NBER WORKING PAPER SERIES

INTERNAL MIGRATION IN THE UNITED STATES

Raven Molloy
Christopher L. Smith
Abigail K. Wozniak

Working Paper 17307
http://www.nber.org/papers/w17307

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
August 2011

Internal Migration in the United States
Raven Molloy, Christopher L. Smith, and Abigail K. Wozniak
NBER Working Paper No. 17307
August 2011
JEL No. J1,J61,R23

ABSTRACT

We review patterns in migration within the US over the past thirty years. Internal migration has fallen noticeably since the 1980s, reversing increases from earlier in the century. The decline in migration has been widespread across demographic and socioeconomic groups, as well as for moves of all distances. Although a convincing explanation for the secular decline in migration remains elusive and requires further research, we find only limited roles for the housing market contraction and the economic recession in reducing migration recently. Despite its downward trend, migration within the US remains higher than that within most other developed countries.

Raven Molloy
Federal Reserve Board of Governors
20th and C Streets NW
Washington, DC 20551
raven.s.molloy@frb.gov

Christopher L. Smith
Federal Reserve Board
Research Division
Stop # 80
20th & C Sts., NW
Washington, DC 20551-0001
Christopher.L.Smith@frb.gov

Abigail K. Wozniak
Department of Economics
University of Notre Dame
441 Flanner Hall
South Bend, IN 46556
and NBER
a_wozniak@nd.edu

The notion that one can pick up and move to a location that promises better opportunities has long been an important part of the American mystique. Examples abound, including settlers making the leap over the Appalachians prior to the Revolutionary War; the nineteenth century advice to "Go west, young man, go west" often attributed to newspaper editor Horace Greeley; John Steinbeck's tale of the Joad family heading west in the 1930s to escape the Dust Bowl in *The Grapes of Wrath*; and the mid-century Great Black Migration northward out of the poverty of sharecropping and wage labor in the South. Indeed, it is widely believed that internal migration rates in the United States—that is, population flows between regions, states, or cities within a country—are higher than in other countries. This belief is not exactly wrong, but reality is more complex. For example, the Dust Bowl migrants of the 1930s were not representative of their time, but rather were an exceptional case during a period of markedly low internal migration (Ferrie, 2003; Rosenbloom and Sundstrom, 2004). While the United States has historically had one of the highest migration rates in the world by many measures, citizens of some other countries—including Finland, Denmark and Great Britain—appear equally mobile. Moreover, internal U.S. migration seems to have reached an inflection point around 1980. As shown in Figure 1, the share of the population that had migrated between states trended higher during much of the twentieth century, with the exception of the Great Depression. However, migration rates have been falling in the past several decades, calling into question the extent to which high rates of geographic mobility are still a distinguishing characteristic of the U.S. economy.

Economists and other social scientists have been interested in migration for more than a century. In the early decades of the twentieth century, a frequent topic of interest was movement from rural to urban areas (for example, Bachmura, 1959; Harris and Todaro, 1970; and the

annotated 1200-paper bibliography from Price and Sikes, 1975). Researchers tended to focus on the social costs of migration, including the "brain drain" from rural areas and the challenges to cities faced with absorbing migrants (Long, 1988, Ch. 1). As decades passed and urbanization of the United States slowed, interest in rural to urban movements waned. Economists developed a model of migration decisions founded in the idea of individual maximization of expected net benefits to location choice. The development of new data sources, like the questions in the U.S. Census (discussed in Long, 1988, Ch. 1), allowed researchers to define migrants and research questions about migrants more precisely. Migration scholars, partly in conjunction with statistical agencies, converged on a broad definition of migration as a move over a long-enough distance to entail an appreciable change in the local economic environment: early examples of the literature on "distance migration" include Sjaastad (1962) and Schwartz (1973). Researchers began focusing on the determinants of migration—describing who moves and why—and analyzing the equilibrating effects of migrants on local economies, as discussed in Greenwood's (1997) useful overview of the literature.

This paper picks up the history of internal migration in the United States in the 1980s. We begin by discussing empirical issues concerning measurement of migration, and then present some basic facts on migration during the 1980 to 2009 period, adding 15 years of data since Greenwood's (1997) overview. We document a downward trend in migration that has partly reversed increases in mobility earlier in the century. We then turn to explanations for these trends. The widespread decline in migration rates across a large number of subpopulations suggests that broad-based economic forces are likely responsible for the decrease. An obvious question is the extent to which the recent housing market contraction and the recession may have caused this downward trend in migration: after all, relocation activity often involves both

housing market activity and changes in employment. However, we find relatively small roles for both of these cyclical factors. While we will suggest a few other possible explanations for the recent decrease in migration, the puzzle remains. Finally, we compare U.S. migration to other developed countries. Although migration has not fallen in most other countries, geographic mobility in the United States still appears to be relatively high.

Measuring Migration

Migration scholars today generally make two decisions to define migrants: 1) they choose geographic units to define potential origin and destination locations; and 2) they define the time period in which individuals must move between origins and destinations.[1] We discuss the options available to researchers making these decisions.

The idea of leaving one local labor market and entering another is often used to motivate how far one has to move to qualify as a migrant. In some data sources, researchers can observe close approximations of local labor markets. A common approach here is to refer to a metropolitan area, which is typically defined by government statistical agencies using commuting patterns in order to capture the idea of a local labor market. A variety of names have been used for metropolitan areas with slightly varying definitions, including metropolitan statistical area (MSA), core-based statistical area (CBSA), and Economic Area (EA).

In practice, using metropolitan areas to define the origin and destination of migrants has some drawbacks. First, these areas do not cover the entire United States, so population flows from rural to metropolitan areas will not be counted as migrants. Second, metropolitan area

[1] Long (1988) discusses a third dimension of the migrant definition, which is the types of residences that count as a permanent residence: for example, whether to include residences such as a dormitory or a second home. Since users of survey data frequently have little leeway in making this decision, we omit this choice from our discussion.

boundaries are revised every few years in order to reflect the current patterns of economic activity, which poses problems for measuring migration consistently over time. Third, metropolitan area identifiers are not available in many public datasets. The commuting zone and public use microdata area (PUMA) concepts present alternatives to the MSA that get around the first of these faults. Like MSAs, these areas are generally (though not always) defined as groups of counties. However, unlike MSAs they cover the entire United States. In 1990 and 2000 Census publicly available microdata, researchers can identify migration across PUMAs. Using a cross-walk between counties and commuting zones, and PUMAs and commuting zones (for 1990 and 2000), researchers can roughly identify migration across commuting zones.[2]

Alternatively, many researchers have used state or county boundaries to define migrants. These geographic units are available in more datasets and have the additional advantages that they include the entire United States and that their boundaries are stable over time. Often respondents are asked whether they have moved across county or state lines, and this information is available to researchers even when exact county or state of prior residence is not. However, using either state or county boundaries suffers from a degree of misclassification: some between-county movers remain within the same local labor market, while between-metropolitan migrants will not be counted in inter-state migration statistics. Inter-region migration, which describes population flows between groups of states, is unlikely to suffer from misclassification but occurs less frequently than migration over shorter distances.

[2] Commuting zones, originally introduced by Tolbert and Killian (1996) and used more recently by Autor and Dorn (2010), are defined by common commuting patterns, and divide the country into 741 local labor markets. Using publicly available Census microdata, in 1980 commuting zones can be determined by county of residence, and in 1990 and 2000, commuting zones can be determined by PUMA. Multiple counties or PUMAs may exist in a single commuting zone, and some commuting zones may cross county or PUMA boundaries. For this reason, it is not possible to know precisely what commuting zone some observations are in. In the statistics reported below, we conservatively assume that an individual did not move across commuting zones if there is at least one commuting zone that is a common member of the set of possible commuting zones of current residence and of residence five years earlier.

Turning to the decision concerning the time period over which to measure migration, the available options are usually limited. In most large public use datasets, migration can typically be observed over an individual's lifetime or over a recent period, usually the last twelve months or five years. Often, only the end points of these time periods are observed. For example, a person who resided in the same metropolitan area five years ago and at the time of the survey would be classified as a non-migrant, even if that person lived in a different metropolitan area for some of the intervening years. Moreover, individuals who have moved many times will be indistinguishable from individuals who have only moved once. This type of measurement error is most severe when considering lifetime migration, since some migrants will have returned to their birth state after having spent perhaps considerable time elsewhere. Another issue with lifetime migration is that some individuals will have moved when they were still a member of their parents' household, and in the data, such people may be indistinguishable from individuals who move frequently during their adult lives. It is possible that life-cycle migration patterns differ across socioeconomic and demographic groups, but without detailed longitudinal data, it is difficult to gauge the severity of these issues.

There are three main sources for constructing U.S. migration rates from large, nationally-representative, and publicly available datasets: the U.S. Census, which has produced decennial data since 1790 and recently began producing annual data in the form of the American Community Survey (ACS); the Annual Social and Economic Supplement of the Current Population Survey (March CPS); and the Internal Revenue Service (IRS) migration data. Some longitudinal datasets can also be used to study migration, but the time spans and geographic identifiers in these sources are usually limited.

The Census provides the greatest flexibility in defining migrants. For most years and samples since 1940, researchers can observe whether an individual is currently residing in a different state or county than five years ago, as well as the exact state of residence in those two periods. Beginning in 1980, researchers can also observe the current metropolitan area and the metropolitan area of residence five years ago for individuals living in cities in both periods. The American Community Survey started in 2000 and reports similar data for an annual frequency, but it only covers all of the United States for the period since 2005 (U.S. Census Bureau, 2009). In the decennial Census, researchers can also construct an approximation of lifetime migration going back to 1850 by comparing current state of residence to an individual's birth state.

Choices are more limited in the Current Population Survey and the IRS migration data, but both allow researchers to construct annual time series on migration over long time periods. Migration rates based on CPS microdata go back to 1965 and can be extended back to 1948 using published tables. The CPS is similar to the American Community Survey in that it asks individuals whether their residence in the previous year was in the same state or county as their current residence. Also, like the American Community Survey, it provides the previous state of residence but not the county. The CPS is a much smaller sample than the other data sources (about one-third of the ACS and 1 percent of the decennial Census), so analysis of finer geographic areas is problematic. There are also published totals from the CPS, ACS, and Census that can be useful for computing migration rates for some populations, but they typically contain little information on where migration flows originate.

The IRS has calculated inter-state migration rates since 1975 and inter-county migration rates since the early 1980s. These data provide the best detail on migration flows between pairs of states and counties. Based on the universe of tax filers, they compute the number of returns

(which approximates households) and the number of exemptions claimed (which approximates people) that flow between pairs of locations.[3] The IRS reports flows in both directions between each pair, so both gross flows and net flows can be calculated. It also reports the total number of non-migrants, which is useful for calculating migration rates. Although the population of tax filers is not necessarily representative of non-filers, according to the Current Population Survey, 87 percent of household heads filed tax returns between 1992 and 2009 (the years for which this information is available) and the fraction of filers did not change during this period. The CPS data show that tax filers tend to migrate more frequently than nonfilers, but these differences also have not changed much over time. Therefore, although the lack of data on nonfilers should raise the estimated level of migration rates in the IRS data relative to the American Community Survey and the CPS, it should not affect the trends.

Basic Facts

The number of people who change residences within the United States each year is large: roughly 1.5 percent of the population moves between two of the four Census regions (Northeast, Midwest, South, and West) annually, and about the same number of individuals (roughly 1.3 percent of the population) move to a different state within the same region, as shown in Figure 2.[4] In addition, roughly 3 percent move across counties within the same state. All together, in

[3] Flows between pairs of counties are only reported for values greater than a certain level. However, the IRS also reports gross inflows and outflows from each county to all other counties, so the data still can be aggregated to measure national flows across county boundaries.

[4] The Current Population Survey and American Community Survey data in Figure 1 (as well as in all analyses below) are based on microdata rather than published tables, in order to exclude individuals in group quarters or with imputed migration data. The imputation exclusion matters for the CPS because their imputation methodology

each year between 5 and 6 percent of the population moves across a county boundary, which is often a long-enough distance to make a meaningful difference in their local housing and labor market environment. These flows are roughly one-third the size of annual flows into or out of employment (Fallick and Fleischman, 2004). Because some people move frequently while others move rarely, the fraction of the population that has moved within the past five years is only about four times the annual migration rate, as shown in Table 1. Lifetime migration rates—the fraction of people who live in a different location than where they were born—are roughly 3½ times higher than five-year migration rates. In total, slightly less than one-third of the population lives in a different state than they were born, while slightly less than one-fifth live in a different Census region. Thus a substantial fraction of the native population has moved a relatively long distance at some point during their lifetimes.

A consequence of the data limitations described in the previous section is that lifetime migration rates do not necessarily reflect recent migration decisions. Among those who live in a different state than their birth state, roughly 35 percent of the 18-34 year olds had moved across state lines in the past five years (averaging across the 1980, 1990 and 2000 Censuses). Thus, nearly two-thirds had moved more than five years previously, even at that relatively young age. Not surprisingly, the fraction of recent migrants is even lower for older lifetime migrants. Fifteen percent of 35-64 year-old lifetime migrants had moved within the last five years, while only 8 percent of lifetime migrants older than 64 had moved within the past five years. Therefore, lifetime migration rates will typically reflect location decisions that are relatively dated.

---

biased migration estimates upward from 1999 to 2005 (Kaplan and Schulhofer-Wohl, 2010; Koerber, 2007). The group quarters exclusion matters for the ACS because prior to 2006 the ACS did not cover individuals in group quarters, who have a higher propensity to migrate than other individuals.

For researchers studying local labor and housing markets, a natural statistic of interest is the fraction of the population that crosses metropolitan area boundaries, since metropolitan areas are a commonly available geographic unit that may approximate a local labor market. Unfortunately it is often difficult to know this number precisely. In the Census and ACS, an individual's current and previous MSA can only be identified if both are large enough to satisfy confidentiality restrictions. Among individuals whose current MSA of residence is reported, about 15 percent moved either from another identified MSA or across state lines in the last five years. Because of these limitations, state and county lines are often used to approximate local labor markets. Fortunately, both provide a reasonable proxy of inter-metropolitan migration. According to the five-year migration statistics from the Census and one-year migration statistics from the ACS, virtually all (97 percent) of cross-state migrants also changed metropolitan areas, while only 60 to 70 percent of migrants across metropolitan areas also changed states. Thus, inter-state migration underestimates the number of people that move across local labor and housing market boundaries. By contrast, inter-county migration overstates metropolitan area migration, as only three-quarters of cross-county migrants changed metropolitan areas. Alternatively, cross-PUMA or cross-commuting zone migration does not suffer this fault, since the PUMA and commuting zone concepts encompass the entire United States. In fact, if researchers are interested in migration across local labor markets, cross-commuting zone migration may be the most relevant concept since they are based on commuting patterns; however, as noted in footnote 2, this measure introduces its own measurement complications and migration across commuting-zones cannot be precisely measured.

Table 1 and the panels of Figure 2 all show a downward trend in migration over the past 25 years. Although the magnitude and timing of this decrease varies somewhat across datasets

and measures of migration, by almost any measure migration in the 2000s was lower than the 1980s. This decrease marks a noticeable departure from the longer-run trend, as migration shows a secular rise from 1900 to 1990 (Ferrie, 2003; Rosenbloom and Sundstrom, 2004).[5] Indeed, documenting this decline is a central point of our paper. Not only are migration rates lower in levels than at any point in the post-war period, they have also entered a period of continuous decline that is longer than any recorded in the twentieth century. Migration rates across short distances, such as within a county, have trended down as well.

To illustrate the decline in migration, we return to Figure 1, which shows lifetime inter-state migration rates and an estimate of five-year inter-state migration rates using the methodology of Rosenbloom and Sundstrom (2004). Specifically, Rosenbloom and Sundstrom assume that a household moved between states in the previous five years if a four or a five year-old living in the household resides in a different state than their birth state. The five-year migration rate is then the fraction of households with four or five year-olds that moved. By this measure, the five-year migration rate peaked in 1980 and by 2009 it had fallen below its level of 1950. Life-time migration rates evolve more gradually because they combine recent rates with earlier rates from an individual's entire lifespan. Nevertheless, lifetime migration rates also dipped in the 2000s, marking the first decline since 1940.

Determinants of Internal Migration

[5] A few researchers have documented a decline in migration from the 1960s to the 1980s using annual Current Population Survey migration rates (Greenwood, 1997; Long, 1988; Rogerson, 1987). It is possible that the reversal in trend migration began in the 1970s rather than the 1980s. However, the contraction in migration from the 1980s to the 2000s is noticeably larger than the earlier decline.

To better understand the recent decline in migration rates, we turn to the literature on determinants of migration, which itself has a long history. Early studies tended to view migration "as a phenomenon of such cataclysmic events as economic depressions, natural disasters, and wars…", as Long (Ch. 1, p. 13) argues. Long credits Lowry (1966) with introducing the "behavioral" model of migration to the social sciences in general. From this perspective, the central idea is that individuals and families weigh the costs and benefits of their location options and migrate when the benefits from relocation outweigh the costs. This insight lies at the heart of models of migration spanning several decades of economic research on the subject (Schultz, 1961; Greenwood, 1985 and 1997; Treyz et al, 1993; Kennan and Walker, 2011).

In a simple, one-period version of the standard model, individuals choose consumption and location to maximize utility given the prevailing wage and price level in each location. If we assume an initial distribution of individuals across locations, migration arises as individuals move from local labor markets where the return on their individual skills is relatively low to markets where this return is relatively high: Borjas (1987) is a well-known use of this basic approach. Migration thus becomes a form of human capital investment: a project that individuals can undertake to raise the returns to their labor. One can then expand the standard model to include roles for factors that vary across individuals and across time for a given location, such as an individual's age or changes in relative prices and wages across locations. Models of migration also recognize that a change in residential location is costly. These costs often depend on the origin, destination, and individual demographic characteristics, but they can also change over time due to a variety of factors including the cost of searching for a new job or home, the cost of terminating a current job or selling a home, or the cost of relocating one's household. Naturally, specific models of migration vary in their treatment of factors that affect utility flows and

migration costs. A few of the many factors migration models have incorporated include beliefs about employment probabilities, expected wages, expected costs of living, local amenities and tax rates, monetary and psychological moving costs, and the costs of buying and selling a home.

Recently, economists have started to conceptualize migration as a part of a search and matching problem (Dahl, 2002; Shimer, 2007). This idea is a logical extension of labor market search theory with frictions (like that pioneered by Peter Diamond, Dale Mortenson, and Christopher Pissarides), because the geographic search that migration often entails is an important component of general labor market search.

Drivers of changes in the aggregate migration rate can be divided into three main mechanisms. First, the distribution of individual characteristics that are correlated with the net benefits of migration—for example, demographic factors—can change. For instance, the aging of the U.S. population may reduce aggregate migration as an increasing share of the population moves into demographic groups with a higher cost of moving. Similarly, the share of individuals owning homes rose since the 1990s, which should depress migration due to the high costs of housing market transactions—an effect that may have become more pronounced during the recent housing market contraction because homes are even more difficult to sell in a period of declining in housing prices.

Second, migration choices for particular groups of individuals can change. An example of how migration rates might change *within* a given demographic group is that young individuals might have become more likely to migrate for college (Hoxby, 2009), raising migration rates for this group. Another example is that if labor demand in some states falls significantly relative to others, then migration should increase between these two groups of states.

Finally, changing fundamental economic factors may influence the net benefits to migration for a broad range of individuals. A number of studies have demonstrated that internal migration rates in the United States are procyclical—that is, migration rises in good economic times and falls in bad times (for example, see Molloy and Wozniak, forthcoming), Greenwood, Hunt and McDowell (1986), Greenwood (1997), Milne (1993), and Pissarides and Wadsworth (1989). Thus, the economic downturn that began at the end of 2008 could be expected to have depressed migration during the last several years.

Explaining Changes in Migration Patterns Since 1980

In explaining why U.S. migration rates have dipped lower in recent decades, a useful starting point is to look at cross-state migration rates across demographic and socioeconomic groups, which are reported in Table 2. We use annual Current Population Survey data for this analysis, but results are largely similar when using annual data from the American Community Survey and five-year or lifetime migration rates from the Census. Differences across groups are also similar for inter-county and inter-region migration. We report estimates separately by decade, but the relative differences have not changed much over time.

The propensity to migrate falls with age, but rises with education. Migration also tends to be a little lower for black, Hispanic, and foreign-born individuals, as well as for individuals with at least one child in the household. Migration rates are the same for men and women. Turning to economic characteristics, migration is higher for the unemployed and renters but similar across income groups—although it should be noted that employment status and home ownership are only recorded in the Current Population Survey for the current year. However,

based on the Panel Study of Income Dynamics, individuals are also more likely to have moved across state lines if they were unemployed or renters in the previous year. Although many of these characteristics are correlated with one another, differences among groups are similar when estimated in a regression framework that includes all of the other characteristics. In terms of magnitudes, the largest differences in the propensity to move are between homeowners and renters, between the unemployed and individuals who are either employed or not in the labor force, between individuals with at least some college and those with less education, and between individuals younger than 34 and those older than 45.

However, these differences across groups are not useful in explaining why migration has fallen in recent decades. The decrease in migration does not seem to be driven by demographic or socioeconomic trends because migration rates have fallen for nearly every subpopulation and the composition of the population has not shifted in a way to affect aggregate migration appreciably. For example, a common supposition is that the aging of the population has reduced aggregate migration since the propensity to move decreases with age. However, the fraction of the population age 45-64 expanded from 20 percent in 1981 to 25 percent in 2010 (the fraction older than 64 did not change much). Based on the average differential between migration rates of this group and the rest of the population, the rise in the 45-64 population share would only have reduced aggregate inter-state migration by 0.1 percentage point, less than one tenth of the aggregate decrease in inter-state migration.

Consequently, research has sought economic factors that might have changed the cost or benefit of moving for the majority of the population during this period. Because the secular decrease in mobility is so widespread, it is likely driven by a factor that has affected a large

fraction of the population, such as a general increase in the cost of moving or a decrease in the incentive or benefit to relocation.

One such widespread factor might be a return to equilibrium after a massive population shift toward the South. Some, such as Glaeser and Tobio (2007), have argued that the introduction of air conditioning as well as right-to-work laws combined to make the South a much more attractive place to live, work, and do business relative to the North, boosting aggregate migration in the post-war period as families and industry gradually moved South. Migration may have slowed in recent decades as the relative costs and benefits between North and South equalized. Figure 3 shows only weak support for this idea, as net population flows across regions have not changed substantially over the past 25 years. The combined East and West South Central divisions do show a switch from positive to negative net migration from 1975 to 1985, but net migration into this area has moved back up somewhat in recent years; the South Atlantic division shows no decline. Net migration into the Pacific division has decreased since the mid-1970s, but the factors leading to this decline are likely different than those that made the southern states relatively more attractive. A related hypothesis is that an accelerated shift away from agriculture may have increased migration mid-century as the population shifted toward higher rates of urban residence. But again, once the new equilibrium is achieved, migration rates should stabilize at lower levels. The historical trends show some support for this, as the percent of the population in non-rural areas rose 20 percentage points between 1930 and 1960 then stabilized at its current level of roughly 75 percent by 1970 (Haines, 2000).

Another important possibility is that changes in the prevalence of two earner households might reduce migration over time as relocation involves finding two jobs instead of one. However, the last row of Table 2 shows the percentage of households with two earners has been

quite stable over the last thirty years. It is important to note that two earners may not be the same as two careers, and we have no good ways to assess whether the intensity or importance of women's jobs has changed over this period.

The causes of the decline in internal migration are clearly an important subject for future work, but at this stage, we have only hypotheses to offer. The idea that multidecade adjustment processes have finally concluded is one explanation that merits further investigation. A second possibility is that technological advances have allowed for an expansion of telecommuting and flexible work schedules, reducing the need for workers to move for a job. Indeed, the fraction of workers who report working from home rose from 2.1 percent in the 1980 Census to 4.1 percent in the 2009 American Community Survey. However, this increase seems to be too small to account for the substantial decrease in migration. A third hypothesis is that locations have become less specialized in the types of goods and services produced, making the types of jobs available more similar across space. Carlino and Chatterjee (2002) show that the population has indeed become less concentrated across metropolitan areas in the postwar period. They find that the share of urban population and employment in dense metropolitan areas and central cities has fallen while the share of population and employment in less dense metropolitan areas has risen. A related idea is that the distribution of amenities has become more homogeneous across locations, making residence in any particular city less attractive. Researchers should consider these ideas, as well as other potential explanations, in further work.

The Recent Housing and Economic Downturn and Mobility

There has been much speculation and some research about the possible role of the housing market contraction and the economic contraction in reducing geographic mobility. The housing argument often refers to the effect of underwater mortgages in damping the ability of homeowners to move. Also, as noted earlier, mobility is often pro-cyclical, so the economic contraction would be expected to reduce mobility. However, we believe that the decrease in mobility is best-understood as a longer-term trend, and that the economic contraction and the housing market bust appear to have contributed relatively little in addition to the longer-run factors.

The argument for a large short-term cyclical influence on mobility during the latest recession often begins by noting a sharp decline since 2005 in annual migration rates as reported in the Current Population Survey, as shown in Figure 1. Indeed, the precipitous drop in the CPS migration estimates brought mobility by that measure to its lowest recorded level since the survey began in the late 1940s (Batini et al., 2010; Frey, 2009). This dramatic decline coincided with a severe housing market downturn.

However, in contrast to the Current Population Survey estimates, the IRS and American Community Survey data paint a different picture of migration rates since 2005. These data also suggest that migration has fallen, but the magnitude of this decline is much more modest and, in the case of the IRS, the decrease merely seems to continue the downward trend since the 1980s. The estimated levels of migration in the IRS and ACS are similar to one another and were more than 50 percent higher than the CPS estimates in 2008, the latest year for which all three datasets are available. (Note that we have excluded imputed migrants from the Current Population Survey and the American Community Survey, as mentioned in footnote 3. Consequently, differences in

imputation procedures cannot account for the divergence between these two measures of migration.)

The similarity between the American Community Survey and IRS estimates may be somewhat surprising because the sources and methodology on which they are based are quite different. By contrast, the Current Population Survey and ACS are based on similar sample designs and the same survey question. Nevertheless, certain methodological differences between the CPS and ACS could potentially contribute to the disparity. For example, while both sampling frames are drawn from the 2000 Census, the ACS uses postal addresses to update the sampling frame whereas the CPS uses building permits. Perhaps the postal service does a better job of capturing new residences than the residential construction data, which would raise migration in the ACS relative to the CPS since recent migrants are more likely to live in new residences. However, the trends in the number of housing units in the ACS and CPS are similar from 2005 to 2009, making this explanation unlikely. Another methodological difference is that the ACS revisits vacant housing units for up to three months in order to collect data, whereas the CPS records a housing unit as vacant after the first visit (Koerber, 2007). This difference would raise the migration rate in the ACS relative to the CPS, but it is not clear why it would cause the gap in migration rates to expand over time. Disparities between the CPS and ACS/IRS have also widened for most demographic/socioeconomic groups and most states (with the exception of the north central division), suggesting that the divergence is not related to weighting geographic areas or subpopulations differently.

Because we are unable to explain the divergence in migration rates between the CPS and other data sources, it is difficult to determine which source presents a more accurate picture of migration in the past five years. We lean towards the IRS and ACS estimates, partly because

they are based on larger samples, and partly because other datasets that we have examined, such as the Panel Study of Income Dynamics and the Survey of Income and Program Participation, also do not show large declines in migration since 2005. However, we have yet to uncover a compelling reason to explain why the findings of the CPS should exaggerate the decline in mobility since 2005. For now, we merely note these differences and use all three sources to examine the change in migration since 2006, a period when migration rates decreased in all three sources.

One explanation for the decrease is that it reflects the usual cyclical decline that occurs during business cycle contractions. To assess this hypothesis, Table 3 compares the decrease in migration since 2006 to past business cycles. In both the Current Population Survey and the IRS data, the current decrease in inter-state migration is about the same magnitude as the 1990-91 and 2001 recessions, and the decrease in inter-county migration is larger than in these two recessions. However, the current recession did not begin until the end of 2007, and migration began to fall one to two years earlier (depending on the dataset). The magnitude of the drop in migration that coincided with the economic recession (from 2007 to 2010) is somewhat smaller than that of previous recessions, even though the current episode was much worse along many dimensions of the labor market. Thus, the business cycle seems unlikely to be the main explanation for the recent decrease in migration.[6]

The housing market contraction seems a more likely candidate to explain the recent drop in migration because it began around the same time as the drop in migration. One frequently proposed mechanism is "house-lock"—when house prices drop considerably, homeowners who

[6] Actual inter-county migration fell by 0.36 percentage point in the CPS, and by 0.72 percentage point in the ACS from 2007 to 2009. Extrapolating the downward trend from the previous ten years (1996-2006), migration would have fallen 0.23 percentage point from 2007 to 2009 had it followed trend. Based on the previous 20 years (1986-2006), migration would have fallen by 0.25 percentage point from 2007 to 2009. Therefore, after accounting for the existing downward trend in migration, there is seemingly little additional decline for the cycle to explain.

owe more on their mortgage than their property is worth will be less likely to move (Ferriera, Gyourko and Tracy, 2010; Henley, 1998; on the other hand, see Schulhofer-Wohl 2010 for evidence that individuals with negative equity may be *more* likely to move). Another possible mechanism is that house price declines heighten concerns about the future value of housing, reducing the incentive for renters to become homeowners and for current homeowners to trade up into higher-quality units. Table 3 shows that the recent decrease in migration has been at least as large, if not larger, than it was during the two previous housing market downturns. This result should not be surprising since the depth of the contraction was more severe in the current episode.

However, both of the housing-related mechanisms proposed above suggest that migration rates should have fallen more for those who are homeowners in the current year, either because negative equity prevents homeowners from moving or because pessimistic expectations for the return on housing should not impede the mobility of renters. In both the CPS and the ACS, neither inter-state nor inter-county migration rates fell more for homeowners than they did for renters in percentage point terms. It is true that homeowners have much lower migration rates, so the *percentage* decline in migration was larger for homeowners than for renters. But overall, recent changes in migration rates of both homeowners and renters have been similar to their longer-run downward trends, suggesting that the housing cycle has not appreciably affected the migration patterns of these groups.

If the drop in migration were driven by the growing share of homeowners with negative housing equity, then we would expect to see migration fall by more in locations with a larger share of underwater mortgages. Figure 4 shows the correlation between the fraction of

mortgages with negative equity in 2009:Q3 and the change in migration from 2006 to 2009.[7] As house-lock should prevent borrowers from moving out of their home, the measure of migration we look at is out-migration from a state added to migration between counties within the same state. Five states had the largest share of underwater mortgages by far, but these states did not experience larger drops in migration than average. Interestingly, migration out of states with a high negative equity share appears to have *risen* a bit more than other states in the Current Population Survey, but this result is not evident in the American Community Survey data.

To explore further, we regress state migration rates from 1981 to 2010 on an indicator for the 2007-2010 period and an interaction between this indicator and the share of mortgages with negative equity in 2009:Q3 (regressions using IRS data end in 2008 instead of 2010). The regressions control for state and year fixed effects, the unemployment rate, the logarithm of average household income, the age distribution of the population, and state-specific linear time trends. As shown in Table 4, we find no evidence that migration rates were lower in the recent period in states with a larger share of underwater mortgages. [8]

If house-lock were reducing migration, we would also expect the migration rate of homeowners to have fallen more than that of renters in high negative equity states compared to other states. We test this conjecture by calculating mobility rates separately for homeowners and renters and running pooled regressions similar to those reported in Table 4 except that we also

[7] The share of negative equity is estimated by CoreLogic and includes second liens. They do not provide estimates prior to 2009:Q3. When we calculate the share of mortgages with negative equity using loan-level data from LPS Applied Analytics and CoreLogic (neither of which includes second liens), the state rankings of the fraction of mortgages with negative equity is very stable between 2007 and 2010.

[8] All control variables are calculated from the CPS. We include state-specific time trends because an F-test of their joint significance strongly rejects that the trends are the same in all states. When excluding state-specific time trends, the probability of having moved over any distance fell more in high negative equity states than other states. However, this result is driven by migration into a state and within-county migration. The drop in in-migration is clearly not due to house-lock and, although the drop in within-county migration might be due to house-lock, within-county migration is too short to affect labor market participation. In addition, we find no evidence that migration out of a state did fell more in high negative equity states when excluding state-specific time trends.

include a triple interaction of the post-2006 dummy, the share of households in a state with negative equity, and a dummy for whether the migration rate is for renters. The results are presented in Table 5. Although the coefficient on the triple interaction is positive when the dependent variable is out-migration—potentially consistent with house-lock—it is small in magnitude and not statistically significant.[9]

A number of other recent studies have also found little role for house-lock in impeding the recent labor market recovery. For instance, Donovan and Schnure (2011) use American Community Survey data from 2007-2009 and find that the probability of having moved in the last year fell more in counties that experienced a larger decline in local housing values; however, this relationship is driven by a decline in migration within a state rather than cross-state moves. Valetta (2010) considers the relationship between changes in house prices in an area and changes in unemployment for renters compared to homeowners. He finds no evidence that the unemployment rate of homeowners rose relative to renters in areas with a larger decline in house prices, as one might expect if house-lock impeded labor market equilibration. Farber (2010) makes similar comparisons and also finds no support for house-lock.

Finally, Bricker and Bucks (2011) use individual-level data from the Survey of Consumer Finances to explore how negative equity affects mobility. Their preliminary findings are that families with negative equity are more likely to move because they are more likely to have suffered a negative shock such as unemployment. Controlling for negative shocks, having negative equity either reduces or has no effect on mobility, depending on the specification. The authors are unable to classify mobility by the distance of the move, an important drawback since our analysis and Donovan and Schnure (2011) suggest that the relationship between mobility and

[9] A relatively large increase in the fraction of underwater mortgages of 0.1 is associated with a 0.25 percentage point increase in the migration rate of renters relative to homeowners in the post-2006 period. This difference is less than one tenth of the typical gap between renter and homeowner migration rates.

negative equity depends on whether the mobility is measured as a short or long distance move. Despite the preponderance of evidence suggesting that houselock has not impeded the labor market recovery to date, labor demand has remained weak and a large fraction of homeowners still have negative housing equity. It is possible that house-lock may become a larger factor in impeding the labor market recovery if homeowners are unable to move as the demand for labor expands.

To see if other aspects of the housing market contraction—such as a diminished desire to invest in housing—may have suppressed migration, we estimate similar regressions as in Table 4 but interact the post-2006 indicator with the peak-to-trough decline in existing home sales or the peak-to-trough decline in house prices. We use annual averages of home sales and prices to smooth out noise in the data and restrict the peak to be between 2004 and 2006 and the trough to be between 2007 and 2009.[10] As reported in Tables 6 and 7, we find no evidence that migration fell more in the recent period in states with larger declines in housing market activity as measured by sales or prices.

As a final way to assess the various reasons underlying the recent decline in migration, we examined answers to the question "Why did you move?" that is asked of migrants in the Current Population Survey. Although the responses to this question are fairly coarse and highly variable from year to year, some patterns emerge. Table 8 reports the fraction of respondents reporting various reasons for moving during the 2003 to 2006 period, when aggregate migration was rising or flat, and during the 2007 to 2010 period, when aggregate migration was falling. Among inter-state migrants, the reasons for moving that fell the most between the two periods are "attend/leave college," "change in marital status," "other family reason," and "natural

[10] Not surprisingly, the peak-to-trough decline in house prices is highly correlated with the fraction of mortgages with negative equity.

disaster."[11] Decreases in job-related and housing-related reasons are small. By contrast, the fraction of inter-county, within state migrants that moved "to own home, not rent," for "new or better housing," for a "better neighborhood" or for "other housing reasons" decreased markedly. Thus, the housing market might have exerted some downward pressure on within-state migration, although not for longer-distance migration. An important caveat to this analysis is that people may move for a variety of factors and asking them to choose a single reason may be misleading.

In summary, we find little evidence that the decrease in migration since 2006 is related to demographic, socioeconomic, or cyclical factors. The small roles for the labor and housing market should not be surprising, because the recent change in migration appears to be a continuation of a downward trend rather than something specific to the recent period. Therefore, it appears that researchers studying changes in migration should focus on factors that might have led to a secular decline since the 1980s, rather than factors specific to recent years.

International Comparisons

It is widely believed that internal mobility rates are higher in the United States than in European countries and other advanced economies, although most comparisons relate to data through the early 1990s at best (for example, Long, 1991; Greenwood, 1997). Historically, international comparisons have been difficult due to data limitations and conceptual difficulties in forming a common definition of internal mobility. Mobility questions are rarely uniform across surveys and censuses, and measures of migration are based on movement between

[11] The decrease in the "attend/leave college" category disappears if we restrict the sample to respondents over 35, although it is still appreciable among respondents between age 25 and 35. The Gulf Coast hurricanes in 2005 caused a spike in moving for reasons related to a natural disaster that dissipated in the 2006-2010 period.

political units of varying sizes in different countries. As a result, many studies compare only a small number of countries for which common mobility statistics exist: for example, Newbold and Bell (2001) compare mobility in Canada and Australia, while Long et al. (1988) compare mobility in the United States, Great Britain and Sweden.

The lack of ideal data has not prevented researchers from speculating on the causes and consequences of the apparently higher levels of internal mobility in the United States relative to Europe. Possible explanations for higher U.S. geographic mobility include housing-related reasons (cheaper housing and limited government regulation of housing markets), long-standing cultural reasons (the United States as "a nation of immigrants" and thus more predisposed to moving, or that young adults in the US traditionally leave home at an earlier age), and that the larger geographic area of the United States facilitates mobility in some way (Long, 1991). Some have speculated that the lower mobility in Europe relative to the United States has contributed to the relatively high and persistent unemployment in Europe (Oswald, 1999). Indeed, Bonin et al. (2008) find a strong association across countries between internal mobility and the frequency of job changes over one's lifetime.

Two recent developments in data availability for the European area have facilitated more careful comparisons of internal mobility between European countries and the United States: a Eurobarometer survey done in 2005, and a European Labor Force Survey for which summary data for some European countries are available from the start of the decade through 2005.

The Eurobarometer is a survey across the European Union on a variety of topics, with a sample size of around 1,000 per country—which in 2005 included questions on mobility,

allowing the calculation of one-year migration rates.[12] Using this source, in Figure 5 we compare one-year mobility rates in 2005 for 26 European countries to the one-year mobility rate in 2005 for the United States. Confirming the commonly-held wisdom, the U.S. mobility rate is significantly higher than the mobility rate for most European countries: more specifically, U.S. mobility by this measure is about twice as large as mobility in most European countries outside of Northern Europe. Mobility rates tend to be higher in Scandinavian countries and in Great Britain than in other European countries, and mobility in some of these countries, like Denmark and Finland, slightly exceeds the US mobility rate. Illustrating the difficulties in making cross-country comparisons, other data sources have suggested the difference in mobility between the U.S. and Europe may be greater than the Eurobarometer data indicate, although inter-EU rankings are generally similar (Ellickson 2010).

The European Labor Force Survey asks respondents about their mobility over the previous year. The difficulty of defining comparable geographic units is partially mitigated by defining internal mobility as movement within a country between what are called "NUTS2" units – for Nomenclature of Territorial Units for Statistics, Subdivision 2. The population of a NUTS2 ranges approximately from 800,000 to 3,000,000, which is roughly comparable to the population of many U.S. states. We have used publically available summary statistics on within-country, inter-NUTS2 mobility to compare internal mobility in 15 European countries to inter-state mobility in the United States. Mobility rates for these countries were either flat or slightly increasing during the first half of the 2000s, but still generally remain below inter-state migration estimates for the United States. The only exceptions are thatcross-NUTS2, within-country

[12] The most recent Eurobarometer wave that asked questions on change of residence was 64.1, which was collected in September and October 2005. The tabulation in Figure 4 is derived from question A4, which asks the respondent "And could you tell me what year you moved in [to your current residence]?" Hence, these mobility rates should be interpreted as a move of any sort (across country, within country, and so on). The U.S. mobility rate in the figure is calculated similarly.

migration rates for Denmark and Hungary are slightly higher by 2007 than the U.S. inter-state mobility rate. Interestingly, migration between European countries where data are available has increased in the 2000s, a trend potentially related to rising economic integration across the European Union.

In addition, we have examined Canadian cross-province mobility provided by Statistics Canada, and mobility between nine regions in England from the British Office for National Statistics. In Canada, interprovincial mobility was mostly flat from 2000 to 2008 and stepped up in 2009, and it remained substantially below US inter-state migration throughout the 2000s. In the U.K. data, the populations of the nine regions range from 2.5 to 8 million: for comparison, the population of the median state in the 2000 US census was 4 million. The level and trend in inter-region mobility in the United Kingdom was similar to the IRS measure of U.S. inter-state migration; inter-region U.K. migration decreased from 2.3 percent in 1999 to 2.0 percent in 2008.

Overall, the secular decline in geographic mobility appears to be specific to the U.S. experience, since internal mobility has neither fallen in most other European economies nor in Canada—with the United Kingdom as a notable exception. One caveat to this conclusion is that the publicly available European LFS data extend only through 2007, so it is unknown how internal migration in Europe has compared to the U.S. experience during the most recent global downturn.

Conclusion

By most measures, internal migration in the United States is at a 30-year low. Migration rates have fallen for most distances, demographic and socioeconomic groups, and geographic

areas. The widespread nature of the decrease suggests that the drop in mobility is not related to demographics, income, employment, labor-force participation, or homeownership. Moreover, three consecutive decades of declining migration rates is historically unprecedented in the available data series. The downward trend appears to have begun around the 1980s, pointing to explanations that should be relevant to the entire period, rather than specific to the current recession and recovery—that is, the decline in migration is not a particular feature of the past five years, but has been relatively steady since the 1980s. Consequently, cyclical downturns in the housing market and/or labor market are unlikely to be the main drivers of the ongoing drop in mobility. Despite the steady decline in U.S. migration, the commonly held belief that Americans are more mobile than their European counterparts still appears to hold true.

In addition to the mystery of its origins, the reduction in geographic mobility is also interesting for its potential macroeconomic implications. For example, it has been suggested that higher migration rates in the United States may indicate lower frictions in the labor market as compared to Europe. Thus, lower migration rates might signal an increase in labor market frictions (although the direction of causality is not clear). On the other hand, high levels of migration may reduce commitment to the provision of local public goods or corrode social ties in other ways, in which case lower mobility might raise aggregate well-being and possibly economic output. The link between migration and macroeconomic performance has received relatively little attention to date; by providing an overview of recent trends in aggregate migration patterns, we hope that this article will fuel new research on the role that it plays in the larger economy.

References

Autor, David H. and David Dorn. 2010. "The Growth of Low Skill Service Jobs and the Polarization of the U.S. Labor Market." Unpublished manuscript.

Batini, Nicoletta, Oya Celasun, Thomas Dowling, Marcello Estevao, Geoffrey Keim, Martin Sommer and Evridiki Tsounta. 2010. "United States: Selected Issues Paper." International Monetary Fund Country Report 10/248.

Bachmura, Frank T. 1959. "Man-Land Equalization Through Migration." *American Economic Review*, 49(5): 1004-1017.

Bonin, Holger et. al. 2008. "Geographic Mobility in the European Union: Optimising its Economic and Social Benefits." IZA Research Report No. 19.

Borjas, George. 1987. "Self-Selection and the Earnings of Immigrants," *American Economic Review*, 77(4), 531-553.

Bricker, Jesse and Brian Bucks. 2011. "Negative Home Equity, Economic Insecurity, and Household Mobility: Evidence from the 2007-2009 SCF Panel." Unpublished manuscript. Paper presented at the Federal Reserve System Committee on Applied Microeconomics, St. Louis. May 5-6, 2011.

Carlino, Gerald and Chatterjee, Satyajit. 2002. "Employment Deconcentration: A New Perspective on America's Postwar Urban Evolution." *Journal of Regional Science.* 42(3): 455-475.

Dahl, Gordon B. 2002. "Mobility and the Return to Education: Testing a Roy Model with Multiple Markets." *Econometrica*, 70(6): 2367-2420.

DaVanzo, Julie. 1983. "Repeat Migration in the United States: Who Moves Back and Who Moves On?" *The Review of Economics and Statistics*, 65(4): 552-559.

Diamond, Peter. 1982. "Aggregate Demand Management in Search Equilibrium." *The Journal of Political Economy*, 90(5): 881-894.

Donovan, Colleen and Calvin Schnure. 2011. "Locked in the House: Do Underwater Mortages Reduce Labor Market Mobility?" Unpublished manuscript.

Ellickson, Robert. 2010. "Differences in Law that Help Explain Why Americans Change Their Residences Twice as Often as the French." Yale University Law School. *Manucsript*.

Fallick, Bruce, and Charles Fleischman. 2004. "Employer-to-Employer Flows in the US Labor Market: The Complete Picture of Gross Worker Flows." Board of Governors of the Federal Reserve System, Finance and Economics Discussion Series 2004-34.

Ferrie, Joseph P. 2003. “Internal Migration.” In *Historical Statistics of the United States, Earliest Times to the Present: Millennial Edition*, ed. Susan B. Carter, Scott Sigmund Gartner, Michael R. Haines, Alan L. Olmstead, Richard Sutch, and Gavin Wright, 1-489-1-494, New York: Cambridge University Press.

Farber, Henry S. 2010. “Job Loss and Unemployment in the 21st Century: The Great Recession in Labor Market Perspective.” Industrial Relations Section, Princeton University Working Paper 560.

Ferriera, Fernando, Joseph Gyourko and Joseph Tracy. “Housing Busts and Household Mobility.” *Journal of Urban Economics*, 68(1): 34-45.

Frey, William H. 2009. “The Great American Migration Slowdown: Regional and Metropolitan Dimensions.” http://www.brookings.edu/reports/2009/1209_migration_frey.aspx

Green and Hendershott. 2001. “Home-ownership and Unemployment in the US.” *Urban Studies*, 38(9): 1509-1520.

Greenwood, Michael J. 1985. “Human Migration: Theory, Models, and Empirical Studies.” *Journal of Regional Science*, 25(4): 521-544.

Greenwood, Michael J. 1997. “Internal Migration in Developed Countries.” In *Handbook of Population and Family Economics*, ed. Mark R. Rosenzweid and Oded Stark, 647-720. Amsterdam, New York and Oxford: Elsevier Science, North-Holland.

Greenwood, Michael J., Gary L. Hunt and John M. McDowell. 1986. “Migration and Employment Change: Empirial Evidence on the Spatial and Temporal Dimensions of the Linkage.” *Journal of Regional Science*, 26(2): 223-234.

Haines, Michael. “The Population of the United States, 1790-1920.” In Engerman, Stanley and R. Gallman (eds.), *The Cambridge Economic History of the United States, Vol. II, The Long Nineteenth Century*, Cambridge: 2000.

Harris, John R. and Michael P. Todaro. 1970. “Unemployment and Development: A Two-Sector Analysis.” 60(1): 126-142.

Henley, Andrew. 1998. "Residential Mobility, Housing Equity, and the Labour Market." *The Economic Journal*, 108 no. 447: 414-427.

Hoxby, Caroline. 2009. “The Changing Selectivity of American Colleges.” *Journal of Economic Perspectives*, 23(4): 95-118.

Kaplan, Greg and Sam Schulhofer-Wohl. 2010. “Interstate Migration Has Fallen Less than you Think: Consequences of Hot Deck Imputation in the Current Population Survey.” Federal Reserve Bank of Minneapolis Working Paper 681.

Kennan, John and James R. Walker. 2011. “The Effect of Expected Income on Individual Migration Decisions.” *Econometrica 79(1):* 211-51.

Koerber, Kin. 2007. “Comparison of ACS and ASEC Data on Geographic Mobility: 2004.” http://www.census.gov/acs/www/library/by_year/2007/

Long, Larry. 1988. *Migration and Residential Mobility in the United States.* New York: Russell Sage Foundation.

Long, Larry, C. Jack Tucker, and William L. Urton. 1988. “Migration Distances: An International Comparison.” *Demography,* 25(4): 633-640.

Long, Larry. 1991. “Residential Mobility Differences Among Developed Countries.” *International Region Sciences Review,* 14(2): 133-147.

Lowry, Ira S. 1966. *Migration and Metropolitan Growth: Two Analytical Models*. San Francisco: Chandler.

Molloy, Raven and Abigail Wozniak. Forthcoming. “Labor Reallocation over the Business Cycle: New Evidence from Internal Migration.” *Journal of Labor Economics.*

Mortensen, Dale I. and Christopher A. Pissarides. 1994. “Job Creation and Job Destruction in the Theory of Unemployment.” *The Review of Economic Studies,* 61(3): 397-415.

Newbold, K. Bruce and Martin Bell. “Return and Onwards Migration in Canada and Australia: Evidence from Fixed Interval Data.” *International Migration Review*, 35(4): 1157-1184.

Oswald, Andrew. 1999. “The Housing Market and Europe’s Unemployment: A Non-Technical Paper.” http://www2.warwick.ac.uk/fac/soc/economics/staff/academic/oswald/

Price, Daniel O. and Melanie M. Sikes. 1975. *Rural-Urban Migration Research in the United States: Annotated Bibliography and Synthesis*. Department of Health, Education and Welfare Publication No. (NIH) 75-565.

Rogerson, Peter A. 1987. “Changes in US National Mobility Levels.” *The Professional Geographer*, 39(3): 344-351.

Rosenbloom, Joshua L. and William A. Sundstrom. 2004. “The Decline and Rise of Interstate Migration in the United States: Evidence from the IPUMS, 1850-1990.” In *Research in Economic History* Vol. 22, ed. Alexander Field, 289-325. Amsterdam and San Diego: Elsevier, JAI.

Schulhofer-Wohl, Sam. 2010. “Negative Equity Does Not Reduce Homeowners’ Mobility.” Federal Reserve Bank of Minneapolis Working Paper 682.

Schultz, Theodore W. 1961. “Investment in Human Capital.” *American Economic Review*, 51(1): 1-17.

Schwartz, Aba. 1973. “Interpreting the Effect of Distance on Migration.” *Journal of Political Economy*, 81(5): 1153-1169.

Shimer, Robert. 2007. “Mismatch.” *American Economic Review*, 97(4): 1074-1101.

Sjaastad, Larry A. 1962. “The Costs and Returns of Human Migration.” *Journal of Political Economy*, 70(5, part 2): 80-93.

Tolbert, Charles M. and Molly Sizer Killian. 1987. “Labor Market Areas for the United States.” Staff Report No. AGES870721. Washington, DC: Economic Research Service, U.S. Department of Agriculture.

Treyz, George I., Dan S. Rickman, Gary L, Hunt, and Michael T. Greenwood. 1993. “The Dynamics of US Internal Migration.” *The Review of Economics and Statistics*, 75(2): 209-214.

US Census Bureau. 2009. *Design and Methodology American Community Survey*. Washington, DC: US Government Printing Office.

Valetta, Robert G. 2010. “House Lock and Structural Unemployment." Paper presented at the Federal Reserve System Committee on Regional Analysis, New Orleans. November 14-16, 2010.

Table 1
Five-Year and Life-Time Migration Rates

	1980	1990	2000	2009
5-year migration : Cross-region	5.5	5.1	4.8	--
5-year migration : Cross-state	9.9	9.6	8.9	--
5-year migration : Cross-MSA	12.0	12.1	11.4	--
5-year migration : Cross-county	19.8	19.5	18.6	--
5-year migration : Cross-PUMA	--	21.2	22.2	--
5-year migration : Cross-commuting zone	13.7	13.5	12.9	--
Life-time migration (US natives only): Cross-region	18.0	18.3	18.3	17.5
Life-time migration (US natives only): Cross-state	31.1	31.9	32.0	31.0

Note. Authors' calculations. Estimates for 1980-2000 are from Decennial Census microdata; estimates for 2009 are from American Community Survey microdata. Cross-county migrants are defined as moving across any state boundary; cross-state migrants have moved across any state boundary. Region refers to the four Census regions: Northeast, Midwest, South, and West. See footnote 2 for description of how cross-commuting zone mobility is calculated. Calculations by authors using Census microdata.

Table 2
Annual Inter-State Migration by Demographic and Socioeconomic Group

	1981-2010	1981-1990	1991-2000	2001-2010
Annual inter-state migration rates:				
Sex: Male	2.4	3.0	2.5	1.7
Sex: Female	2.3	2.8	2.4	1.6
Age: 1-17	2.3	2.9	2.4	1.7
Age: 18-24	4.2	5.1	4.5	3.0
Age: 25-44	3.0	3.6	3.1	2.2
Age: 45-64	1.3	1.5	1.5	1.0
Age: 65+	0.9	0.9	1.0	0.7
Education : Less than high school	1.3	1.5	1.4	1.0
Education : High school	1.5	3.0	1.8	1.2
Education : Some college	2.1	2.9	2.3	1.5
Education : College degree or higher	3.0	4.0	3.4	2.1
Race/ethnicity : White	2.5	3.0	2.6	1.8
Race/ethnicity : Black	2.1	2.4	2.3	1.7
Race/ethnicity : Other	2.6	3.7	3.2	2.0
Nativity: Native	2.0	--	2.4	1.7
Nativity: Foreign born	1.8	--	2.2	1.5
Presence of children in the household : None	2.6	3.1	2.8	2.0
Presence of children in the household : At least one	2.0	2.5	2.1	1.4
Number of working adults in the household (married couples): Neither spouse is working	1.5	2.1	1.4	1.0
Number of working adults in the household (married couples): One spouse is working	2.4	2.9	2.5	1.8
Number of working adults in the household (married couples): Both spouses are working	2.2	2.8	2.5	1.5
Income: Top 50%	2.4	3.0	2.6	1.7
Income: Bottom 50%	2.2	2.8	2.4	1.6
Employment status : Employed civilian	2.3	3.0	2.4	1.6
Employment status : Unemployed	4.5	5.3	5.0	3.5
Employment status : Not in the labor force	1.9	2.2	2.1	1.5
Homeownership : Owner	1.3	1.5	1.4	0.9
Homeownership :Renter	4.7	5.9	4.8	3.5
Other sample statistics:				
Percent of married households that are dual-earner	44.3	42.4	45.6	45.2

Note. Authors' calculations from Current Population Survey microdata, excluding residents of group quarters and imputed migration values. Cells in all but the last two rows reports the percent of the population that moved in the previous year. Nativity is only available from 1994 onwards. Employment status and homeownership are measured in the current year.

Table 3
Change in Annual Migration Rates
(Percentage Points)

	Inter-State : CPS	Inter-State : IRS	Inter-State : ACS	Inter-County, Within State: CPS	Inter-County, Within State: IRS	Inter-County, Within State: ACS
2006-2008	-0.28	-0.19	-0.24	-0.61	-0.26	-0.24
2006-2009	-0.31	--	-0.38	-0.62	--	-0.34
2006-2010	-0.44	--	--	-0.62	--	--
2007-2010	-0.20	--	--	-0.29	--	--
Business cycle: 1990-1992	-0.42	-0.19	--	-0.16	-0.15	--
Business cycle: 2000-2002	-0.33	-0.08	--	-0.41	0.00	--
Housing cycle: 1988-1992	-0.09	-0.19	--	-0.13	-0.13	--
Housing cycle: 1978-1983	--	-0.29	--	--	--	--

Note. Sources are the Current Population Survey, the Internal Revenue Service and the American Community Survey. CPS and ACS statistics are calculated from micro-data and exclude imputed values and individuals living in group quarters. Base in each percentage change is the level in the first year of the designated period; numerator is change in levels between first and last years of the period.

Table 4
Correlation of Change in Migration with Negative Equity

	In-migration: CPS	In-migration: IRS	Out-migration : CPS	Out-migration : IRS	Cross-county, within-state: CPS
	(1)	(2)	(3)	(4)	(5)
(Share of HH with neg. equity in	-0.002	-0.005	0.009*	0.010*	0.000
2009Q3) X (post-2006)	(0.009)	(0.003)	(0.004)	(0.004)	(0.004)
Post-2006 dummy	-0.000	0.001	-0.008**	-0.003**	-0.006**
	(0.002)	(0.001)	(0.003)	(0.001)	(0.002)
Unemp. rate	-0.053*	-0.115**	0.052*	0.073**	-0.004
	(0.025)	(0.017)	(0.025)	(0.013)	(0.022)
Ln(avg. household income)	-0.001	0.006	0.005	0.007**	0.004
	(0.007)	(0.004)	(0.004)	(0.002)	(0.006)
Share 18-24	0.012	0.011	0.013	0.001	0.051**
	(0.026)	(0.014)	(0.023)	(0.006)	(0.019)
Share 25-34	0.054*	0.002	0.011	0.008	0.066**
	(0.022)	(0.012)	(0.022)	(0.006)	(0.017)
Share 65+	0.000	0.024	0.001	0.011	0.001
	(0.024)	(0.015)	(0.021)	(0.009)	(0.019)
N	1372	1472	1323	1472	1372
Weighted mean of migration rate	0.022	0.028	0.023	0.028	0.027

Regressions are state-year regressions of migration rates on year and state fixed effects and state time trends, and covariates listed above. The sample period is 1981-2010 for the CPS sample and 1977-2008 for the IRS sample. The CPS sample excludes 1985 and 1995 because the one-year migration variable is unavailable for those years, and 1981 is excluded from the out-migration regressions because data on previous state is unavailable; due to missing information regarding negative equity shares, 49 states are represented in the CPS sample, and due to additional unavailable information from IRS data, 46 states are represented in the IRS sample. All covariates are calculated from the CPS. Standard errors clustered at the state level are in parentheses. Regressions are weighted by the state population in the CPS sample, and by the sum of mover and stayer exemptions in the IRS data. Weighted mean of the share of households in a state with negative equity in 2009Q3 is 0.19. * and ** indicate significance at the 5 percent and 1 percent levels, respectively.

Table 5
Correlation of Change in Migration with Negative Equity (CPS)

	In-migration	Out-migration	Cross-county, within-state
	(1)	(2)	(3)
(Share of HH with neg. equity in	-0.019	0.025	0.006
2009Q3) X (post-2006) X (renter)	(0.018)	(0.019)	(0.012)
(Share of HH with neg. equity in	0.008	0.004	-0.001
2009Q3) X (post-2006)	(0.007)	(0.004)	(0.007)
(Share of HH with neg. equity in	0.013	-0.030	-0.025
2009Q3) X (renter)	(0.041)	(0.037)	(0.028)
(Post-2006) X (renter)	-0.009*	-0.017**	-0.005
	(0.004)	(0.004)	(0.003)
Renter dummy	0.037**	0.045**	0.044**
	(0.008)	(0.008)	(0.008)
Post-2006 dummy	-0.001	-0.004	-0.003
	(0.002)	(0.003)	(0.002)
Unemp. rate	-0.065**	0.048	-0.001
	(0.025)	(0.027)	(0.022)
Ln(avg. household income)	-0.003	0.008	0.007
	(0.007)	(0.004)	(0.005)
Share 18-24	0.005	0.011	0.038*
	(0.026)	(0.024)	(0.018)
Share 25-34	0.049**	0.008	0.056**
	(0.020)	(0.023)	(0.017)
Share 65+	0.000	0.003	-0.003
	(0.025)	(0.023)	(0.019)
N	2744	2646	2744
Weighted mean of migration rate (owners)	0.012	0.012	0.016
Weighted mean of migration rate (renters)	0.046	0.048	0.051

Regressions are state-year-renter status regressions of migration rates on year and state fixed effects and state time trends, and covariates listed above. Dependent variable is the average mobility rate for each state-year-renter status group (where renter status is owner or renter). The sample period is 1981-2010; 1985 and 1995 are excluded because the one-year migration variable is unavailable for those years, and 1981 is excluded from the out-migration regressions because data on previous state is unavailable. Due to missing information regarding negative equity shares, 49 states are included in the regressions. All covariates are calculated from the CPS. Standard errors clustered at the state level are in parentheses. Regressions are weighted by the state population for the given renter status in the CPS sample. Weighted mean of the share of households in a state with negative equity in 2009Q3 is 0.19. * and ** indicate significance at the 5 percent and 1 percent levels, respectively.

Table 6
Correlation of Change in Migration with Home Sales

	In-migration : CPS	In-migration : IRS	Out-migration : CPS	Out-migration : IRS	Cross-county, within-state: CPS
	(1)	(2)	(3)	(4)	(5)
(Peak-to-trough change	0.008	0.003	0.000	-0.004	0.005
in home sales) X (post-2006)	(0.005)	(0.002)	(0.005)	(0.003)	(0.004)
Post-2006 dummy	0.001	0.000	-0.002	-0.004*	-0.001
	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)
Unemp. rate	-0.051*	-0.105**	0.058*	0.077**	0.004
	(0.023)	(0.015)	(0.026)	(0.013)	(0.022)
Ln(avg. household income)	0.001	0.005	0.004	0.006*	0.006
	(0.007)	(0.003)	(0.004)	(0.002)	(0.006)
Share 18-24	0.014	0.009	0.005	-0.003	0.057*
	(0.027)	(0.012)	(0.022)	(0.006)	(0.022)
Share 25-34	0.052*	0.003	0.001	0.004	0.063**
	(0.023)	(0.011)	(0.021)	(0.005)	(0.019)
Share 65+	0.001	0.021	-0.002	0.010	-0.006
	(0.025)	(0.013)	(0.021)	(0.009)	(0.020)
N	1323	1516	1323	1516	1323
Weighted mean of migration rate	0.023	0.026	0.023	0.027	0.028

Regressions are state-year regressions of migration rates on year and state fixed effects and state time trends, and covariates listed above. The sample period is 1981-2010 for the CPS sample and 1977-2008 for the IRS sample. All covariates are calculated from the CPS. Standard errors clustered at the state level are in parentheses. Regressions are weighted by the state population in the CPS sample, and by the sum of mover and stayer exemptions in the IRS data. Home sales are sales of existing homes from the National Association of Realtors. * and ** indicate significance at the 5 percent and 1 percent levels, respectively.

Table 7
Correlation of Change in Migration with House Price Declines

	In-migration : CPS (1)	In-migration : IRS (2)	Out-migration : CPS (3)	Out-migration : IRS (4)	Cross-county, within-state : CPS (5)
(Peak-to-trough change	-0.001	0.004	-0.007*	-0.006	-0.000
in house prices) X (post-2006)	(0.006)	(0.003)	(0.003)	(0.003)	(0.003)
Post-2006 dummy	-0.002	0.000	-0.004*	-0.003**	-0.004*
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)
Unemp. rate	-0.054	-0.105**	0.052*	0.076**	0.001
	(0.024)	(0.015)	(0.025)	(0.013)	(0.023)
Ln(avg. household income)	0.000	0.005	0.004	0.006*	0.004
	(0.007)	(0.003)	(0.004)	(0.002)	(0.006)
Share 18-24	0.018	0.009	0.008	-0.001	0.059**
	(0.027)	(0.013)	(0.022)	(0.006)	(0.022)
Share 25-34	0.054*	0.001	0.004	0.006	0.063**
	(0.023)	(0.011)	(0.021)	(0.005)	(0.019)
Share 65+	0.004	0.021	-0.000	0.010	-0.003
	(0.025)	(0.013)	(0.021)	(0.009)	(0.020)
N	1350	1548	1350	1548	1350
Weighted mean of migration rate	0.023	0.027	0.023	0.027	0.028

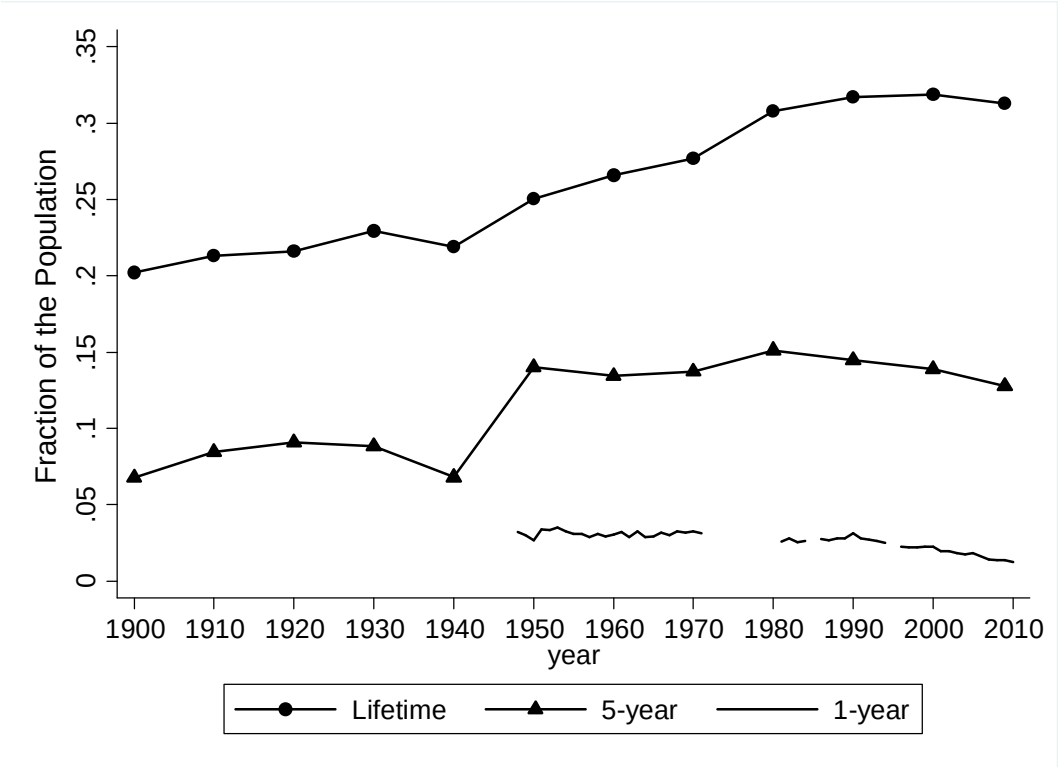
Regressions are state-year regressions of migration rates on year and state fixed effects and state time trends, and covariates listed above. The sample period is 1981-2010 for the CPS sample and 1977-2008 for the IRS sample. All covariates are calculated from the CPS. Standard errors clustered at the state level are in parentheses. Regressions are weighted by the state population in the CPS sample, and by the sum of mover and stayer exemptions in the IRS data. House prices are repeat-sales indexes computed by CoreLogic. * and ** indicate significance at the 5 percent and 1 percent levels, respectively.

Table 8
Percent of Migrants by Reason for Moving

	Inter-State: 2003-2006	Inter-State: 2007-2010	Inter-County, Within State: 2003-2006	Inter-County, Within State: 2007-2010
Change in marital status	4.5	2.9	7.4	7.4
To establish own household	2.9	3.6	5.7	7.9
Other family reason	20.9	19.8	15.2	14.0
New job or job transfer	34.3	35.6	14.1	13.8
To look for work or lost job	5.0	5.7	2.3	3.2
For easier commute	1.5	2.0	7.5	8.6
Retired	1.2	1.3	0.6	0.5
Other job-related reason	4.0	5.4	2.3	3.1
Wanted to own home, not rent	1.7	1.1	9.2	5.4
Wanted new or better housing	2.0	1.8	10.9	9.0
Wanted better neighborhood	1.6	2.0	4.8	3.5
For cheaper housing	2.1	2.7	4.4	6.6
Other housing reason	2.6	1.7	6.5	5.0
Attend/leave college	6.1	4.4	4.8	4.9
Change of climate	2.4	2.7	0.4	0.4
Health reasons	2.7	2.1	1.2	1.6
Other reasons	2.8	4.8	2.4	4.6
Natural disaster	1.9	0.4	0.6	0.4

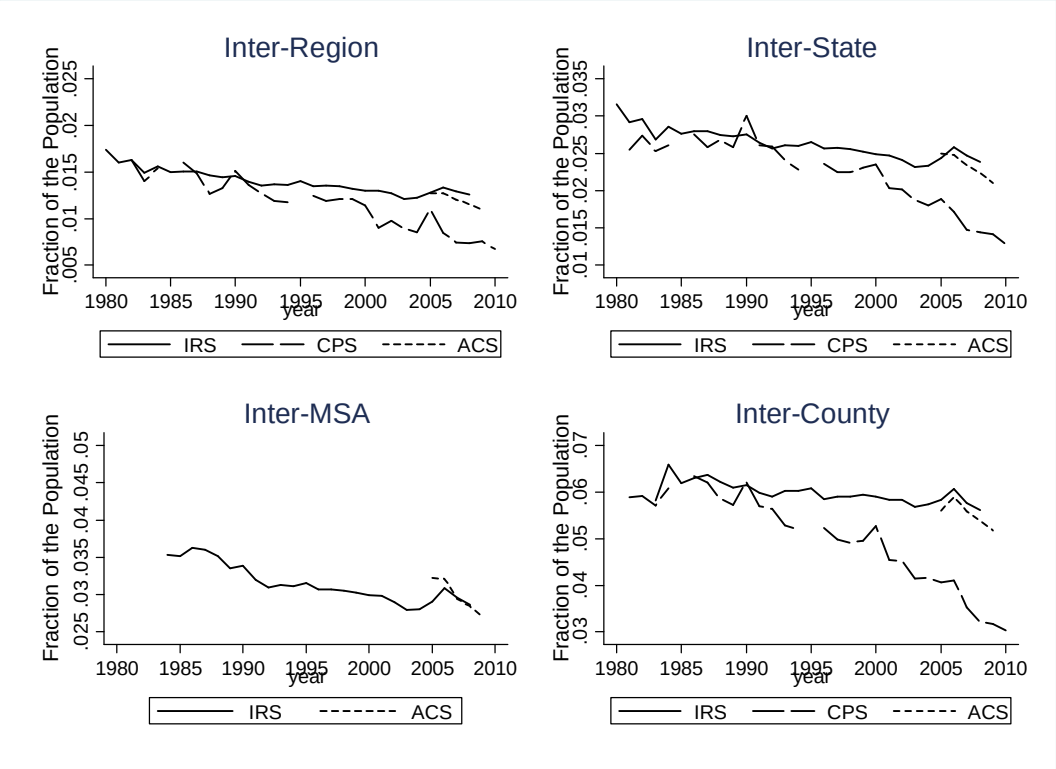
Note. Data are from the Current Population Survey.

Figure 1
Inter-State Migration Rates Since 1900



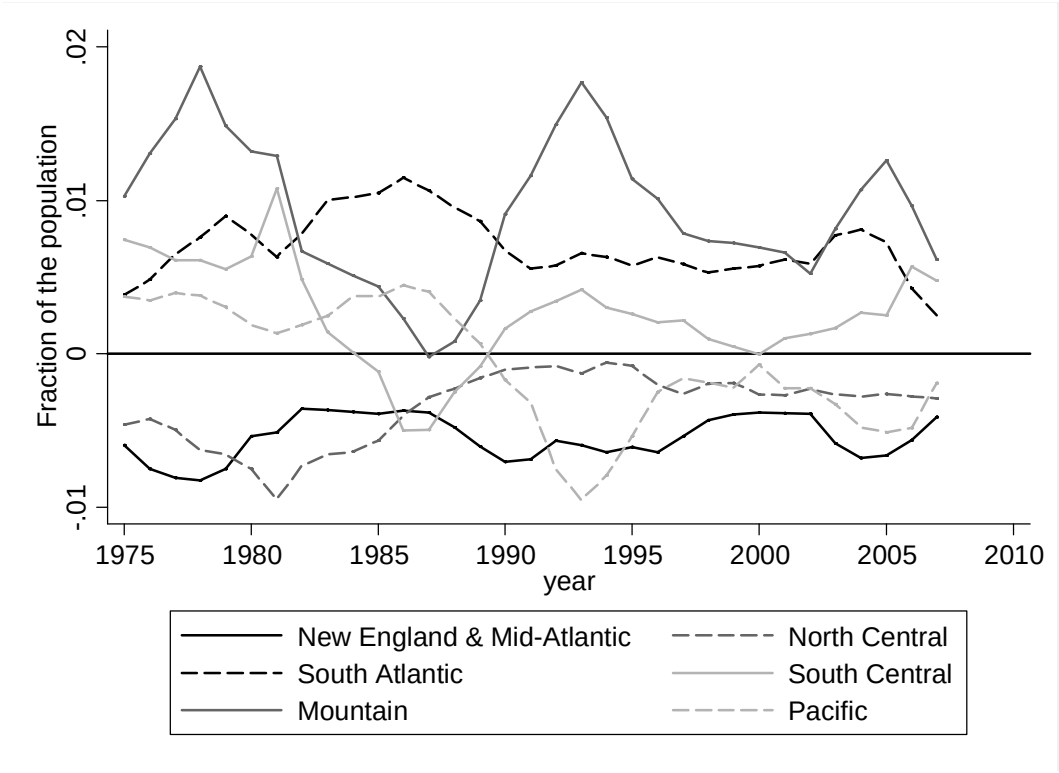
Note. Lifetime and 5-year migration rates are from the denennial Census 1900-2000 and from the ACS for 2009. Five-year migration rates are estimated from microdata on the fraction of households with a 4- or 5-year old residing outside of their birth state (Rosenbloom and Sundstrom 2004). Annual migration rates are calculated from Current Population Survey microdata.

Figure 2
Annual Internal Migration Rates



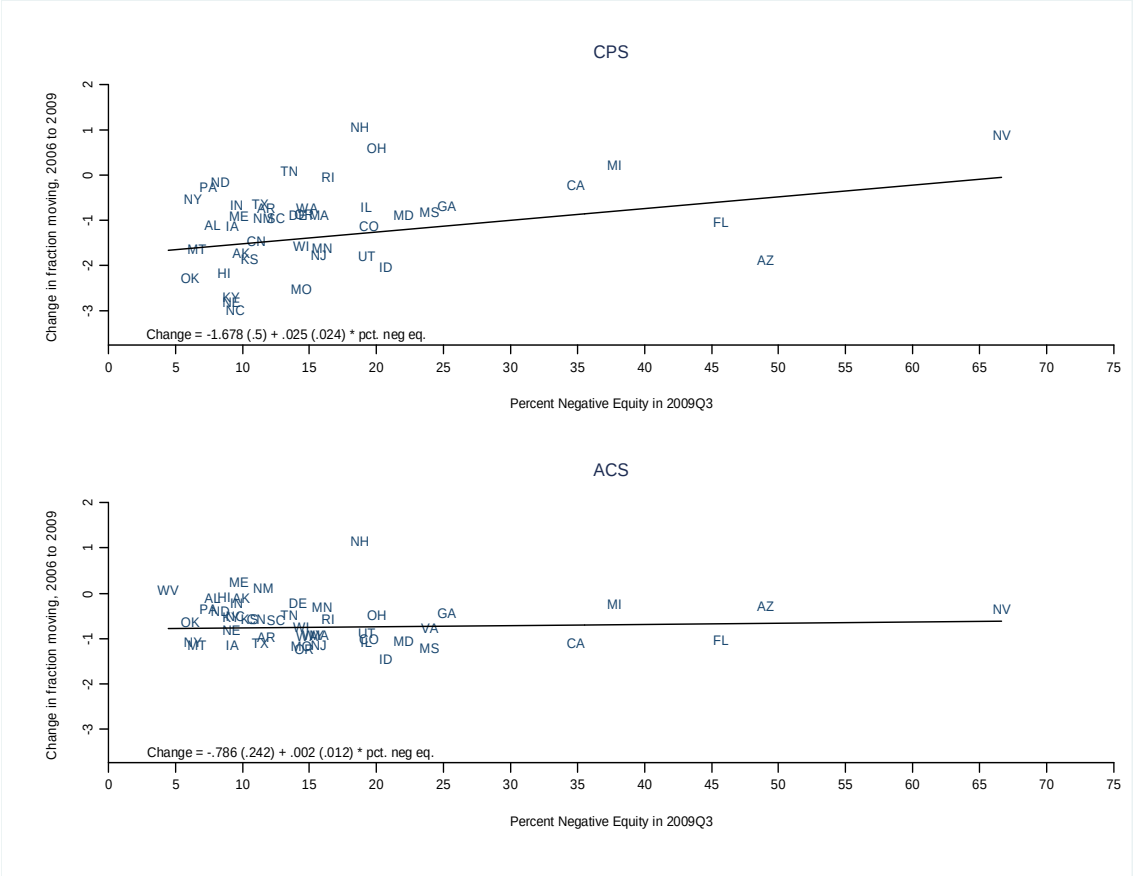
Note. CPS and ACS statistics are authors' calculations from microdata excluding residents of group quarters and imputed values of migration. IRS statistics are authors' calculations based on state-level and county-level flows.

Figure 3
Net Migration by Census Division



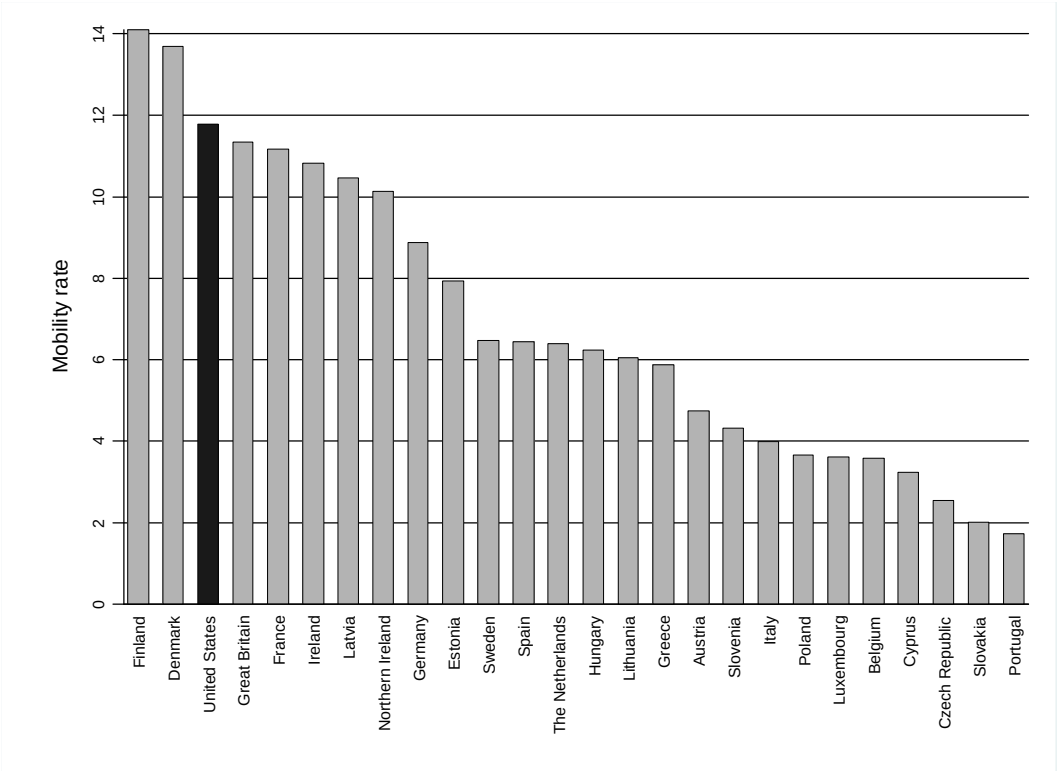
Note. Authors' calculations based on state level IRS statistics. We have combined the Northeast and Mid-Atlantic divisions, the East North Central and West North Central divisions, and the East South Central and West South Central divisions.

Figure 4
Negative Equity and Changes in Migration 2006-2009



Note: Authors' calculations. Migration is the sum of out-migration from a state and inter-county migration within the state. The percent of mortgages with negative equity is from CoreLogic. For the CPS, migration rates are calculated from microdata. For the ACS, out-of-state migration rates are calculated from ACS microdata, while inter-county migration rates are from published statistics.

Figure 5
Fraction of the Population in 2005 that Moved Residence in the Previous Year



Source: For European data, Eurobarometer 64.1, distributed as ICPSR #4641. For US data, March 2005 CPS. Eurobarometer data is derived from a survey administered in September and October of 2005, and the responses refer to mobility since the start of the year. To convert into an estimate of 12 month mobility, European rates in the table have been multiplied by 4/3. Rates are for individuals 16 years and older.