Spatial Manifestations of the "Great American Migration Slowdown":

A Decomposition of Inter-County Migration Rates, 1990-2012

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ABSTRACT

Prior research on the "Great American Migration Slowdown," which refers to the declining rate of U.S. internal migration in recent years and decades, has ignored the spatial manifestations of migration slowdown. This misses an important part of the story because, as we show in this paper, U.S. counties became increasingly connected to one another by migration over the past two decades, with gains in migration "connectivity" helping to partially offset the Great American Migration Slowdown. Using county-to-county migration flow data from the Internal Revenue Service and an innovative application of Das Gupta's demographic standardization and decomposition procedures, we estimate that changes in the rate of U.S. internal migration since the early 1990s would have been between 1.7 and 10.4 points lower (depending on the year) than observed changes had U.S. counties not become increasingly connected to one another by migration. We subsequently examine the unique spatial manifestations of the Great American Migration Slowdown for each of eight types of inter-county migration flows across the rural-urban continuum. We conclude by reflecting on the substantive implications of these changes and why these changes are likely to continue in the future.

KEYWORDS

Migration • Great American Migration Slowdown • Intensity • Connectivity • Decomposition

INTRODUCTION

The phrase, the "Great American Migration Slowdown" (hereafter, GAMS), was coined by Frey (2009:1) to describe the declining rate of U.S. internal migration in recent years and decades that accelerated in the 1990s and, again, during the Great Recession. As we discuss in the next section, previous studies have identified several likely causes and mechanisms involved in the GAMS (Cooke 2013; Johnson et al. 2017; Molloy et al. 2011). They have likewise documented heterogeneity in the existence and magnitude of the GAMS across places in the United States (Frey 2009; Johnson et al. 2017; Ulrich-Schad 2015).

While previous studies rightly focus on the diverse causes, characteristics, and consequences of the GAMS, they are limited because they focus on only one dimension of migration: migration "intensity" (Bell et al. 2002:442), as measured by the rate of U.S. internal migration. The central argument in this paper is that, given the known and critical interdependencies that exist among and connect places to one another (e.g., rural and urban areas; see Lichter and Brown 2011; Lichter and Ziliak 2017), consideration of the "connectivity" of migration (Bell et al. 2002:442) (i.e., the unique migration connections, or ties, that exist among places) is also needed in accounts of the GAMS. The aim of this paper is therefore to demonstrate the importance of attending to the spatial manifestations of GAMS, and of migration slowdown more generally.

Following a discussion of the substantive reasons for taking a more spatial view of migration slowdown, we use annual county-to-county migration flow data from the Internal Revenue Service each year from 1990 to 2012 to examine the spatial manifestation of the GAMS for the United States as a whole. We show that, despite the declining rate of U.S. internal migration, U.S. counties became increasingly connected to one another by migration. We then make use of an innovative application of Das Gupta's (1993) demographic standardization and decomposition procedures to estimate that changes in the rate of U.S.

internal migration since the early 1990s would have been between 1.7 and 10.4 percentage points lower (depending on the exact year) than observed changes had U.S. counties not grown increasingly connected to one another by migration. In other words, gains in the connectivity of migration have considerably offset the GAMS over the past two decades.

We conclude the empirical portion of this paper by considering the potential for heterogeneity in the spatial manifestations of the GAMS for each of eight types of inter-county migration flows across the rural-urban continuum, thereby adding a new dimension to existing efforts to document heterogeneity across places in the existence and magnitude of the GAMS (Frey 2009; Johnson et al. 2017; Lichter and Ziliak 2017; Ulrich-Schad 2015). We then close with a discussion wherein we connect our empirical results to the likely causes and mechanisms discussed in the front end of the paper, and comment on why these dynamics are likely to continue in the future.

BACKGROUND

The Great American Migration Slowdown

While there are healthy debates on exactly how pronounced the slowdown in U.S. internal migration has been in recent years and decades (Kaplan and Schulhofer-Wohl 2012), data from different sources evidence a similar trend. As we show in Figure 1, the rate of U.S. internal migration has slowed, with the GAMS picking up pace beginning in the 1990s and later exacerbated by the Great Recession (Cooke 2013; Frey 2009; Johnson et al. 2017; Molloy et al. 2011; Rosenbloom and Sundstrom 2003; Stone 2016). Scholars are ultimately concerned about the GAMS because it, and migration more generally, is a marker of the economic health and vitality of the United States and places and populations therein.

---FIGURE 1 ABOUT HERE---

The reasons for the GAMS are tied to broad structural shifts in the U.S. and global economies, and, according to Cooke (2013), include the growth of dual-earner couples, the increase in household debt, and the expansion of information and communications technologies. The first two trends are the products of declining real wages over the past quarter-century (Keister 2000), and, when combined with the fact that the ability of U.S. households to maintain consumption levels over time was strongly tied to home values (Bostic et al. 2009), resulted in the ballooning of housing-related debt (Wolff 2010). Housing-related debt and associated inflated home prices played an important role in the Great Recession, which, in turn, is strongly implicated in the GAMS in recent years (Frey 2009; Johnson et al. 2017).

The expansion of information and communications technologies has also helped to keep people in place, with Cooke (2013) suggesting that these are substitutes for migration. Of course, the changing nature and locations of work have also been accompanied by widening economic inequality (McCarty et al. 2016), due, in part, to the rise of precarious employment and growing polarization between so-called “good” and “bad” jobs (Kalleberg 2013). Thus, whereas those in good jobs might substitute migration for information and communications technologies, those in bad jobs might simply forgo migration because of more basic financial constraints given the often substantial costs associated with relocating (Bodvarsson and Van den Berg 2013).

Finally, one might also consider the changing “social geography” of migration and growth in the “holding power” of places (Herting et al. 1997:268). The central idea here is that growing polarization and partisanship (economic, political, sociocultural, etc.) renders places increasingly distinct from one another and more internally homogenous. As a result, migration slows down because flows are increasingly directed from and to places that are more similar to one another. Herting et al. (1997) demonstrated as much for U.S. regions, subregions, and states. Findings from more recent studies of the GAMS for U.S. regions and across the rural-urban continuum are also consistent with this idea (Johnson et al. 2017; Lichter and Ziliak 2017; Ulrich-Schad 2015).

Heterogeneity in and Spatial Manifestations of Migration Slowdown

In light of the preceding discussion, it is not surprising that there is considerable heterogeneity across places in the both the existence and magnitude of the GAMS. For example, in their analysis of county net-migration rates constructed from the U.S. Census Bureau's intercensal estimates for the early 2000s, Johnson et al. (2017; see also Frey 2009), showed that the GAMS was particularly pronounced for historically fast-growing counties in the South and West, as well as for counties in the industrial belt of the Midwest. They also documented strong declines in net-migration for non-metropolitan counties, with Ulrich-Schad (2015) further showing that these declines were most pronounced for rural non-amenity counties. In contrast, and in contradiction to long-run historical trends, counties located in the core of major metropolitan areas tended to experience large net-migration gains.

Of course, in the process of documenting heterogeneity across places in the existence and magnitude of the GAMS, the above studies implicitly raise another important question about the GAMS, and migration slowdown more generally, that has eluded prior research. Specifically, negative changes in the rate of migration, which is a measure of migration "intensity," reveal nothing about possible concurrent changes in migration "connectivity" (i.e., the migration connections, or ties, that exist among places) (Bell et al. 2002:442; see also Czaika and de Haas 2014). As a result, critical interdependencies and interconnections that exist among places (e.g., between rural and urban areas; see Lichter and Brown 2011; Lichter and Ziliak 2017) that are ultimately manifested in migration flows among particular places (and not others) are effectively ignored (see also Bakewell 2014; DeWaard and Ha 2017; Fawcett 1989).

However, as we show in stylized fashion in Figure 2, during the GAMS or any other migration slowdown, places might become less connected to one another by migration (i.e., spatial contraction), more connected (i.e., spatial expansion), or experience no change in migration connectivity. And knowledge of the spatial manifestation of migration slowdown is ultimately important for at least three reasons. First, taking a more spatial (versus aspatial) view of migration slowdown permits us to develop new and distinguish between competing conceptual definitions of migration slowdown. For example, a *strong* migration slowdown might be defined by negative changes in both migration intensity and migration connectivity. In contrast, a *weak* migration slowdown might be defined by negative changes in migration intensity and no change or positive changes in migration connectivity.

---FIGURE 2 ABOUT HERE---

Second, different definitions of migration slowdown implicate different causes and mechanisms. For example, a strong migration slowdown can be explained by standard neoclassical economic models of migration wherein actors engage in cost-benefit calculations to decide whether to migrate (Borjas 1987, 1991; Sjaastad 1962), often making these decisions in the context of multiple competing potential destinations (Pellegrini and Fotheringham 2002). Specifically, actors compare the expected utility of remaining in their current place of residence to that of migrating to a new location over some time horizon, and subsequently discount this difference by the costs that would be incurred by relocating

(Bodvarsson and Van den Berg 2013; Greenwood 1997). At the macro level, the migration decisions and behaviors of actors are ultimately expressed in migration flows among places that tend to be larger in the presence of pronounced gaps (wage gaps, employment gaps, etc.) between migrant-sending and migrant-receiving areas that favor the latter. A strong migration slowdown would therefore indicate equilibrium, or at least convergence, of labor market conditions across places.

In contrast, a *weak* migration slowdown would implicate different causes and mechanisms. For example, negative changes in migration intensity and positive changes in migration connectivity would seemingly involve the constellation of at least two factors. The first is the highly and increasingly selective nature of migration (Bodvarsson and Van den Berg 2013; Chiswick 1999; Kalleberg 2013; McCarty et al. 2016), which contributes to decreases in migration intensity. The second is the growing appeal of new potential migrant destinations to these selected actors, which contributes to increases in migration connectivity. Importantly, at the macro level, by determining the relative contributions of these changes to the overall migration rate, one can quantify the extent to which migration slowdown, e.g., the GAMS, could have been worse absent gains in migration connectivity.

Finally, knowledge of the spatial manifestation of migration slowdown adds a new dimension to efforts to document heterogeneity across places in the existence and magnitude of migration slowdown, including the GAMS (Frey 2009; Johnson et al. 2017; Lichter and Ziliak 2017; Ulrich-Schad 2015). The first and most obvious benefit is that attending to migration connectivity requires going beyond the problematic measure of the net-migration rate (see Rogers 1990), which does not permit an assessment of migration connectivity, by distinguishing between out- and in-migration flows and associated changes in migration intensity and connectivity. A second benefit is the ability to examine whether and to what extent out-migration intensity and connectivity vary by the type of migrant-receiving, or destination, place (e.g., rural versus urban). A similar line of inquiry can be pursued for in-migration intensity and connectivity by the type of migrant-sending, or origin, place. In doing so, different manifestations of migration slowdown may very well characterize these migration patterns, thereby implicating different underlying causes and mechanisms.

RESEARCH QUESTIONS AND EXPECTATIONS

To break new ground and stimulate future research on the spatial manifestations of the GAMS, and on migration slowdown more generally, we seek to answer three research questions in the remainder of this paper. Our first research question is: *Which definition of migration slowdown—strong or weak—characterizes the GAMS?* Our initial expectation is that the GAMS is an example of a weak migration slowdown characterized by negative changes in migration intensity and positive changes in migration connectivity. This expectation follows from our earlier discussion of growing economic inequality, the changing nature and locations of work, and associated economic, political, and sociocultural polarization and partisanship (Cooke 2013; Herting et al. 1997; Kalleberg 2013; Lichter and Ziliak 2017; McCarty et al. 2016). It is also informed by other studies that do not explicitly focus on the GAMS. For example, using data from the National Longitudinal Survey of Youth, Borjas et al. (1992) and Gabriel and Schmitz (1995) showed that geographic differences in returns to skill are an important determinant of the composition of U.S. internal migrants, a finding that demonstrates the highly selective nature of migration (Bodvarsson and Van den Berg 2013; Chiswick 1999). And, with respect to the growing appeal of "new *immigrant* destinations" in the United States (Marrow 2009:1037, emphasis ours; see also Singer 2004), studies show that the recent geographic diversification of the foreign-born population throughout the United States is, in part, a product of economic "pull" factors in non-traditional emerging (versus traditional gateway) migrant destinations, which can further select certain types of workers (e.g., those willing to work so-called 3D—difficult, dirty, and dangerous—jobs) (Gurak and Kritz 2016; Kritz and Gurak 2015; Massey 2008; Singer 2004; Zúñiga and Hernández-León 2005).

The answer to our first research question obligates us to a second research question, which is: *In the event of a weak migration slowdown, to what extent have gains in migration connectivity offset the GAMS?* Our ability to answer this question requires distinguishing the relative contribution of migration connectivity from that of migration intensity to explaining overall change in the migration rate during the GAMS. Accordingly, as we describe in the next section, a central innovation in this paper is our adaptation and use of Das Gupta's (1993) demographic standardization and decomposition procedures to quantify and subsequently disentangle the effects of migration intensity and migration connectivity in an integrated empirical framework.

Finally, building on and extending prior research documenting heterogeneity across places in the existence and magnitude of the GAMS (Frey 2009; Johnson et al. 2017; Lichter and Ziliak 2017; Ulrich-Schad 2015), we seek to answer our third research question: *Do different definitions—and, thus, spatial manifestations—of migration slowdown characterize migration across the rural-urban continuum?* Importantly, and in contrast to prior research, we go beyond net-migration and the net-migration rate. As we discuss in the next section, we examine eight rural-urban migration flows distinguished on the basis of the type of migrant-sending, or origin, place and the type of migrant-receiving, or destination, place. In doing so, we attend to the inherent directionality of migration flows (Bell et al. 2002; Plane and Mulligan 1997).

EMPIRICAL APPROACH

Operationalization and Measurement

We begin by constructing and examining two simple measures of migration. The first measure is the total rate of U.S. internal migration, which is calculated by dividing the total number of migrants in a given period (one-year, five-years, etc.) by the total number of person-years lived during that period (Preston et al. 2001). This is our starting operational definition of migration intensity. The second measure is a count of the total number of origin-destination (i.e., directed) migration ties that exist among all places (the precise spatial unit is specified later on) in the United States (Bell et al. 2002). This is our starting operational definition of migration connectivity.

In addition to these two measures, in an effort to lay out a more integrated empirical framework that can be used to answer each of our three research questions, we also operationalize and measure migration intensity and migration connectivity in another way. We begin by writing the total volume of U.S. internal migration as $\sum_i \sum_j M_{ijp}$, where M_{ijp} is the absolute size of the migration flow from sending area *i* to receiving area *j* in period *p*. Subsequently cross-multiplying and rearranging terms, we arrive at the following:

$$\sum_i \sum_j M_{ijp} = \left(\frac{\sum_i \sum_j M_{ijp}}{\sum_i \sum_j T_{ijp}} \right) \times \left(\frac{\sum_i \sum_j T_{ijp}}{C_p} \right) \times C_p \text{ , for } i \neq j \quad (1)$$

On the right-hand side of Equation 1, the first term is the ratio of the total volume of U.S. internal migration to the total number of migration ties among all places in the United States, where $T_{ijp} = 1$ if migrant-sending place *i* is connected to migrant-receiving place *j* by a migration flow of any size greater than zero in period *p* (0 otherwise). This term summarizes the average size of migration flows, and, after the substitution discussed at the end of this subsection, is our second measure of migration intensity in this more integrated empirical framework. The second term in Equation 1 is the ratio of the total number of migration ties to the total number of U.S. places. This term summarizes the average number of migration ties, and is our second measure of migration connectivity. Finally, the third term in Equation 1 is included to account for change over time in the total number of places contributing to changes in migration intensity and migration connectivity.

For ease of notation in the next subsection, we subsequently rewrite Equation 1 to more compactly express the total volume of U.S. internal migration in period p, now M_p, as a function of the average size of migration flows per migration tie, now $\bar{M}_p$, the average number of migration ties per place, now $\bar{T}_p$, and the total number of places being considered, C_p:

$$M_p = \bar{M}_p \times \bar{T}_p \times C_p \quad (2)$$

Finally, recognizing that the existence and magnitude of the GAMS is determined on the basis of changes in migration rates (versus counts), we substitute R_p for M_p, and $\bar{R}_p$ for $\bar{M}_p$, where R_p and $\bar{R}_p$ are the total and average rates of U.S. internal migration, respectively. The total migration rate is calculated as described in the beginning of this section, and the average migration rate is calculated in a manner similar to the average size of migration flows in Equation 1. Together, these changes yield the following equation:

$$R_p = \bar{R}_p \times \bar{T}_p \times C_p \quad (3)$$

Demographic Standardization and Decomposition

To answer our second research question, we make use of an innovation application of Das Gupta's (1993) demographic standardization and decomposition procedures to quantify and subsequently disentangle the effects of average migration intensity and average migration connectivity to the overall change in the total rate of U.S. internal migration during the GAMS (for other applications of Das Gupta's (1993) procedures, see Lichter et al. (2015), Ruggles (2015), Sana (2008), and Smith et al. (1996)).[1] Given information on each of the inputs in Equation 3 for two, and only two, periods ($p = 1, 2$), we can calculate standardized estimates of the total rate of U.S. internal migration as follows:

$$R_{1.2}^{\bar{R}.\bar{T},C} = \left[\frac{\bar{T}_2 C_2 + \bar{T}_1 C_1}{3} + \frac{\bar{T}_2 C_1 + \bar{T}_1 C_2}{6}\right] \bar{R}_1 \quad (4)$$

The quantity, $R_{1.2}^{\bar{R}.\bar{T},C}$, is the total rate of migration in the first period had only the average rate of migration changed between these two periods. In other words, this quantity is *standardized by* the average number of migration ties per place and the total number of places under consideration in these two periods. A similar standardized estimate can be written for the second period as follows:

$$R_{2.1}^{\bar{R}.\bar{T},C} = \left[\frac{\bar{T}_2 C_2 + \bar{T}_1 C_1}{3} + \frac{\bar{T}_2 C_1 + \bar{T}_1 C_2}{6}\right] \bar{R}_2 \quad (5)$$

Equations 4 and 5 can be rewritten to give standardized estimates of the total rate of migration in the first and second periods that reflect changes in the other two inputs in Equation 3, the average number of migration ties and the total number of places (equations not shown, but available from the lead author upon request). Putting the resulting six standardized estimates together, we can then decompose the change in the total rate of U.S. internal migration between the two periods as follows:

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[1] We note that we have modified Das Gupta's (1993) notation so that his equations can more easily be followed with the application to migration in the current paper in mind.

$$R_2 - R_1 = \left[R_{2.1}^{\bar{R}.\bar{T},C} - R_{1.2}^{\bar{R}.\bar{T},C}\right] + \left[R_{2.1}^{\bar{T}.\bar{R},C} - R_{1.2}^{\bar{T}.\bar{R},C}\right] + \left[R_{2.1}^{C.\bar{R},\bar{T}} - R_{1.2}^{C.\bar{R},\bar{T}}\right] \quad (6)$$

Change in the total rate of migration, $R_2 - R_1$, is the sum of an average rate, or intensity, effect, $R_{2.1}^{\bar{R}.\bar{T},C} - R_{1.2}^{\bar{R}.\bar{T},C}$, and an average ties, or connectivity, effect, $R_{2.1}^{\bar{T}.\bar{R},C} - R_{1.2}^{\bar{T}.\bar{R},C}$, with the rest due to the change in the number of places being considered, $R_{2.1}^{C.\bar{R},\bar{T}} - R_{1.2}^{C.\bar{R},\bar{T}}$.

Going beyond two periods requires further adapting Equations 4-6. Following Das Gupta (1993), for any number of periods ($p = 1, 2, \ldots, P$), we can calculate the total rate of U.S. internal migration in the first period had only the average rate of migration changed between the first period and all other periods ($q = 1, 2, \ldots, Q$) as follows:

$$R_{1^*}^{\bar{R}^*} = R_{1.2,3,\ldots,P}^{\bar{R}.\bar{T},C} = \frac{\sum_{q=2}^{P} R_{1.q}^{\bar{R}.\bar{T},C}}{P-1} + \frac{\sum_{p=2}^{P}\left[\sum_{q\neq 1,p}^{P} R_{p.q}^{\bar{R}.\bar{T},C} - (P-2)*R_{p.1}^{\bar{R}.\bar{T},C}\right]}{P(P-1)} \quad (7)$$

Similar estimates (equations not shown, but available from the lead author upon request) can be calculated for each of the remaining periods, and for the other two inputs in Equation 3—the average number of migration ties and the total number of places—for each period. Using the resulting standardized estimates, we can then decompose the change in the total rate of U.S. internal migration between any two periods *p* and *q* as follows, where $\Delta R_{p^*,q^*}^{\bar{R}^*}$ and $\Delta R_{p^*,q^*}^{\bar{T}^*}$ are the respective migration intensity and migration connectivity effects needed to answer our second research question.

$$\Delta R_{p^*,q^*} = \Delta R_{p^*,q^*}^{\bar{R}^*} + \Delta R_{p^*,q^*}^{\bar{T}^*} + \Delta R_{p^*,q^*}^{C^*} \quad (8)$$

Migration Flow Data

To carry out the work described above, we use county-to-county migration flow data from the Statistics of Income program at the Internal Revenue Service (IRS). To generate these data, the IRS matches the addresses of tax returns in consecutive tax-filing years, with the resulting summaries taking the form of annual counts of county-to-county migration flows of tax filers (roughly equivalent to households) and tax exemptions (roughly equivalent to individuals). Counts of non-migrants are also provided. Following prior research (Curtis et al. 2015; Hauer 2017; Vachon 2015), we focus our analysis on the tax-filing set of household migration flows because migration is frequently a household-level strategy in response to livelihood uncertainties and opportunities (Bodvarsson and Van den Berg 2013; Stark and Bloom 1985). The IRS data are available for consecutive tax-filing years 1990-1991 to 2013-2014. Hereafter, we refer to each two-year period by the first tax-filing year.

There are at least three major criticisms of the IRS migration data. First, because these data are derived from tax returns, they necessarily exclude those who do not file a tax return, which disproportionately includes the poor, the elderly, and those without a social security number (Gross 2005). However, Molloy et al. (2011) showed that nearly 90 percent of U.S. household heads file a tax return each year, making these data suitable and, in some cases, the only option for analyzing population trends, including trends in migration connectivity (DeWaard et al. 2016; Engels and Healy 1981; Isserman et al. 1982).

A second criticism of the IRS data is that estimates of county-to-county migration (i.e., estimates where both the migrant-sending and migrant-receiving counties are disclosed), which are required for the standardization and decomposition procedures detailed earlier, are not disclosed for the smallest migration flows (Gross 2005; Pierce 2015). Specifically, we are unable to observe county-to-county migration flows comprised of less than 10 households. However, as we show in Figure 3, while this reduces migration levels by about one-quarter compared to county migration summaries that do not have this restriction[2], the time trends are comparable.

---FIGURE 3 ABOUT HERE---

Finally, a third criticism of the IRS data is that the most recent migration data are not comparable to those for prior years (Johnson et al. 2017; Stone 2016). As we also show in Figure 3, the U.S. internal migration rate apparently plummeted in 2013 and 2014. However, Stone (2016) argued that these declines are artificial, and are the product of changes to the procedures used to process the IRS data (see Gross 2005; Pierce 2015). Despite the fact that others have used these data with adjustments in empirical work (Hauer 2017; Johnson et al. 2017), correspondence between the lead author and both Pierce (2015) and Stone (2016) has yet to yield a clear solution to this problem. We therefore exclude the 2013 and 2014 IRS data and restrict our focus to the 1990-2012 period. We further note that results for the 1990-2014 period are available from the lead author upon request.

The Rural-Urban Continuum

We answer our third research question by replicating the analyses described above for eight rural-urban migration flows distinguished based on the type of migrant-sending county and the type of migrant-receiving county. Using 2003 Rural-Urban Continuum Codes (RUCC)

[2] County migration summaries are also included with the IRS data, and take the form of counts of total out- (or in-) migration for each county; however, each individual migrant-receiving (or migrant-sending) county is not disclosed, making these summaries unsuitable for use in the demographic standardization and decomposition procedures, detailed earlier.

from the Economic Research Service at the U.S. Department of Agriculture,[3] we first define *metropolitan* counties as those located within a metropolitan area (RUCCs 1-3) and *non-metropolitan* counties as those located outside of a metropolitan area (RUCCs 4-9). We then distinguish types of migrant-sending counties and migrant-receiving counties to examine the following eight rural-urban inter-county migration flows:

1. Metropolitan to metropolitan
2. Metropolitan to non-metropolitan
3. Metropolitan to any/all other counties (i.e., total out-migration from metropolitan)
4. Non-metropolitan to metropolitan
5. Non-metropolitan to non-metropolitan
6. Non-metropolitan to any/all other counties (i.e., total out-migration from non-metropolitan)
7. Any/All counties to metropolitan (i.e., total in-migration to metropolitan)
8. Any/All counties to non-metropolitan (i.e., total in-migration to non-metropolitan)

RESULTS

Measures and Inputs

Earlier, in Figure 3, we plotted the total rate of inter-county migration in the United States. In Figure 4, for ease of comparison, we rescale and replot this rate alongside the total number of directed inter-county migration ties. While the total migration rate was roughly constant, there is nonetheless a slight downward trend over time (see also the trend line in Figure 3),

[3] As RUCC codes are not comparable over time, we used the 2003 RUCC codes because these codes fall closest to the middle (2001) of the 1990-2012 observation window.

which is consistent with existing research on the GAMS (Cooke 2013; Frey 2009; Johnson et al. 2017; Kaplan and Schulhofer-Wohl 2012; Molloy et al. 2011; Rosenbloom and Sundstrom 2003; Stone 2016). In contrast, and with clear fluctuations over time, the total number of migration ties increased. Thus, recalling our first research question, consistent with our initial expectation, these results suggest a *weak* migration slowdown characterized by negative changes in migration intensity and positive changes in migration connectivity.

---FIGURE 4 ABOUT HERE---

Shifting from total to average migration rates and ties in Figure 5 further supports our initial expectation that the GAMS was a weak migration slowdown. With fewer fluctuations than with the total migration rate, the average migration rate trended downward over time. In contrast, the average number of migration ties increased over time, with changes strongly mirroring the trend in the total number of migration ties (see Figure 4). Taken together, all four measures—total and average migration rates and ties—indicate that the GAMS is a weak (versus strong) migration slowdown.

---FIGURE 5 ABOUT HERE---

Standardization and Decomposition Results

To answer our second research question concerning the extent to which gains in migration connectivity have offset the GAMS, we begin by displaying standardized estimates of the total rate of inter-county migration in the United States in Figure 6. The first set of standardized estimates (see series, “Standardized given change only in migration intensity”) show that, had only the average rate of inter-county migration changed over time, the GAMS would not only have materialized, but the total rate of migration would have slowed much more than the observed rate (see Figure 4). The total migration rate would have fallen from a high of 54.9 (per 1,000 households) in 1993 to a low of 46.2 in 2012. In contrast, had only the average number of inter-county migration ties changed over time (see series, "Standardized given change only in migration connectivity"), the total migration rate would have increased from a low of 46.9 in 1991 to a high of 57.4 in 2012, meaning that the GAMS would have failed to materialize. Changes in migration intensity and migration connectivity clearly played opposing roles in contributing to observed changes in the total rate of migration during the GAMS, which would have been much more pronounced had U.S. counties not grown increasingly connected to one another by migration during this period.

---FIGURE 6 ABOUT HERE---

We subsequently quantify the contribution of positive changes in migration connectivity to partially offsetting the GAMS, and display the results of this decomposition in Figure 7. After the early 1990s, negative changes in migration intensity exerted downward pressure on observed changes in the total migration rate, while positive changes in migration connectivity exerted upward pressure. Relative to the selected baseline year of 1990, after 1993, the magnitudes of positive migration connectivity effects ranged from +1.7 (per 1,000 households) in 1994 and 1995 to +10.4 in 2012. Recalling the additive nature of Das Gupta's (1993) decomposition procedures, shown earlier in Equation 8, it follows that the change in the total rate of U.S. internal migration between 1990 and each year after 1993 would have been between 1.7 and 10.4 percentage points lower than what was actually observed had U.S. counties not grown increasingly connected to one another by migration. Finally, as is also evident in Figure 7, with few exceptions (e.g., during the Great Recession), gains in migration connectivity increasingly, but not fully, offset the GAMS over time.

---FIGURE 7 ABOUT HERE---

The GAMS across the Rural-Urban Continuum

Having answered our first two research questions, we turn to our third and final research question, which concerns the potential for heterogeneity in the spatial manifestations of the GAMS across the rural-urban continuum. As we show in Figure 8, migration levels vary across each of the eight types of rural-urban migration flows (refer to common y-axis on the left-hand side of each graph). For example, the total rate of out-migration from metropolitan counties (see graph, "3. Metro to Any/All") is about double that for non-metropolitan areas (see graph, "6. Non-metro to Any/All"), with the bulk of migration from metropolitan counties directed to other metropolitan counties (see graph, "1. Metro to Metro"). Similarly, the total rate of in-migration to metropolitan counties (see graph, "7. Any/All to Metro") is much higher than the rate of in-migration to non-metropolitan counties (see graph, "8. Any/All to Non-metro"). In short, and as one might expect, migration levels are much higher from, to, and among metropolitan counties.

---FIGURE 8 ABOUT HERE---

Bracketing these different migration levels, answering our third research question requires looking within (versus across) each of the eight types of rural-urban migration flows displayed in Figure 8 (refer to the unique y-axis on the right-hand side of each graph). And, although it is difficult to visually discern a clear time trend in some of these graphs, migration slowed down for five of the eight types of rural-urban migration flows. The three types of rural-urban migration flows that did *not* slow down involve migration from non-metropolitan areas (see graphs, "4. Non-metro to Metro," "5. Non-metro to Non-metro," and "6. Non-metro to Any/All"). We therefore focus only on the remaining five rural-urban migration flows that experienced the GAMS.

It is clear from the standardized rates of total migration shown in Figure 9 that, where it materialized, the GAMS would have been much more pronounced had only the average migration rate changed over time (see series, "Standardized given change only in migration intensity"). In contrast, had only the average number of migration ties changed over time (see series, "Standardized given change only in migration connectivity"), the GAMS would not have materialized. Thus, in each and every case where the GAMS materialized, it was a *weak* migration slowdown consisting of negative changes in migration intensity and positive changes in migration connectivity. That said, for some periods and types of flows (e.g., see the latter half of the 1990s in the graph, "2. Metro to Non-metro"), the GAMS was temporarily characterized by a *strong* migration slowdown consisting of negative changes in both migration intensity and migration connectivity.

---FIGURE 9 ABOUT HERE---

Decomposition results are presented in Figure 10 for each of the eight types of rural-urban migration flows. Similar to the decomposition results shown earlier in Figure 7 for the United States as a whole, after the early- to mid-1990s, and with clear fluctuations over time, negative changes in migration intensity exerted downward pressure on observed changes in the total migration rate. In contrast, positive changes in migration connectivity exerted upward pressure. Importantly, the magnitudes of these effects have grown stronger in more recent years.

---FIGURE 10 ABOUT HERE---

DISCUSSION

Migration is a marker of the economic health and vitality of the United States. People migrate to capitalize on employment and wage opportunities, to purchase and enjoy residential and recreational amenities, to be closer to family and friends, or for any number of other reasons. From this vantage point, the GAMS is concerning because migration is potentially impeded, which may have important consequences for economic growth and other outcomes. As we discussed at the outset of this paper, prior research has identified some of the key causes and mechanisms involved in the GAMS, including declining real wages and the growth of housing-related debt (Cooke 2013; Frey 2009; Johnson et al. 2017). These studies have also documented heterogeneity in the GAMS across U.S. regions and the rural-urban continuum (Frey 2009; Johnson et al. 2017; Ulrich-Schad 2015).

Building on these studies, and further informed by research on the need to consider the interdependencies and interconnections that exist among places in the United States (Lichter and Brown 2011; Lichter and Ziliak 2017), the primary contribution of this paper is to urge a more spatial approach to the GAMS by examining concurrent changes in both the intensity of migration flows and the connectivity of migration ties among places. In doing so, as we showed for the United States as a whole and across most of the rural-urban continuum, gains in migration connectivity have partially and increasingly offset the GAMS in recent years and decades. The GAMS would therefore have been much more pronounced had U.S. counties not become increasingly connected to one another by migration.

However, this finding should not be interpreted to mean that the GAMS is a relatively mild or less consequential phenomenon. Instead, as we discussed earlier and as future research should continue to pursue, the GAMS, as a *weak* migration slowdown characterized by negative changes in migration intensity and positive changes in migration connectivity, is rooted in widening inequality in and across places, buttressed by economic, political, and sociocultural polarization and partisanship (Cooke 2013; Herting et al. 1997; Kalleberg 2013; McCarty et al. 2016). These dynamics underlie much more than just the GAMS (Wasserman and Flinn 2017), and are likely to be exacerbated in the future. For example, with respect to recent events, a report by the Tax Policy Center (2017) examined the potential distributional effects of the Tax Cuts and Jobs Act, and showed that the benefits of this new legislation will disproportionately flow to those in the highest income quintiles, especially over the longer term.

Given these developments, an important agenda item for future research is to more clearly connect the slowdown in the U.S. migration rate, including component changes in migration intensity and connectivity, to the underlying causes and mechanisms at work in an environment characterized by widening inequality. In their discussion of international migration, Willekens et al. (2016:899) advocated something similar under the banner of "analytical sociology," and the main idea is to more seamlessly connect macro level trends to the underlying dynamics that create and sustain them (Bakewell 2014; DeWaard and Ha 2017). As we suggested earlier, the increasingly selective nature of migration and the emergence of new migration destinations in the United States are two important starting points for this work.

The above observation also raises concerns about the availability, quality, and comparability of U.S. migration data. As we noted earlier, the IRS county-to-county migration data used in this paper are limited in three respects (Gross 2005; Pierce 2015;

Stone 2016). First, they exclude those who do not file a tax return. Second, county-to-county migration flows comprised of less than 10 households are not disclosed. Third, there are serious concerns about the quality and comparability of the most recent data. However, relative to other sources, the IRS data are the best data for the demographic standardization and decomposition procedures employed here, as surveys like the Current Population Survey and the American Community Survey are simply not large enough to capture all annual migration flows between each and every pair of migrant-sending and migrant-receiving counties.

Given the particular suitability of the IRS county-to-county migration data, one option to try and get at some of the characteristics of tax-filing households is to apply for access to use the restricted version of these data[4], which permit following the same households over time (Young et al. 2016). In this way, changes in characteristics of tax-filing households can be linked to aggregate changes in the intensity of migration flows and the connectivity of migration ties as they contribute to changes in the U.S. migration rate. Other data sources might also be considered, with one potential and underutilized option being the Federal Reserve Bank of New York Consumer Credit Panel, which has a large sample of several million credit histories from Equifax and, among other benefits, is available down to the block level and up to the most recent quarter (Lee and van der Klaauw 2010; Whitaker 2014).

Data considerations aside, by providing the first (to our knowledge) demographic decomposition of the U.S. migration rate during the GAMS, we hope that our work will inspire future efforts to take seriously the spatial manifestations of migration slowdown. This ultimately requires using theoretical concepts and empirical methods and data designed to exploit whether and how places are connected to one another by migration. Importantly, as

[4] See https://www.irs.gov/statistics/soi-tax-stats-joint-statistical-research-program.

we showed in this paper, the resulting insights not only make new and valuable contributions to the existing literature, they also help to point to new research directions and frontiers.

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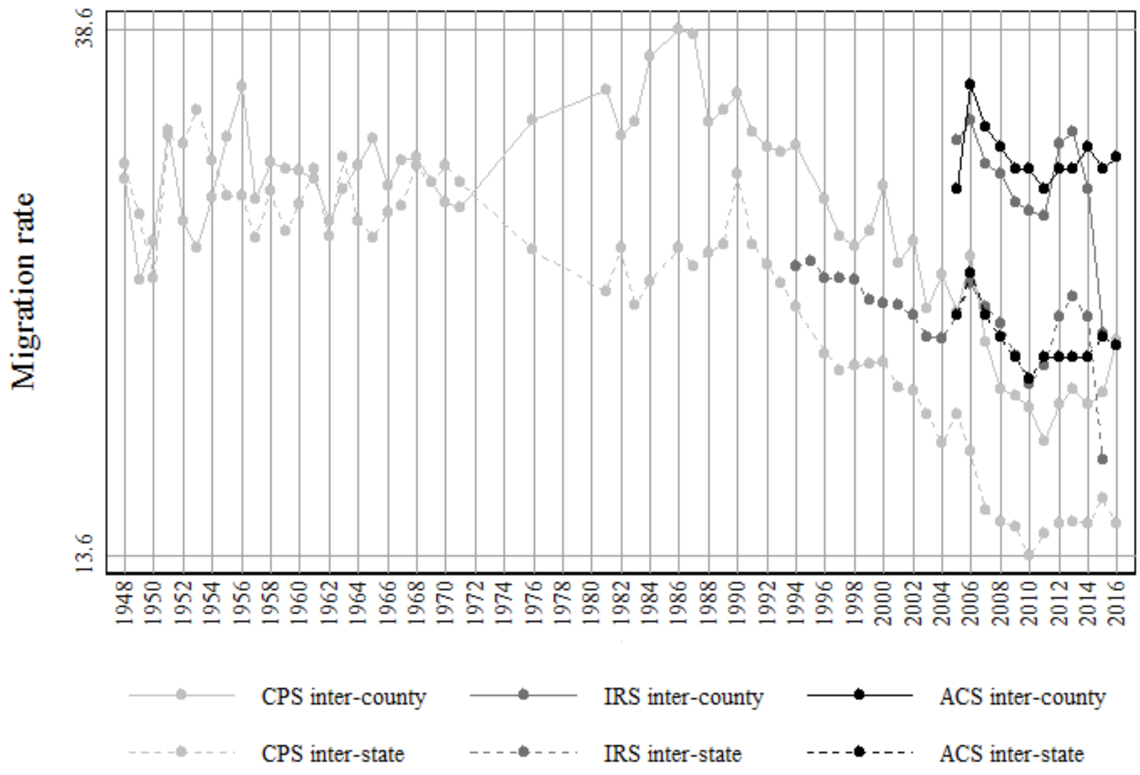
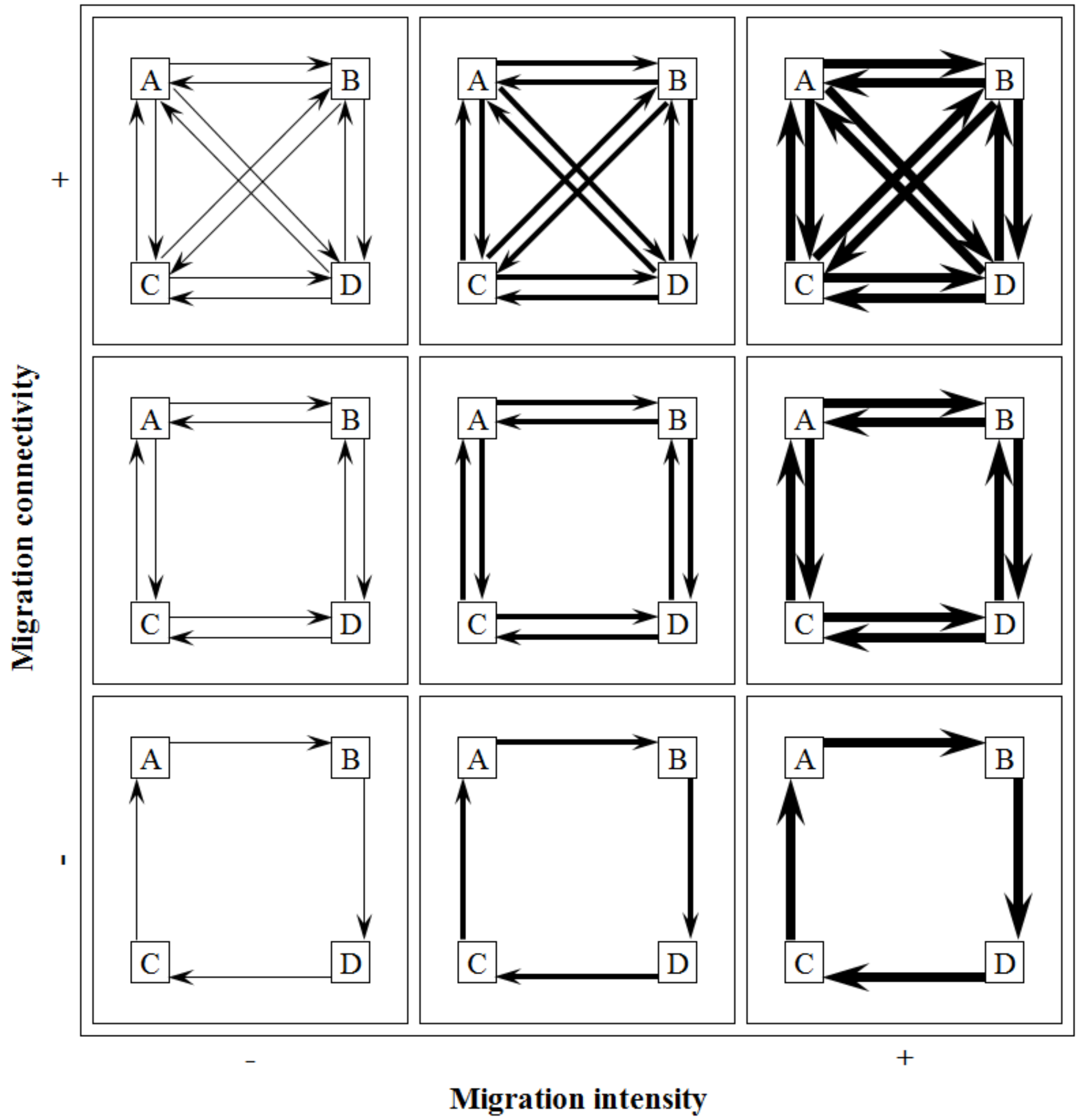
Figure 1. Inter-county and inter-state migration rate: United States, 1948-2016



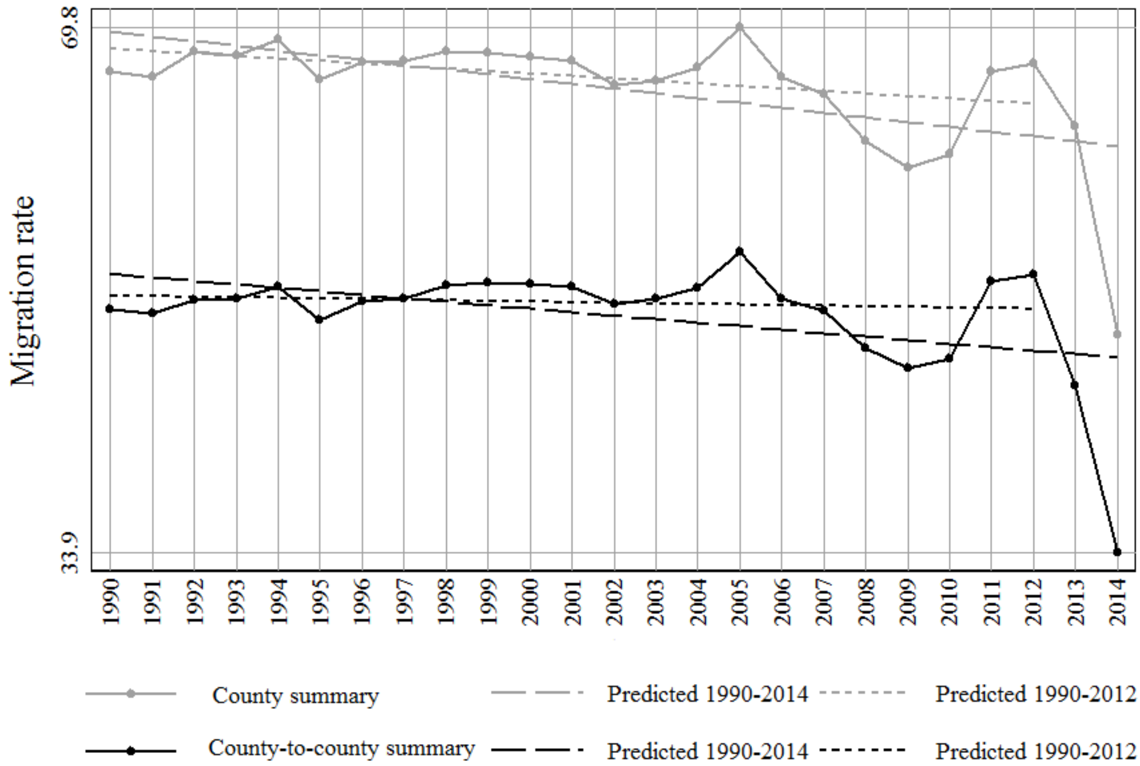
Source: Authors' calculations using data from Stone (2016).
Notes: Migration rate is per 1,000 persons. CPS = Current Population Survey; IRS = Internal Revenue Service; ACS = American Community Survey.

Figure 2. Manifestations of change in migration flows



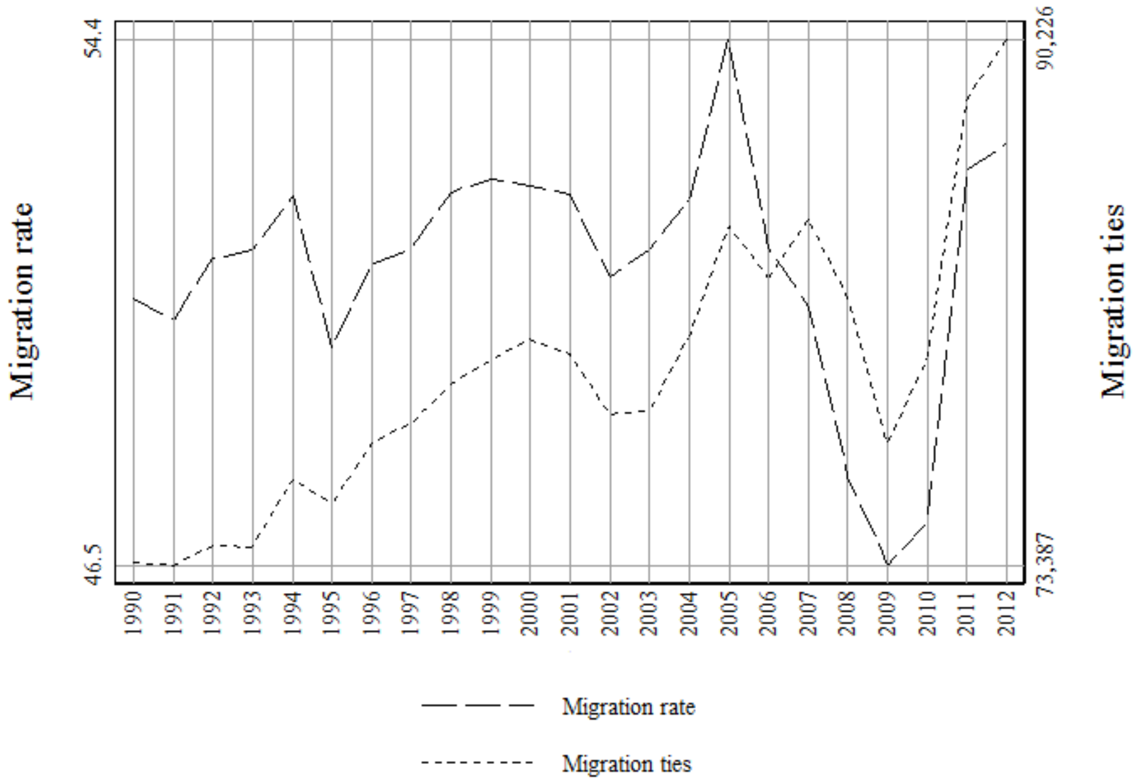
Notes: A, B, C, and D denote places. The width of each arrow denotes the relative size of the migration flow.

Figure 3. Inter-county migration rate by IRS data summary type: United States, 1990-2014



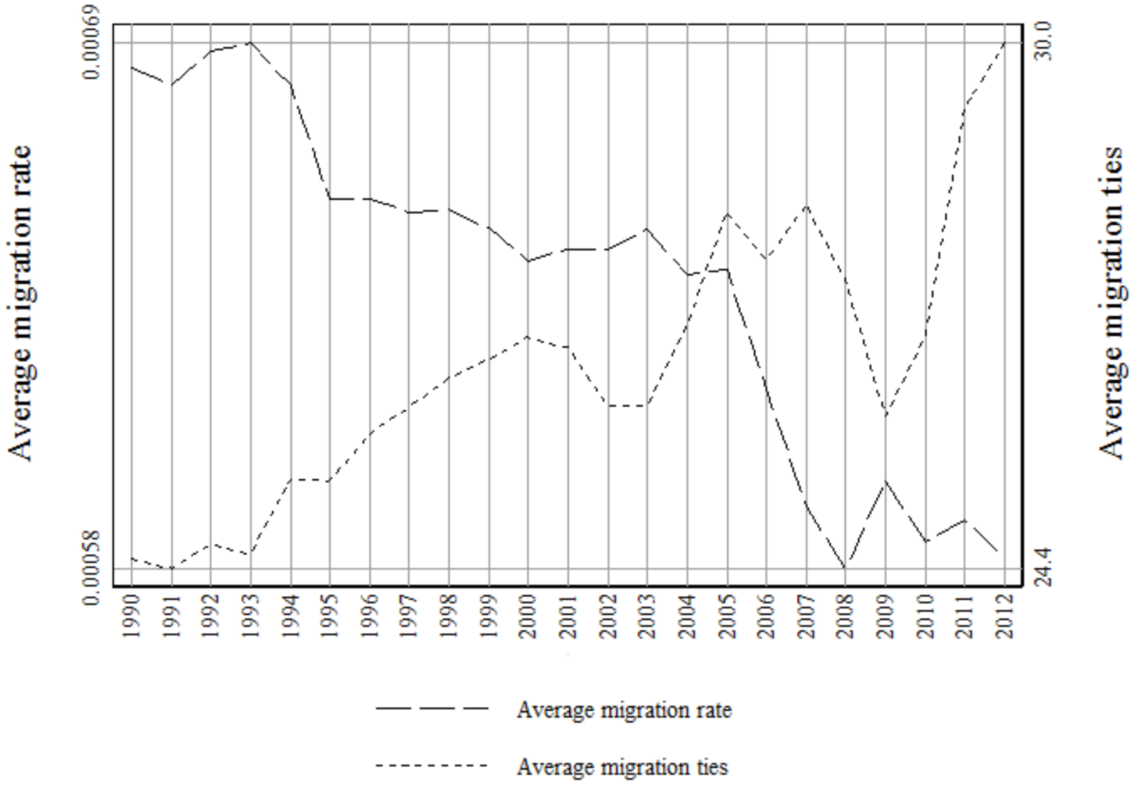
Source: Authors' calculations using IRS migration data.
Notes: Migration rate is per 1,000 households. Year refers to first tax-filing year in IRS migration data. County summaries in the IRS migration data include all inter-county migration flows, but do not disclose each individual origin-destination flow. In contrast, county-to-county summaries were constructed by the authors by summing the individual origin-destination flows, which the IRS only discloses for flows of 10 or more households.

Figure 4. Inter-county migration rate and ties: United States, 1990-2014



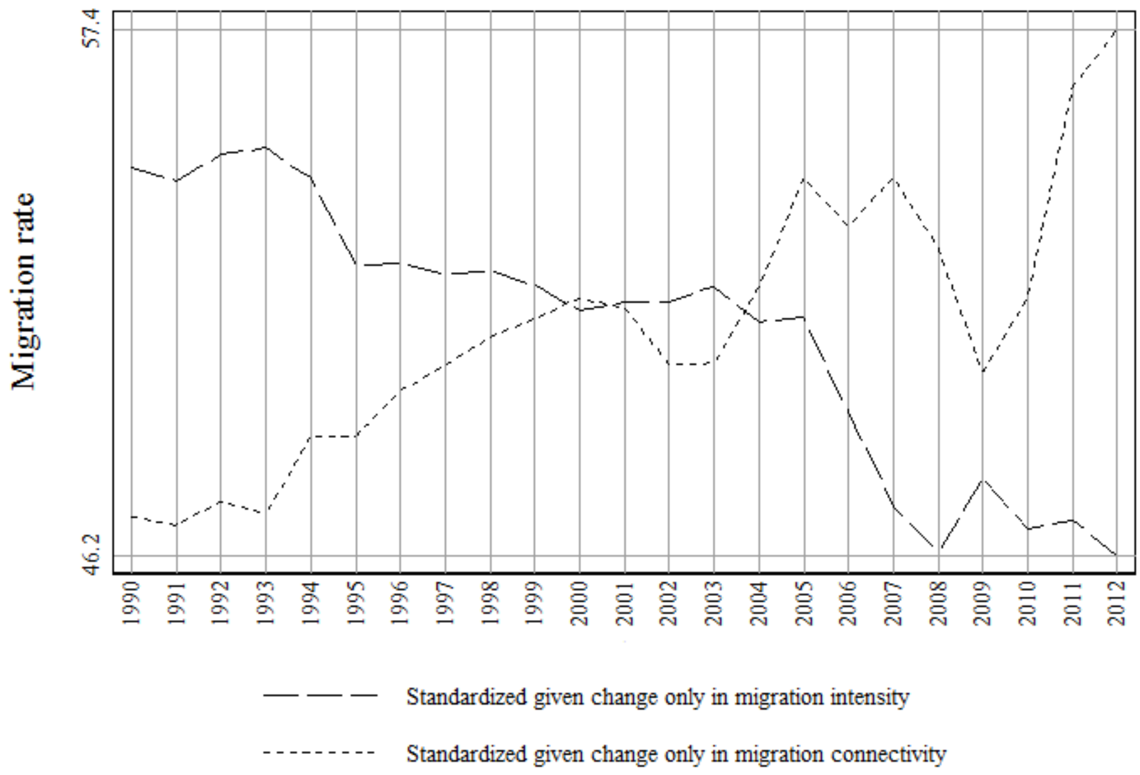
Source: Authors' calculations using IRS migration data.
Notes: Migration rate is per 1,000 households. A migration tie is a directed migration tie, or edge, between one migrant-sending county and one migrant-receiving county. For example, one tie might be the migration flow from Los Angeles County, CA, to New York County, NY, while another migration tie might be the migration flow from New York County, NY, to Los Angeles County, CA. Year refers to first tax-filing year in IRS migration data.

Figure 5. Average inter-county migration rate and ties: United States, 1990-2014



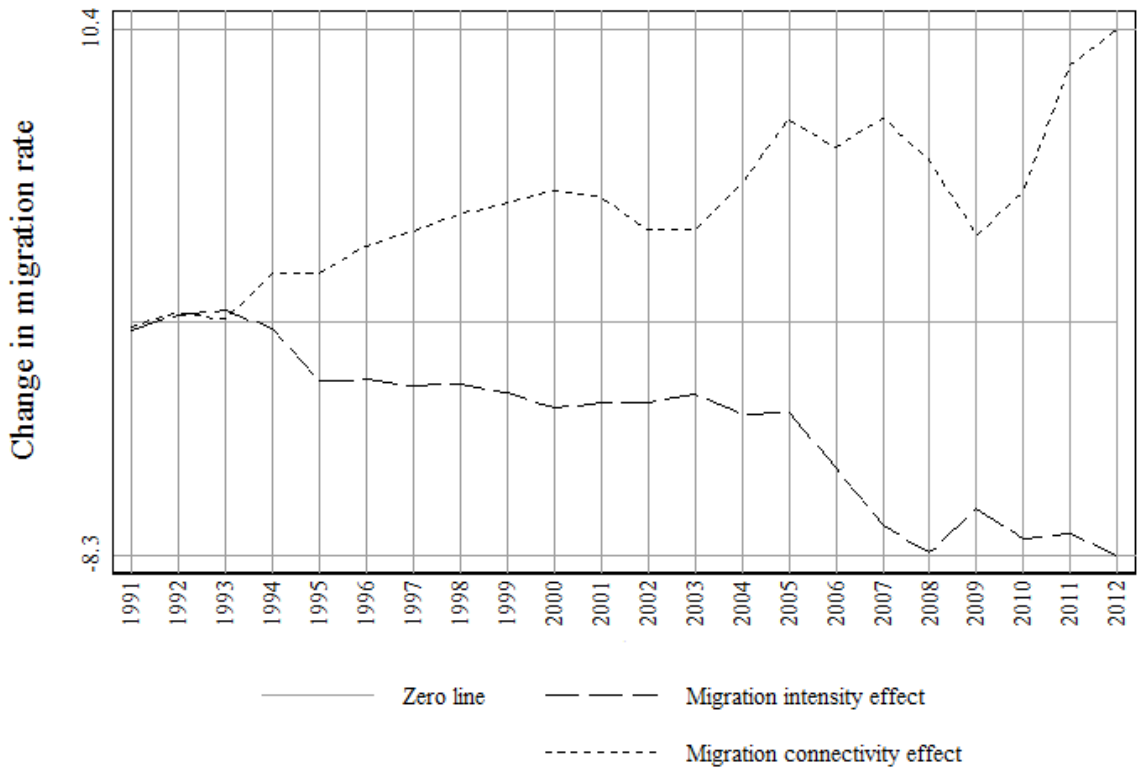
Source: Authors' calculations using IRS migration data.
Notes: Migration rate is per 1,000 households. A migration tie is a directed migration tie, or edge, between one migrant-sending county and one migrant-receiving county. For example, one tie might be the migration flow from Los Angeles County, CA, to New York County, NY, while another migration tie might be the migration flow from New York County, NY, to Los Angeles County, CA. Year refers to first tax-filing year in IRS migration data.

Figure 6. Standardized inter-county migration rate: United States, 1990-2012



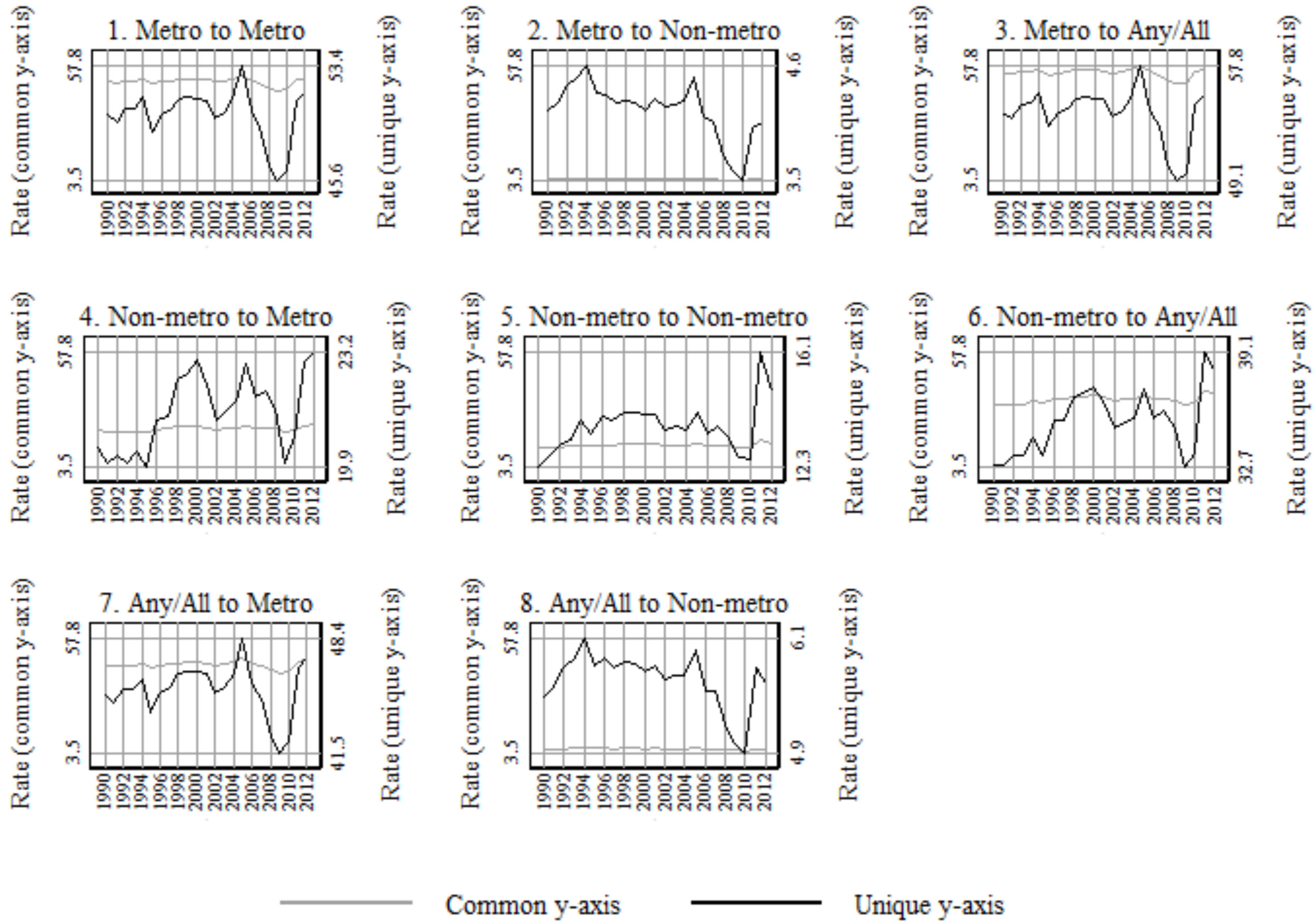
Source: Authors' calculations using IRS migration data.
Notes: Migration rate is per 1,000 households. Year refers to first tax-filing year in IRS migration data.

Figure 7. Change in standardized inter-county migration rate: United States, 1991-2012



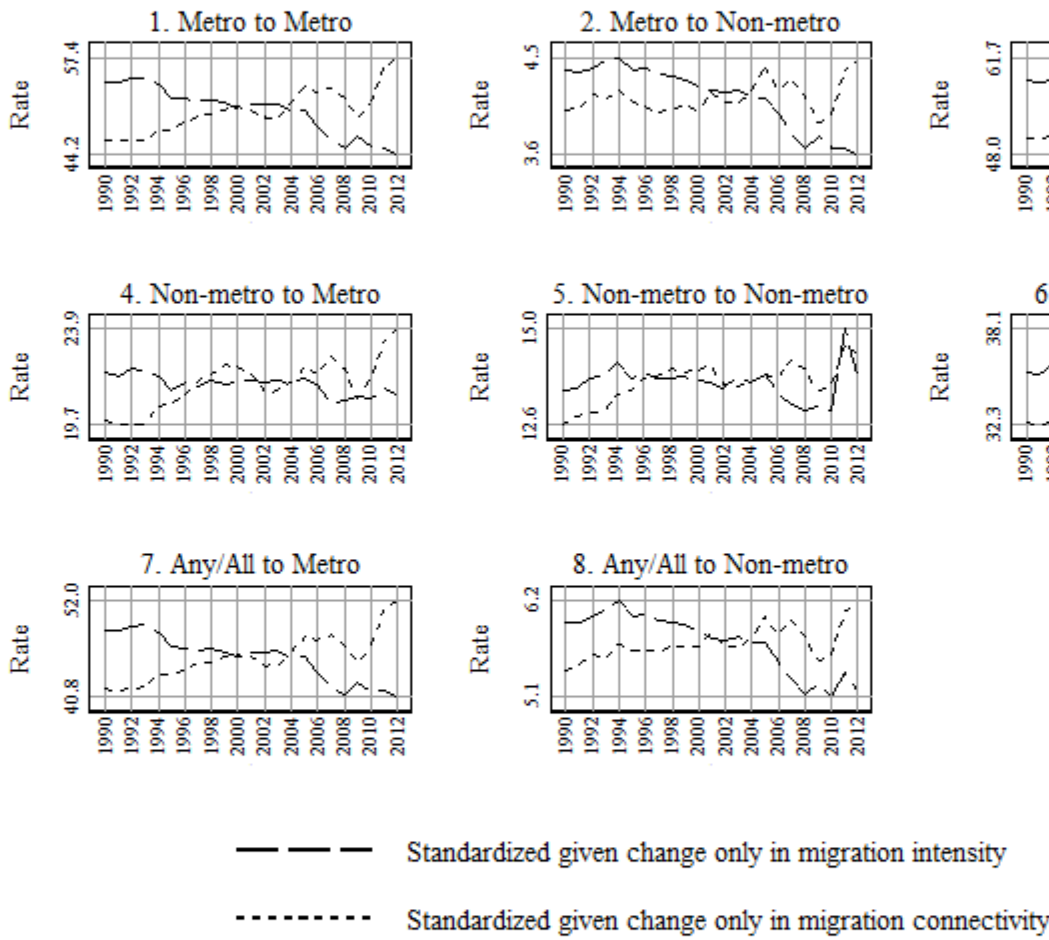
Source: Authors' calculations using IRS migration data.
Notes: Migration rate is per 1,000 households. Year refers to first tax-filing year in IRS migration data. Reference year is 1990.

Figure 8. Observed inter-county migration rate: United States by metropolitan status, 1990-2012



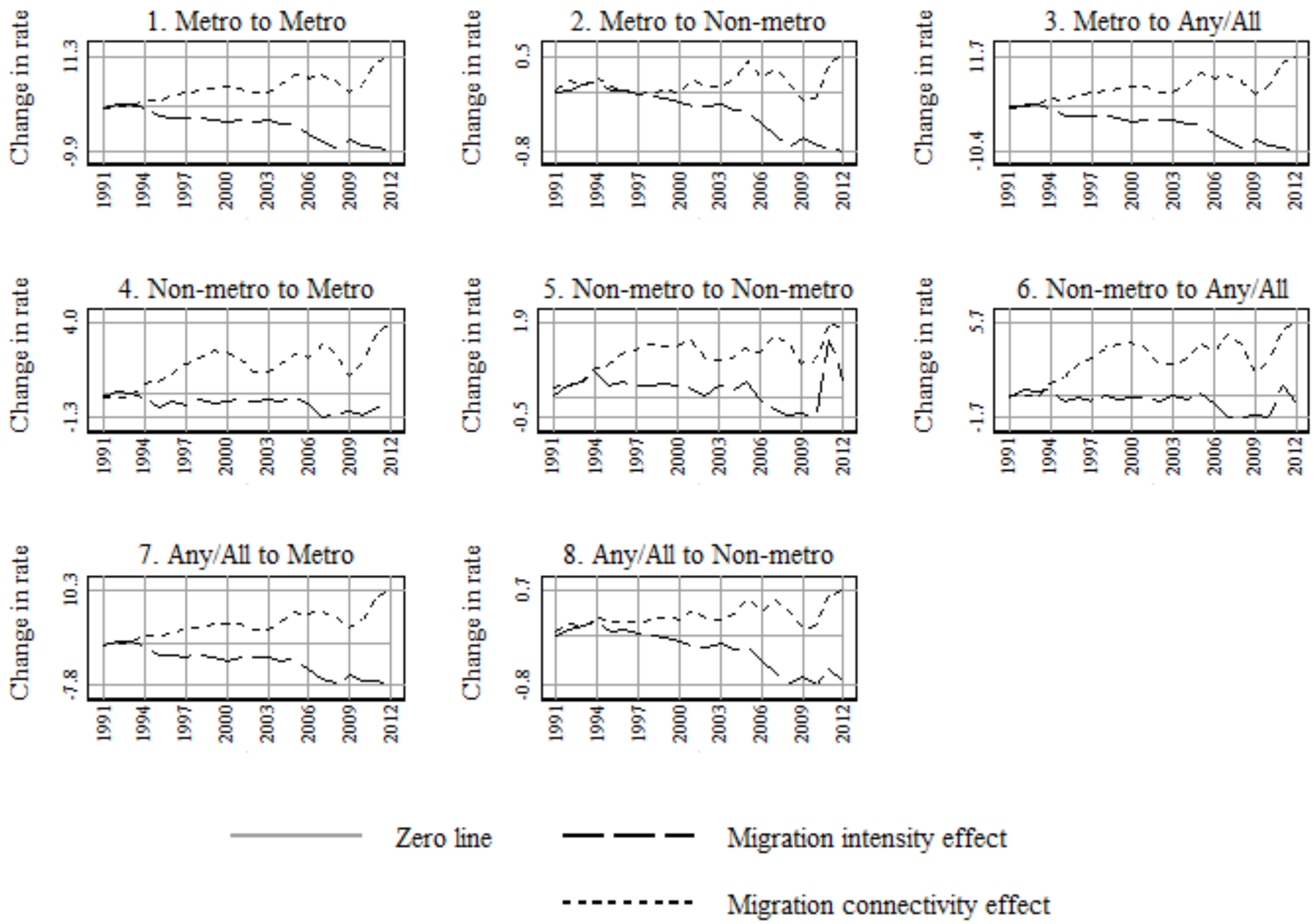
Source: Authors' calculations using IRS migration data.
Notes: Migration rate is per 1,000 households. Year refers to first tax-filing year in IRS migration data.

Figure 9. Standardized inter-county migration rate: United States by metropolitan status, 1990-2012



Source: Authors' calculations using IRS migration data.
Notes: Migration rate is per 1,000 households. Scales of *y*- and *x*-axes differ across panels. Year refers to first tax-filing year in IRS migration data.

Figure 10. Change in standardized inter-county migration rate: United States by metropolitan status, 1990-2012



Source: Authors' calculations using IRS migration data.
Notes: Migration rate is per 1,000 households. Scales of *y*- and *x*-axes differ across panels. Year refers to first tax-filing year in IRS migration data. Reference year is 1990.