Higher Education Subsidies and Human Capital Mobility

Preliminary and Incomplete

John Kennan*
University of Wisconsin-Madison and NBER

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Abstract

In the U.S. there are large differences across States in the extent to which college education is subsidized, and there are also large differences across States in the proportion of college graduates in the labor force. State subsidies are apparently motivated in part by the perceived benefits of having a more educated workforce. The paper uses the migration model of Kennan and Walker (2009) to analyze how geographical variation in college education subsidies affects the migration decisions of college graduates. The model is estimated using NLSY data, and used the quantify the sensitivity of migration decisions to differences in expected net lifetime income. The estimates suggest that State subsidies have little effect on the geographical distribution of college graduates.

1 Introduction

There are substantial differences in subsidies for higher education across States. Are these differences related to the proportion of college graduates in each State? If so, why? Do the subsidies change decisions about whether or where to go to college? If State subsidies induce more people to get college degrees, to what extent does this additional human capital tend to remain in the State that provided the subsidy?

Recent work on migration has emphasized that migration involves a sequence of reversible decisions that respond to migration incentives in the face of potentially large migration costs.[1] The results of Kennan and Walker (2009) indicate that labor supply responds quite strongly to geographical wage differentials and location match effects, in a life-cycle model of expected income maximization.

*Department of Economics, University of Wisconsin, 1180 Observatory Drive, Madison, WI 53706; jkennan@ssc.wisc.edu. I thank Jim Walker and Chris Taber for helpful comments.

[1]See Kennan and Walker (2009), Gemici (2008) and Bishop (2008).

The model is related to earlier work by Keane and Wolpin (1997), who used a dynamic programming model to analyze schooling and early career decisions in a national labor market. Keane and Wolpin (1997) estimated that a $2000 tuition subsidy would increase college graduation rates rise by 8.4%. This suggests that variation in tuition rates across States should have big effects on schooling decisions. This paper considers these effects in a dynamic programming model that allows for migration both before and after acquiring a college degree. In the absence of moving costs, the optimal policy for someone who decides to go to college is to move to the location that provides the cheapest education, and subsequently move to the labor market that pays the highest wage. At the other extreme, if moving costs are very high, the economic incentive to go to college depends only on the local wage premium for college graduates, and estimates based on the idea of a national labor market are likely to be quite misleading. Thus it is natural to consider college choices and migration jointly in a model that allows for geographical variation in both the costs and benefits of a college degree.

2 Geographical Distribution of College Graduates

There are big differences across States in the proportion of college graduates who are born in each State, and in the proportion of college graduates among those working in the State. Figure 1 shows the distribution of college graduates aged 25-50 in the 2000 Census, as a proportion of the number of people in this age group working in each State, and as a proportion of the number of workers in this age group who were born in each State. For example, someone who was born in New York is almost twice as likely to be a college graduate as someone born in Kentucky, and someone working in Massachusetts is twice as likely to be a college graduate as someone working in Nevada. Generally, the proportion of college graduates is high in the Northeast, and low in the South.

There are also big differences in the proportion of college graduates who stay in the State where they were born. Figure 2 shows the proportion of college graduates who work in their birth State. On average, about 45% of all college graduates aged 25-50 work in the State where they were born, but this figure is above 65% for Texas and California, and it is below 25% for Alaksa and Wyoming.

States spend substantial amounts of money on higher education, and there are large and persistent differences in these expenditures across States. Figure 3 shows the variation in (nominal) per capita expenditures across States in 1991 and 2004, using data from the Census of Governments.

Figure 1: Birth and Work Locations of College Graduates, 2000

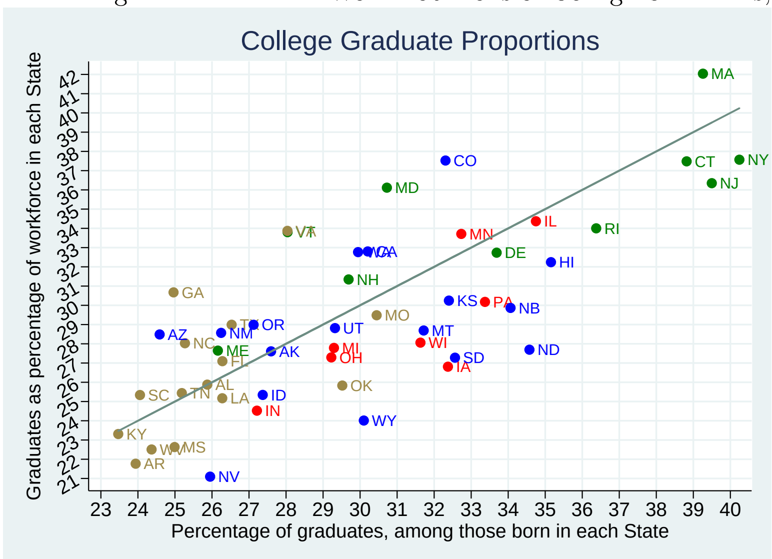


Figure 3: Higher Education Expenditures

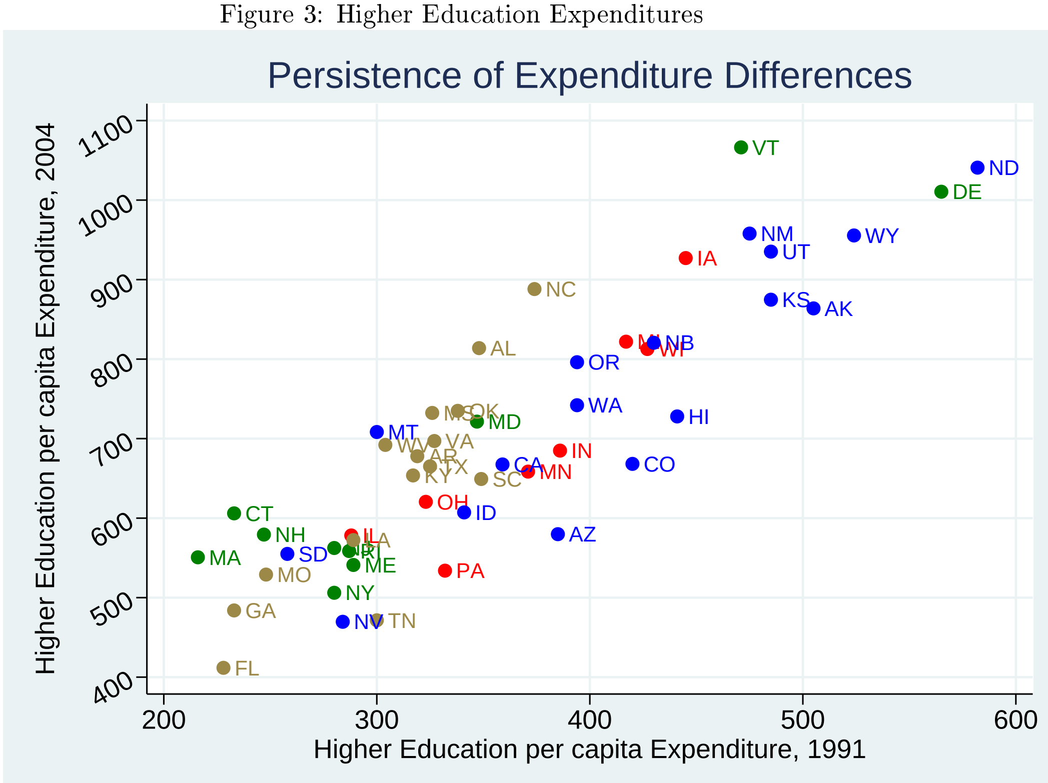
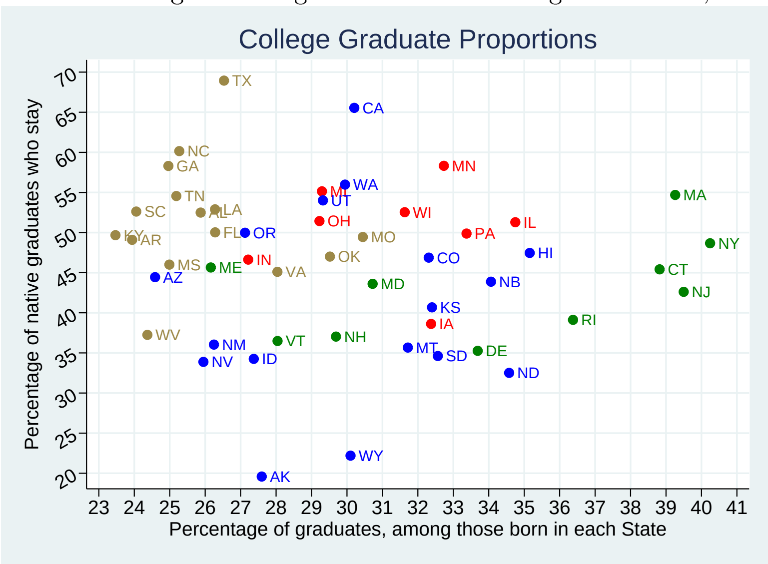
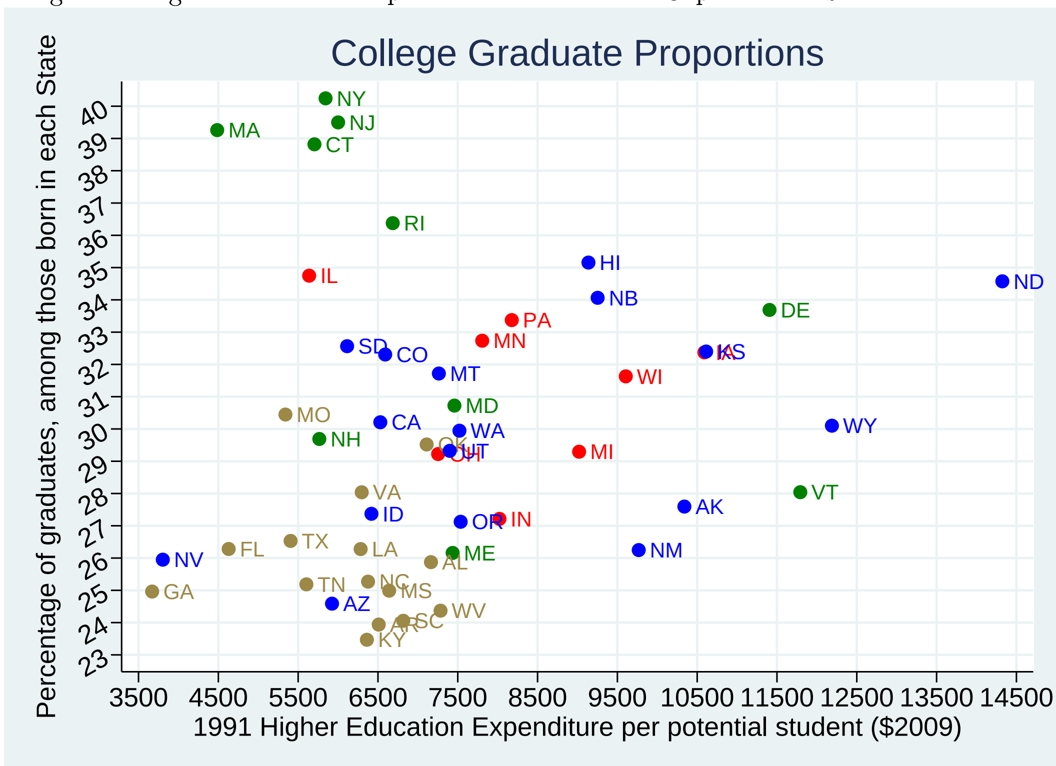


Figure 2: Migration Rates of College Graduates, 2000



The magnitude of these expenditures suggests that a more highly educated workforce is a major goal of State economic policies, perhaps because of human capital externalities. Thus it is natural to ask whether differences in higher education expenditures help explain the differences in labor force outcomes shown in Figures 1 and 2. Figure 4 plots expenditure per student of college age against the proportion of college graduates among those born in each State. There are big variations across States in each of these variables, but these variations are essentially unrelated.

Figure 4: Higher Education Expenditures and Human Capital Distribution



2.1 Tuition Differences

State expenditure on higher education provides a very broad measure of the variation in subsidies, and it might be argued that a more direct measure of college costs might be more relevant. Resident and nonresident tuition rates in 2008-09 by State are shown in Figure 5, and the relationship between (resident) tuition and the proportion of college graduates is shown in Figure 6.[2] Again, there are big differences in tuition rates across States, but no indication that these differences affect college completion rates.

[2]See http://www.hecb.wa.gov/research/issues/documents/TAB6.TuitionandFees2008-09Report-FINAL.pdf

Figure 5: Higher Education Expenditures

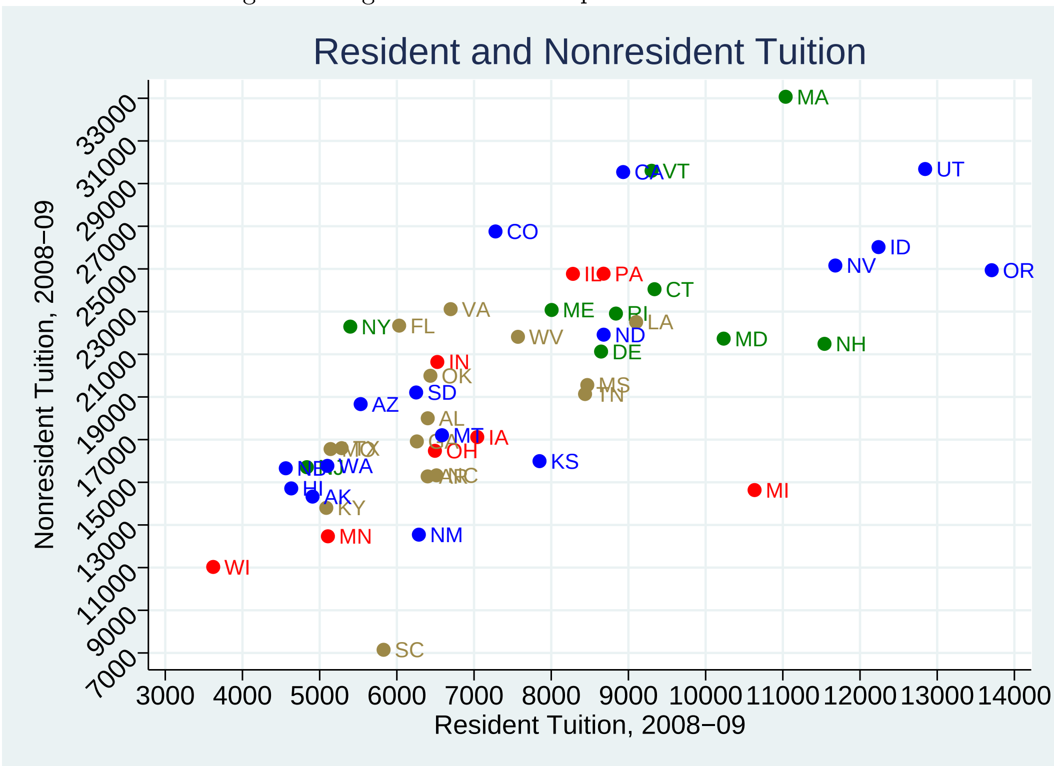
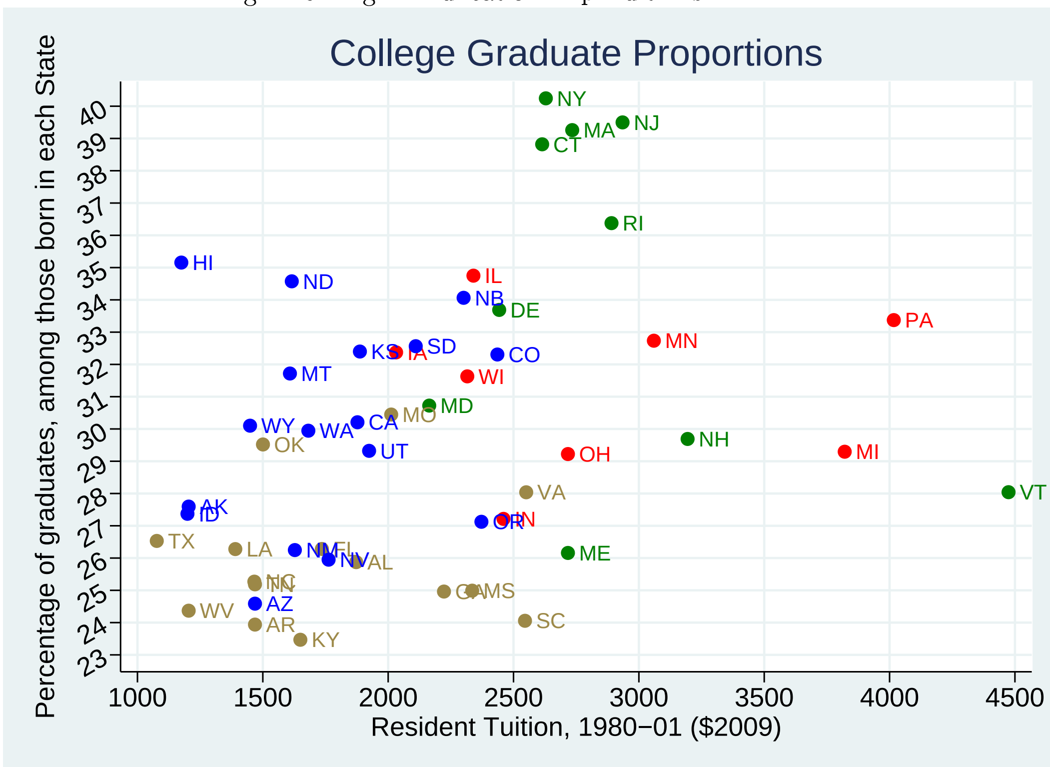


Figure 6: Higher Education Expenditures



A more formal analysis of these data is presented in the next section.

3 Related Work

[To be added]

4 A Life-Cycle Model of Expected Income Maximization

The empirical results in Kennan and Walker (2009) indicate that high school graduates migrate across States in response to differences in expected income. This section analyzes the college choice and migration decisions of high-school graduates, using the dynamic programming model developed in Kennan and Walker (2009), applied to panel data from the 1979 cohort of the National Longitudinal Survey of Youth. The aim is to quantify the relationship between college choice and migration decisions, on the one hand, and geographical differences in college costs and expected incomes on the other. The model can be used to analyze the extent to which the distribution of human capital across States is influenced by State subsidies for higher education. The basic idea is that people tend to buy their human capital where it is cheap, and move it to where wages are high, but this tendency is substantially affected by moving costs.

Suppose there are J locations, and individual i's income y_{ij} in location j is a random variable with a known distribution. Migration decisions are made so as to maximize the present value of expected lifetime income.

Let x be the state vector (which includes the stock of human capital, ability, wage and preference information, current location and age, as discussed below). The utility flow for someone who chooses location j is specified as $u(x, j) + \zeta_j$, where ζ_j is a random variable that is assumed to be iid across locations and across periods and independent of the state vector. It is assumed that ζ_j is drawn from the Type I extreme value distribution. Let $p(x'|x, j)$ be the transition probability from state x to state x', if location j is chosen. The decision problem can be written in recursive form as

$$V(x, \zeta) = \max_j (v(x, j) + \zeta_j)$$

where

$$v(x, j) = u(x, j) + \beta \sum_{x'} p(x'|x, j)\bar{v}(x')$$

and

$$\bar{v}(x) = E_\zeta V(x, \zeta)$$

and where β is the discount factor, and E_ζ denotes the expectation with respect to the distribution of the J-vector ζ with components ζ_j.Then, using arguments due to McFadden (1973) and Rust (1994), we have

$$\exp(\bar{v}(x)) = \exp(\bar{\gamma}) \sum_{k=1}^{J} \exp(v(x, k))$$

where $\bar{\gamma}$ is the Euler constant. Let $\rho(x, j)$ be the probability of choosing location j, when the state is x. Then

$$\rho(x, j) = \exp(v(x, j) - \bar{v}(x))$$

The function v is computed by value function iteration, assuming a finite horizon, T. Age is included as a state variable, with $v \equiv 0$ at age $T + 1$, so that successive iterations yield the value functions for a person who is getting younger and younger.

In the initial period, there is a choice of whether to go to college. Let $\bar{v}_H(x)$ denote the expected continuation value of a high school graduate, and let $\bar{v}_G(x)$ denote the expected continuation value of a college graduate. Then if there are unobserved payoff shocks affecting this choice, drawn from the extreme value distribution, the proportion of people who go to college is

$$\rho_G(x) = \frac{\exp(\bar{v}_G(x))}{\exp(\bar{v}_H(x)) + \exp(\bar{v}_G(x))}$$

4.1 Wages

The wage of individual i in location j at age a in year t is specified as

$$w_{ij}(a) = \mu_j(d) + \upsilon_{ij}(d) + G(d, X_i, a) + \varepsilon_{ij}(d) + \eta_i(d)$$

where d is a college indicator, μ_j is the mean wage in location j (for each level of schooling), υ is a permanent location match effect, $G(d, X, a)$ represents the effects of observed individual characteristics, η is an individual effect that is fixed across locations, and ε is a transient effect. The random variables η, υ and ε are assumed to be independently and identically distributed across individuals and locations, with mean zero. It is also assumed that the realizations of υ are seen by the individual.

The function G is specified as a quadratic in age, with an interaction between ability and education:

$$G(d, b, a) = (1 - d)\left(\theta_{10}a + \theta_{20}a^2 + \theta_{30}b\right) + d\left(\theta_{11}a + \theta_{21}a^2 + \theta_{31}b\right)$$

where b is ability. Thus the gain from college for someone of ability b at age a is given by

$$\Delta G(b, a) = (\theta_{11} - \theta_{10})\, a + (\theta_{21} - \theta_{20})\, a^2 + (\theta_{31} - \theta_{30})\, b$$

The relationship between wages and migration decisions is governed by the difference between the quality of the match in the current location, measured by $\mu_j + \upsilon_{ij}$, and the prospect of obtaining a better match in another location k, measured by $\mu_k + \upsilon_{ik}$. The other components of wages have no bearing on migration decisions, since they are added to the wage in the same way no matter what decisions are made.

4.1.1 Stochastic Wage Components

Since the realized value of the location match component υ is a state variable, it is convenient to specify this component as a random variable with a discrete distribution, and compute continuation values at the support points of this distribution. For given support points, the best discrete approximation $\hat{F}$ for any distribution F assigns probabilities so as to equate $\hat{F}$ with the average value of F over each interval where $\hat{F}$ is constant. If the support points are variable, they are chosen so that $\hat{F}$ assigns equal probability to each point.[3] Thus if the distribution of the location match component υ were known, the wage prospects associated with a move to State k could be represented by an n-point distribution with equally weighted support points $\hat{\mu}_k + \hat{\upsilon}(q_r), 1 \leq r \leq n$, where $\hat{\upsilon}(q_r)$ is the q_r quantile of the distribution of υ, with

$$q_r = \frac{2r - 1}{2n}$$

[3] See Kennan (2006)

for $1 \leq r \leq n$. The distribution of υ is in fact not known, but it is assumed to be symmetric around zero. Thus for example with $n = 3$, the distribution of $\mu_j + \upsilon_{ij}$ in each State for each education level is approximated by a distribution that puts mass $\frac{1}{3}$ on μ_j (the median of the distribution of $\mu_j + \upsilon_{ij}$), with mass $\frac{1}{3}$ on $\mu_j \pm \tau_\upsilon$, where τ_υ is a parameter to be estimated.

Measured earnings in the NLSY are highly variable, even after controlling for education and ability. Moreover, while some people have earnings histories that are well approximated by a concave age-earnings profile, others have earnings histories that are quite irregular. In other words, the variability of earnings over time is itself quite variable across individuals. It is important to use a wage components model that is flexible enough to fit these data, in order to obtain reasonable inferences about the relationship between measured earnings and the realized values of the location match component. The fixed effect η is assumed to be uniformly and symmetrically distributed around zero, with 7 points of support, so that there are three parameters to be estimated. The transient component ε should be drawn from a continuous distribution that is flexible enough to account for the observed variability of earnings. It is assumed that ε is drawn from a zero mean normal distribution with zero mean for each person, with a variance that differs across people. Specifically, person i initially draws $\sigma_\varepsilon(i)$ from a uniform discrete distribution with five support points (where these support points are parameters to be estimated), and subsequently draws ε_{it} from a normal distribution with mean zero and standard deviation $\sigma_\varepsilon(i)$, with ε_{it} drawn independently in each period.

The stochastic wage components are specified separately for high school and college graduates. But since each of these components has zero mean, and the location match component is realized only after entry into the labor force, the choice of whether to go to college depends only on the mean wages $\{\mu_j(d)\}$, and on the function G.

4.2 State Variables and Flow Payoffs

Let $\ell = (\ell^0, \ell^1)$ denote the current and previous location, and let ω be a vector recording wage and utility information at these locations. The state vector x consists of ℓ, ω, education level, ability, home location and age. The flow payoff may be written as

$$\tilde{u}_h(x, j) = u_h(x, j) + \zeta_j$$

where $u_h(x, j)$ represents the payoffs associated with observable states and choices, and where ζ_j may be viewed as either a preference shock or a shock to the cost of moving. For someone who has entered the labor market, the systematic part of the flow payoff is specified as

$$u_h(x, j) = \alpha_0 w\left(d, \ell^0, \omega\right) + \sum_{k=1}^{K} \alpha_k Y_k\left(\ell^0\right) + \alpha^H \chi\left(\ell^0 = h\right) - \Delta_\tau(x, j)$$

Here the first term refers to wage income in the current location. This is augmented by the nonpecuniary variables $Y_k\left(\ell^0\right)$, representing amenity values. The parameter α^H is a premium that allows each individual to have a preference for their native location (χ_A denotes an indicator meaning that A is true). The cost of moving from ℓ^0 to ℓ^j for a person of type τ is represented by $\Delta_\tau(x,j)$.

4.2.1 College Costs

For someone who is in college, the systematic part of the flow payoff is specified as

$$u_h(x,j) = \sum_{k=1}^{K} \alpha_k Y_k\left(\ell^0\right) + \alpha^H \chi\left(\ell^0 = h\right) - \Delta_\tau(x,j) - \gamma - \alpha_0 C\left(\ell^0\right)$$

where γ measures the disutility of the effort required to obtain a college degree (offset by the utility of life as a student), and $C(\ell)$ is the cost of a college degree in location ℓ. The college cost depends on tuition rates, subsidies for higher education, and also parents' education. Let $S(\ell)$ be the subsidy in location ℓ, let $\tau_r(\ell)$ and $\tau_n(\ell)$ be resident and nonresident tuition rates, and let d_m and d_f be indicators of whether the mother and the father are college graduates. Then the college cost is

$$C\left(\ell^0\right) = \delta_0 + \delta_1\chi(\ell = h)\,\tau_r(\ell) + \delta_2\chi(\ell \neq h)\,\tau_n(\ell) - \delta_3 S(\ell) - \delta_4 d_m - \delta_5 d_f$$

4.3 Moving Costs

Let $D\left(\ell^0, j\right)$ be the distance from the current location to location j, and let $\mathbb{A}(\ell^0)$ be the set of locations adjacent to ℓ^0 (where States are adjacent if they share a border). The moving cost is specified as

$$\Delta_\tau(x,j) = \left(\gamma_{0\tau} + \gamma_1 D\left(\ell^0, j\right) - \gamma_2\chi\left(j \in \mathbb{A}\left(\ell^0\right)\right) - \gamma_3\chi\left(j = \ell^1\right) + \gamma_4 a - \gamma_5 n_j\right)\chi\left(j \neq \ell^0\right)$$

This allows for unobserved heterogeneity in the cost of moving, : there are several types, indexed by τ, with differing values of the intercept γ_0. In particular, there may be a "stayer" type, meaning that there may be people who regard the cost of moving as prohibitive, in all states. The moving cost is an affine function of distance (which is measured as the great circle distance between population centroids). Moves to an adjacent location may be less costly (because it is possible to change States while remaining in the same general area). A move to a previous location may also be less costly, relative to moving to a new location. In addition, the cost of moving is allowed to depend on age, a. Finally, we allow for the possibility that it is cheaper to move to a large location, as measured by population size n_j.

4.4 Transition Probabilities

For someone who is in the labor force, the state vector can be written as $x = (\tilde{x}, a)$, where $\tilde{x} = \left(d, \ell^0, \ell^1, x_v^0, x_v^1\right)$ and where x_v^0 indexes the realization of the location match component of wages in the current location, and similarly for the other components. The transition probabilities are as follows

$$p(x' \mid x, j) = \begin{cases} 1 & \text{if} \quad j = \ell^0, \quad \tilde{x}' = \tilde{x}, \quad a' = a + 1 \\ 1 & \text{if} \quad j = \ell^1, \quad \tilde{x}' = \left(d, \ell^1, \ell^0, x_\upsilon^1, x_\upsilon^0\right), \quad a' = a + 1 \\ \frac{1}{n} & \text{if} \quad j \notin \left\{\ell^0, \ell^1\right\}, \quad \tilde{x}' = (d, j, \ell^0, s_\upsilon, x_\upsilon^0), \\ & \qquad 1 \leq s_\upsilon \leq n_\upsilon, \quad a' = a + 1 \\ 0 & \text{otherwise} \end{cases}$$

For someone who is in college, the transition probabilities are

$$p(x' \mid x, j) = \begin{cases} 1 & \text{if} \quad j = \ell^0, \quad \tilde{x}' = \tilde{x}, \quad a' = a + 1 \\ 1 & \text{if} \quad j = \ell^1, \quad \tilde{x}' = \left(1, \ell^1, \ell^0, 0, 0\right), \quad a' = a + 1 \\ 1 & \text{if} \quad j \notin \left\{\ell^0, \ell^1\right\}, \quad \tilde{x}' = (1, j, \ell^0, 0, 0), \quad a' = a + 1 \\ 0 & \text{otherwise} \end{cases}$$

4.5 Data

The primary data source is the National Longitudinal Survey of Youth 1979 Cohort (NLSY79); data from the 1990 Census of Population are used to estimate State mean wages, and data from the Census of Governments are used to measure State subsidies for higher ecucation. The NLSY79 conducted annual interviews from 1979 through 1994, and changed to a biennial schedule in 1994; only the information from 197994 is used here. The location of each respondent is recorded at the date of each interview, and migration is measured by the change in location from one interview to the next.

In order to obtain a relatively homogeneous sample, only white non-Hispanic males are included, using only the years after schooling is completed. For high school graduates, the analysis begins at age 20; it is assumed that college graduates spend four years in college and enter the labor force at age 24. The sample includes 432 high school graduates and 440 college graduates. The high school subsample was analyzed in detail by Kennan and Walker (2009). Wages are measured as total wage and salary income, plus farm and business income, adjusted for cost of living differences across States (using the ACCRA Cost of Living Index).

The State effects $\{\mu_j(d)\}$ are estimated using data from the Public Use Micro Sample of the 1990 Census, since the NLSY does not have enough observations for this purpose. The State effects are estimated using median regressions with age and State dummies, applied to white males who have recently entered the labor force (so as to avoid selection effects due to migration).

5 Empirical Results

The model is estimated by maximum likelihood, assuming a 40-year horizon with a discount factor $\beta = .95$. As a point of reference, the model of Kennan and Walker (2009) is first estimated separately for (white male) high school and college graduates.

Table 1: **Interstate Migration, White Male High School and College Graduates**

	High School		College			
	$\hat{\theta}$	$\hat{\sigma}_\theta$	$\hat{\theta}$	$\hat{\sigma}_\theta$	$\hat{\theta}$	$\hat{\sigma}_\theta$
Utility and Cost						
Disutility of Moving (γ_0)	4.794	0.565	3.598	0.707	3.570	0.687
Distance (γ_1) (1000 miles)	0.267	0.181	0.464	0.129	0.482	0.131
Adjacent Location (γ_2)	0.807	0.214	0.869	0.129	0.852	0.131
Home Premium (α^H)	0.331	0.041	0.170	0.019	0.167	0.019
Previous Location (γ_3)	2.757	0.357	2.383	0.185	2.382	0.179
Age (γ_4)	0.055	0.020	0.083	0.025	0.085	0.024
Population (γ_5) (millions)	0.654	0.179	0.608	0.120	0.678	0.118
Stayer Probability	0.510	0.078	0.196	0.060	0.227	0.057
Cooling (α_1) (1000 degree-days)	0.055	0.019	-0.003	0.012	0.001	0.011
Income (α_0)	0.314	0.100	0.245	0.040	0.172	0.030
Wages						
Wage intercept	-5.133	0.245	-6.401	0.517	-6.054	0.505
Time trend	-0.034	0.008	0.082	0.008	0.065	0.008
Age effect (linear)	7.841	0.356	8.196	0.682	7.936	0.667
Age effect (quadratic)	-2.362	0.129	-2.800	0.223	-2.739	0.220
Ability (AFQT)	0.011	0.065	-0.024	0.156	-0.254	0.167
Interaction(Age,AFQT)	0.144	0.040	0.162	0.107	0.522	0.114
Transient s.d. 1	0.217	0.007	0.207	0.007	0.188	0.687
Transient s.d. 2	0.375	0.015	0.399	0.016	0.331	0.131
Transient s.d. 3	0.546	0.017	0.866	0.025	0.460	0.131
Transient s.d. 4	1.306	0.028	3.358	0.051	0.921	0.019
Transient s.d. 5	—	—	—	—	3.153	0.179
Fixed Effect 1	0.113	0.036	0.323	0.020	0.205	0.022
Fixed Effect 2	0.296	0.035	0.599	0.021	0.722	0.023
Fixed Effect 3	0.933	0.016	1.562	0.030	1.081	0.025
Location match (τ_v)	0.384	0.017	0.517	0.014	0.634	0.016
Loglikelihood	-4214.160		-4925.596		-4876.957	
	4274 observations		3114 observations			
	432 men,124 moves		440 men, 267 moves			

The estimates in Table 1 show that expected income is an important determinant of migration decisions. The results for high school graduates are taken from Kennan and Walker (2009); a slightly enhanced version of the model is estimated for college graduates. The overall migration rate is much higher for college graduates (an annual rate of 8.6%, compared with a rate of 2.9% for high school graduates), but the parameter estimates are quite similar for the two samples, aside from a substantially lower estimated migration cost for college graduates.

The results in Table 1 deal only with migration decisions, conditional on education level. In the model described in Section 4, on the other hand, the level of education is also a choice variable. Moreover, since there is an interaction between ability and eduction in the wage function, the choice of whether to go to college depends on ability. The simplest specification uses just two ability levels, in order to economize on computational time. This binary ability measure is specified as an indicator of whether the AFQT percentile score is above or below the median in the full sample (which is 63).[4] The model allows college students to choose their college location in the same way as the work location. Thus, for example, if the college labor market in an alternative location is more attractive, it might be preferable to go to college there, rather than going to college in the home location and moving after college. Moreover, it might be expected that States which provide large education subsidies would attract college students from other States.

The results in Table 2 extend the findings from the separate models shown in Table 1. Differences in expected income have a strong effect on migration decisions. There is a positive interaction between ability and age in the wage process (and of course high-ability people are more likely to be college graduates – in this sample the median AFQT percentile for the high school subsample is 42, compared with 79 for the college subsample).

5.1 The Effects of Subsidies

The empirical results show little evidence that differences in college costs associated with differences in State subsidies have any effect on educational choices. The point estimates indicate that higher tuition reduces the likelihood of going to college (as would be expected), but higher State subsidies have the opposite effect, and neither effect is precisely estimated. As was mentioned above, there

[4]There is a strong relationship between ability and college choices in the data. The proportion of college graduates is about 50%, but it is about 75% for those above the median of the AFQT distribution (and about 25% for those below the median).

Table 2: **College Location Choice and Migration, White Males**

Utility and Cost	$\hat{\theta}$	$\hat{\sigma}_{\theta}$
Disutility of Moving (γ_0)		
High School	5.640	0.329
College	4.949	0.343
Distance (γ_1)	0.384	0.087
Adjacent Location (γ_2)	0.796	0.097
Home Premium $\left(\alpha^H\right)$	0.220	0.013
Previous Location (γ_3)	2.711	0.140
Age (γ_4)	0.047	0.012
Population (γ_5) (millions)	0.671	0.076
Cooling	0.018	0.008
Income (α_0)	0.265	0.021
College Cost (δ_0)	1.438	0.197
Mother's education	0.833	0.247
Father's education	1.533	0.204
College Subsidy(δ_1)	-0.179	0.240
Tuition	0.649	0.387
Loglikelihood	-10171.15	

Table 4: **College Location Choice and Migration, White Males**

	Wage Parameters			
	High School		College	
	$\hat{\theta}$	$\hat{\sigma}_\theta$	$\hat{\theta}$	$\hat{\sigma}_\theta$
Wage intercept	-3.682	0.202	-6.029	0.460
Age effect (linear)	7.259	0.315	9.495	0.641
Age effect (quadratic)	-2.349	0.122	-2.574	0.224
Ability (AFQT)	-0.141	0.035	0.339	0.037
Location match	0.358	0.015	0.612	0.013
Transient s.d. 1	0.205	0.007	0.195	0.008
Transient s.d. 2	0.377	0.020	0.328	0.021
Transient s.d. 3	0.377	—	0.451	0.026
Transient s.d. 4	0.613	0.025	0.917	0.032
Transient s.d. 5	1.384	0.039	3.045	0.041
Fixed Effect 1	0.160	0.033	0.347	0.031
Fixed Effect 2	0.450	0.025	0.766	0.022
Fixed Effect 3	1.080	0.021	1.112	0.020
Loglikelihood	-10171.15			

is substantial variation across States in the overall level of higher education subsidies, and more specifically in tuition rates, so that it should not be difficult to detect the effects of these subsidies on college choices. Of course there is always the possibility that there are other influences on college choices, omitted from the model, that vary across States in such a way as to offset the effects of subsidies. But aside from this, the results suggest that subsidies are just not important when people decide whether or where to go to college.

6 Conclusion

The data indicate that there are strong economic incentives to migrate from low-wage to high-wage locations. Using a dynamic programming model of expected income maximization to quantify these incentives, it is found that they do in fact generate sizable supply responses in NLSY data. There are also big differences across States in the extent to which higher education is subsidized, and these State subsidies are apparently motivated to a large extent by a perceived interest in having a highly educated labor force. Given the finding that workers respond to migration incentives, it might be expected that State subsidies would have the intended effect, in the sense that States that provide more generous subsidies induce more people to go to college, so that even if some of these people subsequently move elsewhere, the costs of migration are such that most people will choose to stay, so that subsidies increase the level of human capital in the local labor force. But the (preliminary) empirical findings do not support this prediction. Indeed to the extent that State subsidies for higher education are motivated by a desire to enhance the level of human capital within the State, the results provide no evidence that the subsidies have the intended effect.

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