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Welfare-Induced Migration at State Borders: New Evidence from Micro-Data

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Abstract

This paper extends and synthesizes the various approaches used in the recent welfare migration literature to both offer the most comprehensive set of tests to date for welfare migration and to determine the relative importance of short-distance moves in welfare migration flows. The current study follows on the finding of McKinnish (2005) of welfare migration effects obtained by comparing welfare participation at state borders to state interiors. This identification strategy is extended to micro-data from the 1980 and 1990 Decennial Censuses and combined with the demographic comparisons used elsewhere in the welfare migration literature. While there are some exceptions, the results are largely consistent with the presence of welfare migration effects and the substantial importance of short-distance moves in welfare-induced migration flows.

I. Introduction

The question of whether potential welfare recipients migrate across states in response to more generous welfare benefits continues to attract the scrutiny of academics and the interest of policy makers. Studies have almost exclusively focused on the Aid to Families with Dependent Children (AFDC) program, due to its history of relatively large cross-state differences in benefit levels. Several recent studies using a variety of comparison group approaches suggest that at least moderate welfare migration effects do exist. The current study extends and synthesizes this group of recent papers to provide a particularly comprehensive and rigorous set of tests for the welfare migration effect and to explore the relative importance of short-distance moves in welfare-motivated migration.

McKinnish (2005) tests for welfare migration by comparing welfare caseloads at state borders to state interiors. If migration costs are lower for border county residents, border counties on the high-benefit side of a state border should have higher welfare participation relative to the state's interior counties, having disproportionately attracted migrants. Border counties on the low-benefit side should have lower welfare participation relative to the state's interior counties, having disproportionately lost welfare migrants. McKinnish (2005) confirms this relationship using county-level data on AFDC expenditures from 1970-90.

This previous work was unusual in its assumption regarding the importance of short-distance moves in its identification strategy. Most of the recent welfare literature either focuses on the decision to leave one's home state or estimates the effect of welfare generosity on long-distance moves. The one other study designed to identify welfare migration effects from short-distance moves between border counties, Walker(1994), has been criticized for ignoring what were thought to be more important long-distance migration flows.

This paper extends the identification strategy in McKinnish (2005) to micro-data in the 1980 and 1990 Decennial Censuses. It further combines the comparison of border and interior areas with the demographic treatment and comparison groups used elsewhere in the welfare migration literature. In doing so, this study extends the current welfare migration literature in several important ways. First this study tests whether welfare migration effects estimated using the demographic comparisons employed elsewhere in the literature vary by residence in border areas versus interior areas of states. This generates a set of differences-in-differences-in-differences approaches that unify and extend several previous differences-in-differences tests. Second, by employing estimating strategies used elsewhere to eliminate spurious effects of welfare generosity, this generates estimates of welfare migration effects in state interiors that were differenced out in McKinnish (2005). This provides evidence of the relative importance of short and long-distance flows in welfare-induced migration. Finally, the empirical results will show that the comparison of border and interior areas uncovers evidence of welfare migration in specifications that previously rejected welfare migration effects.

II. Research Strategy

It is generally recognized that it is difficult to convincingly study welfare migration without a strategy that makes within state comparisons. Walker (1994), Levine and Zimmerman (1999), Meyer (2000), Gelbach (2004) and McKinnish (2005) all use various comparison group strategies to study migration for AFDC benefits.[1] This section reviews the various strategies employed in the literature and discusses how they will be combined in this paper.

[1] Earlier studies and studies without comparison groups, such as Gramlich and Laren (1984), Blank (1988), and Enchautegui (1997) are not discussed here. Nor are other well-executed recent studies regarding migration and welfare reform (Kaestner, Kaushall and Van Ryzin, 2003) and welfare migration of foreign immigrants (Borjas, 1999). Bruecker (2000) and McKinnish (2005) both give more detailed reviews of the broader welfare migration literature.

A. State Borders Approach

The primary analysis used in this paper relies on the crucial assumption that the costs of between-state migration are lower for individuals located close to state borders. Besides the physical costs of relocating, this could also reflect the lower information costs for border residents. Those living in border counties may be more aware of the neighboring states' welfare benefit policies. Short-distance moves may also allow welfare mothers to retain social networks that are often crucial to their survival.[2]

Consider the very simple example for a country with two states illustrated in Figure 1. The top state is the high-benefit state and the bottom state is the low-benefit state. Area HB is the border area of the high-benefit state and area HI is the interior area of the high-benefit state. Areas LI and LB are similarly defined. If the assumption of differential migration costs is correct, then, all else equal, the border area in HB should contain disproportionately more welfare migrants and welfare recipients compared to area HI, having disproportionately drawn migrants. The border areas in LB should likewise contain disproportionately fewer welfare migrants and welfare recipients compared to area LI, having disproportionately lost migrants.

Using aggregate county-level data on AFDC expenditures from 1970-90, McKinnish (2005) finds that a $100 cross-border benefit differential generates per capita AFDC expenditures that are 4-7% higher in border counties than interior counties of the same state. This differential in welfare expenditures does not reflect differences in generosity between border and interior counties, because benefits are set at the state-level. This difference in expenditures therefore reflects differences in caseloads between border and interior counties. Furthermore, this result is not an artifact of higher welfare take-up in high-benefit states, as the

[2] Edin and Lein (1997) find that most mothers on AFDC receive income transfers from relatives, boyfriends or absent fathers that are an important component of their monthly budget.

higher take-up exists in interior counties, too.[3] Additionally, omitted variable bias is less likely, because counties on each side of the border should be relatively similar in unobserved characteristics, such as geography, climate, and cost-of-living. Large differences in labor market opportunities should not exist; any such differences should be arbitraged away by migration.

The only other paper in the literature to study short-distance moves between counties at state borders is Walker (1994), who uses the aggregate county-to-county migration flows file from the 1980 Census. He specifically focuses on migration between contiguous counties across three state borders with relatively large welfare benefit differentials. Rather than comparing behavior at state borders to state interiors, he studies moves between contiguous counties at state borders, comparing the rate of migration across to the high-benefit state to migration across to the low-benefit state and migration between contiguous border counties within the same state. Comparing migration of poor young women to that of poor young men, he finds little evidence of welfare migration. Meyer (2000), however, points out that by conditioning on poverty-status in the selection of the analysis sample, Walker understates the welfare migration effects. [4] Given limitations of his data, Walker is also unable to separate mothers from non-mothers, a potentially important distinction.

One shortcoming of the within-state comparison of border and interior counties in McKinnish (2005) is that it can only measure the differential effect of welfare migration on border areas. If welfare migration only occurs through short-distance moves, then this comparison captures the full welfare migration effect. If, however, there is substantial welfare

[3] Early welfare migration research often used welfare recipients as the analysis sample. As Meyer (2000) points out, this automatically generates a sample that has disproportionately migrated into high benefit states due to the higher take-up in high-benefit states.

[4] Specifically, Meyer argues that states with higher benefits tend to have lower poverty rates, both due to stronger economies and more generous social services. Therefore, a sample of women in poverty will be more likely to include those who have migrated to a low-benefit state than a high-benefit state.

migration in and out of state interiors, it can substantially understate the full welfare migration effect. In fact, both Meyer (2000) and Brueckner (2000) criticize the focus on short-distance moves across state borders in Walker. They argue that this ignores the fact that most migration is longer-distance, between major metropolitan areas and/or across regions. While it is true that the majority of migration involves longer-distance moves than between contiguous counties, there is no evidence that the majority of welfare-induced migration is long-distance. If the majority of prime-age migration is to locate in better labor markets, long-distance moves are generally warranted, but welfare payments can be improved with short-distance moves across state borders.

This study combines the other comparison group approaches used in the literature to produce separate estimates of welfare migration effects in border and interior areas of states. This allows us to determine if the interior area effects are meaningful and if they differ from border area effects in ways that are consistent with the importance of short-distance moves. The remainder of Section II discusses each of the previous comparison group approaches from the literature that will be combined with the border area approach in this paper.

B. Welfare participation of Migrants

Meyer (2000) argues that if welfare migration exists, then in-migrants to high-benefit states should exhibit higher rates of welfare participation than native-born residents. Using 1980 and 1990 Census data, he confirms that among single mothers, migrants to high-benefit states exhibit higher welfare participation rates than natives of those states and that this difference is larger than the participation differential between migrants and natives in low-benefit states. He finds that these effects are reduced dramatically when controlling for age, race, education, and number and age of children. As Meyer points out, however, it is not clear whether it is desirable to control for these individual characteristics. If welfare migration draws in women with lower education or younger children, then adding these controls eliminates part of the true migration effect.

In the current paper, the differential welfare participation effect between migrants and natives is estimated separately for border and interior areas of states. This tests whether the migrant-native differential found by Meyer varies between state borders and interiors and, likewise, testing whether the border-interior differential found by McKinnish can be attributed to migrants as opposed to natives.

C. Demographic Comparison Groups

The most popular approach in the literature has been to compare the migration behavior of a welfare-prone group, such as single mothers, to the migration behavior of a group less likely to receive welfare, such as married mothers. Walker (1994), as discussed above, compares county-to-county migration flows across three state borders for poor young women to poor young men and finds no evidence of welfare migration. Levine and Zimmerman (1999) use NLSY79 data to compare interstate migration decisions of poor single mothers to four different control groups: poor single women without children, poor single men, poor married women, and poor married men. They also find no evidence of welfare migration. Meyer (2000) uses the 1980 and 1990 Census to compare inter-regional migration of single mothers to single women without children and married mothers. He finds evidence of moderate welfare migration, particularly when he conditions on a sample of high school dropouts. Gelbach (2004), discussed in more detail below, compares lifecycle migration decisions of single mothers who are never-married high school dropouts to single mothers who are never-married high school graduates, previously married high school dropouts, and previously married high school graduates. He also uses married high school dropouts and married high school graduates as additional comparison groups. Gelbach finds strong evidence of welfare migration in 1980, but not 1990. This study will use comparison groups generated based on marital history and education, following Meyer and Gelbach. Male comparison groups and comparison groups based on poverty status will not be pursued.

The top two rows of Table 1 report welfare participation rates for samples of all mothers and samples of single mothers in the 1980 and 1990 Censuses. The remaining ten rows of Table 1 report the welfare participation rates for the treatment group (never-married high school dropouts) and all nine comparison groups that will be used in the demographic comparisons in this paper. As expected, welfare participation is very high among never-married high school dropouts with children under 18. A full 67.3% in 1980 and 62.4% in 1990 received welfare income in the previous year. Welfare participation is also high among never-married high school graduates and previously-married high school dropouts, ranging from 35.5% to 41.5%. Welfare participation is considerably lower among all other comparison groups.

Table 2 illustrates the difficulty in selecting an appropriate comparison group. By picking comparison groups that are most similar to the ever-married dropouts, the comparison groups themselves have substantial welfare participation and, therefore, potentially also migrate for welfare. Comparison groups with low rates of welfare participation are less likely to meet the requirement that they respond to all unobserved characteristics correlated with state welfare benefits in the same manner as the ever-married dropouts. For this reason, results from a wide range of comparison groups are reported in this paper.

Because of the difficulty in choosing an appropriate demographic comparison group, it is particularly useful to have an additional comparison to act as a specification test of the comparison group choice. In this paper, the border-interior comparison will act as just such a test.   The treatment-comparison group differential in responsiveness to welfare benefits will be estimated separately for border areas and interior areas of states, to determine if the treatment-comparison group differential is larger in border areas.

D. Lifecycle Migration

Gelbach (2004) points out that the incentives to migrate for welfare benefits are highest when a mother's children are young, as there is a longer period of welfare benefit eligibility.   He interacts the welfare benefit with age to confirm this lifecycle effect.   He finds evidence of welfare migration in the 1980 Census. In the 1990 Census, however, the migration effects are as large for comparison groups such as previously-married mothers with high school degrees and married mothers with high school degrees as they are for never-married mothers who are high school dropouts. This suggests that the 1990 effects are potentially spurious. Gelbach's approach of allowing the migration effect to vary by child's age will also be pursued in this study, with separate estimation for border and interior areas of states.

III. Geographic Information and Definition of Border Areas

In McKinnish (2005), counties were the unit of observation and border areas were defined as counties with centroids within 25 miles of the neighboring state.[5] Unfortunately, the 1980 and 1990 Decennial Census data used in this study do not identify county of residence. Instead, geographic areas with populations of at least 100,000 are created, labeled as county groups in the 1980 Census and Public Use Microdata Areas (PUMAs) in the 1990 Census. I will refer to both county groups and PUMAs as local areas. In rural areas, these local areas can be

[5] Specifically, border counties were those whose centroid is within 25 miles of a county centroid in the nearest state. County to county distances in this paper are similarly defined.

quite large and contain many counties. In urban areas, they are smaller than, but not necessarily contained within, a single county.

These local areas do not correspond well to the border/interior area distinction necessary for this study. In rural areas, the local areas are larger than desired. The division of urban areas into many smaller units is likewise unhelpful, as the cluster of small geographic areas provides little useful variation. An additional issue is that while centroids are available for the 1990 PUMAs, they are not available for the 1980 county groups.

For this analysis, I consolidate the local areas so that the consolidated groups directly correspond to either a single county or group of counties with no overlap, using the following protocol:

1) Local areas containing multiple, whole counties and no parts of counties remain as is.

2) Counties containing multiple, whole local areas and no parts of local areas are aggregated up to the county level.

3) All remaining cases are ones in which a local areas overlap multiple counties that also contain other local areas. These cases are aggregated up to the smallest set of counties that can be created so that no local areas extend outside of the set.[6]

Following the above protocol, the local areas are aggregated up and county centroids are then used to generate distance measures. Local areas that are a single county are defined as border areas if the county centroid is within 25 miles of another state. Local areas that contain multiple

[6] For some of the smaller states, once this aggregation is conducted, there are not a sufficient number of local areas to perform a meaningful comparison of border and interior areas. As a result of these considerations, Connecticut, Massachusetts, Maine and Rhode Island are eliminated from the 1980 sample and Massachusetts and Vermont are eliminated from the 1990 sample.

counties are defined as border areas if one of the county centroids is within 25 miles of another state.[7]

IV. Data and Empirical Specification

A. Data and Sample

This study uses 1980 and 1990 Census Data. The sample includes all non-institutionalized women ages 18-55, who are the head of household or spouse of the head of household, and for whom number of children ever born equals number of children in the household. The mother samples are restricted to those with at least one child under the age of 18. The sample is further restricted to those who are native-born, reside in the 48 continental states, and were not abroad in the Census year or 5 years prior to the Census.[8] Women who report any form of disability are further removed from the sample, to reduce the probability that the reported welfare income is from SSI rather than from AFDC.[9]

Table 2 reports migration rates for the subsamples used in the analyses in Tables 4-8.[10] The table reports rates of interstate migration in the past 5 years, as well as the fraction of interstate migration that occurs between adjacent states. It is interesting to compare the migration rates from the first two rows of Table 2 to the remaining rows of Table 2. In the first two rows, the sample of all mothers is compared to single mothers. Despite the fact that, as reported in Table 1, there are very large differences in the welfare participation rates of the two groups, their migration behavior appears quite similar. Migration rates are1.3-1.6 percentage

[7] An alternative definition, using the fraction of the population located within 25 miles of the nearest state was also used, with similar, but less precise, estimates.
[8] To be clear, migration in this paper refers only to internal migrantion. Foreign immigrants are not included in the analysis.
[9] Women for whom welfare participation, location 5 years before the Census, marital status or education were allocated are also excluded from the sample.
[10] Zax(1994) discusses the importance of distinguishing migrations that involve relocation to new housing and labor markets from moves that do not. I do not investigate this distinction in the current paper.

points lower for single mothers, and the fraction of migration that occurs between adjacent states is almost identical for the two groups.

These similarities disappear to a substantial degree when the sample is broken out into more narrowly defined categories in the remaining rows of Table 2. Never-married mothers that are high school dropouts have, as reported in Table 1, exceedingly high rates welfare participation rates. Table 2 shows that this group is relatively immobile. Only 5.2% of the never-married dropouts migrated across state lines between 1975 and 1980 and only 6.4% did so between 1985 and 1990. These migration rates are lower than the rates for any of the 9 comparison groups, and, in most cases, considerably lower. Given that the never-married dropouts appear to face disproportionate migration costs, it stands to reason that they are less likely to make long-distance moves. Table 2 also confirms this by reporting the fraction of interstate migration that occurs between adjacent states. Among never-married dropouts that do migrate, 41% migrate to a neighboring state between 1975 and 1980, and 38% likewise migrated to a neighboring state between 1985 and 1990. These rates of short-distance migration are higher for the never-married dropouts than any of the 9 comparison groups. These migration rates suggest that short-distance moves are a particularly important component of migration among welfare-prone groups.[11]

B. Baseline Specification

The baseline logit model used in the analysis is:

$$(1) \quad \log\left(\frac{\Pr(Y_{ils}=1)}{\Pr(Y_{ils}=0)}\right) = \beta_o + \beta_1 T_{ils} + \beta_2 (AFDC_s * T_{ils}) + (StateCont_s * T_{ils})\beta_3 + NeighborCont_{ls}\beta_4 + (NeighborCont_{ls} * T_{ils})\beta_5 + LocCont_{ls}\beta_6 + X_{ils}\beta_7 + State_s * \delta$$

[11] A consequence of this low mobility is that there is a relatively small sample of interstate moves with which to study welfare migration. In 1980, only 5.2% of the 3,949 never-married dropouts migrate, for a total of 175 moves with which to identify the effect of welfare benefits.

where for person *i* in local area *l* in state *s*, *Y* is the binary outcome of interest, either welfare participation or migration. *T* is the treatment group of interest, either border residents, migrants, or never-married high school dropouts with children. *AFDC* is the monthly guaranteed benefit level to a family of four with no additional income, reported in hundreds of dollars.[12] *StateCont* is a vector of state controls including the unemployment rate, average manufacturing wage and average service sector wage. *NeighborCont* contains the AFDC Benefit (in hundreds of dollars), unemployment rate, manufacturing wage and service sector wage for the neighboring state nearest to the respondent's local area.

LocCont contains the unemployment rate, manufacturing wage and service sector wage of the respondent's local area. *X* is a vector of individual controls including urban residence, age, age-squared, race/ethnicity (indicators for white, black and Hispanic), education (indicators for high school dropout, high school diploma, and college degree), number of children, age of oldest child, age of youngest child.

State is a vector of state indicator variables. The main effects of *AFDC* and *StateCont* are absorbed into the state indicators, so that only the interactions appear in the model. In contrast, *NeighborCont* varies within state by local area (depending on the nearest state), and is not absorbed into the state indicators.[13]

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[12] I do not pursue cost of living adjustments performed in some of the other migration papers. Because this paper tests for evidence of short-distance moves across state lines between border counties, the difference in cost-of-living between the original location and the destination should be small. As I discuss in more detail in McKinnish (2005), any welfare benefits measure used in this analysis is in many ways a proxy for the overall generosity of a state's social services for the poor and should be interpreted as such.

[13] In McKinnish(2005), own state AFDC benefit was differenced from the AFDC benefit in the nearest state to create a cross-border differential measure that was then interacted with an indicator for border county. In this study, the state benefit and the benefit of the nearest state are entered separately into the model. The current is closer to that used in other welfare migration papers.

Because the number of adaptations of equation (1) throughout the analysis can be confusing, Table 3 provides an exhaustive list and description of all of the models estimated in Tables 4-10.

C. Correspondence to Differences-in-Differences-in-Differences Estimation

For each baseline specification, the model will also be estimated separately for border and interior areas. It is useful to consider how this exercise corresponds to a differences-in-differences-in-differences estimator. Consider a simplified version of equation (1) :

$$\log\left(\frac{\Pr(Y=1)}{\Pr(Y=0)}\right)=\beta_o+\beta_1 T+\beta_2 AFDC+\beta_3(AFDC*T)$$

where, for example, *Y* is an indicator for welfare participation and *T* is an indicator for migrant.

One possibility would be to estimate a fully-interacted model:

$$\text{(2)}\quad \log\left(\frac{\Pr(Y=1)}{\Pr(Y=0)}\right)=\beta_o+\beta_1 T+\beta_2 B+\beta_3 T*B+\beta_4 AFDC+\beta_5 AFDC*B \\ +\beta_6 AFDC*T+\beta_7 AFDC*T*B$$

where *B* is an indicator for border area resident. In this case β_7 is the differences-in-differences-in-differences estimator. In this example, β_7 estimates whether the migrant-native differential is larger in border areas, or alternatively, whether the border-interior differential is larger among migrants. If, instead, separate logits are estimated for border and interior areas:

$$\text{(3)}\quad \log\left(\frac{\Pr(Y=1}{\Pr(Y=0)}\right)=\alpha_o+\alpha_1 T+\alpha_2 AFDC+\alpha_3 AFDC*T \quad \text{if B=1}$$

$$\text{(4)}\quad \log\left(\frac{\Pr(Y=1}{\Pr(Y=0)}\right)=\gamma_o+\gamma_1 T+\gamma_2 AFDC+\gamma_3 AFDC*T \quad \text{if B=0},$$

then $\alpha_3=\beta_5+\beta_7$ and $\gamma_3=\beta_5$. Therefore, estimating the baseline model separately for border and interior areas and comparing the two coefficient estimates is equivalent to estimating the fully-interacted model. Alternatively, separate logits could be estimated for the treatment and comparison groups:

$$(5)\ \log\left(\frac{\Pr(Y=1}{\Pr(Y=0)}\right)=\alpha_o+\alpha_1 B+\alpha_2 AFDC+\alpha_3 AFDC*B \quad \text{if T=1}$$

$$(6)\ \log\left(\frac{\Pr(Y=1}{\Pr(Y=0)}\right)=\gamma_o+\gamma_1 B+\gamma_2 AFDC+\gamma_3 AFDC*B \quad \text{if T=0},$$

In this case, $\alpha_3=\beta_6+\beta_7$ and $\gamma_3=\beta_7$.

This paper uses the approach described in equations (3) and (4), due to the focus in this study on obtaining separate estimates for the interior and border areas. As is shown in equation (1), the specifications used in this paper do not interact the state indicators or the variables in *X* and *LocCont* with the treatment indicators. Therefore, estimates from fully specified form of equations (3) and (4) are not entirely identical to those obtained using the forms of equation (2) or equations (5) and (6).

V. Empirical Results

A. Welfare Participation Results

The first estimation approach is to test whether welfare participation differs between state borders and interiors and between migrants and natives in ways that are consistent with welfare migration. The specification used in Table 4 is that reported in equation (1) with welfare participation, defined as having received welfare income in the previous year, as the dependent variable. In the first two columns, T is an indicator for border area resident. In the second two columns, T is an indicator for having migrated to the state in the past 5 years. In both cases, the AFDC Benefit, state controls, neighbor state controls and local controls are based on location in the year of the Census. Therefore, in all columns of Table 4, a positive estimate for β_2 is consistent with welfare migration. In the first two columns, a positive coefficient indicates that the difference in welfare participation between the border and interior areas of the state increases in the size of the state welfare benefit. In the second two columns, a positive coefficient indicates that the difference in welfare participation between migrants and natives increases in the size of the state welfare benefit. These details of the specification and their interpretation are recorded in the first two rows of Table 3.

For both of these specifications, it is important to consider the appropriate sample for estimation. On one hand, because welfare participation is almost exclusively an activity of single mothers, it seems appropriate to only perform the analysis on a sample of single mothers. The drawback of only using a sample of single mothers is that: Pr(W|M)=Pr(W|SM)*Pr(SM|M), where W indicates welfare receipt, M indicates a mother and SM indicates a single mother. Welfare migration can therefore affect welfare participation in two different ways. The first is to bring in more single mothers to a high-benefit state, changing Pr(SM|M) for that state. The second is to bring in single mothers that are more welfare-prone than the single mothers already in the state, changing Pr(W|SM). If we only include single mothers in our analysis, we only estimate the effect on Pr(W|SM), and exclude the effect on Pr(SM|M).

One way to think about this concern intuitively would be to image that all single mothers have exactly the same probability of welfare take-up. If then, welfare migration brings more single mothers into the state, the fraction of single mothers that are welfare recipients will remain unchanged, but the total rate of welfare receipt will go up. If we only analyze the welfare participation rate among single mothers, we will miss entirely the effect of welfare migration. As a result of these concerns, Table 4 reports results for two separate samples: all mothers and single mothers.

A similar argument can be made regarding the use of demographic control variables. Using the full set of demographic controls listed in Section IV eliminates the role of welfare migration in increasing the prevalence of high school dropouts or mothers with young children, and only estimates the effect of welfare migration on the probability a high school dropout or young mother receives welfare. As a result, Table 4 reports results using three different sets of control variables. The first set only includes a control for urban residence and no demographic controls. The second set adds controls for mother's age, mother's age squared, number of children, age of oldest child and age of youngest child. The third set adds controls for race/ethnicity (indicators for white, black and Hispanic) and education (high school dropout, high school diploma, and college degree).

The first two columns of Table 4 test the relationship estimated in McKinnish (2005). The top panel uses the sample of all mothers and the bottom panel uses the sample of single mothers. The positive coefficients are consistent with welfare migration, although are statistically significant in only a few specifications. Average derivatives are reported in brackets. An average derivate of 0.005 in the top panel indicates that $100 higher welfare benefits increase the probability a mother in border areas is on welfare half of a percentage point over the probability a mother in interior areas is on welfare. This is an increase of 10% given a base welfare participation rate of 5%, as reported in Table 1. An average derivate of 0.020 in the bottom panel indicates that $100 more of welfare benefits increase the probability a single mother in border areas is on welfare 2 percentage points over the probability a single mother in interior areas is on welfare. This is a 7-8% increase over the base participation rates of 27% and 24% reported in Table 1.[14]

The second two columns of Table 4 test the relationship estimated in Meyer (2000). A comparison of columns 1 and 2 to columns 3 and 4 indicate that the two different comparison group approaches yield positive welfare migration effects of similar magnitude. In the migrant-native comparison, however, the coefficient estimates are largely statistically significant. An average derivate of 0.005 in the top panel of columns 3 and 4 indicates that a $100 increase in welfare benefits increases the probability a recent migrant is on welfare half of a percentage point over the probability a native-born mother is on welfare.

The Table 4 results can be used to return to the discussion above regarding the two effects of welfare migration, one being to increase the prevalence of single mothers, and the other being to increase the propensity for single mothers to receive welfare. A rough decomposition detailed in the Appendix estimates the relative contribution of these two effects. In 1980, 20-40% of the welfare migration effect is to increase the fraction of single mothers, but the majority of the effect is to bring in single mothers that are more welfare prone. For 1990, the two effects contribute equally to the effect of welfare migration on total welfare participation of mothers.

In Table 5, the two comparison strategies from Table 4 are combined. The migrant-native model estimated in columns 3 and 4 of Table 4 is now estimated separately for residents of border areas and residents of interior areas. Table 5 reports the effects for both the interior and border areas in all specifications. This allows the reader to determine the welfare migration

[14] McKinnish(2005) found that the welfare migration effects increased between 1980 and 1990, which were attributed to the accumulation over time of a welfare-prone population through continued welfare migration. This increase is not evident in Table 4.

effect if we take the interior effect to be a true welfare effect, and also if we take the interior effect to be spurious and difference it out.[15]

The results are reported in the first two columns of Table 5, with the 1980 coefficient estimates reported at the top of the table and the 1990 coefficient estimates reported at the bottom of the table. If the majority of welfare migration occurs through short-distance moves, we expect the differential response to welfare benefits between migrants and natives to be larger at state borders than state interiors.

The results for 1980 contradict expectations. In all cases, the larger and more precisely estimated effect is in the interior areas. For 1990, the results do conform to expectations, with the larger effects in the border regions. For brevity, the estimates using the race and education controls are not reported, as those estimates were the smallest and least likely to be significant in Table 3.

One concern when estimating the welfare participation of recent migrants with Decennial Census data is the timing of welfare participation. Welfare participation in the 1980 Census is defined as receiving any welfare income in 1979, while migration is defined as living in a different state in 1975 than at the time of the Census. It is possible that the welfare participation observed in the Census can precede the migration. It is unclear, however, why this data issue would differentially effect border area and interior area residents.

An alternative specification is to use whether or not the mother still lives in her state of birth to determine the migrant designation. This measure captures migration over a longer period, including migration by the respondent's own mother. Columns 3 and 4 of Table 5 simply

[15] This paper does not test for statistically significant differences in the border area and interior area estimates. Casual observation of the magnitudes and standard errors will indicate to the reader that in some cases the differences are likely to be statistically significant and in other cases they are not. The more important evidence, however, is the relatively consistent pattern of larger border area effects estimated throughout the paper.

re-estimate the models from the first two columns replacing the indicator for recent migrant with an indicator for having moved from the state of birth. Using this specification, the results are much more consistent with expectations, with the exception of the 1980 results for the single mother sample. Based on the average derivatives, the border area effect is, on average, three times the size of the interior area effect.

B. Comparison Group Results

This section uses the demographic comparison group approach. The welfare-prone treatment group is the sample of never-married single mothers who are high school dropouts. For the treatment group and the first eight comparison groups, only women with a child under 18 in the household are included in the sample. The first eight comparison groups are never-married high school graduates, never-married college graduates, previously-married high school dropouts, previously-married high school graduates, previously-married college graduates, married high school dropouts, married high school graduates, married college graduates. Previously married is defined as all women who are separated, divorced or widowed. The ninth and final comparison group contains never-married high school dropouts without children.

Table 6 estimates a version of equation (1) in which *Y* is an indicator for interstate migration within the past 5 years. *T* is an indicator for never-married single mothers who are high school dropouts. This specification tests whether the migration response to welfare benefits is larger for the treatment group than the comparison group. For each comparison group, the migration logit is estimated separately on a subsample that consists of the treatment group and that individual comparison group. The AFDC Benefit, state controls, neighbor state controls and local controls are based on location 5 years prior to the Census year. A negative estimate for β_2 is therefore consistent with welfare migration, indicating that higher welfare benefits lower the probability of moving out of state more for the treatment group than for the comparison group. The specifications in Table 6 are similar in approach to those used by Walker (1994), Levine and Zimmerman (1999), Meyer (2000) and Gelbach (2004), although the comparison groups employed in Table 6 are most similar to those used by Meyer and Gelbach.

Table 6 reports estimates for 1980 that are consistent with welfare migration, but not for 1990. The average derivates reported in Table 6 are calculated on the treatment sample of never-married high school dropouts. The highly significant 1980 results suggest that $100 more in welfare benefits lowers the probability that never-married high school dropouts leave the state 1-2 percentage points more than for the comparison groups. These are very large effects given that the baseline migration rate, as reported in Table 2, is only 5.2%. The 1990 effects, however, are extremely small and insignficant.

In Table 7, the 1980 results from Table 5 are re-estimated separately for border and interior areas. The estimates in Table 7 are consistent with larger welfare migration effects in border areas relative to interior areas of states. The average derivates for the border areas, ranging from –0.026 to -.049, are extremely large given the low base migration rate for never-married high school dropouts. If, however, the interior area effect is differenced out, then the remaining migration effects are similar in size to those reported in Table 6.

In Table 8, the 1990 results from Table 6 are re-estimated separately for border and interior areas. The results in this table are particularly interesting given the 1990 results reported in Table 6. In Table 6, the coefficient estimates were almost all very close to zero and statistically insignificant. In Table 8, these small insignificant coefficients appear to be the result of averaging negative coefficients in border areas with positive coefficients in interior areas. The results in Table 8 are therefore much more supportive of a welfare migration effect than the Table 6 results that did not differentiate between border and non-border areas.

If the welfare migration effects in border areas for 1980 are compared to the effects for 1990, the 1980 effects look substantially larger. If, however, the differential effects between the border and the interior areas are compared between 1980 and 1990, they are quite similar in magnitude. This suggests that the comparison group approaches may not be sufficient to net out unobservables and that a differences-in-differences-in-differences approach that combines the demographic comparison with the border/interior comparison may be preferable to test for a true welfare migration effect.

C. Lifecycle Migration Results

Tables 9 and 10 report estimates using a specification similar to that of Gelbach (2004), which interacts the AFDC benefit variable with the age of the oldest child to allow a lifecycle migration effect. The logit model used is:

$$(7) \quad \log\left(\frac{\Pr(Y=1)}{\Pr(Y=0)}\right) = \beta_o + \beta_1 AFDC + \beta_2 (AFDC * Age) + StateCont\beta_3 + (StateCont * Age)\beta_4 + NeighborCont\beta_4 + LocCont\beta_5 + X\beta_6$$

where *Age* is the age of the oldest child and all other variables are as defined in equation (1). The main effect of age of oldest child is contained in the *X* vector. Consistent with Gelbach's specification, the state effects are eliminated and the main effect of the AFDC benefit and State controls are included in the model.[16] The sample is reduced to include only those mothers whose oldest child is between the ages of 4 and 17.

Table 9 reports the results for 1980. Estimates for the never-married high school dropouts are reported in the first column and estimates for the five comparison groups of mothers

[16] State fixed-effects are unnecessary if the comparison group sufficiently captures the effect of unobservables. Levine and Zimmerman (1999) likewise do not use state fixed-effects.

used by Gelbach are reported in the remaining columns. The five comparison groups of mothers are never-married high school graduates, previously married high school dropouts, previously married high school graduates, married high school dropouts and married high school graduates. The coefficients reported in Table 9 are estimates of the main AFDC effect (β_1) and the AFDC-age interaction (β_2). They are not, as they were in Table 6-8, estimated for never-married dropouts relative to a comparison group. Estimates have to be compared across columns of Table 8 in order to make the comparison across demographic groups.

The top two rows of Table 9 report the main AFDC effect as well as the interaction with age of oldest child for the full sample. The results in these first two rows are broadly consistent with the estimates Gelbach obtained with the 1980 Census data. The main effect is large and negative for the never-married dropouts and smaller for most of the comparison groups. The age interaction is positive, but smaller than that obtained by Gelbach.[17]

The lower panels of Table 9 estimate the model in equation (7) separately for border areas and interior areas. The welfare-prone group of never-married dropouts is the only one for whom there is a sizeable difference between the border area coefficient and the interior area effects. It is surprising that the age interaction coefficient is negative, although imprecisely estimated, for the border areas. For the sample of never-married high school graduates, the migration effect is generated in the interior, rather than border areas.

Table 10 reports the lifecycle results from the 1990 Census. The first two rows of this table largely replicate Gelbach's results, particularly the finding of effects for previously-married high school graduates and married high school graduates that are larger than for the never-

[17] There is no expectation that these estimates should replicate Gelbach exactly, as the samples used are slightly different and the state, neighbor and local control variables used in this study are different from those used by Gelbach.

married dropouts. This leads Gelbach to conclude that the welfare migration effects estimated for 1990 are likely spurious. The results reported in the remaining rows, in which the logits are estimated separately for border and interior areas, are particularly interesting. Consistent with a real welfare migration effect, the coefficient estimates for never-married dropouts are large and significant in the border areas but very small and insignificant in the interior areas. This is also true for the never-married high school graduates. But, for the troubling comparison groups of the previously-married and married high school graduates, there is a much smaller difference between the border area and the interior are effects.   When the differential effects between border and interior areas are considered, then the 1990 results are consistent with a welfare migration effect, albeit a smaller one than found for 1980.[18]

VI. Conclusions

The purpose of this study is three-fold. The first is to combine the previous comparison group approaches with a comparison of state border and interior areas to provide a particularly comprehensive and rigorous set of differences-in-differences-in-differences style tests for welfare migration. The second is to investigate the relative importance of short-distance moves in welfare migration flows. The third is to obtain an estimate of the migration effects in state interiors, which were differenced out in McKinnish (2005), in order to obtain an estimate of the total welfare migration effect that could not be identified in McKinnish (2005).

To avoid confusion from the large number of comparisons generated in this paper, Table 11 summarizes the fundamental findings from each table and re-states the magnitudes of the estimated migration effects. While there are some exceptions, the results are largely consistent with fairly sizeable welfare migration effects and with the substantial importance of short-

[18] It is, however, unclear how to interpret the results for the never-married high school graduates as the larger effects are estimated for the interior areas in 1980, but for the border areas in 1990.

distance moves in welfare migration. In fact, the demographic comparison group results and the lifecycle migration results for 1990 show no evidence of welfare migration until the comparison between state borders and interiors is made.

The results, however, suggest we should not be overly confident that we have obtained reliable estimates of welfare migration effects for state interiors. The results are more consistent with true welfare migration effects when considering the differential between border and interior areas. The magnitudes of the effects are also much more consistent between 1980 and 1990 when the interior effects are differenced out. This suggests that the demographic comparison groups have not fully eliminated unobserved variables and that the within state differencing between border and interior areas is warranted to more fully eliminate spurious effects.

The magnitudes of the effects indicate that, on one hand, sizeable differences in welfare benefits do generate sizeable changes in the migration rate of welfare-prone individuals. On the other hand, because the base migration rate is so low, even a sizeable change in the migration rate does not generate particularly large migration flows. This reflects the fact that the welfare-prone are a relatively immobile group.

The results of this study suggest that in a 5-year period, a $100 benefit difference generate the migration of 1-3% of the welfare-prone population located at state borders. These effects are almost identical in magnitude to those reported in McKinnish (2005).

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Appendix

This section uses the results in Table 4 to perform a simple back of the envelope calculation to decompose the effect of welfare migration on welfare participation into its effect on the prevalence of single mothers and its effect on the participation rate of single mothers.

Consider the following decomposition:

$$\Pr(W \mid B) - \Pr(W \mid I) = \Pr(W \mid SM, B) * \Pr(SM \mid B) - \Pr(W \mid SM, I) * \Pr(SM \mid I).$$

Where W is an indicator for welfare, SM is an indicator for single mother, B is an indicator for border resident and I is an indicator for interior resident. Adding and subtracting the term $\Pr(W \mid SM, B) * \Pr(SM \mid I)$, generates:

$$\begin{aligned}\Pr(W \mid B) - \Pr(W \mid I) &= \Pr(W \mid SM, B) * [\Pr(SM \mid B) - \Pr(SM \mid I)] \\ &+ \Pr(SM \mid I) * [\Pr(W \mid SM, B) - \Pr(W \mid SM, I)].\end{aligned}$$

Equivalently, $\Pr(W \mid SM, I) * \Pr(SM \mid B)$ could be added and subtracted, but doing so only generates minor changes in the results in this Appendix. An equivalent decomposition can be produced for the comparison of migrants and natives, by replacing B with an indicator for Migrant (M) and I with an indicator for Native (N).

As an imperfect, but useful, simplification, fix $\Pr(W \mid SM, B)$ and $\Pr(SM \mid I)$. The change in the welfare participation differential resulting from a higher welfare benefit level can then be written as:

$$\begin{aligned}\Delta[\Pr(W \mid B) - \Pr(W \mid I)] &= \Pr(W \mid SM, B) * \Delta[\Pr(SM \mid B) - \Pr(SM \mid I)] \\ &+ \Pr(SM \mid I) * \Delta[\Pr(W \mid SM, B) - \Pr(W \mid SM, I)].\end{aligned}$$

In Table A1 below, average derivatives from the top panel of Table 3 estimate $\Delta[\Pr(W \mid B) - \Pr(W \mid I)]$ and average derivatives in the bottom panel of Table 3 estimate $\Delta[\Pr(W \mid SM, B) - \Pr(W \mid SM, I)]$. Average derivatives from estimates of equation (1) using an indicator for single mother as Y (not reported in this paper) are used to generate $\Delta[\Pr(SM \mid B) - \Pr(SM \mid I)]$. The coefficients in these single mother logits are statistically insignificant in 1980, but statistically significant in 1990. $\Pr(W \mid SM, B)$ and $\Pr(SM \mid I)$ are obtained from sample statistics.

The results of this effort, reported below in Table A1, indicate that for 1980, 20-40% of the welfare migration effect is to increase the fraction of single mothers, but that the majority of the effect is to bring in single mothers that are more welfare prone. For 1990, the two effects contribute equally to the effect of welfare migration on total welfare participation of mothers.

Table A1

	1980		1990	
	Urban	Age/Child	Urban	Age/Child
Panel A: Border-Interior Comparison				
A. $\Delta[\Pr(W \mid B) - \Pr(W \mid I)]$	0.005	0.005	0.005	0.004
B. $\Pr(W \mid SM, B)$	0.288	0.288	0.255	0.255
C. $\Delta[\Pr(SM \mid B) - \Pr(SM \mid I)]$	0.008	0.007	0.009	0.008
D. $\Pr(SM \mid I)$	0.135	0.135	0.170	0.170
E. $\Delta[\Pr(W \mid SM, B) - \Pr(W \mid SM, I)]$	0.023	0.021	0.012	0.014
B*C	0.002	0.002	0.002	0.002
D*E	0.003	0.003	0.002	0.002
% from $\Delta\Pr(SM)$, (B*C)/A	0.40	0.40	0.40	0.40
% from $\Delta\Pr(W \mid SM)$, (D*E)/A	0.60	0.60	0.40	0.40
Panel B: Border-Interior Comparison				
A. $\Delta[\Pr(W \mid M) - \Pr(W \mid N)]$	0.005	0.006	0.006	0.005
B. $\Pr(W \mid SM, M)$	0.253	0.253	0.247	0.247
C. $\Delta[\Pr(SM \mid M) - \Pr(SM \mid N)]$	0.004	0.004	0.012	0.010
D. $\Pr(SM \mid N)$	0.136	0.136	0.172	0.172
E. $\Delta[\Pr(W \mid SM, M) - \Pr(W \mid SM, N)]$	0.023	0.015	0.015	0.010
B*C	0.001	0.001	0.003	0.002
D*E	0.003	0.002	0.003	0.002
% from $\Delta\Pr(SM)$, (B*C)/A	0.20	0.20	0.50	0.40
% from $\Delta\Pr(W \mid SM)$, (D*E)/A	0.60	0.40	0.50	0.40

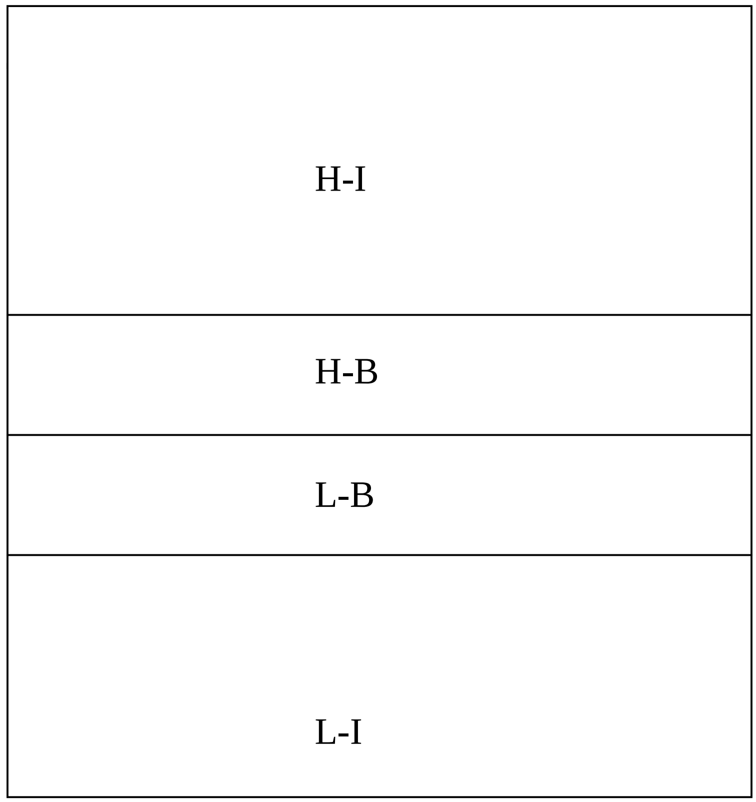

Figure 1: Two State Example

Table 1: Welfare Participation of Various Subsamples

	1980		1990	
	%Welfare	N	%Welfare	N
Mothers with children under 18:				
All Mothers	0.049	725,565	0.051	725,520
Single Mothers	0.271	97,551	0.242	122,727
Never-Married :				
HS Dropouts	0.673	7,166	0.624	9,857
HS Grads	0.406	11,865	0.354	22,300
College Grads	0.169	848	0.082	1,746
Previously-Married				
HS Dropouts	0.411	16,215	0.413	12,327
HS Grads	0.177	52,234	0.157	63,102
College Grads	0.059	8,867	0.036	13,395
Married:				
HS Dropouts	0.042	95,191	0.049	51,931
HS Grads	0.011	432,356	0.010	409,619
College Grads	0.002	99,470	0.002	141,243
w/o Children:				
Never-Married Dropouts	0.057	4,108	0.060	3,333

Notes: Table reports welfare participation rates for samples used in Tables 4-8. Sample is women 18-55 in the 1980 and 1990 Census who are household heads or spouses of heads. Additional details regarding sample selection appear in Section IV. Previously married is defined as separate, divorced or widowed.

Table 2: Migration Rates of Various Subsamples

	1980			1990		
	Migrate	Migrate to Adjacent State	N	Migrate	Migrate to Adjacent State	N
Mothers with children under 18:						
All Mothers	0.115	0.319	355,803	0.105	0.303	725,520
Single Mothers	0.099	0.313	47,662	0.092	0.306	122,727
Never-Married :						
HS Dropouts	0.052	0.410	3,949	0.064	0.383	9,857
HS Grads	0.079	0.305	5,724	0.081	0.298	22,300
College Grads	0.150	0.328	426	0.140	0.286	1,746
Previously-Married						
HS Dropouts	0.086	0.329	7,783	0.092	0.345	12,327
HS Grads	0.105	0.311	25,677	0.095	0.299	63,102
College Grads	0.143	0.281	4,388	0.116	0.288	13,395
Married:						
HS Dropouts	0.089	0.350	46,763	0.089	0.338	51,931
HS Grads	0.112	0.319	211,912	0.098	0.306	409,619
College Grads	0.171	0.309	48,979	0.141	0.290	141,243
w/o Children:						
Never-Married Dropouts	0.083	0.269	2,022	0.106	0.301	3,333

Notes: Table reports rate of interstate migration in the past 5 years and fraction of interstate migration that is to an adjacent state for samples used in Tables 4-8. Sample is women 18-55 in the 1980 and 1990 Census who are household heads or spouses of heads. Additional details regarding sample selection appear in Section IV. Previously married is defined as separated, divorced or widowed. 1980 sample size is reduced from Table 1 because migration information is only reported for a 50% sample.

Table 3: Summary of Empirical Strategy

Table	Comparison	Variable Definitions	Prediction and Interpretation
Table 4 Cols 1&2	Borders vs Interiors	Y: Welfare Participation T: Border Area AFDC Benefit: Census Year Residence	$\beta_2 > 0$; Welfare participation differential between border and interiors of states is increasing in the AFDC benefit.
Cols 3&4	Migrants vs Natives	Y: Welfare Participation T: Migrated in Past 5 Years AFDC Benefit: Census Year Residence	$\beta_2 > 0$; Welfare participation differential between migrants and natives is increasing in the AFDC benefit.
Table 5 Cols 1&2	Migrants vs Natives X Borders vs Interiors	Y: Welfare Participation T: Migrated in Past 5 Years AFDC Benefit: Census Year Residence	$\beta_2 > 0$; Welfare participation differential between migrants and natives is increasing in the AFDC benefit; Larger effect in border areas than interiors.
Cols 3&4	Migrants vs Natives X Borders vs Interiors	Y: Welfare Participation T: Moved from State of Birth AFDC Benefit: Census Year Residence	$\beta_2 > 0$; Welfare participation differential between migrants and natives is increasing in the AFDC benefit; Larger effects in border areas than interiors.
Table 6	Demographic Comparison Groups	Y: Migrated in Past 5 Years T: Never-Married Dropout AFDC Benefit: Residence 5 Years Prior to Census	$\beta_2 < 0$; Higher AFDC benefit reduces probability of out-migration more for never-married dropouts than comparison group.
Tables 7&8	Demographic Comparison Groups X Borders vs Interiors	Y: Migrated in Past 5 Years T: Never-Married Dropout AFDC Benefit: Residence 5-years Prior to Census	$\beta_2 < 0$; Higher AFDC benefit reduces probability of out-migration more for never-married dropouts than comparison group; Larger effects in borders than interiors.

Tables 9&10	Lifecycle Model, Demographic Comparison Groups X Borders vs Interiors	Y: Migrated in Past 5 Years AFDC Benefit: Residence 5-years Prior to Census	$\beta_1 < 0, \beta_2 > 0$; Higher AFDC benefits reduces probability of out-migration for never-married dropouts; Effect is decreasing in the age of the child; Larger effects in borders than interiors. Smaller effects and smaller border/interior differentials for comparison groups.

Notes: Tables 4-8 estimate equation (1) and Tables 9-10 estimate equation (7):

$$(1)\quad \log\left(\frac{\Pr(Y=1)}{\Pr(Y=0)}\right) = \beta_o + \beta_1 T + \beta_2 (AFDC*T) + (StateCont*T)\beta_3 + NeighborCont\beta_4$$
$$+ (NeighborCont*T)\beta_5 + LocCont\beta_6 + X\beta_7 + State*\delta$$

$$(7)\quad \log\left(\frac{\Pr(Y=1)}{\Pr(Y=0)}\right) = \beta_o + \beta_1 AFDC + \beta_2 (AFDC*Age) + StateCon\beta_3 + (StateCont*Age)\beta_4$$
$$+ NeighborCont\beta_4 + LocCont\beta_5 + X\beta_6$$

Table 4: Welfare Participation Logit Results: Border vs Interior and Migrants vs Natives

	AFDC* Border		AFDC*Migrant	
	1980	1990	1980	1990
All Mothers				
Urban Control	0.117	0.107+	0.118**	0.127***
	(0.123)	(0.065)	(0.038)	(0.033)
	[0.005]	[0.005]	[0.005]	[0.006]
Age and Child Controls	0.105	0.097	0.099**	0.107**
	(0.113)	(0.063)	(0.038)	(0.036)
	[0.005]	[0.004]	[0.004]	[0.005]
Race and Education Controls	0.102	0.060	0.035	0.060*
	(0.066)	(0.049)	(0.040)	(0.030)
	[0.004]	[0.002]	[0.001]	[0.002]
N	725,565	725,520	355,803	725,520
Single Mothers				
Urban Control	0.122	0.066	0.121**	0.081***
	(0.079)	(0.054)	(0.044)	(0.024)
	[0.023]	[0.012]	[0.023]	[0.015]
Age and Child Controls	0.136*	0.091+	0.096*	0.064**
	(0.069)	(0.053)	(0.050)	(0.021)
	[0.021]	[0.014]	[0.015]	[0.010]
Race and Education Controls	0.132*	0.071	0.072	0.034+
	(0.052)	(0.047)	(0.054)	(0.019)
	[0.020]	[0.010]	[0.011]	[0.005]
N	97,551	122,727	47,662	122,727

Notes: Table 1 notes describe sample. Top panel uses sample of all mothers. Bottom panel uses sample of single mothers. Table 4 reports coefficient on interaction of AFDC benefits with treatment group indicator from logit model in equation (1). For columns 1 and 2, treatment group is border area residents. For columns 3 and 4, treatment group is migrants in 5 years prior to Census. AFDC benefit is benefit in state of residence in census year. Definition of border areas provided in Section III. For 1980, column 3 is estimated on 50% migration sample. Clustered standard errors are in parentheses. Average derivatives are in brackets. +p-value<0.1 * p-value<0.05 ** p-value<0.01 *** p-value<0.001

Table 5: Welfare Participation Logits: Migrants vs Natives by Border Location

	AFDC* Migrant		AFDC*Move State-of-Birth	
	Border	Interior	Border	Interior
1980				
All Mothers				
Urban Control	0.014	0.124***	0.156**	0.072
	(0.093)	(0.038)	(0.053)	(0.052)
	[0.001]	[0.006]	[0.010]	[0.003]
Age and Child Controls	0.017	0.096*	0.141**	0.068+
	(0.092)	(0.038)	(0.047)	(0.041)
	[0.001]	[0.004]	[0.007]	[0.003]
N	107,899	247,904	219,687	505,878
Single Mothers				
Urban Control	0.045	0.106*	0.042	0.053
	(0.093)	(0.050)	(0.056)	(0.041)
	[0.008]	[0.020]	[0.008]	[0.010]
Age and Child Controls	0.056	0.081	0.050	0.042
	(0.104)	(0.055)	(0.057)	(0.032)
	[0.009]	[0.013]	[0.008]	[0.007]
N	14,170	33,492	28,750	68,801
1990				
All Mothers				
Urban Control	0.201***	0.127***	0.250***	0.112*
	(0.056)	(0.032)	(0.070)	(0.055)
	[0.012]	[0.006]	[0.015]	[0.005]
Age and Child Controls	0.187**	0.113***	0.223***	0.096*
	(0.065)	(0.033)	(0.061)	(0.044)
	[0.010]	[0.005]	[0.012]	[0.004]
N	211,422	514,098	211,422	514,098
Single Mothers				
Urban Control	0.098+	0.081**	0.218***	0.074
	(0.054)	(0.026)	(0.066)	(0.050)
	[0.019]	[0.014]	[0.042]	[0.013]
Age and Child Controls	0.075	0.056	0.203***	0.047
	(0.064)	(0.024)	(0.059)	(0.038)
	[0.012]	[0.008]	[0.033]	[0.007]
N	35,323	87,404	35,323	87,404

Notes: Table 1 notes describe sample. Top panel uses sample of all mothers. Bottom panel uses sample of single mothers. Table 4 notes for columns 3 and 4 describe logit model, estimated here separately for border and interior areas as defined in Section III. Columns 3 and 4 of Table 5 replace indicator for migration in previous 5 years with indicator for residence differs from state of birth. Clustered standard errors are in parentheses. Average derivatives are in brackets. +p-value<0.1 * p-value<0.05 ** p-value<0.01 *** p-value<0.001

Table 6: Migration Logits: Demographic Comparison Groups

	1980		1990	
	AFDC*T	N	AFDC*T	N
Never-Married:				
HS Grad	-0.237*	9,215	0.009	31,137
	(0.111)		(0.056)	
	[-0.011]		[0.000]	
College Grad	-0.037	3,912	-0.037	11,220
	(0.191)		(0.090)	
	[-0.002]		[-0.001]	
Previously-Married:				
HS Dropout	-0.324***	11,259	-0.054	21,530
	(0.085)		(0.061)	
	[-0.015]		[-0.002]	
HS Grad	-0.261*	29,127	0.040	70,361
	(0.107)		(0.080)	
	[-0.012]		[0.001]	
College Grad	-0.565***	7,861	-0.038	22,330
	(0.158)		(0.099)	
	[-0.027]		[-0.001]	
Married:				
HS Dropout	-0.404***	50,216	-0.080	59,956
	(0.081)		(0.083)	
	[-0.019]		[-0.003]	
HS Grad	-0.287**	215,170	0.017	405,068
	(0.095)		(0.090)	
	[-0.014]		[0.001]	
College Grad	-0.388	52,454	-0.040	70,361
	(0.109)		(0.117)	
	[-0.018]		[-0.001]	
Never-Married w/o Children:				
HS Dropout	-0.427***	5,511	-0.130	12,717
	(0.124)		(0.096)	
	[-0.020]		[-0.005]	

Notes: Sample described in Table 1 notes. Table reports estimate of coefficient on AFDC*T in equation (1), where T equals one for never-married dropouts with children under 18 and equals zero for the relevant comparison group. AFDC benefit is benefit for state of residence 5 years prior to Census. Clustered standard errors are in parentheses. Average derivatives, calculated on the sample of never-married dropouts , are in brackets. +p-value<0.1 * p-value<0.05 ** p-value<0.01 *** p-value<0.001

Table 7: 1980 Migration Logit Results: Demographic Group Comparisons by Border Location

	Border	N	**Interior**	N
Never-Married:				
HS Grad	-0.471	3,113	-0.263*	6,013
	(0.375)		(0.130)	
	[-0.030]		[-0.011]	
College Grad	-0.546	1,309	-0.046	2,490
	(0.518)		(0.285)	
	[-0.031]		[-0.002]	
Previously-Married:				
HS Dropout	-0.456	3,868	-0.269*	7,384
	(0.292)		(0.120)	
	[-0.026]		[-0.012]	
HS Grad	-0.585*	8,615	-0.189+	20,501
	(0.257)		(0.111)	
	[-0.030]		[-0.009]	
College Grad	-0.850**	2,364	-0.496**	5,464
	(0.301)		(0.160)	
	[-0.046]		[-0.026]	
Married:				
HS Dropout	-0.616*	17,520	-0.360***	32,696
	(0.265)		(0.103)	
	[-0.034]		[-0.015]	
HS Grad	-0.552*	65,214	-0.270*	149,956
	(0.265)		(0.110)	
	[-0.029]		[-0.012]	
College Grad	-0.735**	15,210	-0.345**	37,249
	(0.286)		(0.120)	
	[-0.041]		[-0.016]	
Never-Married w/o children:				
HS Dropout	-0.808*	1,877	-0.312*	3,570
	(0.365)		(0.132)	
	[-0.049]		[-0.014]	

Notes: Sample described in Table 1 notes. Logit specification described in Table 6 notes, estimated separately here for border and interior areas as defined in Section III. Clustered standard errors are in parentheses. Average derivatives, calculated on the sample of never-married dropouts, are reported in brackets. +p-value<0.1 * p-value<0.05 ** p-value<0.01 *** p-value<0.001

Table 8: 1990 Migration Logit Results: Demographic Group Comparisons by Border Location

	Border	N	**Interior**	N
Never-Married:				
HS Grad	-0.012	9,332	0.143+	21,443
	(0.112)		(0.077)	
	[-0.001]		[0.005]	
College Grad	-0.328*	3,442	-0.011	7,557
	(0.165)		(0.125)	
	[-0.016]		[-0.000]	
Previously-Married:				
HS Dropout	-0.193	6,837	0.149+	14,474
	(0.128)		(0.078)	
	[-0.012]		[0.004]	
HS Grad	-0.136	20,065	0.212*	50,121
	(0.121)		(0.099)	
	[-0.007]		[0.007]	
College Grad	-0.159	6,275	0.069	15,828
	(0.138)		(0.140)	
	[-0.008]		[0.002]	
Married:				
HS Dropout	-0.253+	19,228	0.122***	40,623
	(0.148)		(0.095)	
	[-0.015]		[0.004]	
HS Grad	-0.236+	119,645	0.233*	285,423
	(0.122)		(0.102)	
	[-0.013]		[0.007]	
College Grad	-0.237*	40,901	0.139	101,178
	(0.102)		(0.163)	
	[-0.011]		[0.004]	
Never-Married w/o Children:				
HS Dropout	0.030	3,918	-0.082*	8,672
	(0.178)		(0.157)	
	[0.001]		[-0.002]	

Notes: See Table 7. +p-value<0.1 * p-value<0.05 ** p-value<0.01 *** p-value<0.001

Table 9: Lifecycle Migration Results, 1980 Census

	Never Married HS Dropout	Never Married HS Grad	Previously Married HS Dropout	Previously Married HS Grad	Married HS Dropout	Married HS Grad
Full Sample:						
AFDC Benefit	-0.589**	-0.246*	-0.052	-.090	0.069	-0.024
	(0.218)	(0.106)	(0.089)	(0.055)	(0.060)	(0.048)
AFDC Benefit*Age	0.001	0.025	0.005	-0.001	-0.004	-0.002
	(0.032)	(0.019)	(0.011)	(0.005)	(0.004)	(0.002)
	[-0.018]	[-0.006]	[-0.001]	[-0.009]	[0.003]	[-0.003]
N	2332	3745	6076	20991	33286	147824
Border:						
AFDC Benefit	-1.01+	-0.096	-0.175	-0.133	-0.062	-0.117
	(0.568)	(0.254)	(0.224)	(0.117)	(0.118)	(0.072)
AFDC Benefit*Age	-0.070	0.017	0.009	-0.005	0.005	-0.004
	(0.091)	(0.029)	(0.027)	(0.012)	(0.012)	(0.005)
	[-0.040]	[0.000]	[-0.011]	[-0.016]	[-0.003]	[-0.013]
N	878	1307	2025	5993	11618	44708
Interior:						
AFDC Benefit	-0.473*	-0.226*	-0.033	-0.085	0.094	-0.010
	(0.218)	(0.104)	(0.102)	(0.062)	(0.073)	(0.052)
AFDC Benefit*Age	0.029	0.040*	0.002	0.000	-0.009	-0.001
	(0.030)	(0.020)	(0.012)	(0.006)	(0.005)	(0.002)
	[-0.009]	[0.000]	[-0.002]	[-0.008]	[0.003]	[-0.002]
N	1454	2438	4051	14998	21668	103116

Notes: Sample is mothers with oldest child age 4-17 from sample used in Tables 6-8. Table reports coefficient on interaction of AFDC Benefit with age of oldest child for logit model in equation (7). AFDC Benefit is benefit in state of residence 5 years prior to Census. Average derivatives for sample of women with children ages 4-9 are reported in brackets. +p-value<0.1 * p-value<0.05 ** p-value<0.01 *** p-value<0.001

Table 10: Lifecycle Migration Results, 1990 Census

	Never Married HS Dropout	Never Married HS Grad	Previously Married HS Dropout	Previously Married HS Grad	Married HS Dropout	Married HS Grad
Full Sample:						
AFDC Benefit	-0.173	-0.140	-0.156+	-0.226**	-0.066	-0.169*
	(0.320)	(0.120)	(0.081)	(0.085)	(0.088)	(0.079)
AFDC Benefit*Age	-0.003	0.001	0.013	0.009*	0.006	0.002
	(0.017)	(0.009)	(0.009)	(0.004)	(0.005)	(0.002)
	[-0.005]	[-0.005]	[-0.004]	[-0.010]	[-0.001]	[-0.009]
N	6644	14551	9471	49169	36038	278357
Border:						
AFDC Benefit	-0.343*	-0.368*	-0.049	-0.239*	0.007	-0.119
	(0.160)	(0.147)	(0.188)	(0.110)	(0.150)	(0.097)
AFDC Benefit*Age	0.004	0.003	0.003	0.012	0.003	-0.005
	(0.029)	(0.018)	(0.016)	(0.009)	(0.011)	(0.004)
	[-0.011]	[-0.013]	[-0.002]	[-0.011]	[-0.002]	[-0.010]
N	2231	4452	3036	13722	11542	82013
Interior:						
AFDC Benefit	-0.043	-0.063	-0.173*	-0.189*	-0.085	-0.114
	(0.115)	(0.781)	(0.083)	(0.092)	(0.084)	(0.076)
AFDC Benefit*Age	0.012	0.003	0.012	0.012*	0.012+	0.003
	(0.022)	(0.012)	(0.011)	(0.004)	(0.007)	(0.002)
	[0.001]	[-0.001]	[-0.006]	[-0.006]	[-0.001]	[-0.005]
N	4413	10099	6435	35447	21668	196344

Notes: See Table 9. +p-value<0.1 * p-value<0.05 ** p-value<0.01 *** p-value<0.001

Table 11: Summary of Results

Table	Comparison	Year	For/Against Migration	Magnitude, from a $100 Benefit Increase
Table 4				
Cols 1&2	Borders vs Interiors	1980	For	All Mothers: 0.2-0.5 increase in welfare participation, border relative to interior (base rate: 4.9%); Single Mothers: 2.0-2.3 increase (base rate: 27%)
		1990	For	All Mothers: 0.2-0.5 increase in welfare participation, border relative to interior (base rate: 5.1%); Single Mothers: 1.0-1.4 increase (base rate: 24%)
Cols 3&4	Migrants vs Natives	1980	For	All Mothers: 0.1-0.5 increase in welfare participation, migrants relative to natives (base rate: 4.9%); Single Mothers: 1.1-2.3 increase (base rate: 27%)
		1990	For	All Mothers: 0.2-0.6 increase in welfare participation, migrants relative to natives (base rate: 5.1%); Single Mothers: 0.5-1.5 increase (base rate: 24%)
Table 5 Cols 1&2	Migrants vs Natives X Borders vs Interiors	1980	Against	
		1990	For	All Mothers: Border: 1.0-1.2 increase in migrant-native differential, Interior: 0.5-0.6 increase, (base rate:5.1%); Single Mothers: Border: 1.2-1.9 increase, Interior: 0.8-1.4 increase, (base rate: 24%)
Cols 3&4	Migrants vs Natives X Borders vs Interiors (Moved from State of Birth)	1980	For (All Mothers)	All Mothers: Border: 0.7-1.0 increase in migrant-native differential, Interior: 0.3 increase, (base rate:4.9%)
		1990	For	All Mothers: Border: 1.0-1.2 increase in migrant-native differential, Interior: 0.5-0.6 increase (base rate:5.1%); Single Mothers: Border: 1.2-1.9 increase, Interior: 0.8-1.4 increase (base rate: 24%)

Table	Comparison	Year	For/Against Migration	Magnitude, from a $100 Benefit Increase
Table 6	Demographic Comparison Groups	1980	For	0.2-2.7 decrease in migration of never-married dropouts relative to comparison groups (base rate:5.2%)
		1990	Against	
Tables 7&8	Demographic Comparison Groups X Borders vs Interiors	1980	For	Border: 2.6-4.6 decrease in migration of never-married dropouts relative to comparison groups, Interior: 0.2-2.6 decrease (base rate: 5.2%)
		1990	For	Border: -0.1-1.6 decrease in migration of never-married dropouts relative to comparison groups, Interior: -0.2-0.7 *increase* (base rate: 6.4%)
Tables 9&10	Lifecycle Model, Demographic Comparison Groups	1980	For	1.8 decrease in migration of never-married dropouts with children less than 5 years old (base rate:4.0%)
		1990	Against	
	Lifecycle Model, Demographic Comparison Groups X Borders vs Interiors	1980	For	Border: 4.0 decrease in migration of never-married dropouts with children < 5 years old, Interior: 0.9 decrease (base rate:4.0%)
		1990	For	Border: 1.1 decrease in migration for never-married dropouts with children < 5 years old, Interior: 0.1 *increase* (base rate:5.5%)

Notes: Table reports percentage point change in welfare participation or 5-year interstate migration rates as indicated by average derivates reported in Tables 4-10. Applicable base rates are reported in parentheses.