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Educating a Workforce: Keeping Local Talent

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RESEARCH

INTRODUCTION

The economic landscape of the U.S. is seeing increasing competition for a talented workforce. The concentration of economic activity in metropolitan areas in the U.S. combined with the lack of domestic migration means funding of higher education will increase in importance going forward. Ironically, just as the availability of workers willing to move from one city or state has decreased, so has the commitment by policy leaders to develop a locally grown skilled workforce. State funding for education has still not reached pre-recession levels, and state allocation of funds remains inconsistent year-to-year.¹

For state governments, investment in educating a workforce creates a competitive advantage where out-migration of skilled people is not a substantial concern. A skilled workforce can be leveraged into long-term economic opportunity. Policymakers need to develop a workforce from within their region to ensure that their state can meet demands for future skilled workers, for their state's economy to stay competitive, and for their region to remain economically relevant.

For perspective, Colorado had 7,524 out-of-state college students graduate from the four-year public state universities in 2016.² For college graduates at the age of 25, there is a 48.8 percent chance they have no plans on moving and 26.1 percent chance they definitely plan to move. If all new graduates have the same propensity to move, this percentage has the potential to translate into about 3,672 remaining in-state.

¹ "A Lost Decade in Higher Education Funding." Center on Budget and Policy Priorities, August 22, 2017. <https://www.cbpp.org/research/state-budget-and-tax/a-lost-decade-in-higher-education-funding>.

² Colorado Department of Higher Education, Data & Research: Colleges and Universities, 2016.

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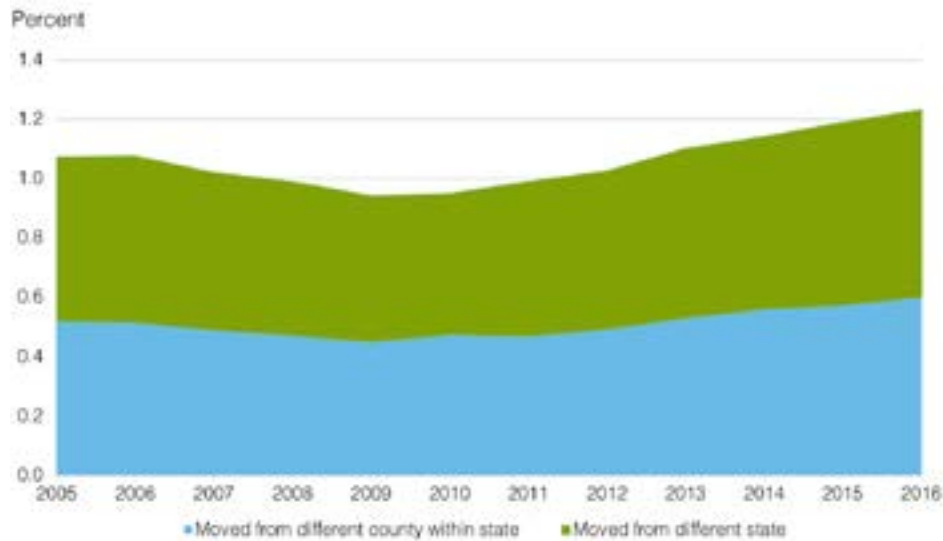


Figure 1: People with a BA+ who have moved out of county as a percent of total U.S. population

Source: American Community Survey

Figure 1 shows there is little outflow of people with B.A.s or higher moving outside their county of origin. The creation of a skilled workforce within a state will be more necessary as time goes on. Historical trends of geographic movement indicate in the U.S. that the share of people who choose not to move has been increasing for over 40 years. As of 2016, eighty-five percent of the U.S. population lives in an urban area. This concentration of population also concentrates economic opportunity.

In the context of urbanization, increased numbers of people not moving in the U.S., and the results of this paper, education does not have a major influence on the likelihood to move for the average person in the U.S. The results of this paper show the effects of social ties, demographics, career status, and housing are much more influential than education on the likelihood to move. As the vast majority of the U.S. states are still under-investing in universities, state governments will need to refocus efforts to direct workforce development. A competitive workforce can influence both where start-ups locate and larger companies set up operations.

INTRODUCTION

Governments can influence economic opportunity through investment in higher education without worrying about a mass exodus of skilled labor.

³ Molloy, Raven, Christopher L. Smith, Riccardo Trezzi, and Abigail Wozniak. "Understanding Declining Fluidity in the U.S. Labor Market." *Brookings Papers on Economic Activity*, 2016, 183–237.

BACKGROUND



Figure 2: U.S. non-movers as a percent of total US population from 1948 to 2016

Source: American Community Survey

The perception of the U.S. population is seen as domestically more mobile; Figure 2 indicates a long-run trend of people staying in place. This graph also indicates the number of people choosing not to move in the U.S. has continued to increase since the 1950s, recording only two years of negative growth. As shown in Figure 3 and Figure 4, migration away from counties of origin peaked in the 1980s. Figure 3 also shows the number of people moving out of their original state has not kept pace with within state movement. This trend is mirrored in people relocating within counties (see Figure 4). This, however, can be juxtaposed with decreases in labor market fluidity and general decreases in domestic migration.³

The rise and collapse of the housing bubble can be seen in this data. Out of state movement spikes from 1999 to 2005 and drops to a level just lower than in the 1950s by 2006. The drastic relocation from one state to another (see Figure 3) could have impacted the distribution of skilled workers.

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One source of increasing skills matching friction during economic downturns occurred because people could not move to new employment opportunities. These mismatched skills could be a contributing factor to the slower recovery. There is a slight upward trend in relocation for people that have a B.A. or higher since the U.S. economy left the recession (see Figure 1).⁴ Mismatches in aggregate industry, occupation, and geographies may explain up to one-third of the unemployment during the Great Recession.⁵

⁴ Sahin, Ay egül, Joseph Song, Giorgio Topa, and Giovanni L. Violante. "Mismatch Unemployment." *The American Economic Review* 104, no. 11 (2014): 3529–64.

⁵ Ibid.

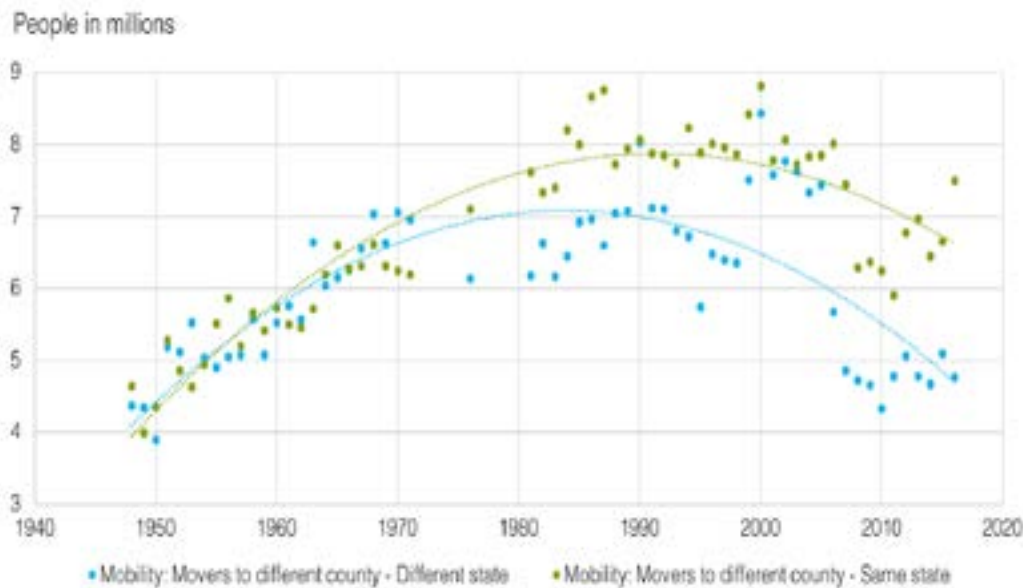


Figure 3: Migration out of county since 1948 to 2016

Source: Moody's Analytics

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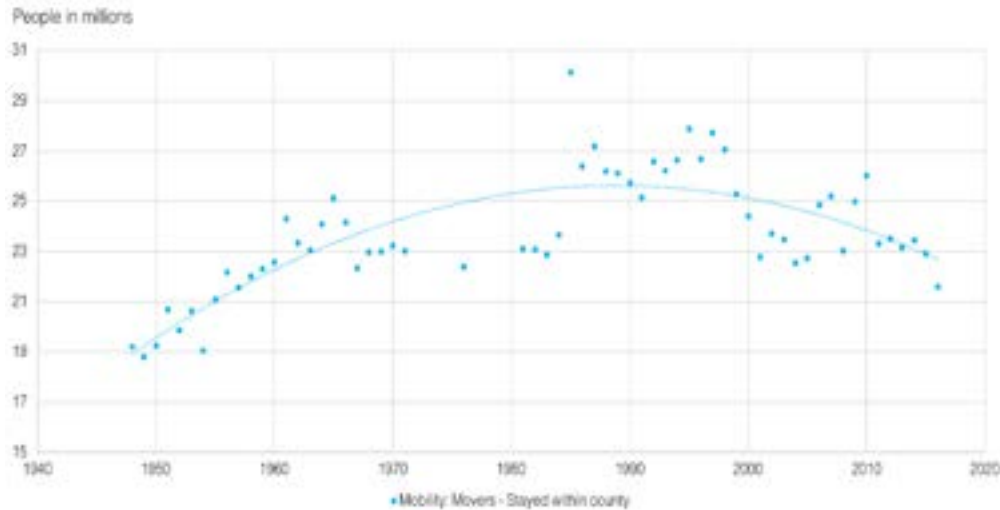


Figure 4: People moving within county of origin

Source: Moody's Analytics

The ability to move has been shown to have benefits for both the people leaving and people who stay in place in developed nations. When the E.U. expanded, there was an increase in real wages in Lithuania when nine percent of their population moved to Western Europe, while conditioning for education, experience, foreign direct investment, unemployment, exports, time, and region.⁶ The effect is consistent with other research that shows benefits both from the push and pull effects of education on who is immigrating.⁷

In the U.S. for highly urbanized areas, this could imply that population churn is as crucial as in-flows. Research on increases in compulsory education and higher education levels shows a positive relationship with geographic movement.⁸

⁶ Elsner, Benjamin. "Does Emigration Benefit the Stayers? Evidence from EU Enlargement." *Journal of Population Economics* 26, no. 2 (2013): 531–53.

⁷ Mayda, Anna Maria. "International Migration: A Panel Data Analysis of the Determinants of Bilateral Flows." *Journal of Population Economics* 23, no. 4 (2010): 1249–74.

⁸ Elsner, Benjamin. "Does Emigration Benefit the Stayers? Evidence from EU Enlargement." *Journal of Population Economics* 26, no. 2 (2013): 531–53.

Malamud, Ofer, and Abigail Wozniak. "The Impact of College on Migration: Evidence from the Vietnam Generation." *The Journal of Human Resources* 47, no. 4 (2012): 913–50.

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The U.S. is in the late stages of urbanization, but there still is some rural to urban migration.⁹ This is similar to global brain drain. Research on the U.K. and U.S. has shown this same type of relationship within domestic borders.¹⁰ However, movement from rural to urban areas does not explain the majority of migration in a developed and urbanized nation given trends for people not moving. Despite any demonstrated benefits from geographic mobility, people in the U.S. continue not to move and remain local, especially when faced with unemployment.

Urban population centers will continue to grow and concentrate economic opportunity. The number of people who don't move averages year-over-year growth of 1.38 percent since 1949, recording only two years of negative growth. In 2016, 86.6 percent of the U.S. population did not move. This change is a 20.1 percent increase over the last 20 years. Figure 2 clearly indicates this trend.

The vast majority of the U.S. population is choosing not to move, and there is no indication that this will change. This is also reflected in the downward trend of people who moved over the past couple decades. Surfacing evidence indicates that immigrant populations do not affect the geographic choices of resident populations.¹¹

Indications are that urban areas will continue to concentrate the population. These trends will make regional investment into education crucial to maintain a skilled workforce. Alignment of a person's education to the needs of a regional economy can further incentivizing not moving.

The U.S.'s general decline in geographic movement, Figure 2, and the continuing growth of the number of people not moving, Figure 3 and Figure 4, invites the question of who moves. In the context of the U.S., research has theorized that funding for public higher education has a negative relationship with out-migration of graduates if education achieves increasing returns to scale.¹²

⁹ Elsner, Benjamin. "Does Emigration Benefit the Stayers? Evidence from EU Enlargement." *Journal of Population Economics* 26, no. 2 (2013): 531–53.

Faggian, Alessandra, and Philip McCann. "Human Capital Flows and Regional Knowledge Assets: A Simultaneous Equation Approach." *Oxford Economic Papers* 58, no. 3 (2006): 475–500.

¹⁰ Weber, Bruce, Alexander Marre, Monica Fisher, Robert Gibbs, and John Cromartie. "Education's Effect on Poverty: The Role of Migration." *Review of Agricultural Economics* 29, no. 3 (2007): 437–45.

¹¹ Wozniak, Abigail. "Are College Graduates More Responsive to Distant Labor Market Opportunities?" *The Journal of Human Resources* 45, no. 4 (2010): 944–70.

¹² Ionescu, Felicia, and Linnea A. Polgreen. "A Theory of Brain Drain and Public Funding for Higher Education in the United States." *The American Economic Review* 99, no. 2 (2009): 517–21.

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The relationship is reversed if education exhibits decreasing returns to scale. Obtaining a higher return on investment for educational attainment could lead people to be more likely to seek better labor market outcomes.

Movement of a college educated population has been tied to labor markets outside the state of their current residence being more influential in decision-making rather than the labor market in the state where they currently reside.¹³ However, new college graduates who move have been found to be a small net loss of new graduates to the state where a person is being educated.¹⁴ As a person ages, they are more likely to put down roots in an area where a major event, like a career change, would be more influential on geographic movement.¹⁵ Figure 3 and Figure 4 demonstrate if people move, they are more likely to stay within the county where they currently live. A person moving beyond a county boundary is far more likely to have joined a new labor shed, while a person who stays within a county is much more likely to remain in the local labor shed.

¹³ Wozniak, Abigail. "Are College Graduates More Responsive to Distant Labor Market Opportunities?" *The Journal of Human Resources* 45, no. 4 (2010): 944–70.

¹⁴ Trostel, Philip A. "The Impact of New College Graduates on Intrastate Labor Markets." *Journal of Education Finance* 36, no. 2 (2010): 186–213.

¹⁵ Schlottmann, Alan M., and Henry W. Herzog. "Career and Geographic Mobility Interactions: Implications for the Age Selectivity of Migration." *The Journal of Human Resources* 19, no. 1 (1984): 72–86.

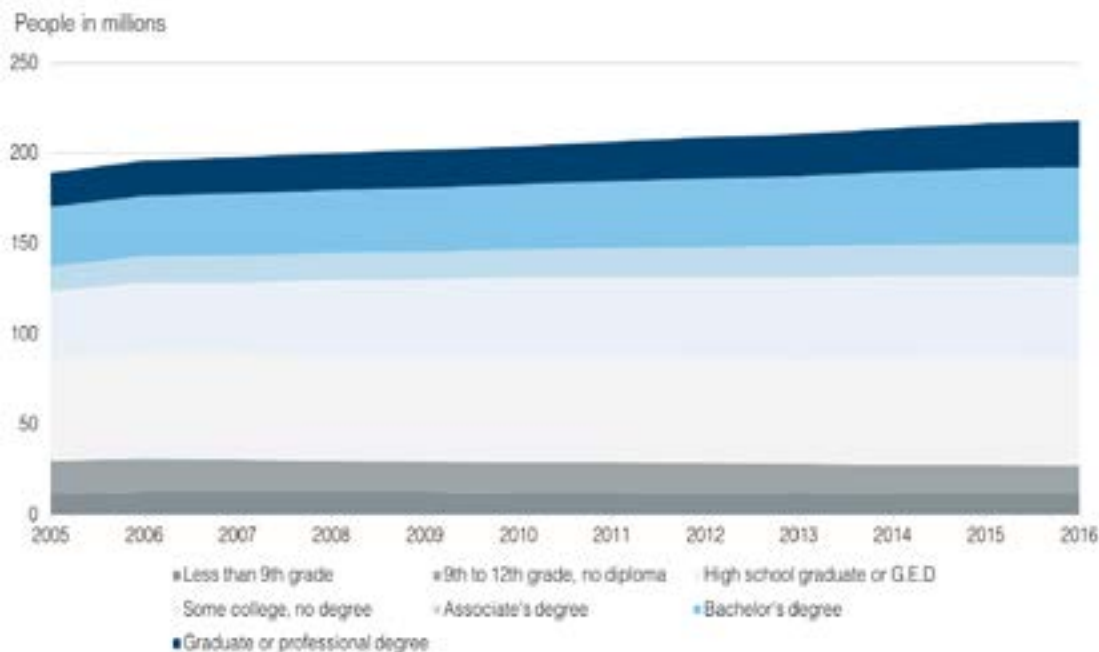


Figure 5: Educational attainment people 25+ in the U.S.

Source: American Community Survey

INTRODUCTION

As urbanization, the process of rural populations moving to urban areas, in the U.S. has already occurred, there is a downward trend in domestic migration. America's metro and micropolitan areas support about 85 percent of the population. Due to a 200-year process of population growth in places with denser initial populations, wage and rent premiums galvanized by industrialization the U.S. no longer see the same type of historical migration from rural to urban areas.¹⁶ The choice to move is now more likely to be a decision between different urban areas. The urbanization of the U.S. has created economic clusters that demand talent.

As of 2016, the U.S. has 39.6 percent of the population age 25 years or over has at least an Associate's degree, see Figure 5. Demand for an educated workforce is increasing competition to achieve higher levels of educational attainment. This trend is demonstrated by the growth of graduate or professional degrees being eight percentage points higher than the growth of Bachelor degrees from 2005 to 2016. Increases in the level of education people need to compete in labor markets increases the need for continuing education. As the share of the U.S. remaining in place increases, the talent in the U.S. will continue to grow and concentrate in urban areas. For individuals to gain new skills, having an effective higher education system becomes ever more necessary to maintain a skilled workforce.

¹⁶ Boustan, Leah Platt, Devin Bunten, and Owen Hearsey. "Urbanization in the United States, 1800-2000." Cambridge, MA: National Bureau of Economic Research, May 2013. <https://doi.org/10.3386/w19041>.

Michaels, Guy, Ferdinand Rauch, and Stephen J. Redding. "URBANIZATION AND STRUCTURAL TRANSFORMATION." *The Quarterly Journal of Economics* 127, no. 2 (2012): 535-86.

"Industrialization and Urbanization in the United States, 1880-1929 - Oxford Research Encyclopedia of American History." *AMERICAN HISTORY*, 2018, 16.

DATA

The data for this analysis comes from the Panel Survey of Income Dynamics (PSID). The data set is a subset of the full survey with 44,166 observations and covers 1997 to 2015. The panel consists of 8,749 individuals with the average person in the dataset for five waves. What the dataset draws from is the entire U.S. population. Each observation is the head of a household and, to avoid redundancy, no other members of the households are included in the dataset. The variables used are intended to capture geographic, family, economic, and demographic variation.

The PSID asks respondents how likely they are to move in the next couple of years. The variable is a categorical variable with four ordinal groups. The responses to the question are as follows: will not move, more uncertain if they will move, probably will move, and definitely will move. In the sample, most people are uncertain about whether they will move. Due to the nature of the question, this makes sense because this variable is asking the probability of a person moving in the next few years. The likelihood to move is the dependent variable used in this analysis.

The variable of interest is educational attainment and is recorded in years. The PSID truncates the variable to 17 years, which captures and graduates of a graduate program. Figure 6 and Figure 7 show a positive relationship between the likelihood to move and educational attainment.

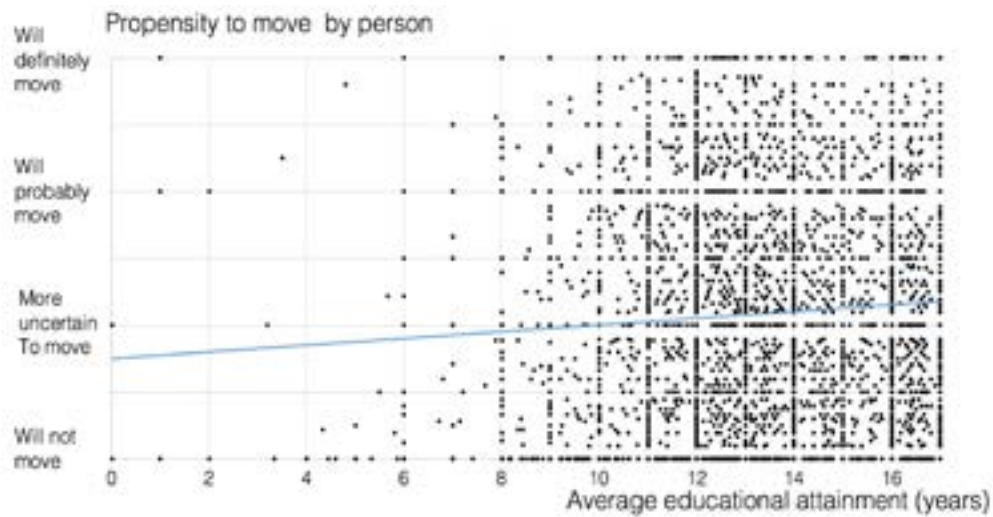


Figure 6: Average years of educational attainment on likelihood of moving by ID

Source: Panel Survey of Income Dynamics 1997-2015

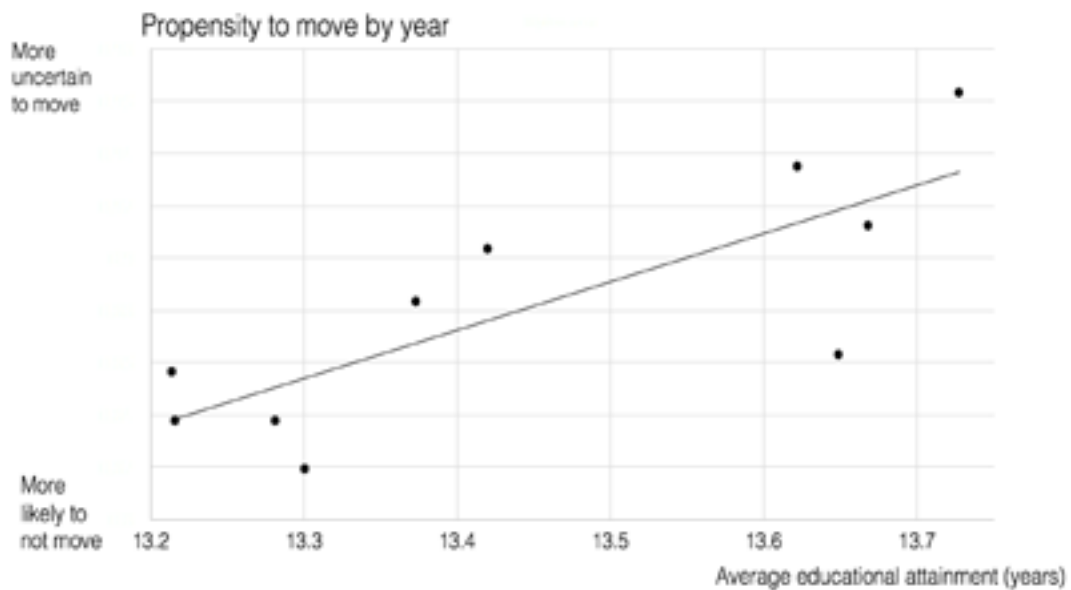


Figure 7: Average years of educational attainment on likelihood of moving by year

Source: Panel Survey of Income Dynamics 1997-2015

GEOGRAPHIC VARIABLES

The geographic variables used in this analysis are: urban area, if a person has moved in the past year, if a person has changed the state they are in, and their region of residency in the U.S. Urban is a categorical variable that starts at rural increasing relative to county population and relative position to a metropolitan statistical area. This variable has a total of eight ordinal categories. Moved in the past year is a combination of two questions: have you moved since spring and have you moved since January. These two variables have been aggregated into moved last year because the former replaced the latter in a couple of waves of the PSID. These two variables are binary. The changed state variable is constructed if a person recorded a different state's FIPS code from the previous year. The regions are broken out into binary variables as well. There are five regions: the northwest, north central, south, west, and Alaska and Hawaii. Due to a lack of hierarchy, binary variables are more appropriate than a categorical variable. The binary variables will normalize to the northwest region.

DEMOGRAPHIC VARIABLES

Controlling for demographics is important to account for the context of an individual. Age, sex, and race are controls for this analysis. Age conditions for a person's stage of life. To account for how behavior changes over time, age squared will be included in the estimations. Female is a binary variable and is normalized against male. Race is a categorical variable covering six ethnicities. The information records if a person is White, Black, Native, Asian, Latino, and other. As keeping this variable categorical provides no meaning, it will be broken down into binary variables normalizing to White.

The variables for families are a means to capture how tied to an area a household is. The number of people in a household is a simple count variable. Marital status is a categorical variable which has been broken down into binary variables.

The categories are single-family homes, two-family homes, townhouses, apartments, mobile homes, and other. The set of housing type variables normalize to other.

ECONOMIC VARIABLES

The economic variables in this dataset are: total family income, employment status, and two work experience variables. Total family income accounts for all income a family received during the past year. This variable records if a household has lost money. The transformation of total family income is a natural logarithm. Scalar adjustments were made to retain the observations that had negative values, while maintaining the information in the variation of total family income. Employment status is a categorical variable which has been reduced from eight to three groups. The categories for this analysis are: employed, unemployed, and not in the labor force. Employed and unemployed will normalize to not in the labor force. The experience variables are the years a person has been working since they were 18 or working full time. Similarly to age, work experience defines stages of a person's working life. In order to account for this, a squared term will be included as well in the estimations.

DATA

Variables	Mean	Standard Deviation	Minimum	Maximum
Likelihood of moving	0.79	1.17	0	3
Years of education	13.51	2.31	0	17
Number of people in household	2.62	1.42	1	13
Age	45.80	15.33	17	97
Years worked since 18	13.58	10.73	0	66
Years worked full-time	11.75	10.75	0	66
Female	0.28		0	1
Ln(total family income)	10.72	1.8	-4.6	20.72
Ln(home value)	7.42	5.77	0	16.01
Single-family homes*	0.71		0	1
Two-family homes*	0.04		0	1
Townhouse*	0.02		0	1
Apartment*	0.16		0	1
Mobile home*	0.05		0	1
Other homes*	0.01		0	1
Urban	6.71	2.44	1	9
Asian*	0.002		0	1
Black*	0.30		0	1
Other*	0.006		0	1
Latino*	0.002		0	1
Native*	0.005		0	1
White*	0.68		12	12
Married	0.53		13	14
Divorced	0.15		0	1
Separated*	0.03		0	1
Single*	0.22		0	1

DATA

Variables	Mean	Standard Deviation	Minimum	Maximum
Widowed*	0.05		0	1
Moved in the past year	0.29		0	1
Changed current state	0.05		0	1
Employed*	0.74		0	1
Unemployed*	0.06		0	1
Not in the labor force*	0.19		0	1
Northwest*	0.14		0	1
North central*	0.27		0	1
South*	0.42		0	1
West*	0.16		0	1
Alaska and Hawaii*	0.002		0	1
Observations				44,166

*Indicates binary variable created from a categorical.

Table 1: Descriptive Statistics

Source: Milken Institute

METHODOLOGY

The model is a random effects ordered logit panel model. By including only the head of household, we can assume there are no relationship errors to the independent variables. The logic informing the assumption is the likelihood of moving means the household has not yet moved. The unobserved factors that might influence a head of household are not confined to a specific homogenous entity, so there is a lack of an arbitrary dependence within each entity of an event that has not happened.

The ordered logit was chosen rather than another categorical model because of the clear nature of an ordinal scale of the dependent variable. Correlations and Variance Inflation Factors do not indicate that the model suffers from multicollinearity. The model has one natural logarithmic transformation, which is total family income. Age-squared accounts for the non-linear component of the data. Standard errors account for heteroskedasticity and auto-correlation. The robustness checks show the relative stability of the estimate of education. In all cases, the random effects parameter (sigma2_u) estimate is positive and significant. The parameter estimate shows entity effects are non-zero in this panel. In Table 2, columns two to seven are robustness checks. Columns five to seven expand the sample, but observations with total family income with over a million dollars are not included.

Likelihood to move_{it} =

$$\alpha + \beta_1 \text{Education}_{it} + \beta_2 \text{Family size}_{it} + \beta_3 \text{Age}_{it} + \beta_4 \text{age}_{it}^2 + \beta_5 \text{Female} + \beta_6 \text{Ln(Total family income)}_{it} + \beta_7 \text{Moved in the past year}_{it} + \beta_8 \text{Changed state}_{it} + \beta_9 \text{Urban}_{it} + \beta_{10} \text{E}_{it} + \beta_{11} \text{H}_{it} + \beta_{12} \text{R}_{it} + \beta_{13} \text{L}_{it} + \beta_{14} \text{M}_{it} + (\mu_i + \varepsilon_{it})$$

METHODOLOGY

- The vector **E** is a set of race binary variables: Black, Native, Asian, Latino, and other.
- Vector **H** is a set of housing binary variables: single-family homes, two-family homes, townhouses, apartments, and mobile homes.
- **R** is a vector of geographic regions: north central, south, west, and Alaska and Hawaii.
- Vector **L** is employed and unemployed.
- The vector **M** is a set of marital status binary variables: single, divorced, widowed, and separated.

RESULTS

EDUCATION

Education shows consistently a positive relationship to the likelihood of moving. The positive and highly significant estimates for education are consistent with previous studies.¹⁷ This result is true for research concerning migration domestic in and international to the U.S.¹⁸ This relationship implies a one-year increase in educational attainment for someone who will probably move, increases their likelihood of moving by 0.16 percent. A one-year increase in education implies for someone who will definitely move, increases the likelihood to move by 0.45 percent.

The impact on the likelihood of moving by education is small and relatively stable over the reported estimations. Those who have higher educational attainment will have greater opportunity, which will lead them to be slightly more likely to move. The effect is consistent while holding employment status, as well as other factors included in the analysis constant.

ECONOMIC VARIABLES

Total family income is overall significant, negative, and maintains these features over most estimations. The effect would indicate that increasing a family's income would reduce the likelihood of moving. However, the effect is surprisingly small. The result indicates when holding other family and employment-related variables constant, income is a factor—just not the most influential factor. The effect demonstrates a 10 percent increase in total family income decreasing someone's likelihood of moving by 0.006 percent for those who will probably move. The effect is even smaller when looking at anyone less certain if they will move.

¹⁷ Clark, Ximena, Timothy J. Hatton, and Jeffrey G. Williamson. "Explaining U.S. Immigration, 1971-1998." *The Review of Economics and Statistics* 89, no. 2 (2007): 359-73.

Ionescu, Felicia, and Linnea A. Polgreen. "A Theory of Brain Drain and Public Funding for Higher Education in the United States." *The American Economic Review* 99, no. 2 (2009): 517-21.

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Machin, Stephen, Kjell G. Salvanes, and Panu Pelkonen. "EDUCATION AND MOBILITY." *Journal of the European Economic Association* 10, no. 2 (2012): 417-50.

¹⁸ Weber, Bruce, Alexander Marre, Monica Fisher, Robert Gibbs, and John Cromartie. "Education's Effect on Poverty: The Role of Migration." *Review of Agricultural Economics* 29, no. 3 (2007): 437-45.

Kerr, Sari Pekkala, William Kerr, Çağlar Özden, and Christopher Parsons. "Global Talent Flows." *The Journal of Economic Perspectives* 30, no. 4 (2016): 83-106.

Docquier, Frédéric, and Hillel Rapoport. "Globalization, Brain Drain, and Development." *Journal of Economic Literature* 50, no. 3 (2012): 681-730.

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Malamud, Ofer, and Abigail Wozniak. "The Impact of College on Migration: Evidence from the Vietnam Generation." *The Journal of Human Resources* 47, no. 4 (2012): 913-50.

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Being unemployed increases the likelihood that a person will move. This effect is highly significant and positive. The effect is more than twice as large when including either work experience controls. As for someone who is employed, the results show no robust relationship. Robustness checks show when using the work experience controls, being employed becomes large, positive, and highly significant. The dramatic change in the coefficient of employed shows the relationship is not robust and should not be interpreted. However, this implies career status does influence a person's likelihood to move.

¹⁹ Farber, Henry S.. 2012. "Unemployment in the Great Recession: Did the Housing Market Crisis Prevent the Unemployed from Moving to Take Jobs?." *American Economic Review*, 102(3):520-25.

DEMOGRAPHIC VARIABLES

Across the estimations, increasing the size of a family decreases the likelihood of moving. The impact is expected because of the increases in the cost of moving more people and cost of living. The effect is relatively small while highly significant. For the robustness checks, the effect is halved when including either work experience variables while maintaining significance.

Single-family homes, two-family homes, townhouses, and mobile homes have a significant and negative relationship with the likelihood of moving. The overall effect of housing is also consistent with increases in family sizes and total family income. The dependent variable does not directly measure movement—only the likelihood to move; the interpretation, therefore, cannot be seen as evidence of "house-lock."¹⁹ One notable exemption is if a person lives in an apartment. The main results show apartments having a negative, significant, and relatively large effect. In all other estimations, there is no stability of residency of an apartment having an effect results and can be inferred as having no effect. An outcome of the robustness analysis is that two family homes loses significance with the addition of years of working full time. A possible reason is that as income grows, a person chooses to move into a larger dwelling. Unfortunately, these variables do not indicate ownership or renter status.

RESULTS

A set of robustness checks shows the natural logarithm of home value is highly significant and reinforces the effect of education. Home value estimations result in instability of coefficients for total family income and number of people in a household. This variable is zero if a renter or non-owner/non-renter. This result would show at least a correlation that people that own a home are much more likely not to move in comparison to those renting or non-owners. Renters make up a much larger portion of the sample than non-owners or non-renters; see Figure 8. The percentage of renters increases from 2006 and is almost entirely due to people switching from owning to renting. Figure 8 demonstrates the increased importance of renters in the sample, which informs the decision to use housing type rather than home value.

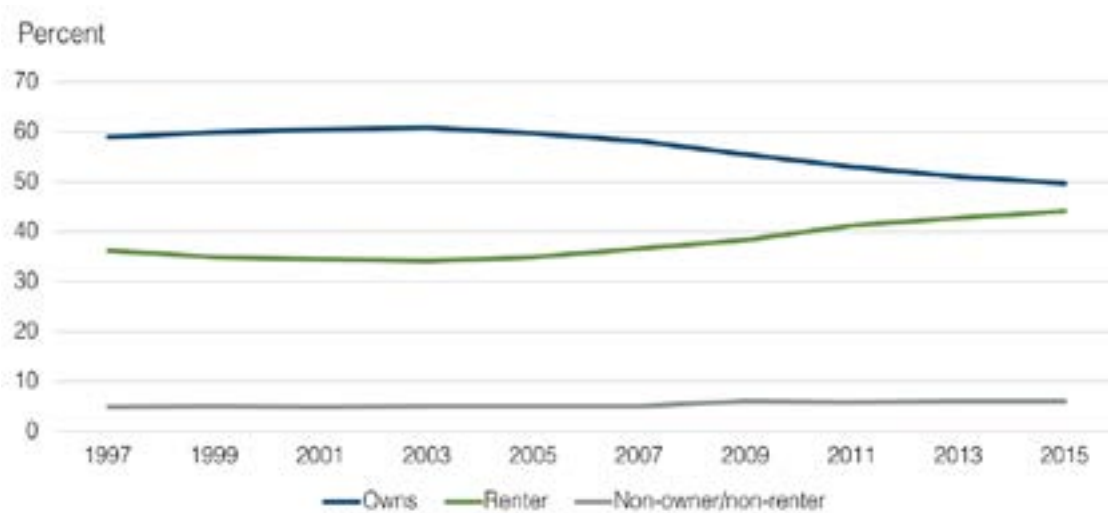


Figure 8: Percent of owners, renters, and non-owner/non-renters 1997 to 2015

Source: PSID Family-level

RESULTS

The age variables are both significant. As a person ages their likelihood of moving decreases at a decreasing rate. This can be seen in the square term that has a positive relationship to the likelihood to move. The robustness checks mirror this behavior and significance but have a smaller effect. The robustness checks support some previous research that people don't move as much until they accumulate some work experience.²⁰ Support for these impacts come from the estimates of the work experience variables, which show as a person's time spent working increases, the likelihood to move decreases at a decreasing rate.

The race variables show non-significance unless a person is black, in which case their likelihood of moving is highly significant, positive, and large. The estimate's effect of being black is stable and would indicate that even when accounting for the variance of work experience, black survey respondents are still more likely to move. The set of four marital status variables are highly significant, large, and positive. The coefficient shows that when a person does not have to take into account another, they are much more likely to move.

Women who are heads of a household have a lower likelihood to move, a difference that is relatively large and highly significant. This result is stable when conditioning for marital status, employment, household size, and income. When the work experience variables are included in the estimation, the effect of being a woman on the likelihood to move is greater. The effect is in the context of holding employment status constant. There are some reasons that this could occur but, within this analysis, this could suggest labor market frictions involving women's ability to move. Further study into this would be necessary but reducing employment matching inefficiency among women could improve a large segment of labor market outcomes.

²⁰ Wozniak, Abigail. "Are College Graduates More Responsive to Distant Labor Market Opportunities?" *The Journal of Human Resources* 45, no. 4 (2010): 944-70.

RESULTS

GEOGRAPHIC VARIABLES

A person's urban environment is highly significant and positive on their likelihood to move. However, the effect is small. This implies greater numbers of people in an urban area increases the likelihood that they will move. If a person has moved in the past year, they are more likely to move. The effect is doubled when taking work experience into account rather than simply age. The effect is positive and highly significant. If a person has changed the state they live in the past year, the likelihood of moving is significant, large, and positive. The set of regional variables shows that living in the continental U.S. does not influence someone's likelihood of moving. However, living in Alaska or Hawaii increases the likelihood of moving, and the effect is large and highly significant. Over the sample period, the number of people living in Alaska or Hawaii does not vary but sees an average 37 percent of people who have moved in the last year.

RESULTS

Variables	Likelihood to Move						
	Base	Main Results	Check 1	Check 2	Check 3	Check 4	Check 5
Education	0.03*** (0.01)	0.04*** (0.01)	0.04*** (0.01)	0.02* (0.01)	0.04*** (0.01)	0.03*** (0.01)	0.05*** (0.01)
Number of people in household	-0.13*** (0.01)	-0.07*** (0.01)	-0.04*** (0.01)	-0.04*** (0.01)	-0.04** (0.01)	-0.03** (0.01)	-0.08*** (0.01)
Age	-0.11*** (0.01)	-0.15*** (0.01)					-0.12*** (0.01)
(Age) ²	.0004*** (0.00007)	0.0009*** (0.0001)					0.0006*** (0.00008)
Female	0.20*** (0.04)	-0.12** (0.05)	-0.17*** (0.05)	-0.19*** (0.05)	-0.21*** (0.05)	-0.23*** (0.05)	-0.12** (0.05)
Ln(total family income)	-0.03*** (0.01)	-0.02* (0.01)	-0.04*** (0.01)	-0.04*** (0.01)	-0.04*** (0.01)	-0.04*** (0.01)	-0.01 (0.01)
Mobile home	-0.82*** (0.14)	-1.15*** (0.16)	-1.16*** (0.16)	-1.14*** (0.16)	-0.72*** (0.14)	-0.70*** (0.14)	-0.79*** (0.14)
Apartment	0.05 (0.12)	-0.26* (0.14)	-0.20 (0.14)	-0.19 (0.14)	0.15 (0.12)	0.15 (0.12)	0.03 (0.12)
Townhouse	-0.42*** (0.15)	-0.71*** (0.16)	-0.64*** (0.16)	-0.63*** (0.16)	-0.27* (0.15)	-0.27* (0.15)	-0.39*** (0.15)
Single-family homes	-1.11*** (0.12)	-1.41*** (0.14)	-1.48*** (0.14)	-1.47*** (0.14)	-1.06*** (0.12)	-1.06*** (0.12)	-1.06*** (0.12)
Two-family homes	-0.30** (0.13)	-0.59*** (0.15)	-0.57*** (0.15)	-0.56*** (0.15)	-0.21 (0.14)	-0.21 (0.14)	-0.30** (0.13)
Moved in the past year	0.17*** (0.03)	0.15*** (0.03)	0.31*** (0.03)	0.31*** (0.03)	0.31*** (0.03)	0.32*** (0.03)	0.15*** (0.03)
Changed current state	0.42*** (0.06)	0.47*** (0.06)	0.50*** (0.06)	0.51*** (0.06)	0.49*** (0.06)	0.50*** (0.06)	0.45*** (0.06)
Urban	0.07*** (0.01)	0.06*** (0.01)	0.03*** (0.01)	0.03*** (0.01)	0.03*** (0.01)	0.03*** (0.01)	0.06*** (0.01)
Black		0.35*** (0.05)	0.29*** (0.05)	0.30*** (0.05)	0.32*** (0.05)	0.33*** (0.05)	0.34*** (0.05)
Native		0.01 (0.26)	-0.02 (0.25)	-0.03 (0.26)	-0.05 (0.26)	-0.05 (0.26)	-0.00 (0.25)
Asian		-0.06 (0.39)	-0.03 (0.38)	-0.10 (0.38)	-0.01 (0.37)	-0.06 (0.38)	-0.09 (0.39)
Latino		-0.55 (0.42)	-0.22 (0.41)	-0.22 (0.41)	-0.11 (0.41)	-0.10 (0.41)	-0.45 (0.42)
Other		-0.30 (0.23)	-0.17 (0.24)	-0.18 (0.24)	-0.03 (0.23)	-0.05 (0.23)	-0.14 (0.22)
Single		0.37*** (0.06)	0.79*** (0.06)	0.81*** (0.06)	0.87*** (0.06)	0.89*** (0.06)	0.39*** (0.06)

RESULTS

Likelihood to Move							
Variables	Base	Main Result	Check 1	Check 2	Check 3	Check 4	Check 5
Widowed		0.40** (0.16)	0.15 (0.16)	0.10 (0.16)	-0.15 (0.11)	-0.21* (0.11)	0.35*** (0.12)
Divorced		0.60*** (0.06)	0.55*** (0.06)	0.54*** (0.06)	0.58*** (0.06)	0.57*** (0.06)	0.58*** (0.06)
Separated		0.91*** (0.09)	0.97*** (0.09)	0.96*** (0.09)	1.02*** (0.09)	1.02*** (0.09)	0.89*** (0.09)
Employed	-0.07 (0.05)	-0.04 (0.06)	0.25*** (0.05)	0.26*** (0.05)	0.39*** (0.05)	0.40*** (0.05)	-0.05 (0.05)
Unemployed	0.28*** (0.07)	0.25*** (0.07)	0.49*** (0.07)	0.49*** (0.07)	0.61*** (0.07)	0.62*** (0.07)	0.25*** (0.07)
North central		0.04 (0.06)	0.05 (0.06)	0.06 (0.06)	0.03 (0.06)	0.04 (0.06)	0.03 (0.06)
South		-0.02 (0.06)	-0.00 (0.06)	0.00 (0.06)	-0.04 (0.06)	-0.03 (0.06)	-0.05 (0.06)
West		0.08 (0.07)	0.09 (0.07)	0.09 (0.07)	0.08 (0.07)	0.07 (0.07)	0.06 (0.07)
Alaska and Hawaii		0.86** (0.38)	0.94** (0.37)	0.89** (0.37)	0.82** (0.34)	0.76** (0.33)	0.74** (0.35)
Years worked since 18			-0.08*** (0.01)		-0.07*** (0.01)		
(Years worked since 18) ²			0.001*** (0.0002)		0.0008*** (0.0001)		
Years Worked Full-time				-0.08*** (0.01)		-0.07*** (0.01)	
(Years Worked Full-time) ²				0.001*** (0.0002)		0.0007*** (0.0001)	
Cut 1	-3.51*** (0.22)	3.76*** (0.32)	-0.31 (0.22)	-0.37 (0.23)	0.42** (0.21)	0.41* (0.21)	-2.92*** (0.25)
Cut 2	-3.01*** (0.22)	-3.27*** (0.32)	0.17 (0.22)	0.11 (0.23)	0.91*** (0.21)	0.91*** (0.21)	-2.41*** (0.25)
Cut 3	-2.01*** (0.22)	-2.28*** (0.31)	1.14*** (0.22)	1.08*** (0.23)	1.89*** (0.21)	1.88*** (0.21)	-1.41*** (0.25)
Sigma2_u	1.46*** (0.06)	1.37*** (0.06)	1.45*** (0.06)	1.46*** (0.06)	1.50*** (0.06)	1.51*** (0.06)	1.41*** (0.05)
Observations	43,803	38,240	38,240	38,240	43,803	43,803	43,803
Number of id	8,749	8,114	8,114	8,114	8,749	8,749	8,749

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 2: Results of panel Random Effects Ordered Logit model

Source: Milken Institute

CONCLUSION

Development of a workforce is not an overnight process. Building institutions that can provide a region with a competitive advantage through education can create a foundation to maintain economic opportunity. The analysis results show education can increase the likelihood of migration somewhat, but policymakers can be confident investments in education will benefit their local economy as even educated workers are increasingly likely to stay close to home. The evidence provided here indicates other factors are substantially more influential on the likelihood to move than education. In addition, higher education can help create roots for people to want to stay in an area.²¹ If a person puts down roots in an area, it is clear that the likelihood of moving is reduced, which is exemplified by marital status, family size, work experience, and housing type.

Being unemployed does increase a person's willingness to move. In the context of the estimation, it is expected that unemployment is the most important economic factor and explains the lack of influence of income. Income does have a robust negative relationship, but the effect is small. Being employed, unsurprisingly, does not have a robust effect. The robustness check shows where someone is in their career is of importance. The effects demonstrate the change in directionality and significance of employment when including years of work experience.

The presence of social ties holding importance over socioeconomic traits is essential for defining what public policy can address. It would seem that places supporting larger populations are at a clear advantage. However, increasing the population of an area increases the likelihood that a resident will move. There are a multitude of reasons why this might be the case. One reason is living costs in urban areas often incentivize renting over owning.

²¹ Malamud, Ofer, and Abigail Wozniak. "The Impact of College on Migration: Evidence from the Vietnam Generation." *The Journal of Human Resources* 47, no. 4 (2012): 913–50.

Trostel, Philip A. "The Impact of New College Graduates on Intrastate Labor Markets." *Journal of Education Finance* 36, no. 2 (2010): 186–213.

CONCLUSION

Increases in the number of people in a household and a more stable living arrangement both have a negative relationship to the likelihood of moving. The results of this paper show the anchors holding people in place are the social and physical connections. States could prioritize providing adequate housing stock to a labor shed, which may increase the possibility that people will stay within a region.

As general trends in the U.S. continue, the U.S. will continue to have growing numbers of people choosing not to move. Reductions in the movement around the U.S. makes it increasingly unlikely for any one place to make up gaps in talent if not produced locally. This effect is also the case when looking at the positive relationship that moving has on people. The effect is greater when the move is to another state. When people move, they are more likely to continue to move. Consistent investment in higher education can create a sustainable workforce development system; otherwise, states incentivizing geographic mobility may be necessary as a stop gap to fill holes in a workforce. Education benefits people over time with greater economic opportunities, and places that invest in education will share the benefits.

KEY FINDINGS

- **Most Americans are highly unlikely to move.**
- **Drawing in a skilled specialized workforce from out of state to supplement local talent is unlikely to solve long-term workforce issues in an average metro.**
- **Women are less likely to move even when controlling for employment status, income, work experience, and education.**
- **People who have moved within the past year are more likely to move again and the effect increases if changing states.**
- **Education increases the likelihood of moving, however, the effect is small.**

APPENDIX

DATA

The data in the introduction comes from one-year estimates of the American Community Survey, and geographic mobility data comes from Moody's Analytics. Population estimates come from the U.S. Census Bureau population division.

For the main results, the data comes from the University of Michigan's Institute for Social Research, Survey Research Center. The subset of the Panel Study of Income Dynamics (PSID) covers 8,749 individuals from 1995 to 2015. The raw dataset contained 80,961 observations. Once removing all null values, 59,651 observations were left. A unique ID was created on recommendations by the Institute for Social Research.²² The changed state variable, from data spanning 1995 to 2015, was merged into the dataset using the ID and year variables. Using one year's state and the next year's FIPS code to determine if a person had moved to another state could be identified. The variable created is if a person has changed the state they live in.

The PSID waves for 1997 and 1999 introduced a set of immigrant families to reflect the national composition of the U.S. The immigrant sample is not designed to be a subset of the data where inference can be made about immigrants.²³ In 1997, the PSID design was changed, affecting survey weights provided, and 1995 was dropped from the data set to account for this change.²⁴ The changes in 1995 may affect the number of people in 1997 that could answer what state they were currently in. Total family income had the presence of large outliers, which required the sample be restricted to income below a million dollars. The size of the family has had households with over ten people removed. Further reduction to the sample is made so only people under the age of 65 remain.

²² Panel Survey of Income Dynamics, FAQs, #9, <https://psidonline.isr.umich.edu/Guide/FAQ.aspx?Type=1>.

²³ PSID staff, "Information on the PSID Immigrant Sample Addition of 1997/1999", Technical Series Paper #00-04, Institute for Social Research, https://psidonline.isr.umich.edu/publications/Papers/tsp/2000-04_Imm_Sample_Addition.pdf.

²⁴ Panel Survey of Income Dynamics, FAQs, #91, <https://psidonline.isr.umich.edu/Guide/FAQ.aspx?Type=10>.

APPENDIX

Non-ordinal categorical variables have been broken down into simple binaries to give an interpretable result.

ROBUSTNESS CHECKS

A further set of robustness checks shows the stability of the coefficient for education. Robustness checks are available upon request. The additional conditions are as follows: Total family income was limited to \$350,000 for all other robustness estimations. The set of estimations was then restricted by years; 2000-2015, 2005-2015, and 2010-2015. The demographic and housing variables have more influence and wash out the effects of some variables as the sample removes years. The robustness checks for each of the three different specifications in Figure 2 show the stability of the estimation with a notable departure when using the sample covering 2010 to 2015. In the context of the recovery, housing and demographics wash out the impact of the other variables. The robustness checks support the results in Table 2. The final set of robustness checks repeats this process. The types of dwellings binary variables are replaced with the natural logarithm of the home value. The variable is zero if a person is not a homeowner. The results show education is always significant and is directionally consistent with the reported results. These last set of estimations show the number of people in a household and total family income become relatively unstable.

ABOUT US

ABOUT THE AUTHOR

Joe Lee is a research analyst with the Milken Institute on the regional economics team. He specializes in labor economics with a focus in human capital and economic development. His recent work includes the internet effect on educational attainment. He has been involved in projects that include regional workforce issues, human capital interactions, entrepreneurship, and innovation. Joe received his MA in economics from CSULB and graduated from The Evergreen State College.

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