Migration, Polarization, and Sorting in the
American Electorate

by

Ian R. McDonald

Department of Political Science
Duke University

Date: __________________________

Approved:

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John H. Aldrich, Advisor

______________________________
Thomas M. Carsey

______________________________
Michael C. Munger

______________________________
David W. Rohde

Dissertation submitted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy in the Department of Political Science
in the Graduate School of Duke University
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Abstract
(American Politics)

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Geographic clustering has been linked to contemporary political polarization by journalists and other researchers in recent years, most recently and notably by Bishop and Cushing (2008). In these accounts, clustering is motivated, in part, by shared tastes for combinations of place attributes that attract individuals with interrelated values and similar characteristics or skillsets. In order to test whether political preferences aligns with location choice, this paper proposes a sorting model based on the composition of migrants’ preferences. Sorting is defined as the increase in the variation of a parameter of preference distributions of different locations, in the absence of individual preference change. The model estimates the probabilities of party identification in U.S. congressional districts among migrants and non-migrants.

Based on an empirical application using the 2006 Cooperative Congressional Election Study, I find that a significant number of district satisfy the sorting condition. A multinomial logit model predicts that individual ideology is significant explanatory variable in the partisanship of destination districts among migrants, even after controlling for the partisanship of originating districts.

The final chapter evaluates polarization in U.S. congressional districts based on intra-decade changes to population size. I show that overall polarization in high growth districts exceeds sorting, and suggest this results from an increase in electoral bias that could result from heavy migration into districts that begin the decade as very homogenous.
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Introduction and Theory

1.1 Overview

Does domestic migration in the U.S. contribute the geographic clustering of political preferences? The intuition underlying this link, and its potential significance, is simple. Migration can reconfigure electoral constituencies, both locally and nationally, without the migrants’ intent or any change in individual preferences. Migration can also change every relevant consideration about the social context and its effect on preferences and behavior. This possibility has special significance in the United States, due to its geographic diversity and enormous array of communities and electoral districts that support constituencies.

Residential mobility is a defining characteristic of the American experience, and Americans generally regard changing residences as easy and unremarkable. But the flow of internal migration in the U.S. is steady and its effects are cumulative. The 2000 census reports that 31.6% of all native-born Americans now reside in a state that does not include their birthplace. Although the rates have declined slightly in recent years, the percentage of all Americans who move to a new state has never
fallen below 2% in any single year from 1947-2006, while the annual percentage of residents moving between counties has never dropped below 7.9%. In some specific instances, the magnitude and variation of recent migration can be enormous. In Nevada, which is remarkable for its large influx of new residents between 1990 and 2007, the 2000 census reported that only 21.3% of its non-immigrant residents were born there. In Louisiana, by contrast, this figure is 79.4%.

The combination of mobility and expansion generates a vast and diverse set of residential configurations, each of which can change political outcomes. In order to understand these effects of migration, changes in both the composition and size in any given location must be taken into account, even if we suppose that political preferences of migrants persist from one place to another. The factors that change aggregated political preferences cited in the domestic migration literature are predictable: individual wealth, age, job prospects, family status, ethnicity, and variables that can be generalized as matters of taste. The complexity is further compounded to the extent that these factors are shaped, if not completely defined, by the ongoing migration decisions of other people.

1.1.1 American Politics and Migration Research

For all of these reasons, migration in the American electorate has produced interest in political science, generating research in both suburbanization (Burns 1994, Oliver 2001) and electoral consequences of regional growth (Converse 1966, Brown 1988, Gimpel 1999, Gimpel & Schucknecht 2003). The literature on suburbanization has focused on the links between new migrants, residential segregation, and local politics. Converse (1966) launched an extensive literature on the effect of northern migration into the south, and its effect on the gradual decline of Democratic strength there. Converse argued that the initial preferences of northerners persisted in the south; this persistence was an important reason for Republican emergence and
greater class and income distinctions in southern voter preferences. Shortly thereafter, Elazar((1970),(1986)) presented a theory about regional diversity based on the cultural norms of various streams of migrants into different destinations. Several studies followed the lead of (Campbell et al. 1960) in exploring the impact of postwar migration into the American south, which helped set the stage for the south’s emergence as a Republican base of support (exceptions include Brown (1988), Glaeser and Ward (2006), Gimpel (1999), Gimpel and Shucknecht (2001), Baybeck (2001)).

While some research in migration has accompanied the growth of the larger body of research based on geography, migration has yet to receive a complete theoretical or empirical treatment in political science.

The relative shortage of empirical research on the political effects of domestic migration results from several inherent problems. First, the volume of domestic migration is generally not sufficient to change outcomes in a single electoral cycle. In the last decade, approximately 14% of American residents change residences per year, and this percentage has actually declined since World War II. Three percent of all Americans move from one state to another in recent years, which means the political consequences at a national level are hard to detect in any given cross sectional survey. Second, there is no single and prevailing theoretical expectation about the effects of migration. In some instances, migration may diversify constituencies, and in other case, it may homogenize them, and these effects may simply cancel each other out across locations and over time. Third, migration effects may differ completely based on the level of aggregation; for example, migration between regions may generate completely different outcomes compared than migration within metropolitan areas or, generically, between cities and suburbs. The slow rate of migration means the long term effects are difficult to isolate from every other consideration that shapes preferences in given location. Finally, the migration data that surveys ordinarily collect do not adequately support two important requirements: they generally do
not specify where do migrants leave within a bounded period, and consequently, do not reveal how far did they migrated. Standard surveys such as the ANES and GSS only collect data about respondents birthplace and time in current residence or current community. While the Census and Internal Revenue Service publish migration volumes with relative precision, their datasets do not provide information about migrants’ political preferences.

1.2 Geographic Sorting and Migration

In the face of these empirical challenges, geographic clustering has recently become a widely explored topic among journalists and popular scholarly works (Brooks 2004, Florida 2002, Bishop & Cushing 2008). All of these authors have examined possible connections between geographic clustering and political polarization. The Bishop and Cushing (2008) account, which considers the cultural implications of clustering in religion, economics, and politics, starts by considering the emergence of landslide counties. When they compare the presidential elections of 1976 and 2004, they find that the percentage of Americans who live in a county with 60% or more voter support for its winning party has increased from 19% to 47.5% in 2004, despite the fact that the vote totals in both of these elections were relatively close. They also found that, in 2004, migrants from Republican counties are 2.5 times more likely to migrate into another Republican county, in contrast with those moving from Democratic counties who moved to Republican or Democratic counties in equal proportion. While Klinkner (2004) noted that this percentage in 1976 was artificially low from a historical perspective, and that the recent increase in landslide counties is actually more typical of American history. Whether or not this is the case, the percentage of residents living in landslide counties has grown steadily since the 1970’s, and it

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1 For 2008, the same metric, which is based on percentages of the entire vote including all candidates, dropped to 45.2%.
provides some evidence that a clustering trend of political preferences has occurred over the last thirty years.

But the landslide counties statistic also illustrates a number of empirical problems that complicate inferences about geographic sorting and polarization. Consider the challenge identifying geographic units that are stable, similar in size, and rich with historical data. The variation among counties illustrates this problem. The differences in county size and composition are especially noticeable moving from east to west, as the size of counties grow and the population averages increase. To the extent that sorting takes place in very large counties, it is difficult to argue that clustering is less of a problem even if the county doesn’t meet the landslide county definition. In addition, the Bishop and Cushing landslide county statistic does not reveal the distribution or location of landslide counties. The effect of landslide counties could be concentrated in one region or group of counties with some kind of peculiar characteristic that doesn’t present itself systematically across the country. For the same reasons, it is conceivable that the victory margin of some perennially contested counties is actually decreasing. In other words, the increase in the landslide county statistic could be hiding an offsetting reduction in a party’s standing victory margin while, at the same time, adding counties that are losing population to the landslide county total. We do not know if the factors that make some counties more homogeneous are affecting all of them. The trends in non-landslide counties are not visible, and these counties may be growing more competitive. Finally, while the landslide county statistic presumes that counties are the geographic unit of interest that captures the underlying notion of clustering, the theoretical claims of interest related to politics are more likely to be motivated by state, regional, neighborhood or city clustering. It is certainly true that the county is an attractive unit of analysis because county level data is very complete, especially in the case of migration. But county level clustering only provides one clue to the dynamics and political implications that
clustering might present.

1.2.1 Linking Migration to Sorting: Theoretical Explanations

In spite of these kinds of empirical challenges, clustering provides a compelling and intuitive narrative, and could evolve into an important component in the polarization literature. Two important bodies of literature in political economy suggest this possibility: research motivated by the Tiebout (1956) hypothesis literature and the dynamic segregation models developed by Schelling (1971) (1978). Tiebout sought to demonstrate that migration, given no moving costs and complete mobility, would lead to Pareto-optimal delivery of public goods and services. This opportunity creates an incentive for migrants to sort based on their particular demand for public services in differing quantity and types. Although the assumption of perfect mobility is restrictive and never met in practice, the hypothesis supports many of the general residential choice tendencies seen in suburban expansion and the definition of new city incorporations (Ostrom, Tiebout & Warren 1961), (Miller 1981).

Schelling (1971) (1978) proposed a series of agent based models in which individual members of two groups migrate in order to achieve some degree of proximity to other residents of similar type. Schelling’s models show that, given even a modest expectation of similar types for the members of two groups in a dyadic relationship will produce extensive or complete segregation under most conditions, well beyond the requirements of most of the model’s individual agents. This means that migration can lead to completely segregated communities, only because individuals seek to live near a relatively small percentage of other individuals with shared attributes.

These theoretical propositions can generate testable hypotheses related to migration and sorting, but they do not, by themselves, account for an explanation as to why clustering in the U.S. may have increased in recent years or generate tests to evaluate this claim empirically. Three driving forces, which at first seem unrelated
to one another, can also provide help theoretical understanding of migration’s clustering potential. First, scholars have established that geographic and social context interacts with migration, combined with the argument that migrants and their political preferences are more fluid and impressionable (Brown 1988). Second, the factors that motivate migration may correlate differently to political preferences at different times. The alignment of migration’s drivers and political preferences fluctuate. A closer alignment between migration and political preference may be explained by a theory of post-industrialism (Bell 1973, Inglehart 1977), which supposes that the large industrial base that fueled the U.S.’s economic expansion in the mid-20th century was replaced by an underlying economy centered on information and service. The work of Florida (2002) follows in this tradition, and it suggests that segregation based on wealth, skills, and taste may be the defining feature of successful modern metropolises. At the same time, migration can increase the geographic variation of preferences, to the extent that migration patterns and motivations do, in fact, correlate to political preference. For example, by Gimpel and Schucknecht (2001, 2003), if a person’s likelihood of migration is strongly correlated with personal income, then migration should increase variation in political preference, to the extent that income and preference are correlated.

Alternatively, if migration drivers are uncorrelated to political preference, then preferences should, eventually, tend to converge across all regions. In the absence of any relationship between migration and political preferences, I expect to see within-location variation increase but the between-location variance eventually shrink or disappear. It should not matter whether or not some places are growing and it doesn’t matter who is left. This expectation is consistent with the Roy Hypothesis (Roy 1951, Sjaastad 1962), which argues that migration tends to disperse specialized skill sets in the labor force.

Finally, consider the potential consequences of the fact that Americans now oc-
cupy a much greater percentage of the country’s land mass. To be sure, the United States has been fully settled for many years, but it has never been fully *occupied*, in terms of the percentage of the country that supports urban or suburban residential growth. While the number of Americans residing in non-rural locations increased dramatically after World War II, the amount of area turned over from rural to urban residence grew even faster, along with the number of urban locations. Linneman and Rybczynski (1998) claim that the U.S. decentralized its population faster than any civilization in human history. The implications of these forces can be theorized from a basic insight from the work of Schelling: given a fixed propensity to choose residences based on shared characteristics with neighbors in a dyadic group relationship, and free movement, people will eventually produce an overall pattern of self-segregation under most conditions. More importantly, this tendency can produces more self-segregation than the amount suggested by the average of individual demand. Suppose, for example, that two groups occupy a set of neighborhoods. Schelling’s theoretical claim is that whenever members of each group tend to expect even a modest percentage of other members to share their characteristics, extensive or complete segregation will still emerge.

Moreover, this pattern emerges when migrants are offered a choice set that includes new and unsettled prospective destinations. Schelling discovered that if migrants prefer some minimal number of common cohort, this desire does not need to be particularly large in relation to other determinants of location choice, in order to produce complete segregation. As long as the preference persists over time, segregation can emerge, to a much greater degree than individuals necessarily expect. Access to new residential possibilities, in regions that were relatively unpopulated until recent decades, as well as suburban and exurban locations across the country, has presented migrants with a corresponding opportunity to sort themselves along a variety of dimensions that are likely to have serious consequences on the composition
of aggregated political preferences. These preferences may have little or no relationship to the motivating forces that determine choice of residence. Indeed, the rate of growth in the amount of land designated as urban has roughly quadrupled since 1945, growing at twice the rate of growth in country’s overall population. Overall, while the percent of urban population has increased from 64% in 1950 to 79% in 2000, and from 151 million to 223 million. But the amount of urbanized area increased from 15 million acres to 60 million acres (Lubowski et al. 2006, 30). The U.S. now has much larger array of possible destinations than ever before mid-20th century, and much more of the country can be successful occupied.

The link between geographic expansion and clustering is suggested, but not proven, by the recent electoral strength of Republican candidates in places with significant population growth. Since the 1990’s, presidential elections have shown a positive relationship between the population growth of a county or congressional district and its level of Republican support. This relationship was quite noticeable in 2004; in the 50 congressional districts with the most growth, Republican candidate Bush won a majority in 45. In 2008, despite winning in 240 of 435 districts overall, Obama won majorities in only 13 of the 50 fastest growing districts. Overall, despite the fact that Bush beat Kerry in a significant number of districts (255 to 180), the average growth rate in Bush districts was 8.9% between 2000 and 2006. The growth rate of Kerry districts was 2.75%. None of these measures implies that the overall level of support for Republicans has grown as a consequence; in districts where he won, Kerry’s margin of victory was generally substantial. Instead, they suggest that clustering may be related to the U.S.’s growing residential footprint: more occupied area creates the opportunity for greater clustering along many dimensions, political preferences included.
1.3 Sorting and Political Polarization

If migration has lead to clustering, does this result imply that migration is implicated in the polarization of the American electorate? If migration adds to political clustering, two conditions must be satisfied. First, clustering must be increasing in a way that is consequential to a new set of political outcomes, or at least bear some relationship to trends we would identify as increased political polarization. We can safely assume that migration always leads to clustering along one or more dimensions, such as shared employment in a single industry, climate preference, likelihood of migration, and so on. But these shared attributes among migrants may never have political implications. Second, the level of aggregation must have relevance to geographic organization. Usually, this means that clustering must occur in geographic units that are large enough to produce political consequences. Any migration will generate, within a city block or the floor of an apartment building, a potential sorting effect. Gentrification of a single neighborhood may produce these effects as well. But the trend must assume some level of aggregation that has meaning to the political phenomenon we wish to describe.

1.3.1 The Distinction Between Sorting and Polarization

Although the terms sorting and clustering might seem interchangeable, I use the term sorting to describe a set of processes that lead to either greater or reduced sortedness, the formal outcome that arises from the clustering of preferences. Insofar as geographic sorting has relevance as part of the larger polarization story in political science, we should note that journalists and scholars discuss sorting in two different ways. First, sorting is sometimes described as the alignment of opinions within groups, such that individuals adapt and conform to a group or ideological norm. These norms may be partisan, ideological, or neither. In a political context, this
could mean that members with minority opinions gradually change their minds about particular issues. For example, the concept of partisan sorting (Levendusky & Fiorina 2006) suggests that individual preferences tend to align with party positions. If the issues have relatively little salience to partisan individuals, then the desire for partisan alignment can become the most important determinant of that opinion (Layman & Carsey 2002). Sorting could also result from greater ideological coherence and its potential unifying effects (Hinich & Munger 1994).

A second way the term sorting is used, and the one that will be the focus here, is to describe a reaggregation of individuals, such that their preferences are more segregated and clustered, while holding individual preferences constant. In other words, I restrict the use of the word sortedness (and convergence, which is the antonym of sorting) to describe the effect of a change in the way preferences are aggregated; this means that sorting is never a consequence of individual preference change. By distinguishing the effect of re-aggregation from the effect individual preference change, I hope to use an important conceptual distinction implied in the polarization literature.

Research in American political polarization has generated two competing, diametrically opposed narratives about democracy and changes in the electorate. While some persuasive evidence that public opinion has polarized (Abramowitz & Saunders 1998), and that policy preferences of elites respond to cues from party leaders, other researchers (Fiorina, Abrams & Pope 2006, Levendusky & Fiorina 2006). Fiorina et al. (2008b) state the argument in this way:

...centrist voters can register polarized choices, and even if the beliefs and positions of voters remain constant, their voting decisions and political evaluations will appear more polarized when the positions candidates adopt and the actions elected officials take become more extreme.
When statistical relationships change, students of voting behavior have a tendency to locate the source of the change in voter attitudes, but unchanging voters may simply be responding to changes in candidate strategy and behavior. (2008b, 556)

In this account, when parties, activists, and political elites are more polarized (that is, the differences between party agendas and political elites are greater), voters can more easily identify which party or elites should receive their support. Party elites are less accountable to a diverse set of policy preferences are more accountable to activists and primary election constituencies, and less concerned with keeping more centrist supporters from straying. Centrist voters become, at once, both more consistent supporters of the party closest to them, yet more alienated from party elites.

The distinction between the concepts of sorting and polarization reveals the fundamental question raised in the polarization literature: have individual the American electorate become more radicalized and ideological in ways that have consequences in the practice of politics? Conversely, are the consequences attributed to this alleged radicalization only the result of changes and processes that are alienated from individual citizens and the electorate at large? A clear distinction between polarization and sorting can help analyze these questions and evaluate them empirically. In short, I apply the definition used by McCarty Poole and Rosenthal (2009) suggesting that the meaning of these terms is distinct but their definitions overlap: sorting is a component of polarization.

By themselves, sorting and polarization are not necessarily difficult to define or operationalize. If we are discussing the electorate, the term polarization describes a measurable shift in the distribution of preferences between groups of citizens. For example, suppose we want to describe polarization between preferences of citizens who either want, at some fundamental level, more or less taxation of high income
earners. If more of these citizens have expressed the desire for a relatively extreme deviation from the median position, we would describe the result as increased polarization. In the context of a legislature, the principle is the same. Given a cardinal measure of ideology, if the mean ideologies of members from two parties have grown further apart, increased partisan polarization has occurred.

Sorting, on the other hand, describes an increased correlation between underlying preferences and affiliation with some subgroup or category. In the example above, we would say that sorting (or, more accurately, sortedness) has increased, if the expression of preferences about tax policy result from an increased alignment between partisanship and the underlying preference. In the legislative example, we would say that members with a certain ideological characteristics are more likely to be members of one party as opposed to the other. In these circumstances, we see greater polarization that is a consequence of sorting. Stated another way, sorting causes polarization to grow or shrink based on the way individuals aggregate themselves, given fixed preferences. If underlying preferences of individuals never changed, and if the composition of individuals within the electorate at-large never changed, sorting and polarization would always be equivalent.

My thesis is based three propositions that will help establish the distinction between sorting and polarization. First, we start with the unremarkable presumption there is a distinction between underlying and expressed preferences\(^2\). This proposition does not mean that individuals misrepresent their preferences, but rather preferences are expressed as a choice that maximizes the realization of underlying preferences, even if choices and preferences never coincides. As a result, changes in the choice set presented to individuals may change their expressed preferences that are constrained by the choice set, even though their underlying preferences may be

\(^2\) Without this distinction, we would presume that changes to any choice set would always reflect a change in underlying preferences, and that the meaning attached to choices would be static
constant.

Second, individuals with unchanging preferences can be reaggregated, and thus change the composition of groups whose expression of aggregated preferences affects political outcomes. These changes in composition may occur without any change in underlying preferences, but may increase (or decrease) the apparent gap in the way that a aggregated preference distribution is characterized and often anthropomorphized. Sorting occurs within an electorate when individuals are reaggregated without changes to individual preferences, and the newly aggregated subgroups show an increased correlation between an underlying preference and likelihood of association with a given category.

Finally, a shift in the difference between two preference distributions may be the result of any combination of the following:

- Changes in expressed preferences
- Rearrangement of the composition of subgroups
- Changes to the underlying preferences of individuals, or
- Replacement of individuals within the universe of citizenry with different individuals

Any and all of these considerations can lead to the outcome that we call polarization. But each element has important differences about the way we interpret polarization, and categorizing and operationalizing these differences can be surprisingly difficult. In the first two instances, where individual preferences do not change, polarization results from re-aggregation of a fixed set of preferences, or a different aggregation of subgroups. I contend that these causes of polarization, in which underlying preferences stay constant, lead to the phenomenon called sorting. Moreover,
if polarization results only from rearranging individuals into newly configured subgroups, then the effect of sorting is indistinguishable from the effect of polarization.

In the latter two instances, the composition of individual preferences changes in the absence of any re-aggregation. Polarization has changed, but sortedness has not.

I propose that polarization is therefore the sum of the effects of sorting (which we can call *sortedness*) plus individual preferences changes. This means that polarization is a superset of sortedness: all sorting increases polarization, but not all polarization is the result of sorting. ³

Differentiating between sorting and individual preference change is both a significant analytical challenge and empirical challenge. Re-aggregation of preferences by geography is a fairly straightforward example of sorting. Migration is one process that increases or decreases sortedness and correspondingly increases polarization. But preferences can be reaggregated by simply changing the choice set. How would we know, for instance, that one-time Democratic party member Ronald Reagan was accurate when he said, "I didn’t leave the Democratic party. The party left me.” If Reagan correctly read his own mind, he illustrated a perfect example of sorting. To confirm, we can begin by looking for evidence that the Democratic party did indeed change. But we might suppose that Reagan’s underlying preferences really did change, despite his protestation to the contrary, and that he and the Democrats left each other by mutual consent. Reagan essentially made a counterfactual claim: had the Democratic party remained unchanged, so would his partisanship.

This distinction between changes in underlying preferences, versus changes in expressed preferences resulting from changes in the choice set, reveals the empirical challenge faced in the polarization literature. In reality, it seems likely that both underlying preferences and the aggregation of those preferences changes all the time,

³ This formulation is described mathematically by McCarty Poole Rosenthal (2009) in the context of legislative polarization, and is explored in detail in the chapter on migration and polarization in Congress.
in different amounts, in all directions, for various components of the electorate. The empirical problem becomes even more difficult to unpack when we consider legislative polarization, where the focus shifts to the complexity of legislator behavior as opposed to legislator preferences.

In summary, this thesis considers sortedness and polarization as measurable outcomes. They are driven by a variety of processes that, as best we can determine, leave traces that can facilitate empirical research and theory development. Sorting processes, such as migration, legislative redistricting, and changing choice sets are all potential components of polarization, but not every force contributing to polarization implies sorting.

Migration is one example of a process that either increases or decreases sortedness. To be sure, migration is an important topic in its own right: for one thing, migration can reveal important tendencies among citizens to choose or reject new locations based on shared political preferences. But as a process that increases or reduces polarization, the immediacy of migration has an important and helpful feature: in the moment that it occurs, migration is a relatively pure instance of a sorting process. In other words, to the extent that migration changes polarization in the short run, its effects will not be conflated with individual preference change or generational change. Eventually, this purity is compromised, in the sense that migrants assimilate or change preference in complex ways, but in the immediate wake of any given instance of migration, we see nothing but pure sorting.

1.4 Measuring and Analyzing Sorting and Convergence

Applying the distinction described above, I refer to an increase in the correlation between geographic subunits and political preferences as changes in geographic sortedness. Any process that increases this correlation is a sorting process; those processes that decrease the correlation are converging processes. Convergence implies
that the correlation between preferences and a categorization has decreased, which means that the distributions of preferences across subgroups (such as geographic units) have become more similar. In his account of post-WWII migration from the north into the south, Converse (1966) showed that migrants increased the number of Republicans while, at the same time, increased class and income based differentiation. In both respects, migration tended to converge preference distributions in the north and south rather than sort them. Convergence can be defined as the opposite of sorting; it is the result of migration that tends to make preference distributions more similar between locations. While the Tiebout and Schelling literatures developed predictions of sorting, another stream of political economy literature (c.f. Roy 1933) predicts convergence.

First, the potential correlation with political preferences may never reflect any self-conscious desire for sharing these preferences. Migrants don’t have to consider, or even know, the place attributes or preferences of residents in order to induce a sorting or convergence effect. Migration always implies that people with some kind of shared motivation end up in the same place. We can generally assume that the motivation is never political, and we can even assume that the motivation is never self-conscious. But if that motivation correlates with political preference, political sorting will occur. The indirectness of political homogenization has serious consequences for the way we think about, and measure, utility of place selection.

Second, unless every imaginable kind of political preference collapses into a single dimension, it is likely that both sorting and convergence will be taking place, simultaneously, in different places, depending on the definition of the geographic (referred throughout as the areal) unit. Additionally, sorting and convergence can depend on the preference dimensions we might consider, along with an increased likelihood of support for the parochial interests of the new destination. For example, the wide variety of politically diverse migrants who moved into Michigan in the 1950’s
generally shared an abiding and homogeneous support for the interests of the U.S. auto industry. An extensive political economics literature theorizes that migration will generally converge preferences rather than sort them. Did migration converge or sort their preferences? Until we specify the relevant dimension of interest, the answer is unclear.

Third, the granularity of locations will change any analysis of sorting or convergence. When we examine relatively small area units, such as neighborhoods, or even the suburban component of a metropolitan area, we may find sorting that is undetectable within and between large regions, counties, or states. Our ability to observe and evaluate either sorting or convergence depends completely on the unit of analysis, and the particular consequences also depend completely on how we choose to aggregate.

Finally, sorting and convergence are dynamic and variable forces, and the consequences are easily confounded by temporal considerations. The effects of migration may not mean very much in a single shot. But the composition of migrants changes, their effect on a new destination is endogenous, and a given wave of migration with uniform characteristics may tend to converge a destination at one stage and then sort it later on. Suppose we identify a single stream of migration that, over time, redefines the electoral composition in a place like Idaho or Montana. In the early going, this stream may change these places into more heterogeneous ones, and later on, without any change in the migrant composition itself, make them more homogeneous and completely different than before the migration began. For this reason, it is impossible to say that any given instance of migration either sorts or converges with consistency. Furthermore, it is safe to assume that, in any given moment of time, migration generates sorting in some places and convergence in others, even if the prevailing trend favors sorting over convergence, or vice versa. Because of this, it is difficult to generalize about overall sorting or convergence trends by simply
examining one instance of migration or even one kind of migration.

Sorting describes the outcome in which aggregated preference distributions between groups have become more distinct; convergence means aggregated preference distributions have become more similar. If there is no relationship between political preference and the reclassification mechanism at all, I expect complete convergence. Under this scenario, migrants would always reflect the distribution from which they emerge. We may see occasional instances of sorting under these circumstances, but if they are completely unrelated to political preference, convergence will be the predominate. If, on the other hand, migrants segregate themselves in ways that correlate to political preference, then sorting will predominate. Both sorting and convergence can occur in different places at the same time.

This definition raises important questions about the meaning of political preference changes that are central to the debate about mass polarization: does an electorate’s seemingly radicalized response to a more polarized and radicalized choice set, by definition, imply that the electorate has radicalized accordingly? The argument by Fiorina is clear: it does not. At the same time, this argument does not imply that the electorate hasn’t polarized for other reasons. Generational forces, people entering and leaving the electorate, or endogenous factors triggered by changes in the choice set, can induce or reveal mass polarization are potential motivators, even if we concede that reclassification is not one of them. Importantly, this definition of sorting excludes any individual opinion change, it also excludes the situation where individuals who change their preferences in order to align their preferences with a party or ideology. This distinction is important because it excludes the Levendusky (2006) construct that he calls partisan sorting. In my restrictive definition, sorting only takes place when individuals are reaggregated, even if opinion change, or partisan alignment, follows as a consequence.
1.4.1 Modeling the effect of migration and growth

In this section, I describe a simple algebraic model which I use in the next chapter by applying it to individual level migration data from the 2006 Cooperative Congressional Election Study. This purpose of this model is to show how the quantity and the expected value of a binary preference of migrants, when separated from non-migrants, change the composition of those preferences in the places where migrants leave and the places where they arrive. If we wish to estimate the effect of migration using individual level data, we have the opportunity to consider a variety of factors besides the net population change in a given location. In a given location, migration generates three discrete sets of individuals: new arrivals, leavers, and stayers. The computation strategy shown below takes advantage of this separation afforded by the survey data. We may find, for example, that two locations with similarly sized inflows and outflows of migrants are affected by migration very differently, if the preferences of new arrivals differs greatly from leavers. In addition, the differences between migrants and non-movers will matter a great deal in places where the number of migrants is relatively large. While the computation shown below is relatively straightforward, it leverages the data’s ability to completely isolate the preferences of each subgroup under the presumption that preferences stay constant.

The strategy is to estimate parameters of a preference distribution for each of the three categories, then evaluate the parameters as leavers leave and arrivers arrive. In general, changes in the values of the parameters for a particular distribution indicate the presence of sorting or convergence. Two locations are sorting if the differences in parameters are increasing; they are converging if the parameters are coming closer together.

The parameter choice depends on how we characterize the distribution. In the simplest case, we examine the $p$ parameter in a Bernoulli distribution, or a binomial
distribution with two parameters: \( n \) and \( p \). We’ll consider two binary preferences, separately: the probability that a respondent expresses Republican party identification and probability of Democratic party identification. By considering these probabilities separately, we can generate a more tractable hierarchical model and validate one set of results against the other.

As described below, I generate six separate sets of probability estimates; this means an estimate for of the likelihood of Republican or Democratic identification among the three different categories of respondents. I generate a multilevel partial pooling, logit model, calculate the variance for each location of interest, and generate a probability estimate for each of three classes of migrants using an empirical Bayesian estimation. In addition, I predict the likelihood of a particular type of place choice with a multinomial logit model.

In one sense, this exercise is descriptive, since the model presumes that places are moving towards sorting or convergence at any given instance. But we can also use this model to examine hypotheses about whether or not sorting is a prevailing trend, and if so, under what conditions. The focus throughout will be on U.S. congressional districts as the unit of analysis.

Suppose we have two preference distribution parameters based on the composition of preferences before and after one period of migration for location \( l \). The instance represents migration over some defined period of time. To capture the effect of sorting as defined earlier, this transformation presumes that the preferences of individuals are held constant, and the composition of aggregate preferences is changed only because migrants either move into location \( l \), or away from it.

The parameter in question needs to reflect an overall movement of mass of preferences either toward or away from another location (or group of locations) that serve as the reference. In the simplest possible example, this parameter would be the probability of a binary preference in a binomial distribution, but it could also
be represented by the mean parameter in a normal distribution. If the appropriate parameter between two preferences distribution grows apart, we have satisfied a condition characterized by sorting. If the parameters grow closer together, then we have seen convergence. It is less obvious in the case of a joint probability distribution with multiple parameters of interests for different dimensions. A conjecture about sorting or convergence could be based on changes between the Euclidean distance of the parameters, or some weighting of them.

For any two locations $a$ and $b$, assume the parameter of interest is $\Theta^0_a$ and $\Theta^1_a$ for location $a$ and $\Theta^0_b$ and $\Theta^1_b$ for location $b$. We then define a function that defines the change in the distance between $\Theta_a$ and $\Theta_b$ over the relevant time period. This means:

$$|\Theta^1_b - \Theta^1_a| > |\Theta^0_b - \Theta^0_a|$$

(1.1)

describes the sorting condition while

$$|\Theta^1_b - \Theta^1_a| < |\Theta^0_b - \Theta^0_a|$$

(1.2)

describes convergence.

Each parameter is determined by a function that decomposes migration activity into three categories: *arrivers*, *leavers*, and *stayers*. This approach looks to transform individual preferences into a parameter that describes an aggregate preference. No matter how we choose to do this, the important feature of this approach is to isolate leavers and to identify separate characteristics of each of three groups, rather than try to simply analyze net migration. The need to isolate both leavers and arrivers emerges for three reasons. First, leavers change aggregate preferences in a given place as much as a new arrival. Second, even if net migration is marginal, arrivers can, hypothetically, bring a very different set of preferences into the mix. Finally,
two places with the same amount of net migration can have very different levels of
circulation; the greater the number of residents cycling through a particular place,
the greater the effect of any significant difference between arrivers and leavers.

In the simplest possible example, suppose that individual preferences are drawn
from a Bernoulli distribution with the relevant parameter \( p \) (the probability of an
individual having a particular preference, such as party identification). To illustrate
this example, I use the following notation. Let \( \Pr(X^t_l) \) equal the probability of a
binary preference (e.g., Republican or Democratic party identification) in location \( l \)
at time \( t \) (either zero or 1, denoting probability preceding or following migration time
interval.

\[
X^t_l \in \{0,1\} 
\]

Suppose we ignore, for now, changes to the population between \( t(1) \) and \( t(0) \)
that result from any factor other than migration, including immigration, births,
and deaths. The analysis looks for evidence that migration has either increased or
decreased the differences between two locations. If we restrict \( t \) to two instances in
time (0 and 1), we can define \( \Pr(X^0_l) \) and \( \Pr(X^1_l) \) as follows:

\[
p^1_l = \frac{n^0_ip^0_i + n^0_jp^0_j}{n^0_i + n^0_j} 
\]

and

\[
p^0_l = \frac{[n^0_ip^0_i + n^0_kp^0_k]}{[n^0_i + n^0_k]} 
\]

where:

\[
n^0_i = n^1_i = \text{non-migrants (stayers)} \\
n^1_j = \text{arriving migrants (arrivers)} \\
n^0_k = \text{departing migrants (leavers)}
\]
Consequently:

\[ n_i^1 = n_i^0 + n_j^1 = \text{stayers + arrivers in } t(1) = \text{total population in } t(1) \]
\[ n_i^0 = n_i^0 + n_k^0 = \text{stayers + leavers in } t(0) = \text{total population in } t(0) \]
\[ n_i^1 - n_i^0 = n_j^1 - n_k^0 = \text{arrivers in } t(1) - \text{leavers in } t(0) = \text{net migration} \]

Equations 4 and 5 are nothing more than the weighted average of the probabilities of non-movers, and the departing and arriving migrants, respectively. The simplicity of this formula is afforded in two ways: first, departing and arriving migrants are isolated as noted above, and secondly, the relative effect of each flow of migration is affected by its size.

In the case of three or more individuals, we say that a group has sorted when the parameter of interest has moved further away from the weighted mean of all the groups. Since individual preferences do not change, the weighted mean stays constant from one time period to the next. But any or all individual groups can sort in relation to the mean, and any combination of groups can either sort or converge.

1.5 Conclusion

This chapter introduces my proposed application of migration to the related yet distinct concepts of sorting and polarization. Migration is a sorting process, given the presumption that the instance of migration does not, by itself, induce changes in a migrant’s underlying political preferences. The effect of migration as a sorting process depends on several factors, including the degree and the manner to which migration drivers are correlated to political preferences, the composition of migrant preferences relative to non-mover preferences, the differences between arriver and leaver preferences in a given destination, and perhaps most importantly, the sheer magnitude of migration. The variation in the amount of migration, as opposed to the composition of migrants, has the potential to create the most interesting and
counter-intuitive outcomes, which the empirical analysis in the next chapters will demonstrate.
Migration and Sorting in the Electorate: Evidence from the 2006 Cooperative Congressional Election Study

In this chapter, I look for evidence of migration-induced clustering in the U.S. electorate, using a unique dataset that identifies recent migrants from the 36,421 respondents in the 2006 Cooperative Congressional Election Study (CCES). These records are then matched to the U.S. Postal Service’s change-of-address database covering the period between 2004 and 2007. First, I elaborate on the distinction between two terms identified in the previous chapter: sorting and convergence. Next, I apply the formal definition and model of sorting discussed in the previous chapter, and then evaluate them empirically with the CCES dataset. Finally, I apply the data to two separate empirical tests of sorting hypothesis: an individual level model that predicts the partisanship of migrants’ destination districts, and an estimate of the number of U.S. congressional districts that show evidence of sorting over the 18 months of migration reflected in the database.  

1 Ansolabehere and Lovett ((2008), unpublished) use the 2006 and 2007 panel data from the CCES in an alternative design.
With these challenges in mind, my analysis focuses on the changes in preference composition that result directly from migration. By narrowing the question into a discussion about composition, we can then make inferences about whether migration tends to sort or converge, along with the conditions that lead to one outcome or the other. I treat increases sorting and convergence as outcomes, driven by some kind of process. As noted in the previous chapter, migration is one kind of process that can induce these outcomes, but there are other processes as well, such as changing individuals’ choice sets. I can then apply the CCES data and determine whether migrants induce sorting or convergence, and identify the places where these outcomes take place.

The two empirical models in this paper looks at the the characteristics of new arrivals, non-movers, and leavers from any given location, which can then generate predictions about their effect on an overall preference distributions. Using the CCES 2006 data described below, I estimate separate probabilities of Democratic and Republican party identification, for migrants (both arriving and departing) and non-movers for each district in the 109th U.S. Congress. Next, I apply these probabilities to estimates of each of these three classes of residents, which will predict the effect of migration since 2006 on each district. Finally, I will estimate a discrete choice model on the significance of preference composition of existing residents in location decisions.  

2 The model proposed here leaves aside some well known techniques to measure clustering and dispersion within and between subgroups, such as the Herfindahl Index, the metrics proposed by Massey and Denton (1988), and the Sullivan (1973) and Koetzle (1998) indices. The model proposed here is exclusively focused on a binary preference. Because my interest focuses on both the change in population and the specific effect of movers and leavers, I chose to develop a new, relatively simple model to evaluate sorting that provides these features.
2.0.1 Sorting versus Convergence

In the formal definition below, sorting and convergence result from assignment of individuals into new locations. These new assignments change the likelihood of partisan identification for each major party; this change results in some distribution of districts that have either sorted or converged. Note that while sorting may describe a predominant tendency for individual locations to sort, the model treats sorting and convergence as attributes of individual locations. As mentioned above, we can think of migration as a kind of reclassification: individuals who migrate have aggregated into a different geographically defined subset of individuals. In turn, migrants have a preference distribution that modifies the distribution of the original group of native residents. The essential idea is that two distributions are sorting if they become more distinct, and they are converging if they become more alike. More formally, convergence means that the difference between two values of an important parameter in the two distributions is shrinking. Sorting means the distributions of different locations are becoming more distinct, or that the difference in the parameter of interest is increasing. Naturally, the functional form of the preference distribution can generate two or more parameters moving in different directions, and we can’t always form a clear assessment whether the sorting or convergence effects are more relevant. In the discussion below, I will sidestep this problem by supposing that individual preferences are drawn from a Bernoulli distribution of some binary variable (e.g., is the individual a Republican, or not). As noted earlier, sorting and convergence reclassify individuals, in the absence of change to these individual’s individual preferences.

Convergence implies greater intra-group variation, as Converse (1966) noted in his description of migration and its overall effect on southern politics. But the important feature is that two converging distributions start to show greater resemblance, motivated by reclassification. Unless the distribution of reclassified individuals doesn’t
change parameter of interest in the original distribution, the distributions will either sort or converge. This exception might occur because the distribution of reclassified individuals and the original distribution share exactly the same parameter. A more likely outcome is that the parameters of the reclassified and original distributions are close enough that the effect is inconsequential. Nevertheless, we could reasonably presume that for parameters drawn from a continuous distribution that some measurable sorting or convergence always takes place any time migrants enter or leave a particular location.

The defining characteristic of sorting is that individuals are reaggregated in a way that changes some characteristic of aggregated group preferences, given that individual preferences remain constant. This modified aggregation of preferences can occur on any dimension, such as race, party, taste, ideology, or changes to a choice set, such that the expressed preference or behavior of individuals becomes more internally consistent.

Given this definition of sorting, I address two questions. First, do individual preferences in a cross-sectional survey reveal any tendency for migration to sort or converge? Specifically, does the destination of migrants predict their party identification? Does the overall migration pattern predict the effect of migrants on the preference distribution in a given location? Where sorting occurs, migration should strengthen and homogenize preferences; where convergence occurs, migration will pull preferences back to the mean. By applying a simple model of sorting and convergence, I can evaluate whether or not these effects have occurred. Second, does the presence of residents who share party identification increase the appeal of a given destination? I will apply a discrete choice model to evaluate this possibility and try to parse shared political preferences from other considerations that determine location choice.
2.1 Data: Cooperative Congressional Election Study of 2006

Migration questions, if asked at all in survey research, are generally limited in specificity or do not specify the places that people migrate from or when they migrated. In some cases, respondents may be asked where they were born, or where they lived five years ago. In particular, we generally cannot combine political preference data with detailed migration information at the individual level, particularly data that provide specific information about the source and destination of migrants. The U.S. Census does provide individual level data for Public Use Micro Areas (PUMA), and asks respondents to identify the place they left, but only at the U.S. state level of detail. In any case, the census does not provide individual level political preferences. Inferences about the preferences of migrants are difficult to extrapolate from aggregate data, because we cannot compare an individual’s own preferences, and the correspondence between these preferences and those that prevail in the migrant’s destination or origin. Usually, migration is analyzed using states or counties, partly because the data are available at those levels, and partly because states essentially do not change boundaries. Sometimes census metropolitan service areas are used, but MSA’s do not span the entire country. For reasons specific to this analysis, I have chosen to focus on migration between U.S. Congressional districts from the 109th Congress (2005-06).

Using the U.S. Postal Service’s address matching database with the 2006 CCES, we can link political preferences with very precise information about their migration patterns. Thanks to this precision, we have an unusual opportunity to choose the areal unit of analysis, in order to determine where sorting or convergence prevails in the data. The unit of analysis will be 110th U.S. Congressional districts in the 2000-2006 time frame, based on responses to the 2006 Cooperative Congressional Election Study (CCES). The survey was conducted over the course of 2006 and 2007,
with both pre- and post-election responses. Developed by a consortium of thirty U.S. universities, CCES includes 36,421 respondents and asks a variety of questions related to the 2006 midterm election and relevant preferences and demographics. In the cross-sectional post-election data used here, nearly every respondent identified as a migrant responded to the survey before moving, which should eliminate contextual effects of a new destination from the responses.

2.1.1 Linking with USPS Change of Address Database

All CCES respondents who submitted a change-of-address form with the postal service appear in the publicly available change-of-address matching database, which is used by organizations who wish to forward mail. The matching technique captures moves for respondents who provided a change of address after establishing a record for the 2006 survey (as of January 2008). Of the 36,421 respondents, approximately 4,300 appeared as matches in the change-of-address database. In each instance, the database provides the Zip+4 record for both the origin and destination of each matching record. For the analysis used in this paper, 1,417 of these matches indicate migration into a new congressional district, and include approximately 3.9% of all respondents.\(^3\)

2.1.2 US Congressional District as Unit of Analysis

The size of the CCES database presents an unusual opportunity to use U.S. congressional districts as a unit of analysis. Surveys based on congressional district must contend with the large number of individual districts and the relatively small number of respondents per districts. In addition, congressional districts, unlike states and counties, are moving targets: in the contemporary setting, all districts must be redefined every ten years, at minimum, and often substantially. These changes

\(^3\) The USPS matching was administered by Polimetrix, who also administered the CCES itself. Polimetrix released only the Zip+4 information.
pose serious problems for cross decade comparisons between congressional districts. In addition, congressional districts, counties, and states or any geographic definition risks the modifiable areal unit problem, in which the effect of a phenomenon like sorting result from an aggregation bias based on the way lines are drawn. Congressional districts are not organized randomly but are instead designed, at least in part, to serve political purposes, regardless of whether we believe that redistricting contributes significantly to incumbency advantage or protection of seats for a particular party. These designs can arguably exaggerate or conceal a given sorting tendency.

Despite these drawbacks, there are significant advantages for this analysis by using congressional districts in comparison to either states or counties. First, congressional districts are relatively consistent in terms of population size. Following a reapportionment, district population sizes are expected to be identical within states and reasonably consistent within a fairly narrow range across states. This means that the likelihood of migration is less likely to be correlated to the size of a particular areal unit. In contrast, the variation of county size is greatly affected by region; in particular, counties are vastly larger and more populous in western states compared to the rest of the country. In addition, any inference about sorting based on a county-level analysis risks bias in the direction of the effects generated by the large number of counties with very small populations. For example, despite the fact that the number of landslide counties has grown significantly since 1976, we must account for the fact that a relatively small outmigration from rural residences to cities and suburbs and can dramatically change an election outcome for a large number of counties without effecting most voters in counties with more people.

In comparison to the states, congressional districts are both more uniform and more granular. A sorting pattern that may be hidden within a state such as Colorado, which may have become more competitive at the state level in national politics, becomes more visible at the congressional district level. Since very large, urban or
western counties may contain multiple congressional districts, we may see patterns emerging in these places by using districts instead of counties or states.

Finally, examination of sorting at the U.S. Congressional district level blends naturally into an analysis of sorting and potential constituency effects on the behavior of Congress members. For example, can we see evidence that sorting of preferences, where it occurs, generates a different kind of behavior in congress members that reflects, rather than initiates, radicalization of the aggregated preferences within their constituencies? Ultimately, we want to see whether geographic sorting helps induce, or at least facilitates, polarization in aggregated electorates and in political institutions.

2.1.3 Descriptive Results from CCES Data

The individual level CCES survey data can help determine whether this growth shows a relationship with the individual political preferences of movers. Using an overall count of migrants, based on the summary shown in Table 2.1 I compare the partisan preferences of movers against the aggregate preferences of districts, both at the origin and destination. Although the CCES contains a substantial number of respondent attributes, this analysis will concentrate on partisan identification; specifically, I use the survey’s three-point partisan id question (Democrat, Republican, Neither).

From the survey responses, each respondent is coded as either a Democratic identifier, Republican identifier, or Independent. Irrespective of the kind of source district, movers to Democratic districts appear to be disproportionately Democratic as shown in Table 2.2. To a lesser degree, the same is true for Republicans and movers to Republican districts. In other cases, the percentages show sorting. For instance, non-moving Democrats comprise 41.4% of the respondents in Democratic districts. But 51.5% of those moving from one Democratic district to another Democratic district are Democrats. Only 11.5% of this kind of mover is Republican, but
Republicans comprise 21.2% of the non-movers in Democratic districts. These patterns hint at the possibility of sorting; migrants are increasing the percentage gap between identifiers. However, 27.7% of those moving from Republican Districts to Democratic districts are Republican. This tendency illustrates convergence, in which the percentage gap between Democrats and Republicans will shrink. Even so, the shrinkage of the gap will be less than if the percentage reflected the presence of Republicans as a whole, or all Republicans moving from Republican districts, which would be the case if party had no relationship to destination whatsoever.

Since we don’t know how inflows and outflows of migrants actually change the distributions of identifiers, summary statistics of movers of this kind do not suggest very much about whether or not they are consistent with a sorting hypothesis.
Table 2.1: Count of Migrants by Partisanship of District of Origin and Destination

<table>
<thead>
<tr>
<th>Origin Type</th>
<th>Dest: Dem</th>
<th>Dest: Swing</th>
<th>Dest: Rep</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Origin: Dem</td>
<td>165</td>
<td>85</td>
<td>182</td>
<td>432</td>
</tr>
<tr>
<td>Origin: Swing</td>
<td>104</td>
<td>97</td>
<td>144</td>
<td>345</td>
</tr>
<tr>
<td>Origin: Repub</td>
<td>137</td>
<td>125</td>
<td>378</td>
<td>640</td>
</tr>
<tr>
<td>Total</td>
<td>406</td>
<td>307</td>
<td>704</td>
<td>1417</td>
</tr>
</tbody>
</table>

4 Computation based on the Haversine formula between longitude and latitude; essentially, this computes the distance between a straight line, adjusted for the earth’s curvature.
Table 2.2: Migrant Democratic and Republican Identifiers by District Type

<table>
<thead>
<tr>
<th>All Moves</th>
<th>To Dem District</th>
<th>To Rep District</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Democratic Identifiers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From Dem District</td>
<td>131</td>
<td>96</td>
<td>227</td>
</tr>
<tr>
<td>From Rep or Swing District</td>
<td>87</td>
<td>128</td>
<td>215</td>
</tr>
<tr>
<td>Total</td>
<td>218</td>
<td>224</td>
<td>442</td>
</tr>
<tr>
<td>Republican Identifiers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From Rep District</td>
<td>186</td>
<td>75</td>
<td>261</td>
</tr>
<tr>
<td>From Dem or Swing District</td>
<td>96</td>
<td>51</td>
<td>147</td>
</tr>
<tr>
<td>Total</td>
<td>282</td>
<td>126</td>
<td>408</td>
</tr>
</tbody>
</table>

| Moves > 200 Miles              |                |                |       |
| Democratic Identifiers         |                |                |       |
| From Dem District              | 37             | 40             | 79    |
| From Rep District              | 30             | 53             | 81    |
| Total                          | 67             | 93             | 160   |
| Republican Identifiers         |                |                |       |
| From Rep District              | 88             | 34             | 121   |
| From Dem District              | 49             | 9              | 58    |
| Total                          | 137            | 43             | 180   |

This table shows the number of migrants in the CCES 2006 dataset who were party identifiers, by partisanship of source and destination districts. It also includes the subset of migrants who moved at least 200 miles.

2.2 Individual Selection of District Type

2.2.1 Model Specification

In this section, I use a discrete choice model that focuses on individual migrant characteristics and their relationship to political preferences in a given destination. The goal of this model is to predict the likelihood of an individual migrating to a particular type of district characterized by its overall party preference. We can then determine if individual political preferences persist as meaningful explanatory
variable. In other words, we want see whether an ideologically conservative (liberal) migrant more likely to migrate into a Republican (Democrat) district, once we have accounted for the migrants’ places of origin and other well known predictors of partisanship. The model should also try to account for the possibility that migration may rearrange migrants in similar places without sorting or converging them in the aggregate. As always, I make no assertion that the prevailing political ideology enters migrants’ decision making process. For the sake of simplicity in this polytomous model, I do not include any place attributes or a hierarchical model, although I do include variables associated with the migrants’ district of origin. However, the model does include several explanatory variables associated with the originating district of migrants. I treat originating districts, combinations of originating and destination districts, and originating district attributes as individual level variables.

The model predicts partisanship as a proxy for political preference, but instead of a separate binary estimate for each party as seen previously, I generate a polytomous estimate using three categories. A discrete choice framework makes sense because I am not especially interested in the degree of partisanship among those districts that are uncompetitive. In this instance, the boundaries are defined at 55% of the two-party vote in the 2004 presidential election. Swing districts, which are used as a base alternative, are those with vote share percentages between 45 and 55.

In this model, the crucial explanatory variable is respondent’s ideology. I focus on ideology because it provides a more conservative and difficult test of sorting than partisanship. If the sorting hypothesis holds, then ideology should stand as significant and consistent with the destination type, even when controlled for the migrants’ partisanship in the district of origin and other alternative explanatory variables. Convergence suggests that ideology conflicts with the type’s prevailing preference, or is insignificant.

Since the model needs to predict the probabilities in a polytomous choice set, and the explanatory variables are based on individual attributes, this model uses the multinomial logit functional form. Multinomial logit models have two important properties. First, multinomial logit generates a coefficient for every variable for each
choice, excluding a base alternative. This will make significance for one party visible even if the other is not, and vice versa. Second, multinomial logit models provides a relatively strenuous test of parameter significance. 

In the multinomial logit specification, we begin with a utility function

\[ U_{ij} = X_{ij}'\beta + \epsilon_{ij} \quad (2.1) \]

where individual i selects choice j from a choice set J, and X is a vector of independent variables. Given the individual seeks to maximize \( U_{ij} \), the model predicts the probability

\[ P(y_i = j|x_i) = p(U_{ij} > U_{ik}) \forall j \neq k \quad (2.2) \]

Assuming the independence of irrelevant alternatives criterion is met, it follows that:

\[ P(y_i = j|x_i) = \frac{e^{X_{ij}'\beta}}{\sum_{j=1}^{J} e^{X_{ij}'\beta}}, j = \text{Democrat, Swing, Republican} \quad (2.3) \]

One alternative needs to be withheld in order for the model to be identified. Withholding Swing districts leaves:

\[ P(y_i = j|x_i) = \frac{e^{X_{ij}'\beta}}{1 + \sum_{j=1}^{J} e^{X_{ij}'\beta}}, j = \text{Democratic, Republican} \quad (2.4) \]

The estimation maximizes a likelihood function representing these choices for all individuals is

\[ L = \prod_{i=1}^{N} \prod_{j=1}^{J} P(y_i = j|x_i)^d \quad (2.5) \]

An alternative strategy is to apply the new class of equilibrium sorting models from the political economy literature. These models are based on the discrete choice framework developed by Berry (1994) that generates group and individual level predictors, and then accounts for unobserved group level variation with an instrumental variables strategy. These models are especially useful in predicting probabilities of specific individual choices and accounting for agglomeration and congestion effects (i.e., the endogeneity associated with choice based on the choices of others). In some respects, this would be the best strategy for a discrete choice problem such as this one, but the focus in this exercise is not on isolating endogeneity or decomposing the elements of a utility function. Rather, the goal is simply to examine whether the correlations partisanship or ideology disappear in a model that includes other variables associated with migration.
if option $d$ is chosen by individual $i$.

Thus, the choice set has three elements: moving to a Democratic, Republican, or Swing district. The model estimates coefficients that predict a Democratic district and a Republican district, compared to the probability of moving to a Swing districts as the baseline alternative. Other migration models have included staying as an option in estimating a utility model, but as suggested earlier, the focus in this analysis is to explain the direction of migrants once the migration decision has been made. We do know that migrants are more likely to be Republican (Gimpel & Schucknecht 2001), an expectation supported in Table 1, but it is not obvious from that generalization how the movement affects the distribution of individual places. Finally, I apply the Hausmann (1984) test to the final result to test the validity of the Independence of Irrelevant Assumptions requirement for multinomial logit models.

Since this particular approach only includes migrants, and excludes migrants who did not move far enough to change congressional districts, it presumably generates selection bias, insofar as the preferences of non-migrants are excluded from the model. Despite this potential shortcoming, note that I have defined sorting as an outcome that might reflect individual preferences for more homogeneous destinations, but might also merely reflect the incidental result of every other driver of migration, whether those drivers are observed or unobserved. The purpose, for now, is not to demonstrate a revealed preference for political homogeneity. Instead, I hope to show that migration, in the aggregate, can contribute to homogeneity, whether or not homogeneity is a desired outcome for individual migrants.

The model includes three sets of explanatory variables: ideology (as noted above), attributes of the migrant’s originating district, and demographics. The important test is the comparison of ideology to the partisanship of a migrant’s destination district, after controlling for the partisanship of a migrant’s originating district. In this model, ideology is based on the five point Likert scale used in the CCES (rescaled to $-2 = $ Very Liberal and $2 = $ Very Conservative). District partisanship is a discrete
variable based on the 2004 presidential vote share. The dependent variable in the model is the partisanship of the destination district. I represent partisanship as a discrete variable, since the qualitative difference between districts with 60% and 70% Democratic or Republican vote share is less apparent, and less relevant, to the analysis than the difference between districts with 50% versus 60%. I also represent Democratic partisanship and Republican partisanship as separate binary variables, both as dependent variables and as controls. In doing so, I imposed a more strict test of statistical significance, but I can show whether or not the effects of Democratic partisanship differ from Republican partisanship. In all four versions of the model, I include the distance of the move, accounting for the fact that moves between Democratic districts tend to cover less distance than moves between Republican districts, irrespective of region. I also include variables for age and dummy variables for black and hispanic ethnicity of respondents.

In Model 2, the first variation of the baseline model, I reduce the dataset to include only migrants who migrated at least 200 miles. Because this selection eliminates migrations between the most proximate districts, it significantly reduces spatial autocorrelation, but also reduces the number of observations. Model 3 includes all observations but controls for the change in percent of urban area in the respondent’s new district compared to the old district. This variable accounts for the fact that respondents who live in districts with higher percentages of urban area are more likely to identify as Democratic party members and therefore political preference may simply mediate a shift in migrant’s location density. Finally, Model 4 adds fixed effects for census regions of originating districts (using Midwest region as a baseline).

2.2.2 Results

The results of all four models are reported in Table 2.3. If sorting occurs, we should expect an migrant’s ideology to predict the kind of district chosen. Conservative ideology should predict a greater likelihood of Republican district, and liberal ideology should predict a greater likelihood of Democratic districts. Note that in the

---

6 Districts with 55% or more of the Democratic 2-party vote share are categorized as Democratic; 45% to 55% as Swing; 45% or less as Republican.
multinomial logit model, each kind of district is being predicted separately; it is possible, for example, for ideology to have significance in Democratic districts but not Republican districts, or vice versa.
Table 2.3: Multinomial logit model predicting destination type

<table>
<thead>
<tr>
<th></th>
<th>Model 1 Baseline</th>
<th>Model 2 (&gt;200 miles)</th>
<th>Model 3 w/ Urban % Change</th>
<th>Model 4 w/ Urban % and Regions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Democratic District</td>
<td>Republican District</td>
<td>Democratic District</td>
<td>Republican District</td>
</tr>
<tr>
<td>Ideology (Conserv.)</td>
<td>-.166* (.078)</td>
<td>.158* (.070)</td>
<td>-.311* (.132)</td>
<td>.023 (.109)</td>
</tr>
<tr>
<td>Demo Originating</td>
<td>-.018 (.196)</td>
<td>.683*** (.171)</td>
<td>-.433 (.347)</td>
<td>-.387 (.285)</td>
</tr>
<tr>
<td>Rep Originating</td>
<td>1.02** (.510)</td>
<td>.380 (.259)</td>
<td>1.44** (.464)</td>
<td>.502 (.446)</td>
</tr>
<tr>
<td>Black</td>
<td>.510* (.255)</td>
<td>.315 (.239)</td>
<td>.466 (.394)</td>
<td>.521 (.356)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>-.005 (.005)</td>
<td>.007 (.004)</td>
<td>-.009 (.009)</td>
<td>.005 (.007)</td>
</tr>
<tr>
<td>Age</td>
<td>-.124** (.036)</td>
<td>-.006 (.032)</td>
<td>-.003 (.189)</td>
<td>-.005 (.007)</td>
</tr>
<tr>
<td>Log Move Distance</td>
<td>1.87*** (.293)</td>
<td>1.43*** (.242)</td>
<td>1.98*** (.298)</td>
<td>1.34*** (.244)</td>
</tr>
<tr>
<td>Increase in Urban % of Mover's New District</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast Originating</td>
<td>.166** (.370)</td>
<td>-.432 (.345)</td>
<td>.421 (.139)</td>
<td>4.02*** (.139)</td>
</tr>
<tr>
<td>South Originating</td>
<td>.376 (.233)</td>
<td>.621** (.195)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West Originating</td>
<td>.700** (.236)</td>
<td>-.016 (.209)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>1361</td>
<td>537</td>
<td>1361</td>
<td>1361</td>
</tr>
</tbody>
</table>

*p < .05 **, p < .01, *** p < .001 Base category is swing districts
2.3 Estimating Effect of Ideology and Partisanship with Selection Models

The models in Table 2.3 estimate the relationship between an individual migrant’s ideology and the prevailing partisanship of the destination, while controlling for the partisanship of a mover’s place of origin. We know that migrants are not selected randomly from the population at large: as a group, they tend to be younger, wealthier, and better educated. Using the entire CCES dataset, I use a Heckman selection model to determine whether the observed significance of individual ideology results from selection bias.

The selection model considers age, income, education, home ownership, and marital status to estimate likelihood of moving to a new congressional district. I estimate two sets of probit models: one model that uses a probit estimate of the likelihood of moving to a Democratic or Republican district among movers, and another model that uses the Heckman selection process to estimate the same likelihood amongst all respondents, accounting for the initial likelihood of actually moving.

I then create two alternatives to self-reported ideology in the explanatory variables. In addition to using self-reported ideology, I use a principal-components factor analysis to estimate a latent value for ideology based on a series of survey questions, including support for the president, religious preference, and policy preference items. This predicted score has a .66 correlation with self-reported ideology. Finally, I replace ideology with partisan identification based on the seven point Likert scale used in the CCES.

Results appear in Tables 2.4, 2.5, and 2.6. In each of the six sets of models presented, ideology (in both forms: self-reported and latent) persists as a statistically significant explanatory variable, as does partisanship.
Table 2.4: Probit and Heckman Selection Probit Models Predicting Moves to Dem and Repub Districts: Ideology self reported

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ideology*</td>
<td>-0.156</td>
<td>0.039</td>
<td>-0.142</td>
<td>0.039</td>
<td>Ideology*</td>
<td>0.146</td>
<td>0.036</td>
<td>0.128</td>
<td>0.036</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>0.439</td>
<td>0.115</td>
<td>0.400</td>
<td>0.115</td>
<td>Black</td>
<td>-0.137</td>
<td>0.115</td>
<td>-0.098</td>
<td>0.109</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.200</td>
<td>0.121</td>
<td>0.172</td>
<td>0.119</td>
<td>Hispanic</td>
<td>0.009</td>
<td>0.115</td>
<td>0.023</td>
<td>0.110</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.006</td>
<td>0.003</td>
<td>-0.001</td>
<td>0.004</td>
<td>Age</td>
<td>0.006</td>
<td>0.002</td>
<td>0.001</td>
<td>0.003</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dem Orig District</td>
<td>0.331</td>
<td>0.108</td>
<td>0.314</td>
<td>0.107</td>
<td>Dem Orig District</td>
<td>-0.099</td>
<td>0.103</td>
<td>-0.089</td>
<td>0.097</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rep Orig District</td>
<td>-0.317</td>
<td>0.104</td>
<td>-0.288</td>
<td>0.101</td>
<td>Rep Orig District</td>
<td>0.389</td>
<td>0.096</td>
<td>0.359</td>
<td>0.092</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log of Move Distance</td>
<td>-0.069</td>
<td>0.018</td>
<td>-0.062</td>
<td>0.018</td>
<td>Log of Move Distance</td>
<td>0.035</td>
<td>0.016</td>
<td>0.029</td>
<td>0.016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increase in Urban Area</td>
<td>1.657</td>
<td>0.146</td>
<td>1.543</td>
<td>0.172</td>
<td>Increase in Urban Area</td>
<td>-1.350</td>
<td>0.123</td>
<td>-1.247</td>
<td>0.142</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast</td>
<td>0.306</td>
<td>0.137</td>
<td>0.286</td>
<td>0.132</td>
<td>Northeast</td>
<td>-0.475</td>
<td>0.133</td>
<td>-0.424</td>
<td>0.127</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>South</td>
<td>0.004</td>
<td>0.114</td>
<td>-0.011</td>
<td>0.109</td>
<td>South</td>
<td>0.268</td>
<td>0.100</td>
<td>0.258</td>
<td>0.095</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>West</td>
<td>0.436</td>
<td>0.118</td>
<td>0.393</td>
<td>0.116</td>
<td>West</td>
<td>-0.217</td>
<td>0.107</td>
<td>-0.177</td>
<td>0.102</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.168</td>
<td>0.200</td>
<td>0.659</td>
<td>0.341</td>
<td>Constant</td>
<td>-1.020</td>
<td>0.187</td>
<td>-1.539</td>
<td>0.260</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Moved to New Dist

| Age             | -0.008   | 0.001 | Age     | -0.008 | 0.001 |
| Income          | -0.009   | 0.004 | Income  | -0.009 | 0.004 |
| Education       | 0.072    | 0.009 | Education | 0.073 | 0.009 |
| Homeowner       | -0.425   | 0.031 | Homeowner | -0.422 | 0.031 |
| Married         | 0.075    | 0.029 | Married  | 0.076 | 0.029 |
| Constant        | -1.321   | 0.056 | Constant | -1.320 | 0.056 |

\( \rho \)

| -0.342 | 0.189 | \( \rho \) | 0.394 | 0.164 |

* Ideology is Self Reported
<table>
<thead>
<tr>
<th></th>
<th>Dem Destination</th>
<th>Rep Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Moves Only</td>
<td>Moves Only</td>
</tr>
<tr>
<td></td>
<td>Coef.</td>
<td>Std. Err.</td>
</tr>
<tr>
<td>Ideology*</td>
<td>-0.228</td>
<td>0.042</td>
</tr>
<tr>
<td>Black</td>
<td>0.471</td>
<td>0.115</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.206</td>
<td>0.038</td>
</tr>
<tr>
<td>Age</td>
<td>-0.005</td>
<td>0.006</td>
</tr>
<tr>
<td>Dem Orig District</td>
<td>0.347</td>
<td>0.030</td>
</tr>
<tr>
<td>Rep Orig District</td>
<td>-0.274</td>
<td>0.023</td>
</tr>
<tr>
<td>Log of Move Distance</td>
<td>-0.071</td>
<td>0.018</td>
</tr>
<tr>
<td>Increase in Urban Area</td>
<td>1.647</td>
<td>1.070</td>
</tr>
<tr>
<td>Northeast</td>
<td>0.275</td>
<td>0.122</td>
</tr>
<tr>
<td>South</td>
<td>-0.006</td>
<td>0.115</td>
</tr>
<tr>
<td>West</td>
<td>0.430</td>
<td>0.119</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.309</td>
<td>0.175</td>
</tr>
<tr>
<td>Moved to New Dist</td>
<td>-0.088</td>
<td>0.087</td>
</tr>
<tr>
<td>Age</td>
<td>-0.009</td>
<td>0.044</td>
</tr>
<tr>
<td>Income</td>
<td>-0.025</td>
<td>0.031</td>
</tr>
<tr>
<td>Homeowner</td>
<td>0.072</td>
<td>0.029</td>
</tr>
<tr>
<td>Married</td>
<td>-1.317</td>
<td>0.056</td>
</tr>
<tr>
<td>Constant</td>
<td>0.396</td>
<td>0.181</td>
</tr>
</tbody>
</table>

* Ideology is predicted from principal-component factor analysis.
Table 2.6: Probit and Heckman Selection Probit Models Predicting Moves to Dem and Repub Districts: Partisanship

<table>
<thead>
<tr>
<th></th>
<th>Moves Only</th>
<th>Selection Model</th>
<th>Rep Destination</th>
<th>Moves Only</th>
<th>Selection Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dem Destination</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Party ID</td>
<td>-0.073</td>
<td>0.020</td>
<td>-0.068</td>
<td>0.020</td>
<td>Party ID</td>
</tr>
<tr>
<td>Black</td>
<td>0.391</td>
<td>0.117</td>
<td>0.356</td>
<td>0.116</td>
<td>Black</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.197</td>
<td>0.121</td>
<td>0.168</td>
<td>0.119</td>
<td>Hispanic</td>
</tr>
<tr>
<td>Age</td>
<td>-0.007</td>
<td>0.003</td>
<td>-0.002</td>
<td>0.004</td>
<td>Age</td>
</tr>
<tr>
<td>Dem Orig District</td>
<td>0.335</td>
<td>0.108</td>
<td>0.318</td>
<td>0.107</td>
<td>Dem Orig District</td>
</tr>
<tr>
<td>Rep Orig District</td>
<td>-0.327</td>
<td>0.104</td>
<td>-0.299</td>
<td>0.100</td>
<td>Rep Orig District</td>
</tr>
<tr>
<td>Log of Move Distance</td>
<td>-0.071</td>
<td>0.018</td>
<td>-0.064</td>
<td>0.018</td>
<td>Log of Move Distance</td>
</tr>
<tr>
<td>Increase in Urban Area</td>
<td>1.661</td>
<td>0.146</td>
<td>1.551</td>
<td>0.171</td>
<td>Increase in Urban Area</td>
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<tr>
<td>Northeast</td>
<td>0.314</td>
<td>0.137</td>
<td>0.292</td>
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<td>Northeast</td>
</tr>
<tr>
<td>South</td>
<td>0.033</td>
<td>0.114</td>
<td>0.015</td>
<td>0.109</td>
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</tr>
<tr>
<td>West</td>
<td>0.463</td>
<td>0.118</td>
<td>0.418</td>
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</tr>
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<td>0.186</td>
<td>0.529</td>
<td>0.343</td>
<td>Constant</td>
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<tr>
<td>Moved to New Dist</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.008</td>
<td>0.001</td>
<td>Age</td>
<td>-0.008</td>
<td>0.001</td>
</tr>
<tr>
<td>Income</td>
<td>-0.009</td>
<td>0.004</td>
<td>Income</td>
<td>-0.009</td>
<td>0.004</td>
</tr>
<tr>
<td>Education</td>
<td>0.072</td>
<td>0.009</td>
<td>Education</td>
<td>0.073</td>
<td>0.009</td>
</tr>
<tr>
<td>Homeowner</td>
<td>-0.425</td>
<td>0.031</td>
<td>Homeowner</td>
<td>-0.422</td>
<td>0.031</td>
</tr>
<tr>
<td>Married</td>
<td>0.075</td>
<td>0.029</td>
<td>Married</td>
<td>0.076</td>
<td>0.029</td>
</tr>
<tr>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>$\rho$</td>
<td>-0.336</td>
<td>0.190</td>
<td>$\rho$</td>
<td>0.385</td>
<td>0.166</td>
</tr>
</tbody>
</table>
Across the different variations of the model, the sorting hypothesis is supported, even when controlling for the prevailing ideology of a migrant’s originating district. This means that liberal migrants are more likely to arrive in Democratic districts and conservative migrants are more likely to arrive in Republican districts, even after we control for the fact that each kind of migrant is also more likely to originate in these kinds of districts. In each of the four variations of the multinomial logit model, the coefficient estimate of the individual respondents’ ideology is statistically significant and properly signed, with only one exception: the Republican district destination in Model 2. The result persists, with almost no change to the coefficient estimate and standard error, in Models 3 and 4, even though the change in urban area percentage has a powerful effect and the fixed effect of particular region is often significant. By comparison, and surprisingly, similar partisanship of respondent’s origin district emerges as a significant variable only when the change in urban percentage is added to the model. Moreover, adding ideology to the model increases the number of correct predictions from 725 to 732 in the baseline model and 807 to 819 in Model 4.

2.3.1 Spatial Autocorrelation and Distance

One possible motivating factor in the sorting or convergence pattern is the relative proximity of Democratic districts to other Democratic districts, and Republican districts to other Republican districts, revealing some pattern of spatial autocorrelation. For this reason, I determined the distance between the origin and destination of each move, based on the Haversine distance formula. The presence of significant spatial autocorrelation among Congressional districts can be safely presumed. Its effect will be to dampen any pattern of sorting or convergence, insofar as it tends to bias toward migration between similar types of districts. In the cross-tabulation shown in Table 2.2, I compare the number of district matches for partisan migrants. We can get some sense of the effect of spatial autocorrelation by comparing the number of district matches and non-matches, and then see if that proportion changes as distance increases.

Spatial autocorrelation of partisan preference reduces our ability to infer that mi-
migration induces sorting. The reason is that spatial autocorrelation changes the choice set of migrants for potential destinations. For example, the proximity of Democratic districts in the northeast may fully explain the tendency of a given migrant to choose Democratic districts there, given that distance is a known limiting factor in migration choice. The modeling strategy must account for this possibility, but the possibilities increase tremendously when we know the details about a migrant’s origination point. First of all, we can exclude migration between similar types of districts in the sorting formula. Secondly, we can control for originating district partisanship. Third, we can account for the fixed effects of the originating region. Finally, we can account for the migration distance.  

In the case of Democratic migrants, we see an overall total of 131 moves from Democratic-to-Democratic districts, and 128 moves from Republican-to-Republican districts; i.e. 259 of the 442 moves. For moves of greater than 200 miles, this proportion stays consistent; 90 of the 160 moves are between the same kinds of districts. In the case Republican partisans, a move of 200 miles seems to increase the likelihood that a respondent will move into a Republican district. Relatively few Republican respondents move from one Democratic district to another, although this likelihood decreases for moves greater than 200 miles.

These tabulations suggest a greater propensity for Republican migrants, more so than Democrats, to arrive in a district with shared preferences, irrespective of the move’s distance. While we still don’t know if moves greater than 200 miles are free of spatial autocorrelation, they are less likely to be affected by it.

2.4 Estimating Migration’s Effect on District Partisanship for Arrivers, Leavers, and Non-movers

2.4.1 Formal Model of Sorting and Convergence of Aggregate Constituencies

This formal description of sorting and convergence looks at the characteristics of groups, as opposed to individuals. In the final section, I estimate a hierarchical logit

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7 An alternative modeling strategy uses these differences as a instrumental variable that reveals a preference for agglomeration or resistance to congestion; see (Bayer & Timmins 2007).
model to estimate the probability of partisanship for each respondent, and then I aggregate these probabilities by congressional district.

2.4.2 Estimating Sorting and Convergence with a Partial Pooling Model

Next, I use the sorting model to generate predictions of partisanship for each subgroup of respondents: movers, leavers, and stayers. Using a multilevel logit model based on the partial pooling formula defined by Gelman and Hill (2007), I use these two classes of respondents to generate three predictions for each party in each district: a) probability of party identification for new arrivals, b) probability of party identification for departing migrants, and c) probability of party identification for non-movers.

Using this technique, I first generate a hierarchical model that predicts the probability of party identification for individuals based on the CCES survey responses. In this case, I use a random-intercept logit model specification, based on the partial-pooling technique described in Gelman and Hill (2007). A difficult modeling problem emerges from the need to adapt to relatively sparse migration data between 435 US Congressional districts. Of the 36,421 weighted responses, only 1400 moved far enough to change congressional districts. The total movement never exceeds 17 and the median is about 5, while 68 districts had either no movers in, or no movers out.

The partial pooling model addresses this shortcoming by leveraging information available within districts with many observations, and leveraging information from the entire dataset when observations are few. The goal is to produce a model that reliably predicts party identification for individual respondents, while accounting for unobserved group level district effects. One way to achieve this would be to apply a fixed effect for each district, without any pooling. Because of the sparseness across districts, some kind of pooling strategy is necessary; otherwise, the variation between districts will be overstated. Complete pooling, in which congressional districts are ignored, defeats the purpose. The partial pooling technique is a compromise between these two extremes; its purpose is to leverage district specific information where it is available, and otherwise use information from the rest of the dataset. This strategy
essentially weights the effect of respondents from a particular district and the total respondent pool based on the number from that particular district.

From these estimates for individual respondents, we can then aggregate accurate mean predictions for individual congressional districts.

In order to apply the sorting and convergence model for these estimates, three separate types of estimates will be necessary: probabilities of party identification for movers, leavers, and non-movers. As noted earlier, the CCES dataset contains the original and destination nine-digit zip code for each respondent. For those who matched the zip+4 forwarding address lookup database, the original and destination zip codes are different. Each nine-digit zip code is linked to its congressional district for the 109th Congress. A respondent is then labeled a "mover" if the move crossed into a new congressional district.

2.4.3 Partial Pooling Random Intercept Model

For respondent i associated with congressional district j, the multilevel varying-intercept model specifies

\[ P(y_i^* = 1) = \logit^{-1}(\alpha_j + \beta_{ij}X_i) \] (2.6)

In a partial pooling model, which \( a(j) \) is drawn from a normal distribution,

\[ a_j \sim N(\mu_a, \xi_j) \] (2.7)

In the logit model specification, \( y^* \) represents the latent variable based on the the probability of observing \( y \) in the model. For this particular hierarchical logit model specification, \( a_j \) comprises the entire group level effect. In a model based on complete pooling, \( a_j \) always equals \( \mu_a \) and is constant regardless of group \( j \). In a model with no pooling, a fixed effect is added, and \( a_j \) deviates from \( \mu_a \) entirely on this effect specific to the group, irrespective of the number of observations.

A partial pooling model, on the other hand, computes \( a_j \) as:

\[ \hat{\alpha}_j \approx \frac{n_j}{\sigma_y^2} + \frac{1}{\sigma^2} \bar{y}_j + \frac{1}{\sigma^2 + 1/\sigma^2} \mu_a \] (2.8)
where \( n_j \) is the number of respondents choosing district \( j \), \( \sigma^2_y \) is the intra-district variance of these respondents, and \( \sigma^2_\alpha \) is the between district variance of the means. The first term is weighted more heavily when there are many observations for a given district; the second is weighted more heavily when there are very few observations. If there are no observations, the first term is eliminated the fixed effect is simply the mean of the overall population.

In this way, \( a_j \) is pulled closer to the mean than it would if the \( a_j \) estimates weren’t pooled at all. The estimates are weighted by the number of observations in each group. In this study, where the number of observations does not exceed 17, this approach uses a combination of the estimates for the specific \( j \) and the overall mean, reducing within-group variance to a realistic level. At the same time, the estimates for respondents in districts with large samples weight this additional group specific information more heavily.

As with any hierarchical model, this approach allows us to relax the assumption that unobserved district-level factors behave independently. To generate the aggregated district level estimate, I compute the mean of the individual probabilities in the dataset. Again, this strategy seems somewhat risky given the relatively small numbers of respondents in several cases. But despite the idiosyncrasy and sparseness of the respondents in particular congressional districts, the individual probability estimates reflect the combined availability information from both the entire dataset and the particular group, thanks to partial pooling described above. The estimate for the probability is therefore:

\[
\bar{p}_j = y^* | x_{ij} = \frac{\sum_{i=1}^{N_j} p_i}{N_j} \tag{2.9}
\]

Finally, I repeat this process six times: once for each of party, for each of the three categories of respondents (arrivers, leavers, and non-movers). After eliminating districts with either zero inbound or zero outbound migrants, my sample includes 367 of the 435 districts (based on 109th boundaries).
2.4.4 Results

The results of each of the six partial pooling models appears in Table 2.7.
Table 2.7: Hierarchical Model Used to Generate Predictions of District Partisanship

<table>
<thead>
<tr>
<th>Level 1 Variables</th>
<th>Arrivers Republican</th>
<th>Arrivers Democrat</th>
<th>Leavers Republican</th>
<th>Leavers Democrat</th>
<th>Non-Movers Republican</th>
<th>Non-Movers Democrat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>-1.136** (0.349)</td>
<td>.607*** (0.192)</td>
<td>-1.088** (0.342)</td>
<td>.661** (0.229)</td>
<td>-964*** (0.079)</td>
<td>.887*** (0.048)</td>
</tr>
<tr>
<td>No Religion</td>
<td>-0.201 (0.255)</td>
<td>-0.148 (0.254)</td>
<td>-0.148 (0.254)</td>
<td>0.082 (0.214)</td>
<td>0.113 (0.197)</td>
<td>-533* (0.221)</td>
</tr>
<tr>
<td>Gun Owner</td>
<td>0.082 (0.197)</td>
<td>-5.18* (0.197)</td>
<td>0.113 (0.197)</td>
<td>-533* (0.221)</td>
<td>0.025 (0.034)</td>
<td>-1.42*** (0.033)</td>
</tr>
<tr>
<td>Married</td>
<td>0.082 (0.193)</td>
<td>-0.002 (0.991)</td>
<td>0.065 (0.195)</td>
<td>0.031 (0.173)</td>
<td>0.128* (0.038)</td>
<td>-0.668* (0.032)</td>
</tr>
<tr>
<td>Female</td>
<td>0.251 (0.183)</td>
<td>.782*** (0.16)</td>
<td>0.205 (0.184)</td>
<td>0.031 (0.173)</td>
<td>0.128* (0.038)</td>
<td>-0.668* (0.032)</td>
</tr>
<tr>
<td>Ideology (Conservative)</td>
<td>.930*** (0.123)</td>
<td>-752*** (0.109)</td>
<td>.918*** (0.122)</td>
<td>-762*** (0.11)</td>
<td>.097** (0.033)</td>
<td>.530*** (0.03)</td>
</tr>
<tr>
<td>2004 DPV Share of Originating (Destination) Dist</td>
<td>0.005 (0.007)</td>
<td>.011* (0.006)</td>
<td>0.008 (0.007)</td>
<td>0.008 (0.007)</td>
<td>N/A (0.007)</td>
<td>N/A (0.006)</td>
</tr>
<tr>
<td>Bush Approval</td>
<td>1.059*** (0.125)</td>
<td>-910*** (0.145)</td>
<td>1.080*** (0.128)</td>
<td>-931*** (0.147)</td>
<td>.833*** (0.022)</td>
<td>-.843*** (0.025)</td>
</tr>
<tr>
<td>Iraq a Mistake</td>
<td>-.594* (0.256)</td>
<td>.930** (0.273)</td>
<td>-.571* (0.259)</td>
<td>.962** (0.279)</td>
<td>-.663*** (0.049)</td>
<td>.412*** (0.048)</td>
</tr>
<tr>
<td>Constant</td>
<td>-6.11*** (0.72)</td>
<td>0.981 (0.605)</td>
<td>-6.349*** (0.754)</td>
<td>-3.606*** (0.714)</td>
<td>-5.380*** (0.141)</td>
<td>2.333*** (0.124)</td>
</tr>
</tbody>
</table>

Level 2: 109th Congressional Districts

| Variance of random effects | .595** (0.27) | .583** (0.237) | .617*** (0.284) | .758** (0.263) | .083*** (0.014) | .088*** (0.013) |
| Mean                      | 0.3 0.89 0.328 0.89 0.89 0.86 | 0.3 0.89 0.328 0.89 0.89 0.86 | 0.3 0.89 0.328 0.89 0.89 0.86 | 0.3 0.89 0.328 0.89 0.89 0.86 | 0.3 0.89 0.328 0.89 0.89 0.86 | 0.3 0.89 0.328 0.89 0.89 0.86 |
| Area under ROC curve      | 0.89 0.86 0.328 0.89 0.86 0.86 | 0.89 0.86 0.328 0.89 0.86 0.86 | 0.89 0.86 0.328 0.89 0.86 0.86 | 0.89 0.86 0.328 0.89 0.86 0.86 | 0.89 0.86 0.328 0.89 0.86 0.86 | 0.89 0.86 0.328 0.89 0.86 0.86 |
| Correlation w/ 2004 DPV   | -0.3144 0.371 -0.294 0.3489 -0.8159 0.8043 | -0.3144 0.371 -0.294 0.3489 -0.8159 0.8043 | -0.3144 0.371 -0.294 0.3489 -0.8159 0.8043 | -0.3144 0.371 -0.294 0.3489 -0.8159 0.8043 | -0.3144 0.371 -0.294 0.3489 -0.8159 0.8043 | -0.3144 0.371 -0.294 0.3489 -0.8159 0.8043 |
| Log Likelihood            | -508.79 -616.76 -508.65 -614.91 -12525.4 -14739.1 | -508.79 -616.76 -508.65 -614.91 -12525.4 -14739.1 | -508.79 -616.76 -508.65 -614.91 -12525.4 -14739.1 | -508.79 -616.76 -508.65 -614.91 -12525.4 -14739.1 | -508.79 -616.76 -508.65 -614.91 -12525.4 -14739.1 | -508.79 -616.76 -508.65 -614.91 -12525.4 -14739.1 |
| N (Weight Adjusted)       | 1465.2 1465.2 33372.6 | 1465.2 1465.2 33372.6 | 1465.2 1465.2 33372.6 | 1465.2 1465.2 33372.6 | 1465.2 1465.2 33372.6 | 1465.2 1465.2 33372.6 |
| Level 2 N (Districts)     | 398 396 435 | 398 396 435 | 398 396 435 | 398 396 435 | 398 396 435 | 398 396 435 |
The coefficient estimates for individual level partisanship are consistent with the expectations of an ordinary model of partisanship. The correlations between partisanship and ideology are very high in the CCES dataset; see (Abramowitz 2007). Ideology is measured on a five point Likert scale and increases as responses are more conservative. The selection of independent variables is designed to increase the area under the receiver operating characteristics (ROC) curve. The model generates values close to .9; the expected value for a curve with no predictive ability is .5.

In order to get some sense of whether most districts trend toward sorting or convergence, I computed correlations with the 2004 Democratic share of the two party vote in the presidential election.
Figure 2.1: a-f: Partisanship Predictions and Democratic Party Vote Share in 2004 Pres. Election
Table 2.8: Distribution of Districts by Predicted Sorting and Direction of Sorting

<table>
<thead>
<tr>
<th>Democratic Districts:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sorted (Attract Dems)</td>
<td>75</td>
</tr>
<tr>
<td>Converged (Did Not Attract Dems)</td>
<td>72</td>
</tr>
<tr>
<td>Sorted (Repel Republicans)</td>
<td>58</td>
</tr>
<tr>
<td>Converged (Did Not Repel Republicans)</td>
<td>89</td>
</tr>
<tr>
<td>Sorted in Both Directions</td>
<td>50</td>
</tr>
<tr>
<td>Converged in Both Directions</td>
<td>55</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>147</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Republican Districts:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sorted (Attract Republicans)</td>
<td>83</td>
</tr>
<tr>
<td>Converged (Did not Attract Republicans)</td>
<td>86</td>
</tr>
<tr>
<td>Sorted (Repel Democrats)</td>
<td>84</td>
</tr>
<tr>
<td>Converged (Did not Repel Democrats)</td>
<td>85</td>
</tr>
<tr>
<td>Sorted in Both Directions</td>
<td>68</td>
</tr>
<tr>
<td>Converged in Both Directions</td>
<td>70</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>169</strong></td>
</tr>
</tbody>
</table>

Democratic and Republican districts are those whose predicted partisanship (i.e., likelihood of respondent choosing Democratic or Republican party identification) exceeded the mean prediction. The combined total is less than 367 districts (the number of districts with at least one mover and one leaver in the dataset) because some districts did not exceed the mean prediction for either party.

Democratic sorted (attract Dems) includes those districts whose post-migration likelihood of Democratic party identification increased. Democratic converged (did not attract Dems) means the likelihood of a Democratic party identification decreased. Democratic sorted (repel Republicans) means the likelihood of a Republican party identification decreased in a Democratic district; Democratic converged (Did not repel Republicans) means this likelihood increased.

The correlation is very strong for the non-mover predictions, for both parties. The correlations are weaker for all four groups of movers, but signed in a direction that would indicate that sorting is more frequent than convergence. For example, the predictions for the probability of Democratic identification among arrivers are mildly and positively correlated with Democratic party vote share.

If we presume a close correlation between the percentage of self identified partisans and support for the 2004 Presidential candidate, we should see similar strength in the mean prediction of partisanship. The scatter plots in Figures 1e and 1f show the overall relationship with Democratic party vote share; the correlations are -.8159 and .8043 for Republicans and Democrats, respectively.
Assuming the predicted percentages are reliable, what changes, if any, to the mean probabilities for movers are leavers emerge? Ultimately, I will apply these percentages in the sorting model presented earlier, but for the moment, consider the comparisons to the results for non-movers above. In all four categories, the correlation with the 2004 Democratic voter share are correctly signed and range between .349 and .371 for Democrats’ arriving and leaving, respectively, and -.314 and -.294 for Republicans. While these correlations aren’t particularly high in their own right, the fact that they are correlated at all, and signed consistently with the party preference based on the vote share metric, suggests the possibility that some sorting is taking place. The coefficients are consistent the observation that arrivers in Democratic districts are disproportionately Democratic identifiers. By the same token, the correlations for leavers are not significantly different. Even if the direction of these correlations is consistent with a sorting hypothesis, we still cannot tell if the Democratic identifiers’ movement into Democratic districts is offset by movement away from Democratic districts. The sorting and convergence model is designed to address this uncertainty.

The variance of the random intercept ultimately drives variation in the district percentage predictions. In this case, the variance estimate is statistically significant and is consistent for the four mover categories and between the two non-mover categories. The means of the individual predictions for each district in each category are combined, and districts with either no inbound or no outbound movers are discarded. Finally, I add population estimates of gross inbound and outbound migrants, along with non-movers, to see which districts are changing predicted percentages of party identification, and the extent to which districts are sorting, converging, or both.

Figure 2.2 shows the relationships between the partisanship of migrants and non-migrants by district, for each party. The scatter plots in Figure 2.2 shows a relationship between the partisanship of migrants and non-migrants by district. While the overall results are correlated, we cannot tell whether the effect of partisanship by arriving migrants is offset by the partisanship of departing migrants.

In Figure 2.3, I break down districts into Democratic and Republican based on
their presidential party vote share. In both cases, migrants are more likely to demonstrate partisan preference for Democrats in Democratic districts and Republicans in Republican districts, in a way that is consistent with the picture from Figure 2.2. Moreover, in Democratic districts, the likelihood of migrants’ Democratic partisanship increases with overall Democratic partisanship of the district, whereas the likelihood of Republican migrant partisanship decreases.

Having computed estimated probabilities of partisan identification for all three categories of respondents, and an estimate of the number of inbound and outbound migrants in each district, I can now compute results based on the sorting and convergence model. A district is identified as either Republican or Democrat if its predicted estimate is greater than the weighted mean for all districts, for each party respectively. For districts defined as Republican, a sorted district means we see an increase in difference in its estimated likelihood of Republican identification versus the mean. A converged district sees a reduction in the difference between its estimate and the mean.

Another kind of sorting also occurs if the likelihood of identification in the other party decreases. This means the likelihood of identification in the majority party increases relative to the likelihood of the minority party. As shown in Table 2.8, we see no consistent pattern for districts to sort or converge by party, despite the fact that ideology does appear to be a significant predictor in a migrant’s destination choice.

2.5 Conclusion

Migration is only one process that may contribute to clustering of American electoral constituencies, and it may less important than the contextual effects that change preferences long after migration has occurred. But migration also has one important advantage from an analytical perspective: if we know the ex ante political preferences of migrants, we can look at how these preferences align with other people in their destinations, and get some sense of whether shared political preferences predict migration behavior and reveal whether or not shared preferences matter to ordinary citizens. By applying this study’s unique cross-sectional dataset, I show some limited
Figure 2.2: New Arrivals and Non-Movers Partisanship Predictions by Party
results that suggest that migrants are somewhat more likely to land in destinations where the prevailing preferences align with their own. These findings are based a single cross sectional dataset and may only reflect the contingencies of the survey and the 2006 electoral environment. Nevertheless, an individual’s self-declared ideology has robust significance in predicting a migrant’s destination, even after we account for the fact that a migrant’s place of origin may explain much of this consistency.

The study also generates predictions of the partisanship in specific locations that
isolates the preferences of migrants from other residents. This approach shows that when we know the details of a respondent’s migration pattern and \textit{ex ante} preferences, we can compute the compositional effect of migration in any given location. This means we can hope to analyze where migration is most significant and assess the importance of both inbound and outbound migration in the clustering effects that we identify. The relationship between population growth and clustering in a given location is one example of a relatively simple prediction that finds some modest support in the partisanship estimates shown here.
3.1 Introduction

If migration contributes to electoral sorting, is polarization among elected officials a likely consequence? A natural place to examine these relationships is the United States Congress. Indeed, we can credibly claim that polarization is the defining characteristic of the contemporary Congress. The rise of polarization has engaged a substantial portion of the congressional scholarship, linking theories about the internal institutional mechanics, including rules, agenda control, and party related incentives (Cox and McCubbins (1993), Oleszek (2004), Rohde (1991), Aldrich and Rohde (2000), and Roberts and Smith (2003) to their relationship to constituencies (Stonecash Brewer and Mariani (2003), Jacobson(2000), and McCarty Poole Rosenthal (2006b). Much of this research focuses growth in income disparity, gerrymandering, incumbency advantages, the southern realignment. While links between geographic sorting and polarization have been discussed from many angles, we have seen little or no research of this type directed specifically to polarization in Congress. In this chapter, I apply this focus, motivated by the possibility that dispersion of the
American electorate into a large number of newly urbanized locations helps motivate polarization in national politics generally and Congress specifically.

This chapter has two goals. First, using aggregate level data over a series of elections, I look for evidence that migration has sorted congressional constituencies. Secondly, I look for linkage between migration and polarization among House members, as opposed to congressional constituencies. In order to accomplish these tasks, I use population growth in U.S. House districts as a proxy for domestic migration between reapportionments. This approach presumes that districts with exceptionally large gains in population are also the districts that receive significant inbound migration. If the theoretical expectation of sorting is met in a straightforward way, these high-growth districts should become increasingly partisan and increasingly ideological. For example, Republican high-growth districts should become more Republican, relative to other Republican districts.

Unlike the analyses using survey data, I look exclusively at aggregate level data at the congressional level. If migration induces sorting, then we should expect the districts who have gained and lost the greatest number of migrants to become increasingly homogenous: parties that controlled these districts should find their support increasing over the course of a decade following redistricting. My examination of data from the past twenty years does not reveal this kind of relationship. In both the 1990’s and 2000’s, changes to the partisanship of growth districts, over the course of each decade, reflect changes in the country as a whole.

Despite the null finding on sorting within congressional electorate, a link between migration and polarization in the House is more apparent. The district data reveal two intriguing characteristics that could reflect a complicated relationship between migration and congressional polarization, rather than a relationship that is simply mediated by sorting. First, as many analyses discovered during the 2004 election, we have seen an extremely strong correlation between population growth and Republican
support for at least two decades. In one sense, this result might be completely spurious. The southern region and many western states have grown dramatically over this time and also happen to be Republican strongholds. On the other hand, we might also find that public policy characteristics of high growth states such as Nevada, Florida, and Texas motivate a significant migration based sorting that skews Republican, in accordance with the Tiebout hypothesis (Tiebout 1956).

Whether this relationship between growth and Republican partisanship is spurious or not, we should ask whether migration changes or reinforces the pre-existing levels of partisanship in these places. For example, we might theorize that the large overall migration pattern in recent decades confers a political advantage to Republicans, even if migrants themselves are less likely to be Republican than original natives. Reapportionment provides a straightforward illustration of this possibility. In the 2000 Census reapportionment, the House saw a net shift of seven House seats from states that chose Gore in the 2000 election to states choosing Bush. But reapportionment is not the only possible benefit to a party with strength in places that are absorbing population. Growth of population can plausibly increase electoral bias in favor the stronger party and could also transform the preferences in migrants whose preferences are malleable and responsive to a change in political context.

In addition, the data suggest that Republican House members from high growth districts in recent congresses have been more ideologically extreme than other Republican members, relative to the partisanship of their districts. Additionally, the gap between Republican and Democratic members from districts with similar partisanship appears to be greater in high growth districts. A tendency such as this might be the result of the peculiar characteristics of a district with substantial numbers of new migrants. For instance, voters in these districts may be more likely to choose presidential candidates and congressional candidates from the same party. Voters who are recent arrivals may be less involved in congressional elections and more likely to
base decisions down the ballot on the national political agenda. Considerations such as these could sustain House members in growth districts who ideological extremity would otherwise seem to be less synchronized with the districts’ constituencies.

In short, the behavior of House members appears to be polarizing in response to the presence of heavy migration in a way that the partisanship of districts’ electorates does not. With this context in mind, this last chapter explores potential links between migration and polarization in Congress, through an examination of the link between polarization and high growth districts.

3.2 Republican Strength in High Growth Districts

The analyses in this chapter emerge from the following assumptions. First, recall that the United States’s residential footprint has expanded since the 1940s, such that the population has actually decentralized if we consider only urban areas, even though more Americans live in places that are designated as urban. As the Schelling (1971), (1978) segregation models described in chapter 1 establish, self-segregation can accelerate when the number of newly available destinations increases. Secondly, the variation in population growth between different places in the country, including places defined by congressional district boundaries, varies enormously. Between 2000 and 2007, the 2nd district of Louisiana lost 38% of its population, while the 6th district of Arizona gained 47.9%.

More importantly, voters in congressional districts with the most growth are heavily and disproportionately Republican. This pattern has unfolded over the last three decades. In the 2000’s, voters in 95 of the 100 fastest growing counties with population of 65,000 or more gave majorities to George W. Bush in 2004, while 81 of these counties supported John McCain in 2008. Even though the Democrats were more successful in high growth congressional districts in 2008, voters in these districts, as a group, still gave decisive support for the Republican presidential ticket: in the
thirty fastest growing congressional districts, the Republican ticket outperformed the national average by eight percentage points.

Examining the distribution of district population growth rates shows a distinct group of districts who receive most of the new growth. In both the 1990’s and 2000’s, an inflection point around the 80th percentile that suggests the presence of a special set of districts that grow at a distinct and accelerated rate, as shown in Figure 3.1 and Figure 3.2. Between 2000 and 2006, growing districts increased by 19.4 million new residents, starting with a population around 280 million in 2000. The fastest growing 71 of 435 districts received half of this increase, as shown in Figure 2. An increase of four million residents appeared in just 21 districts, whose average growth over this six year period was nearly 30%. The growth in this particular set of high-growth districts is unusually large, and with few exceptions, these districts have elected conservative Republicans to Congress while providing some of the most reliable support for Republican presidential candidates, even in 2008.

The association between growth and Republican support doesn’t necessarily imply or assume an important data-generating relationship. Researchers have already observed that migrants are more likely to be Republican, and a simple association between this pattern and higher incomes is easy to spot. Growth could be an epiphenomenal artifact of the relationship between migration and income. But the link between migration and Republican partisanship doesn’t explain why these fast growing districts begin the process, in the wake of reapportionment and redistricting, as Republican strongholds. Nor does it explain why these districts are more consistently Republican in the face of migration flows that are not always decisively Republican and often dilute Republican partisanship. An important and missing consideration stems from the unusually American characteristic that migration and population growth within metropolitan areas has tended to disperse the population rather than concentrate it. Later in the chapter, I provide some evidence to support this claim
as it relates to congressional districts. As noted elsewhere, this observation defies intuition when we note that the percentage of Americans who live in designated urban areas has also increased in recent decades. But since the number of urban locations has increased, along with the area designated to accommodate them, the potential for greater variation of preference distributions among and within urban areas has emerged accordingly.

Thus, we see a migration pattern in recent decades generates the following conjecture. First, we can plausibly suspect that migrants who leave districts that have flat or negative growth are disproportionately Republican, compared to the residents left behind.\footnote{This premise is contradicted by the finding in Gimpel and Karnes (2006), which shows that rural migration tends to leave behind higher income conservatives. In the present context, migration from} If true, this tendency increases Democratic partisanship in lower growth
Figure 3.2: Rank Order Cumulative Distribution of Inbound Population for Growing Districts, House District 2000-06

Note: 100% = 19 million migrants. This chart shows that most growth is absorbed into a relatively small number of districts. However, these highest growth districts are nearly all exurban districts.

districts or shrinking districts. Second, in districts that experience rapid growth, the status quo ante may persist and, to the extent these places are exurban, they tend to be Republican and remain so in the short term, even if migrants may be diluting Republican electoral strength. Third, Republicans could be the beneficiaries of the fluidity typically associated with the preferences of arrivals in a new destination. Migrants are disproportionately young, least likely to be motivated by local political agendas in relation to the national agenda (Oliver 2001), and in general most likely rural areas accounts for only a fraction of total migration.
to be shaped by the context of their political environment (Brown 1988). At some point, growth could lead these districts away from solid Republican support, but neither instantly nor with certainty. Finally, this pattern would enhance the general tendency for Republicans to enjoy a more even distribution around the country, which produces a natural and structural advantage that simplifies the task of constructing districts that maximize Republican strength while packing the relatively concentrated Democrats into fewer districts (Jacobson 2001).

This chapter focuses on three claims about growing congressional districts, all based on aggregate level data. First, I consider the hypothesis that migration has contributed to partisan sorting in House districts over the last two decades. Partisan sorting, in this context, describes an increased likelihood that a voter in a congressional district will support the majority party. If this hypothesis holds, we should expect the distribution of districts with greater migration to reflect an increase in their support for the district’s original majority party, relative to other districts. I test this hypothesis by comparing the distribution of partisanship in high growth congressional districts to the distribution of all other districts, and by assessing the effect of a district’s growth percentage in predicting its partisan change in each of the last two decades.

Next, I offer a simple theoretical argument that partisan bias as described by King and Browning (1989) and Cox and Katz (2002) should increase in the direction of the prevailing partisanship of places receiving migration, even when migration dilutes the partisanship in growing destinations. For example, if the partisanship of migrants into a heavily Republican destination reflects the partisanship of all natives in the migrants place of origination, and if that partisanship is less Republican than the new destination, then the Republicans are beneficiaries of an increase in electoral bias. The relevance of this test is to demonstrate that if we cannot establish a sorting effect due to migration, one party will still receive a benefit from an increase in electoral
bias.

Finally, I test the hypothesis that high growth districts will produce a greater partisan gap between Republican and Democratic House members, for districts at a given level of partisanship. This hypothesis implies a counterfactual claim that the ideological gap between the district’s actual House member and a corresponding member from the other party will be greater in high growth districts. I evaluate this hypothesis by applying a modeling strategy documented in McCarty Poole Rosenthal (2009, referred hereafter as MPR). In this research, MPR analyze partisan polarization as the sum of districts’ partisan sorting, which captures districts’ tendency to choose a members’ party based on district ideology or other relevant characteristics, plus the differences between Republican and Democratic representation for similar districts. MPR refer to the latter component as Average Intradistrict Deviation, or AIDD. I hypothesize that AIDD will be greater in high growth districts.

As I describe in more detail below, either AIDD or sorting, or both, can contribute to polarization. If Republicans and Democrats represented similar districts in the same way, then polarization (if it existed at all) would be entirely the result of sorting. Conversely, suppose that each district is just as likely to choose a Democratic or Republican representative, regardless of its characteristics; for example, we would find no correlation between the likelihood of choosing a Republican and the district’s ideology. If polarization still existed, it would result entirely from AIDD.

Greater AIDD could imply several important features about a district’s representation and the relationship between members and constituents. Potentially, AIDD may reveal a disconnect and a lack of responsiveness to the district’s median preference along a particular dimension. If we suppose that a district’s preferences can be characterized by a single profile, or that two districts are completely identical, we should wonder why districts would be represented differently solely on the basis of a representative’s partisan affiliation. The conditional party government theory
provides a useful account of the incentives faced by members to strictly align their behavior with the expectations of party leadership.

But AIDD may not simply reflect a disconnect between representatives and constituencies; rather, AIDD may reveal the complexity and internal variation of these same constituencies. Fenno (1978) proposed a typology of constituencies within a district’s at-large population, including the recognition that the demands of party loyalists and primary voters differ from the preference distributions of voters in a general election. Arguably, districts with bimodal and symmetrical preference distributions should, typically, generate high levels of AIDD, if we presume that successful candidates will only emerge from one extreme wing of the electorate, or the other. Migrants may add to this complexity if, for example, they are disproportionately sensitive to party cues, relatively disengaged from congressional voting, or less important to the success of incumbent representatives in relation to the numbers.

The chapter concludes with a summary discussion the consequences of this proposed link between high growth districts and Republican strength. In the places where Republican strength has persisted despite a tendency for migration to lead to gradual convergence, my explanation implies that a shift in the electoral balance of power to the Democrats could be non-linear and abrupt. This results from the fact that any shift in partisanship caused by migration in fast growing districts is not necessarily revealed in the behavior of legislators in real time. Moreover, I suggest that a relatively even distribution of Republicans becomes a liability when the overall strength of the Democrats is significantly greater. For the same reason that a gerrymander based on increasing responsiveness creates vulnerability if a party shifts to minority status, so does an even distribution of support.

The measurement strategy for district partisanship, member behavior, and inbound migration relies on simple aggregate data. District partisanship is based on presidential election vote percentages following examples such as Canes-Wrone, Co-
gan, and Brady (2002), Ansolabehere, Snyder, and Stewart (2001), and Erickson and Wright (1980). To capture member ideology, I use first dimension DW-NOMINATE scores, and inbound migration is based on total district population growth. All three of these metrics have important shortcomings. Presidential elections can be highly contingent on the specific circumstances of a particular set of candidates or the political context of single political moment. DW-NOMINATE scores reflect a particular set of scaling decisions and weight various types of votes indiscriminately, while using only first dimension scores ignores the potentially relevant information available in other dimensions.

Total population growth is only a proxy for inbound migration and doesn’t filter immigration or the effect of births and deaths. The amount of immigration, however, is relatively small in relation to domestic migration. For example, if we estimate that migration into new congressional districts is approximately 10-12 million people across the country, this number greatly exceeds the 1.0-1.1 million new legal immigrants, of whom only a fraction will eventually achieve citizenship. In addition, both outbound migration and actuarial trends are much more evenly distributed than inbound migration., and I presume that any variation in birth and death statistics does not generate significant bias.

3.3 Polarization, sorting, and convergence in Congressional Districts

Before proceeding, I will review the distinction between polarization and sorting used throughout this thesis, and then describe these terms in the context of congressional representation. Polarization is the general term to describe an increase in the distance of some important characteristic between two preference distributions. In most situations, this distance can be characterized as an increase in the absolute value of the difference between two means, but there may be alternatives or additional parameters that also characterize this distance, including the variances. Sorting, by
comparison, describes an increase in the correlation between an underlying preference and some relevant categorization associated with that preference. Sorting contributes to polarization, but it is not the only possible contributor. Sorting can be illustrated by the example of partisan sorting, in which individuals with some kind of underlying ideological preference are more likely to align that preference with a corresponding partisanship. In the current U.S. political environment, partisan sorting is the consequence when conservatives are more likely to prefer the Republican party and support Republican candidates. As a result, sorting will increase polarization, and could account for any portion of such an increase, or all of it. At the same time, polarization may be the consequence of other factors: to name two, polarization can result because the composition of individuals may change, such as that seen with generational change, immigration, or the enfranchisement of African Americans. Additionally, some basic characteristics of these individuals’ could change and thereby change voters’ underlying preferences. In short, polarization is the sum of sorting plus individual-level preference changes.

To this prevailing definition from the polarization literature, I add an additional constraint: sorting occurs only in the absence of underlying changes in individual preferences. In other words, sorting is entirely a consequence of categorization of individuals into new aggregations, even if these changes result from changes in choice sets that may look like underlying preference changes. Partisanship provides one example: this definition treats partisanship as a categorization that individuals seek to match with some kind of underlying and more primitive set of preferences. This claim raises important theoretical questions about the nature of preferences and choices. For example, do latent preferences exist apart from the choices and categories presented to individual choosers? A premise in this definition is that individuals attempt to optimize choices in relation to an underlying set of utility functions; sorting implies that individual utility functions have not changed.
Two additional examples of sorting mechanisms include redistricting, which changes aggregates of district constituencies in a straightforward way, and migration. All three of these sorting mechanisms apply to congressional representation in obvious ways. If candidates change to become more extreme, the choice set presented to voters has changed, and voters are more likely to match their preferences to the direction of a candidate on the relevant dimension. As Fiorina argues, this outcome is easily mistaken for mass polarization (Fiorina, Abrams & Pope 2006). Any of these three processes can either increase or decrease sorting. I use the term convergence to describe an outcome where the correlation between a category and a preference is decreased, which also implies that two preference distributions become more similar, or where one distribution approaches the mean of all other distributions.

Finally, the term partial convergence is used to describe a situation where a process such as migration dilutes a prevailing preference, but not enough to usurp the political control associated with that preference. This concept has particular relevance to migration and describes the situation in which a heterogeneous group of migrants arrive into a relatively homogenous destination. If the pattern persists, the migrants will eventually tip the prevailing preferences into another direction, or at least disrupt the effects of homogeneity, but not immediately. Partial convergence has three features that are relevant to the discussion about congressional districts. First, migration changes the composition of the places that migrants leave behind. Often, these changes homogenize the places that lose migrants, as seen in the conspicuous example of northeastern inner cities. Second, migrants may partially dilute the new destination but not enough to swing it without threatening the status quo ante. Finally, partial convergence is difficult to empirically distinguish from sorting, even though migrants are relatively heterogenous and their preferences are uncorrelated to those on the political dimension of interest. In recent decades, partial convergence has increased the Republican structural advantage resulting from the relatively even
distribution of Republican partisans.

Partial convergence could help explain a paradox: how could migration contribute to polarization if migrants themselves are a relatively diverse group? The fact that growing districts are so heavily Republican provides part of the answer. Consider the fact that migration is significant in places that also begin as Republican strongholds; for example, postwar southern California or present day Texas, Georgia, Arizona, and exurban Florida. We know that at the start of the present decade, the fastest growing congressional districts typically started out at least as Republican as they are now. A crucial factor, and the one that explains why migration has helped Republicans more than Democrats, is the fact that the country is dispersing as it expands. Dispersion also creates new opportunities for hothouse networks to emerge and for migration to focus itself into the least dense areas in the country that also afford access to urban development.

Among these sorting mechanisms, migration has the important ability to change the absolute numbers of people in different places, and this property has potential consequences, even if the preference distribution of migrants doesn’t follow any pattern. If migrants happen to diversify an otherwise homogeneous destination, the process is invariably gradual and transitional. Consider two contrasting examples of rapidly growing districts. The tenth district of Georgia, stretching from northeast Atlanta to South Carolina, is a solidly conservative district that appears to have become more so, thanks to migration. To cite a contrasting example (and one that illustrates partial convergence in a straightforward way), consider Idaho’s rapidly growing first congressional district, which covers the western half of the state and much of the metropolitan area of Idaho’s biggest city, Boise. The population in this district grew 20.2% from 2000 to 2006. Much of this migration comes from California, and while these migrants as a group are, arguably, more conservative than Californians at large, they are likely to be relatively diverse relative to the constituency that
voted 68% to 28% for George Bush in the 2000 presidential election. By 2008, voters in this district shifted to the Democrats by four percentage points more than the national average, and even elected a Democrat to the House of Representatives over a weak first term Republican. Even so, Barack Obama only won 36% of the vote in this district, and if migration alone were to eventually weaken the Republicans grip on the district, it will take many more electoral cycles.

Idaho’s first district helps illustrate why population growth is a crucial and easily overlooked consideration when analyzing migration effects. If places simply exchanged equal numbers of migrants, then migration reduces to a zero sum outcome; the net sorting or convergence effects would be reciprocated across every other destination. Unequal growth, in contrast, means that total polarization can increase even if migrants are partially diluting homogeneity in places that are growing. The potential for this surprising result increases when we consider the effect of polarization in a legislative context, as opposed to elections alone. For all of the reasons that a legislative response to changes in constituency composition can be non-linear, or non-existent, migration can contribute to a more polarized legislature whether or not migrants are self-selecting into places where their preferences tend to prevail. To the extent migrants reflect this kind of self-selection, the effect is even stronger, but self-selection (whether self conscious or not) need not be a necessary condition for greater polarization.

Because some places add much more population than others, migration can increase institutional polarization even if the distribution of migrants political preferences is relatively diverse and heterogeneous. This surprising outcome becomes possible when the prevailing preferences in the fastest growing destinations may be so overwhelmingly homogenous that a given wave of heterogenous migration will not transform them for a very long time.
3.3.1 Migration and Redistricting in Congress

If migration leads to dispersion and unequally distributed growth, what are the electoral implications? I try to link the results from my earlier analysis on migration into U.S. congressional districts, and the results of congressional elections and congressional partisanship since 1990. The dramatic increase in partisan polarization within the U.S. Congress, since the 1970s, is widely accepted throughout the literature as noted above. This growth in polarization coincides with the renewal of party institutional power and intra-party coordination. But as we have seen with the growth of polarization among elites more generally, there is presently no clear consensus about the importance and the dynamics of electoral behavior in the genesis of greater party polarization within Congress.

Several explanations for constituents’ role in renewed congressional polarization have emerged, many within the framework of conditional party government theory (Aldrich 1995), (Rohde 1991), (Rohde & Aldrich 2000)). Some of these explanations try to reconcile seemingly un-polarized preferences in the electorate with Congress's more homogeneous and ideological composition and behavior. An important example, in the case of the House of Representatives, one popular explanation, is gerrymandering. As recent decades have imposed a strict legal expectation for post-census redistricting that produces districts with equal population, a greater opportunity for state legislatures to manipulate district configurations has emerged. This could imply the ability to manufacture districts that might increase the number party seats with a given level of partisan support, insulate ideologically extreme incumbents, or reward party loyalists, or all three. In some cases, the party strategy might try to isolate opponents into a few dominant districts; in other cases, where a party enjoys an overall advantage, districts are drawn to reflect such an advantage uniformly.

Either of these redistricting strategies could contribute to polarization (Carson
et al. 2006). However, recent research has often downplayed the significance of gerrymandering as a potential explanation for several of its presumed effects, including polarization. Abramowitz et al. (2006) find that no significant effect of gerrymandering is seen immediately following redistricting. Oppenheimer (2005) find that similar increases in polarization are seen in the U.S. Senate. MPR argue that most polarization effects can be explained by the stark difference between Democratic and Republican representation of a districts with similar electoral characteristics, even though aggressive redistricting practices may have exploited relatively small Republican partisanship advantages in certain cases. The increased relevance of primary elections is another plausible explanation; activists whose influence tends to dominate primary elections enjoy exaggerated influence in elevating ideologues into general elections. Some papers discuss migration as a possible contributing factor, but to date, there has been little systematic study of the links to migration in recent congressional elections.

3.4 Descriptive Statistics

This section reports data about variation in population growth in the 1990’s and 2000’s congressional districts. Before evaluating hypotheses about the implications of high-growth districts, I wish to provide support for two basic assertions: the dispersion of population over the last fifty years, insofar as district configurations are concerned, and that the distribution of population growth includes a set of high-growth district with distinctive characteristics: Republican support, income growth, and regional variation.

District growth and the geographic dispersion of voters into Republican districts reflects a secular trend observed by Jacobson (2000): for some time, Republicans have been more evenly distributed across the country than Democrats. This phenomenon does not contradict that fact that Republicans are stronger in some regions
compared to others, and in rural areas more generally. But compared to Democrats, who have been much more tightly clustered into relatively densely populated urban areas, Republicans are more evenly distributed. This means that the variation of Republican support in different places in recent elections has been relatively small compared to the Democrats. The distribution of Republicans creates opportunities to efficiently apply Republican strength across more districts, and can simplify the task of creating district boundaries that satisfy the goals of a Republican gerrymander. In recent congressional elections, this tendency confers a structural advantage to Republican candidates. My thesis implies that this tendency is increased to the extent that Republicans predominate in high growth, exurban districts.

As Jacobson has noted, the Republican structural advantage can be demonstrated by the success of Republican presidential candidates across a greater proportion of all congressional districts, relative to their overall level of support. Jacobson notes that George W. Bush, in both of his electoral victories, won majorities in a significantly greater number of districts than either of his opponents, despite the relative closeness of the overall results. In 2008, this tendency appears to have diminished somewhat. The normalized Democratic presidential vote shows an increase from 193 Gore districts to 212 Obama districts, but this still provided an 11 seat margin in favor of the Republicans, despite the widespread defeat of Republicans in congressional elections. This result does not mean that some places haven't concentrated and certainly not to contradict the evidence that the country is more urban. On the whole, the country’s population is more evenly distributed, and this pattern favors the Republicans.

To measure population dispersion, I computed a Gini coefficient on the distribution of population per square mile across congressional districts at the end of every decade since the 1940’s. Gini coefficients are based on the cumulative distribution of some population attribute, and provide a single metric that characterizes overall
equality or inequality in the distribution. Gini coefficients are most commonly used as a measure of income inequality but can be used to measure inequality in other contexts. In this example, we would expect dispersion of population to increase the overall equality of population per square mile. A perfectly even distribution of population, in which each district in a given area has exactly the same ratio of population per square mile, would generate a Gini coefficient of zero. If the entire population concentrated entirely into one district, the Gini coefficient would be one.

This measure of population distribution reflects the construction of district boundaries. But if considered nationwide over a long period of time, the effects of district construction from state to state are likely to be neutralized. The data considers population per square mile over a sixty year period and considers the U.S. at large, each region, and a set of selected states with a variety of characteristics. MPR also demonstrate the extent of geographic constraints on the districting process.

The results of the Gini coefficients for the entire country, each census region, and some selected states appears in Table 3.1. The most important result appears in the coefficient trend for all of the United States. The Gini coefficient declines in each decade, although the rate of decline decreases to a marginal amount in the most recent decade. At no point does the Gini coefficient increase, and the decline is steady and persistent. Removing states with fewer than two districts, or as many five districts, reduces the overall Gini coefficient slightly but does not change the overall trend or its magnitude. In two cases (Florida and Texas), the Gini coefficient does increase approaching the 1980s; this trend reflects the dramatic increase in urbanization in these states. Both of these states conform to the pattern of decline by the 1990s.

In the current decade, we also see a mildly negative correlation between population growth and the log of population per square mile (-.243), as we would expect given a trend of population dispersion.
Table 3.1: Gini coefficients of House district population per square mile, by decade

<table>
<thead>
<tr>
<th>Area</th>
<th>1940’s</th>
<th>1950’s</th>
<th>1960’s</th>
<th>1970’s</th>
<th>1980’s</th>
<th>1990’s</th>
<th>2000’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>All US</td>
<td>.908</td>
<td>.884</td>
<td>.853</td>
<td>.836</td>
<td>.825</td>
<td>.812</td>
<td>.811</td>
</tr>
<tr>
<td>FL</td>
<td>.334</td>
<td>.520</td>
<td>.605</td>
<td>.610</td>
<td>.721</td>
<td>.664</td>
<td>.624</td>
</tr>
<tr>
<td>CA</td>
<td>.805</td>
<td>.753</td>
<td>.650</td>
<td>.600</td>
<td>.614</td>
<td>.626</td>
<td>.615</td>
</tr>
<tr>
<td>PA</td>
<td>.758</td>
<td>.746</td>
<td>.755</td>
<td>.757</td>
<td>.775</td>
<td>.759</td>
<td>.700</td>
</tr>
<tr>
<td>TX</td>
<td>.737</td>
<td>.747</td>
<td>.806</td>
<td>.789</td>
<td>.736</td>
<td>.684</td>
<td>.672</td>
</tr>
<tr>
<td>NE</td>
<td>.800</td>
<td>.780</td>
<td>.772</td>
<td>.774</td>
<td>.774</td>
<td>.773</td>
<td>.779</td>
</tr>
<tr>
<td>SO</td>
<td>.733</td>
<td>.839</td>
<td>.812</td>
<td>.791</td>
<td>.760</td>
<td>.711</td>
<td>.700</td>
</tr>
<tr>
<td>WE</td>
<td>.870</td>
<td>.833</td>
<td>.772</td>
<td>.718</td>
<td>.735</td>
<td>.721</td>
<td>.728</td>
</tr>
<tr>
<td>MW</td>
<td>.796</td>
<td>.786</td>
<td>.801</td>
<td>.788</td>
<td>.766</td>
<td>.761</td>
<td>.756</td>
</tr>
</tbody>
</table>

Table 3.2 shows pairwise correlations between political, regional, and demographic considerations that correlate with population growth among congressional districts in the last two decades. The most important implication in the correlations shown here is the link between the districts political preferences and growth. Both DW-NOMINATE 1st Dimension scores and the Bush support percentage are correlated to a districts growth rate. Moreover, these relationships persist even when controlled for census region, insofar as growth is focused on the south and west. The pattern of correlations differs most profoundly in the western region; the correlation between income and growth found elsewhere doesn’t appear in the west. But within all regions, the relationship between population growth and DW-NOMINATE and Bush 2004 presidential vote is positive and substantial. This relationship holds even in the midwest and northeast, where overall growth was much less relative to the west and south.

3.5 Migration and sorting of district partisanship

The growth of a district, by itself, does not reveal whether migration increased or diluted its partisanship. The analysis of district sorting in Chapter 2 suggests no systematic pattern as to which districts will sort or converge, and this lack of pattern reflects the distribution of the highest growth districts. Table 3.4 lists all of the 31 districts that grew by 20% or more between 2000 and 2006, along with the normalized
Table 3.2: Pairwise correlations between district level variables and population growth, by region 2000-06

<table>
<thead>
<tr>
<th>Area</th>
<th>U.S.</th>
<th>Northeast</th>
<th>South</th>
<th>West</th>
<th>Midwest</th>
</tr>
</thead>
<tbody>
<tr>
<td>109th DW-NOM 1</td>
<td>.437 (.000)</td>
<td>.304 (.005)</td>
<td>.389 (.000)</td>
<td>.532 (.000)</td>
<td>.500 (.000)</td>
</tr>
<tr>
<td>109th DW-NOM 2</td>
<td>-.005 (.914)</td>
<td>-.312 (.004)</td>
<td>-.265 (.001)</td>
<td>.202 (.047)</td>
<td>-.041 (.689)</td>
</tr>
<tr>
<td>Bush 04 %</td>
<td>.422 (.000)</td>
<td>.370 (.001)</td>
<td>.288 (.000)</td>
<td>.542 (.000)</td>
<td>.526 (.000)</td>
</tr>
<tr>
<td>HH Income</td>
<td>.231 (.000)</td>
<td>.393 (.000)</td>
<td>.457 (.000)</td>
<td>-.070 (.492)</td>
<td>.558 (.000)</td>
</tr>
<tr>
<td>Med House Value</td>
<td>.021 (.669)</td>
<td>.211 (.056)</td>
<td>.241 (.003)</td>
<td>-.380 (.000)</td>
<td>.227 (.023)</td>
</tr>
<tr>
<td>Rural %</td>
<td>-.009 (.853)</td>
<td>.079 (.480)</td>
<td>-.159 (.048)</td>
<td>.185 (.068)</td>
<td>.150 (.136)</td>
</tr>
<tr>
<td>Hispanic %</td>
<td>.239 (.000)</td>
<td>.018 (.876)</td>
<td>.219 (.006)</td>
<td>.042 (.680)</td>
<td>-.056 (.585)</td>
</tr>
<tr>
<td>Income Growth %</td>
<td>.270 (.000)</td>
<td>.495 (.000)</td>
<td>.233 (.004)</td>
<td>.114 (.262)</td>
<td>.541 (.000)</td>
</tr>
<tr>
<td>Log of Pop Sq. Mi</td>
<td>-.243 (.000)</td>
<td>-.175 (.113)</td>
<td>.029 (.725)</td>
<td>-.384 (.000)</td>
<td>-.281 (.005)</td>
</tr>
<tr>
<td>Median Pop Growth</td>
<td>4.69</td>
<td>2.42</td>
<td>7.20</td>
<td>7.63</td>
<td>2.46</td>
</tr>
<tr>
<td>N</td>
<td>435</td>
<td>83</td>
<td>154</td>
<td>98</td>
<td>100</td>
</tr>
</tbody>
</table>

swing of percentages between the 2000 and 2008 presidential elections. Majorities in 28 of these 31 districts supported Bush in 2000.²

Do these patterns reveal whether high growth districts are consistently sorting or converging, and does that distribution of sorting patterns in the rest of the country? In the case of the 1990’s and 2000’s, there is no apparent pattern of sorting in the highest growth districts. A comparison of the means of the changes (shown in Table 3.3 between 2000 and the normalized 2008 Democratic vote percentages among the districts that supported Bush in 2000, high growth districts (20% or more) show a slightly greater trend to the Democrats in 2008.³ This modestly larger percentage is likely due, in part, to the fact that high growth districts started off further from the mean, and their support for the Democrats in 2008 was a relatively low 46%.

As a group, high growth districts were still heavily Republican in 2008, and Republican support did not erode any more than it did in the rest of the country. Some districts appear to sort, while others seem to have converged or regressed to the mean, as shown in Table 3.4. Almost all of these districts were represented by

² Since the states that receive much of the inbound migration happen to be the large states Florida, Texas, and Georgia, the opportunity for unusually effective gerrymandering, facilitated by additional seats from reapportionment, is a possibility.

³ Percentages in the 2008 election are normalized to 2000 by subtracting 3.5 percentage points from the Democrats and adding 3.5 percentage points to the Republicans.
Table 3.3: Difference of Means tests: Increase in Democratic Vote from 2000 to 2008 and DW-NOMINATE 1

<table>
<thead>
<tr>
<th></th>
<th>Bush 2000</th>
<th>Gore 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Districts Below 20% Growth</td>
<td>0.10 (.370)</td>
<td>1.40 (.364)</td>
</tr>
<tr>
<td>Districts Above 20% Growth</td>
<td>2.00 (.825)</td>
<td>2.83 (4.33)</td>
</tr>
<tr>
<td>Combined</td>
<td>.032 (.342)</td>
<td>1.42 (3.62)</td>
</tr>
<tr>
<td>Difference</td>
<td>-1.90 (1.07)</td>
<td>-1.43 (2.94)</td>
</tr>
<tr>
<td>Pr(</td>
<td>T</td>
<td>&gt;</td>
</tr>
<tr>
<td>Pr(</td>
<td>T</td>
<td>&gt; t)</td>
</tr>
<tr>
<td>N Districts Above 20%/All</td>
<td>28/242</td>
<td>3/193</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>109th Rep Seat</th>
<th>109th Dem Seat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Districts Below 20% Growth</td>
<td>.507 (.011)</td>
<td>-.431 (.011)</td>
</tr>
<tr>
<td>Districts Above 20% Growth</td>
<td>.607 (.032)</td>
<td>-.464 (.205)</td>
</tr>
<tr>
<td>Combined</td>
<td>.519 (.011)</td>
<td>-.432 (.011)</td>
</tr>
<tr>
<td>Difference</td>
<td>.094 (.033)</td>
<td>-.033 (.108)</td>
</tr>
<tr>
<td>Pr(</td>
<td>T</td>
<td>&gt;</td>
</tr>
<tr>
<td>Pr(</td>
<td>T</td>
<td>&gt; t)</td>
</tr>
<tr>
<td>N Districts Above 20%/All</td>
<td>29/232</td>
<td>2/203</td>
</tr>
</tbody>
</table>

Republicans throughout this eight year period. Moreover, the DW-NOMINATE 1 scores were higher than other Republican districts as a group. While nine of these 31 high-growth districts that supported Bush in 2000 swung to the Democrats in 2008, 5 of these nine districts are in California, and all of them have large hispanic populations. Table 3.4 reveals two different stories about the effect of migration in high growth districts. In some cases, migration is reinforcing party dominance; except for a couple of isolated cases, that party is the Republicans. In other cases, migration is diluting strength in high growth districts who began the decade as solidly Republican, but the effect is gradual and incomplete. These districts reflect partial convergence. Almost all of these districts are exurban or rural, and their growth reflects geographic spreading.

If growing districts are more likely to reveal sorting, we should expect to see a district’s growth percent predict the extent of partisan change over a given period of
Table 3.4: Districts with 20%+ Growth 2000-06

1) Majority supported Bush in 2000 and McCain in 20 with normalized increase for Republicans

<table>
<thead>
<tr>
<th>District</th>
<th>Normalized Decrease For Dems</th>
<th>House to Dems</th>
<th>Growth%</th>
<th>Obama%</th>
<th>Hispanic%</th>
<th>Undoc %</th>
</tr>
</thead>
<tbody>
<tr>
<td>FL05</td>
<td>-7</td>
<td></td>
<td>33.4</td>
<td>43</td>
<td>11.7</td>
<td>3.28</td>
</tr>
<tr>
<td>AZ02</td>
<td>-7</td>
<td></td>
<td>39.9</td>
<td>38</td>
<td>27</td>
<td>3.17</td>
</tr>
<tr>
<td>FL07</td>
<td>-4</td>
<td></td>
<td>21.7</td>
<td>46</td>
<td>11.9</td>
<td>2.80</td>
</tr>
<tr>
<td>FL09</td>
<td>-3</td>
<td></td>
<td>20.8</td>
<td>47</td>
<td>13.3</td>
<td>3.16</td>
</tr>
<tr>
<td>AZ06</td>
<td>-3</td>
<td></td>
<td>47.9</td>
<td>38</td>
<td>31.7</td>
<td>5.54</td>
</tr>
<tr>
<td>GA08*</td>
<td>-3</td>
<td></td>
<td>X</td>
<td>25</td>
<td>43</td>
<td>4.7</td>
</tr>
<tr>
<td>GA10*</td>
<td>-3</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>FL14</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TX26</td>
<td>-1</td>
<td></td>
<td>24.9</td>
<td>41</td>
<td>24.2</td>
<td>6.89</td>
</tr>
<tr>
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<td>20.5</td>
<td>44</td>
<td>40.1</td>
<td>4.42</td>
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</table>

2) Majority supported Bush in 2000 and McCain in 2008 with normalized increase for Democrats

<table>
<thead>
<tr>
<th>District</th>
<th>Normalized Decrease For Dems</th>
<th>House to Dems</th>
<th>Growth%</th>
<th>Obama%</th>
<th>Hispanic%</th>
<th>Undoc %</th>
</tr>
</thead>
<tbody>
<tr>
<td>GA06*</td>
<td>1</td>
<td></td>
<td>22.4</td>
<td>37</td>
<td>8.7</td>
<td>5.07</td>
</tr>
<tr>
<td>TX22*</td>
<td>4</td>
<td></td>
<td>24</td>
<td>41</td>
<td>29.9</td>
<td>4.47</td>
</tr>
<tr>
<td>ID01</td>
<td>4</td>
<td></td>
<td>20.2</td>
<td>36</td>
<td>10.2</td>
<td>1.79</td>
</tr>
<tr>
<td>GA07*</td>
<td>4</td>
<td></td>
<td>34.5</td>
<td>39</td>
<td>12</td>
<td>4.78</td>
</tr>
<tr>
<td>NC09</td>
<td>5</td>
<td></td>
<td>24.1</td>
<td>45</td>
<td>7.5</td>
<td>3.59</td>
</tr>
<tr>
<td>CO06</td>
<td>5</td>
<td></td>
<td>21.2</td>
<td>46</td>
<td>8.7</td>
<td>2.23</td>
</tr>
<tr>
<td>TX21*</td>
<td>6</td>
<td></td>
<td>20.6</td>
<td>41</td>
<td>27.2</td>
<td>2.87</td>
</tr>
<tr>
<td>TX10*</td>
<td>6</td>
<td></td>
<td>30.3</td>
<td>44</td>
<td>33</td>
<td>8.12</td>
</tr>
<tr>
<td>TX03*</td>
<td>8</td>
<td></td>
<td>24.8</td>
<td>42</td>
<td>25.9</td>
<td>11.87</td>
</tr>
</tbody>
</table>

3) Majority supported Bush in 2000 and supported or nearly supported Obama in 2008

<table>
<thead>
<tr>
<th>District</th>
<th>Normalized Decrease For Dems</th>
<th>House to Dems</th>
<th>Growth%</th>
<th>Obama%</th>
<th>Hispanic%</th>
<th>Undoc %</th>
</tr>
</thead>
<tbody>
<tr>
<td>FL25</td>
<td>0</td>
<td></td>
<td>24.7</td>
<td>49</td>
<td>83.1</td>
<td>11.9</td>
</tr>
<tr>
<td>FL12</td>
<td>0</td>
<td></td>
<td>20.7</td>
<td>49</td>
<td>22.6</td>
<td>5.74</td>
</tr>
<tr>
<td>CA03</td>
<td>4</td>
<td></td>
<td>22.9</td>
<td>49</td>
<td>16.7</td>
<td>3.69</td>
</tr>
<tr>
<td>CA45</td>
<td>1</td>
<td></td>
<td>29.3</td>
<td>52</td>
<td>51.6</td>
<td>5.63</td>
</tr>
<tr>
<td>CA44</td>
<td>2</td>
<td></td>
<td>29.5</td>
<td>50</td>
<td>54</td>
<td>8.60</td>
</tr>
<tr>
<td>CA25</td>
<td>4</td>
<td></td>
<td>23</td>
<td>50</td>
<td>43.9</td>
<td>4.22</td>
</tr>
<tr>
<td>CA11</td>
<td>5</td>
<td></td>
<td>23.9</td>
<td>54</td>
<td>29.2</td>
<td>5.02</td>
</tr>
<tr>
<td>IL14</td>
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<td></td>
<td>21.7</td>
<td>55</td>
<td>27.1</td>
<td>7.77</td>
</tr>
<tr>
<td>VA10</td>
<td>8</td>
<td></td>
<td>22.2</td>
<td>53</td>
<td>13.1</td>
<td>6.55</td>
</tr>
</tbody>
</table>

4) Majority supported Gore in 2000

<table>
<thead>
<tr>
<th>District</th>
<th>Normalized Decrease For Dems</th>
<th>House to Dems</th>
<th>Growth%</th>
<th>Obama%</th>
<th>Hispanic%</th>
<th>Undoc %</th>
</tr>
</thead>
<tbody>
<tr>
<td>AZ07</td>
<td>-4.5</td>
<td></td>
<td>22.7</td>
<td>57</td>
<td>67.3</td>
<td>12.6</td>
</tr>
<tr>
<td>NV03</td>
<td>2.5</td>
<td>X</td>
<td>35.6</td>
<td>55</td>
<td>27.4</td>
<td>4.59</td>
</tr>
<tr>
<td>GA13*</td>
<td>10.5</td>
<td></td>
<td>20.6</td>
<td>71</td>
<td>18</td>
<td>10.60</td>
</tr>
</tbody>
</table>

* Georgia and Texas redistricted between 109th and 110th Congresses. Presidential vote totals reflect 110th district boundaries.
time, such as the eight years between the first and last presidential elections in a given
decade. Table 3.5 suggests this relationship does not exist for period between 2000
and 2008; some districts have sorted, some show convergence, and the distribution
roughly equates to the distribution of districts overall. Another way to determine this
relationship is to apply an OLS regression predicting partisan change from growth
percent, along with other drivers of partisan change. In this case, the dependent
variable is the change in partisanship over the decade for both the 1900’s and 2000’s.
We see no relationship between change over the decade and growth percentage. This
lack of a relationship persists even when analyzed within parties.

In summary, the results in Tables 3.4 and 3.5 show no evidence of sorting at
the congressional district level for either party. Districts that are growing rapidly
are about as likely to sort as other districts, despite the fact that they are much
more likely to have begun each decade as Republican strongholds. But does the
lack of evidence of sorting translate into a corresponding lack of increase of polar-
ization within the House of Representatives? A simple difference of means test for

Table 3.5: OLS Predicting Partisanship Change between Presidential Elections (Ad-
justed for margin of victory)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coef. Estimate (SE)</th>
<th>Coef. Estimate (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth %</td>
<td>-.010 (.036)</td>
<td>-.005 (.022)</td>
</tr>
<tr>
<td>Bush 00 %</td>
<td>-.009 (.023)</td>
<td>-.220 (.021)</td>
</tr>
<tr>
<td>Med Inc 1999 (K))</td>
<td>.156 (.024)</td>
<td>.290 (.029)</td>
</tr>
<tr>
<td>Black %</td>
<td>.032 (.019)</td>
<td>-.066 (.018)</td>
</tr>
<tr>
<td>Hispanic %</td>
<td>.050 (.015)</td>
<td>.030 (.015)</td>
</tr>
<tr>
<td>Cons</td>
<td>-6.69 (1.87)</td>
<td>1.43 (1.69)</td>
</tr>
<tr>
<td>N</td>
<td>435</td>
<td>435</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.120</td>
<td>.463</td>
</tr>
</tbody>
</table>
DW-NOMINATE 1 scores between high and low growth districts shows significant
difference for both types of districts for both parties. The mean DW-NOMINATE 1
score, which is scaled between -1 and +1, is about .1 higher for districts with 20%
or more growth in both the 1990’s and 2000’s for Republicans, but with little or no
effect for Democrats. Growth districts appear to be more polarized within congress,
even if they are not more sorted within the electorate. I consider two explanations
for this phenomenon: increased electoral bias, and increased average intradistrict
deviation between parties, in high growth districts.

3.6 Migration and Electoral Bias

One potential impact of migration that could translate into greater polarization in
Congress is an increase in electoral bias. The literature on gerrymandering (Cox &
Katz 2002a), (Browning & King 1987) establishes the distinction between bias and
responsiveness, which together determine the impact of new district definitions on
the electoral success of a party given its geographic distribution of support.

Responsiveness describes the extent to which an increase in votes translates into
additional legislative victories. In a system of pure proportional representation, re-
ponsiveness is uniform: an additional number of votes is translated into a propor-
tional increase in legislative seats. In a pure majoritarian winner-take-all district
system, responsiveness depends upon the distribution of party supporters: if sup-
port is distributed in exactly the same way across all districts, responsiveness is nil,
insofar as the majority party will win every seat, regardless of its level of support
above 50%.

Bias, by contrast, describes a party’s ability to capture more seats relative to
its number of votes. If a party is able to win a percentage of seats that exceeds its
percentage of votes, then the party is a beneficiary of electoral bias. Seat shares can
be predicted by this formula applied in Cox and Katz 2002:

\[
\frac{s}{1 - s} = e^\lambda \left( \frac{v}{1 - v} \right)^\rho
\]  

(3.1)
where $s$ represents a party’s share of seats in a legislature, $v$ represents the party’s share of votes, $\lambda$ captures bias, and $\rho$ captures responsiveness.

The computation of bias provides one way to illustrate the effect of gerrymandering or any other configuration of legislative districts. If bias $\lambda$ is positive, the number of seats will rise in relation to the number of votes. How does migration affect bias?

An important assumption is that intra-decade migration will not change the number of seats won by a given party, prior to a reapportionment. Naturally, it is easy to find scenarios where this assumption fails. However, for those districts that begin the decade as strongly Republican and also most affected by significant growth, the assumption seems plausible. If true, we can treat the left side of equation 3.1 as a constant, which is to say: $\frac{s}{1-s} = C$. Thus, bias reduces to:

$$
\lambda = \ln \left[ C \left( \frac{(1-v)}{v} \right) ^\rho \right] \quad (3.2)
$$

Bias increases as vote share decreases if we constrain the seat share to be constant. Although migration, by itself, doesn’t change $v$ across the entire electorate, $v$ is reduced if we change $v$ in equation 1 to $\bar{v}$ for $d \in D$. Under this interpretation

$$
\bar{v} = \frac{\sum_{d=1}^{D} v_d}{D} \quad (3.3)
$$

Overall individual vote shares $v$ will differ from $\bar{v}$ if we ignore the variation in the number of individuals in each district, which changes as a result of migration. If migration partially dilutes partisan strength in a growing district, then $\bar{v}$ will be less than $v$ for the population at large. This increased variation is conspicuous for congressional districts because they begin the period after apportionment relatively close.\(^4\)

Consider the following example based on two districts and net migration. Five Democrats and three Republicans migrate from District 1 to District 2, changing the distribution of constituents as follows:

\(^4\) The standard deviation of district population based on the 2000 census is 28,541. By 2006, the standard deviation had grown to 61,072.

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To illustrate this effect, consider two equally populated districts with 80 voters each, in which District 1 has 50 Democrats, while District 2 other has 50 Republicans, as shown in Table 3.6. Assume individuals retain their original preferences before and after migration. Ten percent of the voters migrate from District 1 to District 2, in proportions that reflect District 1’s original preference distribution; this means 5 Democrats and 3 Republicans migrate to District 2. This migration slightly dilutes the Republican partisanship of District 2, while increasing its overall population from 80 to 88. The Republican share of voters in District 2 drops from .625 to .602, while the share of voters in District 1 remains unchanged.

While the overall share of Republican voters remains at .5, since no individual voters have changed their preferences, the unweighted average of Republican shares between the two districts has dropped from .5 to .489. If we presume that $\rho = 1$ and that shares of seats remains evenly divided, this effect increases Republican bias ($\lambda_{\text{republican}}$) from 0 to 0.45.

This increase in bias reflects the effect of partial convergence: a growing Republican district becomes larger while its partisanship is slightly diluted. In the short run, the effect is a statistical artifact of the modified definition of vote shares, but it could reveal an important reason for a short term disconnect between the partisanship of growing districts and their representation in Congress. It is unclear how dilution of party strength in a scenario like this translates into a shift in the behavior of an elected member, if it does so at all. Suppose that migrants are a relatively inconspicuous component of a member’s various constituencies, and that migrants who aren’t fellow partisans are even less consequential. If this picture is accurate, we should expect to see districts with large migrant influxes able to sustain representation in

Table 3.6: Sample of Bias Effects Between Two Districts with Migration

<table>
<thead>
<tr>
<th>District</th>
<th>Dems(t=0)</th>
<th>Reps(t=0)</th>
<th>$v(\text{rep})$</th>
<th>Dems(t=1)</th>
<th>Reps(t=1)</th>
<th>$v(\text{rep})$</th>
<th>$\overline{v}(\text{rep})$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>30</td>
<td>.375</td>
<td>45</td>
<td>27</td>
<td>.375</td>
<td>.375</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
<td>50</td>
<td>.625</td>
<td>35</td>
<td>53</td>
<td>.602</td>
<td>.602</td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td>80</td>
<td>.500</td>
<td>80</td>
<td>80</td>
<td>.500</td>
<td>.489</td>
</tr>
</tbody>
</table>
which net partisanship is a less reliable determinant.

One way to examine this possibility is to see if higher growth Republican districts will be more conservative than lower growth Republican districts. But does growth predict increased polarization apart from these considerations? To test this outcome, I measure the intraparty relationship between district growth and polarization. The figures in 3.3 show a positive relationship between growth and DW-NOMINATE 1 scores within each party in the 109th Congress, and this relationship persists throughout the decade.

Another possibility is that the ideology expressed by members, reflected in DW-NOMINATE first dimension scores, is more sensitive to district partisanship in high growth districts. If we consider partisanship based on 2008 presidential election results, this result appears to be the case: the slope of the fitted line based on the relationship between 2008 presidential vote percentages and DW-NOMINATE scores from the 109th Congress is significant, and it is much greater than partisanship based on the last two elections.

The plots in Figure ?? show the different levels of responsiveness to district partisanship from members in high growth districts versus other districts. Using presidential vote figures from the last two elections, notably 2008, DW-NOMINATE scores respond to changes in partisanship. High growth districts are more likely to be represented by members with extreme DW-NOMINATE scores, relative to a district’s partisanship. This result makes sense if we believe that high growth districts are more willing to accommodate extremes in direction, due to factors such as a greater reliance on the national party agenda and greater influence of party activists relative to the rest of the electorate.

3.6.1 High growth districts have greater average intradistrict deviation

This test applies MPR’s model of polarization, which breaks it down between partisan sorting and the differences between party representation for given levels of district partisanship, described above. Consider party polarization in Congress. As with any instance of polarization, we measure polarization by the difference between
These figures illustrate that the relationship between growth and DW-NOMINATE scores persists when we control for party, and shows a positive relationship for both Democrats and Republicans.
Figure 3.4: 109th Republican House DWNOM1 vs. Presidential Vote Share, 2000 - 2008
some relevant parameter of a preference distribution, most commonly the distributions means. Assume that polarization is measured by the difference between the parties average member voting score, measured by a scale along the lines of DW-NOMINATE. In addition, a district’s underlying policy preferences can be observed with a cardinal measure.

As MPR reveal, polarization can be represented as the sum of districts collective tendency to choose members from a party who conform to their partisanship, plus the difference between Republican and Democratic representation given a certain level of partisanship. In the first instance, which MPR call sorting, polarization increases to the extent that voters in some districts are more likely Democratic members and others will tend to choose Republicans. Ideology is one possible motivation for these varying likelihoods of party choice, but the motivation does not matter: the important point is that sorting is defined by variation in the probability of party choice across districts. Conceivably, polarization may result entirely from sorting, and nothing else. This would be the case if all representatives from districts with identical levels of partisanship behave the same way, regardless of these representatives’ party affiliation. A central conclusion in the MPR article is that the natural geographic constraints of districting, namely latitude and longitude proximity and contiguity, are responsible for most of the sorting effects that contribute to polarization.

Polarization also increases if two representatives from different parties represent the same district in a different way. Imagine that voters in districts never discriminate between candidates based on partisanship. In other words, each district is equally likely to choose a Republican or a Democrat, regardless of the underlying ideology or preferences of its constituents. If we find Republicans systematically represent such districts differently than Democrats, polarization occurs, even though there is no partisan sorting of districts. MPR refer to this component of polarization as the average intradistrict deviation, or AIDD. Total polarization is the sum of sorting plus AIDD, or:

\[
Total\text{Polarization} = Sorting + AIDD
\]  \hspace*{1cm} (3.4)
MPR represent this analytical distinction in a formal way. Assume polarization is the difference the means of DW-NOMINATE 1 scores, by party, or:

\[ TotalPolarization = E(NOM|R) - E(NOM|D) \]  

(3.5)

where R (D) describes representation by a Republican (Democrat). If \( z \) is a vector of district characteristics that determine its partisanship, and \( p(z) \) is the probability of electing a Republican, then

\[
E(NOM|R) - E(NOM|D) = 
\int \left[ E(NOM|R,u) \frac{p(z)}{\bar{p}} - E(NOM|D,z) \frac{1-p(z)}{1-\bar{p}} \right] f(z)dx 
\]  

(3.6)

which integrates over \( f(z) \), a distribution of characteristics that determine partisanship.

If \( p(z) = \bar{p} \), sorting is eliminated, because there is no variation of \( p(z) \), and equation 6 reduces to:

\[
E(NOM|R) - E(NOM|D) = 
\int [E(NOM|R,z) - E(NOM|D,z)] f(z)dx 
\]  

= AIDD  

(3.7)

In equation 3.7, all polarization could be explained the differences in the behavior of Republican versus Democratic members, with the partisanship level of districts integrated out. In other words, equation 7 captures AIDD.

The effect of district sorting, therefore, equals

\[ Sorting = E(NOM|R) - E(NOM|D) - AIDD \]  

(3.8)

My hypothesis predicts that AIDD will be greater for fast growing districts. The following results apply MPR’s measurement strategy to AIDD applied to all districts and then specifically on higher growth districts for select congresses in each of the last two decades.
3.7 The Effect of Growth on Sorting, AIDD, and Polarization

Given the formulation described above, total polarization is a simple calculation of the differences between the mean of Republican and Democratic House members’ DW-NOMINATE first dimension scores. Measuring AIDD requires estimating the incremental effect of legislator’s partisanship across districts; MPR characterize this result as analogous to a treatment effect. MPR also use district presidential vote share to capture $z$; as indicated earlier, I use presidential vote share in lieu of a more detailed vector of district characteristics predicting partisanship. One strategy is matching districts with similar characteristics, but it is possible to assume linearity of the conditional mean functions of $z$. If we make this assumption, then the expected value of $R$ for any given level of $u$ equals:

$$E(NOM|R) = \beta_0 + \beta_1 R + \beta_2 z$$ (3.9)

Figure 3.5 shows partisanship based on 2004 presidential vote, and its relationship to House DW-NOMINATE 1 scores in the 109th Congress. The two clouds show the clustering of members of each party in the House: the top cloud captures all Republican members and the bottom, elongated cloud captures all Democrats. Significant AIDD is easy to observe in the region between 40 and 60 Kerry support: the DW-NOMINATE 1 scores of Republicans are substantially greater than the corresponding range for Democratic representatives. Higher growth districts appear in bold.

MPR make the assumption that probability can be estimated using a probit transformation of the linear function in equation 9 with an interaction term, which I also incorporate. Finally, they exclude districts whose $p(u)$ values fall under .1 or above .9. MPR adopt this strategy because they believe it is difficult to rely on the linear estimates of AIDD in situations where there are no matched districts. This means we see many Republican and Democratic districts where $p(u) = .5$, while there are no Democratic districts where $p(u)$ approaches 1. I presume that the linear estimates of AIDD apply to the counterfactual situation where a Democrat is elected.

---

5 MPR also add an interaction term between $R$ and $z$ in mean deviations.
Figure 3.5: DW-NOMINATE 1 scores by party for the 109th Congress, vs 2004 presidential election percentage.

The black dots represent districts with 10% or more growth; the upper cloud is Republicans and the lower cloud is Democrats.

in the most extremely Republican districts and vice versa. I ignore the restriction of the .1 to .9 range estimates because so few growth districts are Democratic, there would not be a meaningful number of districts on which to base a computation. Recall that there is a positive relationship between growth and DW-NOMINATE 1 scores for Democrats, i.e., Democrats in high growth districts tend to be more conservative than Democrats in low-growth districts. Given this relationship, the presumption of a linear relationship of AIDD for extremely partisan districts seems plausible.

As shown in Table 3.7, for both the 108th and 109th Congresses, AIDD is consistently greater, while sorting is inconclusive. The table shows the MPR estimates of the 108th Congress AIDD and total polarization, based on the set of districts with
a predicted probability of Republican or Democratic partisanship between .1 and .9. I modified these estimates to include all districts with only one representative during the congress (a number that equals 430 of 435 members in each instance). I also computed polarization and AIDD for the 101 districts that grew 10% or more between 2000 and 2006.

Table 3.7: Average Intradistrict Deviation estimates for 108th and 109th House

<table>
<thead>
<tr>
<th></th>
<th>108th MPR All w/10%</th>
<th>108th MPR All w/10%</th>
<th>109th MPR All w/10%</th>
<th>109th MPR All w/10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Polarization</td>
<td>.867 (.021)</td>
<td>.925 (.021)</td>
<td>.923 (.021)</td>
<td>.947 (.020)</td>
</tr>
<tr>
<td>OLS AIDD Estimate</td>
<td>.667 (.020)</td>
<td>.754 (.020)</td>
<td>.840 (.040)</td>
<td>.759 (.020)</td>
</tr>
<tr>
<td>N Dists</td>
<td>269</td>
<td>430</td>
<td>101</td>
<td>430</td>
</tr>
</tbody>
</table>

Total polarization, as we should expect, is greater when all districts are included in the calculation. In this instance, I follow the MPR computation of total polarization by subtracting the means of each party’s DW-NOMINATE 1 scores. For both congresses, the differences between polarization of high growth districts and all districts is insignificant. But AIDD is significantly greater in districts with 10% growth or more, for both congresses. This result supports the earlier conclusion about DW-NOMINATE showing greater sensitivity for high growth districts. Although the test includes all districts with 10% or more growth, we see evidence that high districts will support a greater ideological disparity in district members’ voting behavior at given levels of partisanship. Finally, this relationship between high growth districts versus all districts holds in the 106th Congress, using the 1992 reapportionment scheme.

3.8 Conclusion

This chapter serves two objectives. First, I apply aggregate level data to congressional districts to see if the results generated from the 2006 CCES data reemerge (McDonald 2009). This kind of comparison openly invites problems related to eco-
logical inference (Kramer 1983). In addition, as noted earlier, congressional districts are temporary and often contrived geographic constructs. Nor does it consider the special consequences of hispanic migration within the U.S., which could explain deviation from the default expectation of a positive relationship between migration and income. With these limitations in mind, along important concerns with the choices used to operationalize migration and district partisanship, I find that congressional districts do not meet my proposed test for the presence of a prevailing sorting trend for the 1990’s and 2000’s decades. At the same time, we do see one pattern consistent with the CCES 2006 data: some districts sort, but not all of them. But the overall distribution of partisan change over each decade is not significantly different between districts with high levels of inbound migration and other districts.

The more important finding is the significant relationship between House member ideology and district growth rates. This chapter provides some preliminary support for the argument that district members from high growth districts will show greater deviation from the conditional mean predicted by district characteristics, including partisanship. If this relationship persists, there are several important implications. The most important is that when population growth is focused in Republican strongholds, the Republicans might see benefits ranging from increased apportionment in areas that they will continue to control, a corresponding increase in electoral bias. We should also ask if growing districts, states, or regions facilitate a more ideological style of representation in Congress. In this chapter, I offer some speculation about this possibility: large numbers of mobile constituents may shift constituencies such that a greater role for party activists and focus on the national political agenda are natural consequences. An important final observation about the relative magnitude of gains and losses seems pertinent: while a large number of districts have been lagging in population gain or losing population, a relatively small number of growing districts have received most of the increases in the 2000 decade. If this trend were reversed, the immediate consequences of migration may be more focused, or focused in a different way, on districts that are losing population.

An important and instructive case over the next couple of election cycles will be
Texas, a state which current estimates predict will receive an extraordinary increase in seat apportionment from 32 to 35 or 36 seats in the 2010 census. Under one set of assumptions, this increase could be a windfall of support for Republicans. But this increase also raises questions about whether migration, particularly if considered along with the behavior of hispanic voters, may lead to a near term dissolving of Republican strength there. Many districts in Texas show evidence of converging (i.e., increased Democratic electoral strength thanks to migration). California provides an example of a state that shifted abruptly from relative Republican dominance to Democratic strength in the 1980’s; further research on this topic ought to consider whether these conditions could be repeated.

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6 See Election Data Services *New Population Estimates...Point to Major Changes for 2010* at http://www.electiondataservices.com
Conclusion

The back story of politics for any location in the United States can be linked to migration. As an instrument of description, migration says more about the way places develop politically, in more detail, than any other mechanism. In a place that is growing rapidly, the effects of migration are not hard to find, but effects of the same magnitude can also present themselves anywhere else. Every instance of migration changes two places at once: the place a migrant arrives and the place left behind. Migration can also reveal many of the reasons why geographic variance in American politics persists: it constantly adjusts the absolute size, the relative wealth, the demographic composition, the economic rationale, of every important location in the country, at every level of aggregation. Moreover, the amount of domestic migration experienced in the United States is unusually large, and if this kind of migration has political consequences, their magnitude is a uniquely American phenomenon.¹

Unfortunately for the political scientist, migration poses enormous challenges

¹ In an recent and important illustration, Gamm (1999) writes a detailed account of Jewish Bostonians’ postwar exodus to the suburbs, which he contrasts with Catholics who were much more likely to stay in Boston. Gamm observes that Catholic churches are organized by, and attached to, location and enforce a credible commitment to location. Synagogues, by contrast, are comprised of individuals irrespective of their residence, and can relocate with their congregants.
to theory building and prediction about political outcomes. As this dissertation illustrates, migration sometimes segregates people with shared political preferences, and sometimes it does the exact opposite. The motivations for migration, in relation to the preferences of individual voters, can be random or systematic, persist for generations or disappear overnight; they might align with political preferences in a meaningful way, or not at all. Migration can homogenize a constituency or diversify it. Moreover, the task of developing theories about migration effects changes with the level of aggregation. For example, the literature about the local public policy implications of migration into wealthy suburbs cannot be immediately extended into a discussion about national electoral politics. Finally, inferences about migration and national politics need to be relevant to the level of aggregation affecting politics and the institutions in question. In particular, the research needs to the ability to determine changes in migration effects over time.

With these challenges in mind, my goal in this dissertation is to introduce a theory driven approach to the study of migration, in a way that develops migration’s potential link to the literature on polarization in the American electorate. If there is one essential causal mechanism underlying this effort, it is the potential for migration to reflect a tendency or desire of migrants to self-segregate. If we can find evidence of this mechanism, we can then move to questions such as: How big, and how measurable, is this tendency? If it exists, how much is needed to change a political outcome? To conclude my dissertation, I summarize the analysis, and suggest some directions for future research based on the dissertations’s theoretical propositions and findings.

4.1 Summary

I begin the dissertation with a discussion about evidence suggesting that the electorate has grown more homogeneous at the county level across the U.S. One com-
pelling finding is that nearly half of all Americans live in a landslide county, a term that refers to a county that gave 60% or more of its support to either the Democratic or Republican presidential candidate. This result has persisted since the 2000 election, and did not significantly decline in 2008. This result stands in contrast to elections as recent as 1976, when less than 20% of the population lived in a landslide county. While migration may not necessarily be a primary cause of this result, it is a potential one, since migration is relatively voluminous, persistent, and its effects could be realized in a relatively short time.

The hypothetical link between migration and polarization is easy to construct. For instance, we can suppose that migration is often motivated by the desire to share proximity with like minded individuals, while the same desire extends into the domain of political preferences. When we consider the composition of the older, large urban centers in the U.S., or the half dozen largest cities on the west coast, we see populations sustained both by migrants who, as a group, have been predisposed to support Democratic party candidates, or residents who have resisted migration, either by choice or the inability to migrate.

Alternatively, we might suppose that driving factors of migration merely correlate with political preference, even if migrants are unconcerned about their neighbors, politically or otherwise. This kind of correlation could be motivated by economic considerations, migrant wealth, or exogenous place attributes, density or lack thereof, or benefits that emerge endogenously such as schools, housing, or tax policy. If these indirect motivations consistently align with political preference, their effect may be even more powerful than any tendency to self-consciously migrate into places where shared preferences predominate.

In the first chapter, I demonstrated that migration in any given location will homogenize or diversify the composition of preferences because of several factors, only one of which is the preference tendencies of inbound migrants. I propose a
straightforward weighted average calculation for determining whether migration homogenizes or diversifies the political preference distribution in a given location. This formulation tries to depart from the tendency of migration accounts to focus on migrants and the places where they arrive. Despite this natural inclination, the people who choose to leave a given location, those who remain, and their numbers in relation to inbound migrants, will determine the overall effect of migration just as much as new arrivals. If the data support the requirements in the formula proposed, we can look for empirical support to claims that migration changes preference distributions, and whether or not these changes help explain a statistical result such as the increase in landslide counties.

Next, the dissertation applies an empirical study that can be used to match the prevailing preference distribution in places to the preferences of migrants. The second chapter uses data from the Cooperative Congressional Election Study of 2006 (CCES) to assess migration effects in two ways. First, I examine the relationship between political preferences at the individual level and the characteristics of the destinations that migrants select. After controlling for a migrant’s place of origin, I find that ideology in two forms, self-categorized and constructed as a latent variable, and partisan identification, help predict the partisanship of a migrant’s new destination.

Second, I summarize these observations using the sorting model described in the first chapter, in order to identify congressional districts that have sorted over eighteen months of migration tracking in the data. The observations in this dataset provide the unique opportunity: we get detailed survey information that precede an individual respondent’s migration. This property of the data means we can consider the migration decisions that are unaffected by the conditions in the migrant’s destination that might shape opinion after the fact. I use data aggregated to the level of congressional districts to create a dataset with geographic units that have political significance. For the period in question, I find no predominant trend showing
districts have sorted. However, I do find that districts represented by Democrats are attractive to a significant number of Republican party identifiers in the dataset, relative to the number who leave, and relative to the districts represented by other Republicans. This analysis uses data that reflects only one time period, but it does demonstrate an approach that could be extended across multiple periods. Whether or not migration decisions aggregate into a sorting effect, it is clear that the preferences of individual migrants tend to correspond with the partisanship of the districts they leave behind, even after accounting for distance.

In the final chapter, I shift to an aggregate level analysis of congressional districts to show the relationship between district growth and polarization between Democratic and Republican House members. I use district growth as a proxy for net inbound migration. Given this premise, I investigate the relationship between the amount of congressional domestic migration with sorting and polarization over the last two decades. Using the formulation developed by McCarty, Poole, and Rosenthal (2009) to measure sorting and polarization of congressional districts, I find that migration does not show a relationship with sorting but presents a surprisingly strong relationship with polarization. The chapter suggests one potential explanation: districts with high levels of migration may be more sensitive to different levels of partisanship within constituencies.

4.2 Future Research

Ultimately, the effect of migration must depend on economic motivations of migrants, and how the political preferences of migrants align with other migrants, and the people who remain in their destinations. When these preferences align, the conditions are ripe for sorting. If, for example, Austin, Texas becomes a magnet that is dominated by the creative class described by Florida (2002), this prevalence could redefine the prevailing preferences in Austin if creatives bring predictable political character-
istics. Otherwise, migration changes nothing of political interest in the short run, other than the size of the city.

In this dissertation, I have not considered two important characteristics of migration that present an immediate opportunity for further study. First, some kinds of migrants are likely to have more immediate impact on a location than others. We might ask, for example, how does likelihood of voter participation translate from one destination to another, and does this likelihood vary by partisanship or ideology? Do age and income affect the persistence of these preferences? Does the volume of migration in relation to total population size change these considerations? Finally, what is the impact of different economic motivations? Second, how do all of these affects vary according to political dimension? We could discover that migrant preferences align with alternative dimensions that are hidden in traditional survey questions about liberal-conservative ideological preferences. This hidden effect could appear to diffuse preferences that are, in fact, sorting in ways that are not necessarily apparent in a unidimensional analysis.

In addition, the research in chapter 3 can be extended and parsed in several ways, beginning with a more time periods going back further to decades preceding 1990. For example, this research could produce a more complete accounting of the effect of migration on the transition of California from a largely Republican state to a Democratic stronghold. The argument in chapter 3 suggests that representation lags behind the dilution of a dominant party’s strength in the face of large scale migration. Can we see an effect of this kind in California in a way that created an abrupt transformation that might translate into similar outcomes elsewhere in the coming decade? Specifically, could migration transform the partisanship of the states that are presently most affected by it, including Texas, Florida, Georgia, and Arizona?

More importantly, the data discussed chapter 3 illustrates the most important
research opportunity revealed by this dissertation. Migration in the U.S. is closely linked to geographic expansion of heavily populated areas throughout the country. Stated differently, the residential footprint of the U.S. has expanded at least as quickly as its population, which in turn has grown 50% since the mid-1960’s. If we choose to characterize migration in terms of choice and utility maximization, we quickly see that the number of destinations has increased dramatically. To the extent that any of these choices are affected by an implied or subliminal tendency to self-segregate, and we compound that effect by the inferences from Schelling described in chapter 1, then the increase in the number of places available to the prospective migrant can contribute to the homogenization of political preferences. While this prospect doesn’t automatically generate this potential result, it makes this result possible, and I believe that the link between migration and homogenization, thanks to access to new residential possibilities (or, if you prefer, residential sprawl) seems plausible. Moreover, this effect is possible at any level of aggregation, since geographic expansion is spread disproportionately. Geographic expansion follows population expansion, the fastest growing regions, not coincidentally, are the regions with the greatest amount of newly occupied real estate in the south and west.

For instance, consider a finding revealed in Table 2.3 that shows the effect of the change in urban percentage as a determining factor in the likelihood of a Democratic or Republican district. Changes in this percentage for migrants is a powerful predictor of the these likelihoods: a migrant who moves to a district where this percentage is decreased is far more likely to be moving into a Republican district, even when controlling for the partisanship in the district of origin.

My conjecture is that the population increase that is strongly associated with Republican congressional districts in the past two decades is coupled with the association between migration and growth in less densely regions of the country. An important question for further research emerges: does migration into these growing
areas help contribute to the emergence of Republican political strength beyond what we might otherwise expect to see? If so, this potential advantage can emerge for reasons besides sorting; that is to say, growth may contribute to Republican strength, at least in the short run, even if growing areas are absorbing lots of non-Republicans. Even a slight bias that leads to a greater number of Republican migrants into Republican areas will change the overall distribution of Republicans (and Democrats) across the country, even if this bias isn’t enough to prevent dilution of Republican strength in places where population is growing.

Together, migration and population growth fuel the demand to consume more land for residences. My proposition, which I hope will generate and support my future research agenda, is that the expansion of the U.S.’s residential footprint has a surprising and largely unaccounted effect on national politics. Specifically, I argue there is reason to suspect that expansion of the country’s residential geographical base has made a significant and direct contribution to the emergence of the modern Republican party and to partisan polarization. This suggestion is not meant to imply that migrants into previously uninhabited places are intrinsically predisposed to reflect Republican party identification, even though I think that link does present itself in recent decades. Instead, my underlying theoretical proposition is that we can find a relationship between the number of residential options within a populace, and the likelihood of the populace to self-segregate.

A hidden and unacknowledged truth is that the number of places where Americans can take up residence has grown significantly in every decade since the Great Depression, even if the total size of the country hasn’t grown at all. As I note in chapter 1, this fact is often obscured when we consider that the percentage of American who live in places designated as urban has also grown significantly and now surpasses 80% of the total population. As I noted, this development coincides with an increase in the amount of land designated as urban that exceeds the percentage
growth in the population.

In terms of the polarization literature, this possibility creates an intriguing possibility that a major contributing factor to political polarization is, at once, motivated by the electorate and nevertheless does not presume any change in the distribution of preferences, or even preference changes within a single individual. Naturally, it is safe to assume that migration will also change the way individuals respond politically, but it is also possible to separate those kinds of effects from the purely compositional changes that are the focus of the dissertation.

In conclusion, this dissertation has tried to express one potential permutation of the larger principle that institutions change political outcomes, in part, because they reflect decisions about the way preferences are aggregated. In every instance, aggregation implies some presumption about the way individuals are classified into subgroups, and in the United States, geographic designation still have an overarching relevance in the aggregation process. The significance of migration reflects this emphasis on the country’s geographic organization. The opportunity for self-segregation, and its potential consequences when the opportunity is realized, will motivate the research agenda.
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Biography

Ian R. McDonald

Born: September 6, 1957; Seattle, Washington USA

AM Duke University 2006

MBA University of Washington 1983

BA Western Washington University 1981