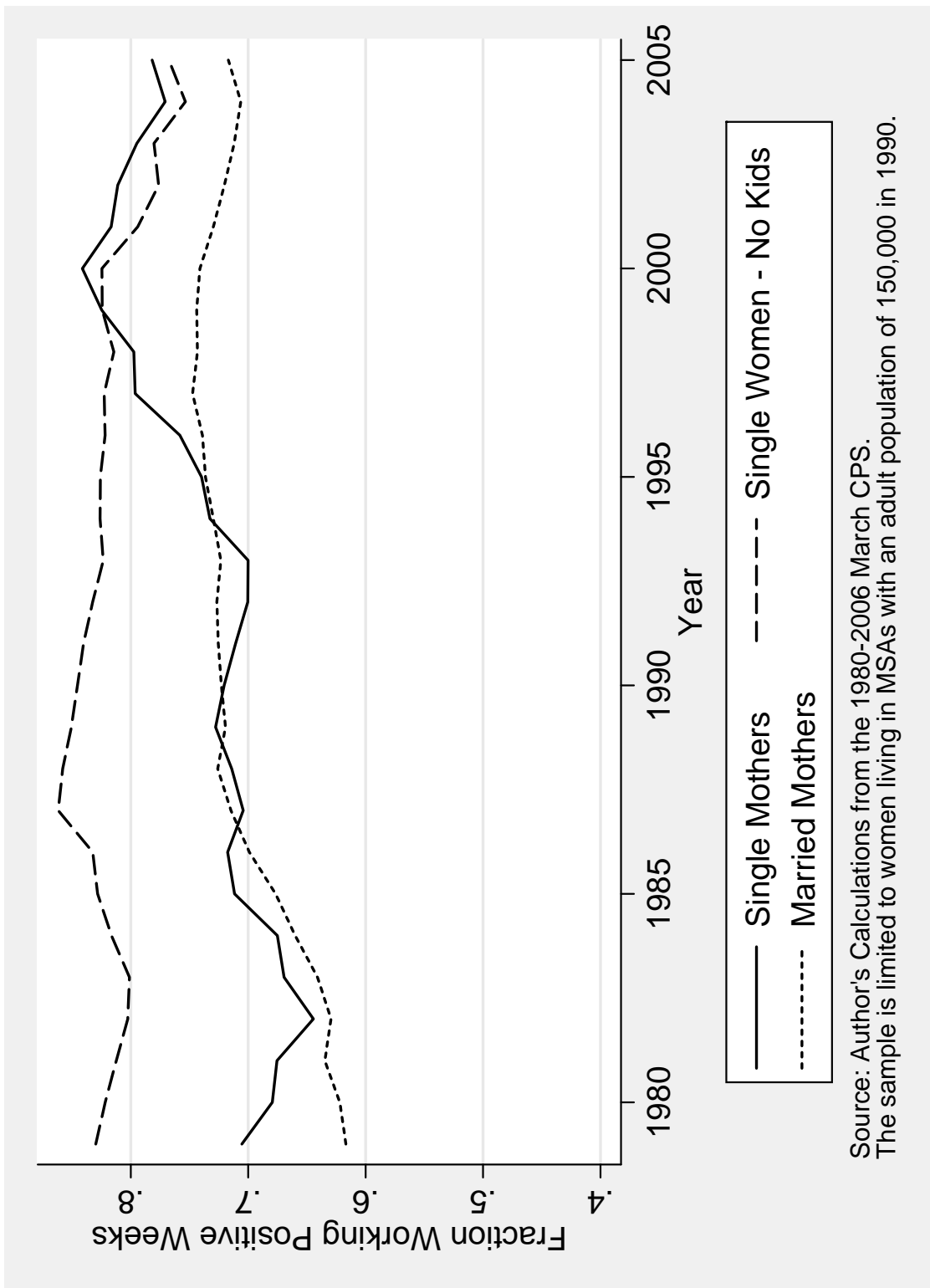


Figure 2: Employment Rates by Pre-Reform Welfare Participation 1979-2005 Women, Age 18-54, HS Degree or Less

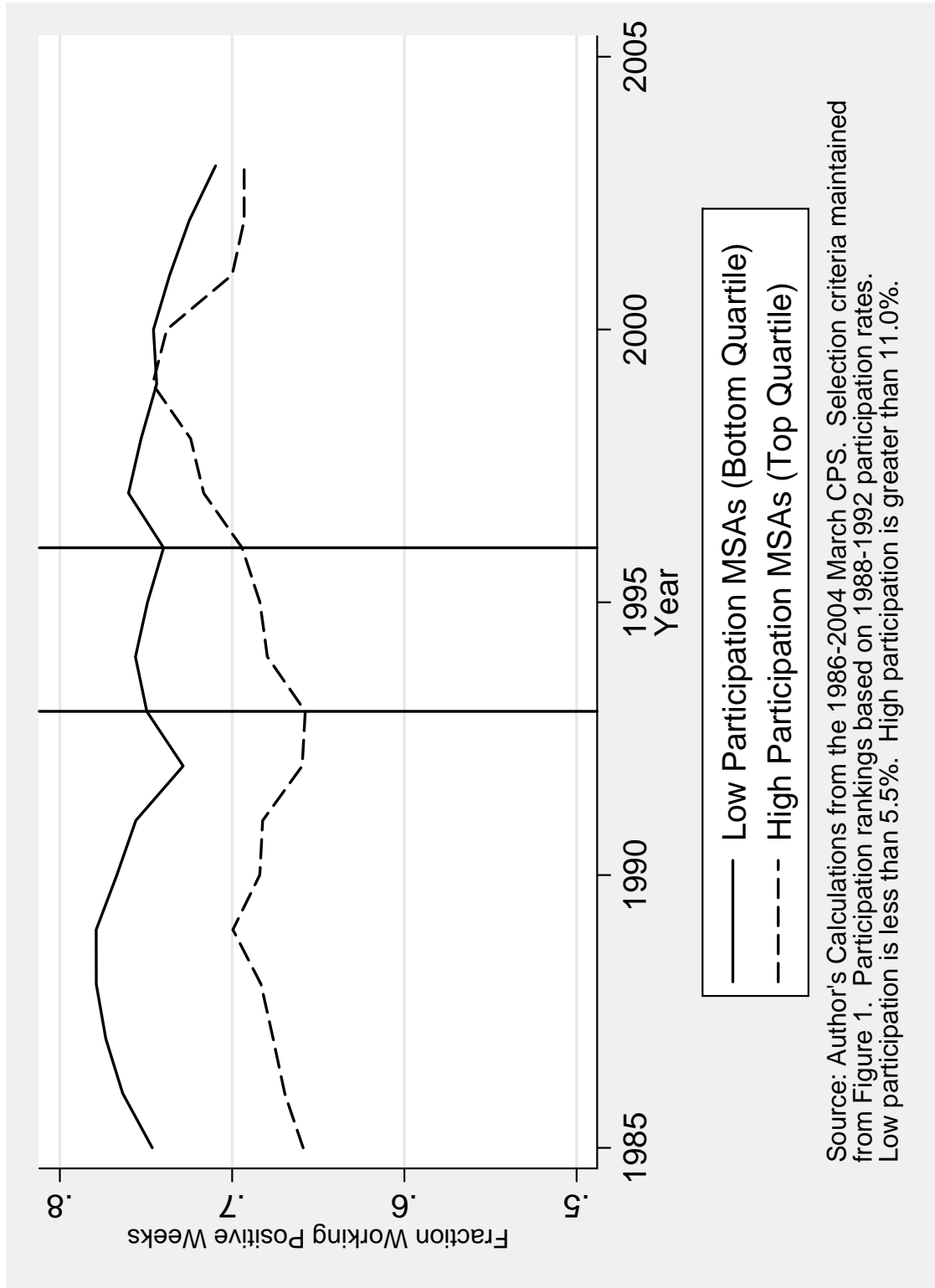
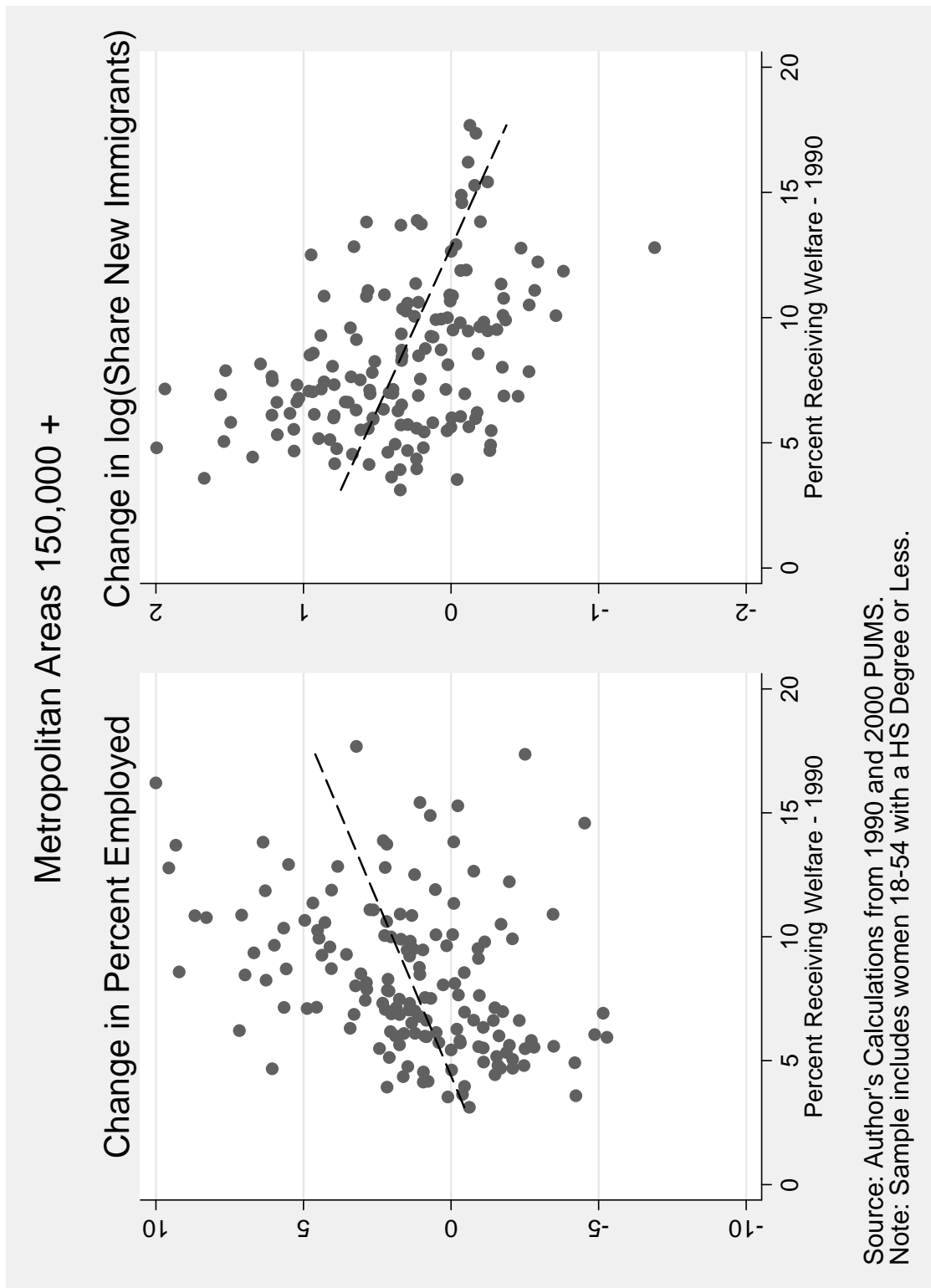


Figure 3: Changes in Native Female Employment and New Immigrant Locations 1990-2000
By 1990 Welfare Participation



Source: Author's Calculations from 1990 and 2000 PUMS.
Note: Sample includes women 18-54 with a HS Degree or Less.

Figure 4: Map of Metropolitan Areas by Fraction of Low-Skilled Female Population Using Welfare 1990

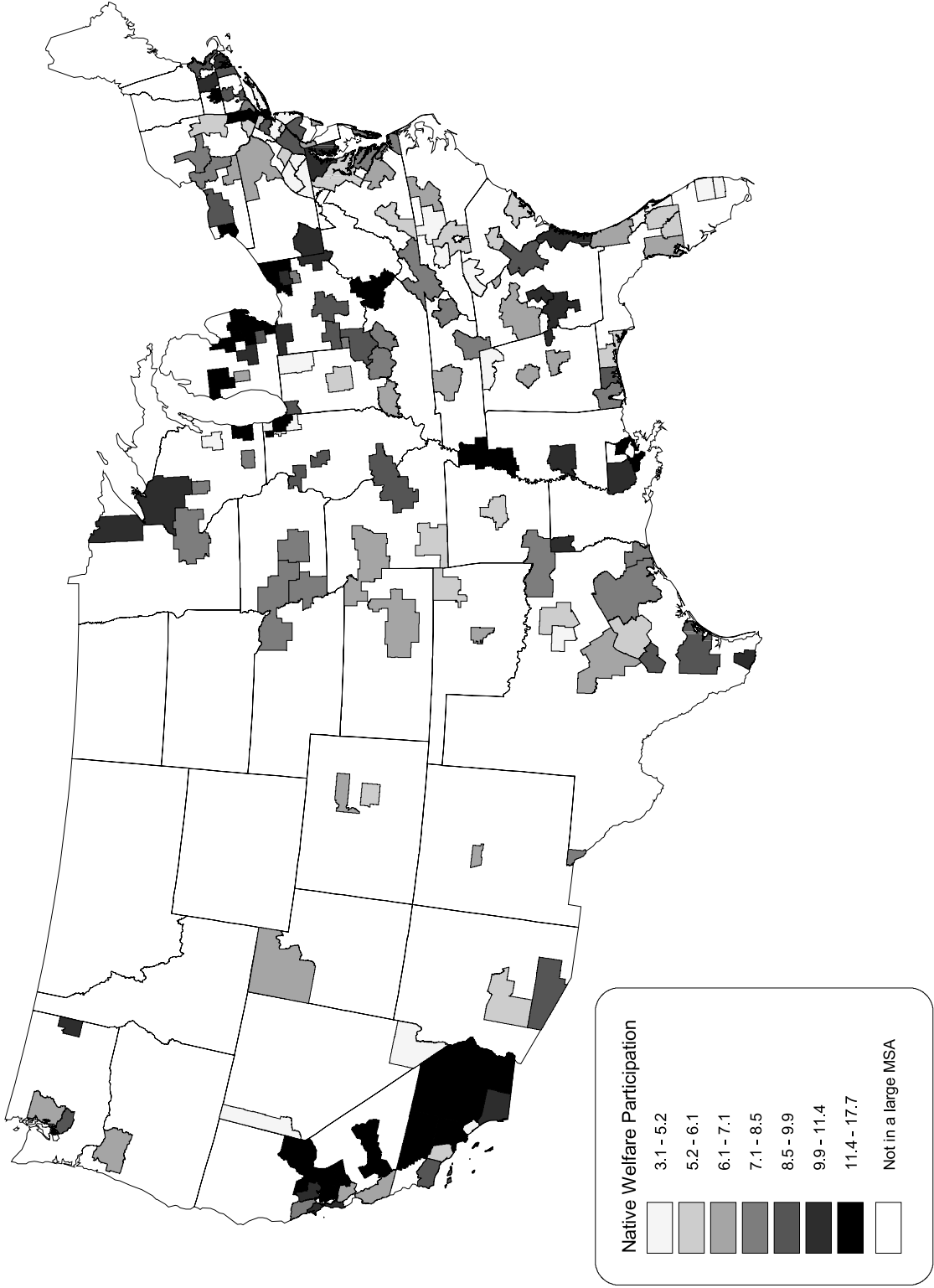


Figure 5: Map of Metropolitan Areas by Change in $\log(\text{Low-Skilled Female Immigrant Share})$ 1990-2000

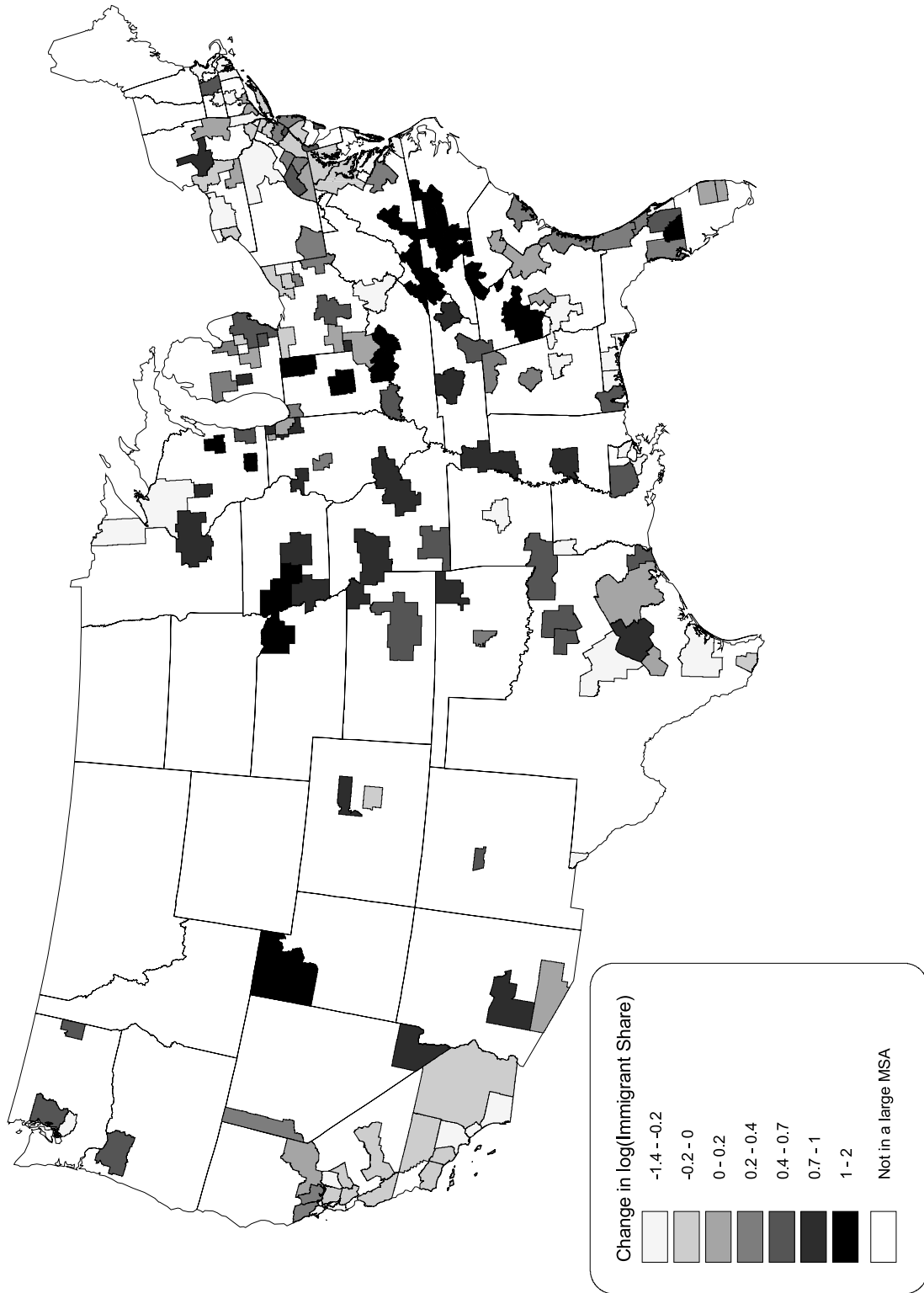
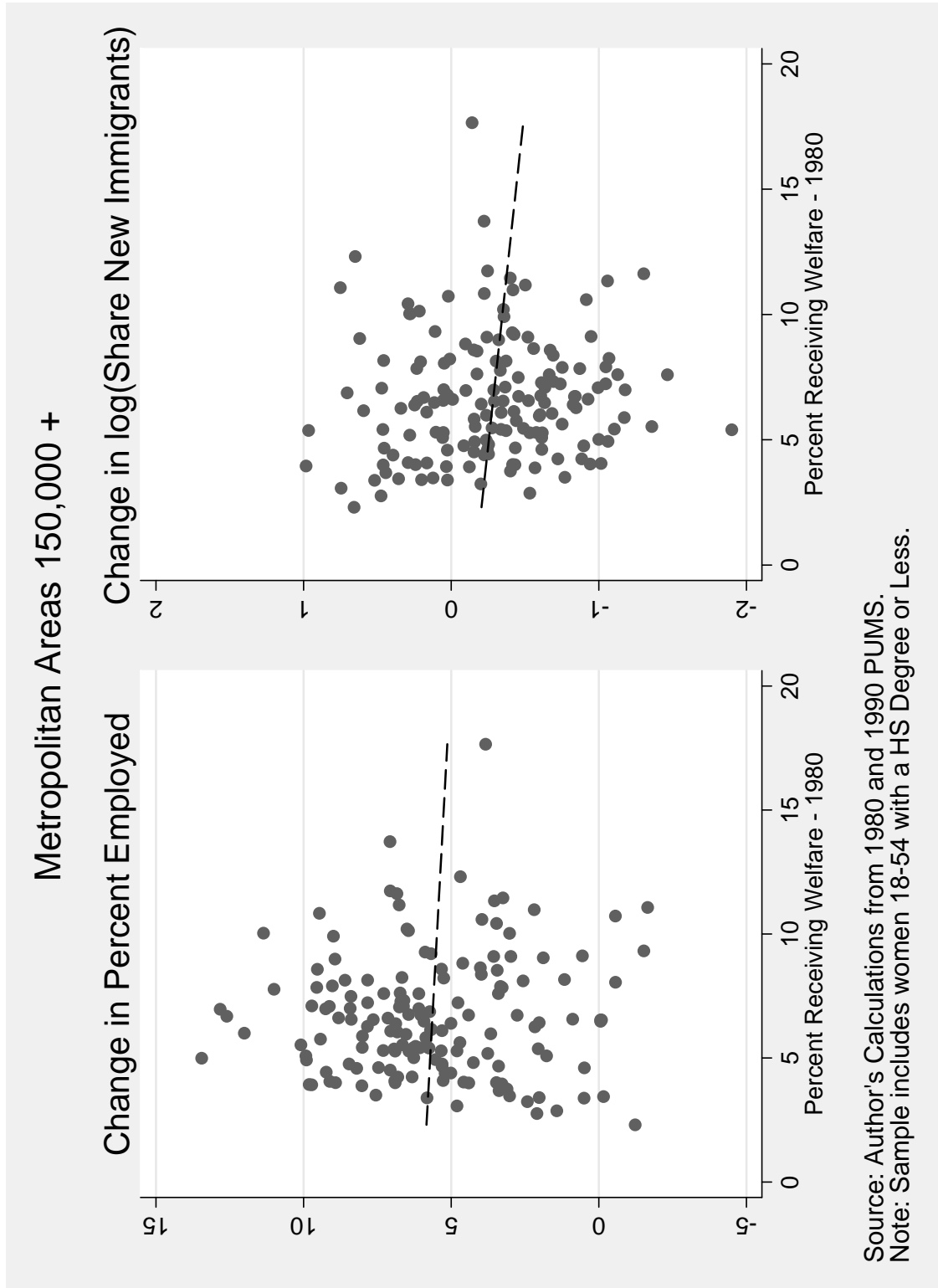


Figure 6: Falsification Test - Changes in Native Female Employment and New Immigrant Locations 1980-1990 By 1980 Welfare Participation



Source: Author's Calculations from 1980 and 1990 PUMS.
Note: Sample includes women 18-54 with a HS Degree or Less.

Figure 7: Predicted Additional Immigrants Selecting a City By Predicted Natives Entering Labor Force

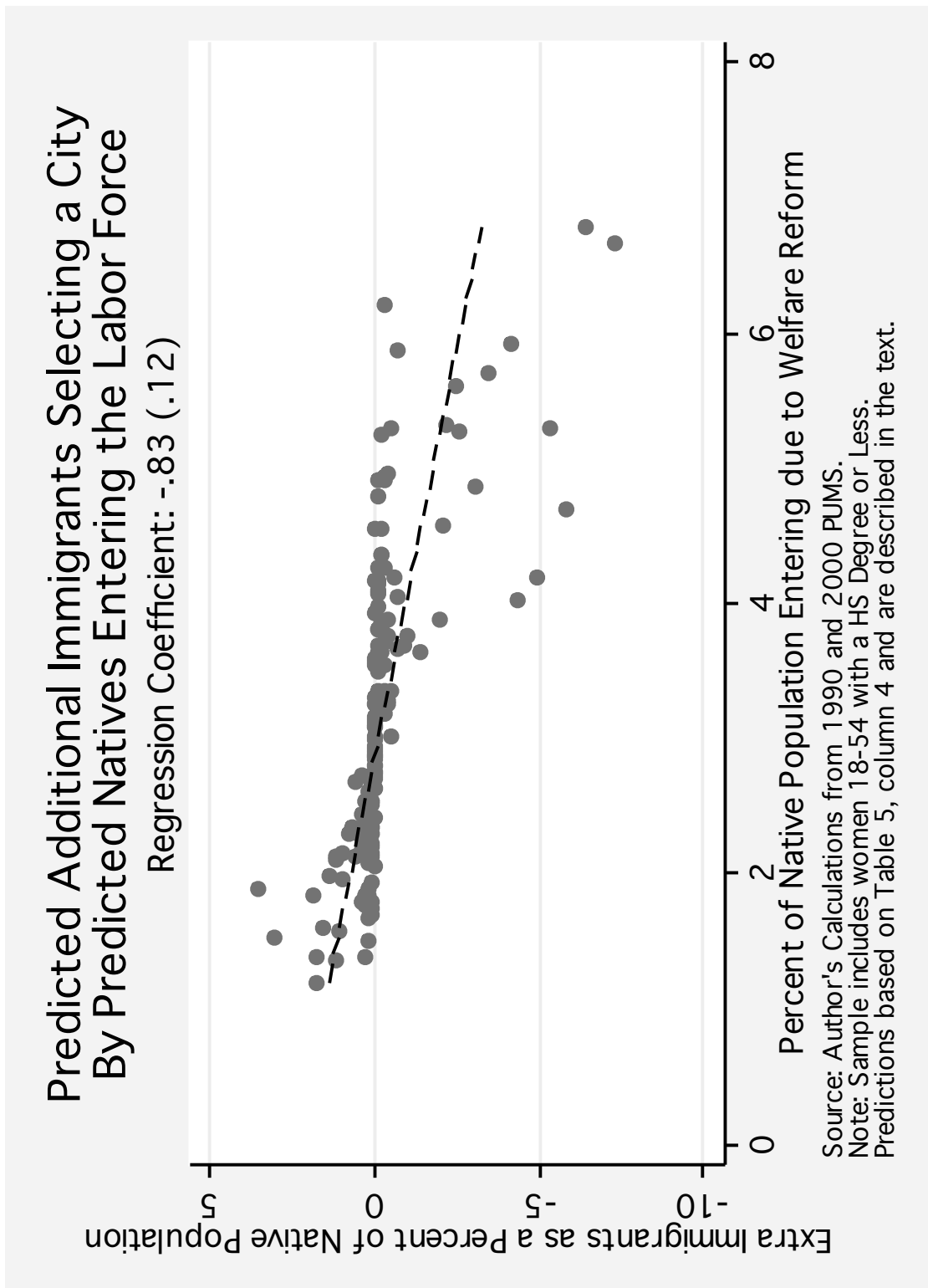


Table 1: Indices of Congruence in Industry and Occupation with Welfare Leavers

Group	Occupation	Industry
High Skilled Native Men	-0.58	-0.61
High Skilled Immigrant Men	-0.37	0.02
Low Skilled Native Men	-0.11	-0.25
Low Skilled Immigrant Men	-0.10	-0.03
High Skilled Native Women	-0.09	0.02
High Skilled Immigrant Women	0.43	0.31
Low Skilled Native Women - did not receive welfare	0.63	0.76
Low Skilled Immigrant Women	0.73	0.54
Low Skilled Single Native Women - received welfare	1.00	1.00

Source: Author's calculations from the 1994-2000 March CPS. The sample selection criteria are maintained from Figure 1. Definition of index of congruence found in the text. Two-digit industries and occupations used. The immigrant sample is restricted to persons arriving after 1990. Low Skilled means no more than a high school degree. High Skilled means at least some college. The index is equal to one by construction for the reference group.

Table 2: Distribution of Source Regions - New Immigrants 18-54, HS Degree or Less

	1980	1990	2000
Mexico	34.0%	36.6%	48.5%
Europe	16.0%	7.2%	7.2%
Caribbean	12.9%	11.6%	8.9%
Southeast Asia	8.4%	10.1%	6.2%
East Asia	7.9%	7.6%	4.5%
South America	6.7%	6.8%	6.7%
Central America	5.8%	13.5%	10.5%
Middle East	3.1%	1.6%	1.4%
Southwest Asia	2.8%	3.2%	3.1%
Africa	1.3%	1.3%	2.7%
Canada	1.2%	0.6%	0.4%
Observations	98,767	145,456	217,104
Total (Weighted)	1,975,340	3,168,171	4,819,553

Source: Author's Calculations from 1980-2000 PUMS. New immigrants are those arriving in the US less than ten years prior to the survey. Person-level census weights used.

Table 3: Descriptive Statistics of Immigrants Arriving Over the Previous Decade, Age 18-54, HS Degree or Less

	1980	
	Men (47.7%)	Women (52.3%)
Unmarried	39.6%	30.0%
No spouse in household	46.3%	33.8%
Household head, no spouse	10.8%	9.7%
Any children in household	45.2%	63.3%
No HS Degree	66.8%	63.1%
	1990	
	Men (52.4%)	Women (47.6%)
Unmarried	50.5%	38.8%
No spouse in household	61.6%	44.5%
Household head, no spouse	11.0%	9.8%
Any children in household	34.2%	56.5%
No HS Degree	58.6%	54.6%
	2000	
	Men (53.1%)	Women (46.9%)
Unmarried	51.9%	36.8%
No spouse in household	65.3%	43.1%
Household head, no spouse	10.6%	9.1%
Any children in household	31.2%	56.4%
No HS Degree	56.0%	51.7%

Source: Author's Calculations from the 1980-2000 PUMS. Sample selection criteria are the same as for Table 2. The numbers in parentheses give the percent of all immigrants who were of each gender. Person-level census weights used.

Table 4: MSA Characteristics 1980-2000

	1980		1990		2000	
	Mean	SD	Mean	SD	Mean	SD
Native Female Employment Rate, HS Degree or Less	66.75	5.81	72.36	5.96	73.71	5.57
Percent Receiving Welfare - Low Education Women	6.67	2.44	8.29	3.04	5.43	2.25
Average annual employment growth rate - over past decade	--	--	2.90	1.70	2.08	1.22
Immigrant Share of MSA Population, previous census	--	--	5.85	5.70	7.78	8.26
Maximum cash benefit, family of three (hundreds of dollars)	--	--	3.90	1.63	--	--
MSA in state that restored Food Stamp benefits	--	--	--	--	0.58	0.48
MSA in state that restored TANF benefits	--	--	--	--	0.36	0.47
MSA in state that restored Medicaid benefits	--	--	--	--	0.32	0.45
MSA in state that restored SSI benefits	--	--	--	--	0.15	0.36

Source: Author's Calculations from the 1980-2000 PUMS and 1980-2000 County Business Patterns. Selection criteria maintained from Table 2. Person-level census weights used.

Table 5: Percentage Change in Share of Female Immigrants Selecting a City

	OLS (1)	IV (2)	IV (3)	IV (4)	IV (5)	IV (6)
Change in Native Female Employment Rate	-0.019 (0.016)	-0.217** (0.066)	-0.241** (0.070)	-0.154** (0.034)	-0.122** (0.028)	-0.145** (0.035)
Change in decade average employment growth rate			0.258** (0.069)	0.124** (0.037)	0.090* (0.036)	0.126** (0.046)
Immigrant Share of MSA Population, 1990				-0.043** (0.006)	-0.034** (0.006)	-0.049** (0.010)
Change in log(Share of Immigrants - College Degree)					0.384* (0.164)	0.471** (0.164)
Maximum cash benefit, family of three						0.085* (0.043)
MSA in state that restored Food Stamp benefits						0.066 (0.112)
MSA in state that restored TANF benefits						-0.148 (0.110)
MSA in state that restored Medicaid benefits						-0.236 (0.131)
MSA in state that restored SSI benefits						0.523** (0.158)
Constant	0.375** (0.053)	0.650** (0.100)	0.893** (0.142)	1.000** (0.102)	0.772** (0.121)	0.619** (0.145)
Number of Cities	156	156	156	156	156	156
R-squared	0.01					
First Stage Coefficient		0.35	0.33	0.42	0.38	0.34
First Stage F-stat		13.86	14.23	33.43	22.57	18.43
Robust standard errors in parentheses						

* significant at 5%; ** significant at 1%

Source: Authors Calculations from the 1990 and 2000 PUMS. Selection criteria maintained from Table 2. The excluded instrument is the female welfare participation rate in 1990. Immigrant shares are calculated using person-level weights. The regressions are unweighted.

Table 6: Percentage Change in Share of Male Immigrants Selecting a City

	OLS	IV	IV	IV	IV	IV
	(1)	(2)	(3)	(4)	(5)	(6)
Change in Native Female Employment Rate	-0.021 (0.020)	-0.255** (0.090)	-0.279** (0.094)	-0.146** (0.038)	-0.097** (0.032)	-0.074* (0.031)
Change in decade average employment growth rate			0.289** (0.088)	0.085* (0.038)	0.040 (0.034)	-0.015 (0.043)
Immigrant Share of MSA Population, 1990				-0.066** (0.007)	-0.052** (0.008)	-0.040** (0.009)
Change in log(Share of Immigrants - College Degree)					0.552** (0.163)	0.547** (0.157)
Maximum cash benefit, family of three						-0.046 (0.046)
MSA in state that restored Food Stamp benefits						-0.343** (0.107)
MSA in state that restored TANF benefits						0.136 (0.127)
MSA in state that restored Medicaid benefits						-0.460** (0.149)
MSA in state that restored SSI benefits						0.408** (0.147)
Constant	0.608** (0.072)	0.928** (0.133)	1.201** (0.192)	1.366** (0.119)	1.051** (0.147)	1.297** (0.177)
Number of Cities	155	155	155	155	155	155
R-squared	0.01					
First Stage Coefficient		0.35	0.33	0.42	0.40	0.34
First Stage F-stat		13.57	14.09	33.21	24.68	18.66

Robust standard errors in parentheses
* significant at 5%; ** significant at 1%

Source: Authors Calculations from the 1990 and 2000 PUMS. Selection criteria maintained from Table 2. The excluded instrument is the female welfare participation rate in 1990. Immigrant shares are calculated using person-level weights. The regressions are unweighted.

Table 7: Percentage Change in Share of Female Immigrants Selecting Cities. Source-Destination Differences.

	OLS (1)	IV (2)	IV (3)	IV (4)	IV (5)	IV (6)
Change in Native Employment Rate	0.006 (0.014)	-0.174* (0.075)	-0.179* (0.072)	-0.133* (0.053)	-0.105* (0.049)	-0.090 (0.053)
Change in average employment growth rate			0.179** (0.056)	0.127** (0.038)	0.086** (0.032)	0.068 (0.039)
Ethnic group members as pct of MSA pop - decade start				-0.073** (0.012)	-0.059** (0.010)	-0.051** (0.010)
Change in log(Share of Immigrants - College Degree)					0.274** (0.054)	0.253** (0.053)
Maximum cash benefit, family of three						0.053 (0.040)
MSA in state that restored Food Stamp benefits						-0.065 (0.115)
MSA in state that restored TANF benefits						0.061 (0.116)
MSA in state that restored Medicaid benefits						-0.041 (0.135)
MSA in state that restored SSI benefits						-0.461** (0.140)
Constant	-0.536** (0.090)	-0.384** (0.117)	-0.191 (0.132)	-0.253* (0.110)	-0.396** (0.111)	-0.534** (0.161)
Observations	1131	1131	1131	1131	961	961
R-squared	0.18					
First Stage Coefficient		0.28	0.28	0.30	0.29	0.32
First Stage F-stat		10.66	11.68	14.66	12.22	12.63
Standard Errors clustered by MSA in parentheses						
* significant at 5%; ** significant at 1%						

Source: Author's Calculations from 1980-2000 PUMS. Selection criteria maintained from Table 2. Destinations not selected by anyone from a source during one year are omitted from the entire sample. Pairs are weighted by the square root of the number of source observations nationwide.

Table 8: IV Coefficient on Change in Female Employment - By Source Region

	β	se	First Stage F-stat
Canada	-0.033	0.093	7.25
Mexico	-0.223	0.189	3.93
Central America	-0.324	0.161	8.48
Caribbean	-0.282	0.154	7.21
South America	0.021	0.082	9.34
Europe	-0.013	0.053	19.38
East Asia	-0.089	0.072	23.77
Southeast Asia	-0.124	0.069	11.58
Southwest Asia	0.008	0.066	14.47
Middle East	-0.141	0.107	11.07
Africa	-0.065	0.078	15.36

Note: The specification and sample selection criteria are identical to column (4) of Table 7.

Table 9: Reduced Form Estimates of Change in Selection Probability by Arrival Year

	Early Arrivers (1)	Late Arrivers/Movers (2)	Only Movers (3)
Welfare Participation Rate - Low Education Women	-0.035* (0.016)	-0.069** (0.014)	-0.069** (0.014)
Change in average employment growth rate	0.067* (0.032)	0.037 (0.029)	0.037 (0.028)
Immigrant Share of MSA Population, 1990	-0.001 (0.006)	-0.023** (0.005)	-0.025** (0.005)
Constant	0.464** (0.141)	1.177** (0.125)	1.203** (0.125)
Observations	152	152	152
R-squared	0.06	0.29	0.30

Standard errors in parentheses

* significant at 5%; ** significant at 1%

Source: Author's Calculations from 1980-2000 PUMS. Selection criteria maintained from Table 2. Early arrivers entered the US prior to 1995, and have not moved since 1995. Late arrivers entered the US after 1995. Movers arrived prior to 1995, but have since moved to a different MSA than where they were living in 1995.