Moving West:
Who Moved to California in the 1930s, Where They Came From, and Why We Think They Moved

Myron P. Gutmann*
Kerri Clement*
Dylan Connor***
Angela R. Cunningham*
Jeremy Mikecz**

*University of Colorado Boulder
**University of Southern California
***Arizona State University

Draft Paper prepared for the Annual Meeting of the Population Association of America
Austin, April 2019

*****Note: September, 2018 Draft. A Revised Version will be Available later*****

Moving West: Who Moved to California in the 1930s, Where They Came From, and Why We Think They Moved

Abstract

This paper is about the people who moved to California between 1935 and 1940, asking questions about who they were, where they came from, and how migrants to California differed to people moving elsewhere. Much of the lore of migration in this era focuses on people leaving the drought-stricken southern U.S. Plains to work in cotton and vegetable fields in California. Despite the historical endurance of this image, significant numbers of people were leaving large cities to move westward, and rapidly growing cities in California were attracting more people than their hinterlands. The precise nature of these migration dynamics are crucial to understanding the development of California and the changing demography of the United States in the 1930s.

The paper makes use of data from the digital full-count version of the U.S. Census of 1940, made available by the IPUMS project at the University of Minnesota, which asked where people enumerated in 1940 had lived five years earlier, in 1935. The main findings of this paper are that while migrants to California resembled their counterparts moving elsewhere, they were disproportionately young, white and less educated, and were more likely to originate in areas affected by drought. This paper concludes that the environmental shocks of the 1930s interrupted the longer-term system of migration that built modern California by temporarily shifting its population to one that was younger, less-well educated, and more agricultural in origin.

Acknowledgements

This research has benefited from research, administrative, and computing support provided by the University of Colorado Population Center (CUPC; Project 2P2CHD066613), funded by the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD). The content is solely the responsibility of the authors and does not necessarily represent the official views of CUPC or NICHD.

Moving West: Who Moved to California in the 1930s, Where They Came From, and Why We Think They Moved

Introduction

Migration to California is one of the persistent refrains encountered in both popular and academic works about the history of the 1930s. The reason for this is simple. In literature and the arts, images of that migration are very well known, whether they be Steinbeck's *The Grapes of Wrath* (Steinbeck, 1939), or the photographs taken by the employees of the Farm Security Administration, such as Dorothea Lange in her classic photographs of impoverished migrants (O'Neal & Collier, 1976). Those themes are accurate, but understudied with a critical lens. While there has not been a large volume of research about migration in the 1930s in general, general knowledge about the era's migration confirms that California was the single most important destination for the decade's migrants.[1] Table 1 (total immigrants by states between 1935 and 1940) and Table 2 (net migrants by state between 1935 and 1940) show that simply. No matter which way one looks California was the destination of choice, with nearly three times as many total immigrants, and four times as many net migrants as the next most popular state.

[Table 1 and Table 2 About here]

We know these details about migration in the United States between 1935 and 1940 because the Census asked respondents in the 1940 Census (enumerated in April of that year), exactly where they lived five years earlier, in April of 1935. Enumerators were required to ask the name of the town, county, and state where each person had lived five years earlier, whether they were living in a place of fewer than 2,500 inhabitants (indicated as "rural"), whether they were living on a farm, and if they were still living in the same county, whether they were living in the same house or same "place" as they had previously. We are able to analyze these responses in detail because the University of Minnesota's IPUMS project has released digital data files for the 1940 Census of Population (Ruggles, 2014; Ruggles, Genadek, Goeken, Grover, & Sobek, 2017).

Table 3 contextualizes the overall migration picture, demonstrating that that the second half of the 1930s was not a time of high volume migration, at least when compared to the United States in other decades in the twentieth century (Rosenbloom & Sundstrom, 2004). Migration in the 1930s is worthy of study despite the relatively small rate of migration because of the importance of both the perceptions of migrant flows and the significance of the environmental

[1] For migration to California specifically, see Bogue and Hagood (1953), Thompson (1955), McWilliams (1942), Johnson and Arpke (1941), and Gregory (1989). For migration in the 1930s more generally, see Gutmann et al. (2016), Boustan, Fishback, and Kantor (2010), Boustan, Kahn, and Rhode (2012), Fishback, Horrace, and Kantor (2006), and Rosenbloom and Sundstrom (2004)

and economic drivers of that era, and in the case of this research, the impact of westward migration – especially to California – in the twentieth century. Of 116.5 million Americans over five years of age living in the States (not including territories such as Alaska, Hawaii, and Puerto Rico) in 1940, and for whom we know a place of residence five years earlier, 5.6 percent had moved between counties within a state between 1935 and 1940, 4 percent had moved from state to state, and a very small number (less than one percent) had moved to the U.S. from another country. There were more migrants, whose number we do not estimate here, who moved from one place to another within a county. We do not report their numbers because enumerators were not always consistent in recording moves within a county, so we do not believe that estimates are sufficiently accurate. We base our analysis only on individuals who moved at least as far as the boundaries of a county.

[Table 3 About here]

These data allow us to undertake a wide variety of analyses, and to show the movement to California spatially, as we do in Figure 1, which maps migration trajectories for individuals who moved to a metropolitan area between 1935 to 1940. In most of the country, as we might expect, metropolitan areas drew from a network of nearby counties, with most people going to the nearest metro area or one not very far away. These patterns look like small octopuses in the map. On the other hand, for much of the western United States, where metropolitan areas were small or distant in 1940, there was a different pattern, one where people went to west coast cities: Seattle, Portland, San Francisco, and especially Los Angeles. Other major cities -- especially Minneapolis, Chicago, Detroit, and Miami -- drew from large areas because of the lack of competing metro areas or their special economic strength, but visually nothing competes with California. Figure 2 tells a similar story. In this map, we show migration trajectories, but do not limit them to metropolitan destinations. The map is more distributed, but the California preference persists. It was a major destination, when most migration was predictably local.

[Figure 1 and Figure 2 about here]

This paper is about the people who moved to California between 1935 and 1940. Who were they? Why did they move, and how did they differ to people moving elsewhere? In addition to their personal characteristics, we are interested in where they came from and the characteristics of those places, especially if they migrated from regions where the weather in the 1930s was especially bad, as well as where they went in California. Much of the lore of migration to California is about people from the drought-stricken southern U.S. Plains going to work in cotton and vegetable fields, but as we will show, there were significant streams of migrants from other regions, including cities, and more people moved to California cities than to rural counties. Understanding those migration decisions is essential to understanding the development of California and patterns of migrations in the 1930s. Moreover, the issues raised by our study of California go beyond California itself, and even the 1930s, to broad issues of social and demographic change in the U.S. in the twentieth century, and to the impact of environmental shocks on migration, a topic of interest around the world today.

Migration theory tells us that people move for a variety of reasons, a mix of pushes and pulls. There is a rich literature that explains migration, both theoretically and empirically, and we do not explore that literature deeply in this paper. We have written about it elsewhere (Gutmann et al., 2016; Gutmann et al., 2017), with more attention to theory, and the overall literature is easily accessible. What is important for this paper is to understand which of the attributes of individuals are meaningful for the study of migration, and how different origin and destination locations play a role. For understanding the characteristics of individuals, our research is influenced by the idea first raised by Roy (1951) that migrants self-select for upward mobility, as well as work by Borjas (1987) and Kanbur and Rapoport (2005) that emphasize skills, especially education.

We also draw upon Migration Systems Theory, especially as it is reflected in studies of disasters, to understand migration in the 1930s (Bakewell, 2013; Black et al., 2011; Fussell, Curtis, & DeWaard, 2014; McLeman, 2013). One of the most important lessons to be learned from recent studies of disaster-related migration that make use of the migration systems approach is the importance of understanding the pre-existing migration system. The basic migration system that operated in the U.S. during the first half of the twentieth century was complex, involving a mix of local and long-distance moves, some rural-to-rural, some rural-to-urban, and some urban-to-urban. Our sense is that there was a significant economic and psychological cost of rural-to-urban, urban-to-rural, and longer-distance moves, which privileged shorter distance moves and moves that kept individuals and families in comfortable settings by preserving their rural or urban experience.

Based on those general observations of the migration system, we speculate that there were three important migration sub-systems that existed independent of the economic and environmental shocks of the 1930s. First, there was one primarily made up of a steady stream of strictly local moves that reflect a constant movement dynamic where people search for a better place to live or work, but do not move far. Second, there was one that was made up of longer-distance moves from rural areas to rural and metropolitan regions where a life-transforming resettlement is possible. Finally, there was a third migration sub-system made up of long-distance moves from one metropolitan area to another. This paper is an effort to untangle those three patterns while also attempting to understand the role of personal characteristics -- especially human capital -- in driving migration in the 1930s.

The widely known story of migration in the 1930s that we began by writing about derives much of its impact from the sense that the intense environmental shocks of the era (Cook, Seager, & Smerdon, 2014) had a disproportionate impact on agricultural communities, and through that, on migration away from the areas that were most seriously affected. Moreover, that story also suggests that the opportunities perceived to be available in California -- especially in agricultural employment -- made the state a particularly attractive destination. This vision associates migration with poverty and environmental hardship, and suggests that the core migration system would be mostly altered by the movement of people with low economic and human capital making their way to places like California with relatively open opportunities for

people whose best chance was working in agriculture. We can formulate this as a first set of hypotheses:

- People from regions disproportionally affected by the environmental and agricultural shocks of the 1930s were more likely to move, and particularly to California, than their counterparts in other regions.
- People moving from environmentally distressed regions to California would tend to have lower levels of human and financial capital, as we would expect these people to be most adversely effected by poor environmental conditions in their origin communities.

At the same time, we expect much of the core migration system to stay intact, so that most migration would take place over relatively short distances, and that the attraction of places like California for people with relatively large endowments of human and financial capital would continue. We can articulate this as a second set of hypotheses:

- Despite the impact of the environmental shocks and economic development in the 1930s, most migration still took place within a system where moves were as short as possible, and short moves were more likely to take place than longer moves.
- The growth of the California economy during the first half of the twentieth century made the state attractive for immigrants with relatively high levels of human and financial capital, which was sustained despite economic and environmental shocks elsewhere.

Migration induced by environmental or economic shocks rather than the pull of opportunity in California may have had implications for the human capital composition of the Californian labor force. If, for example, migrants leaving drought stricken regions for California had lower levels of human capital than the typical migrant and worker in California, these in-migrants may have reduced the average level of human capital among migrants and workers in California. We test for such effects by examining whether the skill-level of the Californian labor force likely improved (brain gain) or declined (brain drain) with the human capital composition of various in- and out-migration flows to California in this period.

We can see the importance of the environmental shocks in Figures 3, 4, and 5, all with maps of data at the scale of the county. Figure 3 includes maps of precipitation and temperature in 1934, as a percentage of the 21-year average from 1920 through 1940. It shows just how hot and dry the country was in that year, as well as the concentration of heat and drought in the western U.S., and especially in the central U.S., mostly the Great Plains. Figure 4 shows the extent of the impact of heat and drought on U.S. agriculture by displaying the percent of cropland where crops failed in 1934, based on data reported in the 1935 Census of Agriculture (Haines, Fishback, & Rhode, 2014; U.S. Bureau of the Census, 1935). The areas with the largest crop failures echo many of the areas with the least rainfall and the highest temperatures in that year. Finally, Figure 5 displays the percent of the estimated 1935 population that migrated out of each county between 1935 and 1940, along with approximate areas of the great Dust Bowl cycles of the 1930s, drawn from Cunfer (2005). Figure 5, when taken in context with Figures 3

and 4, supports the notion that there is considerable but not perfect alignment between places that had the worst agricultural outcomes in 1934 and places that lost the largest percentages of their population between 1935 and 1940. These findings, at the scale of the county, are the core results in Gutmann et al. (2016).

[Figures 3, 4, and 5 About Here]

Our goal in this paper is to move beyond the drivers of out-migration and begin to think about the processes that led individuals to move to certain destinations. Following work we reported in Gutmann et al. (2017) we rely primarily on the characteristics of individuals. The kinds of data we have are far from perfect for the process we want to understand, because our knowledge of people's characteristics before they move are less adequate than we would like. What we know that is important is where they were born (and whether they had moved between birth and 1935), how old they were, whether they already had children, and their level of education, in addition to characteristics of the places that they lived in 1935, especially how large a place they lived in and its agricultural characteristics. We do not know more than that, especially important information for migration studies, such as their marital status (or occupation or another indicator of socio-economic status beyond educational attainment) in 1935, which would be very informative for our analysis. Despite these gaps, the data that are available tell us a lot about the people who lived in the U.S. in the 1930s, their core attributes, their human capital (measured as educational attainment), and the characteristics of the places that they lived in 1935.

Data and Methods

Data

The data for this paper are drawn from the full-count digital version of the 1940 census produced by the University of Minnesota (Ruggles et al., 2017). We describe our procedures for working with these data in Gutmann et al. (2016) and Gutmann et al. (2017). The basic data include all the variables from the 1940 census of population. To them, we have added select characteristics of the counties in which each individual lived in 1935, mostly drawn from the 1935 U.S. Census of Agriculture. We have also followed the work of Fishback and his colleagues (Fishback et al., 2006; Fishback & Kantor, 2003) in consolidating counties where boundaries have changed, where census records are inconsistent, or where imprecise nomenclature makes interpretation challenging (Gutmann et al., 2016). This is the case for a small number of county boundary changes during the 1930s, for the particular issue of Virginia counties where cities are independent in some records, and for places like New York City and St. Louis, Missouri, where city and county names can be ambiguous.

Methods

We bring two ways of looking at migration during the 1930s to the fore in this paper. For one, we concern ourselves with the trajectories that migrants took both before 1935, and between 1935 and 1940, and it encompasses the decision to move to California. It is largely about the paths that migrants took, and the places that they started from or stopped along the way. The analysis we use is descriptive and often makes use of visualization techniques to show migration processes graphically or cartographically.

For the second, we look systematically at who went to California, as opposed to going to another state, as a function of their characteristics of the place they came from. We are also interested who went to metropolitan counties in California, rather than going to their more rural and non-metropolitan counterparts. Although the structure of our data is slightly different from those used in other recent migration studies using linked samples (Abramitzky, Boustan, & Eriksson, 2012; Collins & Wanamaker, 2014), we model migrant selectivity and its determinants in a similar fashion to other recent studies of historical migration. We model migration decisions using a series of binary logistic regression models to test whether migrants and non-migrants differed in their personal characteristics and in the characteristics of their origin counties. These logistic regression models take the following form:

$$\ln\left[\frac{Y}{1-Y}\right] = \beta_0 + \Sigma_{k=1\ldots K}\beta_k X_k \quad (1)$$

where Y refers to the probability of an individual being resident in the same US county in 1935 and 1940. We report these results as logits, where positive values are associated with greater propensity to migrate and negative values suggest that migration was less likely. Thus, β_k can be interpreted as the change in the logit of an individual moving county associated with a one-unit change in the k^{th} independent variable. We extend these models to include a set of interaction terms between the characteristics of the 1935 county of residence and education – our primary measure of individual-level selectivity. With these models we can assess how the effect of education on migration varies across different contexts. Although our measure of education is measured in 1940, the consistency of our results across different age groups suggest that our main conclusions are unlikely to be seriously biased by post-migration educational attainment.

Results

Migration Trajectories

Returning to Table 3, we see the regional distribution of migration, based on region of origin in 1935. The table reports migration outcomes by a set of regional areas (groups of states), dividing the population by those who stay in their 1935 county of residence, those who leave their county but stay in the same state, and those who move out of state or out of the country. The regional categories we use here are displayed in Figure 6. They do not conform with the

conventional regional divisions used by the U.S. Census (Figure 7), which are less useful for the kind of analysis we are doing because they do not capture either environmental, social, or economic regions of the U.S. in a valuable way. We believe that the simple set of alternative regional categories we defined better identify environmental regions as well as allow us to differentiate regions within the west better than the established categories.

[Figure 6 and Figure 7 about here]

The results in Table 3 highlight variation in migration at the regional level. The overall level of migration -- as measured by absolute numbers -- is greatest in the Midwest and the south central region, a reflection of the size of those regions (especially Texas and Illinois), combined with the impact of economic and environmental stress on agricultural success in some places. At the same time, the lowest levels of out-migration were for people who started out in one of the three eastern regions, while the highest proportion migrating to all locations in the U.S. were originating in the southwest (New Mexico, Colorado, Arizona, Utah, and Nevada) and especially the northern plains and mountain states (Nebraska, the Dakotas, Montana, Wyoming, and Idaho).

We see the importance of the northern plains and mountains, the southwest, and the northwest (Washington and Oregon) regions for understanding migration in the 1930s -- especially to California -- in Table 4 and in Figure 8. In Table 5 we show the number of California immigrants from each region of the country, as well as their percentage of the region's estimated population in 1935. While the largest number of migrants came from the South Central and Midwest regions, the largest proportions came from the Southwest, the Northwest, and the Northern Plains and Mountain states. Figure 8 shows the migration trajectories from place to place (county or metropolitan area) where California was one of the top two destinations for people leaving that place. What we see is that a California immigrants came from virtually all of the major metropolitan areas of the U.S., plus almost everywhere else west of the Mississippi.

[Table 4 and Figure 8 About Here]

Distance plays an important role in all this, and we will show later that the likelihood of coming from the Northern Plains and Mountain states is greatest if we take the distance traveled into account. We can visualize this in Figure 9, which shows the 15 largest migration trajectories between 1935 and 1940. This adds interesting information to what we learn from the tables: it shows the general prevalence of moves to the west, allowing us to see that beyond migration to California there was also significant migration flows to the Northwest (Washington and Oregon), and to the Southwest (Colorado, New Mexico, Arizona, Utah, and Nevada). Figure 8 also allows us to see two other interesting flows: one from the Northeast to the Southeast (mostly migration to Florida), and a second migration from the Northern Plains and Mountain States to the Southeast and South Central (mostly migration to Florida and to the Washington, DC area).

[Figure 9 About Here]

In Table 5 we show the number and percent of population migrating at the scale of the state for the ten states that sent the most migrants to California between 1935 and 1940, and here the picture clarifies in important ways. The largest migrant-sending states are a diverse group, including large, populous states (New York, Illinois, Texas), nearby states (Washington and Oregon), but also states strongly affected by the drought of the 1930s: Missouri, Kansas, Nebraska, Colorado, and especially Oklahoma, which sent more than three percent of its estimated 1935 population to California by 1940. This last group of states includes a number of the places that experienced the most significant environmentally-driven migration in the 1930s, led in percentage terms by Oklahoma and Colorado, along with Oregon, a state with a challenged natural-resource economy because of the shrinkage of construction during the 1930s, and because of its proximity to California.

[Table 5 About here]

Thus far we have been looking at migration flows between 1935 and 1940, but our data offer another way to look at migration, taking advantage of the fact that the census record enumerates state of birth in addition to place of residence in 1935 and 1940. State of birth is much less detailed than the locations available by knowing place of residence in the census, but it still gives us an interesting way to think about lifetime migration trajectories. We can see lifetime migration flows in Figures 10, 11, and 12, which are alluvial diagrams showing the lifetime residence patterns of all U.S. resident adults in 1940, excluding those who were living in group quarters. In these diagrams, the horizontal areas on the left are places of birth, those in the middle are places of residence in 1935, and those on the right are places of residence in 1940. We begin in Figure 10 by showing the lifetime experience of all U.S. adults in 1940. One of the main (but not surprising) implications of this analysis is that very few adults in 1940 had been born in the western U.S., including California or our Northwest or Southwest regions. A second finding is that most people stayed in their region of birth, again something that is not surprising. A third finding is that most international migrants started their U.S. experience in the Northeast or Midwest.

[Figure 10 About Here]

Figure 11 allows us to focus in on people who had migrated by looking only at U.S. adults in 1940 who had at least one lifetime move (either from birth to 1935 or from 1935 to 1940). Because all people born outside the U.S. meet this criterion, they constitute a large fraction of the individuals in this figure, one that is dominated in any event by migration from birth to 1935, with the main streams coming from international and going to the Northeast, Midwest, and California. Figure 12 focuses still further, limiting the 1940 destinations to California, the Northeast, and the Midwest. One conclusion is that there is much more migration from birth to 1935 than from 1935 to 1940. Looking only at those flows, and if we concentrate only on California arrivals by 1935, we see three major sources of migrants to California when viewed this way: those coming from international origins, from the Midwest, and from the South

Central region, with the Northeast fourth but far behind. When we move on to 1940 arrivals, we see the relative stability in migration in the 1930s that we have written about earlier. In this context, we see less migration, and the patterns are harder to discern.

[Figures 11 and 12 About Here]

Despite the suggestion in *The Grapes of Wrath* (Steinbeck, 1939) and other sources of information about migration flows destined for rural California, the evidence from the 1940 Census points in a different direction. Table 6 divides California immigrants from other states by the metropolitan status of their origins and destinations. It shows that more than four times as many California immigrants went to metro counties as went to non-metro counties. When we divide them by origin status we see that roughly the same number of California immigrants came from metro as non-metro origins (less than 10% more from metro than non-metro), but almost all the metro-origin immigrants went to metro California, and more than two-thirds of California immigrants with non-metro origins also went to metro California. Even if we acknowledge that the metropolitan counties of California still had lots of agriculture, the data are striking.

[Table 6 About Here]

Figure 13 allows us to take this analysis one step further, by looking at the distribution of California immigrant origins by region and origin metro status. It shows three distinct regional patterns. The large body of immigrants from the South Central and Northern Plains and Mountain regions were mostly non-metro at origin. At the other extreme were migrants from the Northeast and Midwest, who were overwhelmingly metro. In the middle were migrants from the Southwest, Northwest, Southeast, and East Central, who were more evenly divided. This confirms a view of migration to California that again should not be surprising. There were migration flows that reflected the urban industrial status of the Midwest and Northeast, and migration flows that reflected the largely agricultural character of the central part of the U.S., with its difficult weather in the 1930s, both of which drove migration to California.

[Figure 13 About Here]

Regression Results

We display our basic regression results in Table 7, which estimate the likelihood of an individual who did migrate moving to California as opposed to moving to another state. The regression models are progressively more complex, beginning with a simple model that includes only age, race, sex, estimated number of children, and education, and then adding amount of crop failure in 1934, then urban status and distance between Los Angeles county and the region (as defined in this paper), and finally the region from which the person emigrated. The analysis is limited to people who moved between 1935 and 1940, who were between 26 and 65 years old in 1940, and who lived outside California in 1935. We look at migrants within California in some of our later models.

[Table 7 About Here]

Table 7 builds on findings from our earlier research (Gutmann et al., 2016), but focuses on the decision to move to California. The core demographic controls show that younger people were more likely to move to California than older people (although the relationship is not linear, as the Age-squared variable indicates), that white people were more likely to move to California than non-whites, that men were more likely to move to California than women, and that adults with more children were less likely to move. The role of educational attainment in this analysis is interesting, because it suggests that after controlling for other individual and locational attributes, people with lower educational attainment (grade school or high school) were more likely to move to California than to another destination, when compared with those with a college education or higher.

We can see the impact of environmental conditions explicitly in Model 2 of Table 7, which adds a variable based on crop failure in 1934, as recorded in the 1935 Census of Agriculture. The crop failure variable in the census is relatively simple: it measures the number of acres of cropland in each county where crops failed during the year prior to the census. For this analysis we have converted the percent of cropland with failed crops into a categorical variable: low crop failure (the lower third of the crop failure distribution), medium crop failure (the middle third of the distribution), and high crop failure (the top third of the distribution and the reference category). Adding crop failure improves model fit, and confirms that there was more migration to California from counties with the most crop failure. This finding holds even when we add additional covariates, confirming one part of our understanding of migration in the 1930s, and especially migration to California: the primary driver of migration may have been poverty. The third and fourth models in Table 7 add other characteristics of origin regions. Migrants from an urban county (defined as a county with an urban population of 50,000 or more) were more likely to move to California than elsewhere, even when controlling for distance: those closer to Los Angeles County were more likely to move to California.

The model described in the last column of Table 7 adds the region in which people lived in 1935, which allows us to understand the specific influences of regions, but it does not report the coefficients for those variables, which largely show the patterns we have already seen, fokr example in Figure 8: People from the Southeast and East Central regions were the least likely to move to California. Those from the Southwest, South Central, and especially the Northern Plains and Mountain states were most likely to move, even when controlling for distance. And the Northeast, Midwest, and Northwest fell into an intermediate category.

The underlying processes embedded in the interaction between distance (people who were closer in 1935 were more likely to move) and region (some regions were more likely to produce migrants to California) are evident in the histogram of migration distances in Figure 14. The peak migration distance was about 2,000 kilometers from Los Angeles, which would be a line through Dallas, Texas, that includes eastern Oklahoma, Kansas, and Nebraska, and Central South Dakota. East of that line levels of migration fell of, partly a function of distance, but also a

measure of the higher level of migration from regions to the west of the line, which encompasses most of the areas with the worst environmental conditions in the 1930s.

[Figure 14 About Here].

We add a different kind of complexity in Table 8, which looks at the interaction between distance and educational attainment (Table 8, Model 2) and urban origin status and educational attainment (Table 8, Model 3) as determinants of migration to California. The interaction between distance and education is the more interesting model, because by introducing those interactions we see two things: the coefficients for the first-order education variables increase, suggesting that without the interaction with distance those with lower educational attainment were more likely to move. The interaction terms are significant and have signs in the opposite direction of education as a main effect, suggesting that although the less educated were more likely to move all else being equal, as distance increased those with more education were more likely to move, perhaps a reflection of the value of human capital for longer-distance migration. The third model in Table 8 allows us to draw a similar conclusion, this time for people living in urban places in 1935. Although the model is not necessarily improved over one without the interaction terms (see Model 1 in Table 8), the interaction terms tell us that more educated people coming from an urban place were more likely to move than the two other education groups, all other things being equal.

[Table 8 About Here]

We can see the implications of these interactions more clearly in Figure 15, which show the 3-way interaction between distance, race, and education in determining who is most likely to move to California. There are six education-race categories, each indicated by a colored line, while distance is distributed along the x-axis. What we see is that high- and mid-educational attainment whites were the least likely to move relatively short distances, but become most likely to move at distances over about 2800 KM. At the other extreme, Low- and medium-educational attainment non-whites are the most likely to move short distances, and were less likely to move longer distances. High education non-whites and low-education whites are in the middle, relatively likely to move at short distances but less likely to move at long distances, with the crossovers happening between about 1800 KM and 2800 KM. The location of the crossover reinforces the distance information in Figure 15, signaling the special role of migration to California from the middle part of the US, where the weather crisis was the worst.

[Figure 15 About Here]

In Table 9 we return to the question of migration to urban California, in an effort to try to understand the factors that drove some migrants to wind up at an urban destination rather than a rural one. Models 1 and 2 are based on 322,780 migrants who moved from outside California in 1935 to California in 1940; Models 3 and 4 are based on 281,662 migrants who moved from one California County to another between 1935 and 1940. In all the models the dependent variable is whether the immigrant moved to an urban county or not. In each case

(California origin in 1935 or not), there is one model with that includes the urban status of the origin county, and one that does not.

[Table 9 About Here]

The models in Table 9 provide an interesting contrast to our more general models about the move to California (as well as those – reported elsewhere – about the overall decision to move). Perhaps not surprisingly, while the models for people originating in California and those originating outside California are slightly different, their overall interpretation is about the same, so that we can say that the forces that led people to move to urban California counties were about the same for both Californians and outsiders. On the other hand, a number of the control variables are reversed in their signs in all the models, when compared with our more general models, so that older people were more likely to move to urban counties, as were non-whites. Other control variables, including sex (men more likely to move than women) , number of children (persons with fewer children more likely to move), and the urban status of the counties where people lived in 1935 (urban residents were more likely than rural 1935 residents to move to urban California counties), operated in the same direction as our more general models. We suspect that the change in the relationship between whites and non-whites is a reflection of the different racial makeup of non-whites living in and near California (probably more with an Asian origin), compared with other regions. As we explore the role of human capital as characterized by educational attainment, we see another difference: whereas the general pattern for migration to California is for people with the lowest educational attainment to be most likely to move, those who moved to urban California counties were more likely to have attended University. While California cities attracted all sorts of people, their attraction for those with the most education made them distinct.

[Table 10 About Here]

In Table 10 we expand the analysis of those who moved to urban counties in California by including variables about distance moved and level of crop failure in 1934, and adding region of origin in 1935 in Model 2. In both models we see that people living further away were more likely to move to urban counties, while the results about crop failure are somewhat surprising: people from counties with the least crop failure were most likely to move to urban California, probably because they were disproportionately from urban counties elsewhere, and from further away.

[Table 11 About Here]

Finally, Table 11 allows us to think about the differences between people who stayed in California, those who arrived, and those who left, as we think about whether we can talk about a “brain gain” associated with the growth of the state and its mix of low-technology (agriculture) and high technology (aircraft and other) industries in the 1930s. Model 1 in Table 11 compares those who left California with those who stayed, and it shows that older persons and women were more likely to leave, confirming the results we presented earlier. Perhaps

most interestingly, those with college or university education were more likely to leave than those who stayed. In model 2 we compare those who arrived with those who stayed, and we see similar results to Model 1, with the differences that older people were less likely to have arrived, females were less likely to be immigrants than stayers, and those from urban counties less likely to be arrivers than stayers.

Table 11 indicates that while the people migrating to or from California tended to be more educated than non-migrants in California, college-educated people were also overrepresented in the flow out of California. This is evident in Model 3, which compares the education levels of migrants arriving in California to their counterparts who left California over the same period. Individuals with a Grade School or High School education were significantly more likely to move to California than move away. This suggests that California was gaining disproportionate shares of people with lower educations, and perhaps, these individuals were also relatively less likely to leave California after moving there. These results suggest that California migration was *not* necessarily characterized by high levels of "brain gain" in this period, and these patterns can, at least partially, be explained by the apparent attractiveness of California as a destination for migrants from poorer agricultural regions in this period.

Discussion and Conclusions

The prevailing view of migration in the 1930s is in many ways still the story of the Joads in *The Grapes of Wrath* (Steinbeck, 1939): people who experienced hardship and had little human or financial capital to buffer their experience were the ones who moved, overwhelming a pre-existing migration system where longer distance moves – like those to California – privileged moves by people with more human and financial capital. Was that really the case? We begin our discussion by thinking about the core migration system that operated in the 1930s, and asking how our research displays deviations from that system. Building on our earlier work (Gutmann et al., 2016; Gutmann et al., 2017) we start with individual characteristics of migrants, then look at the characteristics of the communities that they came from and moved to, and conclude by asking whether the prevailing view is sustained.

We begin by considering the individual characteristics of California movers, in comparison with those who moved elsewhere. The simple conclusion to draw is that as individuals, movers to California were like other movers between 1935 and 1940, only mostly more so. In general, our earlier research about all adult migrants in the second half of the 1930s shows that they were more likely to be younger, with fewer children, male, and white (Gutmann et al., 2017). Migrants to California had the same characteristics, even more so: compared with migrants who moved to other states, California immigrants were more likely to be younger, with fewer children, male, and white (see Table 7).

Educational attainment is the area where California immigrants differed from all adult migrants in the U.S. between 1935 and 1940. For all migrants, the higher the level of education attained, the greater the likelihood of migrating. That was not true for immigrants to California, where the overall pattern is that individuals who had a college or university education were the least

likely to move. There is a complex process here, as Figure 15 shows by displaying the interaction of education, race, and distance, but it begins to confirm well-established ideas that California was a magnet for people with little human and financial capital, represented in our data by low educational attainment.

We learn more about this process by looking at information about the places that people came from. Part of the well-established story of migration to California in the 1930s suggests that the spur to migration was the environmental and agricultural shock that began to arrive in 1934, and continued on and off throughout the decade with drought, high temperatures, and dust storms. In some ways, here again migrants to California were like all migrants, but more so. All migrants between 1935 and 1940 were more likely to come from a county with high levels of crop failure in 1934, but migrants to California were even more likely to be from such a county than migrants to other states. Part of the signal that we are seeing is one of location, whether measured by distance, region, or ecological zone, or shown on a map (see Figure 8): the most California immigrants came from places inside a zone well-defined by the regions with the worst weather.

By the 1930s the United States was an urban nation (56.1% in 1930 and 56.5% in 1940), so it is not surprising that most migrants between 1935 and 1940 came from urban counties (even though our definition is more restrictive than the Census definition of an urban place, which includes any place with 2,500 or more inhabitants). Again, California immigrants were like other immigrants, but substantially more so (see Table 7), reflecting the number of available migrants from urban origin counties, even if their economic and environmental experiences were not as severe as those coming from the hardest-hit rural areas. As we showed in Table 6, a small majority of California immigrants came from metropolitan counties, but the world that they built was overwhelmingly urban and metropolitan; three fourths of all immigrants coming into California were headed to a metropolitan county.

California was already on its way to becoming a modern state at the beginning of the 1930s. How did the decade's migration affect that transformation? We can learn a lot by thinking about immigrants, emigrants, and stayers, and the kind of human capital they deployed. It is a complicated story, but we can highlight these findings from Table 11:

- White Californians were more likely to leave the state than those who stayed, and whites were more likely to be immigrants than stayers, but less likely to be immigrants than those who left. On balance, this meant that the population was trending in the direction of being more white, but there was a small counter-balancing effect of the arrival of non-white immigrants replacing white emigrants.
- Men were more likely to be immigrants than stayers or leavers, and women were more likely to be leavers than stayers, leading on balance to a population that was increasingly male.
- Immigrants were younger than emigrants, and stayers were younger than leavers, leading to a younger population. Immigrants also brought with them more children than emigrants took away, contributing to population change in the same direction.

- Education gives us the most complicated story of all. Both immigrants and emigrants were more likely to be well educated than stayers, but overall emigrants were more likely than immigrants to have a college or university education. This suggests more of a brain drain than brain gain, or at least that the arrival of poorly educated people from the drought stricken parts of the country did not contribute substantially to the state's human capital.

California was growing rapidly in the 1930s, a process driven by immigration. taken together, the migration of the 1930s made California younger, more white, and more male, and probably somewhat less well-educated. The story is complicated by the details in the data, but it is also less surprising than one might think. California's immigration system was built on long-distance migration, drawing young, white, and relatively well-educated people. The events of the 1930s confirmed much of that overall model, but by drawing more poor and less-well-educated people from the heartland of the U.S., the system was disrupted.

References

Abramitzky, R., Boustan, L. P., & Eriksson, K. (2012). Europe's Tired, Poor, Huddled Masses: Self-Selection and Economic Outcomes in the Age of Mass Migration. *American Economic Review, 102*(5), 1832-1856. doi:doi: 10.1257/aer.102.5.1832

Bakewell, O. (2013). Relaunching migration systems. *Migration Studies*. doi:10.1093/migration/mnt023

Black, R., Adger, W. N., Arnell, N. W., Dercon, S., Geddes, A., & Thomas, D. (2011). The effect of environmental change on human migration. *Global Environmental Change, 21, Supplement 1*(0), S3-S11. doi:http://dx.doi.org/10.1016/j.gloenvcha.2011.10.001

Bogue, D. J., & Hagood, M. J. (1953). *Subregional migration in the United States, 1935-40*. Oxford, Ohio: Scripps Foundation, Miami University.

Borjas, G. J. (1987). Self-Selection and the Earnings of Immigrants. *The American Economic Review, 77*(4), 531-553. doi:10.2307/1814529

Boustan, L. P., Fishback, Price V., & Kantor, S. (2010). The Effect of Internal Migration on Local Labor Markets: American Cities during the Great Depression. *Journal of Labor Economics, 28*(4), 719-746. doi:10.1086/653488

Boustan, L. P., Kahn, M. E., & Rhode, P. W. (2012). Moving to Higher Ground: Migration Response to Natural Disasters in the Early Twentieth Century. *The American Economic Review, 102*(3), 238-244. doi:10.2307/23245535

Collins, W. J., & Wanamaker, M. H. (2014). Selection and Economic Gains in the Great Migration of African Americans: New Evidence from Linked Census Data. *American Economic Journal: Applied Economics, 6*(1), 220-252. doi:doi: 10.1257/app.6.1.220

Cook, B. I., Seager, R., & Smerdon, J. E. (2014). The worst North American drought year of the last millennium: 1934. *Geophysical Research Letters, 41*(20), 7298-7305. doi:10.1002/2014GL061661

Cunfer, G. (2005). *On the Great Plains: agriculture and environment* College Station: Texas A&M University Press.

Fishback, P. V., Horrace, W. C., & Kantor, S. (2006). The impact of New Deal expenditures on mobility during the Great Depression. *Explorations in Economic History, 43*(2), 179-222. doi:http://dx.doi.org/10.1016/j.eeh.2005.03.002

Fishback, P. V., & Kantor, S. (2003). *Data Set for Geographic Distribution of New Deal Spending by Counties.* Retrieved from: http://www.u.arizona.edu/~fishback/Published_Research_Datasets.html

Fussell, E., Curtis, K., & DeWaard, J. (2014). Recovery migration to the City of New Orleans after Hurricane Katrina: a migration systems approach. *Population and Environment, 35*(3), 305-322. doi:10.1007/s11111-014-0204-5

Gregory, J. N. (1989). *American exodus: the Dust Bowl migration and Okie culture in California*. New York: Oxford University Press.

Gutmann, M. P., Brown, D. G., Cunningham, A., Dykes, J., Leonard, S. H., Little, J., . . . Sylvester, K. M. (2016). Migration in the 1930s: Beyond the Dust Bowl. *Social Science History, 40*(4), 1-33.

Gutmann, M. P., Connor, D., Cunningham, A., Dykes, J., Leonard, S. H., Mikecz, J., & Sylvester, K. M. (2017). *Out-migration, Human Capital, and Environmental Shocks in the 1930s*. Paper presented at the Social Science History Association Annual Meeting, Montreal.

Haines, M. R., Fishback, Price V., & Rhode, P. W. (2014). *United States Agriculture Data, 1840 - 2010*. Retrieved from: http://doi.org/10.3886/ICPSR35206.v1

Johnson, T. V., & Arpke, F. (1941). *Migration and settlement on the Pacific coast*. n.p.

Kanbur, R., & Rapoport, H. (2005). Migration selectivity and the evolution of spatial inequality. *Journal of Economic Geography, 5*(1), 43-57. doi:10.1093/jnlecg/lbh053

McLeman, R. A. (2013). *Climate and human migration : past experiences, future challenges*. New York: Cambridge University Press.

McWilliams, C. (1942). *Ill fares the land; migrants and migratory labor in the United States*. Boston: Little, Brown and Company.

O'Neal, H., & Collier, J. (1976). *A Vision shared: a classic portrait of America and its people, 1935-1943*. New York: St. Martin's Press.

Rosenbloom, J. L., & Sundstrom, W. A. (2004). The decline and rise of interstate migration in the united states: evidence from the ipums, 1850-1990. *Research in Economic History, 22*, 289-325.

Roy, A. D. (1951). Some Thoughts on the Distribution of Earnings. *Oxford Economic Papers, 3*(2), 135-146. doi:10.2307/2662082

Ruggles, S. (2014). Big Microdata for Population Research. *Demography, 51*(1), 287-297. doi:10.1007/s13524-013-0240-2

Ruggles, S., Genadek, K., Goeken, R., Grover, J., & Sobek, M. (2017). *Integrated Public Use Microdata Series: Version 7.0*.

Steinbeck, J. (1939). *The grapes of wrath*. New York: Modern Library.

Thompson, W. S. (1955). *Growth and changes in California's population*. Los Angeles: Haynes Foundation.

U.S. Bureau of the Census. (1935). *United States census of agriculture: 1935- ... Statistics by counties. Farms, farm acreage and value, and selected livestock and crops*. Washington: U.S.G.P.O.

Table 1: Top Destination States for Interstate Migration, 1940 Census
Persons aged 20+ in 1940, excluding those living in Group Quarters
Source: See text

State	Immigrants	State	Immigrants
California	482,510	Missouri	99,912
Illinois	172,712	New Jersey	99,804
New York	162,836	Pennsylvania	94,219
Florida	134,237	Washington	92,893
Texas	131,468	Indiana	90,025
Ohio	125,952	Oregon	86,172
Michigan	120,928	Virginia	85,181

Table 2: Net Interstate Migration, 1935-1940
Persons aged 20+ in 1940, excluding those living in Group Quarters
Source: See text

State	Net Migrants	State	Net Migrants
California	367,039	New Jersey	19,933
Florida	88,815	Connecticut	14,993
Oregon	41,241	Louisiana	14,648
Virginia	38,844	Washington	13,721
Michigan	33,890	Arizona	12,600
Washington	32,543	New Mexico	11,471
Maryland	26,576	Indiana	11,000

Table 3. Regional Origin of All Residents in 1935 by 1940 Census Migration Status
Source: See Text

1935 Region	Migration Type					Total
	Stayed in County	Intercounty, Intrastate Move	Interstate Move	International	Unknown	
California	4,763,625	508,792	158,000	0	126,972	5,557,389
	85.72	9.16	2.84	0	2.28	
Southwest	1,873,880	164,548	189,611	0	126,642	2,354,681
	79.58	6.99	8.05	0	5.38	
South central	13,727,403	1,452,950	966,147	0	634,811	16,781,311
	81.8	8.66	5.76	0	3.78	
Northern plains	2,844,649	270,753	346,874	0	186,552	3,648,828
	77.96	7.42	9.51	0	5.11	
Northwest	1,927,070	219,200	144,992	0	91,132	2,382,394
	80.89	9.2	6.09	0	3.83	
Midwest	25,396,959	1,521,626	1,051,098	0	542,768	28,512,451
	89.07	5.34	3.69	0	1.9	
Southeast	8,698,263	705,824	383,334	0	364,540	10,151,961
	85.68	6.95	3.78	0	3.59	
East central	12,753,816	700,770	546,076	0	415,821	14,416,483
	88.47	4.86	3.79	0	2.88	
Northeast	29,705,586	983,667	861,854	0	779,017	32,330,124
	91.88	3.04	2.67	0	2.41	
Abroad	0	0	0	322,077	0	322,077
	0	0	0	100	0	
Total	101,691,251	6,528,130	4,647,986	322,077	3,268,255	116,457,699
	87.32	5.61	3.99	0.28	2.81	5,557,389

Table 4. California Immigrants, 1935-1940
By Region of Origin

Region	Migrants	% Origin Pop.
Southwest	53,029	3.58
Northwest	42,340	2.50
Northern Plains	49,895	2.11
South Central	154,257	1.41
Midwest	109,668	0.55
Northeast	51,071	0.23
East Central	14,242	0.16
Southeast	8,008	0.13

Table 5. Ten States Sending Most Migrants to California, 1935-1940

State	Migrants	% Origin Population
Oklahoma	43,841	3.29
Illinois	35,744	0.70
Texas	34,507	0.94
Missouri	34,494	1.44
New York	27,676	0.32
Kansas	23,541	2.05
Nebraska	23,362	2.72
Washington	23,357	2.22
Colorado	19,138	2.97
Oregon	18,983	2.96

Table 6. Metropolitan Origins and Destinations, California migrants, 1935-1940

	California Non-Metro	California Metro	Total
Origin Non-Metro	68,099	159,265	227,364
Origin Metro	24,498	230,648	255,146
Total	92,597	389,913	482,510

Table 7. Comparison of movers to California to other movers

Sample: Age 26-65 in 1940; Moved county 1935-40;
Lived outside California in 1935
Outcome: Moved to California between 1935 and 1940

	(1)	(2)	(3)	(4)
Age	-0.013***	-0.013***	-0.035***	-0.038***
	(0.002)	(0.002)	(0.002)	(0.002)
Age Squared	0.0002***	0.0002***	0.0005***	0.0005***
	(0.00002)	(0.00002)	(0.00002)	(0.00002)
Education:Grade School	0.042***	0.066***	0.199***	0.209***
	(0.005)	(0.006)	(0.006)	(0.006)
Education:High School	0.290***	0.297***	0.311***	0.310***
	(0.005)	(0.005)	(0.005)	(0.005)
Education:University (reference)				
Race:White (nonwhite=ref)	0.850***	0.693***	0.585***	0.410***
	(0.011)	(0.011)	(0.011)	(0.011)
Sex:Female (male=ref)	-0.060***	-0.067***	-0.078***	-0.077***
	(0.004)	(0.004)	(0.004)	(0.004)
Estimated #kids 1935	-0.099***	-0.104***	-0.077***	-0.070***
	(0.002)	(0.002)	(0.002)	(0.002)
Lowest 1/3 crop failure		-1.138***	-0.386***	-0.261***
		(0.005)	(0.006)	(0.007)
Lowest 2/3 crop failure		-0.759***	-0.333***	-0.280***
		(0.005)	(0.005)	(0.006)
Highest 1/3 crop failure (reference)				
Urban County 1935			0.846***	0.793***
			(0.004)	(0.004)
County not urban 1935 (reference)				
Distance from LA (100KMs)			-0.092***	-0.077***
			(0.0003)	(0.001)
Constant	-3.410***	-2.845***	-0.711***	-1.632***
	(0.034)	(0.034)	(0.035)	(0.042)
Origin Region 1935	No	No	No	Yes
Observations	4,770,921	4,770,921	4,770,921	4,770,921
Log Likelihood	-1,170,619.000	-1,137,836.000	-1,072,018.000	-1,066,815.000
Akaike Inf. Crit.	2,341,254.000	2,275,692.000	2,144,060.000	2,133,669.000

Note: figures in parentheses are standard errors *p<0.1; **p<0.05; ***p<0.01

Table 8. Education by distance

Sample: Age 26-65 in 1940; Moved county 1935-1940;
Lived outside California in 1935
Outcome: Moved to California between 1935 and 1940

	(1)	(2)	(3)
AGE	-0.035***	-0.036***	-0.035***
	(0.002)	(0.002)	(0.002)
Age Squared	0.0005***	0.0005***	0.0005***
	(0.00002)	(0.00002)	(0.00002)
Education:Grade School	0.192***	0.868***	0.216***
	(0.006)	(0.016)	(0.008)
Education:High School	0.309***	0.558***	0.346***
	(0.005)	(0.016)	(0.008)
Education:University (reference)			
Race:White (nonwhite=ref)	0.618***	0.592***	0.618***
	(0.011)	(0.011)	(0.011)
Sex:Female (Male=ref)	-0.079***	-0.084***	-0.080***
	(0.004)	(0.004)	(0.004)
Estimated # Kids 1935	-0.076***	-0.076***	-0.076***
	(0.002)	(0.002)	(0.002)
Urban county 1935	0.829***	0.826***	0.872***
	(0.004)	(0.004)	(0.009)
County not urban 1935 (reference)			
Distance from LA (100KMs).	-0.100***	-0.084***	-0.100***
	(0.0002)	(0.001)	(0.0002)
Education:Grade School *Distance from LA		-0.030***	
		(0.001)	
Education:High School *Distance from LA		-0.011***	
		(0.001)	
Education:Grade School *Urban County 1935			-0.039***
			(0.011)
Education:High School *Urban County 1935			-0.064***
			(0.011)
Constant	-0.700***	-1.021***	-0.727***
	(0.035)	(0.037)	(0.035)
Observations	4,770,921	4,770,921	4,770,921
Log Likelihood	-1,075,704.000	-1,074,472.000	-1,075,686.000
Akaike Inf. Crit.	2,151,428.000	2,148,968.000	2,151,397.000

Note: figures in parentheses are standard errors *p<0.1; **p<0.05; ***p<0.01

Table 9. Movers to urban or rural California

Sample: Age 26-65 in 1940; Moved to or into California 1935-40;
Lived outside or inside California in 1935
Outcome: Moved to urban California between 1935 and 1940

	(1)	(2)	(3)	(4)
In California in 35?	No	No	Yes	Yes
Age	0.059***	0.012***	0.029***	0.018***
	(0.004)	(0.004)	(0.003)	(0.003)
Age Squared	-0.0005***	0.00002	-0.0003***	-0.0002***
	(0.00005)	(0.00005)	(0.00004)	(0.00004)
Education:Grade School	-1.019***	-0.875***	-0.455***	-0.376***
	(0.015)	(0.016)	(0.012)	(0.012)
Education:High School	-0.228***	-0.179***	-0.070***	-0.045***
	(0.015)	(0.016)	(0.011)	(0.011)
Education:University (reference)				
Race:White	-0.536***	-0.336***	-0.243***	-0.225***
	(0.032)	(0.032)	(0.024)	(0.025)
Race:NonWhite (reference)				
Sex:Female.	-0.281***	-0.233***	-0.168***	-0.151***
	(0.009)	(0.010)	(0.008)	(0.008)
Sex:Male (reference)				
Estimated #Kids-35	-0.203***	-0.143***	-0.070***	-0.043***
	(0.003)	(0.004)	(0.004)	(0.004)
Urban county 1935		1.249***		0.741***
		(0.010)		(0.009)
County not urban 1935 (reference)				
Constant	1.109***	1.302***	0.573***	0.232***
	(0.087)	(0.089)	(0.075)	(0.076)
Observations	322,780	322,780	281,662	281,662
Log Likelihood	-150,349.800	-142,176.500	-175,723.500	-172,346.000
Akaike Inf. Crit.	300,715.500	284,371.100	351,463.100	344,710.000

Note: figures in parentheses are standard errors *p<0.1; **p<0.05; ***p<0.01

Table 10. Movers to urban or rural California, with Crop Failure, Region, and Distance

Sample: Age 26-65 in 1940; Moved to California 1935-40;
Lived outside or inside California in 1935
Outcome: Moved to urban California between 1935 and 1940

	(1)	(2)
Age	0.014***	0.006
	(0.004)	(0.004)
Age Squared	-0.00001	0.0001
	(0.00005)	(0.00005)
Education:Grade School	-0.881***	-0.779***
	(0.016)	(0.016)
Education:High School	-0.171***	-0.137***
	(0.016)	(0.016)
Education:University (reference)		
Race:White (nonwhite ref)	-0.349***	-0.467***
	(0.033)	(0.033)
Sex:Female (Male=ref)	-0.223***	-0.218***
	(0.010)	(0.010)
Estimated # Kids 1935	-0.140***	-0.126***
	(0.004)	(0.004)
Urban county 1935	1.098***	1.059***
	(0.011)	(0.011)
County not urban 1935 (reference)		
Distance from LA (100KMs)	0.043***	0.058***
	(0.001)	(0.002)
Lowest 1/3 crop failure	0.084***	0.243***
	(0.017)	(0.020)
Middle 1/3 crop failure	-0.053***	-0.049***
	(0.012)	(0.015)
Highest 1/3 crop failure (reference)		
Region:Midwest		0.738***
		(0.040)
Region:Northern Plains/Mtns		0.857***
		(0.046)
Region:Northeast		-0.054
		(0.046)
Region:Northwest		0.229***
		(0.048)
Region:South Central		0.102**
		(0.042)
Region:Southeast		0.048
		(0.054)
Region:Southwest		0.835***
		(0.053)
Region:East Central (reference)		
Constant	0.470***	0.059
	(0.091)	(0.111)
Observations	322,780	322,780
Log Likelihood	-140,016.600	-137,790.400
Akaike Inf. Crit.	280,057.100	275,618.800

Notes: figures in parentheses are standard errors *p<0.1; **p<0.05; ***p<0.01

Table 11. Comparison of in- and out-flows for California

Sample: Age 26-65 in 1940; Lived in California in 1935
or moved to CA from 35-40
Outcome: Left California between 1935 and 1940
or Arrived in California between 1935 and 1940

	Dependent variable:		
	CA_left	CA_arrived	
	(1)	(2)	(3)
Age	0.011***	-0.114***	-0.098***
	(0.003)	(0.002)	(0.003)
Age Squared	-0.001***	0.001***	0.001***
	(0.00003)	(0.00002)	(0.00004)
Education:Grade School	-0.531***	-0.115***	0.371***
	(0.010)	(0.006)	(0.011)
Education:High School	-0.383***	-0.117***	0.229***
	(0.009)	(0.006)	(0.010)
Education:University (reference)			
Race:White (nonwhite ref)	0.646***	0.307***	-0.520***
	(0.024)	(0.011)	(0.027)
Sex:Female (Male=ref)	0.163***	-0.052***	-0.216***
	(0.007)	(0.004)	(0.008)
Estimated # Kids 1935	-0.196***	-0.014***	0.137***
	(0.004)	(0.002)	(0.004)
Urban county 1935	0.397***	-1.505***	-1.894***
	(0.011)	(0.004)	(0.011)
County not urban 1935 (reference)			
Constant	-3.735***	1.716***	5.068***
	(0.066)	(0.035)	(0.076)
Reference	Stayed	Stayed	Left
Observations	3,032,050	3,264,508	413,102
Log Likelihood	-393,175.000	-958,394.800	-192,545.200
Akaike Inf. Crit.	786,368.100	1,916,808.000	385,108.300

Note: figures in parentheses are standard errors
*p<0.1; **p<0.05; ***p<0.01

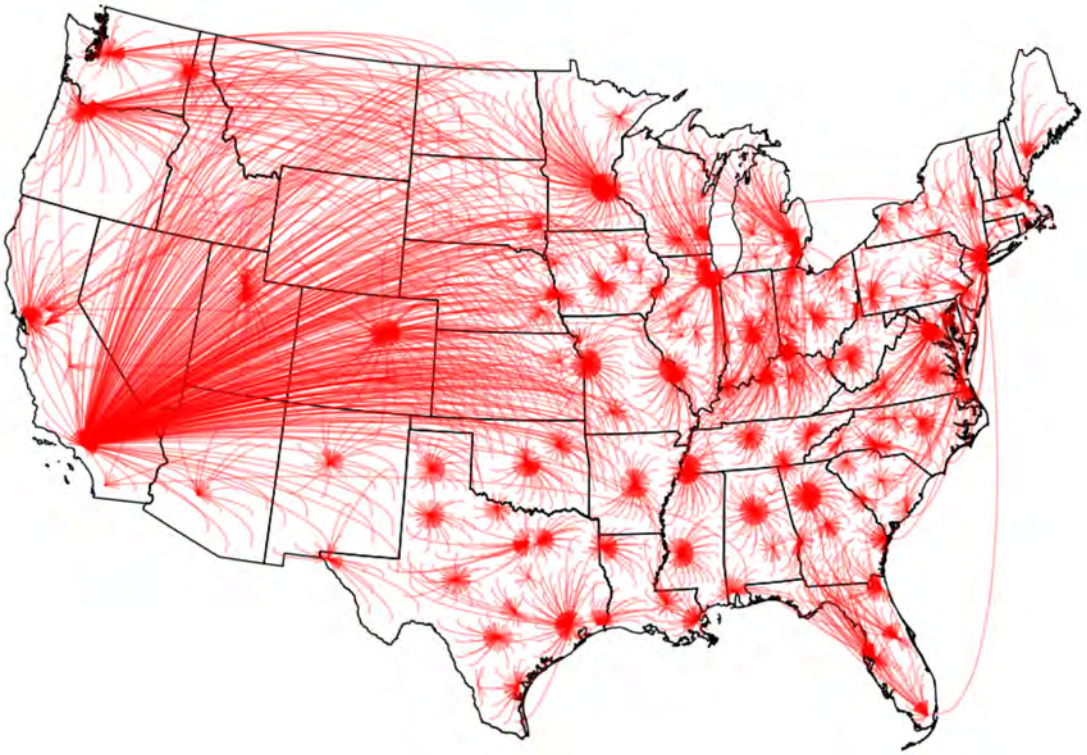

Figure 1: Migration flows during the 1930s: Top metro destination counties in 1940 for each origin county in 1935 (as recorded in the 1940 population census).

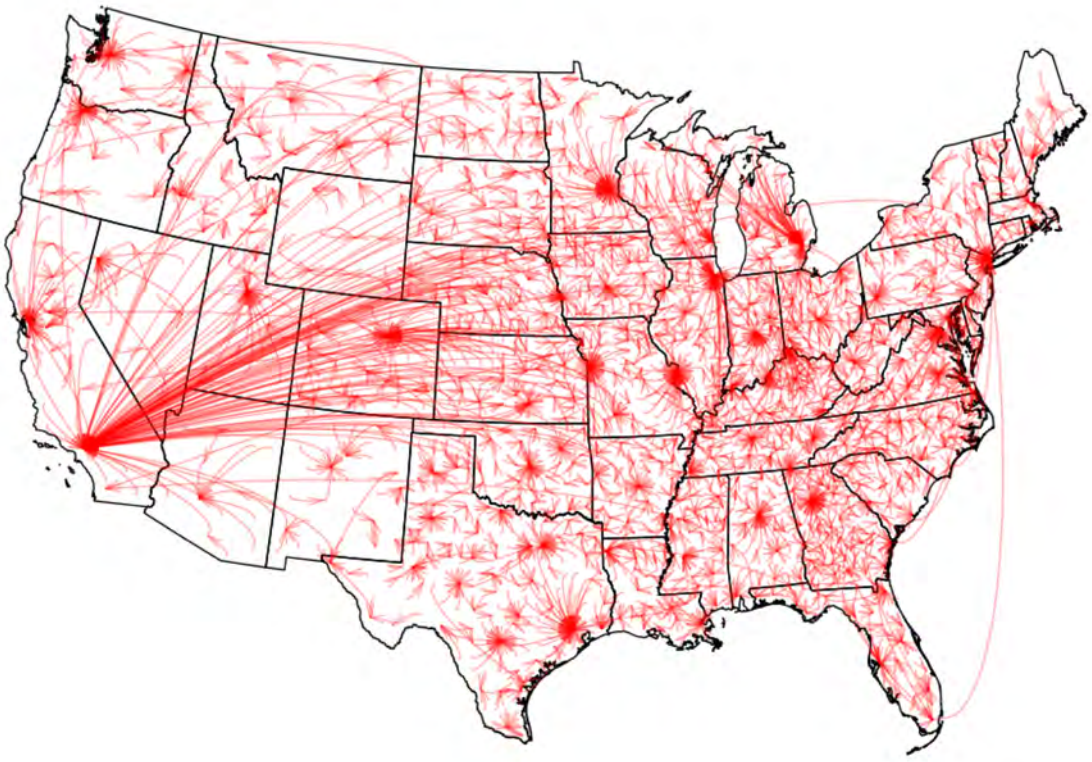

Figure 2: Migration flows during the 1930s: Top destination counties in 1940 for each origin county in 1935 (as recorded in the 1940 population census).

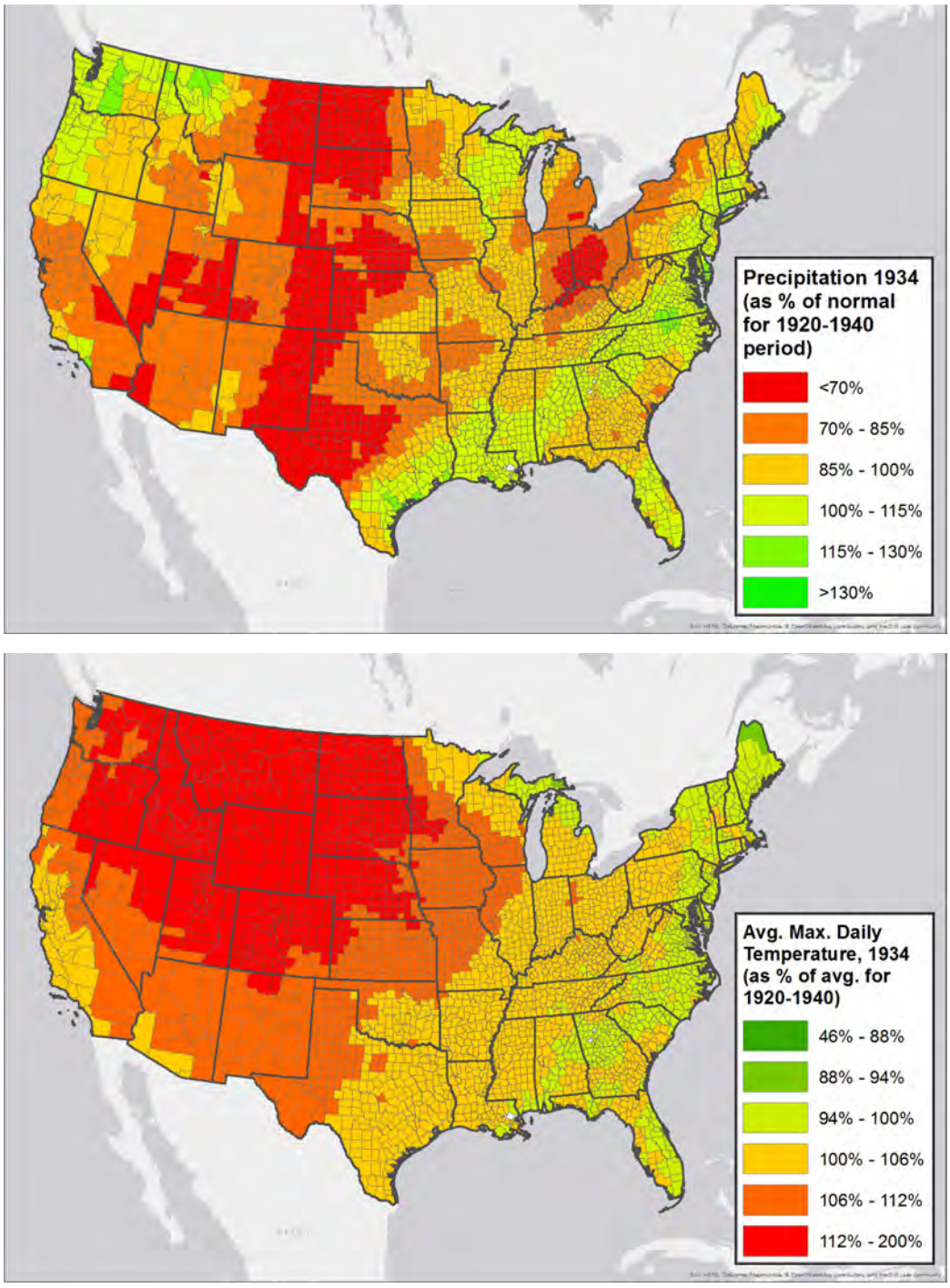

Figure 3: Precipitation and Temperature, 1934, as percent of normal, 1920-1940

Source: See Gutmann et al 2016.

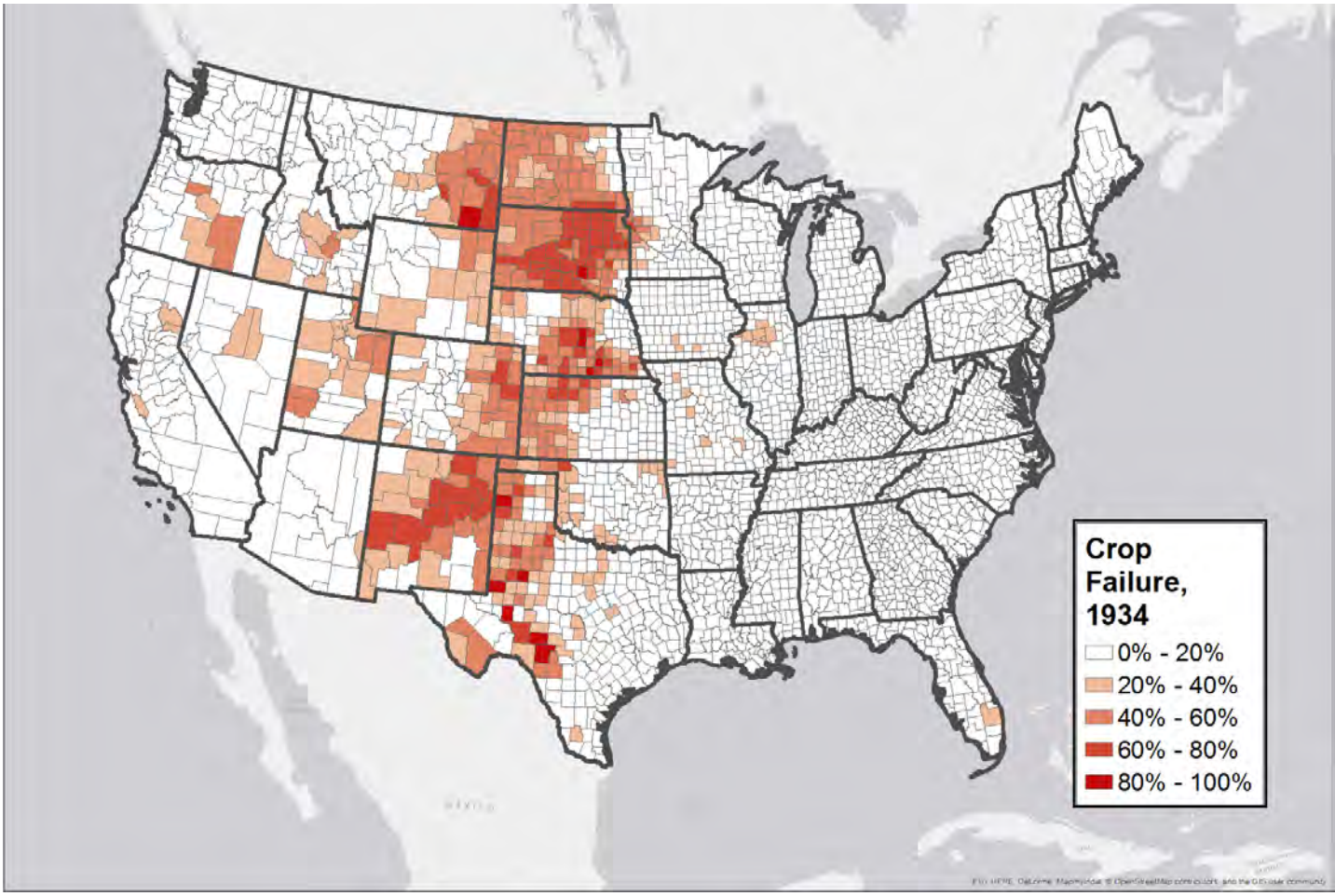

Figure 4: Percent crop failure, by county, 1934.

Source: U.S. Census of Agriculture, 1935

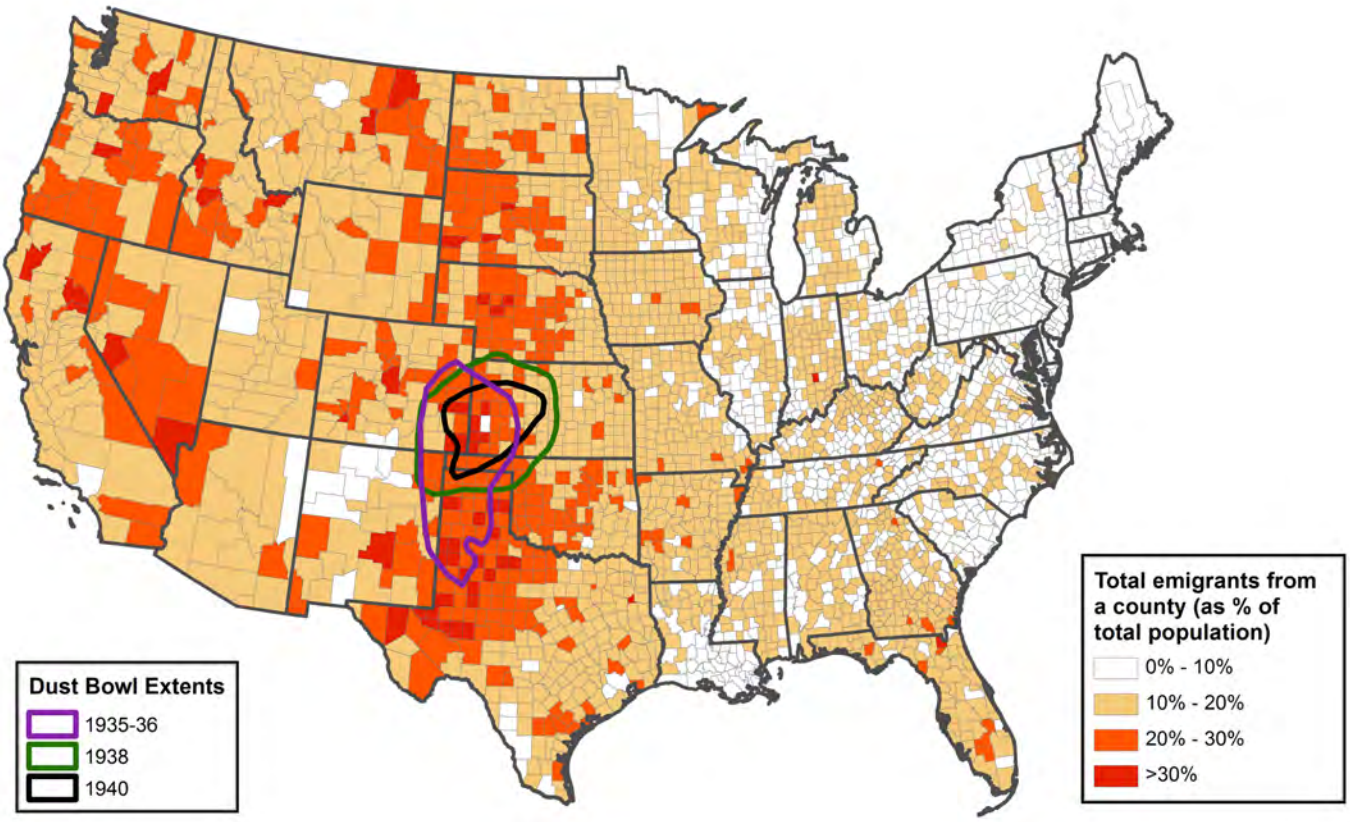

Figure 5: Percent of 1935 population that left the county, as indicated by the 1940 U.S. Census of Population

Figure 6: Revised Demographic Divisions used in this Paper

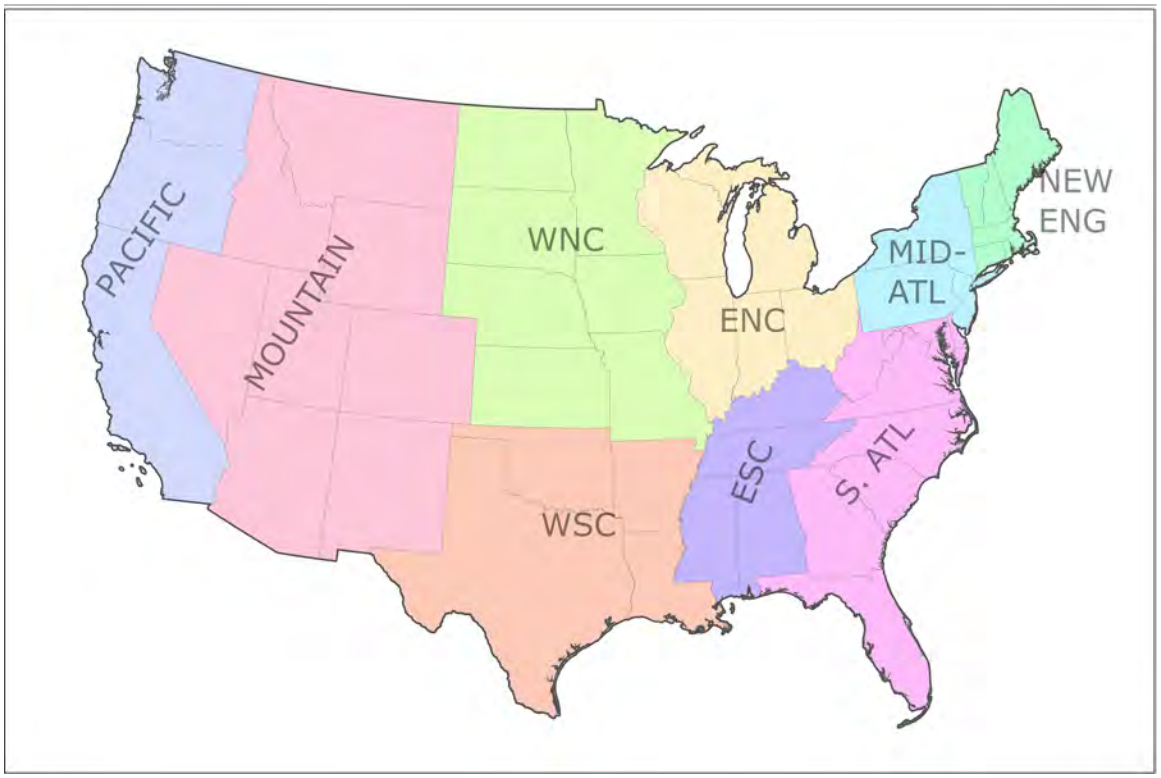

Figure 7: U.S. Census Divisions

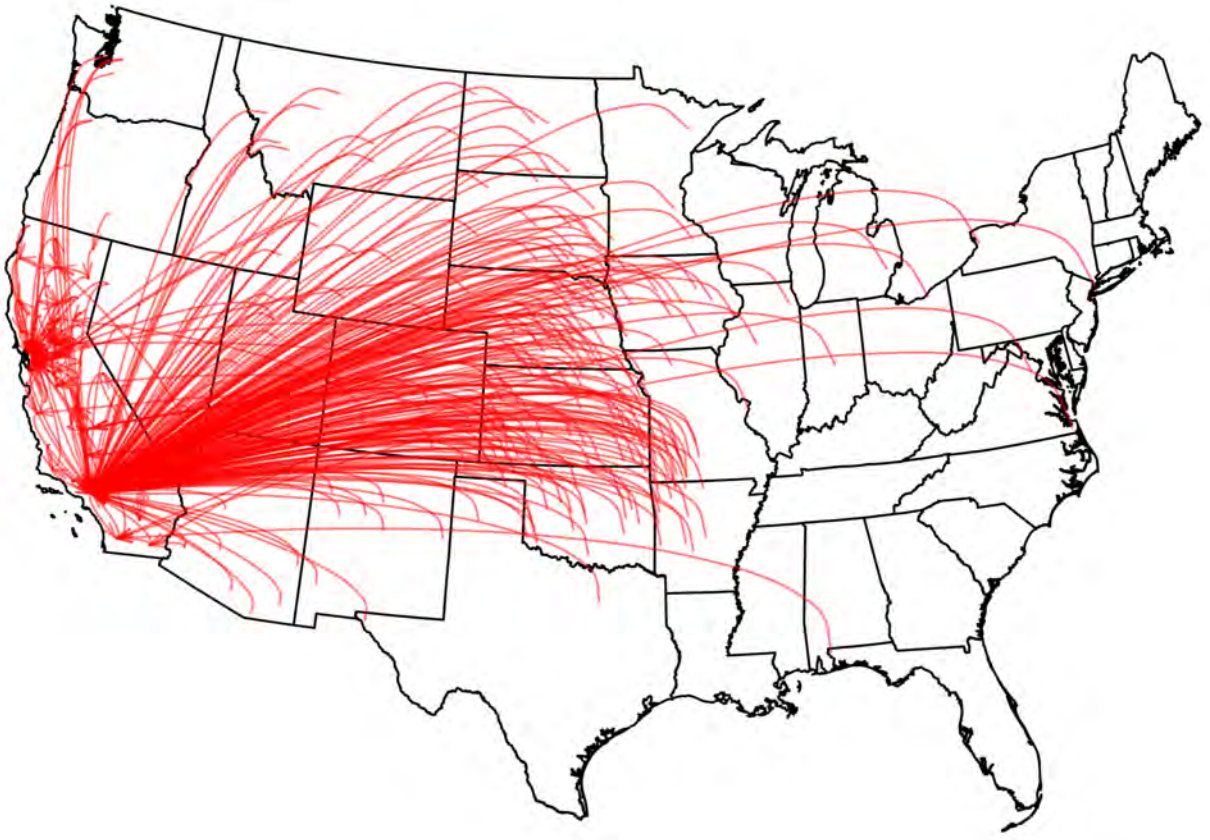

Figure 8: Migration Trajectories from 1935 to 1940
All flows where a California destination is one of the top 2 from a given County or Metropolitan Area

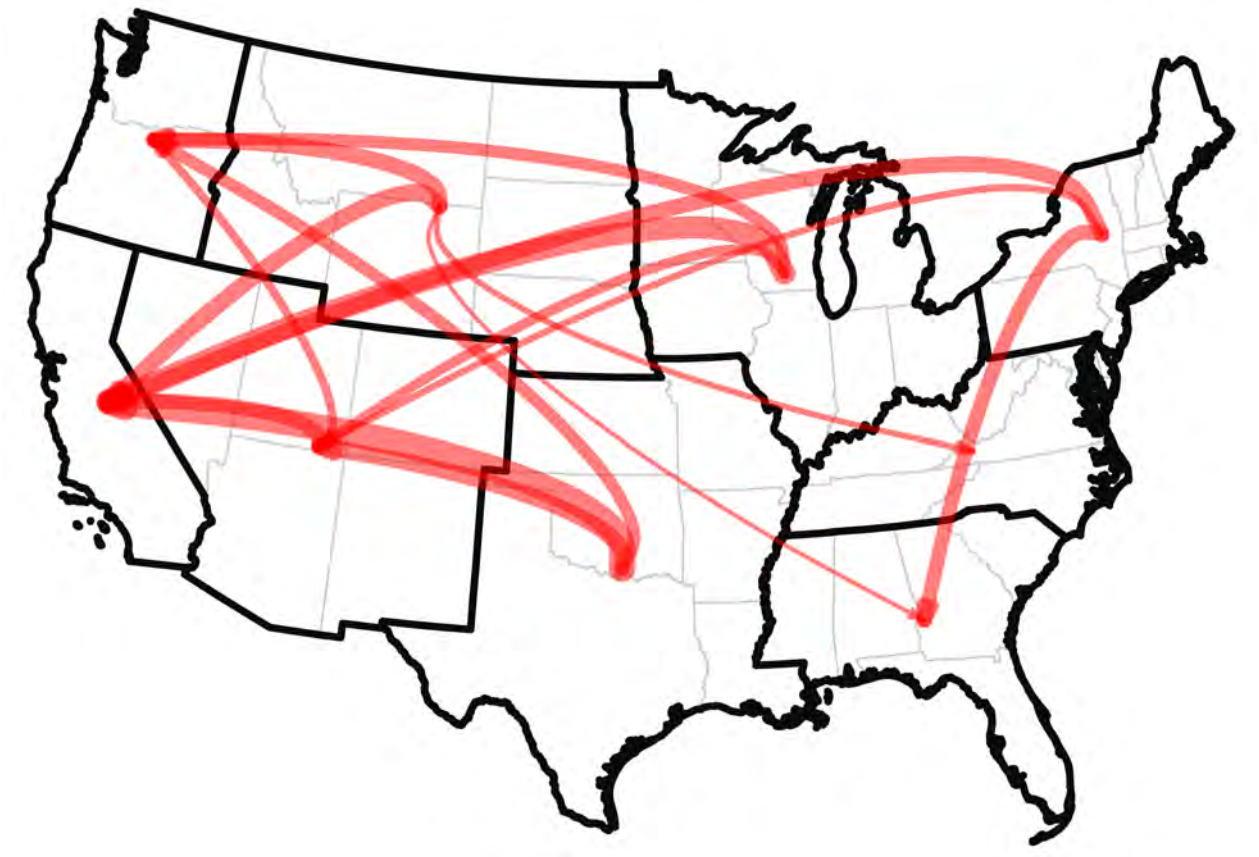

Figure 9: Net Migration Trajectories, 1935-1940
By Region
Top 15 Trajectories (raw number of adult migrants)
Note: width of line is rank of the moves, not the scale

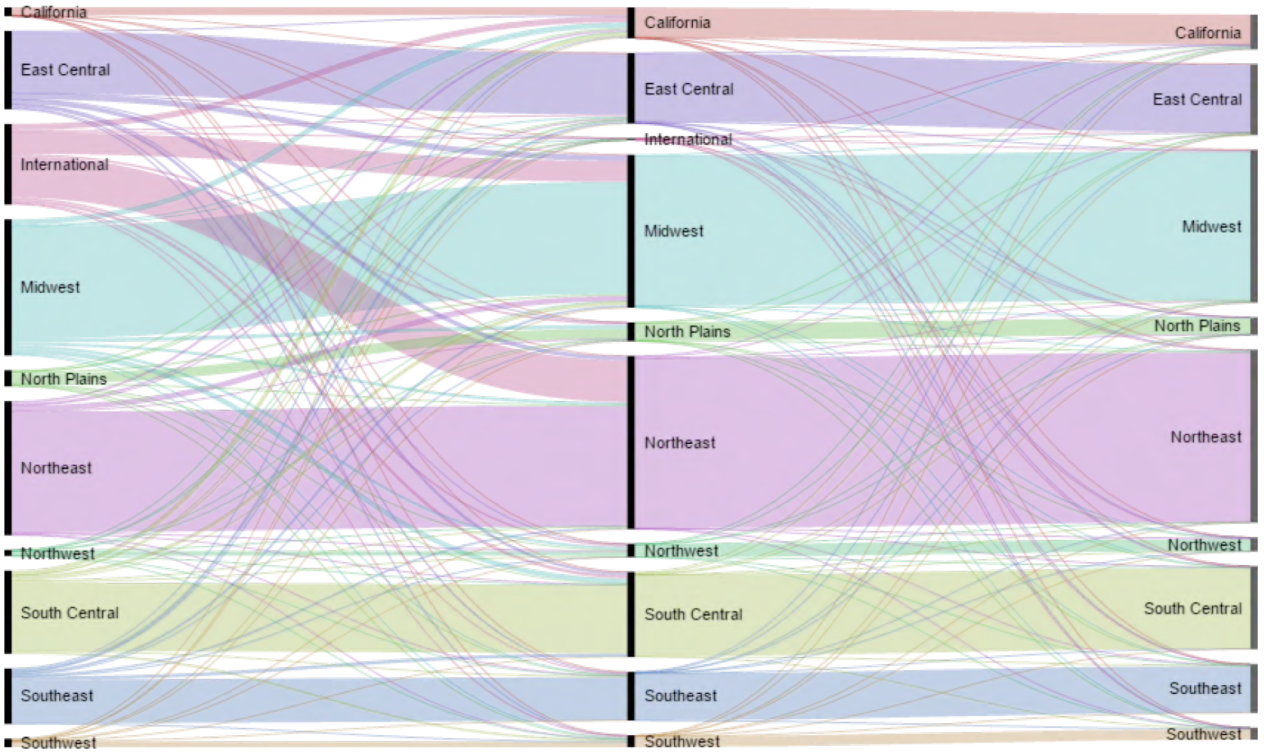

Figure 10: Lifetime Migration Flows, all U.S. Adults (excludes those living in Group Quarters)

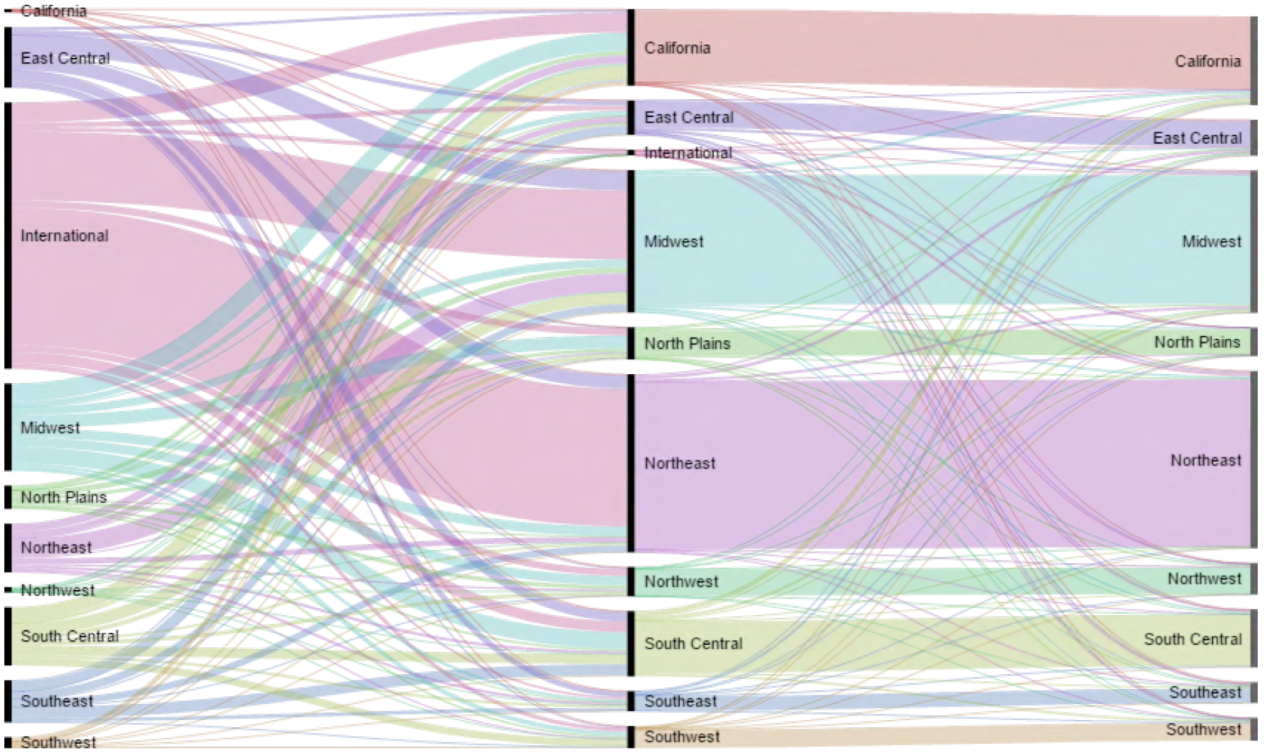

Figure 11: Lifetime Migration Flows, all U.S. Adult Movers (excludes those living in Group Quarters)

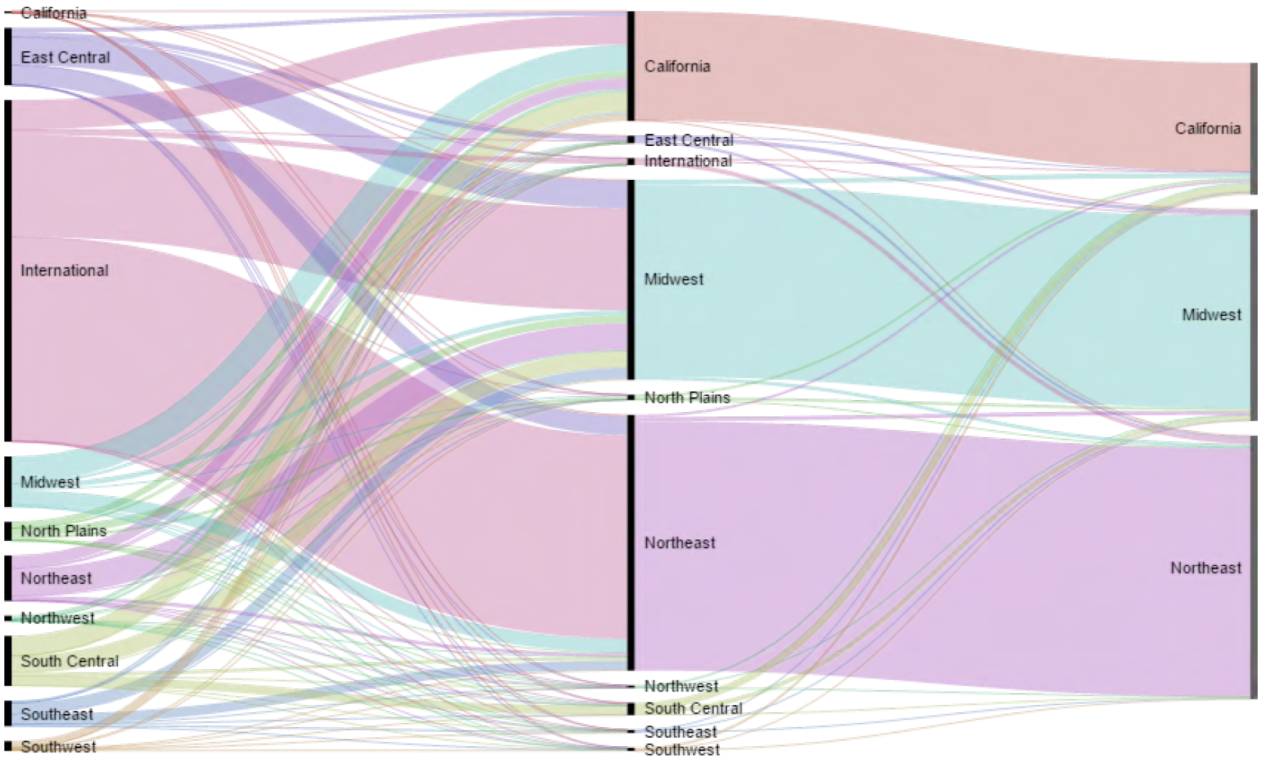

Figure 12: Lifetime Migration Flows, all U.S. Adult Movers – Selected Destinations (excludes those living in Group Quarters)

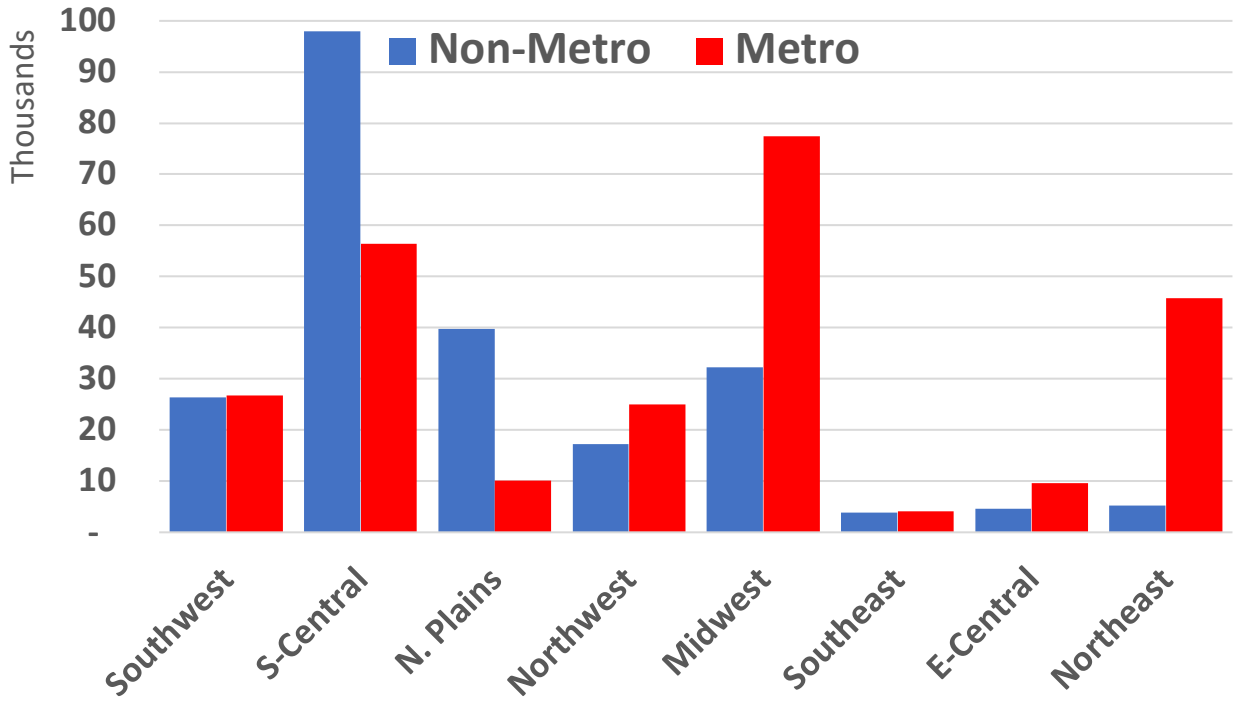

Figure 13: Origin Metro status – California Immigrants by Origin Region

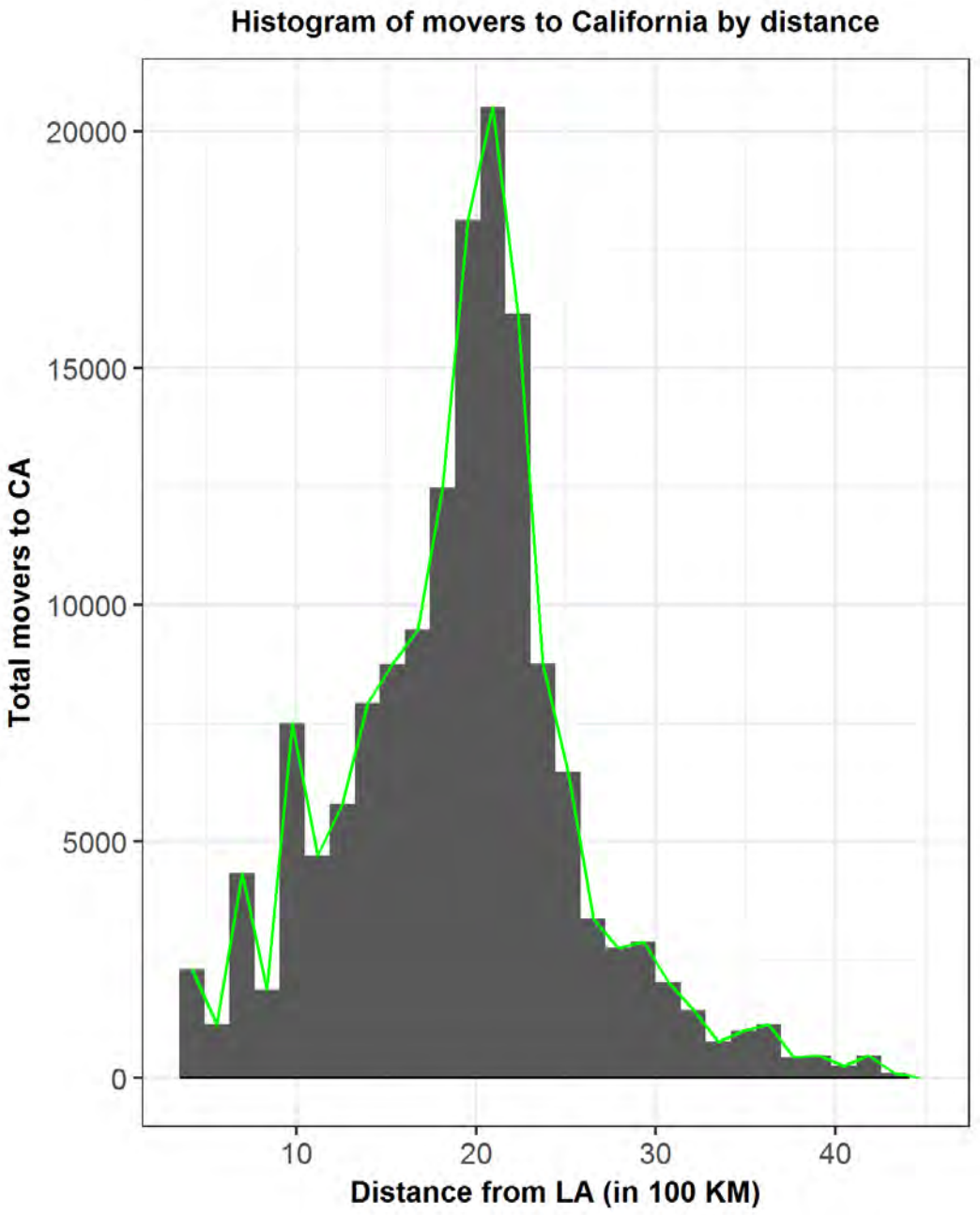

Figure 14: Distribution of Movers to California by distance moved (in 100 KM)

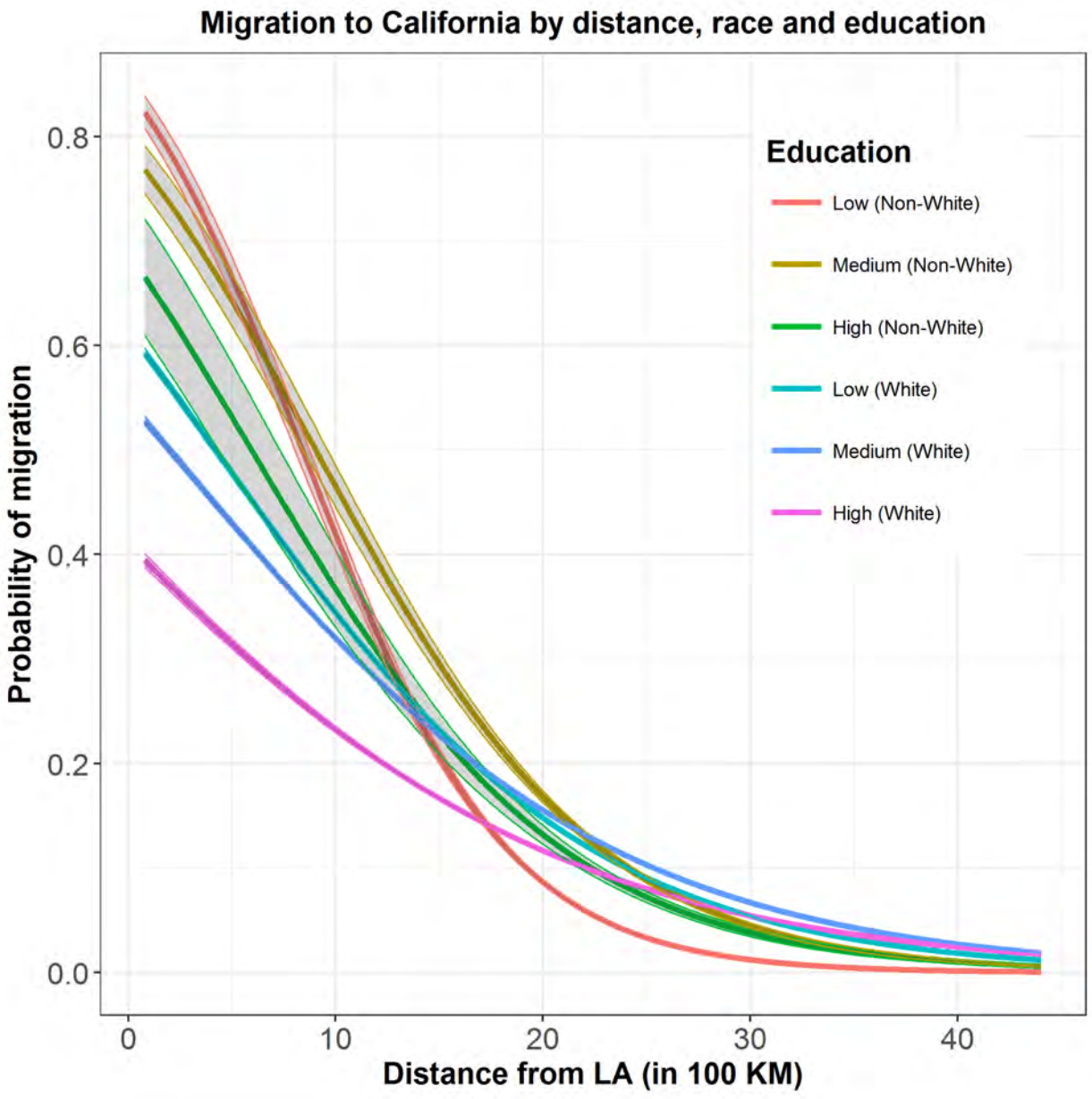

Figure 15: Migration to California by distance, race and education

Regression: Three-way interaction between race, education and distance