

Article

Why and Where Do Highly Educated Workers Relocate? A National-Level Analysis across U.S. Census Regions

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Abstract: Like those in other advanced economies, local American governments attempt to attract and retain skilled workers in their areas. This study aims to examine the determinants and spatial patterns of relocation among new graduates with a bachelor's degree or higher across the U.S. Census Regions, in 2013–2015, using a nationally representative sample collected by the National Science Foundation. While the Northeast and Midwest had negative net migration, the South and West had positive net migration. Compared to the South, skilled workers in all the other regions were more mobile. In general, job satisfaction determined at multiple levels influences the relocation of the highly educated in multiple ways. We found skilled workers satisfied with their job location, security, promotion opportunities, and contributions to society were less likely to relocate. Workers satisfied with their intellectual challenge and independence were more likely to relocate. Race was also an important predictor among the highly educated in deciding whether and where to relocate. Policies considering geographic perspectives are recommended to improve talent attraction and retention. Therefore, our study provides public policymakers with a need to think about how to increase pull factors attracting workers, reduce the push factors making workers relocate, and maintain factors keeping workers in their regions.

Keywords: relocation; job mobility; college-educated workers; job-related satisfaction; race; United States



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1. Introduction

Approximately a quarter (24 percent) of Americans migrated within the country in 2011–2012, which placed the United States (U.S.) among the countries with the highest internal migration rate (24 percent) across the globe, along with New Zealand (26 percent), Finland (23 percent), and Norway (22 percent) [1]. In an advanced economy, a region can be more competitive when it attracts and retains more highly educated workers since the accumulated knowledge and human networks among highly skilled workers can generate positive externalities of economy across the region [2]. Local governments often implement proactive brain acquisition policies to prevent brain drain from their areas and to attract/retain the highly educated workers. For example, since 2019, the State of Vermont has been implementing the Remote Worker Grant Program to provide USD 10,000 to anyone willing to relocate to the state and work remotely for an out-of-state employer, because the state government expects a potential boost to their local economy from additional consumption and the value-added economic activities yielded by incoming new workers [3].

Moving between regions is an important decision for individual workers because it has a substantial influence on their current and future lives. Such decisions are made through a complex consideration of personal, occupational, and environmental factors [4]. Many studies seek to solve the puzzle of why people do or do not select regional mobility. Existing studies on work relocation among U.S. college-educated workers focus heavily

on economic factors such as unemployment, wages, and promotion [5–9]. The literature has also found that other determinants, including, but not limited to, age, race, family, and professional networks substantially impact the job mobility of internal migrants in the U.S. [9]. In addition, a region's locational characteristics such as cultural and recreational amenities, neighborhood safety, and milder climates are associated with outmigration in the U.S. [10].

Since 1993, the U.S. National Science Foundation (NSF) has regularly collected the characteristics of the sample individuals with a bachelor's or higher degree in the U.S., through its Scientists and Engineers Statistical Data System (SESTAT), which contains three separate surveys, i.e., the National Survey of College Graduates (NSCG), the National Survey of Recent College Graduates (discontinued and consolidated with NSCG since 2013), and the Survey of Doctorate Recipients [11]. These NSF data provide important information related to the relationship of degree field and occupation, work activities, salary, and the respondents' demographic information. For example, Kazakis and Fagian [12] examined the inter-state migration behavior of graduates and its effects on their career outcomes using the 2010 SESTAT. However, to our knowledge, there is no study that spatially investigates how a variety of job mobility determinants differently impact workers' relocation by focusing only on "highly" educated workers (those with a bachelor's degree or higher) due to the limit of geographic information in the NSF data. The only geographic information available in the NSF data at the time of analysis (i.e., 2019–2021) was the U.S. Census Regions, a broad yet important regional scale for various purposes such as government's statistics, policymaking, academic research, and geographic perception/division of everyday life [13,14].

Different to previous studies, this study examines the spatial patterns of these workers' relocations and their determinants across the U.S. Census Regions (Northeast, Midwest, South, and West) in 2013–2015 using the NSCG data. This study contributes to workers' migration decision research in two ways. First, it tests actual work relocation across the U.S. Census Regions among skilled workers, whereas previous studies instead heavily used the intention of relocation. Second, it analyzes how job satisfaction affects workers' migration decisions. Furthermore, it classifies important job-related satisfaction factors into micro, meso, and macro levels, and analyzes their impact on the relocation of highly educated workers.

2. Background and Literature Review

People desire to live where they and their family can improve their quality of life by considering work and community factors [15,16]. When relocating, people base their decision by comparing their monetary and non-monetary benefits and costs of staying where they live with those of other regions [17,18]. Workers' relocation decisions also impact their origins and destinations by inducing changes in regional economic development, segregation, and inequalities. Therefore, past studies have analyzed how structural and behavioral factors affect workers' relocation [19]. Location and relocation theories explain which factors influence people and businesses to attract workers to certain locations (pull factors) and which factors encourage them to move out of their current locations (push factors) [20,21]. Based on a literature review, we can largely classify these factors into economic and non-economic categories.

2.1. Economic Factors

Workers move where they can obtain more economic incentives, such as better job opportunities and better wages, than their current region [22–24]. Housing prices, homeownership, and moving costs also affect mobility [9,25,26]. The neoclassical theory of migration explains how economic opportunities, such as wages or promotions, are important factors for people who have a rational economic consideration for relocating to different regions [27,28]. In addition to economic factors, empirical studies indicate that non-economic factors such as social and environmental reasons also affect workers' mobil-

ity decisions to other regions [29–31]. Location-specific amenities such as family, friends, neighborhood, and living environment are important factors influencing people's mobility. People who have greater social capital, social interactions, and networks in their current regions are less likely to move to other regions [9]. Many different personal conditions influence their behavior [29,32–34]. That is, the social value and attitude toward the community can affect workers' mobility decisions [35]. These economic and non-economic factors serve as triggers affecting outflow from current regions and inflow to other regions. That is, economic and non-economic factors can be considered as pull and push factors.

2.2. Non-Economic, Job Satisfaction-Related Factors

Job satisfaction, a psychological incentive, is also important to determine a worker's decision for job relocation. It is traditional wisdom that people obtain a new job after searching for alternative jobs and measuring the differences in benefits and costs when they feel dissatisfied with their current position [36,37]. Organizational studies focusing on how job-related factors affect employees' decisions on their job mobility have found that low job satisfaction has positive effects on job mobility [38–47]. Workers' attitudes and value in organizations is also related to job satisfaction. For example, a lower level of job satisfaction leads to a lower organizational commitment and a high probability of workers' mobility.

We categorize job satisfaction as originating from three different levels of perceptions: micro, meso, and macro levels. Micro-level job satisfaction is the one directly related to the condition of one's current position. Micro-level job satisfaction includes a perception of one's current location, salary, benefit, security, and opportunity for advancement, which can be clearly specified as work conditions and obligations in employment contracts between employers and employees. Basic work conditions such as salary and benefits are primary factors affecting workers' behavior. Low job satisfaction with salary and benefits is related to the workers' mobility. Satisfaction with an employer's location is also related to employees' quality of life and affects their willingness to accept mobility opportunities [48]. Employees seek higher job security in their work and with their current employer [49]. Reducing the uncertainty from low job security affects employees' behavior. Lower satisfaction with their opportunity for advancement has positive effects on workers' mobility from their current workplace [50]. One example is dissatisfaction with a promotion, which is why many people decide to leave their workplace.

Intellectual challenge, level of responsibility, and degree of independence can be grouped into meso-level job satisfaction. While workers pursue monetary gains from their workplaces, they also can seek contentment from personal motivation for their careers, expectations from affiliated organizations, or workplace environments. The level of responsibility is related to the satisfaction of professional growth needs [51]. Having higher satisfaction with their level of responsibility means that employees are satisfied with their responsibilities and relevant potential opportunities to improve their professional skills and careers. The degree of independence shows how much employees value independence in their work and from employers, which is related to the individual's mobility to change his or her current situation [52,53]. The satisfaction of intellectual challenge is related to organizational commitment and workers' behavior [54–57].

A willingness to contribute to society is the highest, broadest level of job satisfaction. Free from satisfaction directly derived from a person or an organization, this macro-level job satisfaction aligns with a concept of fulfilling one's true self and contributing to society by taking social responsibility. This concept is related to the sense of community, which means belonging to a group or a place based on perceived similarity or orientation to common values which facilitate interpersonal relationships [58,59]. Mitchell et al. found that workers with a higher level of engaging in community activities were less likely to relocate to other jobs, using a sample of employees from grocery stores and hospitals [6,36].

2.3. Racial Composition

Racial composition is an important issue to relocate, with many studies conducted [60]. Since people tend to relocate where they feel more comfortable, neighborhood racial composition is an important factor to determine neighborhood preferences and to make migration decisions, especially in the U.S. [61]. As observed from white flight or white exodus, people prefer to move closer to where more people of the same or similar racial or ethnic groups live in their neighborhoods [61]. While racial and ethnic residential segregation is especially high for Blacks and Latinos, the preference to live in co-ethnic neighborhoods is also increasing among other Americans [23,62–64].

2.4. Hypotheses

Based on the preceding review of the literature on internal migration in the U.S., the following hypotheses were set to test:

Hypothesis 1 (H1). *Higher micro-level job satisfaction, as a set of psychological incentives, is negatively associated with work relocation.*

Hypothesis 2 (H2). *Higher meso-level job satisfaction, as a set of psychological incentives, is negatively associated with work relocation.*

Hypothesis 3 (H3). *Higher macro-level job satisfaction, as a set of psychological incentives, is negatively associated with work relocation.*

Hypothesis 4 (H4). *Workers are more likely to move to a region with their same race/ethnicity.*

3. Data and Methods

3.1. Data

The data used for this study are the 2013–2015 National Science Foundation’s National Survey of College Graduates (NSCG). The dataset is anonymized and de-identified by NSF and is made available for research purposes upon request from NSF. NSCG uses a nationally representative sample of U.S. college graduates—those who have earned a bachelor’s degree or higher. Since the dataset is a longitudinal survey intended to collect career history and demographic information, it contains information on work relocation from survey respondents across the four U.S. Census Regions (Northeast, Midwest, South, and West), from 2013 to 2015. We excluded those employees who were not in the U.S.

3.2. Measures

3.2.1. Dependent Variables

The dependent variable used in this study is whether a worker relocated across the U.S. Census Regions from 2013 to 2015. NSCG required survey respondents to report the actual location of their employers during the survey period. For the analysis, we first constructed a dummy variable: whether workers relocated or not from 2013 to 2015. We then categorized the origins and destinations of relocation into the U.S. Census Regions (e.g., workers in the Northeast may have stayed in the same area or may have relocated to another region such as the Midwest, South, or West during the survey period).

3.2.2. Independent and Control Variables

Two key independent variables in this study are job satisfaction and race/ethnicity. Job satisfaction was measured in the NSCG by asking respondents’ perceptions of location, salary, benefit, security, opportunity for advancement, intellectual challenge, level of responsibility, degree of independence, and contribution to society. Respondents’ feedback was recorded using a four-point Likert scale (“very satisfied”, “somewhat satisfied”, “somewhat dissatisfied”, and “very dissatisfied”). We further categorized these types of job satisfaction into three different levels (micro, meso, and macro levels).

Respondents’ race/ethnicity was classified into five groups in NSCG: White, Black, Hispanic, Asian, and others. We controlled for several demographic, socioeconomic,

and organizational characteristics of respondents, including age, gender, marital status, children, educational attainment level, job–education mismatch, college major, full/part time, supervisor, work term, salary, employer size, and employer type. Table 1 presents the descriptive statistics for the variables.

Table 1. Descriptive Statistics.

Variables		2013–2015	Domain
Regional mobility	Total relocation	5.20%	0–1
	Relocate from Northeast to others	6.22%	
	Relocate from Midwest to others	5.51%	
	Relocate from South to others	5.39%	
	Relocate from West to others	3.87%	
Job satisfaction * on			
Location	Mean	3.42	1–4
	SD	0.78	
Salary	Mean	2.99	1–4
	SD	0.85	
Benefit	Mean	3.10	1–4
	SD	0.90	
Security	Mean	3.23	1–4
	SD	0.84	
Opportunity for advancement	Mean	2.82	1–4
	SD	0.91	
Intellectual challenge	Mean	3.26	1–4
	SD	0.83	
Level of responsibility	Mean	3.35	1–4
	SD	0.74	
Degree of independence	Mean	3.49	1–4
	SD	0.71	
Contribution to society	Mean	3.34	1–4
	SD	0.79	
Male	Yes	54.7%	0–1
	No	45.3%	
Race	White	64.8%	1–5
	Black	7.2%	
	Asian	14.7%	
	Hispanic	10.2%	
	Other	3.1%	
Age	Mean	41.32	19–73
	SD	12.62	
Marriage	Yes	65.0%	0–1
	No	35.0%	
Children	Yes	49.6%	0–1
	No	50.4%	
Job–education mismatch	Closely related	63.0%	1–3
	Somewhat related	24.1%	
	Not related	12.9%	
Education level	Bachelor	48.4%	1–3
	Master	38.7%	
	PhD/Professional	12.9%	

Table 1. Cont.

Variables		2013–2015	Domain
Major	Computer and math sciences	8.8%	1–7
	Bio, agri and envir life sciences	8.4%	
	Physical sciences	5.0%	
	Social sciences	15.5%	
	Engineering	20.7%	
	S and E-related fields	14.7%	
	Non-S and E fields	26.9%	
Full time	Yes	87.2%	0–1
	No	12.8%	
Supervisor	Yes	36.7%	0–1
	No	63.3%	
Work term (months)	Mean	82.12	0–605
	SD	94.37	
Log salary	Mean	10.99	4–13
	SD	0.83	
Employer Size	Employees 1–10		1–8
	Employees 11–24		
	Employees 25–99		
	Employees 100–499		
	Employees 500–999		
	Employees 1000–4999		
	Employees 5000–24,999		
Employees Over 25,000			
Employer type	Academic	22.4%	1–3
	Business	65.1%	
	Government	12.5%	

* Response options for level of job satisfaction include (choice of one): 1 = very dissatisfied, 2 = somewhat dissatisfied, 3 = somewhat satisfied, and 4 = very satisfied.

3.3. Method

We built two types of regression models. First, Models 1–5 used a logistic regression model examining the association between a binary dependent variable (i.e., whether workers relocated or not from 2013 to 2015) and its independent variables: (1) Micro-level job satisfaction includes a perception of the current location, benefit, security, and opportunity for advancement; (2) Meso-level job satisfaction includes a perception of the current intellectual challenge, level of responsibility, and degree of independence; (3) Macro-level job satisfaction includes the willingness to contribute to society and independence; and (4) Race/Ethnicity. Demographic, socioeconomic, and organizational characteristics (i.e., age, gender, marital status, children, educational attainment level, job–education mismatch, college major, full/part time, supervisor, tenure duration, salary, employer size, and employer) are also included as control variables in our analyses.

Second, a multinomial logistic regression model was built to estimate the significance of factors affecting a worker’s relocation region choices (i.e., destinations of relocation from each U.S. Census Region: Northeast, Midwest, South, and West) in Models 6–9. A multinomial logistic regression model is generally effective when the dependent variable is composed of various categories with multiple choices and is thus utilized in this study to estimate the effect of individual variables on the probability of choosing a type of alternative relocation region. In this study, relocation choices will be an outcome. The probability that a worker will choose one type of mobility is restricted (i.e., between zero and one).

4. Results

Table 2 presents the total volume and proportions of the population that relocated at the national and U.S. Census region levels. Overall, 5.20 percent of highly educated workers moved to a new region between 2013 and 2015. In terms of the volume and proportions of relocation, there were slight yet statistically significant differences in the volume of movers and stayers among the U.S. Census Regions. The proportions of movers and stayers were 6.22 percent in the Northeast, 5.51 percent in the Midwest, 5.39 percent in the West, and 3.87 percent in the South. The rate ratios between the South and the other regions indicate that the proportions of movers were 61.8, 20.6, and 14.7 percent higher in the Northeast, Midwest, and West, respectively, compared to the South.

Table 2. The proportions of population relocated across the U.S. Census Regions.

Origins \ Destinations	Northeast	Midwest	South	West
Northeast	93.78% (stayers)	1.24%	2.97%	2.01%
Midwest	1.16%	94.49% (stayers)	2.05%	1.85%
South	1.75%	1.63%	94.61% (stayers)	2.01%
West	1.03%	1.05%	1.79%	96.13% (stayers)

Note: Authors’ own analysis. Source: 2013–2015 National Science Foundation’s National Survey.

Figure 1 illustrates the total volume of relocated workers among the U.S. Census Regions. The South was the favorite destination for relocation among all three regions: 130,921 (46.2 percent), 99,905 (44.5 percent), and 119,784 (51.7 percent) of relocated workers from the Northeast, Midwest, and West, respectively, headed to the South. The West was the favorite destination for Southerners (119,290 workers, 43.2 percent) and the second favorite for Northeasterners (93,474 workers, 33.0 percent) and Midwesterners (66,933 workers, 29.8 percent). In contrast, the Northeast was the least favorite destination for relocated workers from the Midwest (57,869 workers, 25.8 percent), South (73,046 workers, 26.5 percent), and West (51,441 workers, 22.2 percent). Overall, the Northeast (−1.9 percent or 99,836 workers) and Midwest (−0.4 percent or 23,950 workers) had negative net migration, whereas the South (0.9 percent or 74,556 workers) and West (0.8 percent or 48,230 workers) had positive net migration.

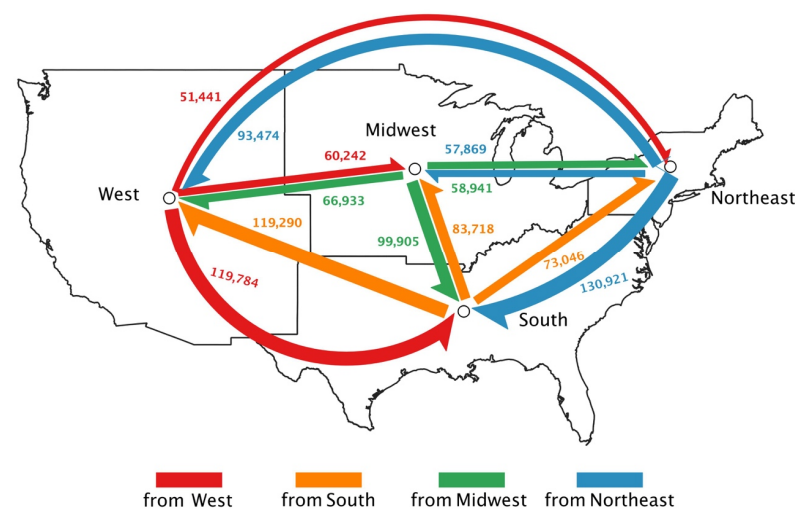


Figure 1. Total Volume of Relocated Highly Educated Workers across the U.S. Census Regions. Note: Authors’ own analysis. Source: 2013–2015 National Science Foundation’s National Survey.

Table 3 provides the results of the logistic regression analysis examining the associations between the independent variables and the possibility of relocation among the highly educated over the 2013–2015 time period. The Model 1 estimates were from all the samples from the U.S., while the estimates in Models 2–5 were from each region (Northeast, Midwest, South, and West, respectively). The coefficients are transformed into odds ratios in Table 3. Overall, the results suggest that different levels of job satisfaction are significantly associated with workers' mobility.

Table 3. Logit estimates of regional mobility: 2013–2015 dataset (Models 1–5).

Variables	All Model 1	Northeast Model 2	Midwest Model 3	South Model 4	West Model 5
Job satisfaction on					
Location	0.800 *** (0.020)	0.875 *** (0.045)	0.818 *** (0.043)	0.734 *** (0.033)	0.841 *** (0.048)
Benefit	0.993 (0.027)	1.050 (0.058)	0.922 (0.050)	1.012 (0.050)	0.999 (0.061)
Security	0.904 *** (0.025)	0.870 *** (0.047)	0.857 *** (0.048)	0.955 (0.049)	0.920 (0.057)
Opportunity for advancement	0.950 * (0.028)	0.970 (0.057)	1.025 (0.062)	0.911 * (0.047)	0.888 * (0.058)
Intellectual challenge	1.150 *** (0.041)	1.057 (0.077)	1.211 ** (0.092)	1.127 * (0.072)	1.232 *** (0.099)
Level of responsibility	0.955 (0.038)	0.987 (0.079)	0.880 (0.072)	0.983 (0.070)	0.961 (0.084)
Degree of independence	1.126 *** (0.040)	1.231 *** (0.090)	1.102 (0.081)	1.0914 (0.068)	1.092 (0.086)
Contribution to society	0.871 *** (0.027)	0.822 *** (0.049)	0.907 (0.059)	0.954 (0.053)	0.793 *** (0.053)
Race					
Black (ref: White)	0.912 (0.075)	1.182 (0.199)	1.394 * (0.243)	0.597 *** (0.078)	1.102 (0.253)
Asian	1.116 ** (0.061)	1.443 *** (0.153)	1.831 *** (0.216)	1.415 *** (0.144)	0.504 *** (0.065)
Hispanic	0.763 *** (0.056)	1.233 (0.182)	1.546 *** (0.252)	0.567 *** (0.077)	0.536 *** (0.0783)
Other	0.902 (0.103)	1.854 *** (0.436)	1.021 (0.260)	1.022 (0.200)	0.430 *** (0.113)
Male	1.402 *** (0.062)	1.347 *** (0.122)	1.307 *** (0.119)	1.377 *** (0.109)	1.535 *** (0.156)
Age	0.957 *** (0.015)	0.991 (0.033)	0.912 *** (0.030)	0.969 (0.028)	0.964 (0.037)
Age squared	1.000 (0.000)	1.000 (0.000)	1.001 ** (0.000)	1.000 (0.000)	1.000 (0.000)
Married	0.939 (0.046)	1.095 (0.110)	0.874 (0.088)	0.789 *** (0.070)	1.031 (0.115)
Children	0.740 *** (0.040)	0.621 *** (0.069)	0.717 *** (0.078)	0.757 *** (0.073)	0.917 (0.110)
Education level					
Master (ref: Bachelor)	1.280 *** (0.059)	1.079 (0.102)	1.464 *** (0.140)	1.214 ** (0.101)	1.347 *** (0.141)
PhD/Professional	1.329 *** (0.094)	1.254 (0.177)	1.277 (0.195)	1.244 * (0.158)	1.345 * (0.215)
Full time	0.737 *** (0.052)	0.798 (0.120)	0.611 *** (0.084)	0.678 *** (0.088)	0.857 (0.134)
Supervisor	1.082 * (0.049)	1.064 (0.098)	1.012 (0.096)	1.141 (0.093)	1.083 (0.110)
Employer Size					
11–24 (ref: 1–10)	0.977 (0.126)	0.913 (0.246)	1.165 (0.295)	1.059 (0.249)	0.713 (0.214)

Table 3. Cont.

Variables	All Model 1	Northeast Model 2	Midwest Model 3	South Model 4	West Model 5
25–99	1.085 (0.113)	1.120 (0.232)	0.754 (0.167)	1.241 (0.242)	1.250 (0.269)
100–499	0.945 (0.0937)	0.968 (0.191)	0.776 (0.157)	1.002 (0.188)	0.986 (0.212)
500–999	1.117 (0.125)	1.370 (0.296)	0.814 (0.193)	1.233 (0.254)	0.988 (0.255)
1000–4999	1.197 * (0.115)	1.264 (0.246)	1.134 (0.220)	1.135 (0.207)	1.195 (0.252)
5000–24,999	1.571 *** (0.146)	1.390 * (0.265)	1.356 (0.254)	1.833 *** (0.315)	1.497 ** (0.306)
Over 25,000	1.660 *** (0.153)	1.714 *** (0.319)	1.312 (0.249)	1.597 *** (0.276)	1.986 *** (0.392)
Job–education mismatch					
Somewhat related (ref: Closely related)	1.081 (0.055)	0.941 (0.096)	1.126 (0.119)	1.140 (0.102)	1.158 (0.131)
Not related	1.017 (0.073)	0.801 (0.119)	1.330 * (0.195)	1.066 (0.137)	0.933 (0.153)
Log_salary	0.975 (0.034)	0.860 ** (0.058)	1.215 ** (0.094)	0.991 (0.062)	0.943 (0.069)
Work term	0.993 *** (0.001)	0.994 *** (0.002)	0.992 *** (0.002)	0.991 *** (0.001)	0.996 * (0.002)
Work term squared	1.000 *** (0.000)	1.000 * (0.000)	1.000 * (0.000)	1.000 *** (0.000)	1.000 (0.000)
Major					
Bio, agri and enviro life sciences (ref: Computer and math sciences)	0.848 * (0.084)	1.024 (0.193)	0.775 (0.163)	0.797 (0.141)	0.984 (0.230)
Physical sciences	1.058 (0.111)	0.984 (0.208)	1.306 (0.281)	0.925 (0.174)	1.210 (0.300)
Social sciences	1.010 (0.084)	0.819 (0.138)	1.141 (0.200)	0.899 (0.130)	1.460 * (0.289)
Engineering	0.951 (0.072)	1.261 (0.185)	0.978 (0.158)	0.808 (0.109)	1.020 (0.187)
S and E-related fields	0.828 ** (0.074)	0.639 ** (0.118)	0.902 (0.164)	0.731 ** (0.115)	1.291 (0.274)
Non-S and E fields	0.827 ** (0.065)	0.838 (0.130)	0.831 (0.137)	0.719 ** (0.100)	1.147 (0.219)
Employer type					
Business (ref: Academic)	0.851 *** (0.049)	0.910 (0.104)	0.661 *** (0.077)	0.946 (0.100)	0.983 (0.134)
Government	0.639 *** (0.054)	0.849 (0.162)	0.522 *** (0.106)	0.676 *** (0.097)	0.695 ** (0.129)
Constant	1.039 (0.449)	1.415 (1.227)	0.409 (0.375)	0.838 (0.653)	0.687 (0.672)
Observations	50,921	10,716	11,678	15,402	13,125
Pseudo R ²	0.065	0.073	0.090	0.079	0.074

Note: Authors' own analysis. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

In Model 1, the micro-level predictors of job satisfaction associated with the location, security, and advancement opportunity of workers' current positions were significantly yet negatively related to relocation. An additional unit of satisfaction with one's current location decreased a worker's odds of migration by 20.0 percent. The possibility of relocation decreased by 9.6 percent with an additional unit of satisfaction with the job security of cur-

rent positions. An additional unit of satisfaction with one's opportunity for advancement was related to 5.0 percent lower odds of relocation.

Among the meso-level job satisfaction predictors, intellectual challenge and degree of independence were positively associated with workers' mobility. Every additional unit of job satisfaction on intellectual challenge and degree of independence generated 15.0 percent and 12.6 percent higher odds of relocation, respectively.

Importantly, macro-level job satisfaction from the sense of one's contribution to society was negatively related to odds of relocation. An additional unit of satisfaction of contribution to society led to 12.9 percent lower odds of a worker's internal migration.

Compared with Whites, Asians were 11.6 percent more mobile but Hispanics were 23.7 percent less mobile. Respondents who identified as Black were also less mobile, but this identification's association with relocation was insignificant.

The analysis results for other control variables also reveal important details of relocation patterns that can potentially be used for future labor and education policies. Males were more mobile than females. Being older and having children were related to lower odds of relocation. A Master's and/or doctoral/professional degree was associated with higher odds of mobility. While full-time workers were less mobile, persons with supervisory positions and those at workplaces with 1000+ employees were more likely to relocate. Duration of work per month was related to lower odds of relation. Compared to graduates from computer science and math programs, those who studied "bio, agriculture, environment, and life sciences", "science and engineering-related fields". and "non-science and engineering-related fields" were less willing to relocate. People working in the business and government fields were less mobile than people in academia.

In each region's model (Models 2–5), the associations between the odds of relocation and predictors were largely as similar as the national-level model (Model 1), but there were some variations in significance level and explanation power. Below are several notable results. Asians were 83.1 percent more likely to relocate in the Midwest (Model 3), but 49.6 percent less likely to do so in the West (Model 5) than Whites. Hispanics were 23.3 percent more mobile in the Northeast (Model 2), but 46.4 percent less likely to relocate to the West (Model 5). Midwestern workers with a job–education mismatch were 33.0 percent more likely to relocate (Model 3). Marriage was negatively related to decreased probability of relocation, but only in the South (Model 4). A higher salary was negatively related to relocation in the Northeast (Model 2), but positively related in the Midwest (Model 3).

Tables 4–7 show the results of which factors influence workers who relocated from each U.S. Census Region to different destinations from 2013 to 2015. Table 4 shows the analysis results of relocation among workers in the Northeast. Northeasterners were less likely to relocate to any region when satisfied with their current positions regarding their contribution to society. The South was the favorite relocation destination among Black Northeasterners (Odds Ratio (OR): 1.79). Asian Northeasterners preferred to relocate to the West (OR: 1.92) and South (OR: 1.31). Supervisors were more likely to move to the South. Northeasterners who studied science and engineering-related fields and non-science and engineering-related fields were less likely to relocate to the West. Workers employed in business and government sectors were more likely to select the West as their relocation destination.

Table 4. Multinomial estimates of regional mobility from Northeast: 2013–2015 dataset (Model 6).

From "Northeast" to	Midwest	South	West
Job satisfaction on			
Location	0.850 (0.094)	0.854 ** (0.061)	0.922 (0.081)
Benefit	1.123 (0.134)	1.044 (0.081)	1.009 (0.095)
Security	0.691 *** (0.076)	0.891 (0.069)	0.974 (0.091)

Table 4. Cont.

From “Northeast” to	Midwest	South	West
Opportunity for advancement	0.966 (0.120)	0.984 (0.082)	0.958 (0.096)
Intellectual challenge	1.129 (0.181)	1.042 (0.106)	1.030 (0.127)
Level of responsibility	1.276 (0.231)	1.022 (0.116)	0.815 (0.107)
Degree of independence	1.430 ** (0.241)	1.146 (0.117)	1.262 * (0.154)
Contribution to society	0.753 ** (0.098)	0.860 * (0.073)	0.815 ** (0.082)
Race			
Black (ref: White)	0.608 (0.285)	1.790 *** (0.364)	0.669 (0.250)
Asian	1.059 (0.254)	1.307 * (0.205)	1.919 *** (0.322)
Hispanic	1.066 (0.349)	1.296 (0.269)	1.268 (0.318)
Other	1.847 (0.884)	1.510 (0.538)	2.426 ** (0.881)
Male	2.304 *** (0.476)	1.304 ** (0.166)	1.036 (0.157)
Age	1.020 (0.078)	0.968 (0.044)	1.019 (0.059)
Age squared	0.999 (0.001)	1.000 (0.001)	1.000 (0.001)
Married	1.086 (0.243)	1.108 (0.157)	1.069 (0.179)
Children	0.900 (0.215)	0.640 *** (0.099)	0.462 *** (0.091)
Education level			
Master (ref: Bachelor)	1.328 (0.271)	0.922 (0.122)	1.224 (0.201)
PhD/Professional	1.305 (0.401)	1.040 (0.211)	1.593* (0.378)
Full time	0.718 (0.235)	0.773 (0.162)	0.862 (0.223)
Supervisor	0.870 (0.176)	1.359 ** (0.171)	0.814 (0.134)
Employer Size			
11–24 (ref: 1–10)	1.501 (0.987)	0.857 (0.332)	0.809 (0.352)
25–99	2.726 ** (1.359)	0.980 (0.295)	0.835 (0.284)
100–499	1.840 (0.912)	1.124 (0.308)	0.549 * (0.186)
500–999	2.856 ** (1.490)	1.363 (0.422)	0.939 (0.335)
1000–4999	2.483 * (1.214)	1.288 (0.354)	0.883 (0.281)
5000–24,999	2.297 * (1.122)	1.386 (0.376)	1.094 (0.335)
Over 25,000	2.415 * (1.168)	2.078 *** (0.538)	1.117 (0.339)
Job–education mismatch			
Somewhat related (ref: Closely related)	1.089 (0.232)	0.877 (0.127)	0.960 (0.171)
Not related	0.548 (0.211)	0.794 (0.162)	0.940 (0.232)

Table 4. Cont.

From “Northeast” to	Midwest	South	West
Log_salary	0.815 (0.118)	0.810 ** (0.073)	0.989 (0.123)
Work term	0.995 (0.004)	0.993 *** (0.002)	0.994 ** (0.003)
Work term squared	1.000 (0.000)	1.000 (0.000)	1.000 * (0.000)
Major			
Bio, agri and enviro life sciences (ref: Computer and math sciences)	1.660 (0.638)	1.167 (0.313)	0.593 (0.203)
Physical sciences	1.265 (0.558)	0.861 (0.284)	0.974 (0.318)
Social sciences	1.153 (0.423)	0.701 (0.177)	0.826 (0.219)
Engineering	1.384 (0.448)	1.325 (0.284)	1.139 (0.266)
S and E-related fields	0.751 (0.311)	0.848 (0.218)	0.359 *** (0.120)
Non-S and E fields	0.822 (0.288)	1.053 (0.233)	0.601 ** (0.155)
Employer type			
Business (ref: Academic)	0.980 (0.240)	1.111 (0.185)	0.676 ** (0.128)
Government	1.187 (0.465)	1.221 (0.308)	0.297 *** (0.132)
Constant	0.980 (0.240)	1.111 (0.185)	0.676 ** (0.128)
Observations		10,716	
Pseudo R ²		0.0751	

Note: Authors’ own analysis. Multinomial logit models estimated with “stayers in the same region (Northeast)” as the base group. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5. Multinomial estimates of regional mobility from Midwest: 2013–2015 dataset (Model 7).

From “Midwest” to	Northeast	South	West
Job satisfaction on			
Location	0.970 (0.114)	0.791 *** (0.060)	0.774 *** (0.067)
Benefit	0.813 * (0.091)	0.982 (0.078)	0.917 (0.083)
Security	0.728 *** (0.084)	0.926 (0.077)	0.856 (0.081)
Opportunity for advancement	1.174 (0.150)	0.967 (0.084)	1.029 (0.104)
Intellectual challenge	1.467 ** (0.248)	1.168 (0.127)	1.131 (0.142)
Level of responsibility	0.801 (0.140)	0.896 (0.105)	0.907 (0.123)
Degree of independence	1.072 (0.167)	1.049 (0.109)	1.189 (0.146)
Contribution to society	0.966 (0.136)	0.948 (0.090)	0.828 * (0.088)
Race			
Black (ref: White)	1.161 (0.474)	1.890 *** (0.415)	0.843 (0.301)
Asian	2.704 *** (0.620)	1.506 ** (0.271)	1.783 *** (0.339)

Table 5. Cont.

From “Midwest” to	Northeast	South	West
Hispanic	1.412 (0.493)	1.793 *** (0.400)	1.275 (0.362)
Other	1.111 (0.583)	0.804 (0.340)	1.247 (0.469)
Male	1.681 *** (0.324)	1.174 (0.154)	1.293 * (0.199)
Age	0.948 (0.069)	0.909 ** (0.042)	0.908 * (0.053)
Age squared	1.000 (0.001)	1.001 ** (0.001)	1.001 (0.001)
Married	0.983 (0.206)	0.843 (0.125)	0.861 (0.143)
Children	0.493 *** (0.118)	1.015 (0.154)	0.522 *** (0.101)
Education level			
Master	1.249 (0.252)	1.552 *** (0.214)	1.509 ** (0.241)
(ref: Bachelor)			
PhD/Professional	0.782 (0.272)	1.642 ** (0.344)	1.241 (0.332)
Full time	0.640 (0.183)	0.691* (0.138)	0.494 *** (0.110)
Supervisor	0.561 *** (0.126)	1.100 (0.147)	1.231 (0.194)
Employer Size			
11–24	2.042 (1.057)	1.074 (0.398)	0.894 (0.393)
(ref: 1–10)			
25–99	0.758 (0.392)	0.682 (0.226)	0.846 (0.293)
100–499	1.209 (0.539)	0.860 (0.248)	0.503 * (0.178)
500–999	1.046 (0.549)	0.812 (0.279)	0.731 (0.289)
1000–4999	1.233 (0.550)	1.084 (0.306)	1.165 (0.360)
5000–24,999	1.867 (0.782)	1.460 (0.394)	1.023 (0.314)
Over 25,000	1.544 (0.671)	1.275 (0.350)	1.279 (0.390)
Job–education mismatch			
Somewhat related	1.417 (0.310)	1.072 (0.163)	1.050 (0.190)
(ref: Closely related)			
Not related	1.492 (0.463)	1.182 (0.252)	1.452 (0.353)
Log_salary	1.629 *** (0.283)	1.066 (0.113)	1.239 (0.164)
Work term	1.001 (0.007)	0.994 *** (0.002)	0.992 *** (0.003)
Work term squared	1.000 * (0.000)	1.000 (0.000)	1.000 ** (0.000)
Major			
Bio, agri and enviro life sciences	2.344 * (1.163)	0.491 ** (0.156)	0.784 (0.264)
(ref: Computer and math sciences)			
Physical sciences	3.354 ** (1.681)	0.934 (0.297)	1.250 (0.425)
Social sciences	3.781 *** (1.660)	0.853 (0.211)	0.912 (0.262)
Engineering	1.469 (0.645)	0.841 (0.188)	1.028 (0.262)

Table 5. Cont.

From “Midwest” to	Northeast	South	West
S and E-related fields	1.853 (0.881)	0.805 (0.198)	0.742 (0.225)
Non-S and E fields	2.379 ** (1.026)	0.680 * (0.155)	0.644 (0.177)
Employer type			
Business (ref: Academic)	0.486 *** (0.118)	0.836 (0.140)	0.604 ** (0.118)
Government	0.255 ** (0.138)	0.832 (0.218)	0.350 *** (0.139)
Constant	0.000 *** (0.001)	0.489 (0.622)	0.357 (0.560)
Observations	11,678	11,678	11,678
Pseudo R ²		0.0895	

Note: Authors’ own analysis. Multinomial logit models estimated with “stayers in the same region (Midwest)” as the base group. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6. Multinomial estimates of regional mobility from South: 2013–2015 dataset (Model 8).

From “South” to	Northeast	Midwest	West
Job satisfaction on			
Location	0.698 *** (0.052)	0.717 *** (0.057)	0.788 *** (0.056)
Salary	0.973 (0.080)	1.064 (0.093)	0.998 (0.079)
Benefit	0.922 (0.078)	0.985 (0.092)	0.968 (0.080)
Security	0.853 * (0.073)	0.949 (0.087)	0.936 (0.077)
Opportunity for advancement	1.170 (0.124)	1.238 * (0.143)	1.018 (0.102)
Intellectual challenge	0.927 (0.108)	1.075 (0.140)	0.976 (0.111)
Level of responsibility	1.286 ** (0.136)	1.000 (0.113)	1.006 (0.099)
Degree of independence	0.815 ** (0.075)	1.050 (0.107)	1.023 (0.091)
Contribution to society	0.698 *** (0.052)	0.717 *** (0.057)	0.788 *** (0.056)
Race			
Black (ref: White)	0.810 (0.165)	0.577 ** (0.134)	0.437 *** (0.106)
Asian	1.810 *** (0.301)	1.025 (0.194)	1.472 ** (0.232)
Hispanic	0.430 *** (0.118)	0.455 *** (0.115)	0.788 (0.153)
Other	0.506 (0.233)	1.017 (0.340)	1.508 (0.406)
Male	1.329 ** (0.179)	1.734 *** (0.247)	1.183 (0.149)
Age	0.982 (0.047)	0.980 (0.053)	0.955 (0.044)
Age squared	1.000 (0.001)	1.000 (0.001)	1.000 (0.001)
Married	0.701 ** (0.106)	0.901 (0.142)	0.784 * (0.109)
Children	0.655 ** (0.111)	0.894 (0.154)	0.748 * (0.115)

Table 6. Cont.

From “South” to	Northeast	Midwest	West
Education level			
Master	1.261	1.139	1.240 *
(ref: Bachelor)	(0.181)	(0.168)	(0.161)
PhD/Professional	1.198	1.452 *	1.126
	(0.256)	(0.326)	(0.233)
Full time	0.653 **	0.477 ***	1.034
	(0.140)	(0.100)	(0.246)
Supervisor	1.175	1.123	1.115
	(0.163)	(0.163)	(0.143)
Employer Size			
11–24	1.133	0.915	1.083
(ref: 1–10)	(0.424)	(0.424)	(0.409)
25–99	0.953	1.465	1.366
	(0.319)	(0.520)	(0.422)
100–499	0.854	1.253	0.981
	(0.269)	(0.428)	(0.298)
500–999	1.245	1.280	1.162
	(0.413)	(0.498)	(0.389)
1000–4999	1.013	1.332	1.121
	(0.305)	(0.448)	(0.331)
5000–24,999	1.935 **	2.776 ***	1.194
	(0.539)	(0.859)	(0.347)
Over 25,000	1.280	2.088**	1.549
	(0.370)	(0.657)	(0.435)
Job–education mismatch			
Somewhat related	1.235	1.256	0.990
(ref: Closely related)	(0.188)	(0.199)	(0.142)
Not related	0.963	1.288	1.011
	(0.212)	(0.286)	(0.211)
Log_salary	1.100	0.828*	1.081
	(0.118)	(0.082)	(0.121)
Work term	0.992 ***	0.989 ***	0.992 ***
	(0.002)	(0.003)	(0.003)
Work term squared	1.000 *	1.000 ***	1.000
	(0.000)	(0.000)	(0.000)
Major			
Bio, agri and enviro life sciences	1.458	0.452 **	0.697
(ref: Computer and math sciences)	(0.435)	(0.161)	(0.190)
Physical sciences	1.410	0.810	0.739
	(0.459)	(0.266)	(0.220)
Social sciences	1.564 *	0.850	0.577 **
	(0.407)	(0.213)	(0.134)
Engineering	0.798	0.796	0.813
	(0.210)	(0.185)	(0.160)
S and E-related fields	0.936	0.680	0.643 *
	(0.273)	(0.187)	(0.152)
Non-S and E fields	1.115	0.663 *	0.540 ***
	(0.283)	(0.162)	(0.116)
Employer type			
Business	0.829	1.161	0.897
(ref: Academic)	(0.145)	(0.215)	(0.156)
Government	0.570 **	0.671	0.764
	(0.144)	(0.178)	(0.170)
Constant	0.094 *	0.635	0.173
	(0.123)	(0.858)	(0.227)
Observations		15,402	
Pseudo R ²		0.0763	

Note: Authors’ own analysis. Multinomial logit models estimated with “stayers in the same region (South)” as the base group. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 7. Multinomial estimates of regional mobility from West: 2013–2015 dataset (Model 9).

From “West” to	Northeast	Midwest	South
Job satisfaction on			
Location	0.784 ** (0.083)	0.973 (0.110)	0.804 *** (0.065)
Benefit	0.967 (0.111)	1.098 (0.127)	0.968 (0.086)
Security	0.798 ** (0.091)	0.805 * (0.091)	1.086 (0.099)
Opportunity for advancement	1.109 (0.141)	0.831 (0.102)	0.823 ** (0.077)
Intellectual challenge	1.121 (0.166)	1.303 * (0.197)	1.265 ** (0.147)
Level of responsibility	0.879 (0.143)	1.121 (0.189)	0.926 (0.117)
Degree of independence	1.338 * (0.200)	1.178 (0.181)	0.929 (0.103)
Contribution to society	0.704 *** (0.087)	0.638 *** (0.078)	0.978 (0.098)
Race			
Black (ref: White)	0.847 (0.398)	1.154 (0.501)	1.232 (0.385)
Asian	0.382 *** (0.101)	0.597 ** (0.136)	0.529 *** (0.098)
Hispanic	0.433 *** (0.127)	0.457 *** (0.138)	0.642 ** (0.128)
Other	0.537 (0.231)	0.394 * (0.204)	0.371 ** (0.157)
Male	1.936 *** (0.381)	1.616 ** (0.313)	1.310 * (0.191)
Age	0.946 (0.068)	0.919 (0.066)	1.005 (0.057)
Age squared	1.000 (0.001)	1.001 (0.001)	1.000 (0.001)
Married	0.835 (0.177)	1.042 (0.222)	1.150 (0.185)
Children	0.852 (0.201)	0.996 (0.228)	0.912 (0.155)
Education level			
Master (ref: Bachelor)	1.103 (0.218)	1.218 (0.245)	1.599 *** (0.240)
PhD/Professional	1.102 (0.344)	1.738 ** (0.484)	1.297 (0.314)
Full time	0.796 (0.232)	0.667 (0.187)	1.063 (0.250)
Supervisor	1.109 (0.215)	1.299 (0.244)	0.955 (0.141)
Employer Size			
11–24 (ref: 1–10)	0.823 (0.566)	0.431 (0.277)	0.829 (0.323)
25–99	1.916 (0.896)	1.165 (0.450)	1.076 (0.327)
100–499	2.028 (0.904)	0.824 (0.331)	0.754 (0.234)
500–999	1.610 (0.873)	1.043 (0.484)	0.765 (0.283)
1000–4999	2.675 ** (1.177)	1.271 (0.477)	0.740 (0.233)
5000–24,999	3.387 *** (1.454)	1.220 (0.455)	1.092 (0.322)

Table 7. Cont.

From “West” to	Northeast	Midwest	South
Over 25,000	2.824 ** (1.231)	1.953 * (0.683)	1.707 * (0.475)
Job–education mismatch			
Somewhat related (ref: Closely related)	1.224 (0.263)	1.155 (0.247)	1.127 (0.183)
Not related	0.971 (0.296)	0.815 (0.259)	0.982 (0.232)
Log_salary	0.929 (0.127)	0.932 (0.125)	0.953 (0.104)
Work term	0.995 (0.004)	0.993 * (0.004)	1.001 (0.004)
Work term squared	1.000 (0.000)	1.000 (0.000)	1.000 * (0.000)
Major			
Bio, agri and enviro life sciences (ref: Computer and math sciences)	0.599 (0.264)	0.811 (0.353)	1.509 (0.534)
Physical sciences	1.226 (0.496)	1.135 (0.503)	1.198 (0.502)
Social sciences	0.951 (0.336)	1.294 (0.461)	2.117 ** (0.663)
Engineering	0.602 (0.201)	0.818 (0.270)	1.609 (0.469)
S and E-related fields	1.314 (0.482)	1.459 (0.542)	1.207 (0.422)
Non-S and E fields	0.955 (0.317)	0.946 (0.328)	1.513 (0.463)
Employer type			
Business (ref: Academic)	0.943 (0.240)	1.155 (0.303)	0.925 (0.182)
Government	0.767 (0.269)	0.574 (0.227)	0.700 (0.178)
Constant	0.436 (0.794)	0.468 (0.855)	0.0728 * (0.106)
Observations		13,125	
Pseudo R ²		0.0763	

Note: Authors’ own analysis. Multinomial logit models estimated with “stayers in the same region (West)” as the base group. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5 summarizes the relocation of Midwesterners. Workers with lower satisfaction on benefits or job security and higher satisfaction on intellectual challenge were more likely to move to the Northeast. The South was the favorite relocation destination among Blacks (OR: 1.89) and Hispanic Midwesterners (OR: 1.79). Asians were more likely to relocate to the Northeast (OR: 2.70), South (OR: 1.51), and West (OR: 1.78). The South and West attracted more educated workers with Master’s (South and West) and/or doctoral/professional (South) degrees. Midwestern supervisors were less likely to move to the Northeast. While Midwestern workers who studied varied science fields and non-science and engineering-related fields were more likely to be mobile to the Northeast, those who studied bio, agriculture, and environmental life science fields were less likely to move to the South. The Northeast and West were less favored relocation destinations among workers in business and government sectors.

As presented in Table 6, satisfaction with current positions in terms of location and societal contribution was negatively related to relocation going from the South to all other regions. Workers with higher satisfaction from responsibility level and lower satisfaction from job security and independence level were more likely to relocate to the Northeast. Workers in the South with higher satisfaction on advancement opportunities were likely to move to the Midwest. Blacks in the South were 42.3 percent and 56.3 percent less likely to

relocate to the Midwest and West, respectively. Hispanics were 57.0 percent and 54.5 percent less likely to move to the Northeast and Midwest, respectively. Asians were more likely to relocate to the Northeast (81.0 percent) and West (47.2 percent). Social science degree holders were more likely to move to the Northeast but less likely to move to the West.

Table 7 shows that satisfaction levels with location, job security, and societal contributions were negatively related to relocation to other regions from the West. In contrast, satisfaction with intellectual challenge and independence was positively associated with outmigration from the West. Western Asians were less likely to relocate to the Northeast (OR: 0.38), Midwest (OR: 0.60), and South (OR: 0.53). Hispanics in the West were also less likely to move to the Northeast (OR: 0.43), Midwest (OR: 0.46), and South (OR: 0.64). Master's and PhD/professional degree holders were more willing to move to the South (Master's) or Midwest (PhD/professional). Workers who studied social sciences were likely to move to the South.

5. Discussion

This study aims to extend the literature on U.S. internal migration by investigating the impacts of job satisfaction and race on relocation among highly educated workers. Results from this paper highlight several important implications of the current internal migration in the U.S.

First, job satisfaction determined at multiple levels influences the relocation of the highly educated in multiple ways. Findings in this research generally support Hypothesis 1 (micro-level job satisfaction) and Hypothesis 3 (macro-level job satisfaction) but reject Hypothesis 2 (meso-level). Factors related to micro-level job satisfaction factors, especially location and security, are important because they can be directly related to one's lifestyle, family, and living conditions. Stronger associations of job security in the Northeast and Midwest may imply that challenging and shrunken labor markets in these areas may make workers avoid economic risk by staying in their current positions. It is notable that workers who think that their jobs contribute to society were less likely to relocate, especially workers in the Northeast and West.

These findings nicely align with the literature arguing that ties to one's sense of community and geographical belonging can affect internal migration [65,66]. Local policymakers may create policy initiatives to boost the sense of community to prevent brain drain in their areas. An unexpected yet interesting finding of this study is the positive association between meso-level job satisfaction and relocation probability. As non-monetary factors, these variables are related to the characteristics of jobs and personal motivations for self-actualization. The findings from this research hint that a person with a higher meso-level job satisfaction level at his or her current position is willing to take on the additional challenge of relocation, especially for higher intellectual challenge and more independent roles. Employers may need to search for effective strategies to make their organizational structure and work environment more creative and independent for their highly educated workers.

Second, the volume of the highly educated workers' migration is relatively low vs. less educated groups [67]. While, overall, 11.6 percent of the U.S. population moved from one place to another in 2015, only 3.4 to 5.5 percent of the highly educated workers who participated in the NSCG relocated from 2013 to 2015. This finding implies that workers with a bachelor's degree or higher can stay where they live longer than others. Areas with more educated workers may have stronger tax bases from their salaries and incomes. Higher income can also boost a local economy as well-paid workers have a higher propensity to consume. Importantly, highly educated workers are more likely to engage in high technology and service industries. Such industries can not only help increase local economic growth but also contribute to building network clusters for innovation and knowledge accumulation.

Third, there are distinct inequalities in the volume of internal migration across the U.S. Census Regions. Compared to the South, skilled workers in all the other regions were highly

mobile. The U.S. Census Bureau reported that the Northeast and Midwest experienced negative net migration among the overall adult population. Therefore, our findings indicate that the Northeast and Midwest were less attractive relocation destinations among both less educated and highly educated workers. Historically, the Northeast has served as the primary area in America because as the earliest settlement area, it includes important clusters of business, finance, government, and education. The Northeast still appears to be the control tower of the U.S. economy because it features many corporate headquarters, federal government agencies, elite universities, research institutions, and related specialized service sectors. However, the form of its economy is more traditional, so there are less attractive job openings for the highly educated. Deteriorating living conditions in terms of relatively high housing prices and traffic congestion may also be other factors which make the Northeast less attractive. Likewise, the Midwest is also losing population because traditional manufacturing and industrial bases have become “rust belts”. In contrast, the West and South became new relocation destinations as they had positive net migration. During the last few decades, the West has led new and innovative economic development by serving as a center of the entertainment industry, biotechnology, computer science, and related service industries. The South has attracted high-tech companies and many manufacturing industries newly returned from overseas. Several of the fastest-growing metropolitan areas in the United States (since the 1980s) are located in the South, including Dallas–Fort Worth, Atlanta, and Houston [68–70].

Fourth, this study’s results support Hypothesis 4. The findings from Tables 4–7, supplemented with the composition of racial/ethnic groups summarized in Table 8, imply that each racial/ethnic group prefers to live where a more racially and ethnically homogeneous population lives. While Blacks were more likely to relocate in all regions, they mostly preferred to choose the South as their destination, where Blacks are the second-largest population group (18.9 percent). Likewise, Hispanics were less mobile in the South and West where more Hispanic populations reside (16.7 percent in the South, 29.3 percent in the West). While Asians in the Northeast were willing to move to the South and West, Asians in the South were likely to move to the Northeast and West. Midwestern Asians were the most willing to relocate to other regions. Asians in the West were less likely to move to other regions. The Midwest contained the smallest Asian population (2.9 percent) and the West had the largest Asian population (9.6 percent). Therefore, racial/ethnic composition may be a strong measure to understand relocation patterns across regions.

Table 8. Racial/Ethnic Group Composition by U.S. Census Regions, 2015.

Race	Region	Northeast	%	Midwest	%	South	%	West	%
White		37,543,115	67.1%	51,914,419	76.9%	69,461,642	58.6%	38,339,102	51.5%
Black		6,184,930	11.0%	6,883,018	10.2%	22,413,113	18.9%	3,304,665	4.4%
Asian		3,383,723	6.0%	1,926,062	2.9%	3,627,476	3.1%	7,116,813	9.6%
Hispanic		7,573,707	13.5%	4,996,825	7.4%	19,847,482	16.7%	21,814,191	29.3%
Other		1,304,045	2.3%	1,826,074	2.7%	3,225,664	2.7%	3,828,955	5.1%
Total		55,989,520	100.0%	67,546,398	100.0%	118,575,377	100.0%	74,403,726	100.0%

Source: U.S. Census Bureau, American Community Survey (2016).

Last but not least, the findings imply that geography may apply to talent attraction and retention, as respondents’ satisfaction with workplace location, contribution to society, and race were related to decisions whether and where to relocate among the highly educated. In addition, having children was also negatively associated with the relocation of skilled workers. Promoting local merits and amenities such as transportation, public education, recreational facilities, and public safety may be necessary. Human networks among local skilled workers and community services may enhance highly educated workers’ commitment to where they reside and work.

Our study has some limitations. First, this study’s geographic unit of analysis is the U.S. Census Regions, not smaller units such as states and counties. This is because the

NSCG only contains the information from these regions. However, our study reports how the different spatial patterns of migration flows and the job satisfaction factors differently influence internal migration across the U.S. Census Regions. Second, there is a time gap between the actual relocation (2015 NSCG) and the relocation-related independent variables with disparate impact (2013 NSCG), because NSCG data are collected biennially or triennially. However, we assume this limitation was negligible because the median duration for staying in a position is more than three years among U.S. workers [71]. We also tried to minimize this issue by selecting people who were employed during both survey time frames. Third, the results and findings were reported from only one time period of relocation (from 2013 to 2015). Therefore, future studies should use multiple times of relocation to support the findings of this study.

Despite these limitations, our study shows a recent snapshot of internal mobility in the United States. The results also demonstrate that social connections with a community are important factors to keep workers in their region, just as much as economic factors. Thus, public policymakers need to think about how to increase pull factors attracting workers, reduce the push factors making workers relocate, and maintain factors keeping workers in their regions [9]. Future studies should consider how workers' job, society, and community-related factors change, as well as how regional policy affects workers' relocation. The outflow of highly educated workers from their regions affects the stock of regional human capital [35]. Therefore, our study gives information that public policymakers need to know for their regional development.

6. Conclusions

This paper aimed to extend the literature on the internal migration of highly educated workers in the U.S. by examining how a set of predictors, especially multiple job satisfaction variables and race, differently impacted the spatial patterns of relocation across the U.S. Census Regions, using the National Science Foundation's 2013–2015 National Survey of College Graduates. The findings from a set of logistic and multinomial logistic regression models reveal that the relocation decision of skilled workers substantially relies on the factors of job satisfaction and race, among which geography-related variables were most influential. This study suggests that policy interventions for talent attraction and retention should consider not only work conditions but also personal, community, societal value, and other preferences.

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