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J Public Econ. Author manuscript; available in PMC 2011 September 21.

Published in final edited form as:
J Public Econ. 2007 April ; 91(3-4): 437–450. doi:10.1016/j.jpubeco.2006.09.002.

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 also 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. The signs and patterns of the estimates are consistent with the presence of welfare migration effects, and the magnitudes of the estimates are consistent with the importance of short-distance moves in welfare-induced migration flows, but most of the estimates are not statistically significant.

Keywords

Welfare programs; Migration

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 paper has benefited from helpful comments from Marianne Bitler, Jonah Gelbach, Bruce Meyer, Jeff Zax, anonymous referees, and participants at the 2005 IRP Summer Workshop.

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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-indifferences 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 produces estimates consistent with welfare migration, albeit statistically insignificant, in some specifications that previously rejected welfare migration effects.

II. Literature Review

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.

A. State Borders Approach

The analysis in the current paper assumes that the costs of between-state migration are lower for individuals located close to state borders. Besides the physical costs of relocating, this could 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. If this assumption holds, border counties on the high-benefit side of a state border should have higher welfare participation relative to interior counties of the same state, having disproportionately attracted migrants. Border counties on the low-benefit side should have lower welfare participation relative to interior counties of the same state, having disproportionately lost migrants. Within-state comparisons of welfare participation in border and interior areas should therefore net out state-level unobservables and generate a measure of relative welfare migration.

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

[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 et al., 2003) and welfare migration of foreign immigrants (Borjas, 1999). Brueckner (2000) and McKinnish (2005) both give more detailed reviews of the broader welfare migration literature.

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that are 4–7% higher in border counties than interior counties of the same state. Because benefits are set at the state-level, this difference in expenditures reflects differences in caseloads between border and interior counties, rather than differences in benefit generosity. Omitted variable bias is of less concern, 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 to study 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. [2] 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 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. The majority of prime-age migration is likely motivated by the desire to locate in a better labor market, and it often requires a long-distance move for an individual to substantially change the characteristics of their labor market. In contrast, welfare payments can be improved with short-distance moves across state borders.

B. 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 migration flows 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) compares lifecycle migration decisions of single mothers who are never-married high school dropouts to single mothers who are

[2]Specifically, Meyer argues that states with higher benefits tend to have lower poverty rates. Therefore, a sample of women in poverty will disproportionately contain migrants to low-benefit states relative to migrants to high-benefit states.

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never-married high school graduates, previously married high school dropouts, and previously married high school graduates. 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 single mothers from the 5% Public Use Microdata Samples (PUMS) from the 1980 and 1990 Decennial Censuses. The remaining nine rows of Table 1 report the welfare participation rates for the treatment group (never-married high school dropouts) and the eight comparison groups used in the migration analysis in Section IV of 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 1 illustrates the difficulty in selecting an appropriate comparison group. By picking comparison groups that are most similar to the never-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.

C. 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.

III. Empirical Strategy

This study combines the other comparison group approaches used in the literature with the border/interior area comparisons employed in McKinnish (2005). For any given comparison group model (e.g. never-married high school dropouts vs. married high school graduates), a model with border-area interactions will be estimated to determine if the effect is larger in border areas. This differences-in-differences-in-differences approach tests whether the treatment-comparison group differentials found in other papers are larger at state borders than in state interiors. It likewise tests whether border area migration effects are larger for more welfare-prone groups than less welfare-prone groups.

A. Census Data

This study uses the 1980 and 1990 5% PUMS. The samples includes all non-institutionalized women ages 18–55, who are mothers with at least one child under 18, 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 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

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disability are further removed from the sample, to reduce the probability that the reported welfare income is from SSI rather than from AFDC.[3]

Table 2 reports migration rates for the same subsamples used in Table 1. 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. Using the first two rows to compare results for all mothers to those for single mothers, we see that the migration rates are only slightly 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 welfare participation rates. Table 2 shows that this group is also 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 all of the other subsamples, 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 all of the other subsamples. These migration rates suggest that short-distance moves are a particularly important component of migration among welfare-prone groups.[4]

B. 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. Unfortunately, the 1980 and 1990 PUMS 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 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.[5] 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.[6]

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

[4]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.

[5]Additional details regarding the local area groupings are provided in Appendix A

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IV. Migration Analysis

This section reports results from migration rate analysis using the demographic comparison group approach. The welfare-prone treatment group is the sample of never-married single mothers who are high school dropouts. The 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 model is first estimated ignoring differences between border and interior areas of states. The baseline logit model used in the analysis is:

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

where for person *i* in local area *l* in state *s*, *Mig* is an indicator for cross-state migration within the past 5 years. *T* is the treatment group indicator for 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 (in 1996 dollars). *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 1996 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), 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.[7]

For each comparison group, the migration logit is estimated separately on a subsample that consists only of the treatment group and that 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 first column of Table 3 reports results from equation (1) for the 1980 Census. The table reports the average marginal effect from the AFDC Benefit*Treatment Group interaction. For all eight comparison groups, the interaction effect is negative, and the effect is statistically significant for seven of the groups. The magnitudes indicate that the average effect of a $100 higher welfare benefit is to lower the probability that never-married high

[6] 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.

[7] 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 specification is closer to that used in other welfare migration papers.

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school dropouts leave their state by 0.77 to 1.58 percentage points more than for the comparison groups.[8] While these are not large migration rates, the effect is sizable given that the baseline 5-year migration rate for never-married high school dropouts is only 5.2 percent.

For the 3-way model reported in columns 2 and 3 of Table 3, all independent variables in equation (1), including the state fixed-effects, are interacted with an indicator for border area residence. Column 2 reports the average marginal effect in interior areas of the AFDC benefit*treatment group interaction and column 3 reports the average *differential* marginal effect in border areas from the AFDC Benefit*Treatment Group interaction.[9] If the welfare migration effects are the same in border areas and interior areas, the estimated effect in the third column should be close to zero. Alternatively, a negative border differential indicates that the welfare migration effect is stronger for those living in border areas 5 years prior to the census than those living in interior areas.

The column 3 results in Table 3 show that the border differential is, in fact, negative in all eight cases. The border effects are consistently negative, although they are not statistically significant. The magnitudes of the border differentials are economically meaningful and sizeable relative to the interior area effects reported in column 2. In the first 5 rows, the border differentials are larger than the interior area effects, suggesting welfare migration effects in border areas that are more than twice the size of the effects in interior areas. [10]

Table 4 reports the migration analysis results from the 1990 Census. The average effects reported in the first column, ignoring border area residence, are not at all suggestive of welfare migration. The effects are all small in magnitude and statistically insignificant; some are positive rather than the predicted negative. Interestingly, once border area interactions are added in columns 2 and 3, the results are much more consistent with welfare migration. The interior area effects reported in column 2 are almost all positive. The differential border area effects generated by adding the border area interactions are all negative, of considerable magnitude, and statistically significant for most of the lower-education comparison groups.

One interpretation of the results in Table 4 is that the pooled effects reported in column 1 miss the evidence of welfare migration that emerges when border area residence is incorporated into the analysis. This could occur if the comparison groups used in column 1 do not provide an accurate counterfactual, and it is only by further differencing the border and interior areas that a welfare migration effect can be estimated. If, however, we believe that the comparison groups used in column 1 are valid, then the wrong-signed positive effects for state interiors call into question whether or not we can make a statement about welfare migration using the 1990 Census data.

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[8]To provide perspective on the magnitude of a $100 change in benefits: In 1980, the average welfare benefit across the 50 states and D.C. is $823 and the standard deviation is $155 (in 1996 dollars). In 1990, the average is $764 and the standard deviation is $140. In both years, approximately 40% of the sample of mothers live where the nearest state has a benefit that is either at least $100 higher or at least $100 lower than their own state's benefit.

[9]Consider the marginal effect of AFDC*T. Let $WelfMig=\frac{\partial \Pr(Mig=1)}{\partial AFDC}$. Then the marginal effect of AFDC*T is $ME=\frac{\Delta WelfMig}{\Delta T}$. Column 1 reports the average of *ME*, calculated for each observation from the estimates of equation (1). Column 2 reports the average of *ME*(Border=0), calculated for each observation with *Border* set to zero from the estimates of equation (1) fully interacted with the border indicator. Column 3 reports the average of $\frac{\Delta ME}{\Delta Border}$, calculated for each observation from the estimates of equation 1 fully interacted with the border indicator.

[10]Unlike the case of a linear model, the average marginal effect in column 1 is not constrained to be a matrix weighted average of the interior area average marginal effect and the border area average marginal effect.

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V. Life-Cycle 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 of oldest child to confirm this lifecycle effect, comparing results for never-married dropouts to several comparison groups. He finds evidence of welfare migration in the 1980 Census. In the 1990 Census, he finds migration effects for the never-married high school dropouts, but also finds effects of similar magnitude for the previously-married and married high school graduates. This suggests that the 1990 effects are spurious.

When I modify equation (1) to imitate Gelbach's specification, I, like Gelbach, find evidence of welfare migration in 1980, but not in 1990.[11] My 1990 results match his in that the effects for previously-married and married high school graduates are larger than for never-married dropouts. When, however, I add border area interactions to the specification, I find evidence of welfare migration for both 1980 and 1990, just as I do in Tables 3 and 4. In both 1980 and 1990, I estimate a sizeable and statistically significant border area differential for never-married dropouts. For the troublesome 1990 comparison groups, however, the border differential is small and insignificant. While the overall effects for these groups were large, there is no differential effect between border and interior areas. This suggests that the effects for these comparison groups are due to unobserved characteristics that are differenced out in the border-interior comparison.[12]

VI. Welfare Participation Analysis

The analysis in this section follows on the migrant/native comparison employed by Meyer (2000). The baseline logit model is:

$$\log\left(\frac{\Pr(Welf_{ils}=1)}{\Pr(Welf_{ils}=0)}\right)=\beta_o+\beta_1 Move_{ils}+\beta_2(AFDC_s * Move_{ils})+(StateCont_s * T_{ils})\beta_3 +NeighborCont_{ls}\beta_4+(NeighborCont_{ls} * T_{ils})\beta_5+LocCont_{ls}\beta_6+X_{ils}\beta_7+State_s * \delta \quad (2)$$

where for person *i* in local area *l* in state *s*, *Welf* is an indicator for welfare receipt in the previous year and *Move* is an indicator that equals one if the mother no longer lives in her state of birth.[13] Equation (2) is identical to Equation (1) except that welfare participation has replaced migration as the outcome of interest and movers and non-movers are the new treatment and comparison groups. For the welfare participation analysis the AFDC Benefit, state controls, neighbor state controls and local controls are based on location in the year of the Census. A *positive* estimate for β_2 is therefore consistent with welfare migration, indicating that the difference in welfare participation between migrants and natives increases in the size of the state welfare benefit.

[11]To imitate Gelbach's specification, I estimate the logit models separately for the never-married high school dropouts and for each comparison group. I interact *AFDC* and *StateCont* with the age of the oldest child and eliminate the state fixed-effects. Because the fixed-effects are removed, the main effects of *AFDC* and *StateCont* are included in the model.

[12]These results are available upon request from the author. In the 1990 results, I do find a statistically significant border differential for the closer comparison group of the never-married high school graduates.

[13]Native-born residents are compared to all those who have moved into the state since birth, rather than those who have just moved in the past 5 years. This generates a larger treatment group and allows us to avoid using the smaller 50% migration sample in 1980. It further captures all moves, including moves by the woman's own mother during childhood that might have been welfare-motivated. Recent migration is additionally problematic because welfare receipt in the prior year can actually precede the migration in the last 5 years, or the welfare participation can simply be a temporary result of the disruption of the move. Results obtained estimating equation (2) with an indicator for 5-year migration rather than an indicator for moved from state of birth are similar in pattern to those reported here, except that the border differentials are negative in 1980 until race and education controls are included in the model.

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It is important to consider the appropriate sample for estimation of equation (2). 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, Tables 5 and 6 report results for two separate samples: all mothers and single mothers.

A similar argument can be made regarding the use of demographic control variables. If education and age of children are included as controls in the model, this 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, Tables 5 and 6 report results using three different sets of control variables. The first set only includes the control for urban residence. The second set adds the 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).

Table 5 reports the welfare participation results for the 1980 Census. Column 1 reports the average marginal effect of the AFDC Benefit*Moved from State of Birth interaction obtained from estimates of equation (2). For all of the specifications and samples, the effect is positive, consistent with the prediction that the welfare participation differential between in-migrants and native-born residents is increasing in the size of the welfare benefit. The effects are statistically significant except when race and education controls are added to the model, although the effects are quite modest in magnitude. The average marginal effect of 0.0032 for the sample of all mothers suggests that the average effect of having $100 higher welfare benefits is to increase the welfare participation of in-migrants by 0.32 percentage points relative to native-born. The baseline welfare participation rate among all mothers in 1980 is 4.9%.

For the estimates in columns 2 and 3, all of the explanatory variables in equation (2) are interacted with border area indicators. The second column reports the average marginal effect of the AFDC*Mover interaction for interior areas, and the third column reports the average differential marginal effect for border areas. A positive effect in the third column suggests that the welfare participation differential between movers and native-born residents is more responsive to welfare benefits in border areas than interior areas. The border differentials are positive in 5 of the 6 specifications, but not statistically significant.

Table 6 reports the welfare participation results from the 1990 Census. The positive average marginal effects in column 1 are again all consistent with welfare migration, although the effects are statistically insignificant when the sample is restricted to single mothers or race

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and education controls are added to the model. The border differentials in column 3 are all positive and of meaningful magnitude relative to the interior area effects. These results suggest a sizeable difference in effects between border and interior areas of states. Interestingly, it is the effects for the most restrictive specifications, for single mothers with additional controls, that are statistically significant. These results again emphasize the gain in making border/interior comparisons in the analysis of welfare migration.

VII. 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).

The patterns and signs of the estimates in this paper are consistent with the presence of welfare migration and also with a differentially larger welfare migration effect for those located close to state borders, although many of the estimates are statistically insignificant. The magnitudes of the effects, while imprecisely estimated indicate that sizeable differences in welfare benefits do generate sizeable changes in the migration rate of welfare-prone individuals. Because, however, 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. As a result, migrants will make up a relatively small fraction of any state's caseload at a given time.

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Appendix A

This appendix provides additional details regarding the local area grouping used in the 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.

To better explain the last point I provide a hypothetical example. Suppose county A is made up of local area 1 and part of local area 2; county B contains the rest of local area 2 and part of local area 3; the rest of local area 3 covers counties C and D. I would aggregate this set of local areas up to a county group consisting of counties A, B, C and D.

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.

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Table 1

Welfare Participation of Various Subsamples of Mothers with Children Under 18

	1980		1990	
	%Welfare	N	%Welfare	N
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

Notes: Sample is mothers with children under 18, who are ages 18–55 in the 1980 and 1990 Census, and who are household heads or spouses of heads. Additional details regarding sample selection appear in Section III. Table reports fraction of the sample that received welfare in the previous year.

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Table 2

Migration Rates of Various Subsamples of Mothers with Children under 18

	1980			1990		
	Migrate	**Migrate to Adjacent State**	**N**	**Migrate**	**Migrate to Adjacent State**	**N**
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

Notes: Sample is described in Table 1 notes. Table reports rate of interstate migration in the past 5 years and fraction of interstate migration that is to an adjacent state. 1980 sample size is reduced from Table 1 because migration information is only reported for a 50% sample.

J Public Econ. Author manuscript; available in PMC 2011 September 21.

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Table 3

Migration Logit Result, 1980 Census

	2-Way	3-Way		
	AFDC* T	Interior	Border Differential	N
Never-Married:				
HS Grad	−0.0077* (0.0036)	−0.0098+ (0.0054)	−0.0122 (0.0176)	9,215
College Grad	−0.0012 (0.0062)	−0.0013 (0.0083)	−0.0368 (0.0305)	3,859
Previously-Married:				
HS Dropout	−0.0120** (0.0033)	−0.0093* (0.0048)	−0.0151 (0.0189)	11,259
HS Grad	−0.0075** (0.0029)	−0.0062+ (0.0034)	−0.0126 (0.0099)	29,127
College Grad	−0.0155** (0.0048)	−0.0164** (0.0060)	−0.0226 (0.0203)	7,861
Married:				
HS Dropout	−0.0158** (0.0040)	−0.0153** (0.0050)	−0.0060 (0.0136)	50,216
HS Grad	−0.0092** (0.0030)	−0.0096** (0.0037)	−0.0053 (0.0090)	215,170
College Grad	−0.0123** (0.0038)	−0.0120** (0.0046)	−0.0098 (0.0116)	52,459

Notes: Sample described in Table 1 notes. Dependent variable is cross-state migration in the previous 5 years. Table reports average marginal effect of the AFDC*Treatment Group interaction where the treatment group is never-married high school dropouts. Logit specification for column 1 is described in equation (1). Logit specification for columns 2 and 3 is equation (1) fully interacted with an indicator for border-area residence. AFDC benefits and all other controls are calculated based on residence 5 years prior to Census. Standard errors, clustered at the state level, are calculated using the delta method.

+ p-value<0.1

* p-value<0.05

** p-value<0.01

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Table 4

Migration Logit Result, 1990 Census

	2-Way	3-Way		
	AFDC* T	Interior	Border Differential	N
Never-Married:				
HS Grad	−0.0006 (0.0040)	0.0124 (0.0079)	−0.0235+ (0.0138)	30,885
College Grad	−0.0077 (0.0181)	−0.0020 (0.0210)	−0.0037 (0.0148)	11,125
Previously-Married:				
HS Dropout	−0.0060 (0.0072)	0.0115 (0.0088)	−0.0691+ (0.0417)	21,438
HS Grad	0.0034 (0.0071)	0.0245+ (0.0148)	−0.0495* (0.0227)	70,186
College Grad	−0.0025 (0.0075)	0.0084 (0.0156)	−0.0180 (0.0329)	22,219
Married:				
HS Dropout	−0.0078 (0.0089)	0.0178 (0.0146)	−0.0348 (0.0255)	59,956
HS Grad	0.0012 (0.0062)	0.0260+ (0.0161)	−0.0508* (0.0228)	405,068
College Grad	−0.0018 (0.0058)	0.0121 (0.0121)	−0.0256 (0.0245)	142,079

Notes: Sample described in Table 1 notes. Dependent variable is cross-state migration in the previous 5 years. Table reports average marginal effect of the AFDC*Treatment Group interaction, where the treatment group is never-married high school dropouts. Logit specification for column 1 is described in equation (1). Logit specification for columns 2 and 3 is equation (1) fully interacted with an indicator for border-area residence. AFDC benefits and all other controls are calculated based on residence 5 years prior to Census. Standard errors, clustered at the state level, are calculated using the delta method.

+ p-value<0.1

* p-value<0.05

** p-value<0.01

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Table 5

Welfare Participation Logit Results, 1980 Census

	2-Way	3-Way	
	AFDC* Move	**Interior**	**Border Differential**
All Mothers			
Urban Control	0.0032* (0.0014)	0.0032** (0.0012)	0.0033 (0.0028)
Age and Child Controls	0.0032 (0.0011)	0.0030** (0.0009)	0.0026 (0.0024)
Race and Education Controls	0.0007 (0.0006)	−0.0001 (0.0004)	0.0011 (0.0011)
N	725,565	725,565	725,565
Single Mothers			
Urban Control	0.0078+ (0.0045)	0.0067 (0.0059)	−0.0012 (0.0094)
Age and Child Controls	0.0063* (0.0030)	0.0053 (0.0034)	0.0009 (0.0077)
Race and Education Controls	0.0013 (0.0024)	−0.0000 (0.0028)	0.0018 (0.0066)
N	97,551	97,551	97,551

Notes: Sample described in Table 1 notes. Top panel uses sample of all mothers. Bottom panel uses sample of single mothers. Dependent variable is welfare receipt in the previous year. Table reports average marginal effects of the AFDC*Mover interaction. Logit specification for column 1 is described in equation (2). Logit specification for columns 2 and 3 is equation (2) fully interacted with an indicator for border-area residence. AFDC benefits and all other controls are calculated based on residence at the time of the Census. Standard errors, clustered at the state level, are calculated using the delta method.

+ p-value<0.1

* p-value<0.05

** p-value<0.01

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Table 6

Welfare Participation Logit Results, 1990 Census

	2-Way	3-Way	
	AFDC* Move	**Interior**	**Border Differential**
All Mothers			
Urban Control	0.0052* (0.0027)	0.0049* (0.0023)	0.0049 (0.0090)
Age and Child Controls	0.0048* (0.0021)	0.0045* (0.0020)	0.0049 (0.0068)
Race and Education Controls	0.0016 (0.0013)	0.0011 (0.0012)	0.0059 (0.0044)
N	725,520	725,520	725,520
Single Mothers			
Urban Control	0.0139 (0.0105)	0.0139 (0.0093)	0.0326 (0.0277)
Age and Child Controls	0.0101 (0.0069)	0.0081 (0.0065)	0.0303+ (0.0181)
Race and Education Controls	0.0044 (0.0038)	0.0009 (0.0032)	0.0273* (0.0119)
N	122,727	122,727	122,727

Notes: Sample described in Table 1 notes. Top panel uses sample of all mothers. Bottom panel uses sample of single mothers. Dependent variable is welfare receipt in the previous year. Table reports average marginal effects of the AFDC*Mover interaction. Logit specification for column 1 is described in equation (2). Logit specification for columns 2 and 3 is equation (2) fully interacted with an indicator for border-area residence. AFDC benefits and all other controls are calculated based on residence at the time of the Census. Standard errors, clustered at the state level, are calculated using the delta method.

+ p-value<0.1

* p-value<0.05

** p-value<0.01