PUBLIC SECTOR INFLUENCE ON INTERSTATE MIGRATION OF THE ELDERLY*

Steve L. Barsby and Dennis R. Cox,
University of Arizona

In his well-known 1956 article, Charles Tiebout argued that geographic mobility could serve as a substitute for a market for public goods.[1] Families would move to those localities which provided the most desirable mix of public goods and modes of finance. Communities, in order to reach their optimum sizes, would attempt to structure their public sectors in such a way that the optimum number of residents would be attracted. These two forces -- family mobility and community competition for residents -- are analogous to normal market forces -- purchaser mobility among sellers and seller competition for buyers. Under certain mobility and information conditions, this "market" process would result in the optimum production of public goods and the optimum distribution of these goods among citizens. This argument does not apply of course to "national public goods," such as national defense. It could apply, however, to local public goods, such as police protection, fire protection, local court systems, education, medical facilities, and possibly others. Perhaps the most important implication of the Tiebout model is the suggestion that local decision making about the mix of public services and modes of finance need not be "responsive" to the wishes of the local citizenry to assure optimal production and distribution of local public goods. Instead the citizens, by their responses to local public sector variations, achieve these optimal results. Democratic and undemocratic decision making procedures will be equally effective, provided families are sufficiently mobile and communities are sufficiently numerous.

In view of the importance of this implication, it is surprising that the fundamental premises of this theory have not received more attention -- especially empirical attention. Tiebout's first and perhaps most crucial assumption is that families are mobile and responsive to variations in local public sectors. Tiebout urged that this assumption ". . . should be checked against reality [1,p.423]." We are not aware of any efforts to perform this check explicitly.[1] In this paper we present the results of a simple test of the mobility assumption -- results which offer little in support of it.

This paper is extracted from a larger study of interstate mobility of elderly persons (aged 65 and older). The elderly comprise a particularly appropriate group for this test for at least two reasons. First, it is plausible that the public sector preferences of elderly persons are more homogeneous within the group than are the preferences of the population as a whole, so that by separating this group out we may more clearly discern the relationship between public sector variation and migration. For example, the elderly might be expected to be less concerned with expenditures on health care facilities than the general population; or, since many older persons have little current income (financing consumption out of wealth) they might be expected to be less repulsed by income taxes than by property taxes, relative to the general population.

The second reason that this group is particularly appropriate is that older persons have less attachment to the private sector of the economy, and so can give more weight to the public sector in making locational choices. Younger families, still relying principally on labor income, must compromise their public sector preferences with private sector opportunities. In contrast, social security benefits, annuity income, dividends, interest and rental income can be received in any location. Families which are more reliant on these sources of income, or simply on depletion of wealth, to finance consumption are freer to choose their residential locations on the basis of public sector preferences.

While the age-group focus of our study has certain advantages in this application, its concentration on interstate, rather than intercommunity, mobility is certainly a disadvantage. The obvious reason is that within states there can be considerable variation among communities in the mix of public services and the modes of finance. Descriptions of the public sectors of states are only averages and cover possibly large local variability. In addition, intrastate mobility escapes our attention. We hope in the near future to be able to expand our investigation to intercommunity mobility.

Our statistical model is

$$M_{i,j} = E_{i,j}\,\alpha_j \prod_{k=1}^{9} X_{i,k}^{B_{k,j}} \prod_{h=1}^{55} Y_{i,j}^{B_{h,j}} \quad ,$$

where

$M_{i,j}$ signifies the j^{th} migration rate for the i^{th} state,

$X_{i,k}$ signifies the value of the k^{th} public sector variable for the i^{th} state,

$Y_{i,h}$ signifies the value of the h^{th} non-public sector variable for the i^{th} state,

α_j is a constant scale adjustment for the j^{th} migration rate,

$E_{i,j}$ is the multiplicitive error term for the i^{th} state, and the j^{th} migration rate, and

$B_{k,j}$ and $B_{h,j}$ are elasticities of the explana-

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tory variables X and Y with respect to the j^{th} migration rate. Elasticities are estimated by converting all the values of the M's, X's and Y's to logarithms (base e) and performing conventional least squares fitting to the transformed variables.

The migration rates of each of the 48 contiguous states employed as dependent variables in this paper are computed from the 1960 Census of Population twenty-five percent sample. They are the number of in (out) migrants into (out of) a state between 1955 and 1960 aged 65 and older (65-69) divided by the population of the state aged 65 and older (65-69) in 1960. These rates are computed for males, females, and all sexes. Thus we obtain twelve migration rates for each state.

The public sector variables are obtained from various sources. They are

- X_1: Minimum number of years of residence required for old age assistance eligibility, 1950-1960 average;
- X_2: Maximum monthly old age assistance payment for one person, 1950-1960 average;
- X_3: Dollar amount of special old age state income tax exemption, 1963;
- X_4: Dollar amount of special old age state income tax credit, 1963;
- X_5: Per capita state and local property tax receipts, 1957-1962 average;
- X_6: Per capita state and local income tax receipts, 1950-1960 average;
- X_7: Per capita state and local expenditures on education, 1950-1960 average;
- X_8: Per capita state and local expenditures on health and hospitals, 1950-1960 average;
- X_9: Per capita state and local expenditures on public welfare, 1950-1960 average.

The remaining explanatory variables (Y) developed for our larger study will not be described in detail here. Most of them could be described as private sector variables. They consist of previous (1949-1950) migration rates, wage rates in various industries, unemployment rates, labor force participation rates, turnover rates, industrial structure variables, average education level, housing occupancy rate, monthly rental rate, and a geography variable (north vs. south).

With respect to most of the explanatory variables, we entertained certain a priori notions of the direction of the effect of the variables on the migration rates. These will be described for the public sector variables for in-migration. We expected opposite effects for out-migration. The first two variables (X_1 and X_2) describe the relative generosity of state old age assistance programs. Given the generally low incomes of elderly persons, many of them should be concerned with the availability and level of old age assistance payments. It seems reasonable to suggest, then, that less strict residency requirements and higher maximum benefits levels will be associated with greater in-migration rates. We therefore expected a negative elasticity for X_1 and a positive elasticity for X_2.

Variables three and four reflect special tax advantages for elderly persons. We expected positive elasticities for both of them. It should be noted that the special exemptions and credits are not very large in the states which have them, so that it is perhaps too much to expect them to influence locational choices. We expected negative elasticities on both of the average tax level variables (X_5 and X_6), with perhaps property taxes having the larger (absolute value) elasticity for reasons described earlier.

The last three public sector variables partially describe the mix of public services provided, and represent potential "offsets" to income and property tax payments. We predicted that state and local government expenditures for education (variable X_7) would have a negative elasticity on the grounds that most persons in our age group do not have school-age children, and as a result such expenditures act simply to increase taxes with no offsetting benefits. On the other hand, persons over age 65 are relatively important beneficiaties of health and hospital services, and of public welfare expenditures. Consequently we expected variables X_8 and X_9 to have positive elasticities.

Our resluts are contained in Tables 1 and 2.[2] Table 1 reports the simple correlation coefficients (r) between each of the public sector variables and each of the migration rates. Significant coefficients are underlined and coefficients with signs conforming to our expectations are indicated by asterisks. These coefficients for variables X_4, X_6, X_8, and X_9 are not significant (at the .05 confidence level) for any of the migration rates. The coefficient for X_3 (amount of special old age state income tax exemptions) is significant for only one of the twelve migration rates, and it has the "wrong" sign. The remaining four variables display fairly consistent patterns. They are generally significant for in- or for out-migration rates, but not for both. However, signs of the significant coefficients for variables X_1, X_2, and X_7 are opposite to our expectations. This leaves per capita state and local property tax receipts (X_5). For this variable the correlation coefficients for out-migration rates are significant at the .01 confidence level and have the expected sign, indicating that high property tax levels repulse elderly persons.

Table 2 contains estimated elasticities for the public sector variables. These elasticities come from regression equations containing non-public sector variables as well, but elasticities for these variables are reported here. The coefficients of determination (R^2) in Table 2 apply to the entire equations, including non-public sector variables. Most of the elasticities in the table are zero. The reason for this is that we did not include a variable in a regression equation unless its regression coefficient would be significant at the .05 level of confidence. Elasticities with the expected signs are indicated by asterisks.

The most noteworthy thing about the results in Table 2 is that the elasticity for the single independent variable giving significant, predicted results in Table 1 (X_5) is significant in only one of the twelve equations. While it still

Table 1

Simple Correlation Coefficients[a] Between the Public Sector Variables and Migration Rates

Migration Rates	Public Sector Variables[b]								
	1	2	3	4	5	6	7	8	9
Gross In-Migration Males Aged 65+	.311	.106*	.157*	-.115	.001	-.011*	.300	-.046	-.146
Gross In-Migration Females Aged 65+	.315	.189*	.223*	-.115	.135	-.018*	.364	.059*	-.185
Gross In-Migration Total Aged 65+	.315	.150*	.193*	-.118	.072	-.016*	.331	.011*	-.170
Gross Out-Migration Males Aged 65+	.073*	.276	.241	-.113*	.479*	-.152	.237*	.215	-.115*
Gross Out-Migration Females Aged 65+	.086*	.354	.308	-.087*	.438*	-.072	.231*	.121	-.155*
Gross Out-Migration Total Aged 65+	.040*	.257	.258	-.123*	.448*	-.152	.202*	.102	-.161*
Gross In-Migration Males Aged 65-69	.325	.067*	.126*	-.091	-.019	.007	.330	-.050	-.141
Gross In-Migration Females Aged 65-69	.338	.135*	.175*	-.099	.096	-.011*	.341	.045*	-.175
Gross In-Migration Total Aged 65-69	.332	.102*	.151*	-.097	.040	-.004*	.335	-.001	-.161
Gross Out-Migration Males Aged 65-69	.087*	.319	.253	-.102*	.500*	-.149	.286*	.218	-.057*
Gross Out-Migration Females Aged 65-69	.074*	.266	.231	-.081*	.437*	-.128	.213*	.161	-.127*
Gross Out-Migration Total Aged 65-69	.080*	.295	.245	-.093*	.473*	-.141	.250*	.191	-.096*

*Expected sign.

[a]Single underlining indicates significance at .05 confidence level; double underlining indicates significance at .01 level.

[b]Defined in text.

Table 2

Migration-Rate Elasticities[a] of
Public Sector Variables

Migration Rates	Public Sector Variables[b]									R^{2}[c]
	1	2	3	4	5	6	7	8	9	
Gross In-Migration Males Aged 65+					-.26*			-.73		.97
Gross In-Migration Females Aged 65+									-.26	.97
Gross In-Migration Total Aged 65+						.03		-.51	.18*	.98
Gross Out-Migration Males Aged 65+						-.04				.81
Gross Out-Migration Females Aged 65+			.02						-.17*	.82
Gross Out-Migration Total Aged 65+										.78
Gross In-Migration Males Aged 65-69						.05		-1.07		.97
Gross In-Migration Females Aged 65-69						.04		-.62	-.31	.99
Gross In-Migration Total Aged 65-69								-.71	-.17	.96
Gross Out-Migration Males Aged 65-69				-.08*						.87
Gross Out-Migration Females Aged 65-69						-.04				.92
Gross Out-Migration Total Aged 65-69						-.05				.90

*Expected sign.

[a]All elasticities are significant at .05 confidence level.

[b]Defined in text.

[c]Coefficient of determination applies to entire equation, including some variables not shown here.

has the predicted sign, it appears in an equation for in-, rather than out-migration as was the case in the previous table. X_5 does not appear more often because it is highly correlated with a binary variable for geography (states below the 37th parallel have the value two while states above the parallel have the value one for this variable). When the geography variable enters a regression equation, the partial correlation of X_5 with the out-migration rates becomes insignificant.

The bulk of the entries in Table 2 are for variables which had no significant simple correlations with the migration rates -- X_6, X_8 and X_9. Additionally, elasticities for variables X_3, X_5, X_6 and X_9 are low. The largest of these is .31. On the other hand, migration elasticities for X_8 (expenditures on health and hospitals) are relatively large, and suggest that high expenditures for health care facilities strongly discourage in-migration of elderly persons.

CONCLUSION

Data on migration of elderly persons offer scant support at best for Tiebout's crucial assumption about mobility in relation to the public sector. Most simple correlations between the public sector variables and migration rates were either non-significant or had "wrong" signs. Public sector variables rarely were significant in our complete migration equations. Three did not appear at all. Three more appeared in only one equation. Of the three remaining independent variables, only one contained elasticities of the predicted sign.

As usual, in studies of this kind, our results contain many caveats and may not be regarded as conclusive. We hope to pursue this matter with better data and, possible, greater perception in the future.

FOOTNOTES

[1]The largest body of relevant literature deals with location of industry, rather than location of population. Undoubtedly, factors which affect business location choices ultimately also affect family location choices. It could happen, though, that the public sector affects business location through its affect on family location and therefore on wage rates. Most research on the effect of taxes on business location has failed to reveal strong, consistent relationships. For a survey of much of this literature, see John F. Due, "Studies of State-Local Tax Influences on Location of Industry," National Tax Journal, June, 1961, pp. 163-173. A more recent paper, which deals approximately with mobility patterns of middle-sized cities is Raymond J. Struyck, "An Analysis of Tax Structure, Public Service Levels, and Regional Economic Growth," Journal of Regional Science, 1967, No. 2, pp. 175-183. A clarifying note on this article appeared in Journal of Regional Science, 1969, No. 2. Struyck finds strong inverse relationships between rates of population growth and levels and rates of changes of taxes in fifty cities.

[2]It should be noted that there are some purely statistical factors affecting the correlations between our dependent and some of the independent variables. Since all the migration rates are defined as ratios where the denominators are population figures, and several of the independent variables also are ratios where the denominator is population (all the "per capita" variables), positive spurious correlation is introduced. On the other hand, since in-migration, ceteris paribus, raises population and thereby lowers all the per capita independent variables, negative correlation is introduced. For out-migration this effect produces positive correlation. We should, therefore, be more than usually suspicious of positive correlation for out-migration rates. We should also, perhaps, be somewhat more lenient than usual in judging the significance of negative correlation coefficients.

REFERENCES

1. Tiebout, Charles M., "A Pure Theory of Local Expenditures, Journal of Political Economy, Vol. 64, No. 3, October, 1956, pp. 418-424.