INTERSTATE MIGRATION OF AMERICAN YOUNG ADULTS IN 1985–90: AN EXPLANATION USING A NESTED LOGIT MODEL

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This paper explains the 1985–90 interstate migration of young adults (aged 25–29 in 1990) in the United States, by applying a two-level nested logit model to a multidimensional migration table. Our main findings are as follows. The migration behaviors were affected in a rational way by income level, unemployment rate and, more importantly, employment growth (especially the growth in the service sector). The effects of foreign immigration were (1) complementary to the interstate migration of those with higher income and better education, and (2) competitive to the interstate migration of those with lower income and little education. Assistance to Families with Dependent Children (AFDC) benefit had statistically significant but rather trivial "magnet" effects on the interstate migration of poor women. These factors operated within the strong "gravity constraints" of distance and relative population size as well as the important "cultural constraints" of ethnic similarity. With respect to the effects of personal attributes, education and race were much more important than gender, poverty status, and the foreign-born/US-born distinction.

KEY WORDS: Nested logit model, multidimensional migration table, interstate migration

1. INTRODUCTION

In the 1960s, most migration researchers conceptualized the migration process in an industrialized country as a labor market phenomenon: migration responds mainly to the spatial disparities in economic opportunities. A typical model to explain origin- and destination-specific flows of migrants included such labor market factors as wage level, unemploy-

ment rate and employment growth rate, together with distance and origin and destination populations (Lowry 1966).

In the 1970s when "counter-urbanization" was widely reported for many industrialized countries, the importance of quality of life in general and environmental quality in particular on migration was emphasized. Terms like snowbelt and sunbelt became widely used in the characteization of migration in the United States. Climatic factors and indicators of social environment became more frequently incorporated in migration models as explanatory factors (Graves 1976; Greenwood 1981). Studies based on time-series migration data indicated that the conventional labor market variables became less powerful through the 1970s, with part of the explanatory power being captured by climatic factors (Shaw, 1985; Liaw and Ledent, 1987). It seemed that the average income in the industrialized countries had reached such a high level that economic opportunity, relatively to quality of life, was no longer as important as before.

Through the 1970s and 1980s, the decline of the traditional manufacturing industries, which used to be the main creators of high-paying and secure full-time jobs, shifted the burden of job creation to the service sector, where relatively high proportions of new jobs are low-paying and insecure part-time ones. Accompanied by economic globalization, this shift resulted in the stagnation of the demand for labor in the United States, especially in the so-called "rustbelt" which used to be called the industrial heartland. The resulting scarcity of new jobs, especially since the severe recession of the early 1980s, compelled those in the labor force, particular the young adults, to pay more attention to economic matters. Thus, it can be expected that the migration process has increased its dependence on the labor market variables, especially employment growth, toward recent years.

Recent political debates in the US have focused on the possible migration implications of changes in policies toward welfare payments and foreign immigration. With the increase in government debts and the shift toward conservatism in recent years, the officials of some states suspected that their relatively generous welfare benefits might have become magnets on poor migrants. In the mean time, it is suspected that in states like California, foreign immigrants may have become so numerous that they have the undesirable effect of pushing out the native population due to labor displacement or social disruption resulting from rapid demographic change (Walker et al. 1992; Frey 1995a). To be relevant to such political issues, it would certainly be valuable to incorporate welfare and immigration variables in an explanatory model of migration.

While US migration patterns adhere to well-known selectivity patterns according to personal characteristics such as age and education, it is particularly important to take cognizance of the ways race and ethnic background affects migration in contemporary America. Past research has shown that with regard to migration and distribution, Blacks, Hispanics, Asians and other groups follow specific migration paths associated with cultural attractions and constraints (Long 1988; McHugh 1989; Johnson and Rossman 1990; Bartel 1989), and the recent findings from the 1990 census suggest that these separate patterns are continuing (Frey 1995b). Migration selectivity by race-ethnicity is especially important to assess in light of the increasing concentration of "new immigrant" minorities, Hispanics and Asians, in a few port-of-entry states, at the same time that largely white, domestic migrants are dispersing from these areas (Frey, 1995b). This raises the question of the role of race-ethnicity in explaining the out-migration from these increas-

ing multi-ethnic states, as well as the role of a state's race-ethnic composition as an attraction for potential migrants. For Whites, race-selective migration may reflect preferences for a given race-ethnic environment. However, for Blacks, American Indians, and particularly the new immigrant minorities, selective migration may reflect "cultural constraints" since needed social support networks, kinship ties, and access to informal employment opportunities are only available in states with a large concentration of co-ethnics. For these reasons we suggest that race and ethnic background constitutes an important cultural constraint on migration patterns, which need to be incorporated into the analysis.

The purpose of this paper is to explain the interstate migration behavior of young adults (aged 25–29 in 1990) in 1985–90 by a wide range of explanatory variables in order to achieve a high level of explanation. We choose to focus on the young adults for a couple of reasons. First, because of their highest migration propensity, they have the greatest impact on population redistribution. Second, because they have relatively small location-specific capital (e.g. job seniority and physical assets), their migration behaviors are expected to be relatively sensitive not only to labor market variables but also to the attraction of welfare and the competition from immigrants.

Our objectives are to be achieved by applying a two-level nested logit model to a highly disaggregated migration table that was generated from the 1990 census. An important advantage of the nested logit model is that by using properly defined propensity measures as the dependent variables, its estimated results can be interpreted at both macro and micro levels.[1] The highly disaggregated migration data help reduce the risk of committing ecological fallacy.

2. MIGRATION DATA AND STATISTICAL MODEL

Our multidimensional migration table for the 25–29 age group includes the following seven dimensions: (1) sex (male, female); (2) race (Non-Hispanic White, Black, Asian, Hispanic, and American Indian); (3) education (less than high school, high school, some college, and college); (4) poverty status (poor, non-poor); (5) place of birth (U.S., foreign); (6) state of residence in 1985; and (7) state of residence in 1990. All persons whose 1985 and 1990 states of residence are different are classified as migrants, whereas those with identical states in these two years are classified as stayers. For migrants, these states are called origin and destination, respectively. For simplicity, we use race to represent "race and ethnicity". Pacific Islanders are included in the Asian group. Eskimos and Aleutians are included as American Indians.[2] Poverty status is defined according to the official

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[1] By contrast, the estimated result of a model with net migration rate or volume as the dependent variable can not be interpreted at the micro level, because nobody can be identified as a "net migrant" (Rogers, 1990). The micro-level interpretation of the estimated result of a model with the conventional immigration rate as the dependent variable is also problematic, because this rate is not a propensity measure due to the fact that its denominator (i.e. the destination population) is not the real at-risk population (Da Vanzo, 1976).

[2] The racial composition of this age group was 74.4% Non-Hispanic Whites, 12.8% Blacks, 2.4% Asians, 9.8% Hispanics, and 0.9% American Indians. The share by the foreign-born was 9.2%.

poverty line. Observations with unknown poverty status, representing 2.06% of the young adult population, are excluded from our analysis.[3]

For explaining migration behavior, the census data have well-known shortcomings. First, the level of migration is understated, because no more than one migration in the five-year period for each person can be revealed. Second, since the values of all personal attributes are measured at or near the end of the five-year interval, it is difficult to figure out the values of attributes like poverty status as of the beginning of the migration interval. For such attributes, causal inference depends on the plausibility of the assumption that the 1985 values remained largely similar to the 1990 values.

The census data, however, also have important advantages. First, their very large sample size permits highly reliable statistical inference in multivariate context. Second, it permits the incorporation of a variety of interactions with demographic subgroups (e.g. race-ethnicity, education, poverty status, nativity). Third, their national scope yields a comprehensive picture of interstate migration.

The formulation of the two-level logit model is as follows. For a potential migrant with personal attributes s and residing in state i, the migration behavior depends on (1) a departure probability $p_{s,i}$ at the upper level, and (2) a set of destination choice probabilities, p[j | s,i] for all j not equal to i, at the lower level. Based on a set of reasonable assumptions, these probabilities then become functions of observable explanatory variables in the following two sub-models (Kanaroglou, *et al.* 1986).

Destination Choice Model

$$p[j|s,i] = \frac{e^{c'x_{s,i,j}}}{\sum_k e^{c'x_{s,i,k}}} \tag{1}$$

where $x_{s,i,j}$ is a column vector of observable explanatory variables; c' is a row vector of unknown coefficients; and j and k are not equal to i.

Departure Model

$$P_{s,i} = \frac{e^{(bo + u^*I_{s,i} - b'y_{s,i})}}{1 + e^{(bo + u^*I_{s,i} - b'y_{s,i})}} \tag{2}$$

where $y_{s,i}$ is another column vector of observable explanatory variables; bo, u and b' are unknown coefficients, with u being bounded between 0 and 1; and $I_{s,i}$ is the so-called inclusive variable:

$$I_{s,i} = \ln \sum_k e^{c'x_{s,i,k}} \tag{3}$$

Assuming that the migration behavior of all persons in the same cell of the multidimensional migration table depends on the same set of $p_{s,i}$ and p[j| s,i], we estimate the unknown

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[3] We excluded the young adults with unknown poverty status from our analysis, mainly because their departure rate (30.4%) was much higher than those of the poor (14.6%) and the non-poor (16.7%). A large proportion of the excluded individuals were probably students.

coefficients in equations (1) and (2) sequentially by the maximum quasi-likelihood method (McCullagh 1983; Liaw and Ledent 1987).[4]

Our choice and specification of potentially useful explanatory variables to be considered for inclusion in the model are guided by (1) previous research findings in the literature (e.g. the simultaneous inclusion of contiguity and the log of distance to represent relative locations in the destination choice model (Liaw and Otomo, 1991)), (2) the relevance to political issues (e.g. the separation of US-born immigrants from foreign-born immigrants in the specification of immigration rates), and (3) extensive preliminary cross-tabulations of the migration data (e.g. the marked differences in departure rates by education and race but not by gender). In constructing a relatively comprehensive model (to be called the best model for simplicity), we will only include the explanatory variables that are statistically significant (i.e. those whose t-ratios have a magnitude of at least 2.0). Since our sample sizes (291,150 observations in the destination choice model and 6,785 observations in the departure model) are very large,[5] the distributions of the t-ratios are close to that of the standard normal variate. The definitions of the explanatory variables are shown in Appendix A. The data sources for these variables are described in Frey *et al.* (1996).

The goodness of fit of a given specification of a model is to be measured by:

$$\text{Rho-square} = 1 - Lg / Lo \qquad (5)$$

where Lg is the maximum quasi-likelihood of the given specification and Lo is the maximum quasi-likelihood of the corresponding null model (i.e. the destination choice model with $c' = 0$ or the departure model with $b' = 0$). Note that the ceiling of Rho-square is much less than 1.0 so that a value of 0.2 may indicate a very good fit (McFadden 1974). Another indicator of goodness of fit is:

$$\text{Weighted R-square} = 1 - Sg / Sn \qquad (6)$$

where Sg is the weighted residual mean square of the given specification; and Sn is the weighted residual mean square of the null model (Liaw and Ledent 1987). Although the value of weighted R-square tends to be much larger than that of Rho-square, we choose Rho-square over Weighted R-square, because we found that the former is more sensitive to changes in the combinations of explanatory variables.

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[4] According to the sequential method, we first estimate the coefficients of the destination choice model and then compute the values of the inclusive variable, which are then passed upward for the estimation of the coefficients of the departure model. Compared with the simultaneous method, this method is more capable of handling huge real-world problems like ours but tends to understate somewhat the standard errors of the estimators. The greater the sample size, the less important the understatement. Note that both the two-level formulation of the choice model and the sequential estimation method do not imply that the decision to depart is made before the decision to choose a destination, and that an important advantage of the two-level formulation is the separation between "push" and "pull" aspects of the migration process.

[5] The 291,150 observations in the destination choice model include 3,283,062 interstate migrants. Since the migration information was available only for the members of the households receiving the "long form", the actual number of migrants revealed on the long forms was about 548,000 persons (16.7% of 3,283,062). The 6,785 observations of the departure model include 19,965,602 potential migrants, derived from about 3,334,000 persons on the long forms. The the number of observations is much greater in the destination choice model than in the departure model, because the choice set of the destination choice model has as many as 50 alternatives, whereas that of the departure model has only two alternatives.

To help evaluate the relative importance of one subset of explanatory variables (say conventional labor market variables) against another subset (say variables representing the effects of foreign immigration), we will delete the two subsets of variables in turn from the best model and then compare the resulting decreases in Rho-square: the greater the decrease, the more important the deleted subset of variables.

3. ESTIMATION RESULTS OF THE DESTINATION CHOICE MODEL

3.1. Findings from the Best Model

We found in the best model that the migration behaviors of the young adults were affected by a wide range of explanatory variables (Table 1). With a Rho-square of 0.1661, the explanatory power of the best model is rather strong. Note that the corresponding weighted R-square is as high as 0.6923. The specific effects of various explanatory variables are as follows.

Effects of Conventional Labor Market Variables   To represent the labor market condition at potential destinations, we use three state-specific variables: (1) income per capita, (2) employment growth rate, and (3) unemployment rate. Instead of wage level, we use income per capita to represent income opportunity, because wage data collected in most industrialized countries tend to overstate the wage level of low-wage regions. By excluding the firms with less than 30 employees from the sampling universe, the data collection scheme excludes a higher proportion of low-wage employees in low-wage regions than in high-wage regions.

We found in the best model in Table 1 (Part 1) that the interstate young adult migrants were in general attracted by the high income of the potential destination. The positive effect of the interaction term between income per capita and a dummy variable representing college education indicates that this attraction was particularly strong to college graduates. It seems that college graduates were by far the most effective in using interstate migration to improve their income.

We also found that the migrants of all levels of education were similarly responsive to the attraction of the growth of total employment at destination. However, the responses to the growth of service employment differed significantly by education: the strongest for those with less than some college education, weaker for those with some college education, and near zero for college graduates. It seems that most of the new jobs created by the service sector in the late 1980s were low-skill jobs to which the better educated migrants were less attracted.

There was some evidence that the migrants of all education levels avoided destinations with high unemployment rate. The avoidance was much stronger for those with some college education and for college graduates. A likely consequence of this difference is that the prospect of being employed after migration is better for the better educated.

Effects of Quality-of-Life Indicators   Since climates that are either too cold in winter or too hot in summer tend to be less comfortable, we use coldness and hotness to represent the quality of the physical environment and expect these two variables to have negative effects on the migrants' destination choice propensities. We also use violent crime rate as an indicator of the quality of the social environment and expect a negative effect. As expected, all three quality-

Table I (Part 1)   Estimation Result of Destination Choice Model for Interstate Migrants in the 25–29 Age Group: 1985–90

Explanatory Variable	Best Model		Income Level		Employment Growth		Unemployment Rate	
	Coef.	(T)	Coef.	(T)	Coef.	(T)	Coef.	(T)
1. LABOR MARKET VARIABLES								
Income	0.31	9.6	—	—	0.86	27.3	0.54	18.3
Income * College Education	0.94	26.0	—	—	1.03	27.7	1.22	37.9
Total Employment Growth	2.19	24.8	2.49	28.4	—	—	1.02	13.1
Services Employment Growth	3.12	29.7	3.24	30.7	—	—	3.80	40.6
Services Employment Growth * Some College Ed.	−1.26	−12.1	−1.26	−12.0	—	—	−0.73	−7.5
Services Employment Growth * College Ed.	−3.66	−36.6	−3.89	−38.9	—	—	−2.96	−31.5
Unemployment Rate	−0.74	−2.7	−1.04	−3.9	−3.35	−13.5	—	—
Unemployment Rate * Some College Ed.	−5.03	−14.6	−5.04	−14.6	−3.11	−9.9	—	—
Unemployment Rate * College Ed.	−7.41	−20.9	−11.30	−34.6	−1.98	−5.9	—	—
2. QUALITY-OF-LIFE INDICATORS								
Coldness	−0.17	−42.6	−0.12	−36.6	−0.28	−79.6	−0.17	−42.6
Hotness	−0.06	−13.6	−0.03	−4.6	−0.20	−32.4	−0.07	−11.3
Violent Crime Rate	−2.20	−15.4	−1.43	−10.2	−1.89	−13.3	−3.32	−24.4
3. WELFARE ATTRACTION								
AFDC Benefit * Poor Black Female	0.75	3.9	0.71	3.7	0.78	4.0	0.81	4.2
AFDC Benefit * Poor Asian Female	2.12	4.5	2.03	4.3	2.35	5.0	2.15	4.5
AFDC Benefit * Poor Female with L. T. High School Ed.	0.34	2.2	0.24	1.6	0.39	2.5	0.36	2.4
AFDC Benefit * Poor Female with High School Ed.	0.70	4.9	0.61	4.3	0.73	5.0	0.71	5.0
4. FOREIGN IMMIGRATION								
Immigration Rate	0.09	26.2	0.13	39.5	0.07	19.7	0.12	34.3
Immigration Rate * Poor White with L. T. Some Col. Ed.	−0.20	−21.9	−0.21	−23.1	−0.20	−21.0	−0.21	−22.8
Immigration Rate * Poor Black with L. T. Some Col. Ed.	−0.14	−8.8	−0.15	−9.1	−0.18	−10.8	−0.15	−9.5
Immigration Rate * Poor Hispanic with L. T. Some Col. Ed.	−0.12	−7.4	−0.12	−7.9	−0.10	−6.2	−0.12	−7.6
Immigration Rate * Poor Am. Indian with L. T. Some Col. Ed.	−0.28	−6.5	−0.29	−6.6	−0.27	−6.3	−0.29	−6.6

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Explanatory Variable	Best Model		Income Level		Employment Growth		Unemployment Rate	
	Coef.	(T)	Coef.	(T)	Coef.	(T)	Coef.	(T)
5. RACIAL ATTRACTION								
Racial Similarity	0.12	24.8	0.10	21.0	0.22	47.2	0.12	25.1
Racial Similarity * Black	0.27	25.2	0.30	27.9	0.12	11.1	0.27	25.4
Racial Similarity * Asian	0.36	29.3	0.38	31.4	0.22	18.0	0.36	29.3
Immigration Rate * Hispanic	0.25	26.7	0.27	28.5	0.11	11.9	0.25	26.4
Racial Similarity * American Indian	0.45	22.0	0.46	22.5	0.35	17.1	0.46	22.1
Racial Similarity * Less Than High School Ed.	0.07	8.1	0.08	8.8	0.07	8.1	0.07	7.7
Racial Similarity * Black * Less Than High School Ed.	−0.11	−4.3	−0.12	−4.5	−0.11	−4.4	−0.10	−3.9
Racial Similarity * Asian * Less Than High School Ed.	−0.09	−3.1	−0.09	−2.9	−0.10	−3.1	−0.10	−3.4
Racial Similarity * American Indian * L. T. High School Ed.	−0.09	−2.0	−0.10	−2.1	−0.11	2.3	−0.09	−1.9
6. RELATIVE LOCATION								
Ln(Distance)	−0.61	−145.3	−0.62	−149.3	−0.60	−140.8	−0.62	−146.7
Ln(Distance) * Less Than High School Education	−0.14	−15.1	−0.14	−14.7	−0.14	−14.9	−0.13	−14.7
Ln(Distance) * Alaska	0.30	71.1	0.30	72.4	0.31	71.6	0.28	67.7
Ln(Distance) * Hawaii	0.07	19.2	0.05	14.9	0.10	25.4	0.07	19.1
Contiguity	0.71	89.0	0.70	87.6	0.73	90.2	0.70	87.8
Contiguity * College Education	0.08	8.2	0.08	8.4	0.08	8.9	0.07	7.6
7. SIZE OF ECUMENE								
Ln(Population Size)	0.74	225.9	0.75	233.1	0.70	215.6	0.72	226.3
Rho-Square	0.1661		0.1655		0.1631		0.1655	
Decrease in Rho-Square from Best Model	—		0.0006		0.0030		0.0006	

Table I (Part 2)   Estimation Result of Destination Choice Model for Interstate Migrants in the 25–29 Age Group: 1985–90

Explanatory Variable	Labor Market Variables		AFDC Benefit		All Effects of Immigration		Negative Effect of Immigration	
	Coef.	(T)	Coef.	(T)	Coef.	(T)	Coef.	(T)
1. LABOR MARKET VARIABLES								
Income	—	—	0.31	9.6	0.59	19.8	0.27	8.3
Income * College Education	—	—	0.93	25.7	1.00	27.1	1.01	27.7
Total Employment Growth	—	—	2.21	25.0	2.66	30.5	2.21	24.9
Service Employment Growth	—	—	3.09	29.5	2.48	24.0	3.06	29.1
Service Employment * Some College Ed.	—	—	−1.24	−11.9	−1.22	−11.6	−1.19	−11.4
Service Employment Growth * College Ed.	—	—	−3.63	−36.4	−3.63	−35.8	−3.57	−35.6
Unemployment Rate	—	—	−0.78	−2.8	−1.58	−5.7	−0.49	−1.8
Unemployment Rate * Some College Ed.	—	—	−4.99	−14.5	−5.62	−16.2	−5.56	−16.1
Unemployment Rate * College Ed.	—	—	−7.41	−20.9	−7.86	−21.8	−7.70	−21.6
2. QUALITY-OF-LIFE INDICATORS								
Coldness	−0.14	−50.9	−0.16	−42.4	−0.23	−75.2	−0.16	−41.9
Hotness	0.02	4.5	−0.09	−13.7	−0.19	−40.8	−0.09	−13.6
Violent Crime Rate	−2.04	−15.2	−2.19	−15.3	−0.79	−6.0	−2.20	−15.4
3. WELFARE ATTRACTION								
AFDC Benefit * Poor Black Female	0.80	4.2	—	—	0.82	4.4	0.56	4.7
AFDC Benefit * Poor Asian Female	2.13	4.5	—	—	2.72	5.7	2.64	5.6
AFDC Benefit * Poor Female with L. T. High School Ed.	0.31	2.0	—	—	−0.57	−3.9	−0.67	−4.6
AFDC Benefit * Poor Female with High School Ed.	0.64	4.5	—	—	−0.28	−2.0	−0.38	−2.8
4. FOREIGN IMMIGRATION								
Immigration Rate	0.23	83.4	0.09	26.3	—	—	0.09	24.3
Immigration Rate * Poor White with L. T. Some Col. Ed.	−0.21	−23.2	−0.19	−21.4	—	—	—	—
Immigration Rate * Poor Black with L. T. Some Col. Ed.	−0.20	−12.0	−0.10	−6.8	—	—	—	—
Immigration Rate * Poor Hispanic with L. T. Some Col. Ed.	−0.11	−6.9	−0.11	−6.9	—	—	—	—
Immigration Rate * Poor Am. Indian with L. T. Some Col. Ed.	−0.28	−6.7	−0.27	−6.3	—	—	—	—

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Table I (Part 2) Estimation Result of Destination Choice Model for Interstate Migrants in the 25–29 Age Group: 1985–90

Explanatory Variable	Labor Market Variables		AFDC Benefit		All Effects of Immigration		Negative Effect of Immigration	
	Coef.	(T)	Coef.	(T)	Coef.	(T)	Coef.	(T)
5. RACIAL ATTRACTION								
Racial Similarity	0.20	42.8	0.12	24.7	0.14	28.5	0.12	24.0
Racial Similarity * Black	0.15	15.0	0.25	24.9	0.22	20.7	0.27	25.5
Racial Similarity * Asian	0.24	19.8	0.36	29.9	0.35	28.4	0.37	30.1
Racial Similarity * Hispanic	0.11	12.5	0.25	26.7	0.24	25.1	0.24	26.3
Racial Similarity * American Indian	0.35	16.9	0.45	22.0	0.45	21.6	0.46	22.1
Racial Similarity * Less Than Male School Ed.	0.07	8.4	0.07	8.4	0.09	10.5	0.09	10.6
Racial Similarity * Black * Less Than High School Ed.	−0.10	−4.1	−0.12	−4.9	−0.14	−5.3	−0.14	−5.4
Racial Similarity * Asian * Less Than High School Ed.	−0.10	−3.2	−0.08	−2.7	−0.11	−3.5	−0.11	−3.5
Racial Similarity * American Indian * L. T. High School Ed.	−0.10	−2.3	−0.09	−2.0	−0.10	−2.2	−0.10	−2.2
6. RELATIVE LOCATIONS								
Ln(Distance)	−0.65	−155.7	−0.61	−145.3	−0.60	−140.6	−0.61	−144.2
Ln(Distance) * Less Than High School Education	−0.13	−13.5	−0.14	−15.2	−0.15	−16.6	−0.15	−16.4
Ln(Distance) * Alaska	0.26	62.3	0.30	71.2	0.32	75.4	0.30	70.7
Ln(Distance) * Hawaii	0.04	10.6	0.07	19.2	0.11	31.1	0.07	18.9
Contiguity	0.66	82.6	0.71	89.1	0.72	89.8	0.71	88.8
Contiguity * College Education	0.08	8.3	0.08	8.2	0.08	8.0	0.08	8.1
7. SIZE OF ECUMENE								
Ln(Population Size)	0.68	222.6	0.74	226.2	0.75	230.3	0.74	225.2
Rho-Square	0.1597		0.1660		0.1654		0.1657	
Decrease in Rho-square from Best Model	0.0064		0.0001		0.0006		0.0003	

Table I (Part 3) Estimation Result of Destination Choice Model for Interstate Migrants in the 25–29 Age Group: 1985–90

Explanatory Variable	Climatic Variables		Violent Crime Rate		Racial Similarity		Destination Population	
	Coef.	(T)	Coef.	(T)	Coef.	(T)	Coef.	(T)
1. LABOR MARKET VARIABLES								
Income	−0.57	−21.5	0.21	6.6	0.27	8.5	1.43	45.2
Income * College Education	0.88	24.5	0.94	25.7	0.84	22.7	1.11	30.4
Total Employment Growth	2.45	27.9	2.35	26.8	2.32	25.8	2.93	31.1
Service Employment Growth	4.64	44.9	2.92	28.1	3.18	30.1	−1.20	−10.9
Service Employment Growth * Some College Ed.	−1.22	−11.4	−1.27	−12.2	−1.20	−11.3	−1.06	−10.3
Service Employment Growth * College Ed.	−3.60	−34.9	−3.64	−36.5	−3.59	−35.2	−3.37	−33.9
Unemployment Rate	−1.80	−6.6	−1.56	−5.8	−0.68	−2.4	0.47	1.7
Unemployment Rate * Some College Ed.	−5.12	−14.8	−5.02	−14.6	−4.82	−13.8	−4.06	−11.7
Unemployment Rate * College Ed.	−8.18	−23.3	−7.45	−21.0	−7.70	−21.3	−3.75	−10.5
2. QUALITY-OF-LIFE INDICATORS								
Coldness	—	—	−0.18	−46.1	−0.14	−39.8	−0.40	−102.5
Hotness	—	—	−0.11	−18.9	−0.06	−9.2	−0.34	−52.9
Violent Crime Rate	−1.48	−11.0	—	—	−2.91	−22.2	−5.30	−39.8
3. WELFARE ATTRACTION								
AFDC Benefit * Poor Black Female	0.51	2.6	0.69	3.6	−1.12	−5.7	0.89	4.2
AFDC Benefit * Poor Asian Female	1.74	3.6	2.15	4.6	4.52	9.8	2.39	4.5
AFDC Benefit * Poor Female with L. T. High School Ed.	−0.24	−1.6	0.35	2.3	0.50	3.3	0.70	4.1
AFDC Benefit * Poor Female with High School Ed.	0.15	1.0	0.70	4.9	0.83	5.7	1.03	6.5
4. FOREIGN IMMIGRATION								
Immigration Rate	0.15	59.7	0.07	21.9	0.11	32.2	0.23	63.8
Immigration Rate * Poor White with L. T. Some Col. Ed.	−0.19	−20.6	−0.20	−21.7	−0.24	−26.2	−0.23	−21.7
Immigration Rate * Poor Black with L. T. Some Col. Ed.	−0.07	−4.6	−0.15	−9.3	−0.10	−6.5	−0.20	−10.9
Immigration Rate * Poor Hispanic with L. T. Some Col. Ed.	−0.10	−6.3	−0.12	−7.6	0.16	10.8	−0.08	−4.8
Immigration Rate * Poor Am. Indian with L. T. Some Col. Ed.	−0.21	−5.0	−0.29	−6.6	−0.27	−6.3	−0.27	−5.4

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Table I (Part 3) Estimation Result of Destination Choice Model for Interstate Migrants in the 25–29 Age Group: 1985–90

Explanatory Variable	Climatic Variables		Violent Crime Rate		Racial Similarity		Destination Population	
	Coef.	(T)	Coef.	(T)	Coef.	(T)	Coef.	(T)
5. RACIAL ATTRACTION								
Racial Similarity	−0.05	−11.9	0.15	34.0	—	—	0.08	16.5
Racial Similarity * Black	0.52	52.6	0.21	21.2	—	—	0.22	22.1
Racial Similarity * Asian	0.59	51.1	0.32	26.7	—	—	0.42	31.9
Racial Similarity * Hispanic	0.48	55.5	0.22	23.8	—	—	0.30	30.9
Racial Similarity * American Indian	0.63	30.5	0.43	20.7	—	—	0.32	13.9
Racial Similarity * Less Than High School Ed.	0.07	8.1	0.07	8.1	—	—	0.05	5.7
Racial Similarity * Black * Less Than High School Ed.	−0.11	−4.5	−0.11	−4.4	—	—	−0.06	−2.6
Racial Similarity * Asian * Less Than High School Ed.	−0.09	−2.9	−0.09	−3.1	—	—	−0.09	−2.7
Racial Similarity * American Indian * L. T. High School Ed.	−0.09	−1.9	−0.09	−2.0	—	—	−0.08	−1.5
6. RELATIVE LOCATION								
Ln(Distance)	−0.58	−139.4	−0.61	−144.8	−0.62	−146.2	−0.53	−124.7
Ln(Distance) * Less Than High School Education	−0.14	−15.2	−0.14	−15.3	−0.13	−14.4	−0.12	−12.5
Ln(Distance) * Alaska	0.24	59.7	0.31	73.1	0.28	06.6	0.14	30.2
Ln(Distance) * Hawaii	0.05	14.2	0.09	26.2	0.06	17.6	−0.12	−32.0
Contiguity	0.75	93.8	0.71	89.3	0.71	87.9	0.75	86.0
Contiguity * College Education	0.06	6.6	0.07	7.9	0.07	7.4	0.17	16.4
7. SIZE OF ECUMENE								
Ln(Population Size)	0.77	242.1	0.74	227.2	0.73	220.4	—	—
Rho-Square	0.1640		0.1660		0.1606		0.1346	
Decrease in Rho-Square from Best Model	0.0021		0.0001		0.0055		0.0313	

Table I (Part 4) Estimation Result of Destination Choice Model for Interstate Migrants in the 25–29 Age Group: 1085–90

Explanatory Variable	Contiguity Effect		Distance Effect		Distance & Contiguity		Best Spec.	
	Coef.	(T)	Coef.	(T)	Coef.	(T)	Coef.	(T)
1. LABOR MARKET VARIABLES								
Income	0.11	3.4	0.77	23.3	0.86	20.3	0.31	9.6
Income * College Education	0.95	25.2	1.07	27.1	1.33	26.3	0.94	26.0
Total Employment Growth	2.78	30.3	1.24	13.2	1.00	8.2	2.19	24.8
Service Employment Growth	2.80	25.7	3.68	32.6	4.08	27.9	3.12	29.7
Service Employment Growth * Some College Ed.	−1.28	−11.8	−1.22	−10.9	−1.34	−9.3	−1.26	−12.1
Service Employment Growth * College Ed.	−3.78	−36.1	−3.84	−35.9	−4.53	−33.2	−3.66	−36.6
Unemployment Rate	0.02	0.1	−0.69	−2.3	1.20	3.1	−0.74	−2.7
Unemployment Rate * Some College Ed.	−5.05	−14.1	−5.05	−13.7	−5.31	−11.2	−5.03	−14.6
Unemployment Rate * College Ed.	−6.79	−18.4	−8.44	−22.4	−8.78	−18.2	−7.41	−20.9
2. QUALITY-OF-LIFE INDICATORS								
Coldness	−0.16	−39.8	−0.12	−32.9	−0.11	−24.2	−0.17	−42.6
Hotness	−0.05	−7.8	−0.09	−14.7	−0.09	−12.5	−0.08	−13.6
Violent Crime Rate	−2.35	−16.0	−1.91	−13.2	−1.73	−9.4	−2.20	−15.4
3. WELFARE ATTRACTION								
AFDC Benefit * Poor Black Female	0.74	3.7	0.82	3.9	0.83	3.1	0.75	3.9
AFDC Benefit * Poor Asian Female	2.10	4.3	2.36	4.5	2.32	3.5	2.12	4.5
AFDC Benefit * Poor Female with L. T. School Ed.	0.40	2.6	0.04	0.3	−0.21	−1.0	0.34	2.2
AFDC Benefit * Poor Female with High School Ed.	0.76	5.1	0.57	3.7	0.37	1.9	0.70	4.9
4. FOREIGN IMMIGRATION								
Immigration Rate	0.12	33.0	0.03	9.3	−0.02	−5.8	0.09	26.2
Immigration Rate * Poor White with L. T. Some Col. Ed.	−0.20	−21.0	−0.20	−20.3	−0.19	−14.8	−0.20	−21.9
Immigration Rate * Poor Black with L. T. Some Col. Ed.	−0.15	−8.7	−0.14	−8.0	−0.14	−6.4	−0.14	−8.8
Immigration Rate * Poor Hispanic with L. T. Some Col. Ed.	−0.13	−8.2	−0.08	−4.9	−0.08	−3.7	−0.12	−7.4
Immigration Rate * Poor Am. Indian with L. T. Some Col. Ed.	−0.30	−6.6	−0.22	−4.8	−0.16	−2.6	−0.28	−6.5

(continued)

Table I (Part 4) Estimation Result of Destination Choice Model for Interstate Migrants in the 25–29 Age Group: 1085–90

Explanatory Variable	Contiguity Effect		Distance Effect		Distance & Contiguity		Best Spec.	
	Coef.	(T)	Coef.	(T)	Coef.	(T)	Coef.	(T)
5. RACIAL ATTRACTION								
Racial Similarity	0.15	29.0	0.03	6.0	0.01	1.3	0.12	24.8
Racial Similarity * Black	0.20	18.1	0.48	43.7	0.55	39.8	0.27	25.2
Racial Similarity * Asian	0.31	24.7	0.49	41.9	0.51	34.6	0.36	29.3
Racial Similarity * Hispanic	0.23	23.7	0.35	36.3	0.44	34.6	0.25	26.7
Racial Similarity * American Indian	0.45	21.0	0.56	25.0	0.67	24.0	0.46	22.0
Racial Similarity * Less Than High School Ed.	0.07	7.5	0.07	7.5	0.05	4.6	0.07	8.1
Racial Similarity * Black * Less Than High School Ed.	−0.11	−4.2	−0.08	−3.0	−0.08	−2.4	−0.11	−4.3
Racial Similarity * Asian * Less Than High School Ed.	−0.09	−2.9	−0.13	−4.1	−0.11	−2.7	−0.09	−3.1
Racial Similarity * American Indian * L. T. High School Ed.	−0.09	−1.8	−0.10	−2.0	−0.07	−1.1	−0.09	−2.0
6. RELATIVE LOCATION								
Ln(Distance)	−0.94	−311.0	—	—	—	—	−0.61	−145.3
Ln(Distance) * Less Than High School Education	−0.15	−15.2	—	—	—	—	−0.14	−15.1
Ln(Distance) * Alaska	0.34	77.6	—	—	—	—	0.30	71.1
Ln(Distance) * Hawaii	0.11	26.9	—	—	—	—	0.07	19.2
Contiguity	—	—	1.55	248.1	—	—	0.71	89.0
Contiguity * College Education	—	—	0.08	8.5	—	—	0.08	8.2
7. SIZE OF ECUMENE								
Ln(Population Size)	0.75	221.3	0.71	210.1	0.72	168.5	0.74	225.9
Rho-Square	0.1606		0.1540		0.1036		0.1661	
Decrease in Rho-square from Best Model	0.0055		0.0121		0.0624		—	

of-life indicators turned out to have negative effects on the destination choice behaviors, with the effect of coldness being stronger than that of hotness.

Attractive Effect of Welfare   To study the effect of welfare benefits on interstate migration, we focus on the AFDC (Assistance to Families with Dependent Children) benefit per recipient family.[6] We found some evidence that poor female interstate migrants of two minority races were affected positively by the AFDC benefit of destination: Blacks and Asians. Among poor women, high school graduates were more attracted than high school dropouts by the benefit. This difference suggests that high school graduates were probably more knowledgeable than high school dropouts about interstate variation in welfare benefits. It may also reflect the greater dependence of poor high school dropouts on local family support.

Complementary and Competitive Effects of Immigration   Expecting that the effects of foreign immigration might be highly selective with respect to personal attributes, we use immigration rate as an explanatory variable and let it interact with dummy variables representing various personal attributes of the migrants in question.

We found that foreign immigration had a positive effect on the destination choice of the non-poor migrants: the non-poor migrants were more prone to select destinations with higher immigration rates. By contrast, its effects on the poor migrants with relatively low education (less than some college education) were mostly negative, except for Asians. These negative effects were stronger for American Indians and Non-Hispanic Whites than for Blacks and Hispanics. Our finding is in general consistent with the idea that new immigrants tend (1) to compete for low-end jobs and can hence discourage the entry of economically and educationally poor interstate migrants, and (2) to help generate more low-cost services which are attractive to the interstate migrants of high socioeconomic status.

Attractive Effects of Racial Similarity   As indicated earlier, increasing concentrations of different race-ethnic groups in specific states may strongly constrain the destination choices of the minority groups dependent on co-ethnic networks for social and economic support. We expect the interstate migrants to be more attracted to the destinations with a familiar racial milieu. We also expect that the migrants with less education were less able to adjust to a new cultural milieu and hence more prone to be attracted to destinations with more similar racial milieu. To test these expectations, we use racial similarity as an explanatory variable and let it interact with various personal attributes of the migrants.

We found that racial similarity indeed had a positive effect on all migrants, and that the effect was stronger for each of the four minority races than for Non-Hispanic Whites. For Non-Hispanic Whites and Hispanics, we further found that those with less than high school education were more attracted by racial similarity. However, for other races, this education selectivity was either reversed (Blacks) or nearly zero (Asians and American Indians). We are somewhat disappointed that the selective effect of education on the attraction of racial similarity did not turn out to be as general as we had expected.

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[6] The effect of the combined benefit of AFDC and Food Stamp on the interstate migration of the US poverty population is assessed in Frey *et al.* (1996).

Effects of Relative Location   To represent the relative location of a potential destination, we use two explanatory variables: (1) the natural log of the distance between the population gravity centers of origin and destination states, and (2) contiguity (a dummy variable assuming the value of 1 if there is a common border between the two states). As distance increases, information and the ease of maintaining contacts with the social network at origin decrease and the moving cost increases. Distance is thus expected to have a negative effect. The log transformation is based on the common observation that the marginal friction of distance is a decreasing function of distance. We also expect contiguity to have a positive effect, because a contiguous potential destination is not subject to the effect of "intervening opportunities".

We found that ln(distance) indeed had an extremely significant negative effect. Since information field tends to be smaller for less educated individuals, we also found that the negative effect of ln(distance) was particularly strong on the migrants with less than high school education. For the two outlying destination states, we found that the marginal frictions of distance were smaller (–0.31 for Alaska and –0.54 for Hawaii).

As expected, the effect of contiguity turned out to be positive. We also found that contiguity had a positive interaction with a dummy variable representing college education, suggesting that the best educated were most likely to be involved in "interstate suburbanization" (e.g. from New York and Philadelphia metropolitan centers to their suburbs in New Jersey).

Positive Effect of the Size of Ecumene   To control for the positive effect of the size of ecumene at destination, we use the natural log of the population of destination as an explanatory variable. The log transformation is used to prevent the difference between a few very small states and a few extremely large states from dominating the estimation result. We found that ln(population size) of destination had an extremely significant positive effect on the destination choice propensity.

3.2.   Assessing the Relative Importance of the Explanatory Variables by the Method of Deletions

By deleting each of the three labor market variables in turn from the best model and observing the resulting decreases in Rho-square (Part 1 of Table 1), we found that the explanatory power of employment growth (0.0030) was more important than those of income and unemployment rate (both 0.0006). It seems that the main economic reason for selecting a particular destination was the availability of jobs —even low-paying and insecure jobs in the service sector.

The relative explanatory powers of the two policy relevant variables, AFDC benefit and immigration rate, were evaluated in Part 2 of Table 1. The former (0.0001) turned out to be less important than the latter (0.0006). Note that the explanatory power of immigration included both complementary and competitive effects, each contributing only about 0.0003 to immigration rate's explanatory power. Compared with the joint explanatory power of the set of three labor market variables (0.0064), the powers of AFDC benefit and immigration rate were much less important.

With respect to the quality-of-life indicators (Part 3 of Table 1), the explanatory power of violent crime rate (0.0001) was much smaller than the joint explanatory power of coldness and hotness (0.0021). This difference partly reflects the fact that crime is highly localized and varies more within states, whereas temperature varies more among states.

Much more important than AFDC benefit, foreign immigration, and quality-of-life indicators in affecting the destination choice behaviors was racial similarity (0.0055). Familiar cultural milieu, including the availability of relatives and friends, was a highly desirable attribute for an attractive destination. In attracting migrants, racial similarity was nearly as important as all labor market variables combined.

With respect to relative location (Part 4 of Table 1), both distance (0.0121) and contiguity (0.0055) had strong independent explanatory powers, although they are highly correlated. Clearly, distance was more important than contiguity. The simultaneous deletion of distance and contiguity results in the largest reduction in Rho-square (0.0624), indicating that relative location is by far the most important factor on the choice of destination.

4.   ESTIMATION RESULT OF THE DEPARTURE MODEL

4.1.   Findings from the Best Model

With a Rho-square of 0.0630 and a weighted R-square of 0.8031, the best departure model fits the data rather well. A wide range of explanatory variables turned out to have statistically significant effects on the departure behaviors (Part 1 of Table 2). Although having a t-ratio slightly less than 2.0, the inclusive variable is also included in the best model, because it plays the theoretical role of summarizing the attractiveness of the rest of the system.

Effects of Conventional Labor Market Variables   We found that origin income had a retention effect on potential migrants. This retention effect was particularly strong on the best educated young adults (college graduates). Although the negative effect of total employment growth rate turned out to be statistically insignificant, we found strong evidence that the potential migrants were subject to the retention effect of service employment growth. The push effect of unemployment rate turned out to be statistically significant only to the best educated young adults.

Effects of Quality-of-Life Indicators   With respect to the climate of origin, both coldness and hotness turned out to have push effects on potential migrants, with the latter being stronger than former.[7] As an indicator of the poorness of social environment, violent crime rate also turned out to have a significant push effect.

Retention Effect of Welfare Benefit   The only statistically significant retention effects of AFDC benefit that we are able to find are on (1) poor Black women, and (2) poor women with some college education.

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[7]A reviewer suggested that the greater push effect of hotness, relative to coldness, might be due to some untapped period effect.

Table II (Part 1)   Estimation Result of the Departure Model for Interstate Migrations of the 25–29 Age Group: 1985–90

Explanatory Variable	Best Model		Income Level		Employment Growth		Unemployment Rate		Labor Market Variables	
	Coef.	(T)	Coef.	(T)	Coef.	(T)	Coef.	(T)	Coef.	(T)
Constant Term	−1.83	−24.3	−2.04	−38.8	−1.99	−25.3	−1.79	−23.9	−2.20	−40.2
1. EFFECTS OF LABOR MARKET VARIABLES										
Income	−0.40	−5.8	—	—	−0.48	−6.7	−0.45	−6.6	—	—
Income * College Education	−0.49	−6.3	—	—	−0.34	−4.2	−0.65	−9.2	—	—
Services Employment Growth Rate	−2.39	−25.0	−2.37	−24.6	—	—	−2.45	−25.8	—	—
Unemployment Rate * College Education	2.61	4.8	5.06	11.2	4.22	7.8	—	—	—	—
2. EFFECTS OF QUALITY-OF-LIFE INDICATORS										
Coldness	0.04	6.5	0.01	2.7	0.07	10.8	0.04	6.9	0.03	6.7
Hotness	0.12	13.2	0.11	12.3	0.17	17.2	0.13	13.3	0.16	16.1
Violent Crime Rate	2.34	9.2	1.40	6.0	3.45	13.1	2.51	9.9	2.46	10.1
3. RETENTION EFFECTS OF WELFARE BENEFIT										
AFDC Benefit * Poor Black Female	−0.56	−3.6	−0.52	−3.3	−0.54	−3.3	−0.57	−3.6	−0.48	−2.9
AFDC Benefit * Poor Female * Some Col. Ed.	−0.25	−2.6	−0.23	−2.4	−0.22	−2.2	−0.25	−2.6	−0.20	−1.9
4. PUSH EFFECTS OF IMMIGRATION										
Immigration Rate * Poor White	0.18	23.0	0.18	22.5	0.18	21.9	0.18	22.9	0.18	20.9
Immigration Rate * Poor Black	0.09	4.5	0.08	4.3	0.09	4.3	0.09	4.4	0.08	3.9
Immigration Rate * Poor Asian	0.12	4.4	0.13	4.7	0.13	4.6	0.12	4.3	0.14	4.6
Immigration Rate * Poor Hispanic	0.08	5.4	0.08	5.1	0.07	4.9	0.08	5.4	0.07	4.5
Immigration Rate * Poor American Indian	0.12	2.5	0.11	2.4	0.10	2.1	0.12	2.5	0.09	1.9
Immigration Rate * White * Less Than High Sch. Ed.	0.10	9.3	0.10	9.4	0.01	8.8	0.10	9.3	0.10	6.8
Immigration Rate * Black * Less Than High Sch. Ed.	−0.06	−2.8	−0.05	−2.7	−0.06	−2.7	−0.06	−2.8	−0.06	−2.6
Immigration Rate * Asian * Less Than High Sch. Ed.	0.13	4.5	0.13	4.6	0.13	4.4	0.13	4.4	0.13	4.4
Immigration Rate * Hispanic * Less Than High Sch. Ed.	0.03	2.6	0.03	2.3	0.03	1.9	0.03	2.5	0.02	1.4
Returning immigrantion Rate of US-Born Persons	0.72	23.5	0.65	22.3	0.79	24.7	0.71	23.0	0.61	20.5

5. RETENTION EFFECTS OF RACIAL SIMILARITY										
Racial Similarity * Black	−0.29	−17.0	−0.28	−16.3	−0.28	−15.8	−0.29	−16.9	−0.26	−14.3
Racial Similarity * Asian	−0.55	−22.4	−0.56	−22.8	−0.58	−22.7	−0.55	−22.3	−0.59	−22.7
Racial Similarity * Hispanics	−0.44	−26.9	−0.43	−26.4	−0.42	−24.5	−0.44	−27.0	−0.41	−23.6
Racial Similarity * Am. Indian	−0.48	−14.2	−0.47	−13.6	−0.43	−11.9	−0.48	−14.2	−0.40	−10.9
Racial Similarity * Foreign-Born	0.14	8.5	0.14	8.3	0.14	7.9	0.14	8.5	0.13	7.4
Racial Similarity * Foreign-Born Asian	−0.14	−5.8	−0.14	−5.6	−0.13	−5.2	−0.14	−5.7	−0.13	−4.9
Racial Similarity * Foreign-Born Hispanic	−0.16	−7.3	−0.16	−7.0	−0.15	−6.5	−0.16	−7.2	−0.14	5.9
6. RETENTION EFFECT OF SIZE OF ECUMENE										
Ln(Population Size)	−0.27	−26.9	−0.32	−40.9	−0.30	−28.9	−0.26	−26.4	−0.36	−43.6
7. DRAWING POWER OF THE REST OF SYSTEM										
Inclusive Variable	0.04	1.9	−0.02	−1.2	−0.04	−1.8	0.04	2.3	−0.12	−6.1
8. SELECTIVITY BY PERSONAL ATTRIBUTES										
High School Education	0.25	9.3	0.30	11.2	0.31	11.0	0.24	9.0	0.37	13.3
Some College Education	0.66	29.3	0.68	30.1	0.68	28.9	0.66	29.1	0.70	29.5
College Education	1.92	13.7	1.06	23.2	1.68	11.5	2.33	21.2	1.54	46.7
Black	−0.71	−18.4	−0.74	−19.2	−0.76	−18.6	−0.70	−18.1	−0.78	−19.0
Asian	−1.84	−20.1	−2.01	−22.3	−2.07	−21.9	−1.82	−19.8	−2.27	−24.1
Hispanic	−1.25	25.9	−1.31	−27.2	−1.26	−24.9	−1.25	−25.7	−1.35	−26.2
American Indian	−2.11	−13.1	−2.21	−13.6	−2.05	−12.0	−2.09	−12.9	−2.16	−12.4
Foreign-Born Black	0.52	8.8	0.51	6.5	0.50	8.1	0.52	8.7	0.47	7.5
Foreign-Born American Indian	0.72	2.7	0.71	2.6	0.72	2.6	0.72	2.7	0.69	2.4
Female	−0.08	−7.4	−0.06	−6.2	−0.10	−9.5	−0.08	−7.5	−0.09	−7.9
9. EFFECTS OF POPULATION COMPOSITIONS										
Non-Native's Share of State Population	0.52	7.7	0.26	4.3	−0.11	−1.7	0.58	6.8	−0.40	−7.1
Armed Forces' Share of State Employment	0.38	2.0	0.77	4.2	−0.41	−2.1	0.34	1.8	0.10	0.5
Armed Forces' Share of State Employment * Black	2.46	6.5	2.36	6.3	2.08	5.3	2.48	6.6	1.95	4.9
Rho-Square	0.0630		0.0628		0.0615		0.0630		0.0607	
Decrease Rho-square from the Best Model	—		0.0002		0.0016		0.0001		0.0023	

Table II (Part 2)   Estimation Result of the Departure Model for Interstate Migrations of the 25–29 Age Group: 1985–90

Explanatory Variable	AFDC Benefits		Foreign-born Immigration		US-born Immigration		Climatic Variables		Violent Crime Rate	
	Coef.	(T)	Coef.	(T)	Coef.	(T)	Coef.	(T)	Coef.	(T)
Constant Term	−1.84	−24.5	−1.77	−22.4	−2.10	−27.3	−1.39	−20.2	−1.97	−26.5
1. EFFECTS OF LABOR MARKET VARIABLES										
Income	−0.38	−5.5	−0.25	−3.4	0.15	2.2	−0.46	−8.7	−0.15	−2.4
Income * College Education	−0.49	−6.3	−0.59	−7.2	−0.56	−7.0	−0.55	−6.9	−0.43	−5.5
Service Employment Growth Rate	−2.39	−24.9	−2.38	−23.5	−2.60	−26.0	−2.59	−27.1	−2.55	−26.8
Unemployment Rate * College Education	2.54	4.8	2.43	4.4	1.21	2.2	2.28	4.3	3.16	6.0
2. EFFECTS OF QUALITY-OF-LIFE INDICATORS										
Coldness	0.04	6.4	0.03	4.5	−0.00	−0.5	—	—	0.02	3.2
Hotness	0.13	13.3	0.11	10.6	0.12	12.5	—	—	0.11	12.1
Violent Crime Rate	2.37	9.3	2.67	9.9	1.43	5.4	2.48	10.7	—	—
3. RETENTION EFFECTS OF WELFARE BENEFIT										
AFDC Benefit * Poor Black Female	—	—	−0.47	−3.5	−0.55	−3.3	−0.60	−3.8	−0.60	−3.8
AFDC Benefit * Poor Female * Some Col. Ed.	—	—	0.46	4.7	−0.24	−2.4	−0.27	−2.7	−0.25	−2.6
4. PUSH EFFECTS OF IMMIGRATION										
Immigration Rate * Poor White	0.18	23.1	—	—	0.18	21.9	0.18	22.1	0.19	23.2
Immigration Rate * Poor Black	0.04	2.3	—	—	0.09	4.3	0.09	4.4	0.09	4.7
Immigration Rate * Poor Asian	0.12	4.3	—	—	0.12	4.2	0.11	4.0	0.12	4.3
Immigration Rate * Poor Hispanic	0.08	5.1	—	—	0.07	4.8	0.08	5.2	0.08	5.4
Immigration Rate * Poor American Indian	0.11	2.3	—	—	0.11	2.3	0.11	2.4	0.12	2.5
Immigration Rate * White * Less Than High Sch. Ed.	0.10	9.5	—	—	0.11	9.4	0.09	8.1	0.11	9.7
Immigration Rate * Black * Less Than High Sch Ed.	−0.05	−2.5	—	—	−0.05	−2.4	−0.07	−3.3	−0.05	−2.4
Immigration Rate * Asian * Less Than High Sch. Ed.	0.13	4.5	—	—	0.12	4.1	0.11	4.0	0.13	4.6
Immigration Rate * Hispanic * Less Than High Sch. Ed.	0.03	2.6	—	—	0.03	1.6	0.02	1.4	0.04	2.8
Returning Immigrantion Rate ofUS-Born Persons	0.72	23.4	0.72	22.2	—	—	0.79	26.3	0.67	22.2

5. RETENTION EFFECTS OF RACIAL SIMILARITY

Racial Similarity * Black	−0.29	−16.9	−0.29	−15.9	−0.27	−15.1	−0.30	−17.3	−0.26	−15.1
Racial Similarity * Asian	−0.56	−22.5	−0.55	−21.1	−0.50	−19.1	−0.55	−21.6	−0.55	−22.3
Racial Similarity * Hispanic	−0.44	−26.9	−0.44	−26.5	−0.42	−24.6	−0.44	−26.6	−0.44	−26.6
Racial Similarity * Am. Indian	−0.48	−14.1	−0.47	−13.0	−0.46	−12.9	−0.49	−14.1	−0.48	−13.9
Racial Similarity * Foreign-Born	0.14	8.5	0.14	8.1	0.14	8.1	0.14	8.1	0.14	8.2
Racial Similarity * Foreign-Born Asian	−0.14	−5.7	−0.15	−5.7	−0.14	−5.6	−0.14	−5.7	−0.14	−5.6
Racial Similarity * Foreign-Born Hispanic	−0.16	−7.3	−0.16	−6.6	−0.15	−6.6	−0.16	−7.0	−0.16	−7.2
6. RETENTION EFFECT OF SIZE OF ECUMENE										
Ln(Population Size)	−0.27	−27.1	−0.27	−25.8	−0.32	−31.2	−0.28	−34.4	−0.26	−26.1
7. DRAWING POWER OF THE REST OF SYSTEM										
Inculsive Variable	0.03	1.3	−0.03	−1.5	−0.03	−1.6	0.08	3.9	0.05	2.8
8. SELECTIVITY BY PERSONAL ATTRIBUTES										
High School Education	0.26	9.8	0.16	6.9	0.31	11.2	0.19	7.2	0.34	8.9
Some College Education	0.66	29.5	0.52	29.7	0.69	29.5	0.62	27.6	0.66	29.3
College Education	1.94	13.9	2.01	13.6	2.23	15.3	1.95	13.8	1.77	12.6
Black	−0.73	−19.1	−0.82	−20.1	−0.73	−17.9	−0.69	−17.5	−0.62	−16.3
Asian	−1.87	−20.5	−1.96	−21.0	−1.77	−18.1	−1.78	−18.9	−1.80	−19.6
Hispanic	−1.27	−26.3	−1.37	−28.1	−1.27	−24.9	−1.20	−24.6	−1.22	−25.2
American Indian	−2.14	−13.2	−2.27	−13.4	−2.19	−12.9	−2.02	−12.3	−2.02	−12.5
Foreign-Born Black	0.53	8.9	0.51	8.2	0.53	8.5	0.51	6.5	0.53	9.0
Foreign-Born American Indian	0.72	2.7	0.72	2.6	0.73	2.6	0.69	2.5	0.72	2.7
Female	−0.08	−7.9	−0.07	−8.6	−0.01	−1.3	−0.08	−8.1	−0.07	−7.2
9. EFFECTS OF POPULATION COMPOSITIONS										
Non-Native's Share of State Population	0.50	7.5	0.46	6.6	0.88	12.8	0.57	8.8	0.56	8.3
Armed Forces' Share of State Employment	0.37	2.0	0.40	2.0	2.45	14.3	0.10	0.5	0.044	2.3
Armed Forces' Share of State Employment * Black	2.68	7.2	2.61	6.6	2.24	5.7	2.41	6.3	2.21	5.9
Rho-Square	0.0630		0.6012		0.0617		0.0625		0.0628	
Decrease in Rho-square from the Best Model	0.0001		0.0018		0.0014		0.0005		0.0002	

Table II (Part 3)   Estimation Result of the Departure Model for Interstate Migrations of the 25–29 Age Group: 1985–90

Explanatory Variable	Racial Similarity		Origin Population		Inclusive Variable		Education		Race	
	Coef.	(T)	Coef.	(T)	Coef.	(T)	Coef.	(T)	Coef.	(T)
Constant Term	−2.05	−22.8	−1.58	−19.6	−1.85	−24.9	−1.00	−10.7	−1.95	−21.3
1. EFFECTS OF LABOR MARKET VARIABLES										
Income	−0.28	−3.4	−1.53	−25.6	−0.36	−5.5	−1.12	−12.8	−0.42	−5.2
Income * College Education	−0.54	−5.8	−0.58	−6.9	−0.48	−6.2	—	—	−0.55	−5.7
Services Employment Growth Rate	−2.28	−19.9	−2.72	−26.9	−2.37	−25.0	−2.92	−21.3	−2.32	−19.6
Unemployment Rate * College Education	2.02	3.2	−0.14	−0.3	2.59	4.9	—	—	1.95	3.0
2. EFFECTS OF QUALITY-OF-LIFE INDICATORS										
Coldness	0.05	8.9	0.13	24.7	0.04	6.6	0.02	2.1	0.04	6.0
Hotness	0.13	11.4	0.20	20.9	0.13	13.6	0.06	4.4	0.12	10.1
Violent Crime Rate	1.27	4.3	1.87	6.9	2.40	9.4	2.28	6.3	0.81	2.7
3. RETENTION EFFECTS OF WELFARE BENEFIT										
AFDC Benefit * Poor Black Female	−0.63	−3.3	−0.77	−4.6	−0.53	−3.4	−1.50	−6.7	—	—
AFDC Benefit * Poor Female * Some Col. Ed.	−0.24	−2.1	−0.28	−2.7	−0.24	−2.5	—	—	−0.23	−1.6
4. PUSH EFFECTS OF IMMIGRATION									0.13	10.2
Immigration Rate * Poor White	0.19	19.6	0.19	22.2	0.18	22.9	0.18	16.1	—	—
Immigration Rate * Poor Black	0.11	4.5	0.10	4.8	0.08	4.3	0.07	2.7	—	—
Immigration Rate * Poor Asian	0.06	2.0	0.09	3.2	0.12	4.6	0.04	1.0	—	—
Immigration Rate * Poor Hispanic	0.05	2.6	0.09	5.6	0.08	5.3	0.09	4.2	—	—
Immigration Rate * Poor American Indian	0.13	2.2	0.12	2.6	0.11	2.4	0.11	1.7	—	—
Immigration Rate * White * Less Than High Sch. Ed.	0.10	7.4	0.10	8.8	0.10	9.2	—	—	—	—
Immigration Rate * Black * Less Than High Sch.	−0.07	−2.9	−0.05	−2.5	−0.06	−2.8	—	—		
Immigration Rate * Asian * Less Than High Sch. Ed.	0.06	1.9	0.22	4.1	0.13	4.5	—	—	—	—
Immigration Rate * Hispanic * Less Than High Sch. Ed.	−0.03	−1.8	0.05	3.6	0.03	2.3	—	—	—	—
Returning Immigration Rate of US-Born Persons	0.48	13.1	0.90	28.2	0.71	23.4	0.91	20.9	0.54	14.4

5. RETENTION EFFECTS OF RACIAL SIMILARITY

	b	t	b	t	b	t	b	t	b	t
Racial Similarity * Black	—	—	−0.24	−12.9		−16.9	−0.39	−15.8	—	—
Racial Similarity * Asian	—	—	−0.50	−18.6	−0.56	−22.7	−0.50	−13.9	—	—
Racial Similarity * Hispanic	—	—	−0.47	−27.1	−0.44	−26.9	−0.45	−19.6	—	—
Racial Similarity * Am. Indian	—	—	−0.52	−14.5	−0.48	−14.1	−0.56	−11.4	—	—
Racial Similarity * Foreign-Born	—	—	0.15	8.5	0.14	8.5	0.18	7.3	—	—
Racial Similarity * Foreign-Born Asian	—	—	−0.15	−5.9	−0.14	−5.7	−0.17	−4.7	—	—
Racial Similarity * Foreign-Born Hispanic	—	—	−0.18	−7.6	−0.16	−7.3	−0.20	−6.3	—	—
6. RETENTION EFFECT OF SIZE OF ECUMENE										
Ln(Population Size)	−0.24	−20.1	—	—	−0.27	−29.7	−0.15	−10.9	−0.21	−18.6
7. DRAWING POWER OF THE REST OF SYSTEM										
Inclusive Variable	0.05	2.0	0.23	11.9	—	—	0.58	46.3	0.19	19.0
8. SELECTIVITY BY PERSONAL ATTRIBUTES										
High School Education	0.21	6.6	0.09	3.4	0.26	12.4	—	—	0.06	2.5
Some College Education	0.63	23.5	0.61	25.6	0.67	30.1	—	—	0.56	27.8
College Education	2.00	12.0	2.01	13.6	1.95	14.0	—	—	1.82	10.5
Black	−0.16	−5.4	−0.42	−10.5	−0.74	−20.1	−0.49	−9.0	—	—
Asian	−0.03	−0.6	−1.27	−13.1	−1.93	−24.9	−0.38	−3.2	—	—
Hispanic	−0.26	−6.7	−1.10	−21.0	−1.30	−31.2	−0.68	−11.1	—	—
American Indian	−0.10	−1.8	−1.71	−10.1	−2.20	−14.3	−0.96	−4.3	—	—
Foreign-Born Black	0.29	4.8	0.55	8.8	0.52	8.7	0.67	7.7	—	—
Foreign-Born American Indian	0.52	1.7	0.77	2.7	0.72	2.7	0.94	2.4	—	—
Female	−0.06	−5.2	−0.08	−7.1	−0.07	−7.2	−0.11	−7.3	−0.08	−6.2
9. EFFECTS OF POPULATION COMPOSITIONS										
Non-Native's Share of State Population	0.84	10.8	1.66	30.8	0.47	7.6	1.25	13.8	1.01	13.5
Armed Forces' Share of State Employment	1.02	4.6	0.41	2.1	0.45	2.5	−1.09	−4.1	0.77	3.4
Armed Forces' Share of State Employment * Black	1.27	2.9	2.04	6.2	2.47	6.6	1.76	3.2	0.42	1.1
Rho-Square	0.0574		0.0612		0.0630		0.422		0.0557	
Decrease in Rho-square from the Best Model	0.0057		0.0018		0.0000		0.0208		0.0073	

Note: in the columns headed by "Race", the coefficient and t for "Immigration Rate" are 0.13 and 10.2, respectively.

Table II (Part 4)   Estimation Result of the Departure Model for Interstate Migration of the 25–29 Age Group: 1985–90

Explanatory Variable	Gender		US-born vs. Foreign-born		Non-Native Distriction		Armed Forces' Share of Emp.		Foreign & US born Immigration Rates	
	Coef.	(T)	Coef.	(T)	Coef.	(T)	Coef.	(T)	Coef.	(T)
Constant Term	−1.94	−26.2	−1.85	−24.4	−1.92	−25.8	−1.86	−24.4	−2.04	−25.4
1. EFFECTS OF LABOR MARKET VARIABLES										
Income	−0.33	−4.8	−0.37	−5.4	−0.16	−2.5	−0.36	−5.4	0.30	4.3
Income * College Education	−0.48	−6.1	−0.50	−6.3	−0.46	−5.9	−0.49	−6.3	−0.67	−7.9
Service Employment Growth Rate	−2.46	−25.7	−2.38	−24.5	−2.12	−23.6	−2.39	−24.6	−2.59	−24.7
Unemployment Rate * College Education	2.61	4.9	2.46	4.6	3.30	6.4	2.46	4.6	1.13	1.9
2. EFFECTS OF QUALITY-OF-LIFE INDICATORS										
Coldness	0.04	6.4	0.04	6.4	0.03	4.6	0.04	6.4	−0.01	−2.2
Hotness	0.13	13.5	0.12	13.0	0.12	12.7	0.12	13.0	0.10	10.1
Violent Crime Rate	2.33	9.1	2.37	9.2	2.48	9.7	2.40	9.3	1.75	6.3
3. RETENTION EFFECTS OF WELFARE BENEFIT										
AFDC Benefit * Poor Black Female	−0.64	−4.1	−0.60	−3.8	−0.51	−3.3	−0.62	−3.9	−0.44	−3.2
AFDC Benefit * Poor Female * Some Col. Ed.	−0.30	−3.1	−0.25	−2.5	−0.23	−2.4	−0.25	−2.5	0.46	4.5
4. PUSH EFFECTS OF IMMIGRATION										
Immigration Rate * Poor White	0.18	22.7	0.18	22.7	0.18	22.6	0.18	22.7	—	—
Immigration Rate * Poor Black	0.09	4.7	0.09	4.6	0.08	4.3	0.09	4.6	—	—
Immigration Rate * Poor Asian	0.12	4.5	0.12	4.4	0.13	4.7	0.12	4.4	—	—
Immigration Rate * Poor Hispanic	0.08	5.1	0.08	5.3	0.08	5.1	0.08	5.3	—	—
Immigration Rate * Poor American Indian	0.11	2.4	0.11	2.4	0.11	2.4	0.12	2.4	—	—
Immigration Rate * White * Less Than High Sch. Ed.	0.10	9.3	0.10	9.3	0.10	9.2	0.10	9.3	—	—
Immigration Rate * Black * Less Than High Sch. Ed.	−0.06	−2.7	−0.05	−2.6	−0.06	−2.8	−0.05	−2.5	—	—
Immigration Rate * Asian * Less Than High Sch. Ed.	0.12	4.4	0.13	4.4	0.13	4.5	0.13	4.5	—	—
Immigration Rate * Hispanic * Less Than High Sch. Ed.	0.03	2.4	0.04	2.7	0.03	2.2	0.03	2.5	—	—
Returning Immigration rate of US Born Persons	0.66	22.2	0.72	23.2	0.77	25.8	0.72	23.2	—	—

5. RETENTION EFFECT OF RACIAL SIMILARITY

Racial Similarity * Black	−0.29	−16.9	−0.29	−16.5	−0.30	−17.3	−0.29	−10.8	−0.27	−14.2
Racial Similarity * Asian	−0.55	−22.2	−0.55	−26.5	−0.58	−23.9	−0.55	−22.2	−0.49	−18.1
Racial Similarity * Hispanic	−0.44	−26.6	−0.45	−28.0	−0.43	−26.5	−0.44	−26.6	−0.43	−24.7
Racial Similarity * Am. Indian	−0.48	−14.1	−0.48	−14.0	−0.46	−13.5	−0.46	−14.2	−0.44	−11.8
Racial Similarity * Foreign-Born	0.14	8.6	—	—	0.14	8.4	0.06	4.3	0.14	7.8
Racial Similarity * Foreign-Born Asian	−0.14	−5.8	—	—	−0.14	−5.6	−0.06	−2.6	−0.15	−5.6
Racial Similarity * Foreign-Born Hispanic	−0.16	−7.3	—	—	−0.16	−7.1	−0.08	−3.9	−0.15	−6.2

6. RETENTION EFFECT OF SIZE OF ECUMENE

Ln(Population size)	−0.27	−26.8	−0.27	−26.8	−0.32	−41.7	−0.27	−26.7	−0.32	−30.0

7. DRAWING POWER OF THE REST OF SYSTEM

Inclusive Variable	0.02	0.8	0.03	1.8	−0.02	−1.3	0.03	1.8	−0.10	−4.8

8. SELECTIVITY BY PERSONAL ATTRIBUTES

High School Education	0.26	9.9	0.25	9.2	0.30	11.3	0.25	9.3	0.22	9.1
Some College Education	0.66	29.3	0.66	29.0	0.67	29.9	0.66	29.1	0.54	30.2
College Education	1.92	13.7	1.94	13.7	1.89	13.5	1.94	13.7	2.32	15.2
Black	−0.73	−18.9	−0.69	−17.6	−0.78	−20.7	−0.69	−17.6	−0.83	−19.6
Asian	−1.88	−20.4	−1.85	−20.0	−2.06	−23.7	−1.85	−19.9	−1.88	−19.1
Hispanic	−1.27	−26.1	−1.26	−25.7	−1.31	−27.4	−1.26	−25.7	−1.40	−27.5
American Indian	−2.16	−13.4	−2.11	−12.9	−2.18	−13.4	2.12	−13.0	−2.36	−13.3
Foreign-born Black	0.52	8.8	—	—	0.51	8.5	—	—	0.52	8.0
Foreign-born American Indian	0.73	2.7	—	—	0.71	2.6	—	—	0.73	2.5
Female	—	—	−0.08	−7.4	−0.08	−7.8	−0.08	−7.4	−0.01	−1.0

9. EFFECTS OF POPULATION COMPOSITIONS

Non-Native's Share of State Population	0.55	8.1	0.51	7.5	—	—	0.50	7.4	0.83	11.5
Armed Forces' Share of State Employment	1.12	7.1	0.38	2.0	0.20	1.1	0.28	2.0	2.47	13.7
Armed Forces' Share of State Employment * Black	2.44	6.5	2.31	6.1	2.52	6.7	2.27	6.0	2.40	5.8

Rho-Square	0.0629	0.0628	0.0629	0.0628	0.0598
Decrease in Rho-square from the Best Model	0.0001	0.0002	0.0002	0.0002	0.0032

Push Effects of Immigration   Foreign immigration turned out to have a significant push effect on the poor young adults of every race. It was particularly strong on poor Whites. It was also selective with respect to education. For Whites, Asians and Hispanics, those with less than high school education were more subject to the push effect of foreign immigration. However, the least educated blacks were somewhat less subject to this push effect. The returning immigration rate of US-born persons also turned out to have a significant push effect on the young adult migrants. Our findings suggest that the push effect of foreign-born immigrants was mainly on the poorest and least educated residents, whereas the push effect of returning US-born immigrants was on the residents of all statuses and qualifications.

Retention Effects of Racial Similarity   We found strong evidence that all four minority races, especially Asians, Hispanics and American Indians, were subject to the retention effects of racial similarity. With the exception of Asians and Hispanics, the retention effects of racial similarity were somewhat weaker for the foreign-borns than for the native-borns.

Retention Effect of the Size of Ecumene   As a proxy of the size of ecumene at origin, the natural log of origin population size turned out to have a highly significant retention effect.

Drawing Power of the Rest of the System   Representing the attractiveness of the rest of the system from the viewpoint of a given origin, the inclusive variable turned out to have a nearly significant and rather weak drawing effect on the potential migrants.

Selectivity by Personal Attributes   Our results provide a strong confirmation to the well-known effect of education: the higher the education, the higher the migratory tendency. Using those with less than high school education as the reference group, the estimated coefficients are 0.25 for those with high school education, 0.66 for those with some college education, and as high as 1.92 for college graduates.

With respect to race, we found that being a member of a minority race had a negative effect of the departure probability. This was particularly true for American Indians and Asians. Among Blacks and American Indians, the foreign-borns turned out to be more migratory than their US-born counterparts. With respect to gender, females turned out to be somewhat less migratory than males.

Effects of Population Compositions   It is well-known that non-natives (i.e. those whose state of residence was different from birth state) tend to be much more migratory than natives and foreign-borns (Long 1988; Liaw 1990). In order to incorporate the effect of nativity, as well as the effect of the distinction between military and civilian sectors, we use (1) non-native's share of state population and (2) armed forces' share of state employment as two additional area attributes in the departure model, because our multidimensional migration table does not include such distinctions.

We found that non-native's share of state population indeed had a positive effect on departure rate. We also found that armed forces' share of state employment also had a positive effect, and that this positive effect is particularly strong if the potential migrants were Blacks, probably because Blacks had disproportionately greater presence in the military.

4.2. *Assessing the Relative Importance of the Explanatory Variables by the Method of Deletions*

Using the decrease in Rho-square due to the deletion a subset of explanatory variables as a measure of the importance (i.e. the explanatory power) of the subset (Table 2), we may make the following inferences.

Among the three labor market variables, the retention effect of service employment growth (0.0016) was much more important than the retention effect of income (0.0002) and the push effect of unemployment rate (0.0001).

The push effect of foreign immigrants (0.0018) was somewhat stronger than the retention effect of employment growth (0.0016), though weaker than that of the block of conventional labor market variables (0.0023). In contrast, the other policy-relevant variable, AFDC benefit, made a minimal contribution (0.0001).

With respect to the quality-of-life indicators, the push effects of coldness and hotness (0.0005) as well as violent crime rate (0.0002) were rather unimportant, being much less important than the retention effect of service employment growth (0.0016).

With respect to the effects of personal attributes on departure propensities, gender (0.0001) and the US-born/foreign-born contrast (0.0002) were rather unimportant. Of paramount importance are education and race: the deletion of education and its interactions with other variables results in a decrease of Rho-square of 0.0208, whereas the deletion of race and its interactions with other variables causes the Rho-square to decrease by 0.0073.

In multivariate context, the positive effect of the inclusive variable (i.e. the drawing power of the perceived attractiveness of the rest of the system) on departure rate seemed to be very weak (0.0000). To a large extent, this was due to its strong overlap in explanatory power with the education and race factors (Part 3 of Table 2). By examining the patterns of inclusive values, we found that this overlap was due to the fact that Whites and better educated individuals had higher inclusive values.[8] Thus, a sensible interpretation of the high importance of education and race in the departure model is that the better educated individuals and Whites were more aware of the attractiveness of the rest of the system and hence had higher tendencies to migrate.

5. CONCLUSION

We have found that the interstate migration pattern of the young adults was very strongly constrained by relative location and population distribution, because distance, contiguity, and destination and origin population sizes turned out to be among the most important explanatory variables in the nested logit model. In other words, a simple gravity model can explain a large proportion of the observed migration pattern. Thus, we may say that the migration pattern was very strongly subject to "gravity constraint".

[8]With respect to education, the average inclusive values are 0.12 for high school dropouts, 1.21 for high school graduates, 0.69 for those with some college education, and 1.81 for college graduates. With respect to race, the corresponding values are 1.46 for Whites, 0.44 for Blacks, −0.55 for Asians, −0.24 for Hispanics, and −1.91 for American Indians.

An important finding of this study is that, much like the gravity constraint, the "cultural constraint" of a potential migrant's race and ethnicity exerts a strong impact on the migration process. This is because racial similarity and its interactions with personal attributes also turned out to be highly important in both destination choice and departure models. Familiar racial milieu not only reduced the departure probability but also increased the destination choice probability. This constraint was particularly strong on minorities. It contributes to "demographic Balkanization" (Frey 1995b) and implies that the United States as a melting pot is more an ideal than a reality.[9]

Within these two constraints, we found the effects of the conventional labor market variables—income level, employment growth, and unemployment rate. In both destination choice and departure models, employment growth turned out to be much more important than income level and unemployment rate. It was the availability of new jobs, particularly those in the service sector, that was the main economic determinant on the interstate migration behaviors.

With respect to foreign immigration, our finding supports the idea that it has (1) a complementary effect on the interstate migration of those with better education and higher income, and (2) a competitive effect on the interstate migration of those with little education and lower income. Although foreign immigration was less important than employment growth in influencing migrant's destination choice, it had strong "push" effects influencing the departure decisions of potential migrants from areas of origin. With respect to welfare benefit, we found some statistically significant but substantively trivial support for the idea that high AFDC benefit tends to reduce departure probability and increase destination choice probability of poor women.

With respect to quality-of-life indicators, we found that a state with cold winter, hot summer, and high violent crime rate was less able to attract migrants from other states and to retain its own residents, and that the climatic effect was moderate, whereas the effect of violent crime rate was rather weak.

Finally, with respect to the effects of personal attributes on the tendencies to migrate, education and race turned out to be much more important than gender, poverty status, and the foreign-born/US-born distinction. The importance of education and race was mainly due to the fact that the better educated individuals and Whites were more prone to have favorable perceptions on the rest of the system and hence were more likely to migrate.

In sum, this analysis has underscored the continued importance of conventional labor market variables in influencing the interstate migration of young adults. This is especially the case for growth in the expanding service sector which holds particular sway among those with less than college education. Our results gave credence to the view that immigration exerts an accentuated "push" on the departure of poor and less educated domestic migrants as well as an attenuated "pull" on their destination choice; and showed minimal effects of welfare benefits on each part of the migration process. However, our findings

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[9]For an extensive discussion of these points, see Frey (1993b). For an interesting discussion about the long-term effects of the "new immigration" since the 1970s on the ethnic polarization of the US population, see Massey (1995).

also point the strong constraints exerted on the migration system associated with the elements of the classic gravity model and the "cultural constraints" of race and ethnicity in contemporary America. Those latter considerations are often overlooked in much of the policy and economic literature on internal migration.

APPENDIX A. DEFINITION OF THE EXPLANATORY VARIABLES IN THE NESTED LOGIT MODEL

1. EXPLANATORY VARIABLES IN THE DESTINATION CHOICE MODEL

Income: This is the income per capita of a potential destination computed in the following way. First, we adjust the state-specific 1985 and 1989 nominal per capita incomes by the corresponding state-specific cost of living indices of the same years. Second, the 1985 and 1989 adjusted values are then averaged. The unit is $10,000 per person.

Total Employment Growth: For each potential destination, this variable is the state-specific 1985–1989 growth of total civilian employment divided by the 1985 total civilian employment. The unit is "proportion per 4 years".

Service Employment Growth: For each potential destination, this variable is the state-specific 1985–1989 growth of service employment divided by the 1985 service employment. The unit is "proportion per 4 years".

Unemployment Rate: This is the 1985 unemployment rate of a potential destination state. The unit is proportion. Instead of the average value of the 1985–89 period, we use the 1985 value for unemployment rate, because we believe that among the three labor market variables, it is more subject to the feedback effect of migration.

AFDC Benefit: For each potential destination, this variable is computed in the following way. First, the state-specific 1985 and 1989 maximum monthly AFDC benefits per recipient family are adjusted by the corresponding 1895 and 1989 cost of living indices, respectively. Second, the adjusted 1985 and 1989 values are then averaged. The unit is $1,000 per month per family.

Immigration Rate: For each potential destination, this variable is obtained by dividing the state-specific number of 1985–90 foreign-born immigrants by the 1985 state population. Since the data come from the 1990 census, individuals less than 5 years old in 1990 are excluded from both numerator and denominator. The unit is "percent per 5 years".

Coldness: For each potential destination, this variable is defined as a weighted average of the heating degree-days of cities with records from 1951 to 1980, using city populations as the weights. The unit is 1000 degree(F)-days.

Hotness: For each potential destination, this variable is defined as a weighted average of the cooling degree-days of cities with records from 1951 to 1980, using city populations as the weights. The unit is 1000 degree(F)-days.

Violent Crime Rate: For each potential destination, this variable is the average of state-specific 1985 and 1989 violent crime rates. The unit is cases per 1,000 residents.

Ln(Distance):   This variable is the natural log of the distance between the population gravity centers of origin and destination states. The unit is ln(miles).

Contiguity: For each potential destination, this is a dummy variable assuming the value of 1, if it shares a common border with the state of origin.

Racial Similarity: For the migrants of a specific race, this is the logit of the specific race's proportional share of the potential destination's population in 1985, computed indirectly from the data of the 1990 census.

Ln(Population Size):   For each potential destination, this variable is the natural log of the state-specific 1985 population, computed indirectly from the data of the 1990 census. The unit is ln(1,000,000 persons).

In the destination choice model, some of the above variables are multiplied by various dummy variables to create interaction terms, as shown in the following two examples. First, in order to see if college graduates were more sensitive to the attraction of destination income, we create "Income * College Education" by multiplying Income by a dummy variable which assumes the value of 1 if the migrants in question were college graduates. Second, in order to see if the distance decay effect is different for an outlying state, we create "Ln(Distance) * Hawaii" by multiplying Ln(Distance) by a dummy variable which assumes the value of 1 if either the origin or the potential destination was Hawaii.

2. EXPLANATORY VARIABLES IN THE DEPARTURE MODEL

All the explanatory variables in the departure model that have the same names as those in the destination choice model are defined in the same way, expect for that the state in question is the origin rather than a potential destination. Since they are self-evident, we will skip the details. Also self-evident are a set of dummy variables showing the distinctions in education, race, gender, and place of birth. The explanatory variables that require detailed definition are the following.

Returning Immigration Rate of US-born Persons: For each origin, this variable is obtained by dividing the state-specific number of 1985–90 US-born immigrants by the 1985 state population. Since the data come from the 1990 census, individuals less than 5 years old in 1990 are excluded from both numerator and denominator. The unit is "percent per 5 years".

Non-native's Share of State Population: For each origin, this variable is computed from the data of the 1980 and 1990 censuses in the following way. First, the 1980 and 1990 state-specific numbers of non-natives (i.e. those who were born in other states in the United States) were divided by the corresponding total populations of the state. Second, the two resulting figures are then averaged and transformed into a logit. The reasons for using this variable are (1) that it is well-known that non-natives are more migratory than natives

(Long 1988), and (2) that our multidimensional migration table does not have the non-native/native distinction.

Armed Forces' Share of State Employment: For each origin, this variable is computed from the data of the 1980 and 1990 censuses in the following way. First, the 1980 and 1990 gender- and state-specific employments in the armed forces were divided by the corresponding total employment. Second, the two resulting figures are then averaged and transformed into a logit. The reasons for using this variable are (1) that members of the armed forces are expected to be more migratory than their civilian counterparts, and (2) that our multidimensional migration table does not have military/civilian distinction.

Inclusive Variable: For each origin, this variable represents the attractiveness of the rest of the United States. Its values are computed according to equation (3), using the estimated coefficients of the best destination choice model.

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