Migration of Recent College Graduates: Evidence from the National Longitudinal Survey of Youth

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In the context of today's tight labor markets, as well as projections of continued growth in demand for workers with high skills, various states are considering how to retain and attract recent college graduates. Such efforts involve identifying an area's relative strengths and weaknesses and taking actions as needed, either to capitalize on the strengths or mitigate the weaknesses. Perhaps surprisingly, however, little systematic evidence exists on the factors influencing location decisions of recent graduates, since previous studies of migration have focused on the population in general. This study is a first step in providing such evidence, making use of the National Longitudinal Survey of Youth from 1979 to 1996 to examine cross-state migration in the five-year period after completion of schooling.

The study first presents information on geographic mobility of young adults by educational attainment and region of the country. These data indicate that the college-educated are more likely to migrate than those without a college education. Also, southern and western sections of the country gained migrants in the 1980s and 1990s at the expense of northern and eastern sections. Next, the study briefly outlines previous explanations for migration in the general population and investigates their applicability both to young college graduates and—for comparison—to other young adults without four years of college. In terms of the likelihood that a given person will move away from the state in which he or she grew up or received an education, the study shows that the person's past history of

migration is very important. In addition, the majority of moves were to states with stronger economies or more attractive characteristics (as measured by factors such as higher employment growth, lower unemployment, higher pay, lower housing costs, or better amenities). The study concludes with some explanations for the observed movement of recent college graduates into and out of certain regions of the country.

I. Patterns of Migration for Young Adults

To track migration patterns, this study uses the National Longitudinal Survey of Youth (NLSY), a project of the U.S. Bureau of Labor Statistics. The NLSY is based on a nationally representative sample of about 6,000 persons who were 14 to 22 years old in 1979.[1] These youths and young adults were reinterviewed once a year until 1994 and once every other year thereafter. The final year of data available for this study is 1996, when the interviewees were 31 to 39 years old.

Given that the NLSY is a general-purpose survey intended to be representative of an entire cohort, the experiences of sample members varied widely. For example, some members of the sample did not complete even high school, while others completed not only high school, but various levels of higher education. Some individuals in the NLSY remained in the same state throughout their lives, while others showed considerable geographic mobility.

The NLSY pertains to fewer individuals than some other data sets containing migration information, so the data from the sample may reflect actual national figures with a greater margin of error. However, in contrast to other surveys, the NLSY has the advantage of tracking residential location over a long time interval.[2] The NLSY indicates the state in which respondents were residing at birth, at age 14, and in each year of the survey. A previous study by the author determined the state of residence at the time of high school and college graduation (if applicable) for most members of the sample (Kodrzycki 2000). Therefore, it is possible to analyze moves subsequent to when young adults first tended to enter the labor market. These transition periods are of interest to public policymakers concerned with retaining recent graduates in the local area or attracting out-of-state graduates into the area.

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Many of those surveyed in the NLSY made long-distance moves at some point in their lives. Table 1 indicates the fractions who were in a different location at the end of the sample time frame (1996) as compared with various reference points. According to the top panel, for example, 38.9 percent of all sample members were in a different state in 1996 than at birth, and 25.5 percent were in a different state than when they were first observed in 1979. The middle panel indicates migration to a noncontiguous state, and the bottom panel indicates migration to another Census division.[3] Depending on the specific time period, about two-thirds to three-quarters of interstate moves were to a noncontiguous state or to a different Census division.

High school dropouts and high school graduates were about equally likely to move across state lines.

[1] The full NLSY includes two additional samples focusing on minorities and the economically disadvantaged and military personnel. These subsamples were not used in the current study.

[2] Annual supplements to the Current Population Survey (CPS) provide information on moves since the previous year for a total of about 50,000 to 60,000 households. Because of the methods used to rotate households in and out of the survey, migration patterns for many of these households can actually be observed over a two-year time frame. Even so, the information tends to be less useful for college students and recent college graduates than for most other adults. This is because the CPS refers to permanent residence, which may differ from residence while attending school or while in a temporary job. The decennial Censuses indicate change in location for the entire population; public use files provide randomly drawn samples from the full data set. The latest available data come from the 1990 Census, referring to moves between 1985 and 1990. In addition to the NLSY, another data set that may be useful for analyzing geographic mobility over long periods of time is the Panel Study of Income Dynamics (PSID). The PSID has tracked a sample of families and their descendants annually from 1968 through 1997 and biennially thereafter. The original sample consisted of 4,800 families (of which about 3,000 were nationally representative and the remainder representative of the low-income population).

[3] Census divisions are defined as follows. New England: CT, ME, MA, NH, RI, VT. Middle Atlantic: NJ, NY, PA. East North Central: IL, IN, MI, OH, WI. West North Central: IA, KS, MN, MO, NE, ND, SD. South Atlantic: DE, DC, FL, GA, MD, NC, SC, VA, WV. East South Central: AL, KY, MS, TN. West South Central: AR, LA, OK, TX. Mountain: AZ, CO, ID, MT, NV, NM, UT, WY. Pacific: AK, CA, HI, OR, WA.

Table 1
Migration Rates between Various Dates and 1996, by Educational Attainment, NLSY Sample
Percent in a different location in 1996

	High School Dropout	High School Graduate Only	Some College	College Graduate Only	More than College	Full Sample
Between States						
Birth	34.8	34.1	38.5	45.8	55.5	38.9
Age 14	23.2	23.4	26.8	36.7	46.2	28.3
1979[a]	19.2	19.2	24.9	36.6	45.0	25.5
High School Graduation	n.a.	18.8	24.1	35.1	43.7	25.5
College Graduation	n.a.	n.a.	n.a.	29.6	40.0	34.0
Memo: Between High School and College	n.a.	n.a.	n.a.	24.1	31.6	26.8
Between Noncontiguous States						
Birth	26.3	24.5	29.3	33.0	43.0	28.8
Age 14	17.1	16.1	20.6	27.1	34.6	20.6
1979[a]	12.9	12.8	19.0	25.5	33.4	18.0
High School Graduation	n.a.	12.2	18.3	23.4	31.9	17.7
College Graduation	n.a.	n.a.	n.a.	20.5	30.6	24.7
Memo: Between High School and College	n.a.	n.a.	n.a.	15.6	21.5	18.2
Between Census Divisions						
Birth	25.7	25.2	30.1	33.8	44.7	29.5
Age 14	16.8	16.6	20.4	26.2	36.2	20.8
1979[a]	11.8	13.5	18.5	25.3	35.5	18.3
High School Graduation	n.a.	13.2	18.0	23.6	34.3	18.4
College Graduation	n.a.	n.a.	n.a.	20.5	32.3	25.4
Memo: Between High School and College	n.a.	n.a.	n.a.	16.6	23.9	19.8
Number of observations[b]	594	2354	1224	769	551	5492

n.a. = not applicable.
[a] Sample members were between the ages of 14 and 24 in 1979.
[b] Including persons for whom migration rates could not be calculated because information on location was missing.
Source: Author's calculations using the National Longitudinal Survey of Youth.

However, education beyond high school was associated with substantially greater mobility. For example, the percentage changing their state of residence between 1979 and 1996 was 19.2 percent for those completing only high school, but 36.6 percent for those completing four years of college and 45.0 percent for those with even higher levels of education.[4]

Some of the moves for college graduates were the result of attending college out of state, but they continued to be quite mobile after graduation. Just over one-quarter of the college graduates in the sample (26.8 percent) graduated from an institution that was outside the state where they attended high school. By 1996, even greater numbers were located outside their home state: 35.1 percent for those who completed four years of college and 43.7 percent for those who had more than four years of college.

[4] In a similar analysis, Bound and Holzer (1995) examined a sample of 23- to 33-year-olds in the National Longitudinal Study of Youth to calculate migration rates over a nine-year period. They found that 48 percent of white male college graduates were located outside their original metropolitan area, compared to only 30 percent for those with some college, 20 percent for those with a high school diploma, and 13 percent for high school dropouts. Among white women, migration rates were about twice as large for college graduates as for all other categories. Among blacks, migration rates also were highest among college graduates. However, Bound and Holzer found that within a given educational attainment category, blacks were less likely to move than whites. Also using NLSY data, Borjas, Bronars, and Trejo (1992) indicate that people who moved across states between the year they were age 14 and 1986 were more highly educated on average than people who did not move.

Table 2
Frequency of Moves between 1979 and 1996, by Educational Attainment, NLSY Sample
Percent Moving per Period[a]

	High School Dropout	High School Graduate Only	Some College	College Graduate Only	More than College
Between States	5.3	5.3	6.4	8.7	10.2
Between Noncontiguous States	3.6	4.0	4.7	6.0	7.6
Between Census Divisions	3.5	4.1	4.7	6.3	7.8

[a] Equal to the number of changes in location between consecutive time periods divided by the total number of time periods. The sixteen time periods are as follows: annually between 1979-80 and 1993-94, and 1994 to 1996. Missing location entries were assigned the last known location.
Source: Author's calculations using the National Longitudinal Survey of Youth.

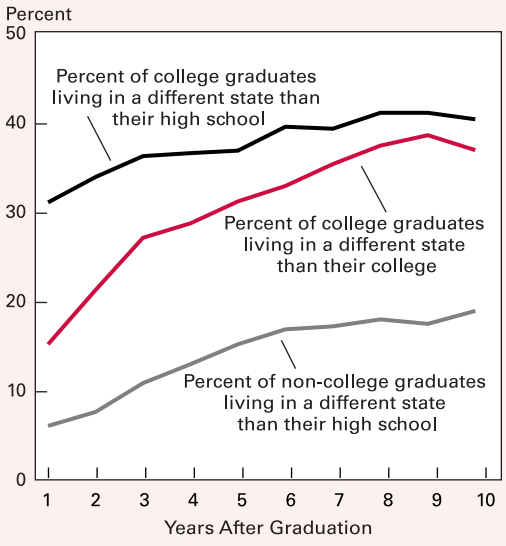
The greater mobility of the college-educated, as compared with high school graduates, can also be expressed in terms of the frequency of movement. Table 2 shows the average percentage of the NLSY sample who moved across states or Census divisions each year between 1979 and 1996. For high school graduates, on average 5.3 percent moved to a different state in any given year; for those completing four years of college, the rate was 8.7 percent, and for those with more than four years of college, the rate was 10.2 percent. The average frequency of moves for those completing less than four years of college was more similar to that of high school graduates than to that of those completing four years of college.

For college graduates, most shifts in location took place fairly shortly after graduation (Figure 1). One year after college graduation, just over 30 percent of graduates were living in a state other than where they attended high school. This proportion rose to about 40 percent by year six, but then stayed roughly unchanged through year 10. One year after college graduation, only about 15 percent of college graduates were living in a different state from where they attended college. This share rose to about 30 percent by year five and to about 39 percent by year nine before tapering off.[5] For non-college graduates, only 15 percent changed states within five years of high school graduation. This proportion remained less than 20 percent in year 10.

The remainder of the study focuses on long-distance moves within five years of graduation from college or high school. As indicated, much of the post-graduation migration occurred within five years. Furthermore, as a practical matter, restricting the analysis to only five years allows more graduating classes to be tracked. The remaining analysis also collapses educational attainment into two categories. "College graduates" encompass those who completed four or more years of college. The terms "non-college graduates" and "high school graduates" are used synonymously to refer to sample members who complet-

Figure 1

Percent of 1979 to 1991 Graduates Living in a Different State Than Their College or High School



Source: National Longitudinal Study of Youth.

[5] These findings are in accord with Eberts (1992), who noted that the propensity to migrate in the general population is about twice as large between ages 22 and 24 as it is at age 30.

Table 3
Five-Year Migration Rates across Census Divisions for College Graduates, 1979 to 1991, NLSY Sample

Census Division	Domestic In-Migration	Domestic Out-Migration	Domestic Net Migration	Out-Migration Including: Between States within Census Division	Out-Migration Including: Between States and International	Memo: Sample Size
A. By High School Location						
New England	19.5	29.9	–10.4	41.6	44.2	77
Middle Atlantic	19.3	20.5	–1.2	31.6	31.6	171
East North Central	9.8	25.6	–15.9	35.8	35.8	246
West North Central	13.2	27.4	–14.2	44.3	45.3	106
South Atlantic	32.9	19.2	13.8	33.5	35.3	167
East South Central	23.5	35.3	–11.8	41.2	41.2	51
West South Central	23.6	19.4	4.2	22.2	22.2	72
Mountain	69.4	36.1	33.3	36.1	41.7	36
Pacific	52.6	10.5	42.1	17.1	17.1	76
United States	23.5	23.5	0	33.9	34.7	1002
B. By College Location						
New England	16.4	20.5	–4.1	27.4	31.5	73
Middle Atlantic	15.6	13.8	1.8	26.9	27.5	167
East North Central	17.3	23.2	–5.9	31.8	31.8	220
West North Central	14.7	25.5	–10.8	35.3	36.3	102
South Atlantic	27.5	15.0	12.6	24.6	25.1	167
East South Central	21.3	25.5	–4.3	29.8	29.8	47
West South Central	10.9	28.3	–17.4	30.4	30.4	92
Mountain	42.5	25.0	17.5	27.5	30.0	40
Pacific	26.3	11.6	14.7	16.8	17.9	95
United States	19.8	19.8	0	28.0	28.8	1003

Note: The entries referring to the Census division of high school use the number of persons who graduated from high school in the Census division indicated for the denominator of the migration rates. The numerator for each entry in the "in-migration" column refers to the number of persons who graduated from high school in another Census division and were living in the indicated location five years after college graduation. The numerator for each entry in the "out-migration" column refers to the number of persons who graduated from high school in the location indicated but were no longer in that Census division five years after college graduation. The entries referring to the Census division of college use the number of persons who graduated from college in the Census division indicated for the denominator of the migration rates. The numerator for each entry in the "in-migration" column refers to the number of persons who graduated from college in another Census division and were living in the indicated location five years later. The numerator for each entry in the "out-migration" column refers to the number of persons who graduated from college in the location indicated but were no longer in the same Census division five years later.

Source: Author's calculations using the National Longitudinal Survey of Youth.

ed high school but not four years of college. High school dropouts are omitted from further analysis.

Table 3 shows regional migration patterns for the college graduating classes of 1979 to 1991, with about 1,000 persons in the sample. The top panel refers to migration relative to the location of high school attendance; the bottom panel is relative to the location of college attendance.[6] The first three columns show separate estimates of in-migration, out-migration, and the difference between them—net migration.

[6] The sample size differs between the top and bottom panels because one person graduated from college in the United States but graduated from high school outside the country. To be comparable with later calculations, the table omits people who were not in the labor force five years after college graduation.

Within five years of graduation, 23.5 percent of the sample were living in a different Census division from the one where they completed high school and 19.8 percent were living in a different Census division from where they completed college. Because the data refer only to domestic migration, there is no difference between the aggregate numbers migrating in and migrating out: domestic net migration is zero for the nation.

Differences in net migration rates do exist for individual regions. Consider first migration relative to the state of high school graduation. Migration of recent college graduates into the South Atlantic, Mountain, and Pacific divisions was far higher than the national average. These areas gained 33 percent, 69 percent,

Table 4
Five-Year Migration Rates across Census Divisions for High-School Graduates, 1975 to 1991, Not Completing Four Years of College, NLSY Sample
By High School Location

Census Division	Domestic In-Migration	Domestic Out-Migration	Domestic Net Migration	Out-Migration Including: Between States within Census Division	Out-Migration Including: Between States and International	Memo: Sample Size
New England	4.6	4.6	.0	9.2	9.2	87
Middle Atlantic	2.6	11.6	–9.1	14.5	14.5	352
East North Central	1.8	10.0	–8.2	11.4	11.4	552
West North Central	8.1	8.7	–.6	14.5	15.6	173
South Atlantic	12.6	3.6	8.9	8.7	8.9	414
East South Central	5.3	14.3	–9.0	15.0	15.8	133
West South Central	21.2	1.2	20.0	1.8	2.9	170
Mountain	18.6	17.8	.8	22.0	22.9	118
Pacific	14.0	6.6	7.4	8.3	8.3	242
United States	8.4	8.4	0	11.2	11.6	2241

Note: The number of persons who graduated from high school in the Census division indicated is used for the denominator of the migration rates. The numerator for each entry in the "in-migration" column refers to the number of persons who graduated from high school in another Census division and were living in the indicated location five years later. The numerator for each entry in the "out-migration" column refers to the number of persons who graduated from high school in the location indicated but were no longer in that Census division five years later.
Source: Author's calculations using the National Longitudinal Survey of Youth.

and 53 percent more college graduates through in-migration, respectively, relative to the numbers of college graduates who had finished high school there. In addition, the South Atlantic and Pacific—along with the Middle Atlantic and West South Central—saw below-average proportions of college graduates migrating out to other parts of the country. The out-migration rate for the Mountain states was above the nationwide average but far short of these states' rate of in-migration. As a result, net in-migration rates were highest for the South Atlantic, Mountain, and Pacific divisions (between 14 and 42 percent). Judging by the NLSY, New England, the East and West North Central, and East South Central areas lost the highest shares of college graduates through domestic migration during this period (10 to 16 percent).[7]

The bottom part of the table shows similar migration concepts, but relative to the college state. For the most part, the broad conclusions about regional flows of recent college graduates remain unchanged: the South Atlantic, Mountain, and Pacific divisions were the big net gainers. However, some areas look relatively weaker or stronger by this new measure. For example, New England continues to show net domestic out-migration but at a more modest rate. The implication is that New England was better at retaining students who went to college in the region than in retaining New England high school students who went to college elsewhere.

Table 4 shows migration rates in the five years following high school graduation for those who did not complete college, a total of about 2,200 persons in the sample. The respective rates of inflows and outflows for all areas are substantially lower than in the case of college graduates. This confirms that people without a college degree are less likely to move long distances than people with a college degree—even examining individual regions. Two other differences with respect to regional patterns are especially striking. First, an above-average percentage of high school graduates from the Middle Atlantic left the region, while relatively few migrated in from other regions. Thus, the Middle Atlantic shows a large net exodus—about as large as those for the East North Central and East South Central. Second, the highest net gain was for the West South Central, which experienced an especially

[7] The negative findings are not necessarily indicative of a "brain drain" for these areas, since they omit migration from foreign countries. The figures also omit other potential domestic sources of college graduates, such as increases in the fraction of high school students from the region who obtain a college degree and inflows after the five-year period shown.

high rate of in-migration (comparable to that of the Mountain region).

The fourth and fifth columns of Tables 3 and 4 show out-migration rates including additional categories of moves—beyond those across Census divisions. The numbers in column 4 include moves to other states within the same Census division. Column 5 also encompasses moves outside the United States. The analysis in the remainder of the study includes this most comprehensive definition of migration. Although the rates of migration are higher than when just inter-division moves are considered, the rankings by Census division remain fairly similar.

II. Previous Explanations for Migration

A wide-ranging literature has attempted to explain migration patterns. Some studies have used observations on individuals or households to examine the likelihood of out-migration. Other studies using aggregated data have examined place-to-place migration (moves from a given location to another given location and vice versa) or net migration (difference between the number of moves to a given location and the number of moves away from a given location). Studies of migration differ also with respect to geographic unit and time period. Nevertheless, the literature has achieved some degree of consensus regarding relevant individual characteristics, labor market conditions, and non-labor-market influences.[8]

In accord with the above findings using the NLSY, studies using other data sets also have noted that migration is highest among the young and the college-educated. Following their large migration out of the South during the 1940s and 1950s, blacks have been less likely to move than whites. But considerable heterogeneity also exists within age, education, and race categories. In particular, studies indicate that people who have moved in the past are more likely to move in the future.

For the working-age population, migration has been found to respond to relative labor market opportunities in different areas, such as earnings or unemployment differentials. Ongoing topics of inquiry include whether migrants are influenced more by negative conditions in their initial location ("push") or the prospect of improvement upon moving ("pull"). Studies generally reach similar conclusions whether or not they adjust measured pay differentials for overall living costs. However, at least one study finds that high housing costs discourage in-migration.[9] No clear evidence exists on whether these economic variables have different impacts for people of different ages or different levels of educational attainment.[10]

Noneconomic factors also play a role in determining where people move. Research has found that amenities associated with climate and the like have had an impact on the direction of moves, although most studies find that these are a less important influence than labor market conditions. The distance between two locations serves as a deterrent to migration between them. To some extent, this may be because of the financial costs of moving. However, the research tends to put more emphasis on the psychic costs of being away from family and long-time friends, as well as the barriers to obtaining accurate information about faraway locations.

III. Regression Analysis for Recent Graduates

The NLSY data are used first to investigate which factors help to explain out-migration by recent graduates. Specifically, the regressions examine whether or not individuals had moved out of state by the fifth year following graduation from college or high school. The potential explanatory variables included personal characteristics as well as economic and quality-of-life characteristics of the origin state. (Means and standard deviations of the variables are shown in Appendix Table 1, and the rankings of the states according to various characteristics are shown in Appendix Table 2.) In Table 5, the dependent variable is equal to one if five years after college graduation the person was living in a state other than the one in which he or she graduated from high school. In Table 6, migration is defined relative to the state of college graduation. The regressions shown in these tables refer to sample members with at

[8] Studies of individual migration use a dichotomous dependent variable (migrated or did not migrate). Examples of this approach are DaVanzo (1978) and Borjas, Bronars, and Trejo (1992). Studies of aggregate place-to-place migration include Gabriel, Shack-Marquez, and Wascher (1993). Studies of aggregate net migration include Greenwood and Hunt (1989), Pissarides and McMaster (1990), and Treyz, Rickman, Hunt, and Greenwood (1993).

[9] See Gabriel, Shack-Marquez, and Wascher (1993).

[10] However, DaVanzo (1978) finds that the unemployed are more sensitive to economic differences across regions than are the employed. Borjas, Bronars, and Trejo (1992) find that people with different levels of education tend to have different preferences of location, depending on their likely earnings relative to others.

Table 5

Probit Regression Analysis of College Graduate Migration Relative to High School State

(Dependent variable =1 if college graduate was not in state of high school graduation five years after college graduation, 0 otherwise)

	(1)	(2)	(3)	(4)	(5)
Migrated between birth and high school	.458*** (.087)	.481*** (.095)	.510*** (.096)	.478*** (.089)	.496*** (.097)
Migrated between high school and college	1.47*** (.121)	1.50*** (.134)	1.51*** (.127)	1.50*** (.129)	1.50*** (.130)
White	.330** (.140)	.286* (.157)	.268* (.141)	.305** (.144)	.262* (.150)
Female	–.071 (.105)	–.092 (.108)	–.073 (.106)	–.075 (.104)	–.084 (.107)
Employment growth rate, difference from national average		–.081** (.034)			–.066** (.032)
Unemployment rate, difference from national average		.028 (.028)			.007 (.034)
State population		–.021*** (.008)			–.017* (.009)
Dummy for seacoast			–.271** (.122)		–.236* (.140)
Average maximum wind speed			.013** (.006)		.011** (.005)
Average number of clear days			–.003 (.002)		–.002 (.003)
Degree days			–.000 (.000)		–.000 (.000)
College graduate pay relative to national average				–.895* (.535)	
State land area	–.111 (.814)	.435 (.697)	.705 (.783)	–.023 (.824)	.943 (.853)
Year of college graduation dummies	no	yes	yes	yes	yes
Constant	–1.13*** (.240)	–.988*** (.340)	–1.34** (.694)	–.294 (.668)	–1.05 (.744)
Pseudo R^2	.216	.234	.234	.229	.238
Number of observations	1002	1002	1002	1002	1002

Robust standard errors in parentheses.
***Significantly different from zero at 1 percent level.
**Significantly different from zero at 5 percent level.
*Significantly different from zero at 10 percent level.
Source: Author's calculations. See text.

least four years of college. Table 7 pertains to migration in the five years after high school graduation for non-college graduates, relative to the state of high school completion. Table 8 considers alternative measures of interstate moves, discussed below.

The estimates were derived from a probit model. The reported significance levels are based on robust standard errors assuming independence of disturbances only across (not within) states. Individuals who were not in the civilian labor force five years after graduation (because they were students, in the military, or for other reasons) were excluded from the regressions.[11]

The first column of Table 5 shows the results when including individual characteristics but no area

[11] In practice, this restriction has little effect on the results, except for having the effect of diminishing differences in migration propensities across men and women.

economic variables. Recent college graduates were more likely to move to a different state if they had moved previously. Movement to another state to attend college was an especially strong factor. Someone who had gone to college out-of-state was 54 percent more likely to be out-of-state five years after graduation than someone who went to college in-state.[12] Students were also influenced by their family's moving patterns. Someone who had moved across state lines between birth and high school was 17 percent more likely to change states again than someone who was in the same state at birth and high school graduation. Holding previous migration constant, white college graduates were more likely to migrate than nonwhites, but the difference between males and females was statistically insignificant. These individual characteristics explain over 20 percent of the variation in individual migration patterns.[13] As it turns out, their impacts remain very similar when additional explanatory variables are added.

The regression in column 1 also includes a control for the land area of the high school state. The larger the state, the farther one could move without crossing a state boundary; therefore, interstate migration is expected to be negatively related to state size. However, this variable is insignificant.

The specifications summarized in columns 2 to 5 add various economic and amenity variables pertaining to the individual's home state (that is, the location of high school graduation). They also control for the timing of college attendance, measured by dummy variables referring to year of graduation. These dummies generally indicate a stronger propensity for cross-state moves among graduating classes prior to 1988 than later in the sample.[14] Their inclusion does not affect the conclusions regarding the roles played by the other variables.

Column 2 includes three indicators of employment opportunities in the high school state: employment growth compared to the national average (averaged over five years, starting with the year of graduation), the unemployment rate in the year of graduation compared to the national average, and state population.[15] As indicated in Appendix Table 2, six of the ten states with the highest employment growth in the sample period are in the South Atlantic and Pacific regions (Florida, Georgia, Virginia, Washington, Delaware, and North Carolina). These were the parts of the country shown to have the lowest out-migration rates among college graduates. However, three Mountain states (Nevada, Arizona, and Utah) are among the top five, but that region had a relatively high rate of out-migration (albeit also a very high rate of in-migration). States with chronically high unemployment are more diverse, although all the states in the East South Central region had very high unemployment relative to the national average, and this region had very high average out-migration for college graduates. In some cases, state rankings reflect sharper cyclical swings than in the nation as a whole. The East North Central states suffered extremely high unemployment in the national recessions of the early 1980s. New England had unusually low unemployment in the recovery years that followed (which dominate in this sample), but then was hit very hard in the following national recession (1990–91). State population is included as a reflection of the diversity of opportunity that large states offer.

Which college graduates migrate is explained more by individual characteristics than by the overall employment opportunities offered in the state where they graduated.

[12] This calculation involves converting the coefficients shown in the table from their impacts on the probit index to their impacts on the probability, evaluated at the means of the other variables.

[13] The pseudo R^2 values shown in the table are based on comparing the value of the log likelihood function in each specification against two hypothetical alternatives: including only the constant term and achieving a perfect fit (log likelihood = 0). Therefore they cannot be interpreted as percent of variance explained, as in a linear regression. When the specification in column (1) is re-run using a linear probability model, the R^2 is 0.28.

[14] Another version of the regressions used indicators of the national economy instead of year dummies. There was some indication that migration increased during periods of high growth, but the coefficient was never statistically significant.

[15] Some additional employment-related measures were tested but produced inferior results. These included the relative unemployment rate of college graduates, the proportion of jobs in professional, technical, and managerial occupations, and the size of the college graduating class relative to population (intended as a measure of the competition for jobs). A higher proportion of jobs in professional, technical, and managerial occupations was found to deter out-migration, but this variable is highly correlated with other economic variables and loses significance when entered simultaneously with them.

The results in column 2 of Table 5 confirm that, controlling for personal characteristics, recent college graduates whose home states offer relatively high employment growth are less likely to move to other states. Also, students from states with large populations are less likely to leave. High unemployment in the state at the time of college graduation had a positive but insignificant effect on migration. Although two of these employment indicators are significant, their inclusion increases the explanatory power of the regression only slightly. In other words, *which* college graduates migrate is explained more by individual characteristics than by the overall employment opportunities offered in the state where they graduated.

Recent college graduates tended to move away from states with poorer job attributes while preferring to remain in coastal locations.

One reason for the low added explanatory power of the employment-related variables is that their correlation with out-migration is weak for certain regions. The confluence of high employment growth and high out-migration in the Mountain states has been noted already. In addition, the Middle Atlantic states experienced low out-migration, even though their employment growth was quite low.

The next two columns of Table 5 include alternative variables that potentially can account for migration patterns. Instead of the employment variable, column 3 includes amenities associated with location and weather.[16] These amenities were used by Greenwood and Hunt (1989); each has the correct sign and is statistically significant when entered individually in a specification that includes personal characteristics.[17] As indicated, recent college graduates are less likely to move away from their home state if it was on a seacoast or had low average wind speed. The average number of clear days and the average number of heating plus cooling degree days had insignificant impacts.

The specification in column 4 includes hourly pay for college graduates in the home state relative to the national average. This pay variable is averaged for the year of graduation and four subsequent years and refers to full-time, full-year workers.[18] Rates of pay for college graduates tend to be highest in heavily urban states in the East and lowest in heavily rural states. Eastern states in the top 10 for the sample period included New Jersey, Maryland, Connecticut, the District of Columbia, New York, Massachusetts, and Virginia; the remaining top states were Alaska, California, and Michigan. These state rankings were quite consistent over time.[19] The results shown in column 4 confirm the hypothesis that recent college graduates are less likely to move away from their home state if it offers high average pay for college graduates.[20]

It could be argued that pay should be adjusted for regional differences in cost of living. One element of these differences is energy use. At least in this set of regressions (measuring the tendency of college graduates to move from their home state), average heating plus cooling degree days had no significant effect on migration. The other major element of cost-of-living differences is housing expenses. This hypothesis was tested using estimates of median house prices in the state relative to the national median, averaged over five years starting with the year of graduation.[21] The hypothesis is that recent college graduates are more likely to move away from areas where house prices are high.

Throughout the sample, the lowest house prices were generally in the central portions of the country. But the location of the highest house prices changed.

[16] The weather information was based on information from the National Climatic Data Center (http://www.ncdc.noaa.gov/ol/documentlibrary/hcs/hcs.html#overview5-1 and http://ftp.ncdc.noaa.gov/pub.data/ccd-data). Degree days, representing deviations in temperature from 65 degrees Fahrenheit, are taken from a representative period. Heating degree days by state refer to July 1994 to June 1995 and cooling degree days refer to calendar year 1994. Data on the number of clear days and maximum wind speed were averaged over the available locations in each state for as many years as were available. Wind readings from Mount Washington were excluded from the New Hampshire data.

[17] Omitted from the regression are the additional Greenwood-Hunt amenity variables that were never significant.

[18] The variable was constructed using March Current Population Survey estimates for earnings for full-time, full-year workers divided by the number of hours worked. The use of the five-year average in part is to avoid year-to-year variability owing to the small state samples in the CPS.

[19] The correlation coefficient between average pay for college graduates in 1980-84 and in 1985-89 is 0.83; the correlation between 1980-84 and 1990-94 is 0.77.

[20] To test the findings in Borjas, Bronars, and Trejo (1992), another version of this regression substituted the hourly pay premium for college graduates. This variable equals the hourly rate of pay for college graduates as a multiple of the hourly rate of pay for non-graduates, relative to this same premium nationally. The pay premium variable was insignificant.

In 1980, seven of the top ten states were in the West: Hawaii, California, Alaska, Nevada, Colorado, Washington, and Wyoming. By 1990, although Hawaii and California continued to rank one and two, respectively, the remaining top ten jurisdictions were all on the East Coast: Connecticut, Massachusetts, New Jersey, Rhode Island, New York, New Hampshire, the District of Columbia, and Maryland. The early 1990s saw relatively low housing inflation—or even deflation—in states that had had the most rapid increases in the 1980s.[22] Three New England states—Connecticut, Maine, and Massachusetts—went from being in the top ten in relative increase between 1985 to 1989 to the bottom ten in the 1990–94 period. Nevertheless, despite these reversals, home prices in the Northeast (as well as in Hawaii and California) remained far above the national average through the end of the surveys.

States with high house prices also tend to have other characteristics that draw recent college graduates.

In contrast to the hypothesis, regression analysis with this sample fails to find that high house prices lead to out-migration (not shown in the tables). Entered without other economic variables, house prices enter negatively, reflecting the fact that states with high house prices also tend to have other characteristics that draw recent college graduates. Entered with these other variables, house prices inevitably have an insignificant effect.[23]

The results in columns 2, 3, and 4 suggest that employment opportunities, amenities, and average pay each influence interstate migration to some extent. Because of correlations among some of these variables, a regression that includes all of these variables results in fewer of them showing up as significant. For example, average pay for college graduates tends to be higher in more populous states and in states that have a seacoast. The last column gives a flavor of the conclusions that may be drawn when some of the variables are combined: employment growth and state population remain significant determinants of migration. Of the amenity variables, the existence of a seacoast and wind speed also are significant.

Another way of looking at out-migration is with respect to the state where the individual attended college (Table 6). The dependent variable is the same as the one in Table 5 for the approximately 73 percent of the sample who went to college in-state, but differs for the remaining 27 percent who went out-of-state.

The findings in Table 6 are generally similar to those in the previous table. However, some interesting differences appear. Past migration measures remain strongly significant, but their quantitative impact is lower. Someone who migrated between birth and high school is 8 percent more likely to move away from his or her college state than someone who had not, and someone who migrated between high school and college is 31 percent more likely to move post-college than someone who had not. These effects are roughly half those shown in Table 5.

By contrast, the contributions of state characteristics are somewhat greater. The unemployment rate in the college state at the time of graduation and an absence of clear weather become significant predictors of out-migration, in contrast to the findings relative to the home state. The significance of a coastal location becomes greater. Students who attend college in a state with a seacoast are 12 percent less likely to leave than students who attend college in an interior state.

For comparison with the college graduate results, Table 7 shows migration regressions for non-college graduates within five years of high school graduation, using the high school state as the reference location. Prior migration has an even stronger effect than in the case of college students. Some other interesting differences are found with respect to the economic variables. High unemployment is found to be a significant contributor to out-migration. Among the dummy variables, degree days matters, suggesting that higher utility costs cause recent high school graduates to flee the

[21] Housing prices were constructed using a two-step procedure that made use of annual data on home price inflation and two years of data on home values. First, a tentative house price series was constructed by starting with the median housing values reported in the 1980 Census of Housing and applying annual inflation rates calculated from the repeat-sales home price index issued by Fannie Mae and Freddie Mac. Next, the inflation rates were adjusted additively by equal amounts each year so as to produce a 1990 house value that corresponded to that reported in the 1990 Census. Prices before 1980 and after 1990 were based on applying inflation rates from the repeat-sales home price index adjusted by the same constant. The largest upward adjustment was 0.9 percent for Oklahoma. The largest downward adjustment was 1.5 percent for Wyoming.

[22] The correlation coefficient between state housing price increases in 1990-94 and 1980-84 is -0.29; between 1990-94 and 1985-89 it is -0.89.

[23] House prices are highly positively correlated with college graduate pay and coastal location, and highly negatively correlated with the unemployment rate.

Table 6

Probit Regression Analysis of College Graduate Migration Relative to College State

(Dependent variable =1 if college graduate was not in state of college graduation five years after graduation, 0 otherwise)

	(1)	(2)	(3)	(4)	(5)
Migrated between birth and high school	.238** (.093)	.288*** (.098)	.299*** (.097)	.265*** (.097)	.303*** (.098)
Migrated between high school and college	.857*** (.095)	.942*** (.100)	.946*** (.091)	.914*** (.099)	.954*** (.093)
White	.477*** (.134)	.430*** (.133)	.418*** (.131)	.450*** (.131)	.411*** (.132)
Female	–.138 (.093)	–.157 (.097)	–.132 (.096)	–.141 (.095)	–.144 (.097)
Employment growth rate, difference from national average		–.074** (.030)			–.050 (.031)
Unemployment rate, difference from national average		.048*** (.018)			.016 (.028)
State population		–.024*** (.007)			–.018** (.007)
Dummy for seacoast			–.382*** (.119)		–.317** (.134)
Average maximum wind speed			.012** (.006)		.010** (.005)
Average number of clear days			–.004** (.002)		–.003 (.002)
Degree days			–.000 (.000)		–.000 (.000)
College graduate pay relative to national average				–1.05** (.508)	
State land area	–.323 (.801)	.228 (.658)	.727 (.691)	–.230 (.837)	.922 (.704)
Year of college graduation dummies	no	yes	yes	yes	yes
Constant	–1.09*** (.197)	–1.36*** (.316)	–1.52*** (.563)	–.529 (.661)	–1.32** (.600)
Pseudo R^2	.089	.116	.118	.106	.122
Number of observations	1003	1003	1003	1003	1003

Robust standard errors in parentheses.
***Significantly different from zero at 1 percent level.
**Significantly different from zero at 5 percent level.
*Significantly different from zero at 10 percent level.
Source: Author's calculations. See text.

Frost Belt.[24] Pay is insignificant and has an unexpected sign: Young people without a college degree tend to leave states where average earnings are high for this educational attainment category.[25]

A potential problem with the preceding regressions arises from the fact that moves of a similar distance are more likely to result in a crossing of state boundaries in some parts of the country than in others. The regressions attempted to correct for geographic differences by including state land area as an independent variable. A different approach, shown in

[24] Degree days equals cooling plus heating degree days, but heating degree days dominate. The correlation between total degree days and heating degree days is 0.96.

[25] This may be because high pay for people without a four-year college degree discourages employers from creating jobs for this group.

Table 7

Probit Regression Analysis of High School Graduate Migration Relative to High School State

(Dependent variable =1 if high school graduate was not in state of high school graduation five years later, 0 otherwise)

	(1)	(2)	(3)	(4)	(5)
Migrated between birth and high school	.572*** (.107)	.589*** (.112)	.592*** (.112)	.580*** (.111)	.598*** (.115)
White	.142 (.100)	.087 (.106)	.019 (.103)	.118 (.102)	.014 (.108)
Female	.033 (.080)	.046 (.081)	.059 (.077)	.038 (.079)	.072 (.078)
Employment growth rate, difference from national average		–.045 (.034)			–.034 (.033)
Unemployment rate, difference from national average		.058*** (.021)			.084*** (.020)
State population		–.019 (.012)			–.010 (.012)
Dummy for seacoast			.052 (.169)		.183 (.171)
Average maximum wind speed			–.006 (.009)		–.002 (.009)
Average number of clear days			–.0005 (.003)		.004 (.002)
Degree days			.00014** (.00006)		.00019** (.00006)
High school graduate pay relative to national average				.600 (.765)	
State land area	–1.50 (1.07)	–.274 (1.02)	–1.35 (.956)	–1.60 (1.04)	–1.51 (.972)
Year of high school graduation dummies	no	yes	yes	yes	yes
Constant	–1.43*** (.141)	–1.42*** (.163)	–1.92** (.817)	–2.09*** (.740)	–2.85*** (.715)
Pseudo R^2	.039	.055	.057	.044	.066
Number of observations	2241	2232	2232	2232	2232

Robust standard errors in parentheses.
***Significantly different from zero at 1 percent level.
**Significantly different from zero at 5 percent level.
*Significantly different from zero at 10 percent level.
Source: Author's calculations. See text.

Table 8, is to adjust the dependent variable so as to exclude moves that arguably are minor. For example, a recent graduate could find a job very close to where he or she went to high school or college but choose to commute from a more distant location. In the first alternative definition of the dependent variable, moves from a state smaller than 10,000 square miles to a contiguous state are not counted (that is, the dependent variable equals zero for moves from these states, unless the move is to a noncontiguous state). This change reduces the number of measured interstate moves in the Northeast—especially for those originating in Connecticut, Massachusetts, New Jersey, and Rhode Island.[26] The second alternative specifically addresses the existence of labor market areas that span

[26] Jurisdictions with a land area less than 10,000 square miles are the following: Connecticut, Delaware, the District of Columbia, Hawaii, Maryland, Massachusetts, New Hampshire, New Jersey, Rhode Island, and Vermont. The next smallest state, West Virginia, has an area of more than 24,000 square miles.

Table 8

Probit Regression of College Graduate Migration Using Alternative Concepts of Distance for Interstate Moves

	Relative to High School State						Relative to College State					
	To a noncontiguous state in the case of small states			More than 125 miles			To a noncontiguous state in the case of small states			More than 125 miles		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Migrated between birth and high school	.438*** (.092)	.466*** (.094)	.422*** (.088)	.450*** (.093)	.448*** (.096)	.418*** (.090)	.265*** (.098)	.274*** (.099)	.247*** (.097)	.268** (.126)	.266** (.125)	.249** (.123)
Migrated between high school and college	1.31*** (.141)	1.30*** (.135)	1.29*** (.136)	1.32*** (.118)	1.29*** (.116)	1.28*** (.114)	.883*** (.089)	.882*** (.088)	.846*** (.096)	.820*** (.088)	.798*** (.092)	.780*** (.097)
White	.266* (.142)	.227* (.128)	.236* (.142)	.297** (.149)	.255** (.130)	.263* (.141)	.411*** (.128)	.390*** (.126)	.408*** (.124)	.566*** (.154)	.556*** (.148)	.564*** (.144)
Female	–.150 (.094)	–.120 (.094)	–.124 (.089)	–.164 (.110)	–.137 (.107)	–.140 (.104)	–.153 (.098)	–.131 (.098)	–.136 (.098)	–.189* (.107)	–.175* (.105)	–.179* (.106)
Employment growth rate, difference from national average	–.032 (.041)			–.030 (.045)			–.046 (.037)			–.022 (.046)		
Unemployment rate, difference from national average	.076*** (.028)			.081*** (.028)			.075*** (.022)			.079*** (.026)		
State population	–.013* (.008)			–.006 (.008)			–.018*** (.006)			–.013* (.007)		
Dummy for seacoast		–.507*** (.185)			–.435** (.198)			–.520*** (.164)			–.371* (.204)	
Average maximum wind speed		.0008 (.009)			.008 (.010)			.009 (.006)			.004 (.010)	
Average number of clear days		–.002 (.002)			–.001 (.002)			–.002 (.002)			–.001 (.002)	
Degree days		–.00007 (.00008)			–.00008 (.00009)			–.00006 (.00008)			–.00004 (.00009)	
College graduate pay relative to national average			–2.22*** (.687)			–1.54** (.693)			–1.90*** (.635)			–1.53** (.666)
Year of college graduation dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Constant	–.901*** (.287)	–.179 (.731)	1.15 (.721)	–.968*** (.308)	–.696 (.721)	.500 (.730)	–1.35*** (.317)	–1.19* (.647)	.344 (.700)	–1.45*** (.326)	–1.24* (.699)	–.051 (.692)
Pseudo R^2	.195	.202	.199	.198	.198	.195	.107	.113	.102	.102	.100	.097
Number of observations	1002	1002	1002	1002	1002	1002	1003	1003	1003	1003	1003	1003

Source: Author's calculations. See text.

state boundaries. For example, it is possible to remain in the New York City area while moving among southern New York, most of New Jersey, western Connecticut, and eastern Pennsylvania. In this alternative, interstate moves are counted only if they exceed 125 miles (regardless of state size).[27] This has the effect of re-categorizing moves for a more diverse set of states, including some relatively large states with a concentration of students attending college close to a state boundary. Table 8 shows the effects of these changes for the college graduate regressions presented in columns 2, 3, and 4 of Tables 5 and 6.

These two new specifications yield similar results. They confirm that economic opportunities and amenities influence the location decisions of recent college graduates, although there are some differences from the previous results. Unemployment and (in most cases) state population are found to be statistically significant, but employment growth is not (columns 1, 4, 7, and 10). The alternative regressions continue to show that college graduates prefer to remain in seacoast locations (columns 2, 5, 8, and 11) and in states where pay for college graduates is high (columns 3, 6, 9, and 12). This latter finding is stronger than in the original regressions.

IV. Economic Opportunities: Push or Pull?

The regressions indicated that recent college graduates tended to move away from states with poorer job attributes (measured in a variety of ways) while preferring to remain in coastal locations. For non-college graduates, unemployment and high energy costs were causes of migration, but there was no tendency to leave states with low pay. However, the regressions did not address the extent to which migration patterns were a reflection of economic opportunities and amenities in the new location ("pull"), as opposed to a lack of opportunity or amenities in the home or college state ("push").

Ideally, the effects of "push" versus "pull" can be studied by measuring the total gross or net flows of people between specific areas and relating this to conditions in the two areas. For example, if one can measure the number of people moving from Massachusetts to California in a given time period, it is possible to regress this and other interstate flows on the economic characteristics of each state at the relevant time. The NLSY does indicate the location of each person in each year, but the total sample size is far too small to compute meaningful migration rates between specific states or even regions in any given year.[28]

Alternatively, Table 9 indicates the proportion of moves by recent college graduates and high school graduates to states with more favorable conditions than their state of origin. (In essence, by differencing the variables, Table 9 examines "net pull.") By these measures, employment opportunities and amenities appear to have been about equally important in determining the direction of college graduate migration decisions. For example, the first entry in the first column indicates that 58 percent of recent college graduates moved during the first five years to a state with higher average employment growth than their high school state. Similar fractions of moves were to states that had lower unemployment, a larger population, clearer weather, fewer degree days, and higher pay. One-half of all moves were to states with lower housing prices. Only 24 percent of moves were from interior states to states with a seacoast, but another 34 percent of moves were from one seacoast state to another, and only 11 percent of moves were from a seacoast state to an interior state. The next column shows moves relative to the college state, and the results are fairly similar, except that pay seemed to figure a little less prominently and housing costs more prominently.

The final column examines similar concepts, but for those without a four-year college degree. High school graduates who moved were even more drawn than college graduates to states with improved job prospects, as measured by employment growth and unemployment, but were less likely than college graduates to end up in states with higher average pay. Seventy percent of their moves were to states with higher employment growth and 64 percent to states with lower unemployment, but only 44 percent to states with higher pay.[29] In addition, higher shares of moves were to states with lower energy costs (as measured by degree days) and clearer weather.

[27] Distance is measured between origin and destination counties, based on an algorithm kindly provided by Jordan Rappaport.

[28] The interregional migration rates aggregated for all years, such as those shown in Tables 3 and 4, probably are meaningful estimates of the actual data. However, the relative economic conditions of different regions varied during the time period. Thus it would not be appropriate to use economic variables aggregated across time periods.

[29] This last finding suggests that the geographic sorting noted by Borjas, Bronars, and Trejo (1992) may be due in large measure to the failure of high school graduates to move to places where they are paid more.

Table 9
Percentage of Movers within Five Years of College or High School Graduation Who Moved to States with More Favorable Economic Conditions or Amenities

	College Graduates, Relative to High School State	College Graduates, Relative to College State	High School Graduates, Relative to High School State
Economic Condition or Amenity			
Higher employment growth	57.5	59.9	70.2
Lower unemployment rate	55.4	55.7	63.5
Larger population	57.2	51.4	58.3
Seacoast (from non-coast)[a]	24.3	24.1	34.5
Less windy	52.8	48.9	48.0
Clearer weather	58.4	54.6	70.2
Fewer degree days	56.3	52.5	67.9
Higher pay[b]	54.3	48.2	44.0
Lower housing prices	50.5	55.0	54.0
Improvements in at least:			
3 variables	88.3	86.9	91.9
4 variables	69.1	66.9	80.3
5 variables	50.0	45.5	62.6
5 variables counting all moves to a seacoast state	57.4	53.8	67.2

[a] The percentages of movers in the three categories who were in a seacoast state both at graduation and after moving were 34.9, 30.1, and 29.0, respectively. The percentages moving from a seacoast state to a non-coastal state were only 11.4, 15.2, and 11.9, respectively.
[b] Refers to college graduate pay for college graduates, non-college graduate pay for others.
Source: Author's calculations using NLSY. Economic and amenity variables are defined in the same way as in the regressions.

The bottom part of the table indicates the proportion of each group that moved to states offering improvement in at least three, four, and five of the nine economic conditions and amenities listed. Interestingly, high school graduates were more likely than college graduates to move to states where general conditions were "better" than in their origin state. About 63 percent of high school graduates' moves were to states that had improved rankings on the majority of indicators, versus 46 to 50 percent for college graduates. This disparity may possibly reflect the greater homogeneity of jobs available for non-college graduates than is the case in professional and technical occupations. That is, college graduates may be more likely than non-graduates to get a specific job offer that more than compensates for subpar economic conditions or amenities.

V. Explanations for Observed Regional Patterns

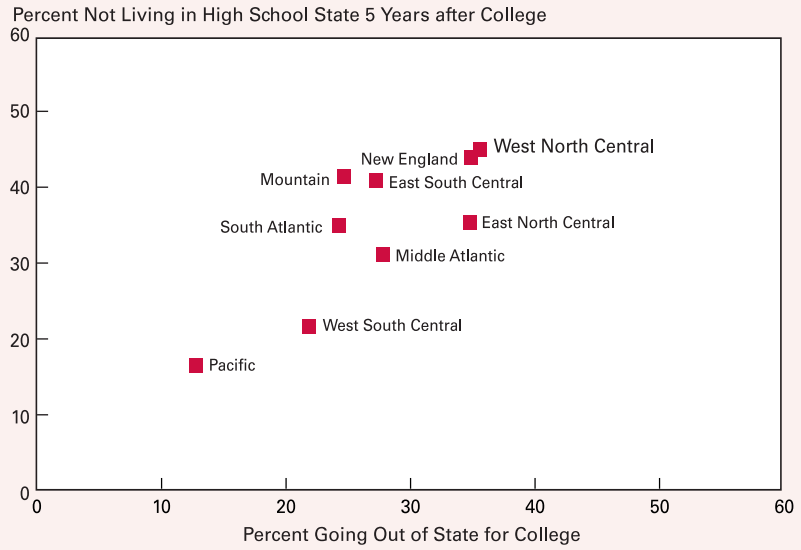
It was shown earlier that the Pacific, Mountain, and South Atlantic states gained population through net migration while others held approximately steady or lost population. This section presents some explanations for these regional patterns among college graduates, using the regression variables.

The regressions indicated that a key factor accounting for regional differences in post-graduation migration propensities is earlier migration. Different parts of the country vary in the proportion of students who go out of state for college, and students who go out of state for college are less likely to return to their high school location after college. Figure 2 shows this correlation by Census division. In the NLSY sample, the Pacific states had the lowest proportion leaving for college (13 percent) and also the lowest proportion living out-of-state five years after college (17 percent). This contrasts sharply with the West North Central and New England states, which had the highest shares of students going out-of-state for college (35 to 36 percent) and highest remaining out-of-state after college (44 to 45 percent). This evidence on the Pacific versus the New England states suggests that the structure of higher education may be one factor influencing migration. The Pacific states—notably California—have an extensive, relatively low-cost, public higher education system, so most college-bound students in the region

Figure 2

Correlation between College and Post-College Migration Rates, by Census Division Location of High School

Graduates from 1979 to 1991



Source: National Longitudinal Study of Youth.

remain in the area for college. By contrast, New England's higher education establishment is heavily private, attracting many students from outside the region in addition to serving students from New England. Public colleges and universities traditionally have played a relatively limited role.[30]

Different parts of the country differ also with respect to how geographically mobile young adults were during childhood. Figure 3 shows these rates for college graduates, according to Census division location of high school attendance. Individuals from the East North Central, Middle Atlantic, Pacific, and West South Central regions were more likely to have been born in the same state where they attended high school than those in other Census divisions. By contrast, childhood mobility for residents of New England and the Mountain states was very high, with about one-half graduating from high school in a different state than the one where they were born. As highlighted in the regressions, these regional differences were associated with differences in geographic mobility as young adults.[31]

The roles of positive economic and quality-of-life influences in different Census divisions are highlighted in Figure 4. For those who moved, the figure shows the difference in conditions in the destination state of college graduates relative to the high school state. Young adults moving to the South Atlantic and Mountain states enjoyed greater average increases in employment growth and greater decreases in unemployment than movers to most other regions. (Movers to the East South Central states did very well in terms of employment growth but not unemployment, while movers to New England enjoyed the greatest reduction in unemployment but faced an environment with lower employment growth.)

The clearest attraction of the Pacific region is its location. Sixty percent of college-graduate movers to the Pacific states came from states without a seacoast, by far the largest proportion of any region.[32] The economic advantages of the region are more mixed. For example, movers to the Pacific states enjoyed higher average employment growth and the highest percentage increase in expected pay (as measured by the difference in college-graduate pay between their new

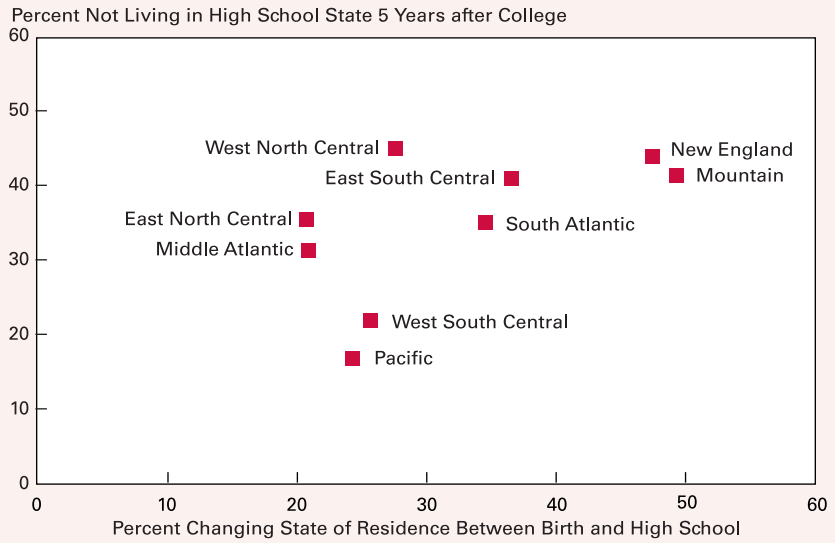
[30] Public colleges and universities accounted for 66.5 percent of all bachelor's degrees granted in the United States in 1997. In California, the largest state in the Pacific division, their share was 77.4 percent. In Massachusetts, the most populous state in New England, their share was 30.7 percent. See Kodrzycki (1999).

[31] New England presents a particularly sharp contrast in geographic mobility between high school students who went on to four years of college and those who did not. While college graduates had exceptionally high geographic mobility as children, the rate for non-college graduates was close to the national average and their tendency to leave their home state after high school (as shown in Table 4) was comparatively low.

[32] This contrasts, for example, with New England. Vermont is the least populous of the New England states and the only one lacking a seacoast. Nevertheless, only about 12 percent of recent college graduates who moved to a New England state came from a non-coastal state. The overwhelming majority came from a state with a seacoast.

Figure 3

Correlation between Childhood and Post-College Migration Rates, by Census Division Location of High School
Graduates from 1979 to 1991



Source: National Longitudinal Study of Youth.

and old states). However, they also faced the steepest increase in house prices. Median home prices in the Pacific states were almost twice as high as in the states where the in-migrants had gone to high school. New England was second, with more than a 40 percent premium.

VI. Conclusions

This study has presented an array of information concerning cross-state moves of young college graduates. The evidence comes from the National Longitudinal Survey of Youth, which encompassed graduating classes from the late 1970s through the early 1990s. What are the pertinent lessons for employers and policymakers?

The majority of young college graduates in a state are likely to be people who went to high school or college in that state. However, recent graduates also show a high degree of willingness to undertake long-distance moves. According to the NLSY, five years after college graduation, 30 percent of the graduates no longer live in the state where they attended college and 35 percent no longer live in the state where they attended high school. These rates are at least twice as high as those for young adults who have less education.

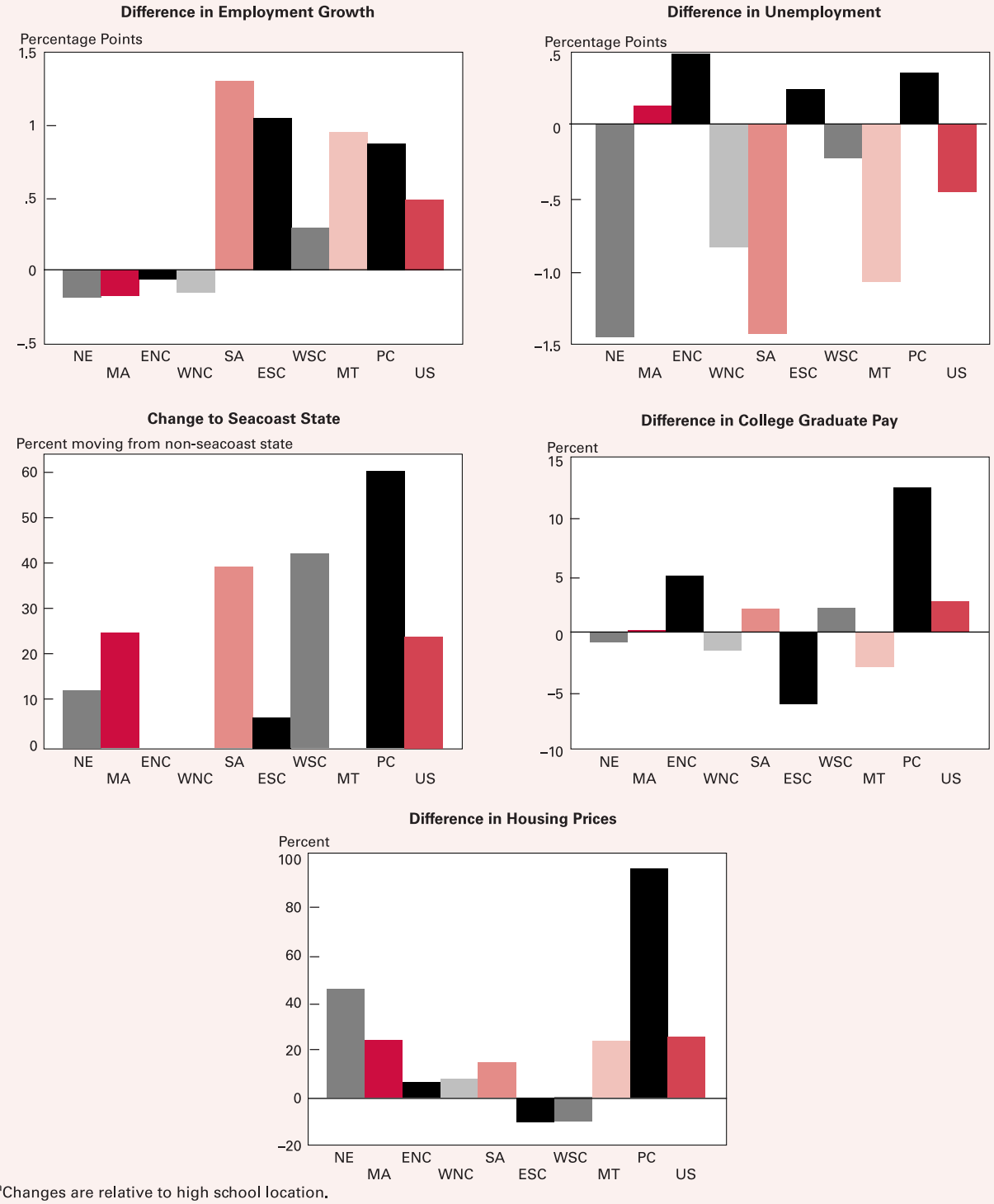
Young adult movers are likely to be people who have moved in the past—either during childhood or to attend college. State economic and quality-of-life conditions also influence migration. Young graduates are more likely to move if they are in a state that has low employment growth, high unemployment, or low pay for college graduates. The majority of moves are to states offering improved conditions along at least one dimension—high job growth, lower unemployment, higher pay, lower housing costs, or better amenities. However, it is important to note that a high fraction of moves are to states that seem to offer worse conditions in some respect. For example, over 40 percent of the observed moves were to states with lower employment growth than in the origin state.

These results imply that location preferences vary from individual to individual, and that circumstances unobservable to researchers (such as specific job offers or personal relationships) also help determine location decisions. Thus, an employer located in a slow-growing or otherwise "unattractive" state that is trying to fill a relatively small number of slots may not be at a marked disadvantage compared to employers in other parts of the country. Recruiting success depends largely on matching particular individuals to particular jobs, rather than on being located in a particular part of the nation.

Nevertheless, some parts of the country have been successful in attracting and retaining college graduates while others have experienced net outflows. For the graduating classes analyzed in the NLSY (1979 to 1991), the South Atlantic and Mountain regions gained roughly 15 to 30 percent more young college graduates as a result of migration from other regions of the country, compared to the numbers of college graduates who had gone to high school there. These net inflows

Figure 4

Changes in Selected State Indicators for College Graduates, by Census Division Destination[a]



[a]Changes are relative to high school location.
Note: See footnote 3 for listing of Census divisions.
Source: Author's calculations.

seem rooted in these areas' particularly strong economies. On the other hand, the explanation for the very heavy net migration into the Pacific states does not lie solely in their overall economic characteristics. Although these states offered relatively rapid employment growth and high pay, one drawback was their high housing costs. The location of these states appears to have been a draw, as a very high share of in-migrants came from states without a seacoast.

In some cases, regional patterns can be explained in part by differences in past migration. New England is a case in point. College-bound students from New England were more likely to go out-of-state for college than students from almost any other region. Many also moved between birth and high school. According to the analysis presented here, these demographic factors contributed to the likelihood that young college graduates who went to high school in New England ended up locating outside the region after completion of their studies.

Finally, the study indicated that young college graduates moving to New England faced steep increases in housing costs (second only to the increases faced by those moving to the Pacific region). This perhaps discouraged in-migration from other parts of the country. However, in general, the evidence was very weak that high housing costs cause the college-educated to move *away* from their home state in the first five years after graduation. Housing markets perhaps are a more significant factor in retaining graduates as they grow older. This and other hypotheses concerning housing might usefully be tested in follow-on research.

Appendix Table 1

Means and Standard Deviations of Variables Used in Regression Analysis

	College graduates, relative to high school state (1,005 observations)		College graduates, relative to college state (1,004 observations)		High school graduates, relative to high school state (2,241 observations)	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Dependent variables						
Migrated after graduation (standard definition)	.348	.477	.289	.453	.116	.320
Migrated after graduation (noncontiguous variant)	.318	.466	.270	.444	.112	.316
Migrated after graduation (125-mile variant)	.293	.455	.236	.425	.097	.296
Independent variables						
Migrated between birth and high school	.290	.454	.290	.454	.232	.422
Migrated between high school and college	.251	.434	.251	.434	n.a.	n.a.
Race (1=white, 0=non-white)	.905	.293	.905	.293	.794	.404
Sex (2=female, 1=male)	1.49	.500	1.49	.500	1.49	.500
Employment growth rate, difference from national average	–.127	1.13	–.080	1.16	–.218	1.56
Unemployment rate, difference from national average	.173	2.03	.140	1.97	.241	1.79
State population	8.30	5.73	8.77	6.01	8.62	6.09
State area	65,263	66,694	72,449	73,455	70,535	65,469
Dummy for seacoast	.512	.500	.533	.499	.492	.500
Average maximum wind speed	60.3	6.52	60.1	6.47	59.8	5.91
Average number of clear days	97.2	27.1	99.0	28.1	99.2	30.0
Average degree days	5876	1318	5815	1366	5795	1382
College graduate (or non-graduate) pay relative to national average	1.02	.094	1.02	.087	1.00	.092

n.a. = not applicable.
Source: Author's calculations. See text.

Appendix Table 2

State Rankings for Selected Variables Used in Regression Analysis

Annual Averages

Census Division and State	Employment growth (1 = high)	Unemployment (1 = low)	Population (1 = high)	Seacoast (1 = yes, (0 = no)	Maximum windspeed (1 = low)	Number of clear days (1 = high)	Number of degree days (1 = low)	College graduate pay (1 = high)	Non-college graduate pay (1 = high)	Median house price (1 = low)
New England										
Connecticut	43	7	25	1	26	34	33	4	7	49
Maine	27	23	38	1	2	42	45	42	43	28
Massachusetts	44	10	11	1	49	29	34	8	10	47
New Hampshire	19	2	41	1	48	35	41	28	19	45
Rhode Island	48	21	39	1	47	26	25	24	27	42
Vermont	21	8	49	0	1	51	44	49	41	33
Middle Atlantic										
New Jersey	39	17	9	1	43	31	24	2	3	48
New York	47	26	2	1	20	48	28	7	8	44
Pennsylvania	46	35	4	0	38	44	31	15	15	18
East North Central										
Illinois	41	42	5	0	22	25	35	12	6	31
Indiana	31	37	12	0	18	40	29	34	23	9
Michigan	35	50	8	0	13	47	36	10	2	12
Ohio	40	43	6	0	23	46	32	19	11	19
Wisconsin	26	28	16	0	26	36	42	23	22	22
West North Central										
Iowa	36	16	27	0	50	26	40	41	37	3
Kansas	34	5	32	0	32	9	30	40	32	10
Minnesota	23	12	21	0	21	38	49	21	25	32
Missouri	33	31	15	0	5	15	26	33	30	15
Nebraska	30	1	35	0	31	12	38	46	46	7
North Dakota	38	6	46	0	35	33	50	48	48	14
South Dakota	14	3	45	0	40	19	47	51	51	4
South Atlantic										
Delaware	10	14	48	1	15	28	19	11	21	36
District of Columbia	45	38	47	0	4	29	14	5	31	43
Florida	3	24	7	1	42	32	8	29	39	29
Georgia	5	18	13	1	10	14	4	18	34	25
Maryland	28	11	18	1	51	20	21	3	9	41
North Carolina	9	13	10	1	25	16	10	39	47	17
South Carolina	16	29	24	1	10	11	7	37	45	16
Virginia	8	9	14	1	16	20	15	9	24	35
West Virginia	50	51	34	0	12	50	23	43	26	6
East South Central										
Alabama	25	46	22	1	28	23	6	26	36	8
Kentucky	24	45	23	0	3	37	18	35	33	5
Mississippi	32	47	31	1	7	13	5	47	49	1
Tennessee	17	36	17	0	5	22	12	30	42	13
West South Central										
Arkansas	13	44	33	0	8	10	11	45	50	2
Louisiana	49	49	19	1	28	24	3	17	29	24
Oklahoma	42	22	26	0	37	7	13	25	35	11
Texas	22	27	3	1	34	6	9	13	28	21
Mountain										
Arizona	2	25	29	0	17	1	16	20	20	38
Colorado	15	19	28	0	24	8	43	14	12	39
Idaho	18	34	40	0	43	17	39	44	40	20
Montana	37	33	43	0	46	41	46	50	44	23
Nevada	1	30	42	0	30	4	27	22	13	40
New Mexico	12	39	37	0	33	3	22	31	38	27
Utah	4	15	36	0	36	5	37	27	18	34
Wyoming	51	20	50	0	45	18	48	38	14	30
Pacific										
Alaska	6	48	51	1	41	49	51	1	1	46
California	29	32	1	1	14	2	1	6	5	50
Hawaii	11	4	44	1	9	43	2	36	17	51
Oregon	20	40	30	1	39	39	17	32	16	26
Washington	7	41	20	1	18	45	20	16	4	37

Source: Author's calculations. See text.

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