To Move or Not to Move: College Major and Geographical Mobility

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Background

- **Education & Geographical Mobility**
  - Education influences individual's geographical mobility (Bowles, 1970; Groen, 2004; Bernard et al., 2014)
- **College Major & Mobility**
  - Mainly from the perspectives of social mobility rather than geographical mobility
  - College major is a part of education investment to gain social mobility (Berger, 1988; Wolniak et al., 2008; Altonji et al., 2015)
  - This effect depends on whether occupation is related to college major (Robst, 2007)
- **Lack analysis of this relationship:**
  - college major & geographical mobility?

Research Question

- **What is the effect of college major on geographical mobility?**
  - Original ➔ occupational location
- **More specifically:**
  - Geographical mobility means:
    - Location change from high school to occupation
    - Does the relationship remain the same among all majors?

Hypotheses

- **H1: Location Dependence**
  - Original location has impact on geographical mobility
    - People from different regions may have different probabilities of mobility
- **H2: Influence of College Major**
  - Majors of college education has impact on whether geographical mobility occurs
    - People with different college majors may have different probabilities of mobility

Data & Variables

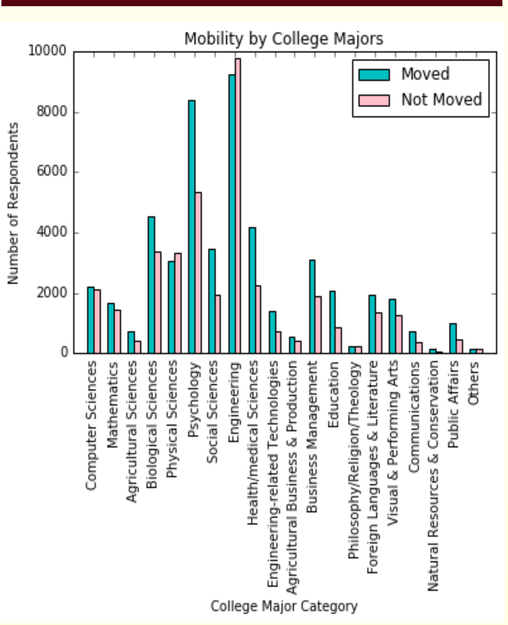
- **NSCG**:
  The 2015 National Survey of College Graduates

Variables	Description
Dependent Variables	
Whether Moved	For logistic regression and prediction tree. 1 if original location is different from occupational location, 0 if not
Skills required by Job	For college major classification. Categorical, represents types of skills required by respondent's current job
Independent Variables	
College Major	Categorical, 20 college major categories
Age	Continuous, age of respondents
Female	1 if the respondent is female, 0 if is male
Race	Categorical, race of respondents
Relationship	1 if in a stable romantic relationship, 0 if not
Original Location	Categorical, 1 to 9 for U.S. regions, 10 for foreign countries
Income	Continuous, logged annualized income in dollars
Tenure	Instrumental variable for income. Categorical, job tenure

Methods

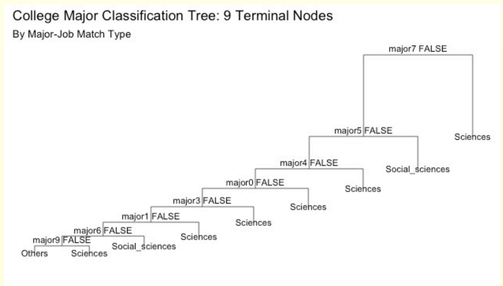
- **Techniques:**
  - Logistic Regression: hypotheses testing
  - Decision Tree: classification & prediction
- **Steps:**
  - College majors classification with tree model
  - Hypotheses testing with logistic regression with instrumental variable
  - Visualization & prediction of mobility with tree model

Distribution



College Major Classification

- Patterns of geographical mobility are different among college major categories
- College Majors could be classified
  - Different majors provide different skills required by the labor market
- Use the skills required by individual's current job, to classify the 20 college major categories in the dataset
  - Tree model to classify majors into 3 groups:
    - Fit jobs require (1) sci/tech skills, (2) social sciences skills, (3) other skills



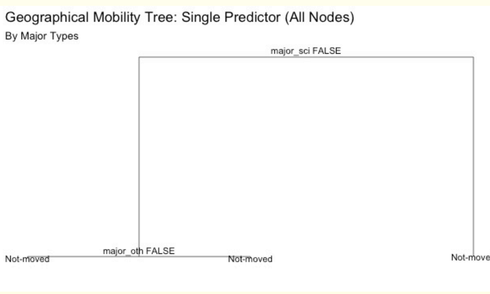
Results of Logistic Regression

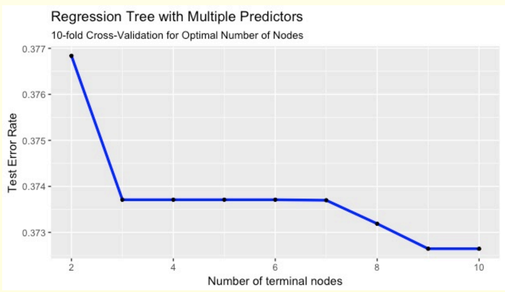
	Dependent variable: Whether Moved		
VARIABLES	(1)	(2)	(3)
Log(Income) with IV	-5.04e-05	-0.000455*	-0.000455*
Age	0.00292***	0.00157***	0.00178***
Female	-0.0418***	-0.0241***	-0.0142***
Black	0.0160***	-0.0174***	-0.0183***
Asian	0.292***	0.00750*	0.00226
Hispanic	0.0281***	-0.00322	-0.00546
Stable Relationship	0.0685***	0.0154***	0.0151***
Baseline: New England Region			
Middle Atlantic		-0.0117	-0.0112
East North		-0.0510***	-0.0496***
West North		-0.0575***	-0.0556***
South Atlantic		-0.117***	-0.116***
East South Central		-0.0212*	-0.0194*
West South Central		-0.130***	-0.128***
Mountain Region		-0.0288***	-0.0285***
Pacific & US Territory		-0.185***	-0.186***
Foreign Country		0.590***	0.591***
Majors with: Technical Skills			0.0493***
Majors with: Social Sciences Skills			0.0426***
Constant	0.223***	0.336***	0.289***
Observations	90,660	90,660	90,660
R-squared	0.057	0.275	0.277

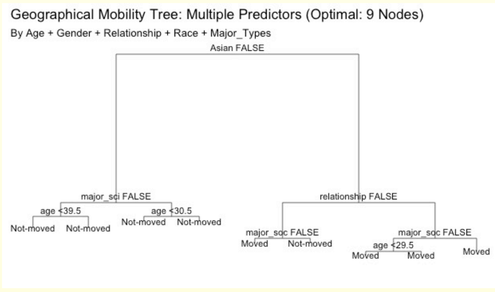
*** p<0.01, ** p<0.05, * p<0.1

Tree Model: Visualization & Prediction

- **Use tree models to**:
  (1) Visualize the relationship between college major and geographical mobility
  (2) Predict whether individuals would move, given college major
  (3) Predict whether individuals would move, given college major and demographic factors
- **Use the classified college major**:
  - to reduce dimension of analysis







Conclusion & Discussion

- **Hypotheses testing:**
  - Probabilities of geographical mobility are different among regions.
  - Majors of college education influences geographical mobility
- **Mobility Prediction:**
  - College major as single predictor could not lead to useful prediction
  - Combined with other factors, college major could provide information for prediction
  - College major is useful but not vital
- This study only provides a glimpse of the relationship between college major and geographical mobility
- Further Questions:
  - How does original location influence mobility? What role does it play
  - Does a specific category of college major provide great opportunity of social/geographical mobility?
    - e.g. computational social science ☺
  - The association between social mobility & geographical mobility?

Limitations

- **Data**
  - The NSCG lacks specific geographical information, only providing regions.
  - The NSCG may not be representative to population distribution. It has a special interest in young college graduate with sciences/technology majors.
- **Method**
  - Would take the dimension of time into consideration in the future.
  - More advanced techniques, such as spatial analysis tools/models, could have been applied, given better data.

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