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State Taxes, Tax Exemptions, and Elderly Migration

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Abstract. We use 1995-2000 interstate migration data for the elderly population in the U.S. to test how taxes and specific tax exemptions affect migration decisions. We show that the elderly prefer to migrate to states with low inheritance taxes, high property taxes, low amounts of federal revenue transfers, low cost of living, and higher average temperatures. The preference for high property taxes in destination states may be an indication that the elderly prefer locations where local amenities are capitalized into property values, since the elderly tend to be empty-nesters and presumably own properties that are on average smaller and less valuable. We show that exempting pension payments from income tax affects elderly out-migration negatively and significantly, while exempting prescription drug sales from sales tax affects elderly in-migration positively and significantly. As in the case of the preference for higher property taxes, free-riding behavior may be an explanation for these preferences.

1. Introduction

In a federal system, different states will offer different combinations of public goods and taxes to finance such public goods. According to Tiebout (1956), individuals will sort themselves across states on the basis of their preferences for such public goods and taxes. In this paper we investigate the effect of state fiscal policies on the interstate migration of elderly Americans between 1995 and 2000 using a gravity model of migration. Focusing on elderly migration provides two significant benefits, one practical and one analytical. The practical benefit is that the empirical results obtained can be expected to have important policy implications. The fraction of the elderly population in the U.S. is increasing and, according to reports of the U.S. Census Bureau, is expected to continue increasing. In order to take advantage of the opportunities presented by this increase, and conversely to face the challenges posed by it, governments at the federal, state, and local levels will need to focus more attention and resources on the elderly population. Our results can guide them in this process.

The analytical benefit is that the elderly population consists primarily of retirees and hence is relatively immune to conditions in the labor market. While positive labor market conditions may well attract younger migrants, elderly migrants generally do not need to consider such conditions in their migration decisions. As a result, one would expect the effects of public policy variables (and local amenities) to manifest themselves more clearly in the migration decisions of the elderly than in those of a younger population.[1]

The specific questions we attempt to answer in this paper are: what policies attract the elderly and what policies drive them away? In particular, how do tax exemptions affect the migration decisions of the elderly? We apply a cross sectional analysis to the elderly migration dataset published in a 2003 special report of the 2000 Census, entitled 'Internal Migration of the Older Population' (U.S. Census

[1] Graves (1979) and Clark and Hunter (1992) compare different age groups' migration decisions and show that the main attractions for migrants differ significantly by age group.

Bureau, 2003). We sort the elderly into three age groups (the young elderly, the middle-aged elderly, and the old elderly) and combine the data of those groups' migration flows between states with data about state characteristics, in particular data about state and local government finances and data about certain state-specific amenities. A novel contribution of this paper is that we take into account specific tax exemptions offered by certain states by creating dummy variables.

We construct a gravity equation that takes into account both the pushing effects of an origin state's characteristics and the pulling effects of a destination state's characteristics, including the states' various tax exemptions and their interactions. Thus we are able to separate costs and benefits of state fiscal systems faced by the elderly. Moreover, our sorting of the elderly into specific age groups allows us to determine whether such costs and benefits differently impact different age groups within the elderly population. Finally, we compare and contrast our results with the results obtained by other researchers using earlier Census data.

Previous studies have surprisingly found mixed results for the effect of income taxation on elderly migration. We propose a potential explanation for these results. In our analysis, we interact a state's individual income tax rate with a pension exemption (if any) offered by that state. The possible relevance of a pension exemption is that pension income represents the lion's share of income for many, or even most, retirees. Taking into account our interaction coefficient, we indeed find that as income tax rates increase in the origin state, the elderly out-migrate significantly less if a meaningful pension exemption is offered by the state. An appealing interpretation of this result is that the elderly find high income taxes to be desirable (presumably for the public goods such taxes make possible) so long as they are not among those paying them.

Previous studies have also reported inconsistent results for the effect of property taxation on elderly migration. We obtain the seemingly counterintuitive result that destination states with high levels of average property taxation attract the elderly, coupled with the expected result that origin states with high levels of average property taxation repel them. The difference between our results and those of prior studies is primarily driven by two factors: the set of fiscal variables that are used as control variables in the analysis and the age of migrants. A possible explanation for our results, albeit not one for which we have definitive evidence, is another free-rider story. Higher property taxes are generally strongly correlated with higher levels of local amenities, and it is unsurprising that such amenities would attract the elderly. However, property taxes are also generally an increasing function of property values. Since most of the elderly are empty-nesters, they presumably acquire properties that are on average smaller, and hence on average less valuable, than those that predominate in a given locale. If that is indeed the case, elderly in-migrants can to some extent free ride off the property taxes paid by others. Moreover, their ability to free ride will increase with the overall level of property taxes.

Although elderly *in*-migrants tend to acquire properties that are on average smaller and less valuable, this does not mean that elderly *out*-migrants will tend to own properties that are on average smaller and less valuable. The reason is that many potential out-migrants will continue to own the property that they lived in before their nest became empty. All else equal, such properties would be expected to be of average size and hence of average value for the given locale. Hence, if such locale has high property taxes, such taxes will act as an inducement to downsize. Once the decision to downsize has been made, it is to be expected that some fraction of those who downsize will, based on a comparison of costs and benefits of possible destinations, choose a destination other than the origin state. Hence, there will be increased out-migration.

As was the case in previous studies, we get no clear result as to the effect of general sales taxes on elderly migration. We do, however, find that an exemption from sales tax for prescription drugs affects elderly in-migration positively and significantly. Finally, in addition to the foregoing, we also find that the elderly prefer to migrate to states with low inheritance and estate taxes, low amounts of Federal revenue transfers, low cost of living, and higher average temperatures.

2. Literature review and background

There is an extensive literature on the effects of taxation and public policies on interstate migration of the elderly in the U.S. Providing a full review of this literature is beyond the aim of this section. Instead, we restrict our review to the literature that focuses on cross sectional analysis using the 2000

Census or earlier aggregate data.[2] Studies using aggregate interstate migration data generally employ one of two empirical approaches. The first approach uses the ratios of in-migrants and out-migrants to a state's population as the dependent variables in in-migration and out-migration regressions, respectively. This approach has been shown by Cebula (1978, 1979, 1990), and more recently by Conway and Rork (2006), to yield powerful results. The second approach uses bilateral flow data of in- and out-migrants to estimate a gravity model of migration. Conway and Houtenville (2001, 2003) have used this approach, and we use it as well, focusing on state-specific tax exemptions that may disproportionately benefit the elderly. We further provide separate estimation results for different age groups within the elderly population.

Cebula (1990) analyzes elderly interstate migration between 1975 and 1980 as reported in the 1980 Census and shows that the mere existence of a state income tax has a significant negative effect on elderly in-migration into a state. Using the same data source, Voss et al. (1988) focus on the effect on elderly interstate migration of state-level inheritance and estate taxes and find that high state-level inheritance and estate taxes also have a significant negative effect on elderly in-migration into a state.[3]

Rather than focus on a single tax variable, we focus on a wide range of taxes. In this respect we follow a number of recent studies that made use of the elderly interstate migration data from 1985 to 1990 as reported in the 1990 Census. Gale and Heath (2000) use a two-step least squares method to focus on the determinants of elderly in-migration. Their method makes it possible to model elderly-targeted state spending endogenously and to estimate the level of public goods provided to the elderly. They find significant effects for standard amenity variables. However, they obtain mixed results for the effects of tax variables. Property taxes are found to have a statistically significant negative effect on net elderly in-migration, a result that generally comports with theory. Sales tax levels are not found to have any statistically significant effect. However, a positive change in sales tax rates, i.e., a sales tax increase, significantly reduces net elderly in-migration. Finally and surprisingly, income taxes are found to have a statistically significant positive effect on net elderly in-migration. We obtain a similar result in our study, and by making use of the interaction between income taxes and the exemption of pension payments from such taxes, we propose an explanation for this anomalous outcome.

Conway and Houtenville (1998) obtain coefficients in their elderly out-migration estimations that suggest that the Tiebout Hypothesis holds. However, most of the coefficients in their in-migration estimations have the same sign as their out-migration counterparts. Thus, if a given variable is found to be a significant factor driving the elderly out of a state, it is also found to be a significant factor driving the elderly into such state. This is not what theory would suggest.

Voss et al. (1988) had already encountered this problem, which is known as the "same sign problem." They attribute the same sign problem to "counter-stream migration": it turns out that the states with the highest in-migration rates also tend to be the states with the highest out-migration rates (which is not surprising since the large population of elderly in a state like Florida can act as a magnet attracting the out-of-state elderly but also can act as a pool from which other states can attract Florida's elderly in turn). One way to attempt to overcome the same sign problem is to use disaggregated data. When regressions are run on different age subgroups of the elderly population, results are less often encumbered with a same-sign problem than are those of regressions using pooled data.

Conway and Houtenville (2001) use both gross and net interstate migration flows. They find that low cost of living[4], low income taxes, exemption of food from sales taxes, and low inheritance and estate taxes positively affect elderly in-migration. Somewhat less intuitively, they also find that lower spending on public welfare induces elderly in-migration. Their findings constitute an important contribution to the literature, in part because they explicitly show that earlier studies which focus only on a restricted subset of state and local public policy variables may be subject to omitted variable bias in their findings. We heed their advice and closely follow their specifications by including a wide range of

[2] Conway and Rork (2012) provide an extensive review of the elderly migration literature. In this review, they discuss the pros and cons of using individual level data instead of aggregate data. Studies based on individual level data suffer from deficiencies including limitations on sample size and time window, and they face significant computational complexity. Studies using aggregate data do not suffer from these same deficiencies.

[3] Inheritance and estate taxes have recently been attracting attention in elderly migration research. See Conway and Rork (2006) for additional findings on that topic.

[4] The importance of interstate differentials in cost of living was previously emphasized by Cebula (1978).

state and local public policy variables in our regression analysis.

Conway and Houtenville (2003) do not separately estimate in-migration and out-migration, but instead estimate a gravity equation. They find that pull and push factors do not have a uniform (or uniformly significant) effect across different age groups of the elderly population. For example, they find that the younger elderly are attracted by climate and government policies while the older elderly are driven out by a high cost of living.

Conway and Rork (2012) prescribe panel data methods as a tool for better capturing the significance of push and pull effects on migration. These methods would not be useful to our discussion, however, since our focus is more on the effect of various state-provided tax exemptions that tend to vary little over time and less on effective tax rates which tend to vary far more over time.

Our analysis acknowledges the importance of "quality of life" and noneconomic local amenity variables first found by Cebula (1979). Subsequent research has put forward the theory that the availability of amenities in a jurisdiction may be partially (or even completely) compensated for in such jurisdiction's labor and real estate markets.[5] Graves and Waldman (1991) examine this theory under the plausible assumption that the elderly constitute a small group whose aggregate migration decision cannot affect the wage structure in the jurisdiction to or from which it is migrating. They provide empirical evidence to show that "in a world in which compensation for amenities occurs in varying degree in land and labor markets at alternative sites and there are no moving costs, retirement migration will be toward areas in which more of the compensation for amenities is in wages" (p.1376). This is not surprising: the elderly generally can free ride to the extent that compensation for amenities occurs in the labor market, but they generally cannot free ride to the extent that compensation occurs in the real estate market.

A similar argument of free riding can be made in the context of tax exemptions. Taxes affect individuals' migration decisions only to the extent that those individuals are affected by those taxes. Thus, in order to capture the actual effect of taxes on individuals' migration decisions, one needs not only to look at tax rates but also to estimate the impact that various tax exemptions have on such tax rates. Conway and Houtenville (1998, 2001) attempt this by interacting income taxes with an income tax exemption limited to the elderly and by interacting sales taxes with a sales tax exemption for food. Although theirs is an intriguing approach, and we will to some extent follow it in our paper, their estimates of interaction coefficients are generally too small to be meaningful, except with respect to sales tax in one specification. In contrast, we find relatively clear cut effects of income tax exemptions on elderly migration.

3. Theoretical background

In this section, we develop a simple model of migration to illustrate how certain variables may affect a retired individual's migration decision. Suppose there are J states and N retirees. An individual retiree n derives utility from private consumption x, local public goods G (a vector of state specific public goods and services), and local amenities A (a vector of noneconomic factors such as environmental quality and climate). The utility function of retiree n can be written $U_n(x, G, A)$ and satisfies the following conditions:

1. $U_n(x, G, A)$ is twice differentiable, concave in all of its arguments, and strictly increasing in x.

2. There exists G^* such that $\frac{\partial U_n(x,G^*,A)}{\partial G} = 0$ for any given x and A, and there exists A^* such that $\frac{\partial U_n(x,G,A^*)}{\partial A} = 0$ for any given x and G. Moreover, for every $G^0 < G^*$, $\frac{\partial U_n(x,G^0,A)}{\partial G} > 0$, and for every $G^1 > G^*$, $\frac{\partial U_n(x,G^0,A)}{\partial G} < 0$. Similarly, for every $A^0 < A^*$, $\frac{\partial U_n(x,G,A^0)}{\partial A} > 0$, and for every $A^1 > A^*$, $\frac{\partial U_n(x,G,A^0)}{\partial A} < 0$.

These conditions guarantee that preferences are single-peaked.

If a retiree resides in state i, she enjoys local public goods G_i and local amenities A_i. Thus, the utility function of retiree n in state i is $U_n(x, G_i, A_i)$. State specific price levels and taxes affect a retiree's budget constraint for private consumption. Thus, even though a state's public goods and amenities may be attractive to a retiree, if the state's price level and taxes sufficiently restrict her private consumption, she may choose to avoid such state. We will denote

[5] Greenwood et al. (1991) estimate the "amenity-richness" and environmental quality of a state by calculating compensating differentials. Other interesting studies on compensation in labor and real estate markets include Haurin (1980), Roback (1982), and Knoll and Griffith (2003).

the state specific price level of state i as p_i and the state specific taxes of state i as t_i and t_{l_i}, with t_i representing state and local taxes related to consumption and living (e.g., sales taxes and property taxes), and t_{l_i} representing state taxes related to wealth and income (e.g., income taxes levied on pension and/or social security payments and estate and inheritance taxes).

The final variable we consider that can be expected to affect a retiree's decision to move is the actual cost of moving. We posit that the cost of moving from state i to j is a function of the distance d_{ij} between states i and j, hence $c(d_{ij})$. We assume that the cost function $c(d_{ij})$ is strictly increasing and convex in distance d_{ij}.

Suppose that retiree n initially resides in state i and that w_n is the wealth she has accumulated for her retirement. The solution to the following optimization problem gives retiree n's utility if she moves from state i to state j:

$$U_n^{ij} = \max_x U_n(x, G_j, A_j) \quad (1)$$

$$such\ that\ (p_j + t_j)x \le w_n\left(1 - t_{I_j}\right) - c(d_{ij})$$

where $(p_j + t_j)x$ is the after-tax cost in state j of private consumption x and $w_n\left(1 - t_{I_j}\right) - c(d_{ij})$ is the amount of resources (after taxes and moving expenses) that retiree n will have available for private consumption in state j. Since utility is strictly increasing in x, we obtain

$$U_n^{ij} = \quad U_n\left(\frac{w_n\left(1-t_{I_j}\right)}{p_j+t_j} - \frac{c(d_{ij})}{p_j+t_j}, G_j, A_j\right). \quad (2)$$

On the other hand, if retiree n chooses to remain in state i, her utility will not be impacted by moving costs, and so is given by

$$U_n^i = U_n\left(\frac{w_n\left(1-t_{I_i}\right)}{p_i+t_i}, G_i, A_i\right). \quad (3)$$

Let U_n^* denote the set of retiree n's best alternatives to remaining in state i. Hence

$$U_n^* = \max(U_n^{i1}, U_n^{i2}, \dots, U_n^{ii-1}, U_n^{ii+1}, \dots, U_n^{iJ}) \quad (4)$$

Retiree n moves from state i to state j if and only if $U_n^{ij} \in U_n^*$ and $U_n^{ij} > U_n^i$.

In this model, a retiree's decision whether or not to relocate from state i to state j is ultimately based on the vector $\left(p_j, t_j, t_{I_j}, G_j, A_j, d_{ij}\right)$. It is instructive to examine interactions between the variables in this vector. The following claims focus on pairwise interactions. Proofs are provided in the appendix.

Hypothesis 1*- Public Goods or Amenities vs. Consumption or Income Tax:* If a state increases its provision of public goods or if the amenities in a state increase, it is possible that either an increase or a decrease in taxes will be required to keep constant the attractiveness of such state to a given retiree. Since preferences for public goods and amenities are single peaked, whether an increase or decrease in taxes will be necessary depends on how the levels of public goods and amenities compare to their optimal levels G^* and A^*.

Hypothesis 2*- Cost of Living vs. Consumption Tax:* In order to keep constant the attractiveness of a state to a given retiree, an increase in price level needs to be offset one-to-one by a decrease in consumption taxes.

Hypothesis 3*- Distance vs. Consumption or Income Tax:* If two states are equally attractive to a retiree, but are different distances from the retiree's state of origin, then all else equal, the more distant state will have lower consumption or income taxes. In the case of consumption taxes, the difference is proportional to the marginal cost of moving, inversely proportional to net wealth (i.e., wealth after taking income taxes into account), and proportional to the price level (including taxes in such price level). In the case of income taxes, the difference is proportional to the marginal cost of moving and inversely proportional to wealth.

4. Data and methodology

We use interstate migration data for the elderly population between the years 1995 and 2000 as found in the 2000 Census. The elderly are defined as those who are 65 years of age or older. The dataset displays the state of residency in 2000 arrayed against the state of residency in 1995. Thus, migration flows are determined by a change in residence between the year 1995 and the year 2000. We limit ourselves to migration flows between 48 states (excluding Alaska, Hawaii, and the District of Columbia). We don't consider within-state migrations or migrations between the U.S. and foreign countries.

Table 1 displays three rankings of states based on their in-migration and out-migration. We first rank

the states according to their share of all elderly migrants. This ranking is heavily influenced by the different sizes of the different states, and thus it says little about the relative intensity of the urge to migrate. Therfore, we also rank the states according to their ratios of elderly migrants to total population and their ratios of elderly migrants to total elderly population. Note that the "counter-stream migration" claim put forward in earlier studies is confirmed by the in- and out-migration ratios displayed in Table 1. Nevada, Arizona, and Florida generally have very high rankings in measures of in-migration, but they also generally have very high rankings in measures of out-migration.

Table 1. Interstate in-migration and out-migration statistics.*

	in-migration share in total elderly migration (%)		out-migration share in total elderly migration (%)
FL	19.6	***NY***	10.24
AZ	6.49	***FL***	9.4
CA	6.29	***CA***	8.64
TX	4.86	***IL***	5.02
NC	3.44	***NJ***	4.51
	ratio of in-migration to state's population (%)		**ratio of out-migration to state's population (%)**
NV	2.55	***NV***	1.21
AZ	2.14	***AZ***	0.95
FL	1.96	***FL***	0.94
DE	1.13	***NH***	0.93
NH	0.99	***OR***	0.84
	ratio of in-migration to state's elderly pop. (%)		**ratio of out-migration to state's elderly pop. (%)**
NV	18.88	***NV***	8.97
AZ	14.28	***NH***	7.35
FL	10.29	***WY***	6.79
DE	8.13	***NM***	6.54
NH	7.82	***AZ***	6.33

*Total number of U.S. elderly migrants during 1995-2000 is 1,456,760.

We estimate the following reduced form gravity equation:

$$\begin{aligned} Migrants_{ij} = {} & \alpha + \beta_1(\text{Neighbor})_{ij} \\ & + \beta_2(\text{Distance})_{ij} + \gamma_1(\text{Exemption})_i \\ & + \gamma_2(\text{Exemption})_j + \gamma_3(\text{Tax})_i + \gamma_4(\text{Tax})_j \\ & + \gamma_5(\text{Expenditure})_i + \gamma_6(\text{Expenditure})_j \\ & + \gamma_7(\text{CostLiving})_i + \gamma_8(\text{CostLiving})_j \\ & + \gamma_9(\text{Population})_i + \gamma_{10}(\text{Population})_j \\ & + \gamma_{11}(\text{Amenity})_i + \gamma_{12}(\text{Amenity})_j \\ & + \gamma_{13}(\text{PensionExemp} * \text{Inc. Tax})_i \\ & + \gamma_{14}(\text{PensionExemp} * \text{Inc. Tax})_j + \varepsilon_{ij} \end{aligned} \quad (5)$$

The dependent variable $(Migrants)_{ij}$ varies according to whether the estimation is for gross or net migration. For the estimation of gross migration flows, $Migrants_{ij}$ is the natural logarithm of the total number of elderly migrants from state *i* to state *j*. For net migration, $Migrants_{ij}$ is the natural logarithm of the difference between the number of migrants from state *i* to state *j* and the number of migrants from state *j* to state *i*, provided that the gross flow from state *i* to state *j* is greater than that from state *j* to state *i*. This specification follows the one employed by Conway and Houtenville (2001). The explanatory variables are defined as follows:

Neighbor is a dummy variable for neighboring states. If states *i* and *j* share a common border, *Neighbor* is one; otherwise *Neighbor* is zero.

Distance is the natural logarithm of the linear distance between the population gravity centers of states *i* and *j*. The latitude and longitude of the population gravity center for each state (as of 2000) were obtained from the U.S. Census Bureau.

Exemption is a vector consisting of four indicator variables for various state tax exemptions. The indicator variables are scored using the raw data from an online source (in the case of social security, pension, and drug sale exemptions)[6] and from Schoenblum (2001) (in the case of inheritance tax exemptions).

[6] Retirement Living- Taxes by States, www.retirementliving.com. Technically, the raw data on this site reflects the status of current state tax exemption rules. However, these rules, given their structural nature, historically change very slowly, if at all. Thus, the current rules provide a valid proxy for the rules in effect during the 1995 to 2000 time frame.

a. *Social Security Exemption* indicates whether a given state exempts or partially exempts social security payments from state income tax. In the case of exemption, the indicator variable is set at one; otherwise, it is zero.

b. *Pension Exemption* indicates whether a given state provides a meaningful exemption for private pension payments from state income tax. We define a meaningful exemption as the exemption of $6000 or more of private pension income. This allows us to classify roughly half the states (29 in all, and 22 of the 43 states that impose an income tax) as offering a meaningful exemption. We input one in case of exemption, and zero otherwise.

c. *Drug Sale Exemption* indicates whether a given state exempts the sale of prescription drugs from sales tax. We input one in case of exemption, and zero otherwise.

d. *Inheritance Tax Exemption* indicates whether a given state imposes any estate, inheritance, or gift tax above and beyond the common baseline determined by the Section 2011 Federal estate tax credit. If there is no such incremental tax, the indicator variable is set at one; otherwise, it is zero.

Tax is a vector consisting of the effective individual income tax rate, corporate income tax rate, property tax rate, general sales tax rate, and "all other" tax rate in a given state. The effective tax rates are calculated by dividing the revenue derived by the state (and by local governments within such state) from the specified tax by the state's aggregate personal income. We then take the average for the years 1990 through 1995. We also include in this vector two other sources of state and local government revenue, "Federal revenue" and "total charges". Federal revenue is the revenue the state receives directly from the Federal government in the form of transfers. To be consistent with our tax variables, we convert this variable into a ratio by dividing the state's Federal revenue by its aggregate personal income and then taking the average for the years 1990 through 1995. Total charges is the revenue the state derives from all other fees and charges it imposes. Again, we calculate a ratio by dividing the state's total charges by its aggregate personal income and then taking the average for the years 1990 through 1995. Data for all of the foregoing were obtained from the U.S. Census Bureau's "State and Local Government Finances" database. Although we include all of the foregoing tax and revenue items in our regressions in order to avoid an omitted variables bias, we will only report selected variables in Tables 3 and 4.

Expenditure is a vector of per capita state and local government expenditures in a given state, including expenditures on education, highways, health and hospitals, police, fire protection, parks and recreation, and public transport. We take the average of aggregate expenditures from 1990 to 1995, convert these to constant dollars using cost of living-adjusted state price indexes, and then convert them to per capita amounts by dividing them by the state's population. Data were obtained from the U.S. Census Bureau's "State and Local Government Finances" database. Although we include all of the foregoing expenditure items in our regressions in order to avoid an omitted variables bias, we will only report coefficients for education and health expenditures.

Cost of Living is the natural logarithm of the consumer price index in a given state. Berry et al. (2000) present state-wide uniform indexes for cost of living in each state from 1960 to 2003; we use the 1994 values provided in their study.

Population is the natural logarithm of the average population of a given state for the years 1990 through 1995. Data were obtained from the U.S. Census Bureau. In this vector we also include population density and urbanization ratios. We find the population density by dividing the state's total population by its area. We took the urbanization data for the year 1990 from Morgan and Morgan (2000).

Amenity is a vector consisting of temperature and crime rate, both reported in Morgan and Morgan (2000). State temperatures were the average of temperatures from 1961 through 1990. Crime rate data were the number of cases per 100,000 population.[7]

Income Tax-Pension Exemption Interaction is an interaction term for the individual income tax rate and the pension exemption in a given state. We

[7] Investigating county level documentation on the number of crimes (as provided by the Disaster Center) reveals that the crime to population ratio was relatively stable throughout the 1990s. Thus, endogeneity is not a concern to our study. We use the state level crime rate data provided by Morgan and Morgan (2000) to ensure homogeneity of data methodology across states.

also tested interaction terms for the individual income tax and the social security exemption as well as the general sales tax rate and the exemption of drugs from sales tax. These two interactions resulted in high levels of collinearity, which makes the significance levels of coefficient estimates unreliable. Thus, we only include the interaction term for the individual income tax rate and the pension exemption in our results.

Table 2 provides the means and the standard deviations of our dependent and explanatory variables.

Table 2. Descriptive statistics.

	Mean	St. Dev.
Gross Flow	5.07	1.73
Net Flow	4.3	1.8
Neighbor	0.1	0.3
Distance	2.68	0.75
Inheritance Tax Exemp	0.66	0.47
Social Security Exemp	0.7	0.46
Pension Exemp	0.53	0.5
Drug Sale Exemp	0.92	0.27
Individual Income Tax	0.023	0.012
Property Tax	0.032	0.011
General Sales Tax	0.026	0.011
Federal Revenue	0.037	0.011
Education Exp	0.065	0.01
Health Exp	0.02	0.009
Cost of Living	4.37	0.09
Population	15.1	0.97
Urban	0.68	0.14
Crime	8.42	0.26
Density	146.9	186.2
Temperature	542.7	76.3

Summary statistics for gross flow, neighbor, and distance are based on 2168 state pairs.
Summary statistics for net flow are based on 1104 state pairs.
Summary statistics of all other variables are across 48 states.

5. Empirical results

Tables 3 and 4 present our regression results. The destination state and origin state coefficients are denoted by "Dest" and "Org," respectively.

5.1 Gross migration

We begin by analyzing interstate gross migration of the elderly. In addition to providing estimates for the entire elderly population, our data allow us to report separate regression results for three age subgroups: the young elderly (from 65 to 74 years old), the middle-aged elderly (from 75 to 84 years old), and the old elderly (older than 84). Coefficient estimates and their robust standard errors for these age subgroups are shown in Table 3.

The neighbor dummy variable has a positive coefficient and is significant: there is much migration between neighboring states. The distance between two states has a negative coefficient and is significant: the greater the distance between two states, the less the migration between them. These results, which occur uniformly across all age subgroups, match results reported in Conway and Houtenville (2001). The results are hardly surprising and are likely due to two factors which can be expected to exert a negative effect on long-distance migration: direct costs of moving surely increase with distance, while the degree of familiarity with prospective destinations almost surely decreases with distance.

The inheritance tax exemption variable[8] for the destination state uniformly has a positive coefficient that is significant: all subgroups of the elderly population are pulled to states that do not impose any incremental transfer taxes. This is an intuitively appealing result, for while only a small fraction of the elderly population is generally subject to transfer taxes, that fraction is mobile (they are wealthy) and hence readily able migrate to avoid the taxes. Perhaps somewhat surprisingly, coefficients for the inheritance tax exemption for the origin state are insignificant (although they are, as would be expected, uniformly negative).

The individual income tax variable for the destination state has a negative coefficient that is significant both for the pooled data and for the young elderly. This is what one would expect: a higher income tax repels migrants. The remaining coefficients for the income tax variable are insignificant.

To further study the impact of a state income tax, we created an interaction variable between the individual income tax variable and the pension exemption variable. The possible relevance of this interaction should be obvious: for many retirees, pension income, along with Social Security income, represents the lion's share of all income. Thus, to the extent that a state levies an income tax, even at a high rate, but accompanies such income tax with a

[8] Recall that the inheritance tax exemption enters our regressions as a dummy variable: it is one if a state levies no incremental transfer taxes, and zero otherwise. Among states that actually levy such taxes, rates do not vary a lot.

meaningful exemption for pension income, a retiree earning primarily pension income will not be overly concerned about the income tax because she will not pay it. Indeed, such a retiree may welcome the income tax, since the tax imposed on others will presumably fund public goods that may provide her some benefit. We do, in fact, find some evidence to support this speculation: taking the interaction coefficient into account, as the income tax rate increases in the origin state, all subgroups of the elderly population out-migrate significantly less, provided that a meaningful pension exemption is offered by the origin state.

Table 3. Interstate gross migration.

	Pooled	65-74	75-84	85 and older
Neighbor	0.737***	0.715***	0.898***	0.941***
	(0.072)	(0.073)	(0.071)	(0.072)
Distance	-1.585***	-1.564***	-1.345***	-1.067***
	(0.147)	(0.159)	(0.137)	(0.131)
Distance Squared	0.106***	0.111***	0.085***	0.047*
	(0.028)	(0.030)	(0.027)	(0.027)
Inheritance Tax Ex. (Dest)	0.110**	0.156***	0.106**	0.151***
	(0.044)	(0.048)	(0.050)	(0.055)
Inheritance Tax Ex. (Org)	-0.073	-0.071	-0.060	-0.086
	(0.045)	(0.048)	(0.052)	(0.055)
Social Sec. Ex. (Dest)	0.049	0.113*	0.094	0.100
	(0.055)	(0.059)	(0.063)	(0.067)
Social Sec. Ex. (Org)	0.089	0.128**	0.125*	0.063
	(0.057)	(0.060)	(0.067)	(0.068)
Pension Exempt (Dest)	-0.108	-0.057	-0.047	-0.162
	(0.123)	(0.133)	(0.138)	(0.159)
Pension Exempt (Org)	0.256**	0.211	0.363**	0.535***
	(0.124)	(0.133)	(0.143)	(0.154)
Drug Sale Exempt (Dest)	1.163***	1.275***	0.988***	0.762***
	(0.085)	(0.091)	(0.097)	(0.104)
Drug Sale Exempt (Org)	0.631***	0.716***	0.562***	0.496***
	(0.083)	(0.088)	(0.091)	(0.108)
Ind. Income Tax (Dest)	-10.848***	-13.208***	-4.745	-8.687
	(4.166)	(4.320)	(4.657)	(5.363)
Ind. Income Tax (Org)	-0.502	-4.199	4.101	1.946
	(4.201)	(4.621)	(4.819)	(5.240)
Property Tax (Dest)	26.433***	22.723***	25.744***	24.000***
	(3.851)	(3.918)	(4.311)	(4.614)
Property Tax (Org)	18.774***	20.237***	16.087***	13.575***
	(3.714)	(3.962)	(4.091)	(4.768)
General Sales Tax (Dest)	-7.214**	-10.735***	-6.048*	-8.358**
	(3.258)	(3.360)	(3.666)	(4.052)
General Sales Tax (Org)	-7.573**	-9.152**	-6.667*	-11.259***
	(3.369)	(3.646)	(3.688)	(4.341)
Federal Revenue (Dest)	-4.429	-3.810	-2.509	-0.400
	(3.595)	(3.919)	(3.932)	(4.282)
Federal Revenue (Org)	7.308**	8.240**	11.314***	14.878***
	(3.461)	(3.671)	(3.862)	(4.228)

Table 3. Interstate gross migration (continued).

	Pooled	65-74	75-84	85 and older
Education Exp. (Dest)	9.606*	18.726***	0.744	-3.413
	(5.620)	(5.971)	(6.208)	(6.965)
Education Exp. (Org)	-1.191	-0.561	-0.205	-9.976
	(5.588)	(6.130)	(6.432)	(7.091)
Health Exp. (Dest)	15.522**	20.956***	4.752	-6.835
	(6.216)	(6.562)	(6.833)	(7.735)
Health Exp. (Org)	-15.897**	-11.335	-19.973**	-32.723***
	(6.796)	(7.035)	(7.820)	(8.990)
Cost of Living (Dest)	-1.618***	-1.353**	-0.436	-0.166
	(0.617)	(0.657)	(0.719)	(0.736)
Cost of Living (Org)	1.881***	1.543**	3.391***	2.432***
	(0.677)	(0.695)	(0.747)	(0.800)
Population (Dest)	0.589***	0.529***	0.590***	0.665***
	(0.037)	(0.040)	(0.043)	(0.049)
Population (Org)	0.852***	0.803***	0.791***	0.757***
	(0.039)	(0.042)	(0.044)	(0.050)
Urban (Dest)	0.144	-0.185	-0.000	-0.211
	(0.301)	(0.319)	(0.344)	(0.381)
Urban (Org)	0.721**	0.941***	0.070	0.246
	(0.309)	(0.322)	(0.327)	(0.361)
Crime (Dest)	0.193	0.063	0.318*	0.517***
	(0.163)	(0.168)	(0.185)	(0.196)
Crime (Org)	0.384**	0.264	0.434**	0.475**
	(0.153)	(0.161)	(0.179)	(0.198)
Density (Dest)	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Density (Org)	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Temperature (Dest)	0.005***	0.006***	0.005***	0.002***
	(0.001)	(0.001)	(0.001)	(0.001)
Temperature (Org)	0.003***	0.003***	0.005***	0.004***
	(0.000)	(0.001)	(0.001)	(0.001)
IncTax*PensionExp (Dest)	-8.111*	-9.796**	-9.160**	-2.998
	(4.175)	(4.502)	(4.621)	(5.251)
IncTax*PensionExp (Org)	-13.199***	-11.978***	-17.741***	-20.396***
	(4.138)	(4.470)	(4.745)	(5.089)
Constant	-28.934***	-26.028***	-42.584***	-41.045***
	(5.290)	(5.530)	(6.188)	(6.834)
Observations	2167	2090	1972	1724
Adjusted R-squared	0.83	0.80	0.77	0.70

Standard errors are reported in parentheses. *p<0.1 **p<0.05 ***p<0.01.

We also investigate the response of the elderly to a complete exemption of Social Security receipts from state income taxation. Positive coefficients are obtained for all age subgroups, but they are mostly insignificant. Only the young elderly present uniformly significant results: they significantly migrate to states that do not tax social security receipts, but they also significantly migrate away from states that do not tax such receipts. However, it is difficult to ascribe much meaning to these results. The reason is that fully thirty-five out of the forty-eight states in our study exempt social security receipts from in-

come tax, and those states include all of the most populous states as well as every single state that falls into the category of being a traditional retirement haven.

For property taxes, we find a same-sign problem across all age subgroups. The elderly significantly migrate away from states where property taxes are high, but they also significantly migrate to states where property taxes are high. While the positive and significant effect of property tax on out-migration is intuitive and in line with earlier findings[9], the same is not true for our in-migration result, which differs from results reported by Cebula (1978), Clark and Hunter (1992), and Gale and Heath (2000). The difference may be attributable to two factors: the set of taxes being used as control variables and the age of migrants being studied. Clark and Hunter (1992) obtain a negative and significant effect of property tax in the destination state for elderly migrants older than 55, and Gale and Heath (2000) obtain the same result for elderly migrants older than 60. Both of these studies omit potentially important control variables from their regressions. Conway and Houtenville (2001) demonstrate that the set of control variables should include sales tax in order to obtain reliable results with respect to elderly migrants. They rerun the regressions of Clark and Hunter (1992) using the same tax definitions but adding sales tax as a control variable. When they do this, they find that property tax in the destination state turns out to have a positive and significant effect on in-migration, which is qualitatively the same result we obtain. While Gale and Heath (2000) include sales tax in their analysis, they omit a control variable for inheritance tax. Finally, Cebula (1978) considers non-elderly migrants (under the age of 50) and also obtains a negative and significant effect for property tax in the destination state.

There is a plausible explanation for elderly (but not non-elderly) in-migrants possibly responding counterintuitively to property tax. High property tax levels generally correspond to high levels of locally-provided amenities, which the elderly presumably value. The trick is to benefit from such amenities without paying too much for them. Since property taxes are generally an increasing function of property values, the elderly can disproportionately benefit from locally-provided amenities by purchasing relatively less valuable properties. Elderly in-migrants are well-situated to do precisely that: as predominantly empty-nesters they will generally seek properties that are on average smaller and hence less valuable than those that predominate in a given locale. Thus, the attraction to high property tax destinations may be a classic free-rider story.

But there is a second piece to this story. An elderly would-be migrant will frequently be moving from a larger property (acquired before the nest was empty) to a smaller one (commensurate with an empty nest). As long as a would-be migrant remains in the original property in the origin state, the would-be migrant is not only unable to free-ride, but is also paying unnecessarily high property taxes to the extent that the origin state is a high property tax state. Thus, the higher the property taxes in the origin state, the greater the motivation to move and, all else equal, the greater the likelihood that such move will result in interstate migration. This means that the same sign "problem" in the case of property tax might not be a problem at all.

Our general sales tax variable presents another same-sign problem across all age subgroups, albeit one for which we have no innovative explanation. The elderly significantly migrate to states where sales taxes are low, but they also significantly migrate away from states where sales taxes are low. The drug sale exemption variable also presents a same sign problem across all age subgroups. The elderly significantly migrate to states that exempt drugs from their general sales tax. However, the elderly also significantly migrate away from states that exempt drugs from their general sales tax.

A surprising finding in our regressions concerns the impact of Federal revenue on elderly migration: the elderly are not pulled into states that derive a larger share of their revenues from the Federal government (although this result is not statistically significant) and they are pushed out of states that derive a larger share of their revenues from the Federal government (and this result is uniformly statistically significant). One would expect the reverse to be true: from the vantage of a state's residents, funds received from the Federal government allow the state to provide public goods without any need for the state to impose any directly corresponding taxes or fees. A possible explanation is that greater Federal revenues may correspond to some other undesirable feature of a state. Alternatively, a state may receive greater Federal revenues because it has a more powerful and perhaps concomitantly more corrupt political establishment, in which case the funds may not be spent in a manner that benefits its elderly residents.

[9] See, e.g., Cebula and Kohn (1975).

With respect to state education expenditures, we find that the elderly as a whole, and the young elderly in particular, are statistically significantly drawn to states with higher expenditures. In contrast, education expenditures by an origin state do not yield any significant results (although the coefficients are uniformly negative and hence consistent with the in-migration results). There is no obvious reason why the elderly value education expenditures.

With respect to state health expenditures, we find that the elderly as a whole, and the young elderly in particular, are statistically significantly attracted to states with higher expenditures. Moreover, health expenditures by an origin state statistically significantly discourage out-migration for all age subgroups except the young elderly (the coefficient for the young elderly is negative but is not significant). These results are what one would expect: the elderly are significant consumers of health services and can therefore be expected to value expenditures on such services.

Cost of living is generally a highly significant factor pulling the elderly to destination states with low costs of living and pushing them from origin states with high costs of living. Only in the case of in-migration of the middle-aged and old elderly are the regression coefficients not significant (although they do have the anticipated sign).

Finally, temperature is a significant factor pulling the elderly to warmer destination states. However, the elderly also significantly out-migrate from warmer origin states. As already noted, such a same sign problem tends to be caused by counter-steam migration. Indeed, it is worth noting that except for the education expenditure, health expenditure and cost of living variables, most of the coefficients reported for the pooled data in table 3 have the same sign for the origin and the destination variables.[10] Turning our focus from gross migration data to net migration data may to some extent cure this problem.

5.2 Net migration

The regressions reported in table 4 use the natural logarithm of net migration as the dependent variable. Focusing solely on migration between any two states, we define the destination state as the state with the greater number of in-migrants and the origin state as the state with the smaller number of in-migrants. We then define net migration between such states as the positive number equal to the excess of the number of in-migrants to the destination state over the number of in-migrants to the origin state.[11] In this discussion, we limit our focus to differences in our regression results for net migration and gross migration.

Sharing a common border significantly induces net migration of all three subgroups of the elderly, as was the case for gross migration in the previous subsection. However, this result is not observed for the pooled net migration data.

As was the case for gross migration, the absence of incremental inheritance taxes in a destination state is a highly significant factor for inducing in-migration of the young and the old elderly, as well as of the pooled elderly. However, this result was not observed for the middle-aged elderly. On the other hand, the absence of incremental inheritance taxes in the origin state significantly lowers out-migration for this age subgroup.

Our results for the income tax, pension exemption, and interaction variables are mostly inconclusive. However, we obtain an interesting result for the old elderly. For this age subgroup, the interaction variable shows a positive but not statistically significant marginal effect for in-migration and a negative statistically significant marginal effect for out-migration when pensions are meaningfully tax-exempt in the destination and the origin states, respectively. When combining the effects of the income tax variable and the interaction term, we find that the old elderly migrate to states that couple high income taxes with a meaningful pension exemption but not to states that have high income taxes without a meaningful pension exemption. Similarly, they migrate out of states that have high income taxes without a meaningful pension exemption, but tend to remain in states that couple high income taxes with a meaningful pension exemption. Thus, we find that the old elderly dislike income taxes if and only if they are among those who are required to pay them. Our finding differs from that in Conway and Houtenville (1998); looking at the 1990 census, they reported that pension exemptions had no bearing on either elderly in-migration or out-migration.

[10] Although the population variable's coefficient has a positive sign for both the origin state and the destination state, that is to be expected in a gravity model of migration.

[11] When we limit our attention to migration between two states, the number of in-migrants to one state necessarily equals the number of out-migrants from the other state.

With respect to property taxes, our net migration regression results generally agree with our gross migration results. We find that a higher property tax level in a destination state is a highly significant pull factor attracting all subgroups of the elderly to the state. In addition, for all subgroups except the young elderly, we find that a higher property tax level in the origin state is a significant push factor inducing the elderly to exit the state. As noted above in the discussion of our gross migration results, these results are inconsistent with Gale and Heath (2000) but consistent with Conway and Houtenville (1998, 2001). Cebula (1974) obtains a negative and significant effect for property tax using net migration for white men and women (separately) older than 65, but sales tax and inheritance tax are excluded from his analysis.

Table 4. Interstate net migration.

	Pooled	65-74	75-84	85 and older
Neighbor	0.246	0.282*	0.656***	0.637***
	(0.163)	(0.153)	(0.136)	(0.120)
Distance	-1.539***	-1.656***	-1.059***	-0.985***
	(0.262)	(0.275)	(0.234)	(0.214)
Distance Squared	0.116**	0.149***	0.092**	0.064
	(0.051)	(0.052)	(0.046)	(0.042)
Inheritance Tax Ex. (Dest)	0.343***	0.268***	-0.040	0.201**
	(0.103)	(0.099)	(0.093)	(0.097)
Inheritance Tax Ex. (Org)	-0.206**	-0.157	-0.187*	-0.110
	(0.104)	(0.100)	(0.097)	(0.091)
Social Sec. Ex. (Dest)	-0.193*	-0.160	-0.103	0.017
	(0.116)	(0.114)	(0.104)	(0.107)
Social Sec. Ex. (Org)	0.030	0.137	0.062	-0.125
	(0.121)	(0.128)	(0.112)	(0.103)
Pension Exempt (Dest)	-0.197	0.044	0.213	-0.493**
	(0.225)	(0.245)	(0.228)	(0.250)
Pension Exempt (Org)	0.409	-0.036	0.498	0.618**
	(0.362)	(0.365)	(0.304)	(0.251)
Drug Sale Exempt (Dest)	0.908***	1.100***	0.765***	0.493**
	(0.209)	(0.223)	(0.216)	(0.234)
Drug Sale Exempt (Org)	-0.041	0.201	-0.019	0.008
	(0.187)	(0.188)	(0.165)	(0.154)
Ind. Income Tax (Dest)	9.864	8.794	10.954	-2.728
	(8.612)	(8.861)	(8.540)	(9.027)
Ind. Income Tax (Org)	9.272	-4.435	7.882	7.203
	(10.322)	(10.849)	(9.293)	(8.715)
Property Tax (Dest)	56.734***	48.234***	52.304***	33.774***
	(8.419)	(8.254)	(8.083)	(8.215)
Property Tax (Org)	16.227*	8.508	14.278*	15.798*
	(8.299)	(9.034)	(8.271)	(8.280)
General Sales Tax (Dest)	13.015*	13.358*	9.248	8.079
	(7.231)	(7.029)	(7.134)	(7.366)
General Sales Tax (Org)	2.962	-5.523	5.681	2.723
	(7.609)	(7.595)	(7.486)	(7.251)

Table 4. Interstate net migration (continued).

	Pooled	65-74	75-84	85 and older
Federal Revenue (Dest)	-15.834**	-2.327	-15.672**	0.046
	(7.032)	(7.109)	(7.159)	(6.758)
Federal Revenue (Org)	31.501***	12.520*	14.908**	9.997
	(7.540)	(6.851)	(6.713)	(6.873)
Education Exp. (Dest)	-9.053	-14.625	-11.188	-12.703
	(11.835)	(11.741)	(11.848)	(11.443)
Education Exp. (Org)	-38.412***	-25.997**	-16.388	-8.260
	(12.628)	(12.118)	(10.931)	(10.939)
Health Exp. (Dest)	14.996	11.187	15.863	-2.778
	(11.192)	(11.582)	(12.111)	(11.311)
Health Exp. (Org)	-54.118***	-26.486*	-33.594**	-23.673*
	(14.675)	(15.398)	(13.451)	(13.157)
Cost of Living (Dest)	-4.081***	-3.462***	-3.423***	-2.681**
	(1.285)	(1.215)	(1.235)	(1.109)
Cost of Living (Org)	3.428**	3.398**	2.123	0.692
	(1.353)	(1.377)	(1.326)	(1.314)
Population (Dest)	0.247***	0.076	0.171**	0.390***
	(0.082)	(0.082)	(0.077)	(0.079)
Population (Org)	0.746***	0.825***	0.562***	0.508***
	(0.098)	(0.090)	(0.086)	(0.084)
Urban (Dest)	-2.242***	-1.477***	-0.233	-0.469
	(0.566)	(0.562)	(0.580)	(0.541)
Urban (Org)	1.342*	0.769	0.711	-0.404
	(0.692)	(0.634)	(0.586)	(0.608)
Crime (Dest)	-0.007	0.040	-0.376	0.194
	(0.359)	(0.334)	(0.333)	(0.320)
Crime (Org)	0.574*	0.289	0.130	0.149
	(0.316)	(0.307)	(0.310)	(0.322)
Density (Dest)	-0.000	-0.001	-0.001**	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Density (Org)	-0.001**	-0.001*	-0.001*	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Temperature (Dest)	0.008***	0.009***	0.007***	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Temperature (Org)	-0.001	-0.002	0.000	0.002
	(0.001)	(0.001)	(0.001)	(0.001)
IncTax*PensionExp (Dest)	-10.247	-16.791*	-13.553*	11.503
	(8.068)	(8.865)	(8.028)	(8.502)
IncTax*PensionExp (Org)	-6.808	6.463	-12.372	-15.845*
	(11.568)	(11.617)	(9.920)	(8.954)
Constant	-17.098	-16.502	-5.571	-6.993
	(10.425)	(10.219)	(10.142)	(10.323)
Observations	1091	1058	1027	939
Adjusted R-squared	0.68	0.68	0.60	0.51

Standard errors are reported in parentheses. *p<0.1 **p<0.05 ***p<0.01.

With respect to sales taxes, our results are generally not statistically significant. However, the elderly as a group and the young elderly in particular are pulled into states that have higher sales taxes. In addition, a drug sale exemption in a destination state is a highly significant factor attracting migrants of all age subgroups. In contrast, a drug sale exemption in an origin state has no significant impact on out-migration. By way of comparison, Conway and Houtenville (1998) also report that the elderly migrate to states with high sales taxes (statistically significantly) and migrate away from states with high sales taxes (insignificantly).

With respect to non-fiscal variables, our net migration results generally correspond fairly closely to our gross migration results. In particular, we again find that cost of living matters. We find that all subgroups of the elderly migrate to states with a lower cost of living (highly significantly) and that the pooled elderly and the young elderly migrate from states with a higher cost of living (significantly). These results, which are consistent with those found by Cebula and Alexander (2006), Conway and Houtenville (1998, 2001), and Gale and Heath (2000), are hardly surprising: many elderly live on a fixed income, i.e., an income that does not change as the cost of living changes, and their fixed income "goes farther" in a state with a lower cost of living.

Finally, for all age subgroups except the old elderly, warmer average temperatures are a highly significant factor pulling migrants to destination states. Warmer average temperatures, however, turn out to be an insignificant pushing factor for out-migration for every age group as well as for the pooled net migration data.

6. Conclusion

We use 1995 through 2000 data from the 2000 Census to investigate the effect of various state fiscal policies (and certain other variables) on the interstate migration of elderly Americans. Among our findings are a number that are not unexpected: the lack of incremental inheritance taxes affects elderly in-migration positively and significantly (in nearly every specification); an exemption of prescription drugs from sales taxes affects elderly in-migration positively and significantly (in every specification); expenditures on public health affect elderly out-migration negatively and significantly (in nearly every specification); warmer average temperatures affect elderly in-migration positively and significantly (in nearly every specification).

A more intriguing finding concerns the interaction of income taxes with a meaningful income tax exemption for pension payments. Thus, taking our interaction coefficient into account, we find that as income taxes increase in an origin state, the elderly out-migrate significantly less, provided such state offers a meaningful pension exemption (in most specifications). That is, if a state offers a pension exemption, the elderly actually prefer such state to have higher income taxes. A possible explanation comes from the fact that for most retirees pension income (along with Social Security income) is the largest source of income. If a state does not tax such income, retirees in the state are able to enjoy the benefits funded by higher income taxes without significantly sharing in the payment for such benefits. In effect, they enjoy a free ride.

Another intriguing finding is that higher property taxes affect in-migration positively and highly significantly (in every specification), and affect out-migration positively and significantly as well (in nearly every specification). This result differs from Cebula (1974, 1978), Clark and Hunter (1992), and Gale and Heath (2000). This difference is driven by the age of migrants and (more importantly) the set of fiscal variables that are used as control variables in the analysis. Cebula (1978) considers non-elderly migrants (under the age of 50), Clark and Hunter (1992) consider elderly migrants older than 55, and Gale and Heath (2000) focus on elderly migrants older than 60. Clark and Hunter (1992) and Gale and Heath (2000) omit control variables for sales tax and inheritance tax, respectively, and Cebula (1974) omits both of these taxes. As demonstrated by Conway and Houtenville (2001), such omissions can change and indeed reverse the results.

A possible explanation for our property tax result comes from the nature of the first move of a significant number of retirees: such move involves trading down from a larger residence that was appropriate for child rearing to a smaller residence that is more appropriate as an empty nest. That higher property taxes would encourage such trading down is clear. But when looking for a replacement residence, higher property tax jurisdictions can be affirmatively appealing: such jurisdictions provide more property-tax funded amenities, and owners of larger properties (i.e., not elderly retirees with their small empty nests) disproportionately pay for such amenities. Thus, the migration story may again involve the elderly seeking to enjoy a free ride.

A third intriguing finding, but one for which we can offer no compelling explanation, is that Federal government revenue transfers positively and significantly affect out-migration (in nearly every specification). A possible explanation might be that greater Federal revenues may correspond to some unobserved undesirable feature of a state.

Finally, we note that cost of living matters a lot for in-migration as well as for out-migration. Higher cost of living negatively and highly significantly affects in-migration (in nearly every specification) and positively and highly significantly affects out-migration (in nearly every specification).

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Appendix 1: Hypotheses' Proofs.

Proof of Hypothesis 1:

Total differentiation of U_n^{ij} yields

$$dU_n^{ij} = \frac{1}{p_j + t_j}\frac{\partial U_n}{\partial x}\left(-w_n dt_{I_j} - c' dd_{ij} + \frac{c(d_{ij}) - w_n\left(1 - t_{I_j}\right)}{p_j + t_j}\left(dt_j + dp_j\right)\right) + + \frac{\partial U_n}{\partial G_j}dG_j + \frac{\partial U_n}{\partial A_j}dA_j \quad \text{(A.1)}$$

Holding other variables constant, the necessary change in income taxes following a one unit increase in public goods provision to remain on the same indifference curve is given by

$$dt_{I_j} = \frac{p_j + t_j}{w_n}\frac{\partial U_n/\partial G_j}{\partial U_n/\partial x}dG_j \quad \text{(A.2)}$$

Since we assume a retiree's preferences for public goods provision is single-peaked, we have $dt_{I_j} > 0$ for $\frac{\partial U_n}{\partial G_j} > 0$, and $dt_{I_j} < 0$ for $\frac{\partial U_n}{\partial G_j} < 0$.
Similarly, the necessary change in income taxes following a one unit increase in local amenities to remain on the same indifference curve is given by

$$dt_{I_j} = \frac{p_j + t_j}{w_n}\frac{\partial U_n/\partial A_j}{\partial U_n/\partial x}dA_j \quad \text{(A.3)}$$

Hence we obtain $dt_{I_j} > 0$ for $\frac{\partial U_n}{\partial A_j} > 0$, and $dt_{I_j} < 0$ for $\frac{\partial U_n}{\partial A_j} < 0$ by virtue of single-peaked preferences. The relationship between local consumption taxes and the level of public goods provision or amenities is established similarly.

Proof of Hypothesis 2:

Using the total differential obtained in the proof of Claim 1, we obtain $\left(dt_j + dp_j\right) = 0$, so that $dt_j = -dp_j$ follows.

Proof of Hypothesis 3:

Using the total differential obtained in the proof of Claim 1, we obtain

$$dt_{I_j} = \frac{-c'}{w_n}dd_{ij} \quad \text{(A.4)}$$

and

$$dt_j = \frac{-c'(p_j + t_j)}{w_n\left(1 - t_{I_j}\right) - c(d_{ij})}dd_{ij}. \quad \text{(A.5)}$$

Appendix 2: Robustness for Migration Rate.

We rerun our regressions for pooled gross and net migration data using the migration rate as an alternative dependent variable. The migration rate is calculated by dividing the number of gross or net migrants, as the case may be, by the sum of the populations of the origin and destination states. By rerunning our regressions in this way, we are better able to compare our results to those of other researchers who have analyzed migration rates rather than migration flows.

Our results are presented in Table A1. The coefficients reported in the "Flow" columns are taken from the pooled regression results for gross and net migration data found in tables 3 and 4, respectively; the coefficients reported in the "Rate" columns are obtained from the same regression specification as in the "Flow" column but making use of migration rate as the dependent variable. The results obtained using migration rates are qualitatively very similar to those obtained using migration flows. The most notable change is that when looking at gross migration, for the inheritance tax exemption variable, the individual income tax variable and the Federal revenue variable, significance switches from the pulling (destination) factor to the pushing (origin) factor or vice versa.

Using migration rate as the dependent variable, Cebula (1978), Clark and Hunter (1992), and Gale and Heath (2000) all obtained negative and statistically significant coefficients for property tax in the destination state. In contrast, we obtain positive and significant coefficients for the same variable, exactly as we did when using migration flows rather than migration rates. Thus, it is not the difference in our dependent variable that explains why our results differ from those of prior researchers. Rather, the difference between our results and those of prior researchers is driven by the age of migrants and, more importantly, the set of fiscal variables that are used as control variables in the analysis, as discussed more in detail in section 5 of this paper.

Table A1. Flow vs. rate as dependent variable.

	Gross Migration		*Net Migration*	
	Flow	***Rate***	***Flow***	***Rate***
Neighbor	0.737***	0.764***	0.246	0.266
	(0.072)	(0.078)	(0.163)	(0.168)
Distance	-1.585***	-1.582***	-1.539***	-1.641***
	(0.147)	(0.162)	(0.262)	(0.278)
Distance Squared	0.106***	0.101***	0.116**	0.135**
	(0.028)	(0.031)	(0.051)	(0.053)
Inheritance Tax Ex. (Dest)	0.110**	0.074	0.343***	0.399***
	(0.044)	(0.047)	(0.103)	(0.103)
Inheritance Tax Ex. (Org)	-0.073	-0.180***	-0.206**	-0.251**
	(0.045)	(0.047)	(0.104)	(0.100)
Social Sec. Ex. (Dest)	0.049	-0.041	-0.193*	-0.126
	(0.055)	(0.059)	(0.116)	(0.116)
Social Sec. Ex. (Org)	0.089	-0.048	0.030	-0.058
	(0.057)	(0.061)	(0.121)	(0.126)
Pension Exempt (Dest)	-0.108	-0.090	-0.197	-0.461**
	(0.123)	(0.129)	(0.225)	(0.232)
Pension Exempt (Org)	0.256**	0.500***	0.409	0.497
	(0.124)	(0.126)	(0.362)	(0.340)
Drug Sale Exempt (Dest)	1.163***	1.057***	0.908***	0.757***
	(0.085)	(0.093)	(0.209)	(0.216)
Drug Sale Exempt (Org)	0.631***	0.525***	-0.041	-0.122
	(0.083)	(0.090)	(0.187)	(0.196)
Ind. Income Tax (Dest)	-10.848***	-5.138	9.864	7.241
	(4.166)	(4.280)	(8.612)	(8.589)
Ind. Income Tax (Org)	-0.502	13.094***	9.272	17.520*
	(4.201)	(4.249)	(10.322)	(9.866)
Property Tax (Dest)	26.433***	30.924***	56.734***	49.436***
	(3.851)	(4.034)	(8.419)	(8.349)
Property Tax (Org)	18.774***	29.836***	16.227*	24.442***
	(3.714)	(3.977)	(8.299)	(8.791)
General Sales Tax (Dest)	-7.214**	-1.021	13.015*	9.203
	(3.258)	(3.441)	(7.231)	(7.035)
General Sales Tax (Org)	-7.573**	3.911	2.962	10.599
	(3.369)	(3.623)	(7.609)	(8.039)
Federal Revenue (Dest)	-4.429	-9.285**	-15.834**	-20.46***
	(3.595)	(3.858)	(7.032)	(7.185)
Federal Revenue (Org)	7.308**	3.716	31.501***	26.167***
	(3.461)	(3.752)	(7.540)	(7.763)
Education Exp. (Dest)	9.606*	4.396	-9.053	-6.766
	(5.620)	(6.062)	(11.835)	(12.208)
Education Exp. (Org)	-1.191	-10.610*	-38.412***	-44.67***
	(5.588)	(5.992)	(12.628)	(12.936)

Table A1. Flow vs. rate as dependent variable (continued).

	Gross Migration		*Net Migration*	
	Flow	***Rate***	***Flow***	***Rate***
Health Exp. (Dest)	15.522**	19.254***	14.996	10.629
	(6.216)	(6.527)	(11.192)	(11.544)
Health Exp. (Org)	-15.897**	-2.136	-54.118***	-40.00***
	(6.796)	(7.146)	(14.675)	(14.745)
Price Level (Dest)	-1.618***	-2.677***	-4.081***	-3.372***
	(0.617)	(0.640)	(1.285)	(1.267)
Price Level (Org)	1.881***	-0.415	3.428**	1.198
	(0.677)	(0.698)	(1.353)	(1.394)
Population (Dest)	0.589***		0.247***	
	(0.037)		(0.082)	
Population (Org)	0.852***		0.746***	
	(0.039)		(0.098)	
Urban (Dest)	0.144	0.103	-2.242***	-2.883***
	(0.301)	(0.307)	(0.566)	(0.563)
Urban (Org)	0.721**	1.347***	1.342*	1.725***
	(0.309)	(0.311)	(0.692)	(0.636)
Crime (Dest)	0.193	0.247	-0.007	0.249
	(0.163)	(0.168)	(0.359)	(0.361)
Crime (Org)	0.384**	0.094	0.574*	0.379
	(0.153)	(0.157)	(0.316)	(0.287)
Density (Dest)	-0.001***	-0.001***	-0.000	-0.000
	(0.000)	(0.000)	(0.001)	(0.001)
Density (Org)	-0.001***	-0.001***	-0.001**	-0.001*
	(0.000)	(0.000)	(0.000)	(0.000)
Temperature (Dest)	0.005***	0.005***	0.008***	0.008***
	(0.001)	(0.001)	(0.001)	(0.001)
Temperature (Org)	0.003***	0.004***	-0.001	-0.001
	(0.000)	(0.001)	(0.001)	(0.001)
IncTax*PensionExp (Dest)	-8.111*	-7.276*	-10.247	-0.964
	(4.175)	(4.382)	(8.068)	(8.177)
IncTax*PensionExp (Org)	-13.199***	-20.760***	-6.808	-10.210
	(4.138)	(4.157)	(11.568)	(10.582)
Constant	-28.934***	-6.509	-17.098	-10.944
	(5.290)	(5.093)	(10.425)	(9.360)
Observations	2167	2167	1091	1091
Adjusted R-squared	0.827	0.704	0.682	0.520