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 rigorous tests to date for welfare migration and to also measure 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. The findings for some specifications are mixed, but overall are relatively supportive of the presence of welfare migration effects and of the substantial importance of short-distance moves in welfare-induced migration flows.

I. Introduction

The question of whether potential welfare mothers migrate across states in response to more generous welfare benefits continues to attract the scrutiny of academics and the interest of policy makers. 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 set of particularly rigorous tests of the welfare migration effect and to explore the relative importance of short-distance moves in welfare-motivated migration.

McKinnish (2005) tested 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) confirmed this relationship using county-level data on welfare expenditures from 1970-90.

This earlier work was unusual in it relied on the importance of short-distance moves in its identification strategy. Most of the recent welfare literature has either focused merely on the decision to leave ones home state or estimated 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), was criticized for ignoring what were surely 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 comparison of 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 provides an additional rigorous, differences-in-differences-in-differences type of test of welfare migration. Second, by employing estimating strategies used elsewhere to eliminate spurious effects of welfare generosity, this allows us to obtain estimates of welfare migration effects in state interiors that were differenced out in McKinnish (2005). This allows us to shed some light on the relative importance of short and long-distance flows in welfare-induced migration. Finally, the comparison of border and interior areas help to resolve some mixed findings regarding welfare migration in previous studies. In particular, Gelbach (2004) finds strong welfare migration effects using 1980 Census data, but mixed evidence in 1990 data. Comparing border to interior areas helps bolster our confidence in the 1990 welfare migration effects.

II. Research Strategy

It is now 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.[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 some nice 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 comparison group approach used in this paper relies on the crucial assumption that the costs of between-state migration are lower for individuals located in the border counties compared to the interior counties. 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 H1 contains the interior counties of the high-benefit state that do not border on the other state and area L1 is similarly defined for the low-benefit state. Area H2 contains the counties of the high-benefit state that border on the other state, and area L2 is likewise defined for the low-benefit state. If the assumption of differential migration costs is correct, then, all else equal, the border counties in area H2 should contain disproportionately more welfare migrants and welfare recipients compared to area H1, having disproportionately drawn migrants. The border counties in area L2 should likewise contain disproportionately fewer welfare migrants and welfare recipients compared to area L1, 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 welfare 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

[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.

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 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. Economic theory tells us that 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 only compares 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. He finds little evidence of welfare migration.

One shortcoming of this within-state comparison of border and interior counties 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 it captures the full welfare migration effect. If, however, there is substantial welfare migration in and out of state interiors, it can substantially understate the effect of welfare migration. In fact, both Meyer (2000) and Brueckner (2000) criticize the focus on short-distance moves across state borders in Meyer.

[3] Early welfare migration research often conditioned on welfare receipt in selected the research 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.

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.

Taking the comparison group approaches used in other studies, and estimating effects separately for border and interior areas of states can shed further light on this issue.

B. Welfare participation of Migrants

Meyer (2000) points out that if welfare migration exists, then in-migrants to a state 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 this paper, the differential welfare participation effect is estimated separately for border and interior areas of states. This first allows an even more rigorous test for welfare migration, testing 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. Furthermore, by estimating the migrant-native differential separately for border and interior areas, we can ascertain the relative size of the migration effect in interiors vs borders, which will give some indication of how much of the effect was differenced out in McKinnish (2005).

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 inter-state 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 generated by

income will not be pursued. The treatment-comparison group differential in responsiveness to welfare benefits will be estimated separately for border areas and interior areas of states. As with the migrant-native differentials discussed above, this will both allow a more rigorous test for welfare migration and give some indication of the relative magnitudes of the migration effect at state borders and in state interiors.

D. Lifecycle Migration

Gelbach (2004) adds a creative insight to this literature. He 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, but in the 1990 Census 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.

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.[4] 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

[4] Specifically, border counties were those whose centroid was 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 much 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 in distance to nearest state or AFDC benefit in nearest state. An additional issue is that while centroids are available for the 1990 PUMAs, they are not available for the 1980 county groups.

To address these issues I first 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.

Through 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 counties are defined as border areas if one of the county centroids is within 25 miles of another state.[5]

[5] 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, coefficient estimates.

IV. Data and Empirical Specification

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. 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.[6]

The baseline logit model used in the analysis is:

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

where Y is the binary outcome of interest, either welfare participation or migration. T is the treatment group of interest (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.[7] *StateCont* is a vector of state controls including the unemployment rate, average manufacturing wage and average service sector wage. *NeighborCont* contains the unemployment rate, manufacturing wage and service sector wage for the neighboring state nearest to the respondent's local area.

[6] Women for whom welfare participation, location 5 years before the Census, marital status or education were allocated are also excluded from the sample.

[7] 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.

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 by local area (depending on the nearest state), and is not absorbed into the state indicators.[8]

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 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.

For both of these specifications, two important issues that must be considered are what sample to use for estimation and what individual controls to include in X. On one hand, because

[8] 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. This allows me to estimate a specification more similar to specifications used in other welfare migration papers.

welfare participation is almost exclusively an activity of single mothers, it seems appropriate to only perform the analysis on a sample of single mothers. On the other hand, part of the effect of welfare migration should be to increase the prevalence of single mothers in a high-benefit area. By only including single mothers in the sample, we exclude the fact that there are more single mothers and only pick up whether welfare migration has produced a population of single mothers that are more welfare-prone. Similarly, if we put in the full set of demographic controls listed in Section IV above, we then control for the fact that welfare migration might increase the prevalence of high school dropouts or mothers with young children, and only ask if welfare migration generates a population of high school dropouts with young children that are more welfare prone.

Therefore, Table 2 reports results for two separate samples: all mothers and single mothers. The first two rows of Table 1 report welfare participation rates, migration rates and sample sizes for these two subsamples. They indicate, as expected, that welfare participation is higher and migration is lower for single mothers compared to the full sample of mothers.

Table 2 further reports results for 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 2 test the relationship estimated in McKinnish (2005). The positive coefficients on the AFDC Benefit-Border area interaction indicates that mothers in border areas of high benefit states are more likely to be on welfare that mothers in the interior areas of the same high benefit states. The positive coefficients are therefore consistent with

welfare migration, although the effects are statistically significant in only one specification, using the sample of single mothers and age and child controls.[9]

The second two columns of Table 2 test the relationship estimated in Meyer (2000). The positive coefficients on the AFDC Benefit-Migrant area interaction indicates that recent migrants to high-benefit states are more likely to be on welfare than natives of high-benefit states. The positive coefficients are therefore also consistent with the presence of welfare migration, and statistically significant in most of the specifications.

In all four columns, it is almost uniformly the case that adding additional individual controls reduces the size of the effect. In the 1980 results, reducing the sample from all mothers to single mothers tends to increase the magnitude of the coefficient. In the 1990 results, the reverse is true.

In Table 3, the two comparison strategies from Table 2 are combined. The model with recent migrant interactions estimated in columns 3 and 4 of Table 2 is now estimated separately for residents of border areas and residents of interior areas. The results are reported in the first two columns of Table 3, 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 recent migrants living in border areas if high benefit states to have higher welfare participation rates than natives living in border areas of high benefit states, and for this migrant-native differential to be larger than the differential in interior areas of high-benefit states.

The results for 1980 overwhelming contradict expectations. In all cases, the larger and statistically significant effects are found for interior area residents. For 1990, the coefficient

[9] 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 2.

estimates for 1990 are 40-60% larger for border areas, although also less precisely estimated. For brevity, the estimates using the race and education controls are not reported, as those coefficients were the smallest and least likely to be significant in Table 2.

One concern about estimating the welfare participation of recent migrants with Decennial Census data is that the timing of welfare participation might not match up. For example, 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, rather than use recent migration, use whether or not the mother still lives in her state of birth. This measures captures migration over a longer period, including migration by the respondent's own mother. Columns 3 and 4 of Table 3 simply 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. For the 1980 results using the sample of all mothers, the border area coefficient estimates are more than twice the size of the interior area coefficients. The 1980 coefficients diminish substantially in magnitude when the sample is restricted to single mothers. The 1990 results also show border area coefficient estimates that are twice the size of interior coefficient estimates, this time for both the all mother sample and the single mother sample.

B. Comparison Group Results

In Table 4, the dependent variable of interest is inter-state migration within the past 5 years. This table tests where the migration response to welfare benefits is larger for welfare prone demographic groups than demographic groups with very low rates of welfare participation. The specification used is that reported in equation (1). In this analysis, T is an indicator for never-married single mother who are high school dropouts. For the specifications in which migration is the dependent variable, the AFDC Benefit, state controls, neighbor state controls and local controls are based on location 5 years prior to the Census year. A negative effect of AFDC benefits suggests that living in a state with higher welfare benefits lowers the probability of moving out of state in the next 5 years, and is therefore consistent with welfare migration. The specifications in Table (4) 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 4 are most similar to those used by Meyer and Gelbach.

The coefficient on the interaction of AFDC benefit with the treatment group indicator tests whether the effect of AFDC benefits is larger for the treatment group relative to the comparison group. Nine comparison groups are used in Table 4. 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. The final comparison group contains never-married high school dropouts without children.

The bottom ten rows of Table 1 report the welfare participation and migration rates for the treatment group and all nine comparison groups. 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 quite 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. This table 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.

Table 1 also demonstrates that the welfare-prone groups are also less mobile. Only 5.1 percent of the never-married dropouts, only 175 mothers, migrated between 1975 and 1980. A consequence of this low mobility is that there is a relatively small sample of inter-state moves with which to study welfare migration.

For the results in Table 4, the coefficient estimates are reported for the specification in equation (1), and for a variation in which state fixed-effects are removed from the model, and the state AFDC benefit, unemployment rate, manufacturing wage and service sector wage are included instead. If the model is correctly specified, then there should be no difference between the two specifications. If the model is not correctly specified, if there are unobserved state

characteristics correlated with AFDC Benefits that affect the migration decisions of the treatment group differently than the comparison group, then the specifications should still produce the similar, albeit biased, estimates if the treatment and comparison groups are evenly distributed across the states. If however, the treatment and comparison groups are not evenly distributed across states, the state fixed-effects reduce the bias by restricting identification to within-state comparisons. It is useful to report both specifications because Levine and Zimmerman (1999) and Gelbach (2004) do not include state fixed-effects in the model.[10]

There are two main findings in Table 4. The first is that there are highly significant welfare migration effects in 1980, but not in 1990. The second is that while the state fixed-effects do tend to reduce the magnitudes of the coefficient estimates somewhat; overall they do not have a large effect on the findings.

In Table 5, the 1980 results from Table 4 are re-estimated separately for border and interior areas. State fixed-effects are included in the models. The results in Table 5 are consistent with a larger welfare migration effect in border areas relative to interior areas of states. The coefficient estimates for the border areas are all at least 70% larger than the interior areas coefficients. It is also the case that the interior coefficients themselves are largely significant. If it is true that differencing out the effect of welfare benefits on the migration of the comparison group does entirely eliminate the spurious effects of benefits on migration, then this suggests that there are non-trivial migration effects for residents of state interiors, but the effects are larger for border area residents.

In Table 6, the 1990 results from Table 4 are re-estimated separately for border and interior areas. As was the case in Table 5, state fixed-effects are included in the models. The

[10] Meyer (2000) only conducts analysis at the regional level and does include regional indicators. Walker (1994) . . . .

results in this table given the initial 1990 results reported in Table 4. In Table 4, the coefficient estimates were almost all close to zero and statistically insignificant. In Table 6, these small insignificant coefficients seem to be the result of averaging negative coefficients, consistent with welfare migration, in border areas with relatively positive coefficients, inconsistent with welfare migration, in interior areas. Therefore, the results in Table 6 are much more indicative of a welfare migration effect than the Table 4 results that did not differentiate between border and non-border areas.

Comparing the 1980 results in Table 5 with the 1990 results in Table 6 shows that in both years, the differential between the border area and interior area coefficients are similar in magnitude. The difference is that in 1980 the interior area coefficients are negative and consistent with welfare migration and in 1990 the interior area coefficients are positive and inconsistent with welfare migration. This raises the question of whether the interior area effect is spurious and should be differenced out, or whether the 1980 interior area effects reflect true welfare migration.

C. Lifecycle Migration Results

Tables 7 and 8 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:

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

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. The sample is reduced to include only those mothers whose oldest child is between the ages of 4 and 17.

Table 7 reports the results for 1980. The estimates for the most welfare-prone group of mothers, never-married high school dropouts, are reported in the first column and the estimates for five comparison groups of mothers 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 7 are the estimates for an individual treatment or comparison group, rather than estimates for the never-married dropouts relative to a comparison group as they were in Tables 4-6.

The top two rows of Table 7 report the main AFDC effect as well as the interaction with age of oldest child for border and interior areas combined. 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. These results do not fully replicate Gelbach as the main effects for both never-married dropouts and never-married high school graduates are larger than those obtained by Gelbach and the age interaction for never-married dropouts is smaller than that obtained by Gelbach.[11]

The lower panels of Table 7 estimate the model in equation (2) 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 coefficient. There is some concern, however, that the age interaction coefficient is negative,

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

rather than positive, for the border areas. It is also interesting to note that the interior, rather than the border areas, generates the effect observed in the full sample of never-married high school graduates. This could indicate that the effect for never-married high school graduates is spurious.

Table 8 reports the lifecycle results from the 1990 Census. The first two rows of this table very closely replicates Gelbach's results, both the magnitudes of the coefficients on the main AFDC effect and the fact that the coefficients for several of the comparison groups are larger than the coefficient for the never-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 comparison groups with very low rates of welfare receipt, the results are not consistent with welfare migration. The effects for border areas and interior areas are much more similar in magnitude, sometimes with the larger effect in the interior areas. These results suggest that the troubling results for previously-married high school graduates and married high school graduates estimated in the top two rows were indeed spurious, but that the similarly-sized effect estimates for never-married dropouts reflects true welfare migration effects.

VI. Conclusions

The findings regarding welfare migration in this study are mixed, but overall are relatively supportive of the presence of welfare migration effects and of the substantial importance of short-distance moves in welfare-induced migration flows.

A particularly interesting finding is that in some specifications in which welfare migration effects do not exist at the aggregate level, they appear once the analysis is disaggregated between border and interior areas. The mixed findings for 1990 in Gelbach (2004) are altered in this way when the estimates are estimated separately for border and interior areas.

The evidence on the size of welfare migration effects in state interiors relative to state borders is mixed. In most cases, the evidence points to real, but modest, effects in the interior, and effects 70-250% larger at state borders. But other evidence, particularly the demographic comparisons and lifecycle estimates for 1990, point to no interior migration effect. This leaves open to interpretation whether the interior estimates should be considered "real" migration effects, or whether they should be differenced out in order to further eliminate spurious effects.

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Table 1: Welfare Participation and Migration Rates of Various Subsamples

	1980			1990		
	Welfare	Migrate	N	Welfare	Migrate	N
Mothers with children under 18:						
All Mothers	0.049	0.114	355,445	0.051	0.105	725,318
Single Mothers	0.271	0.097	47,584	0.243	0.092	122,820
Never-Married :						
HS Dropouts	0.673	0.051	3,490	0.624	0.065	9,932
HS Grads	0.406	0.079	5,725	0.355	0.081	22,393
College Grads	0.168	0.142	422	0.081	0.140	1,746
Previously-Married						
HS Dropouts	0.411	0.085	7,769	0.415	0.091	12,355
HS Grads	0.177	0.103	25,637	0.158	0.095	63,063
College Grads	0.058	0.140	4,371	0.036	0.116	13,381
Married:						
HS Dropouts	0.042	0.088	46,726	0.049	0.089	51,914
HS Grads	0.011	0.111	211,680	0.010	0.098	409,432
College Grads	0.002	0.171	48,969	0.002	0.141	141,102
W/O Children:						
Never-Married Dropouts	0.057	0.082	2,021	0.060	0.105	3,347

Notes: Table reports welfare participation and migration rates for samples used in Tables 2-6. 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. For 1980, the reported sample size, N, is for the half the sample in the 50% migration sample. The sample for which welfare participation rates are calculated is approximately of size 2N.

Table 2: Welfare Participation Logit Results

	AFDC* Border		AFDC*Migrant	
	1980	1990	1980	1990
All Mothers				
Urban Control	0.156	0.125	0.125**	0.138***
	(0.169)	(0.088)	(0.040)	(0.032)
Age and Child Controls	0.105	0.097	0.099**	0.107**
	(0.113)	(0.063)	(0.038)	(0.036)
Race and Education Controls	0.101	0.055	0.034	0.075**
	(0.086)	(0.051)	(0.043)	(0.029)
N	725,565	725,520	355,803	725,520
Single Mothers				
Urban Control	0.153	0.087	0.140**	0.089***
	(0.131)	(0.071)	(0.047)	(0.025)
Age and Child Controls	0.136*	0.091+	0.096*	0.064**
	(0.069)	(.053)	(0.050)	(0.021)
Race and Education Controls	0.111	0.046	0.095+	0.040+
	(0.072)	(0.045)	(0.052)	(0.022)
N	97,551	122,727	47,662	122,727

Notes: Table 1 notes describe sample. Table 2 reports coefficient on interaction of AFDC benefits with treatment group indicator for logit model in equation (1). AFDC benefit is benefit in state of residence in census year. 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. Definition of border areas provided in Section III. For 1980, column 3 estimated on 50% migration sample. +p-value<0.1 * p-value<0.05 ** p-value<0.01 *** p-value<0.001

Table 3: Welfare Participation Logits: Migrants vs Natives

	AFDC* Migrant		AFDC*Move State-of-Birth	
	Border	Interior	Border	Interior
1980				
All Mothers				
Urban Control	0.025	0.131***	0.190**	0.069
	(0.093)	(0.039)	(0.063)	(0.056)
Age and Child Controls	0.017	0.096*	0.141**	0.068+
	(0.092)	(0.038)	(0.047)	(0.041)
N	107,899	247,904	219,687	505,878
Single Mothers				
Urban Control	0.084	0.116*	0.068	0.051
	(0.096)	(0.051)	(0.062)	(0.044)
Age and Child Controls	0.056	0.081	0.050	0.042
	(0.104)	(0.055)	(0.057)	(0.032)
N	14,170	33,492	28,750	68,801
1990				
All Mothers				
Urban Control	0.197	0.139***	0.287***	0.120*
	(0.057)	(0.032)	(0.076)	(0.057)
Age and Child Controls	0.187	0.113***	0.223***	0.097*
	(0.065)	(0.033)	(0.061)	(0.044)
N	211,422	514,098	211,422	514,098
Single Mothers				
Urban Control	0.097+	0.090**	0.244***	0.080
	(0.054)	(0.027)	(0.067)	(0.052)
Age and Child Controls	0.075	0.053	0.203***	0.047
	(0.065)	(0.024)	(0.059)	(0.038)
N	35,323	87,404	35,323	87,404

Notes: Table 1 notes describe sample. Table 2 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 3 replace indicator for migration in previous 5 years with indicator for residence differs from state of birth. +p-value<0.1 * p-value<0.05 ** p-value<0.01 *** p-value<0.001

Table 4: Migration Logits: Demographic Comparison Groups

	1980			1990		
	(1)	(2)	N	(3)	(4)	N
Never Married HS Dropout Relative to:						
Never Married:						
HS Grad	-0.237*	-0.252*	9,215	0.009	-0.036	31,137
	(0.111)	(0.125)		(0.056)	(0.061)	
College Grad	-0.037	-0.066	3,912	-0.037	-0.064	11,220
	(0.191)	(0.175)		(0.090)	(0.103)	
Previously Married:						
HS Dropout	-0.324***	-0.419***	11,259	-0.054	-0.136+	21,530
	(0.085)	(0.092)		(0.061)	(0.078)	
HS Grad	-0.261*	-0.324***	29,127	0.040	-0.004	70,361
	(0.107)	(0.100)		(0.080)	(0.082)	
College Grad	-0.565***	-0.564***	7,861	-0.038	-0.105	22,330
	(0.158)	(0.123)		(0.099)	(0.092)	
Married:						
HS Dropout	-0.404***	-0.517***	50,216	-0.080	-0.152+	59,956
	(0.081)	(0.092)		(0.083)	(0.091)	
HS Grad	-0.287**	-0.379	215,170	0.017	0.000	405,068
	(0.095)	(0.095)		(0.090)	(0.090)	
College Grad	-0.388	-0.444***	52,454	-0.040	-0.004	70,361
	(0.109)	(0.102)		(0.117)	(0.082)	
Never-Married w/o Children:						
HS Dropout	-0.427***	-0.447***	5,511	-0.130	-0.193	12,717
	(0.124)	(0.111)		(0.096)	(0.099)	
State Fixed-Effects?	Y	N		Y	N	

Notes: Sample described in Table 1 notes. Table reports coefficient on interaction of AFDC benefit with treatment group indicator for logit model in equation (1). Treatment group is never-married high school dropouts with children under 18. AFDC benefit is benefit for state of residence 5 years prior to Census. +p-value<0.1 * p-value<0.05 ** p-value<0.01 *** p-value<0.001

Table 5: 1980 Migration Logit Results: Border vs Interior by Demographic Comparison Group

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

Notes: Sample described in Table 1 notes. Logit specification described in Table 4 notes, estimated separately here for border and interior areas as defined in Section III.
+p-value<0.1 * p-value<0.05 ** p-value<0.01 *** p-value<0.001

Table 6: 1990 Migration Logit Results: Border vs Interior by Demographic Comparison Group

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

Notes: See Table 5. +p-value<0.1 * p-value<0.05 ** p-value<0.01 *** p-value<0.001

Table 7: 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)
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)
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)
N	1454	2438	4051	14998	21668	103116

Notes: Sample is mothers with oldest child age 4-17 from sample used in Tables 4-6. Table reports coefficient on interaction of AFDC Benefit with age of oldest child for logit model in equation (2). AFDC Benefit is benefit in state of residence 5 years prior to Census. +p-value<0.1 * p-value<0.05 ** p-value<0.01 *** p-value<0.001

Table 8: 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)
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)
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)
N	4413	10099	6435	35447	21668	196344

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