Local Changes in Intergenerational Mobility

Handy, Christopher and Shester, Katharine

April 2022

LOCAL CHANGES IN INTERGENERATIONAL MOBILITY

Christopher Handy
University of North Carolina

Katharine L. Shester
Washington and Lee University

April 2022

Abstract: We study changes in intergenerational income mobility over time at the local level in the U.S., using data on individuals born in the 1980s. Previous research has found no change in mobility at the national level during this time period, but we show that this hides substantial increases and decreases in mobility at the local level. For children from low-income families, there is convergence in mobility over time, and average differences by region become much smaller. For children from high-income families, the geographic variation in mobility becomes much larger. Our results suggest caution in treating mobility as a fixed characteristic of a place.

JEL: J62, R20

Keywords: intergenerational mobility, income mobility, geographic variation, urban-rural differences

---

Handy (corresponding author): Department of Economics, University of North Carolina, Gardner Hall CB 3305, Chapel Hill, NC 27599. Email: chandy@unc.edu.

Shester: Department of Economics, Washington and Lee University, 204 W Washington St, Lexington, VA 24450. Email: shesterk@wlu.edu.

Acknowledgements: We are grateful to participants at the Southern Economic Association Meetings for helpful suggestions, and we thank Balen Essak, Lilly Grella, John Juneau II, Margaret Kallus, Will Schirmer, and Mandie Wahlers for excellent research assistance.

I. Introduction

Intergenerational mobility is widely studied and often treated as a marker of a society's level of fairness or opportunity. Recently, with access to the universe of tax records for certain birth cohorts and the ability to link parents and children based on dependent claiming, researchers have been able to study mobility in the U.S. at much finer levels — both geographically and temporally — than was previously possible. Chetty et al. (2014a) focus on mobility for children whose parents are at the 25th percentile of the national parent income distribution. Using estimates at the level of commuting zones (CZs, which are clusters of counties) for children born 1980–82, they find large geographic variation in mobility, both across and within regions. Chetty et al. (2014b) address the question of changes in mobility over time at the national level, and find that upward mobility was close to constant for children born 1971–1993.

We revisit these questions of spatial and temporal variation in intergenerational mobility by examining changes in mobility at the CZ level across birth cohorts, using statistics released by the Opportunity Insights project on mobility for the 1980–86 birth cohorts. We find that while mobility from the 25th percentile did not change on average nationally across these birth cohorts, there were large increases and decreases at the local level. We show a map of these changes in mobility in Figure 1, revealing more positive changes in Texas, most of the Southeast, and some of the Midwest, and more negative changes in the West and in Florida.

Our findings suggest that some of the results in Chetty et al. (2014a) are particular to the birth cohorts they study, and that the geographic patterns of mobility can change substantially, even over a relatively short span of time. There is convergence in mobility from the 25th percentile between the 1980 and 1986 birth cohorts, such that places with lower initial mobility tend to experience a more positive subsequent change. Regional differences in mobility become much smaller over this time period: differences in average mobility across the four census regions can explain 25 percent of the overall variation in mobility in the 1980 cohort, but only 5 percent in the 1986 cohort. An example of this phenomenon is that Chetty et al. (2014a) find that mobility is lowest in the Southeast, but this region experiences generally positive changes in mobility between the 1980 and 1986 cohorts, as shown in our map in Figure 1. Chetty et al. (2014a) also find that, on average, mobility from the 25th percentile is lower in urban areas than in rural areas. We find that this gap increased somewhat between the 1980 and 1986 cohorts, from 2.6 to 3.3 percentiles.

If mobility from the 25th percentile improves over time in a CZ, this could reflect a general increase in incomes (relative to the national distribution) for all children who grew up in that CZ, or the improvement could be confined to children in the CZ who grew up in low-income households. To address this question, we repeat our analysis using mobility from the 75th percentile. We find evidence of significant divergence in mobility from the 75th percentile between the 1980 and 1986 cohorts. The cross-sectional standard deviation of mobility increases by 45 percent over this time period, regional gaps increase, and urban areas fall further behind rural areas on average.

Therefore, while Chetty et al. (2014a), studying the 1980–82 cohort, find substantial geographic variation in mobility from the 25th percentile, and less variation in mobility from the 75th percentile, we find that in the 1986 cohort, the situation is very different: because of convergence in mobility from the 25th percentile and divergence in mobility from the 75th percentile, in the 1986 cohort there is more geographic variation in mobility from the 75th percentile. We show that, in a mechanical sense, this can be attributed to a change in the correlation between the height (at the median of the parents' income distribution) of the rank-rank relationship between children's income and parents' income and the slope of that relationship. The correlation was significantly negative in the 1980 cohort, so that places with higher rank-rank relationships had flatter slopes. However, in the 1986 cohort, the correlation was slightly positive.

Our work complements a growing literature that uses the statistics produced by Opportunity Insights to study geographic variation in mobility. Krause and Reeves (2017), Weber et al. (2017), and Weber et al. (2018) further explore the urban-rural differences in mobility noted by Chetty et al. (2014a). Other local characteristics that have been linked to income mobility include historical racial segregation (Andrews et al., 2017), the Great Migration of African Americans from the South to the North between 1940 and 1970 (Derenoncourt, 2021), school finance reforms that equalize revenues across public school districts (Biasi, 2019), residual earnings and marriage rates (Rothstein, 2019), low birthweight (Robertson and O'Brien, 2018), and the level of violent crime (Sharkey and Torrats-Espinosa, 2017). Lefgren, Pope, and Sims (2020) find at most a very weak role for state-level policies in explaining spatial patterns of income mobility.

A number of papers have examined changes in mobility over time, both at the national level (Aaronson and Mazumder, 2008; Fletcher and Han, 2018; Hilger, 2017; Lee and Solon, 2009) and over a very long time span by region (Tan, 2019; Connor and Storper, 2020). Our paper documents substantial changes in mobility at the local level even over a much shorter time span. Chetty et al. (2014a) and Chetty et al. (2017) both study changes in income mobility for cohorts born in the late 20th century, and are the papers closest to ours. Chetty et al. (2014a) estimate roughly constant mobility across birth cohorts 1971–1993, where mobility is measured as the slope in a linear regression of the child's income rank or college attendance on parental income rank. Chetty et al. (2017) find a decline in the fraction of children who earn more than their parents, with a steady decrease for children born between 1940 and 1960, then a slower decline for children born between 1960 and the early 1980s.

Our work also contributes to a small literature that adds some qualifications to the findings produced by the Opportunity Insights project. Gallagher, Kaestner, and Persky (2019) argue that geographic differences in family characteristics can explain a large share of the spatial variation in income mobility documented by Chetty et al. (2014a). Similarly, Rothbaum (2016) finds that some spatial variation in forecasted causal effects of place in Chetty and Hendren (2018a, 2018b) can be attributed to geographic differences in resident characteristics.

II. Data

a. Opportunity Insights data on income mobility and CZ characteristics

Our data on intergenerational income mobility comes from the Opportunity Insights project.[1] The process of measuring mobility is described in detail in Chetty et al. (2014a), so we will only provide a summary here. Opportunity Insights begins with tax records for individuals born 1980–91 who are U.S. citizens as of 2013. Parents of these individuals are identified based on dependent claiming. Income, for both parents and children, is defined as household pretax income. Parent family income is averaged over 1996–2000, and child family income is measured at age 26. The earliest cohort in the income mobility data is children born in 1980 and observed in 2006. The final cohort for which we have income mobility data is children born in 1986 and observed in 2012. For simplicity, Opportunity Insights assigns each child permanently to the first CZ in which

[1] We use the file "Trends in Mobility: Commuting Zone Intergenerational Mobility Estimates by Birth Cohort," available on the Opportunity Insights website as data to accompany Chetty et al. (2014b). This file includes estimates of both income mobility and college mobility by commuting zone and birth cohort.

they are observed. For most children, geographic location is assigned using 1996 tax returns, which is the first available year of parent tax return data.

Opportunity Insights ranks parents in the national distribution of parent income, and children in the national distribution of child income among the appropriate cohort. Absolute mobility from the *p*th percentile is then defined as the expected rank achieved by children whose parents are at the *p*th percentile of the national parent income distribution. Chetty et al. (2014a) and many subsequent papers focus on absolute mobility from the 25th percentile, and we begin our analysis with this outcome in the following section. Absolute mobility is computed using simple regressions, specific to each CZ and cohort, of children's ranks on parents' ranks, and taking the fitted value for children with parents at the *p*th percentile. That is, if the child's rank is r and the parents' rank is p, then the expected outcome for children in CZ c and cohort t, conditional on parental income, is

$$\bar{r}_{pct} = a_{ct} + b_{ct} p \, . \qquad (1)$$

Chetty et al. (2014a) focus on the 1980–82 cohort (they do not explore changes over time) and refer to $\bar{r}_{25,c}$ as absolute mobility for CZ c. The Opportunity Insights data we use reports a_{ct} and b_{ct} for CZ-cohort cells with at least 250 children. In section III, we measure absolute mobility from the 25th percentile at the CZ-cohort level, $\bar{r}_{25,ct}$, and focus on how this changes across cohorts within a CZ. In section IV, we present evidence on changes in absolute mobility from other percentiles of the parents' income distribution.

We also use data from Opportunity Insights on the following CZ characteristics: urban status, fraction with a short commute, Gini coefficient among the bottom 99%, high school dropout rate, social capital index, fraction single mothers, and fraction black.[2] The data generally reflects CZ characteristics as measured in the 2000 census, which is approximately when parents' income was measured for the purpose of computing the mobility statistics. A CZ is defined to be urban if it intersects an MSA, and rural otherwise.

b. Limitations

---

[2] We use the file "Geography of Mobility: Commuting Zone Characteristics," available on the Opportunity Insights website as data to accompany Chetty et al. (2014a). The Excel file "Geography of Mobility: Commuting Zone Characteristics - Definitions and Data Sources", available on the same site, contains details about how these characteristics were measured.

Because there are just a few hundred observations in some CZ-cohort cells, statistical noise in the mobility estimates complicates our goal of learning about changes in mobility. For example, the Opportunity Insights mobility estimates are based on a single year of data on children's income, and this will potentially be a very noisy measure of lifetime income. This noise is smaller in larger CZs, so all of our results are weighted by cohort size, and we present some results both for all CZs and for the largest half of CZs.

There are also a couple of measurement concerns that are well known in the literature on intergenerational income mobility. One is related to the distinction between the permanent and transitory components of income. Single-year measures of parents' income may reflect large transitory shocks, and this can attenuate the estimated intergenerational transmission (Solon, 1992; Zimmerman, 1992). Opportunity Insights handles this in the usual way, averaging parents' income across 1996–2000 to obtain a better estimate of parents' permanent income, before assigning parent income ranks. This reduces but does not eliminate the attenuation bias (Mazumder, 2016).

A second concern about the measurement of income mobility is that children's income is observed relatively early in their careers, at age 26. Because the cross-sectional variance of permanent earnings grows as a cohort ages, the dependent variable in a regression of child's income on parent's income will be artificially scaled down, leading to estimates of intergenerational persistence that are too small (Grawe, 2006; Haider and Solon, 2006). Using ranks instead of income should reduce the resulting bias, and Chetty et al. (2014a) find that estimated intergenerational persistence is similar when children's income is measured at ages 26 and 40, but Mazumder (2016) argues that mobility is still likely to be overestimated in the Opportunity Insights data.

We do not view these biases as major threats to our analysis. Mazumder (2016) notes that it is unlikely that biases in the estimated level of mobility affect the main finding of Chetty et al. (2014a) that there are large geographic differences in mobility. Similarly, our focus in this paper is *changes* in mobility over time, and estimates of these changes are not affected by the biases described above as long as the degrees of attenuation bias and life cycle bias are stable across birth cohorts.

III. Changes in absolute mobility from the 25th percentile

In this section, we present our main results on changes in absolute mobility from the 25th percentile. We describe the geographic distribution of the changes and show that the changes do not appear to be merely transitory. There are substantial differences in average mobility across regions in the 1980 cohort, but these differences are much smaller in the 1986 cohort. Mobility is lower on average in urban areas in both cohorts, but this gap is larger in the 1986 cohort.

a. The geographic distribution of changes in mobility

In Table 1, we present summary statistics on the level of absolute mobility from the 25th percentile for the 1980 and 1986 birth cohorts, the first and last cohorts for which we have data. These statistics are from the 621 CZs for which we have mobility data in both cohorts. The first two columns show that mobility was very similar among the 1980 and 1986 cohorts, but there was a substantial decrease in the standard deviation, from 3.42 percentiles among the 1980 cohort to 3.07 percentiles among the 1986 cohort. In Appendix Figure 1, we present density plots of the geographic variation in absolute mobility for these cohorts. There is less variation in the 1986 cohort, as already revealed by Table 1, but we also see that the distribution changes from skewed left in the 1980 cohort to skewed right in the 1986 cohort.

In the final column of Table 1, we show summary statistics for the change in absolute mobility from the 25th percentile between the 1980 and 1986 birth cohorts. The mean change is just 0.1 percentiles and the median change is almost exactly zero, which echoes the absence of change in mobility at the national level documented by Chetty et al. (2014b). However, this central tendency masks substantial increases and decreases in mobility at the local level. The standard deviation of the change in mobility is 1.95 percentiles, which is more than half of the standard deviation of the cross-sectional distribution for the 1980 cohort. The distribution of changes is somewhat skewed right, which matches the density plots in Appendix Figure 1.

We map these changes in mobility between the 1980 and 1986 cohorts in Figure 1. The most positive changes are in Texas, the Upper Midwest, and the Southeast. The most negative changes are in the West, but moderately negative changes are also visible in Florida, the Middle Atlantic, and New England. Most of the Rust Belt experienced little change in income mobility.

Interestingly, some of these regional patterns of changes in mobility represent convergence relative to the geographic patterns in the level of mobility documented by

Chetty et al. (2014a). Most notably, Chetty et al. (2014a) find that absolute mobility from the 25th percentile among the 1980–82 cohort was lowest in the Southeast, and also low in the Rust Belt. By contrast, we find that most CZs in these regions experienced increases in mobility between the 1980 and 1986 cohorts. In Figure 2, we show a scatterplot of mobility in the 1986 cohort on mobility in the 1980 cohort. Comparing the estimated regression line on the graph with the 45 degree line, we see that CZs with low mobility initially tend to experience a subsequent increase, while CZs with high initial mobility tend to experience a decrease. The slope of the estimated regression line implies that CZs that differ by 10 percentiles in the 1980 cohort will differ by only 7.7 percentiles in the 1986 cohort.

In Appendix Table 1, we list the ten largest positive and negative changes. We do this both among all CZs and among the largest half of CZs, recognizing that some of the most extreme changes among all CZs could be due to noisy estimates from smaller places. North Dakota and Texas are heavily represented among the most positive changes, and this is consistent with the resource booms occurring in those areas between 2006 and 2012, when income was measured at age 26 for the 1980 and 1986 cohorts, respectively (see also Butikofer, Dalla-Zuanna, and Salvanes (2019), who link resource booms to increases in intergenerational mobility for affected cohorts in Norway). California and Florida are overrepresented among the most negative changes in mobility, possibly due to larger busts in the housing market, and a greater severity of the Great Recession, between 2006 and 2012 in these places.

b. Persistence of changes in mobility

Given the relatively short time span we are able to study, one potential concern about our results above is that the changes in mobility may be spurious. This could happen, for instance, if mobility at the CZ-cohort level partly reflects transitory shocks at the level of individuals or families, or year-to-year fluctuations in the composition of parents in each birth cohort. There would then be mean reversion in mobility across cohorts, which could lead to the convergence in mobility we described above.

While transitory shocks or compositional effects could be driving some of the changes in mobility, there are three reasons we believe that more interesting dynamics are occurring. First, if changes in mobility were only due to transitory shocks, and if the variance of those shocks was constant across cohorts, then the cross-sectional variance of absolute mobility would also be constant across cohorts. But this is not what we find: as detailed above, the cross-sectional standard deviation of absolute mobility decreased between the 1980 and 1986 cohorts, which is consistent with convergence of mobility at the CZ level over time. Second, when we repeat our analysis using absolute mobility from the 75th percentile of the parents' income distribution, we find *divergence* of mobility across CZs over time, which is inconsistent with a model in which changes in mobility are being driven only by mean reversion.

Finally, we find statistical evidence against the hypothesis that changes in mobility are purely transitory. Taking advantage of the fact that we observe mobility for more than two cohorts, we regress changes in mobility on lagged changes, reasoning that if changes in mobility are spurious or purely transitory, mean reversion will cause a negative association between earlier and later changes. More precisely, for CZ c and cohort t, we estimate the following model with cohort fixed effects:

$$\Delta \bar{r}_{25,ct} = \alpha + \beta \, \Delta \bar{r}_{25,c,t-1} + \gamma_t + \varepsilon_{ct} \, . \tag{2}$$

We cluster standard errors at the state level to account for spatial correlation across CZs.

A coefficient of $\beta > 0$ indicates that earlier and later changes are positively associated, consistent with some time trends at the CZ level (an extreme case is if each CZ were on a linear trend with no transitory disturbances, so that $\beta = 1$). If mobility follows a random walk, so that previous changes on average persist in the next period, then $\beta = 0$. Finally, mean reversion implies that positive changes are expected to be followed by negative changes, so that $\beta < 0$ (if all changes in mobility are purely transitory, and the variance of the transitory shock does not change over time, then $\beta = -0.5$).[3]

Table 2 shows the results of this exercise. We stack all available first differences in mobility and estimate the model described above. In the first two columns, we use all available mobility data, which includes CZ-cohort cells with at least 250 births. In the first column, we use one-year birth cohorts (1980, 1981, etc.), and find that the estimated coefficient on the lagged change –0.173. While the negative coefficient indicates some role for transitory fluctuations, the point estimate is much closer to the random walk case ($\beta = 0$) than the purely transitory case ($\beta = -0.5$), and we can easily reject the hypothesis that $\beta = -0.5$. In the second column, we use two-year cohorts, formed by averaging 1980 and 1981 into a single cohort, averaging 1982 and 1983 into a single cohort, and so on. The motivation for this is that two-year cohorts should smooth out

---

[3] For details, see Wooldridge (2016), pp. 420–421. The coefficients we estimate are identical to those described in his two-step procedure.

some of the transitory fluctuations at the annual level. In this model, the estimated coefficient on the lagged change in mobility is 0.150, and we cannot reject the hypothesis that mobility follows a random walk across birth cohorts ($\beta = 0$).

We expect that, to the extent that some changes in mobility reflect year-to-year fluctuations in the composition of birth cohorts, or transitory shocks at the level of individuals or their families, the transitory component of estimated mobility may be more important in smaller areas. Therefore, in the final two columns of Table 2, we repeat our analysis using only the mobility data from the largest half of CZs. As expected, the estimated coefficient on the lagged change in mobility is more positive in this sample, compared to the corresponding estimate among the full sample. When using one-year cohorts, the estimated coefficient on the lagged change in mobility is -0.04, close to the random walk case ($\beta = 0$). When using two-year cohorts, the estimate is 0.238. Although noisy, this estimate suggests there may be some underlying trends in mobility over time.

c. Changes by region

As we noted above, the map of changes in mobility from the 25th percentile between the 1980 and 1986 birth cohorts (Figure 1) shows mostly positive changes in the Southeast, the region in which mobility was initially lowest. In Figure 3, we explore this regional convergence further using density plots for the four census regions of the country. For the 1980 cohort, the plots show substantial variation in mobility both across regions and within regions. For example, the Midwest has a very long right tail and the South is somewhat skewed left, matching the findings in Chetty et al. (2014a) that mobility is highest in parts of the Great Plains and lowest in parts of the South. However, in the 1986 cohort, there is much less variation in mobility across regions. This is the result of large changes in average mobility between the 1980 and 1986 cohorts, most notably a decline in average mobility in the West and an improvement in the South. The distribution of mobility within the South also changes shape, switching from skewed left in the 1980 cohort to skewed right in the 1986 cohort.

In Table 3, we show regression estimates of regional differences in mobility from the 25th percentile. In the odd-numbered columns, the regressions include only the region indicators, with Northeast as the baseline region. The South has the lowest average mobility in both cohorts, but experienced the largest positive change between the 1980 and 1986 cohorts (1.9 percentiles), and was much closer to the other regions in 1986. The average change in the Midwest was also very positive (1.3 percentiles), while mobility declined by 0.4 percentiles in the Northeast and 1.2 percentiles in the West. There is much less variation in the regional differences in the 1986 cohort compared to the 1980 cohort, matching our density plots in Figure 3. The region indicators explain 25 percent of the variation in mobility in the 1980 cohort, but only 5 percent of the variation in the 1986 cohort. In column 5, the region indicators explain more than one third of the variation in changes in mobility between the 1980 and 1986 cohorts.

Chetty et al. (2014a) used data on CZ characteristics to study the correlates of mobility from the 25th percentile, finding, for example, that places with less sprawl have higher mobility, while places with a larger share of single-mother households have lower mobility. In light of this evidence, our finding of regional convergence between the 1980 and 1986 cohorts could simply reflect that, say, single-mother households are more common in the South, and the correlation between single-mother households and lower mobility declined over time. (These CZ characteristics are fixed, and have the same values for the 1980 and 1986 cohorts.) In the even-numbered columns of Table 3, we add controls for the six CZ characteristics on which Chetty et al. (2014a) focus (see Table VI of their paper). We follow their practice of standardizing these characteristics to have mean 0 and standard deviation 1; although we are not primarily interested in interpreting the coefficients on these variables, they tend to have the expected signs in columns 2 and 4. Comparing columns 5 and 6, the addition of these characteristics does not explain a great deal of the regional convergence we find in mobility from the 25th percentile.

d. Changes in urban and rural areas

One geographic pattern documented by Chetty et al. (2014a) for the 1980–82 cohort is that urban areas have lower average mobility than rural areas. We define urban areas as CZs that intersect MSAs, as in Chetty et al. (2014a). We find that this gap in mobility between urban and rural CZs further widened between the 1980 and 1986 cohorts. In Appendix Figure 2, we show density plots of mobility from the 25th percentile for urban and rural areas. In both the 1980 and 1986 cohorts, mobility is higher on average in rural areas, and more dispersed as well. Between the 1980 and 1986 cohort, average mobility declined in urban areas, and the variance among urban areas decreased. In rural areas, average mobility increased, with no obvious change in dispersion.

In Table 4, we present regression estimates of differences in mobility between urban and rural areas, following the pattern of our analysis of regional differences above. Average mobility was higher in rural areas by 2.6 percentiles in the 1980 cohort, but this gap increased to 3.3 percentiles in the 1986 cohort. Unlike our findings for regional differences, it appears that CZ characteristics can largely explain these changes. In the even-numbered columns, the conditional difference between rural and urban areas is about 1 percentile in the 1980 cohort, and 0.6 percentiles (and not statistically significant) in the 1986 cohort.

IV. Changes in absolute mobility across the distribution of parents' income

The changes we find above in mobility from the 25th percentile could be due to changes that apply to all children within a CZ (that is, due to a shift in the rank-rank relationship between children and parents within that CZ) or to a change in the slope of the rank-rank relationship within the CZ (what Chetty et al. (2014a) call "relative mobility"). In this section, we first address this issue by studying changes in mobility from the 75th percentile. We find patterns that are very different from our results for mobility from the 25th percentile, suggesting an important role for changes in the slope of the rank-rank relationship within CZs. We then show that the height of the rank-rank relationship (at the median of the parent income distribution) and the slope of the rank-rank relationship have a significant negative correlation in the 1980 cohort, but are positively correlated in the 1986 cohort.

a. Changes in absolute mobility from the 75th percentile

Chetty et al. (2014a) noted much less geographic dispersion in mobility at higher percentiles of parents' income. We find that while this is true in the 1980 birth cohort, the geographic variation in mobility from the 75th percentile increased over the following years, and that by the 1986 cohort, there is more dispersion in mobility from the 75th percentile than from the 25th percentile.

In Table 5, we present summary statistics on the level of absolute mobility from the 75th percentile for the 1980 and 1986 birth cohorts, as well as for the changes in mobility between these cohorts, analogous to the summary statistics in Table 1 for mobility from the 25th percentile. Average mobility from the 75th percentile was very similar among the 1980 and 1986 cohorts, just as was the case for mobility from the 25th percentile. However, while the geographic variation in mobility from the 25th percentile decreased between the 1980 and 1986 cohorts, the cross-sectional standard deviation of mobility from the 75th percentile increased substantially, from 2.31 percentiles in the

1980 cohort to 3.37 percentiles in the 1986 cohort. The density plots in Appendix Figure 3 illustrate this increase in geographic variation over time.

In the final column of Table 5, we show summary statistics for the change in absolute mobility from the 75th percentile between the 1980 and 1986 birth cohorts. As for mobility from the 25th percentile, the mean and median changes are close to zero, but there are large increases and decreases in mobility at the local level. The standard deviation of the change in mobility is 2.01 percentiles, which is almost as large as the cross-sectional standard deviation of the level of mobility in the 1980 cohort (2.31 percentiles). We map these changes in Appendix Figure 4, along with the initial level of mobility in the 1980 cohort, as the maps in previous papers often focus on the 25th percentile only. There are many similarities to the changes in mobility from the 25th percentile: large positive changes in Texas and North Dakota, and generally negative changes in California and Florida. There are also some differences, relative to changes in mobility from the 25th percentile. Changes in mobility from the 75th percentile were close to zero in much of the Southeast, and positive in many parts of Appalachia and the Midwest.

Mobility from the 25th percentile converged between the 1980 and 1986 birth cohorts, in the sense that places with lower levels of mobility in 1980 experienced more positive subsequent changes, on average. We find the opposite for mobility from the 75th percentile: mobility *diverged* between the 1980 and 1986 cohorts. In Figure 4, we show a scatterplot of mobility in the 1986 cohort on mobility in the 1980 cohort. The estimated simple regression line has a slope of 1.19, which is significantly above 1 (the standard error is 0.08), suggesting that the gap between low- and high-mobility places is growing over this time period.

We find that this national pattern is also reflected in the changes in regional differences in mobility: mobility from the 75th percentile was similar across regions in the 1980 birth cohort, but the regional differences are larger in the 1986 cohort, which is the opposite of the pattern for mobility from the 25th percentile. In Figure 5, we show density plots of mobility from the 75th percentile by region. In the 1980 cohort, there are relatively small differences in average mobility across regions, and also not much within-region variability. In the 1986 cohort, there is much more dispersion in mobility within regions, and average mobility is noticeably lower in the West compared to the other regions. In Appendix Table 2, we show regression estimates of regional differences in mobility from the 75th percentile, matching our analysis above of regional differences in mobility from the 25th percentile. The results in the odd-numbered columns confirm that differences in average mobility across regions increased between the 1980 and 1986 cohorts, due to a large decrease in mobility in the West and an increase in mobility in the Midwest.

Above, we found that the urban disadvantage in mobility from the 25th percentile increases between the 1980 and 1986 cohorts. That pattern is repeated, even more strongly, for mobility from the 75th percentile. We show density plots of mobility from the 75th percentile in urban and rural areas in Appendix Figure 5, and corresponding regression estimates in the odd-numbered columns of Appendix Table 3. The density plots show that, between the 1980 and 1986 cohorts, the geographic variation in mobility increases a little among rural areas and increases more noticeably among urban areas. Average mobility from the 75th percentile was 2.6 percentiles lower in the 1980 cohort, and this increases to 4.3 percentiles among the 1986 cohort.

b. Reconciling the changes from the 25th and 75th percentiles

We find that these very different trends at the 25th and 75th percentiles — geographic convergence at the 25th percentile, but divergence at the 75th percentile — can be explained, in a mechanical sense, by a change in the relationship between the height and the slope of the rank-rank relationship between children's income and parents' income at the CZ level. We define the height of this rank-rank line as the height at the median of the parents' income distribution, or $\bar{r}_{50,ct}$ for CZ c and cohort t, using the notation in equation (1) above. Recall that the slope of the line is b_{ct} in equation (1), which is what Chetty et al. (2014a) call "relative mobility."

Chetty et al. (2014a), focusing on the 1980–82 cohort, find that there is substantial geographic variation in mobility from the 25th percentile, but less variation in mobility from the 75th percentile. This matches our findings for the 1980 cohort, and can be understood as a negative correlation between the height of the rank-rank line and its slope: places with more mobility at the median of the parents' income distribution tend to have flatter rank-rank slopes, so that the variance in mobility is high for children of low-income families, but lower for children of high-income families.

We find that the correlation between the height of the rank-rank line and its slope is –0.40 in the 1980 birth cohort, but increases to 0.12 in the 1986 birth cohort. Therefore, in the 1986 cohort, places with more mobility at the median of the parents' income distribution tend to have an *even greater* advantage at the 75th percentile of the parents' income distribution, but mobility is more compressed at the 25th percentile of the parents' income distribution. This matches our findings in Tables 1 and 5. In the 1980 cohort, the cross-sectional standard deviation of mobility was 3.42 at the 25th percentile, but only 2.31 at the 75th percentile. But in the 1986 cohort, the standard deviation was 3.07 at the 25th percentile and had increased to 3.37 at the 75th percentile.

V. Discussion

We document substantial increases and decreases in intergenerational mobility between the 1980 and 1986 birth cohorts at the local level in the U.S. There is convergence in mobility from the 25th percentile over this time period, and region becomes a much weaker predictor of mobility. Meanwhile, the opposite occurs at the other end of the distribution of parents' income: there is substantial divergence in mobility from the 75th percentile, with increasing gaps across regions and between urban and rural areas.

Overall, our results suggest that it may not be appropriate to treat mobility as a fixed characteristic of a place, even over a relatively short time span. Because children's income was measured at age 26 for the purposes of producing the mobility statistics we study, the 1980 and 1986 cohorts are observed in 2006 and 2012, respectively, which spans the largest U.S. recession since the Great Depression. We expect that mobility changed more during this period than it typically would over the course of six years, but our findings highlight how risky it could be to measure a place's mobility using a small number of birth cohorts.

Our results are also related to the large literature on trends in regional differences and urban-rural differences in income and education within the U.S. Evidence from the decades before 1980 tends to find income convergence across places (Glaeser and Gottlieb, 2009; Nunn, Parsons, and Shambaugh, 2018). However, those sources find much weaker evidence for convergence after 1980. More recently, the evidence points toward divergence: Diamond (2016) finds increasing geographic variation in the share of workers who are college graduates, Moretti (2011) finds income divergence that is especially strong among college graduates, and Card, Rothstein, and Yi (2021) find an assortative matching pattern such that higher-skill workers are more likely to live in high-wage CZs.

Our finding of increasing geographic dispersion in mobility from the 75th percentile is certainly consistent with the findings described above, especially the more recent research documenting divergence among the population of college graduates, who are disproportionately likely to have been raised in high-income households. More surprising is our finding that the urban disadvantage in mobility grew over time, especially for mobility from the 75th percentile. However, migration limits the extent to which we can directly connect our findings to the literature cited above: the mobility statistics we use are based on assigning children to the CZ in which they were born, whereas the literature on regional or urban-rural differences tends to focus on current residents, and college graduates are more geographically mobile than other education groups (Diamond, 2016).

We are very curious whether a longer panel of income mobility data would show a continuation of the trends we document in this paper. We have focused on results for the 1980 and 1986 birth cohorts because they are the first and last cohorts for which income mobility data is available at the local level, but as far as we can tell, the patterns we find developed steadily over this time period, so that our results are not due to any particular quirk about the 1980 or 1986 cohort. For example, in Appendix Figure 6, we show the cross-sectional standard deviations of mobility from the 25th and 75th percentiles, for each of the seven birth cohorts spanning 1980–86. The dispersion of mobility from the 25th percentile decreases in almost every year, and the dispersion of mobility from the 75th increases every year. A longer panel of income mobility data at the local level, perhaps at the scale of a generation, would also be quite valuable for understanding the dynamics and sources of changes in mobility, and would complement recent work, cited in the introduction, on changes in mobility historically or over much longer time periods.

References

Aaronson, Daniel, and Bhashkar Mazumder. 2008. "Intergenerational Economic Mobility in the United States, 1940 to 2000." Journal of Human Resources, 43(1), 139–172.

Andrews, Rodney, Marcus Casey, Bradley L. Hardy, and Trevon D. Logan. 2017. "Location matters: Historical racial segregation and intergenerational mobility." Economics Letters, 158, 67–72.

Biasi, Barbara. 2019. "School Finance Equalization Increases Intergenerational Mobility: Evidence from a Simulated-Instruments Approach." NBER Working Paper 25600.

Butikofer, Aline, Antonio Dalla-Zuanna, and Kjell G. Salvanes. 2019. "Breaking the Links: Natural Resource Booms and Intergenerational Mobility." Working Paper.

Card, David, Jesse Rothstein, and Moises Yi. 2021. Discussion Paper, U.S. Census Bureau, Center for Economic Studies, CES 21–32.

Chetty, Raj, et al. 2014a. "Where is the land of opportunity? The geography of intergenerational mobility in the United States." Quarterly Journal of Economics, 129(4), 1553–1623.

Chetty, Raj, et al. 2014b. "Is the United States Still a Land of Opportunity? Recent Trends in Intergenerational Mobility." American Economic Review: Papers & Proceedings, 104(5), 141–147.

Chetty, Raj, et al. 2017. "The fading American dream: Trends in absolute income mobility since 1940." Science, 356(6336), 398–406.

Chetty, Raj, and Nathaniel Hendren. 2018a. "The Impacts of Neighborhoods on Intergenerational Mobility I: Childhood Exposure Effects." Quarterly Journal of Economics, 133(3), 1107–1162.

Chetty, Raj, and Nathaniel Hendren. 2018b. "The Impacts of Neighborhoods on Intergenerational Mobility II: County-Level Estimates." Quarterly Journal of Economics, 133(3), 1163–1228.

Connor, Dylan Shane and Michael Storper. 2020. "The changing geography of social mobility in the United States." Proceedings of the National Academy of Sciences, 117 (48), 30309–30317.

Derenoncourt, Ellora. 2021. “Can you move to opportunity? Evidence from the Great Migration.” Working paper.

Diamond, Rebecca. 2016. “The Determinants and Welfare Implications of US Workers’ Diverging Location Choices by Skill: 1980-2000.” American Economic Review, 106(3), 479–524.

Fletcher, Jason, and Joel Han. 2019. “Intergenerational Mobility in Education: Variation in Geography and Time.” Journal of Human Capital, 13(4), 585–634.

Gallagher, Ryan, Robert Kaestner, and Joseph Persky. 2019. “The geography of family differences and intergenerational mobility.” Journal of Economic Geography, 19, 589–618.

Glaeser, Edward L. And Joshua D. Gottlieb. “The Wealth of Cities: Agglomeration Economies and Spatial Equilibrium in the United States.” Journal of Economic Literature, 47(4): 983–1028.

Grawe, Nathan D. 2006. 2006. “Lifecycle bias in estimates of intergenerational earnings persistence.” Labour Economics, 13(5), 551–570.

Haider, Steven, and Gary Solon. 2006. “Life-Cycle Variation in the Association between Current and Lifetime Earnings.” American Economic Review, 96(4), 1308–1320.

Hilger, Nathaniel G. 2017. “The Great Escape: Intergenerational Mobility in the United States, 1930-2010.” Working paper.

Krause, Eleanor, and Richard V. Reeves. 2017 “Rural dreams: Upward mobility in America’s countryside.” Center on Children and Families at Brookings.

Lee, Chul-In, and Gary Solon. 2009. “Trends in Intergenerational Income Mobility.” Review of Economics and Statistics, 91(4), 766–772.

Lefgren, Lars J., Jaren C. Pope, and David P. Sims. 2020. “Contemporary State Policies and Intergenerational Income Mobility.” Journal of Human Resources, 0717-8921R1.

Mazumder, Bhashkar. 2016. “Estimating the Intergenerational Elasticity and Rank Association in the United States: Overcoming the Current Limitations of Tax Data.” Research in Labor Economics, 43, 83–129.

Moretti, Enrico. 2011. “Local Labor Markets.” In *Handbook of Labor Economics*, Vol. 4b, 1237–1313.

Nunn, Parsons, and Shambaugh. 2018. "The Geography of Prosperity." In *Place-Based Policies for Shared Economic Growth*, The Hamilton Project.

Robertson, Cassandra, and Rourke O'Brien. 2018. "Health Endowment at Birth and Variation in Intergenerational Economic Mobility: Evidence From U.S. County Birth Cohorts." Demography, 55, 249–269.

Rothbaum, Jonathan. 2016. "Sorting and Geographic Variation in Intergenerational Mobility." Working paper.

Rothstein, Jesse. 2019. "Inequality of Educational Opportunity? Schools as Mediators of the Intergenerational Transmission of Income." Journal of Labor Economics, 37(S1), S85–S123.

Sharkey, Patrick, and Gerard Torrats-Espinosa. 2017. "The effect of violent crime on economic mobility." Journal of Urban Economics, 102, 22–33.

Solon, Gary. 1992. "Intergenerational Income Mobility in the United States." American Economic Review, 82(3), 393–408.

Tan, Hui Ren. 2019. "A Different Land of Opportunity: The Geography of Intergenerational Mobility in the Early 20th-Century US." Journal of Labor Economics, forthcoming.

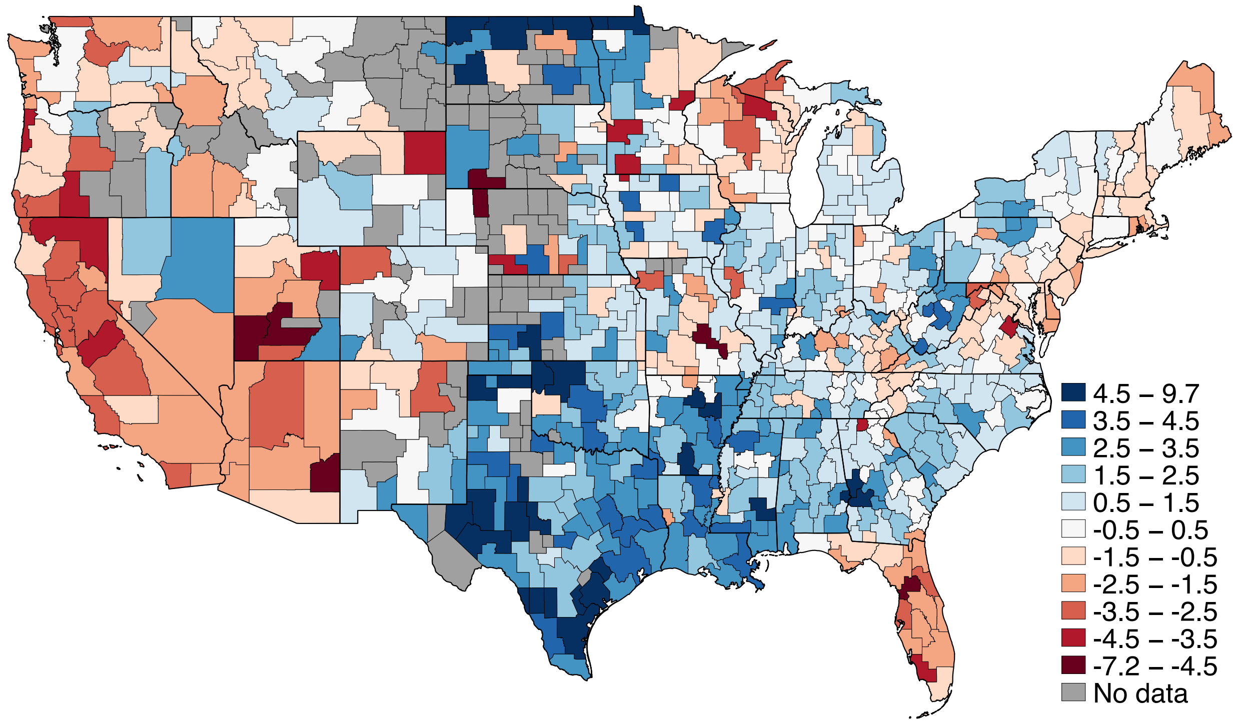
Weber, Bruce, J. Matthew Fannin, Sam M. Cordes, and Thomas G. Johnson. 2017. "Upward Mobility of Low-Income Youth in Metropolitan, Micropolitan, and Rural America." The Annals of the American Academy of Political and Social Science, 672, 103–122.

Weber, Bruce, J. Matthew Fannin, Kathleen Miller, and Stephan Goetz. 2018. "Intergenerational mobility of low-income youth in metropolitan and non-metropolitan America: A spatial analysis." Regional Science Policy & Practice, 10, 87–101.

Wooldridge, Jeffrey M. 2016. Introductory Econometrics: A Modern Approach, 6th edition. Boston, MA: Cengage Learning.

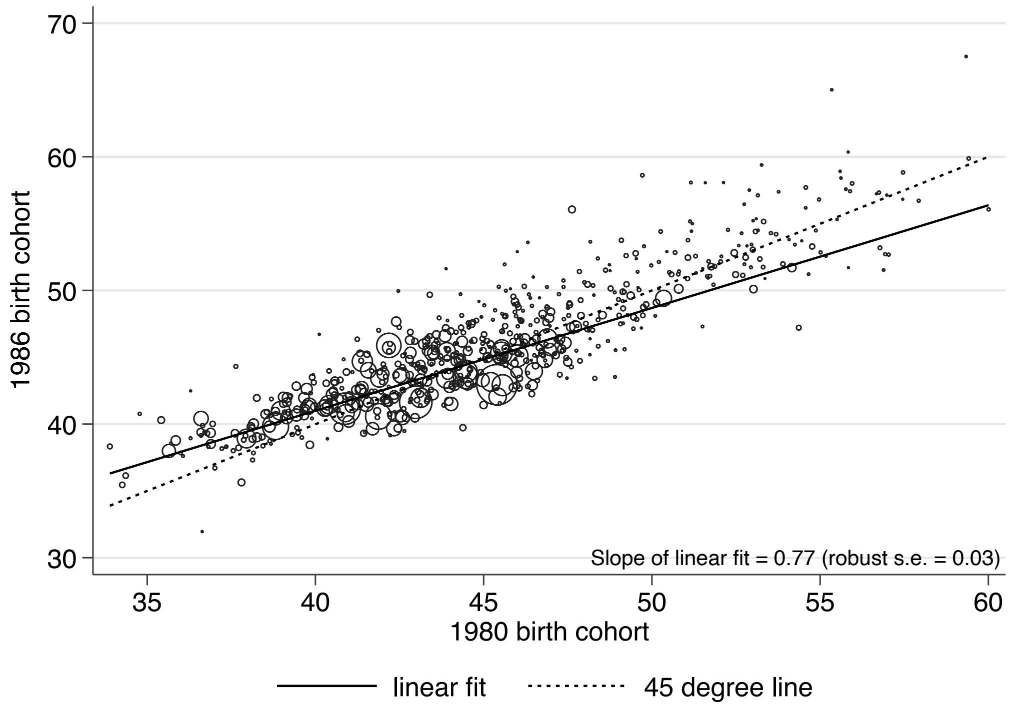
Zimmerman, David J. 1992. "Regression Toward Mediocrity in Economic Stature." American Economic Review, 82(3), 409–429.

Figure 1: Absolute mobility from 25th percentile, change between 1980 and 1986 birth cohorts



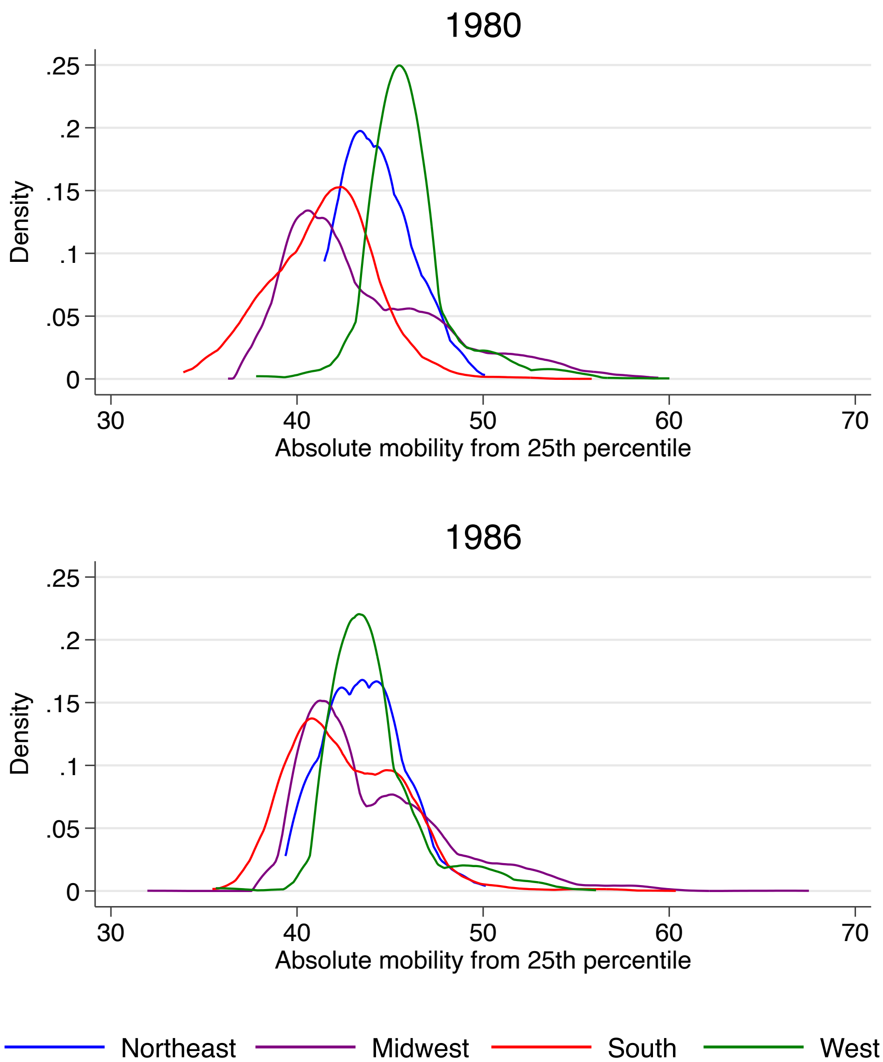
Notes: Mobility statistics for each commuting zone and birth cohort are from Opportunity Insights. Absolute mobility from the 25th percentile is defined as the expected income percentile, measured nationally among the birth cohort at age 26, achieved by children whose parents are at the 25th percentile of the national parent income distribution. See section II for further details on the measurement of mobility.

Figure 2: Absolute mobility from 25th percentile among 1980 and 1986 birth cohorts



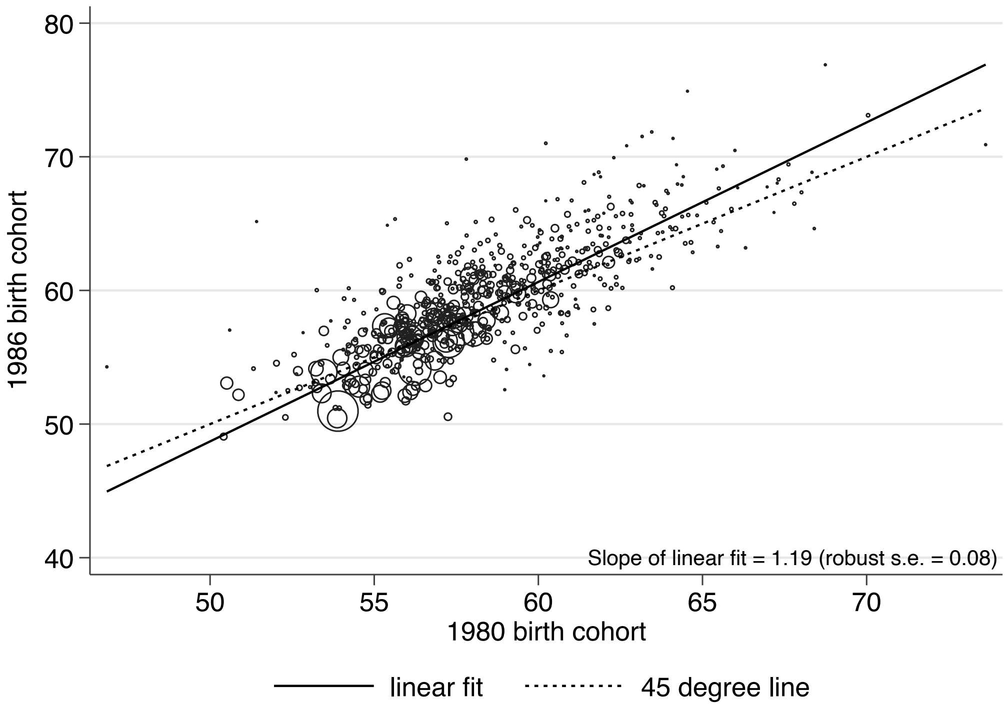
Notes: We show mobility from the 25th percentile in the 1980 and 1986 birth cohorts for 621 CZs, as well as the estimated regression line from a simple regression of mobility in the 1986 cohort on mobility in the 1980 cohort. Both the marker sizes and the regression estimates are weighted by cohort size.

Figure 3: Distribution of absolute mobility from 25th percentile for each region, 1980 and 1986 birth cohorts



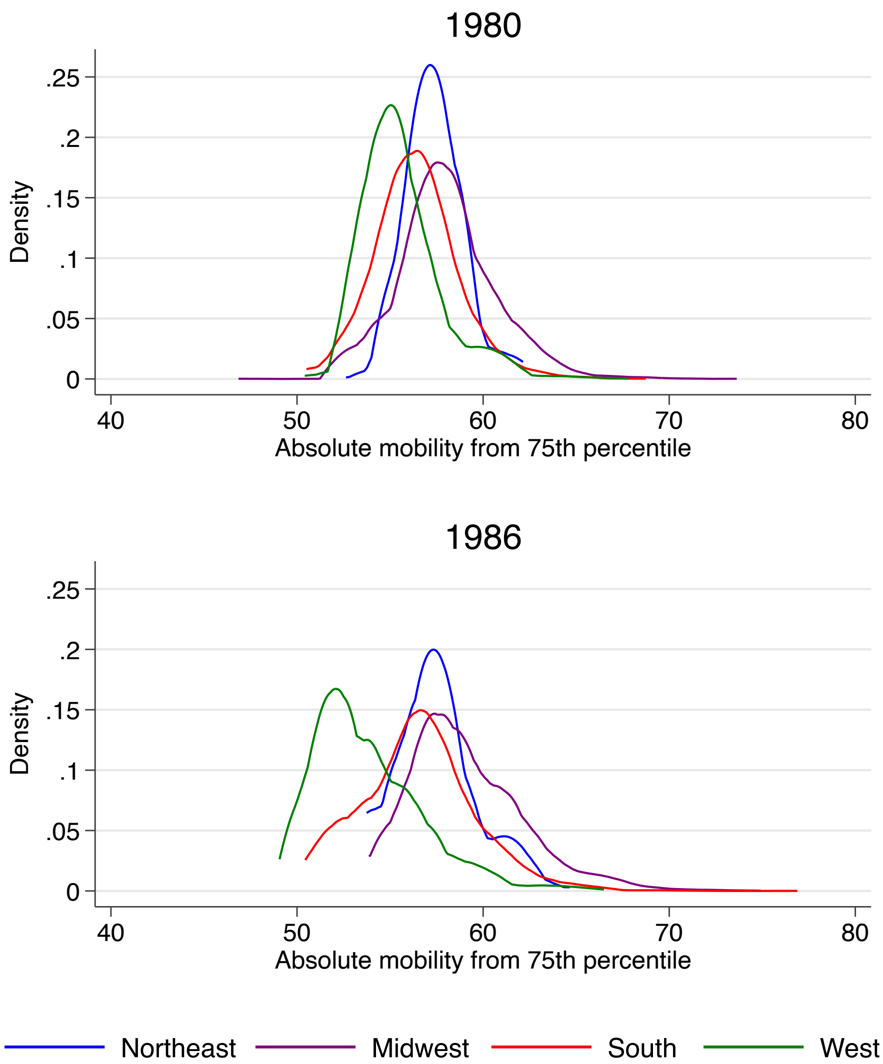
Notes: We show kernel density plots of mobility from the 25th percentile, by census region and year. The estimated densities are weighted by cohort size.

Figure 4: Absolute mobility from 75th percentile among 1980 and 1986 birth cohorts



Notes: We show mobility from the 75th percentile in the 1980 and 1986 birth cohorts for 621 CZs, as well as the estimated regression line from a simple regression of mobility in the 1986 cohort on mobility in the 1980 cohort. Both the marker sizes and the regression estimates are weighted by cohort size.

Figure 5: Distribution of absolute mobility from 75th percentile for each region, 1980 and 1986 birth cohorts



Notes: We show kernel density plots of mobility from the 75th percentile, by census region and year. The estimated densities are weighted by cohort size.

Table 1: Summary statistics for absolute mobility from 25th percentile

	1980 cohort	1986 cohort	Change
Mean	43.38	43.51	0.12
Standard deviation	3.42	3.07	1.95
Percentiles			
5th	38.16	39.68	– 2.65
25th	41.08	41.42	– 1.35
50th	43.13	42.95	–0.03
75th	45.42	45.29	1.47
95th	49.25	49.41	3.48

Notes: N = 621 CZs with mobility data for both the 1980 and 1986 birth cohorts. All statistics are weighted by cohort size.

Table 2: Persistence of changes in absolute mobility from 25th percentile

	Dependent variable: Changes in absolute mobility			
	All CZs		Largest half of CZs	
	One-year cohorts	Two-year cohorts	One-year cohorts	Two-year cohorts
Lag change in mobility	– 0.173***	0.150	– 0.041	0.238
	(0.052)	(0.126)	(0.062)	(0.143)
Observations [unique CZs]	3,140 [631]	624 [624]	1,590 [318]	318 [318]

Notes: Results are from regressions of changes in mobility from the 25th percentile on lagged changes in mobility from the 25th percentile. Two-year cohorts are formed by averaging 1980 and 1981 into a single cohort, averaging 1982 and 1983 into a single cohort, and so on. All regressions include cohort fixed effects and are weighted by cohort size. Standard errors are clustered at the state level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Regressions results for regional differences in mobility from the 25th percentile

	1980 cohort		1986 cohort		Change	
	(1)	(2)	(3)	(4)	(5)	(6)
Midwest	–0.556	–1.368***	0.673	–0.633	1.289***	0.718**
	(0.747)	(0.503)	(0.813)	(0.500)	(0.263)	(0.299)
South	–2.803***	–1.699**	–0.865	–0.096	1.885***	1.597***
	(0.494)	(0.763)	(0.627)	(0.755)	(0.337)	(0.368)
West	1.744***	1.061*	0.559	–0.120	–1.122***	–1.163***
	(0.506)	(0.588)	(0.683)	(0.589)	(0.347)	(0.347)
Controls (standardized)						
Fraction short commute		0.695***		1.075***		0.465***
		(0.163)		(0.156)		(0.119)
Gini bottom 99%		–0.090		0.160		0.240
		(0.254)		(0.235)		(0.214)
High school dropout rate		–0.402***		–0.223		0.191
		(0.153)		(0.161)		(0.116)
Social capital index		0.039		0.319		0.300**
		(0.185)		(0.200)		(0.158)
Fraction single mothers		–1.727***		–1.874***		–0.239
		(0.256)		(0.295)		(0.207)
Fraction black		–0.269		–0.015		0.356*
		(0.228)		(0.257)		(0.192)
Constant	44.200***	44.348***	43.535***	43.945***	–0.627***	–0.430***
	(0.427)	(0.607)	(0.552)	(0.592)	(0.233)	(0.216)
R^2	0.251	0.745	0.047	0.663	0.366	0.419

Notes: $N = 621$ CZs with mobility data for both the 1980 and 1986 birth cohorts. Results are from regressions of changes in mobility from the 25th percentile on region indicators, with Northeast as the baseline region. Data on controls is from Opportunity Insights, and we standardize each control to have mean 0 and standard deviation 1. For 103 CZs with missing data on high school dropout rates, we set the standardized value to 0 and and include an indicator for CZs with missing data. All regressions are weighted by cohort size. Standard errors are clustered at the state level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Regression results for urban-rural differences in mobility from the 25th percentile

	1980 cohort		1986 cohort		Change	
	(1)	(2)	(3)	(4)	(5)	(6)
Urban	–2.589***	–0.968**	–3.291***	–0.585	–0.750***	0.473*
	(0.424)	(0.411)	(0.411)	(0.377)	(0.262)	(0.257)
Controls (standardized)						
Fraction short commute		0.317		0.945***		0.746***
		(0.288)		(0.241)		(0.149)
Gini bottom 99%		–0.335		0.172		0.478*
		(0.293)		(0.221)		(0.266)
High school dropout rate		–0.389**		–0.263		0.148
		(0.162)		(0.187)		(0.122)
Social capital index		–0.224		0.214		0.440***
		(0.169)		(0.167)		(0.158)
Fraction single mothers		–1.438***		–1.832***		–0.494*
		(0.379)		(0.337)		(0.258)
Fraction black		–1.010***		–0.092		1.050***
		(0.329)		(0.285)		(0.194)
Constant	45.728***	44.311***	46.526***	44.297***	0.806***	–0.141
	(0.333)	(0.548)	(0.354)	(0.472)	(0.145)	(0.281)
R^2	0.049	0.686	0.088	0.661	0.011	0.280

Notes: $N = 621$ CZs with mobility data for both the 1980 and 1986 birth cohorts. Results are from regressions of changes in mobility from the 25th percentile on an urban indicator, where a CZ is classified as urban if it intersects an MSA. Data on controls is from Opportunity Insights, and we standardize each control to have mean 0 and standard deviation 1. For 103 CZs with missing data on high school dropout rates, we set the standardized value to 0 and and include an indicator for CZs with missing data. All regressions are weighted by cohort size. Standard errors are clustered at the state level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

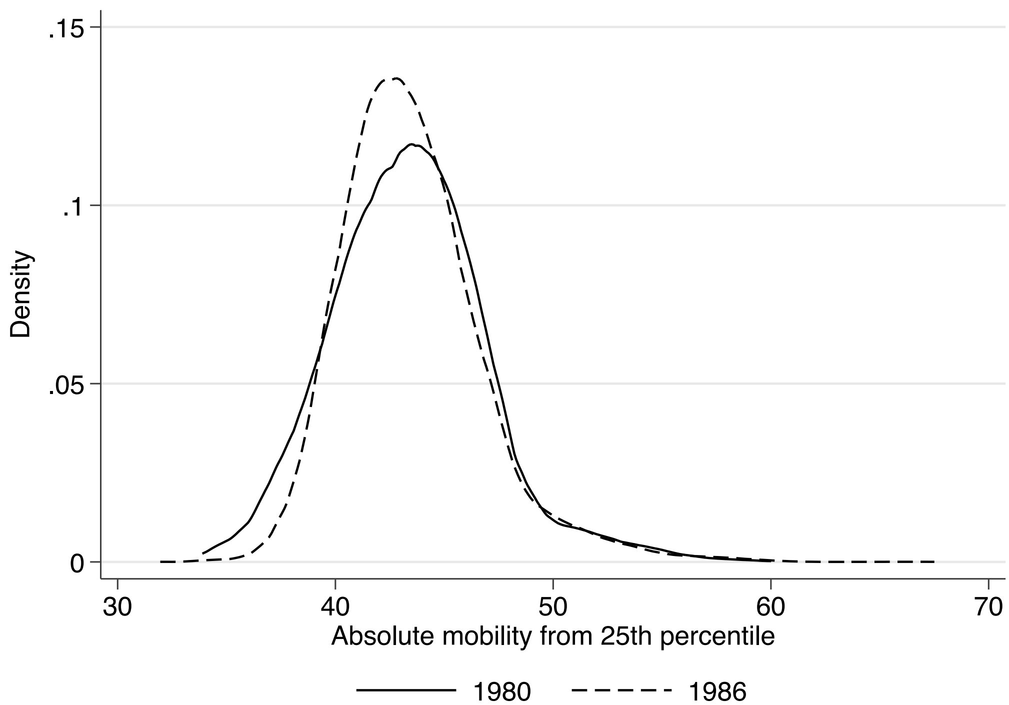
Table 5: Summary statistics for absolute mobility from 75th percentile

	1980 cohort	1986 cohort	Change
Mean	56.80	56.62	– 0.10
Standard deviation	2.31	3.37	2.01
Percentiles			
5th	53.47	50.97	– 3.43
25th	55.32	54.11	– 1.30
50th	56.77	56.74	– 0.03
75th	57.89	58.27	1.11
95th	60.89	62.17	3.19

Notes: $N = 621$ CZs with mobility data for both the 1980 and 1986 birth cohorts. All statistics are weighted by cohort size.

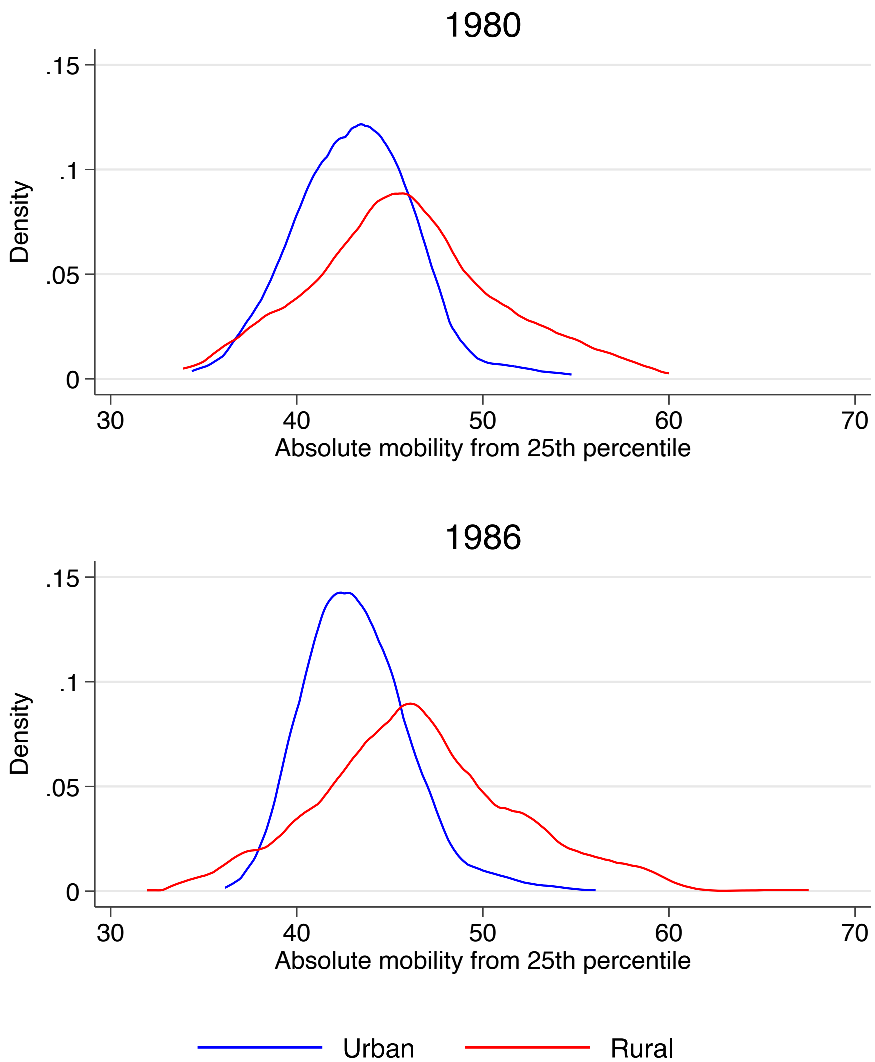
APPENDIX TO "LOCAL CHANGES IN INTERGENERATIONAL MOBILITY"

Appendix Figure 1: Distribution of absolute mobility from 25th percentile, 1980 and 1986 birth cohorts



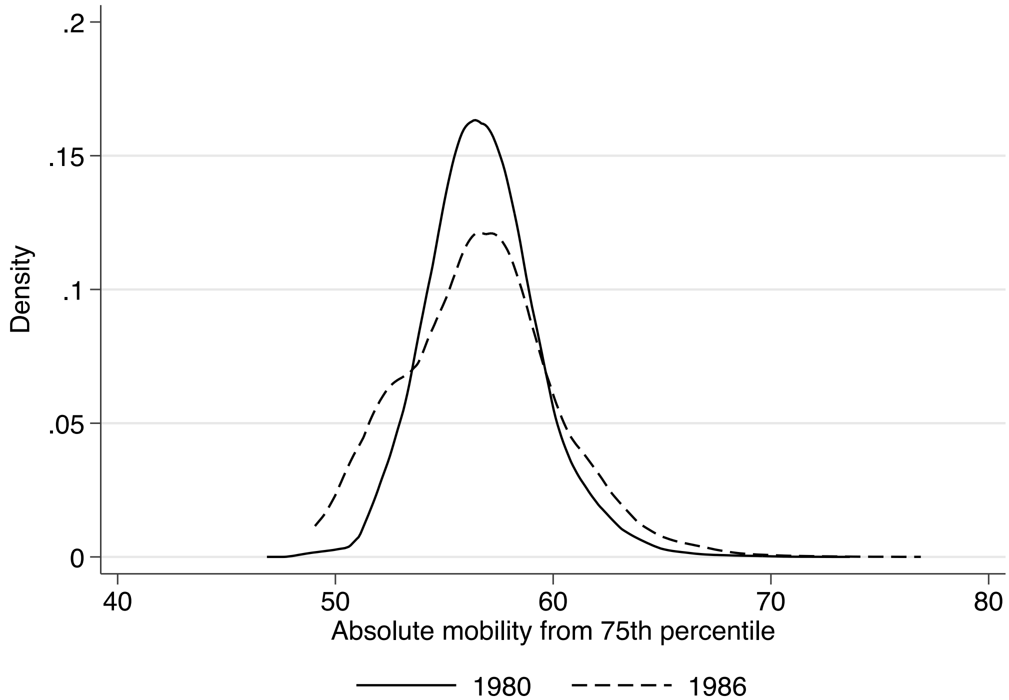
Notes: We show kernel density plots of mobility from the 25th percentile, separately for the 1980 and 1986 birth cohorts. The estimated densities are weighted by cohort size.

Appendix Figure 2: Distribution of absolute mobility from 25th percentile for urban and rural areas, 1980 and 1986 birth cohorts



Notes: We show kernel density plots of mobility from the 25th percentile, by urban status and year. A CZ is defined to be urban if it intersects an MSA. The estimated densities are weighted by cohort size

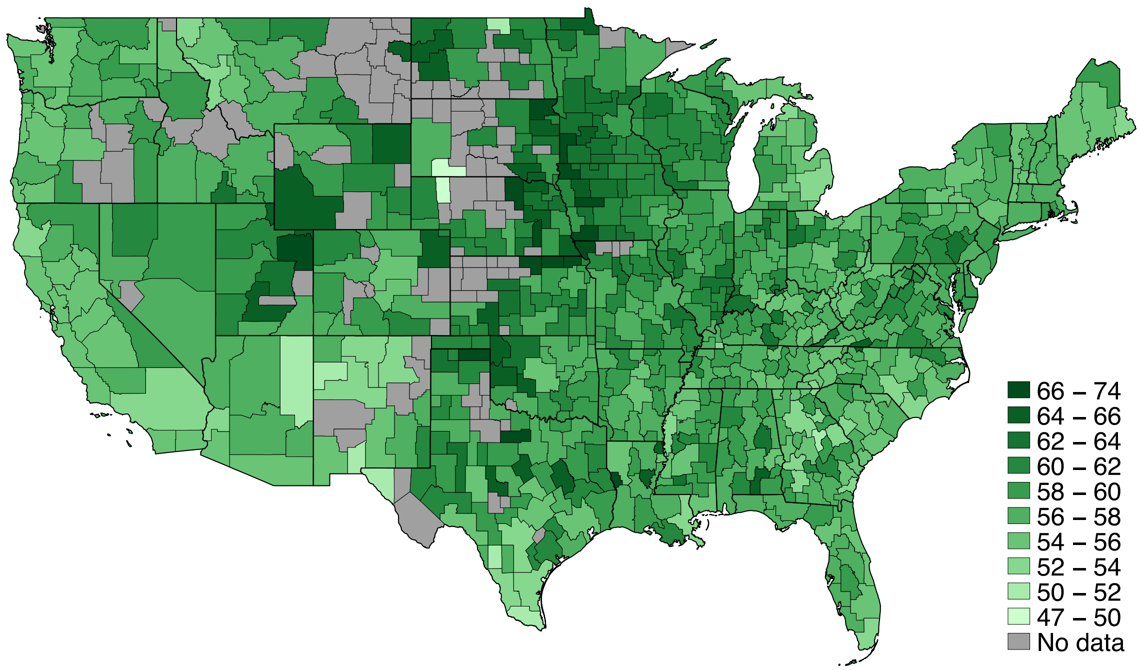
Appendix Figure 3: Distribution of absolute mobility from 75th percentile, 1980 and 1986 birth cohorts



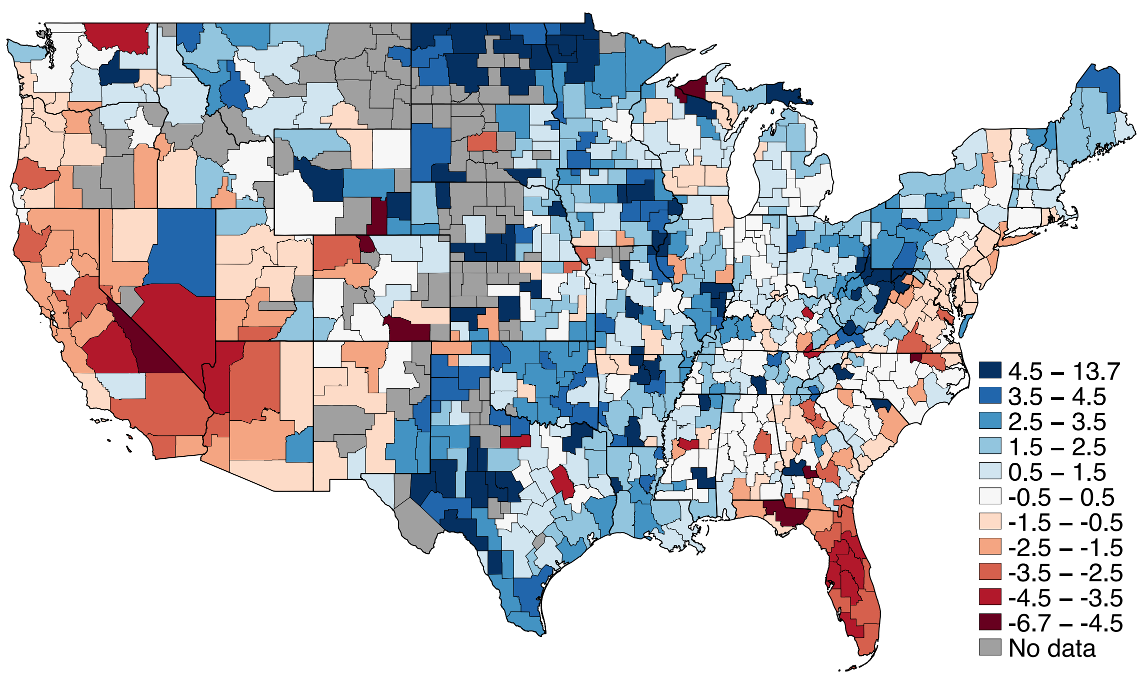
Notes: We show kernel density plots of mobility from the 75th percentile, separately for the 1980 and 1986 birth cohorts. The estimated densities are weighted by cohort size.

Appendix Figure 4: Maps of absolute mobility from 75th percentile

Panel A: Absolute mobility from 75th percentile in 1980 birth cohort

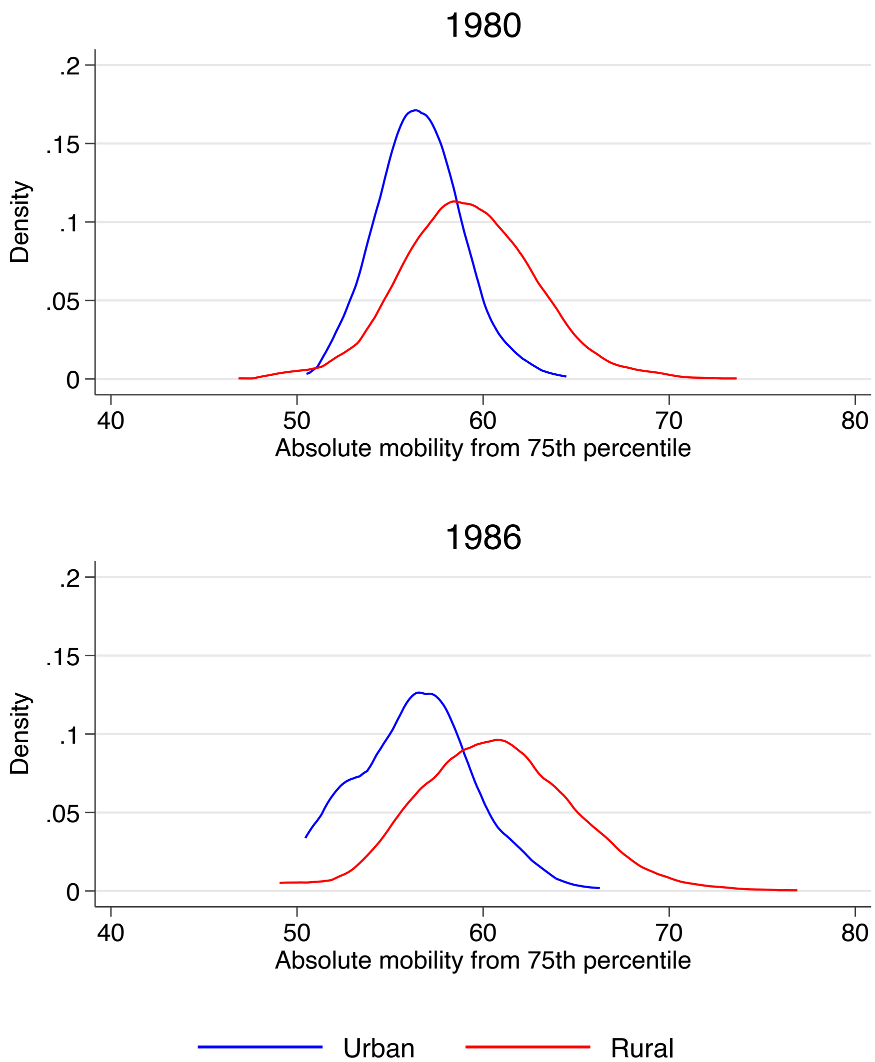


Panel B: Change in absolute mobility from 75th percentile between 1980 and 1986 birth cohorts



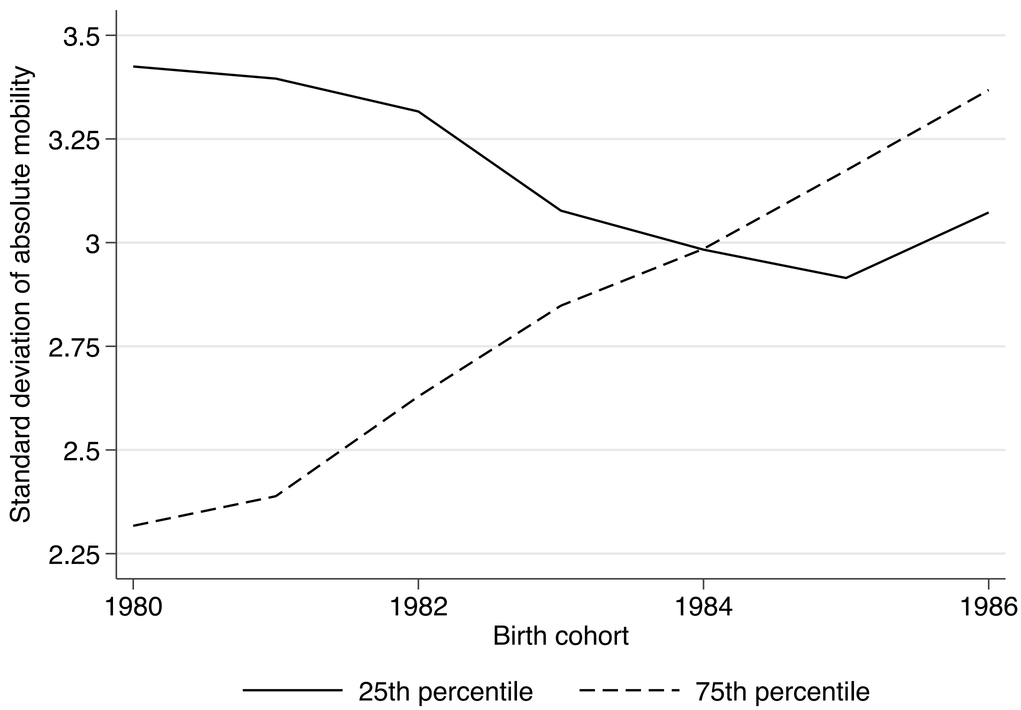
Notes: Notes: Mobility statistics for each commuting zone and birth cohort are from Opportunity Insights. Absolute mobility from the 75th percentile is defined as the expected income percentile, measured nationally among the birth cohort at age 26, achieved by children whose parents are at the 75th percentile of the national parent income distribution. See section II for further details on the measurement of mobility.

Appendix Figure 5: Distribution of absolute mobility from 75th percentile for urban and rural areas, 1980 and 1986 birth cohorts



Notes: We show kernel density plots of mobility from the 75th percentile, by urban status and year. A CZ is defined to be urban if it intersects an MSA. The estimated densities are weighted by cohort size.

Appendix Figure 6: Standard deviation of mobility from 25th and 75th percentiles, by birth cohort



Notes: We plot the cross-sectional standard deviation in mobility, separately for mobility from the 25th percentile and mobility from the 75th percentile, for each birth cohort from 1980 to 1986. Each standard deviation is weighted by cohort size.

Appendix Table 1: Largest changes in absolute mobility from 25th percentile, 1980–1986 birth cohorts

All CZs			
Most positive changes		Most negative changes	
Williston, ND	9.67	St. George, UT	– 7.15
Minot, ND	8.90	Safford, AZ	– 5.38
Midland, TX	8.43	Richfield, UT	– 5.36
Dickinson, ND	8.17	Rolla, MO	– 4.88
Pearsall, TX	7.74	Gordon, SD	– 4.68
Beeville, TX	7.50	Ocala, FL	– 4.65
Dumas, TX	7.28	Worthington, MN	– 4.36
Pecos, TX	6.91	Gillette, WY	– 4.22
Sweetwater, TX	6.90	Pine City, MN	– 4.20
El Dorado, AR	6.68	Fredericksburg, VA	– 4.17
Largest half of CZs			
Most positive changes		Most negative changes	
Midland, TX	8.43	St. George, UT	– 7.15
Victoria, TX	6.27	Ocala, FL	– 4.65
Corpus Christi, TX	5.27	Fredericksburg, VA	– 4.17
Columbus, GA	4.88	Cape Coral, FL	– 3.57
Clarksdale, MS	4.44	Klamath Falls, CA	– 3.57
Laredo, TX	4.06	Modesto, CA	– 3.54
Lubbock, TX	3.97	Bellingham, WA	– 3.49
New Orleans, LA	3.81	Medford, OR	– 3.36
Huntsville, TX	3.78	Sacramento, CA	– 3.36
Houston, TX	3.70	Bend, OR	– 3.33

Notes: We show the largest positive and negative changes in mobility from the 25th percentile between the 1980 and 1986 birth cohorts. Results for the largest half of CZs apply to CZs with an average 1980–86 cohort size greater than the median, which is 1,766 births.

Appendix Table 2: Regressions results for regional differences in mobility from the 75th percentile

	1980 cohort		1986 cohort		Change	
	(1)	(2)	(3)	(4)	(5)	(6)
Midwest	0.628	–0.437***	1.581*	–0.574	0.992*	–0.123
	(0.493)	(0.351)	(0.877)	(0.353)	(0.554)	(0.313)
South	–1.040***	–0.789*	–0.904	–0.003	0.182	0.839**
	(0.345)	(0.426)	(0.754)	(0.425)	(0.540)	(0.334)
West	–1.840***	–1.356***	–3.538***	–2.952***	–1.576**	–1.574***
	(0.530)	(0.437)	(0.682)	(0.444)	(0.614)	(0.308)
Controls (standardized)						
Fraction short commute		0.797***		1.451***		0.686***
		(0.104)		(0.118)		(0.094)
Gini bottom 99%		–0.536***		–0.594***		–0.072
		(0.193)		(0.218)		(0.171)
High school dropout rate		–0.082		0.072		0.149
		(0.097)		(0.122)		(0.111)
Social capital index		0.254		0.889***		0.630***
		(0.205)		(0.203)		(0.153)
Fraction single mothers		–0.956***		–1.002***		–0.104
		(0.196)		(0.232)		(0.200)
Fraction black		0.887***		0.728**		–0.127
		(0.191)		(0.287)		(0.185)
Constant	57.401***	57.655***	57.318***	57.601***	–0.064	–0.080
	(0.282)	(0.344)	(0.682)	(0.316)	(0.486)	(0.223)
R^2	0.156	0.533	0.273	0.729	0.194	0.461

Notes: $N = 621$ CZs with mobility data for both the 1980 and 1986 birth cohorts. Results are from regressions of changes in mobility from the 75th percentile on region indicators, with Northeast as the baseline region. Data on controls is from Opportunity Insights, and we standardize each control to have mean 0 and standard deviation 1. For 103 CZs with missing data on high school dropout rates, we set the standardized value to 0 and and include an indicator for CZs with missing data. All regressions are weighted by cohort size. Standard errors are clustered at the state level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix Table 3: Regression results for urban-rural differences in mobility from the 75th percentile

	1980 cohort		1986 cohort		Change	
	(1)	(2)	(3)	(4)	(5)	(6)
Urban	–2.632***	–1.011***	–4.297***	–0.782**	–1.672***	0.221
	(0.308)	(0.293)	(0.489)	(0.343)	(0.274)	(0.247)
Controls (standardized)						
Fraction short commute		0.515***		1.293***		0.811***
		(0.168)		(0.169)		(0.114)
Gini bottom 99%		–0.597***		–0.482*		0.109
		(0.199)		(0.264)		(0.214)
High school dropout rate		–0.146		–0.089		0.053
		(0.105)		(0.151)		(0.129)
Social capital index		0.487***		1.244***		0.743***
		(0.149)		(0.169)		(0.140)
Fraction single mothers		–0.814***		–0.969***		–0.228
		(0.245)		(0.278)		(0.224)
Fraction black		0.840***		1.148***		0.368**
		(0.226)		(0.228)		(0.165)
Constant	59.185***	57.993***	60.560***	57.893***	1.437***	–0.104
	(0.232)	(0.339)	(0.301)	(0.361)	(0.161)	(0.254)
R^2	0.110	0.522	0.124	0.671	0.053	0.368

Notes: N = 621 CZs with mobility data for both the 1980 and 1986 birth cohorts. Results are from regressions of changes in mobility from the 75th percentile on an urban indicator, where a CZ is classified as urban if it intersects an MSA. Data on controls is from Opportunity Insights, and we standardize each control to have mean 0 and standard deviation 1. For 103 CZs with missing data on high school dropout rates, we set the standardized value to 0 and and include an indicator for CZs with missing data. All regressions are weighted by cohort size. Standard errors are clustered at the state level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$