

# 60 Years Later and Still Going Strong: The Continued Relevance of the Tiebout Hypothesis

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**Abstract:** The theory known as the Tiebout Hypothesis concludes that an individual or family's decision to move to a community matches their desired level of public goods. In this paper, we review results from over 40 articles in the last 14 years, validating the claim that the Tiebout Hypothesis continues to be relevant and topical. The "basket" of public goods reviewed includes U. S. states' respective tax rates, Sun Belt migration levels, the relative cost and appeal of quality public schools, differing welfare policies, pollution levels, and comparative economic and personal freedom. The theory is that a proper sorting of these influences can guide policy makers to an optimal level of public goods for private entities and jurisdictions.

## 1. Introduction

It has been sixty years since "A Pure Theory of Local Expenditures" was published by Charles Tiebout (1956) in the *Journal of Political Economy*. His paper provides both theory and evidence that people "vote" for the optimal share of public goods with their feet. Voting is the decision to move to a community that has their desired level of public goods. This theory became known as the Tiebout Hypothesis. Since 1956, there were hundreds of papers published in economic, social science, and regional science journals that set out to test the many implications of the Tiebout Hypothesis using different methodologies, disaggregating migration flows by different groups of people, distinguishing between in-migration and out-migration, adding in additional explanatory variables, and distinguishing between different types of local government expenditure. Based on current debates in this area, the Tiebout Hypothesis appears as relevant to today's political economy as it was 60 years ago.

Tiebout's paper was groundbreaking because up to that time the standard belief among most economists was that there was no free market solution for

the optimal allocation of public goods. Tiebout agrees with Musgrave (1939) and Samuelson (1954) that there is only a "political" solution for the allocation of federal government expenditures, but argues for the occurrence of "sorting," i.e., people moving freely among different communities will choose the community that best suits their preference for local government expenditures and taxes. Thus, people vote for public goods and their financing with their feet. He argues that the Musgrave and Samuelson approach is valid for federal government expenditures because the federal government represents all people in the United States. However, applying the Tiebout Hypothesis to other countries was fraught with much higher barriers, such as differences in culture and political structure, so the international applications are limited.

There were eight key assumptions Tiebout (1956) made in his model: (1) consumer-voters are fully mobile and will move to that community where their preferences are best met; (2) consumers have complete knowledge of revenues and expenditures on public goods in every community and will react to

those differences; (3) there are many communities to choose from; (4) employment is not an issue to consider; (5) public goods accrue only to the community paying for them; (6) communities grow to take advantage of economies of scale in the provision of public goods; and (7) communities try to grow or contract to maintain optimal size.

Even Tiebout (1956) realizes that perfect sorting of consumer-voters would not be achieved because of the realities such as limited job opportunities, consumer voters not having total knowledge of the choices of public goods in all communities, limits to mobility, moving costs, etc. Tiebout postulated his model as a conceptual solution to Samuelson's (1954) dilemma:

However no decentralized pricing system can serve to determine optimally these levels of collective consumption. Other kinds of "voting" or "signaling" would have to be tried. (Samuelson, 1954, pp. 388)

Thus, testing the Tiebout Hypothesis is about looking for evidence of the type of signaling Tiebout proposes in his 1956 paper. It is unreasonable to expect to find complete Tiebout sorting such that all people in a community have exactly the same set of preferences for collective goods. Community members are constrained by limited job opportunities, high moving costs, lack of knowledge, or other barriers to moving to where their preferences can be fully met.

It is precisely because of the constraints discussed above that most studies empirically test for evidence of Tiebout sorting. Sorting includes control variables to account for employment opportunities (variables such as the unemployment rate and per capita income, for example), moving costs (such as distance), and other attractive local characteristics (such as climate variables, cost of living, etc.). Clark and Hunter (1992) describe three such models to explain migration. One is the human capital model which views migration as an investment: consumers choose their place to live based on where they have the best economic opportunities. In other words, consumers weigh the present value of future benefits of relocation against the present value of the costs of moving. This model implies that factors such as the unemployment rate and per capita income are important determinants of migration where the unemployment rate would dissuade in-migration and higher per capita income would induce in-migration, leading to greater economic opportunity.

The other two models discussed in Clark and Hunter (1992) are based on the assumption that households migrate based on their desire to consume

location-specific goods. Consistent with this assumption is the Tiebout-Tullock Hypothesis, which specifies that people choose to relocate based on the public goods offered at each location, thus avoiding the burden of higher taxes. Naturally, the studies based on this model find a plethora of evidence that in-migration is significantly impacted by local government expenditure on desirable public goods, like public schools, but negatively correlated with higher taxes. Also consistent with the hypothesis that people choose where to live based on location-specific amenities is the hedonic wage approach of Rosen (1979). In this model, labor movements respond to differences in wages, but workers are willing to accept lower wages in areas that have more of the amenities they desire, i.e. there is somewhat of a tradeoff between wages and quality of life. Further, this model postulates that areas with more desirable location-specific goods will therefore have lower wages and higher land rents. It also implies that if the wage/amenities tradeoff was at its optimum value, migration would cease. Then, if a community improves its amenities, new migrants would flow in, which would increase the supply of labor, decrease wages, and increase the demand for housing, raising land rents until a new equilibrium is reached. In 1971, Gordon Tullock published his article "Public Decisions as Public Goods" in the *Journal of Political Economy*, extending the Tiebout analysis and demonstrating that the operations of government itself raise a new and difficult public goods problem.

Another commonly used model is the gravity model. This model, when applied to migration studies, models migration as a function of attractive forces and repulsive forces. Attractive factors may include economic opportunity (employment and higher income, for example), local amenities, public goods, quality of life, etc., and repulsive factors may include distance, population size, crime, disamenities, higher taxes, a higher cost of living, and other factors. For more details on the gravity model see Haynes and Fotheringham (1984), for example.

This paper reviews many of the papers published since 1990 that examine various facets of the Tiebout Hypothesis. For papers prior to 1990, one should refer to Dowding et al. (1994) for a review of approximately 200 studies related to the Tiebout Hypothesis. Further, this survey of the literature will limit itself to papers referring to the Tiebout Hypothesis and the United States and will not address papers dealing with the capitalization of public goods into housing prices.

As many papers in this review find, different groups of consumer-voters have different sets of preferences so we would expect different patterns of migration among these different groups. Among the groups investigated are the elderly, African-Americans, Native Americans, young college-educated workers, empty nesters, and different age groups. The different groups are found to have different factors that attract their migration and different factors that may repel their migration to certain areas.

Papers dealing with elderly migration include Conway and Houtenville (1998), Conway and Houtenville (2001), Conway and Houtenville (2003), Gale and Heath (2000), Farnham and Sevak (2006), and Kallan (1993), who looks at empty-nesters. The presumption is that the elderly are less interested in the quality of public schools since they no longer have school age children, and less concerned about income taxes because their income is often from other sources, such as pensions and social security. Also, this group is more mobile because they are usually no longer constrained by employment opportunities and are therefore more attracted to warmer climates and lower taxes. Meanwhile, papers such as Clark and Hunter (1992), Grassmeuck (2011) investigate migration over the life cycle, looking at different age groups and observing not only the change in the significance of certain explanatory variables but also the change in the sign of those variables through the life cycle.

Another distinguishing feature of these papers is the set of public goods that are found to impact migration patterns. Many papers look at the quality of the local public schools as an attraction, except for the elderly and empty nester populations. Other papers explore the impact of welfare and Medicaid on the attraction or repulsion of different groups of consumer-voters. Yet other papers include many different public goods to determine which public goods were statistically significant in determining migration.

Many of the papers reviewed could fit into one or more of the sections of this paper but, with a few exceptions, are included only in the section which is the main focus of their study. Overall, there is a general consensus among the papers published testing the Tiebout Hypothesis that there is a need to include multiple independent variables. Migration is impacted by several factors: economic opportunities/labor market conditions, quality of life, local amenities, environmental factors, other control variables like population or population density, distance from originating location to destination, climate, and, most

importantly, the Tiebout-Tullock variables such as public goods and taxes.

## 2. Testing the Tiebout Hypothesis

### 2.1. Local migration

Theoretically, the evidence of Tiebout sorting should be strongest in local migration. We are more likely to observe some of Tiebout's more extreme assumptions, namely that moving costs are zero, people have perfect information about the mix of public goods and taxes in all possible areas that they can move to, and that they are not constrained because of job opportunities since they can make these local moves and remain at their current job.

Dealing with local governments enables a strict focus on local level differences, such as local taxes, expenditures, housing, schooling, and delivery of other public services, testing a Tiebout-like mechanism at work. It enables the researcher to dispense with region- and state-wide differences in labor markets, amenities, and fiscal well-being. (Grassmeuck, 2011, p. 120)

In this section, the papers reviewed investigated the determinants and motivations of local movers.

Grassmueck (2011) focuses on intra-county migration, or the migration of households from one minor civil division (MCD) to another within the same county, in response to the pressure that some local governments were facing to lower property taxes and consolidate. Using data for Pennsylvania, his findings are that people are attracted, not repelled, by higher levels of spending and taxes at the local level as long as they perceive a higher quality of those services.

The theoretical model used in Grassmueck (2011) is based on the reasons to move. He postulates that the decision to relocate is based on the expected gain in utility by moving, i.e., the investment model. Thus, his model uses the differences between the present location and the potential new MCD in housing characteristics, education characteristics, local government expenditures, local tax rates, and other local characteristics as the key independent variables. Other variables are included to control for other motives to move to or away from a particular community. The dependent variable in his model is the intra-county in-migration rate per 1,000 residents for the 66 counties in Pennsylvania from 1995 to 2000. He excluded the county of Philadelphia.

Grassmeuck (2011) ran several regressions, distinguishing between intra- and inter-school district

moves, moves by those households containing at least one child less than 19 years old and those over 60 years old. Also, he ran regressions for Metro vs. Non-metro areas. Among his findings are that people are more likely to move in areas where there are more government units per capita, meaning that if people have more choices about their mix of public goods and taxes they are more likely to move. The empirical analysis reveals that in all 15 models tested, the coefficient on local property taxes is positive and statistically significant at the 5% level or better and that in almost all models the difference in local government spending was positive and statistically significant. These results provide additional evidence in support of the Tiebout Hypothesis in that people are not repelled by higher taxes if it means better local amenities or public goods. However, he found that the quality of the school district, measured either as a difference in SAT scores or spending per student, is not a factor in the decision to move to another school district, which contradicts many other studies that will be discussed later in this paper.

Nechyba and Strauss (1998) use a discrete choice model, which entails using a nested logit empirical approach to estimate the impact of local fiscal policy and other variables on community choice. Their model finds that all of the usual variables included in the Tiebout-type studies as control variables are statistically significant with the expected sign, as is the variable measuring local per pupil spending on public school. Utility choice theory treats the decision to move as the consumer having to evaluate communities with different characteristics, including different levels of public goods and taxes, and choosing the one that maximizes their utility. If the community they are already in is the best, they do not move. This means that the model must include variables that consider housing and individual and community characteristics simultaneously.

The data they used came from the income tax and homestead rebate forms of homeowners in six New Jersey school districts for the fiscal year 1987. They limited their study to the subset of school districts that were relatively small in land area so that it can be assumed that the "agent in these school districts could feasibly have lived anywhere in the area of study is reasonable" (pp. 59). They also chose school districts that did not have any racial or ethnic tension, so as to not skew the results toward greater out-migration or less in-migration by one race and to ensure that there was some variation in local fiscal characteristics. Thus, their study was limited to six school districts in the suburbs of Camden City in Camden

County. These six districts all had the characteristics that no two were more than five miles apart, fiscal characteristics varied considerably, and they did not include minority populations greater than 5% of the community population. Their study gives evidence that households are giving consideration to the quality of public schools in their location decision, holding all else equal. This is consistent with Tiebout sorting.

## 2.2. Migration over the life cycle

Clark and Hunter (1992) is unique in that they try to explain the causes of migration through the life cycle by testing the migration rates of each five-year age group starting with ages 20-24 and ending with ages over 75. They also include 35 explanatory variables in their model: four to account for economic opportunity, 19 to represent location-specific amenities, and 12 fiscal variables. For this review, of most interest are statistical results as they pertain to the fiscal variables. Clark and Hunter (1992) find that for in-migration the coefficients on the state income tax variable tends to be negative and statistically significant for many of the younger age and middle aged groups (from 20-24 to 50-54 with no significance for only the 40-44 age group) but positive and statistically significant for the 70-74 and 75 and older age groups. This, again, suggests that the elderly who are no longer working are not overly impacted by income taxes and may be attracted to areas with higher income taxes because those states can provide better public goods. Meanwhile, the younger age groups are repulsed by higher income taxes because these age groups are working and earning taxable income. However, this is somewhat contradicted by the finding that for all age groups except 75+ the coefficient on statewide marginal income tax rate is positive and statistically significant.

The coefficients on property tax are positive and statistically significant for age groups 25-29 and 30-34 but negative and statistically significant for all age groups 55 and older. This suggests that younger age groups who have or plan to have school age children are drawn to areas with better public schools funded by higher property taxes. The older age groups, who presumably no longer have school-aged children, view property taxes as a deterrent to migrating to that area. The so-called 'death tax' variable is negative and statistically significant for the age groups of 50-54 to 65-69, as one might expect. These age groups are more concerned about passing on their estate to their family when they die. However, the variable is no longer statistically significant for those aged 70

and higher. Perhaps many in those groups have already distributed much of their estate to their heirs. The variable measuring countywide per student expenditure on schools had a positive coefficient and was statistically significant for the 20-24 age group and the 55-59 and older age groups. This finding is not what would be expected, as these are the age groups least likely to have school-aged children and therefore least likely to gain from living in an area with good public schools. For all other age groups the variable was not statistically significant. For eight of the twelve age groups, the coefficient on countywide per capita expenditure on welfare was negative and statistically significant. For the other four age groups it was not statistically significant. For only three age groups, 35-39, 40-44, and 50-54, was the variable on per capita spending on health and hospital statistically significant, and for those groups the coefficient was negative. Lastly, the coefficient on statewide average unemployment benefits was statistically significant for only one age group, those over 75, and the coefficient was negative.

Overall, the results found in Clark and Hunter (1992) gave mixed evidence of Tiebout-sorting with regards to public goods and taxation. Their paper also yielded results that gave evidence that different age groups have different sets of preferences and that those differences in preferences were influencing where people were choosing to live. While some of the empirical results are counterintuitive, many of the results are not, yielding some evidence that people are "voting with their feet" based on their own personal tastes and preferences for public goods and taxes.

### 2.3. Do the Elderly vote with their feet

The papers reviewed in this section limit their investigation of migration to the elderly population or empty-nesters. As noted, there are many key assumptions in the Tiebout model that may be extreme; for example, that people are not migrating based on labor market conditions, i.e., living off dividend income. However, in this regard the elderly are thought to be one of the more mobile groups because the retired elderly are no longer bound by location due to employment opportunities. There are some major differences between the elderly population and other age groups other than not working. The elderly will be consuming more leisure than younger groups, so the types of amenities that are important to them may be different, and the elderly are living off pension income which is often non-taxable, so income taxes are a lesser concern for many elderly. The

changing demographics in the U.S. and around the developed world make this issue even more critical to study and understand as the median age and lifespan increase.

Conway and Houtenville (1998) were among the first to examine both in- and out-migration of the elderly and whether or not their migration was impacted by the public sector provision of public goods and levels of taxation. They test their hypotheses about elderly migration using state migration data from the 1990 Census. They proposed that the factors that would draw the elderly to certain states would be different than for other age groups. They note that levels of income tax may be irrelevant since they are mostly dis-saving and, in fact, states with higher levels of income taxes may be more attractive to the elderly because those states may be able to provide a higher quality of public goods and amenities while shifting the tax burden onto those earning wages and salaries. However, the elderly would still have a disdain for other forms of taxation, namely sales taxes and property taxes. Further, the types of public goods that may attract the elderly are different than those of other groups. Presumably, some lower income elderly will be attracted to states with higher Medicaid payments.

They find that, at the state level, out-migration of the retired elderly aged 65 or over is statistically significantly impacted positively by a higher cost of living, higher government spending on items other than education and health care, higher crime rates, abnormally hot or cold climates, and higher tax rates, as expected. However, they find that out-migration was negatively impacted by spending on public schools, which is opposite of what was expected, since higher spending on public education is thought to be of no concern to the elderly who no longer have school-age children. In addition, financing better public schools would likely entail higher property tax rates.

Their results for the determinants of in-migration of the retired elderly aged 65 or over are that in-migration influences are nearly the same as for out-migration, which is quite different from what was expected. In-migration is positively impacted by higher income tax rates, something which later works (e.g., Gale and Heath, 2000) explain as a possible indication that greater reliance on income taxes means less reliance on sales and property taxes. Since many of the retired have relatively low taxable income, they are marginally impacted by income taxes, while they would be more heavily impacted by higher sales and property taxes. Nonetheless, the findings in Conway and Houtenville (1998) provide some results that

appear to be consistent and some that appear to be inconsistent with Tiebout sorting.

Conway and Houtenville (2001) follow up on their 1998 paper by using different measures of government spending and taxation. In this paper they examine both net and gross state-to-state migration flows. Another emphasis in this paper is how the various fiscal policies are measured. For example, they use four different measures of income tax burden: proportion of total general direct state and local spending financed with state and local personal income taxes in 1984, state income tax bill for elderly households of median income (assuming no pension exemption) in 1985, marginal state income tax rate for elderly households of median income (assuming no pension exemption) for 1985, and personal income tax effort index in 1984. They also have multiple measures of death taxes, property taxes, sales taxes, and all other taxes.

They perform six regressions. One set of three regressions used the natural log of gross inflows of people aged 65 years or older, and the other set used net inflows as the dependent variable. For each dependent variable they use three sets of tax measurements.

One of their important conclusions is from their model is that including cross-correlated random effects decreases the statistical significance of the policy variables, which in many cases become statistically insignificant. They conclude that studies which do not include those cross-correlated random effects overstate the statistical significance of the policy variables. They also find the same sign problem that they identified in their 1998 paper. In many instances the effect of a variable in the originating state and the destination state are the same, meaning that these variables impact in-migration and out-migration in the same way. The most consistent result they found is the sales tax exemption for food. Consistently in the regressions, that variable was positive and statistically significant, meaning that states which exempt food from sales taxes attracted more elderly households.

Overall, the results found in Conway and Houtenville (2001) are mixed. For the most part, their analysis found many cases in which the expected sign on a variable was the opposite of what was estimated using their model. Thus, their research does call into question some of the assumptions made concerning Tiebout sorting, especially the wrong signs for some variables, the "same-sign" problem where the sign of the coefficient is the same for both origin and destina-

tion state, and that with the inclusion of the cross-correlated random effects the policy variables are not statistically significant in some cases.

Conway and Houtenville (2003) further addresses their previous studies. In this paper they examine the migration behavior of the elderly, recognizing that the older and younger elderly may make different decisions and have different consequences for the states in which they live. Their econometric analysis focuses on the motives of the elderly to move, dividing the elderly into three groups: those aged 65-74, those aged 75-84, and those aged 85 or older. They consider motives such as amenity vs. return/assistance and the Tiebout-related fiscal policy variables.

They find that all elderly age groups avoid moving to states with high estate/inheritance/gift taxes, although the effect weakens with age. The youngest elderly appear to be "shopping around" for destinations with a temperate climate and favorable government policies regarding income taxes and welfare spending, whereas the older elderly are more likely to be "driven out" of their origin state by a high cost of living and higher income and property taxes. Distinguishing between different age groups of the elderly was a major innovation and led to some empirical results that were more consistent with what one would expect to find using the Tiebout Hypothesis.

Gale and Heath (2000) also investigate the determinants of elderly internal migration in the United States. Their study differs from previous studies in that they treat the growth rate of the economic and policy variables as endogenous in the determining the effects of those variables on in-migration of the elderly. They argue that many state-expenditure and taxation policies are dependent upon the support of the elderly, and therefore the in-migration of the elderly can impact fiscal policy in those states simultaneously with fiscal policy being a determinant of in-migration. They use state hospital and health care spending per capita as the public expenditure variables since they assume that those are the public goods most appealing to seniors.

Using OLS and 2SLS, Gale and Heath (2000) estimate the parameters of their model. The results of interest for the purpose of testing the Tiebout Hypothesis concern elderly attraction to states where a greater share of the tax burden is on wage earners. Gale and Heath find the effect of income taxes is not statistically significant, but sales taxes are negative and statistically significant in determining in-migration of the elderly. Further, when estimated using

OLS the per capita spending on hospital and health care was negative and statistically significant, opposite the expected sign. However, when treating the policy variables as endogenous, the statistical significance of the per capita spending on hospitals and health care variable disappears. They suggest that previous studies which found the counterintuitive results may have suffered from failing to consider some of the policy variables as endogenous. Their results provide mixed evidence of Tiebout sorting. They do find, on the one hand, that the elderly are choosing to live in places with lower sales taxes and are indifferent to income tax rates, since they are earning less income at this stage of life, but do not find that local spending on hospitals and health care, fiscal variables likely to be important to the elderly, matter in their choice to live. One possible reason for their health and hospital expenditure finding is that the elderly who are migrating may be those who are in better health and therefore do not value spending on health and hospitals very highly.

While not explicitly dealing with elderly migration, Farnham and Sevak (2006) examine the migration of empty-nesters. Their study focuses on those households making their first move since their youngest child reached the age of 18. The assumption is that these households' demand for local educational services declines at this stage in their life cycle, but compared to the elderly they may be less mobile because of their ties to workforce. Their initial finding is that those empty-nesters moving to other states achieve a significant reduction in their exposure to school spending and property taxes relative to non-movers. Some estimated parameters from their study find that empty-nesters moving from out of state experience a decline of \$662 in annual per pupil expenditure on public schools, a \$112 decline in annual local educational spending per capita, and \$589 decline in annual property taxes paid. Relative to non-movers, cross-state empty-nesters migrants experienced a 10% decline in local education spending but a 29% decline in property taxes.

Farnham and Sevak (2006) find that within-state empty-nesters movers experienced no significant fiscal adjustment. However, when the authors account for state-level limitations to Tiebout sorting, such as mandated levels of school spending or limitations to reducing property taxes and for public school competition and job-location constraints, the empirical evidence in their paper does support the notion that within-state empty-nesters are experiencing a fiscal adjustment toward lower school spending and lower

taxes. They conclude "...Tiebout's assumption of fiscal sorting behavior is upheld in the data, but evidence suggests that a combination of state-level fiscal institutions and non-fiscal factors in the residential location choice of households combine to 'hobble' Tiebout voters" (p. 426).

Kallan (1993) is not explicitly a test of the Tiebout Hypothesis. In fact, there is no reference to Tiebout in his paper. The paper is a multilevel analysis of elderly migration, focusing more on variables related to local factors such as crime rates, climate, and cost of living and on individual characteristics of the elderly males such as age, retired or not, married or not, income, homeowner, disabled, etc. However, his analysis does include an independent variable, HEALTH SERV, which is measured as the number of hospital beds per capita. This variable, in part, can be considered a public good. Kallan uses a logistic regression model with numerous interaction variables to estimate the parameters of his model. In all, he includes four different combinations of interaction variables, including one model with no interaction variables. His findings indicate that the coefficient on HEALTH SERV is positive and statistically significant. In the model with no interaction variable and one of the models with interaction variables, the level of significance is only at the 10% level, but in the other two models with interaction variables the level of significance is the 5% level. Thus, his paper does provide some evidence of Tiebout sorting, where elderly males are attracted to areas with more abundant hospital care.

#### **2.4. State income taxes and interstate migration**

One of the implications of the Tiebout Hypothesis is that we would tend to see more sorting the smaller is the scope of the public sector. It is simply unlikely that such a large group of households that would occupy a state would have the same preferences for collective goods, thus we would expect to see less opportunity to migrate to a place with the optimal level of public goods and taxes when there is only one such jurisdiction at the state level. In other words, we are more likely to see a greater deal of sorting at the local government level than at the state level. The next set of papers reviewed, however, still find evidence of Tiebout sorting, even at the state level.

One such study was Shelley et al. (1993). They explore the relationship between net interstate migration and a wide variety of explanatory variables taken from the literature using data from 1970-1980, including various measures of state income taxes and public

goods. They employed factor analysis since they were dealing with a large number of independent variables that were highly correlated with other independent variables. Based on the factor loadings, they identified five factors, or five statistically independent dimensions. They labeled the five factors *Fiscal Policies*, *Social Hostility*, *Labor Relations*, *Ecological Context*, and *Infant Mortality* and used the variables listed in Table 1 below.

**Table 1.** Variables included in each factor.

Fiscal Policies	Social Hostility	Labor Relations	Ecological Context	Infant Mortality
TAXPC	INPC	RIGHT-WORK	POPUL	INFMORT
EXPPC	CRIMRATE	UNRATE	POPDEN	
TAXINC	PROPCRIM	UNION	ENROLL	
EXPINC	VIOLCRIM	WAGE	PUBASST	
		STOP	ADMIT	
		AVGTEMP		

where *TAXPC* = state taxes per capita, *EXPPC* = state expenditures per capita, *TAXINC* = state taxes per \$1,000 of income, *EXPINC* = state expenditures per \$1,000 in income, *INPC* = state income per capita, *CRIMRATE* = total crime rate, *PROPCRIM* = property crime rate, *VIOLCRIM* = violent crime rate, *RIGHT-WORK* = dummy variable =1 for states with right-to-work laws, *UNION* = percentage of work force in unions, *WAGE* = average hourly wage, *STOP* = work stoppages per total work time, *AVGTEMP* = average temperature in the state’s largest city, *POPUL* = state population, *POPDEN* = population density, *ENROLL* = percentage of the population aged 5 to 17 enrolled in school, *PUBASST* = public assistance grant per capita, *ADMIT* = year state admitted to the union, and *INFMORT* = Infant Mortality rate.

After their paper discusses some of the alternative techniques, they decide to employ OLS using the factors as the independent variables. In their study, they chose to keep all variables in each factor using the variable’s factor score as the weight. The authors used the natural logarithm of the dependent variable, net in-state migration, so that its distribution was more normal. Their results show that the *Fiscal Policies* factor was positive and statistically significant at well below the 1% level. The positive sign indicates that the relationship between net interstate migration and state expenditures per capita and state expenditures per \$1,000 income is as expected since the expenditure variables loaded with a positive sign into the fiscal policy variable. However, the factor scores on taxes per capita and taxes per \$1,000 of income

were also positive, indicating that higher taxes also positively increase in-migration. This result supports the notion that, again, perhaps voters are willing to accept higher taxes if the higher taxes result in higher-quality amenities and public goods.

Other results of their empirical analysis show that the *Labor Relations* factor was negative and statistically significant at below the 1% level, indicating that greater union penetration, higher unemployment rates, more work stoppages, and not having right-to-work laws caused less net migration. The *Ecological Context* factor was positive and statistically significant at less than the 1% level, meaning higher enrollments in school, their proxy for school quality, and more recent state admission to the union were positively correlated with net migration flows, and size of the state, population density, and higher welfare spending were negatively correlated with net migration, all as expected. The *Social Hostility* factor was not statistically significant at even the 10% level.

Cebula (2009) uses both local and state taxes as independent variables to test the Tiebout Hypothesis. Overall, the author postulates that in-migration is a function of economic conditions in the area, fiscal factors in the area, and environmental factors in the area. Using the number of net in-migrants to state *j* during 2002-2005, expressed as a percentage of the state population in 2000, as the dependent variable and including independent variables measuring state income tax burden and state plus local property tax burdens, he finds that both tax burdens have a negative coefficient and are statistically significant at the 1% level. Other findings in this paper are that per pupil expenditure on public education has a positive coefficient and is statistically significant at the 1% level. This finding is consistent with the notion that people are often attracted to places where there are higher quality schools but the tax burden is low.

Saltz (1998) also lends evidence that state income taxes impact net state in-migration. Using data for net state in-migration between 1985 and 1989 of persons aged 20-40, the paper finds evidence that having a state income tax served as a deterrent to migration of young workers. The key independent variable in the model was a dummy variable for states that have a state income tax system (1 = has an income tax). Using OLS, the empirical results find that the coefficient on the income tax dummy variables is negative, as expected, and statistically significant at the 5% level. The other independent variables used were the expected real median family income in the state, a dummy variable for the Western states, and the percentage of the population of the state under the age

of 55, to account for the possibility that younger age groups were attracted to states with a higher percentage of younger households.

Cohen et al. (2014) also investigate the impact of state income taxes on interstate migration. Using data from the IRS data set of state-state migration flows, they found that states with higher top marginal tax rates experienced greater out-migration of tax payers. Using a model that considers all state to state migrations pairwise, the authors estimate the determinants of outmigration, defined as the share of state  $i$ 's population (lagged one year) that migrates from state  $i$  to state  $j$  in a given year  $t$ . The authors use top marginal tax rate as the independent variable to measure taxes. In all, they estimate the coefficients using OLS for nine different specifications of their model, and in all cases the coefficient on the top marginal tax rate is negative and statistically significant at the 1% level. The nine different specifications reflect a step-wise process of adding in various control variables and using state paired fixed effects and time fixed effects.

Another paper analyzing the impact of state income taxes on interstate migration is Gius (2011). He examines the effect of income taxes on interstate migration by age and race using probit analysis. Specifically, he studies the impact of income taxes on the migration of various age-groups, African-Americans, and the college educated. Another unique feature of this paper was the use of data from the National Longitudinal Study of Youth-Geocode survey data. His dependent variable was the dummy variable equal to 1 if the person moved from one state to another, 0 otherwise. He used data from both the 1979 NLSY and the 1997 NLSY. The three age groups tested were 19-25, 28-36, and 35-43. He also estimated the model for each age group twice, once for African-Americans only and the other for Whites only.

The results presented in his paper provide further evidence that, after accounting for other factors, people of all ages and races tend to move from higher income tax states to lower income tax states, although the change in tax rate variable was statistically significant in only five of the six cases analyzed and at only the 10% level for three of the five cases where it was statistically significant. Further, the coefficients themselves were small. For example, for a 10% increase in the tax rate the probability of moving into that state decreased 1.06% in the largest case. In general, the income tax variable was stronger for whites than for African-Americans. In the case of African-Americans aged 35-43, the coefficient on the change

in tax rate was negative but not statistically significant at even the 10% level. Among the additional findings in his study, he found that changes in marital status had a significant impact on moving. For those who moved to another state, 12.5% had a change in marital status, while those that did not move only 4.4% had a change in their marital status.

All of these papers, except one, Shelley et al. (1993), provide evidence that people are "voting with their feet" to avoid higher state income taxes, all else equal. In the paper by Shelley et al. (1993) they find that people are willing to tolerate higher state income taxes if accompanied by a larger array of public goods. All of these papers lend support to the Tiebout Hypothesis.

## 2.5. The impact of welfare and Medicaid on migration

Another topic of interest among researchers on the Tiebout Hypothesis has been the impact of welfare and/or Medicaid payments on both in- and out-migration. The hypothesis has been that certain groups, those more likely to benefit from higher welfare payments, may be attracted to locales where there are higher payments, while others who might have to pay for those higher benefits and regard themselves as unlikely to need those benefits might be repulsed by higher payments.

Cebula and Clark (2013) set out to test the impact of Medicaid benefits on migration, or the 'Medicaid Magnet hypothesis,' extending the scope of the Tiebout sorting literature to include Medicaid benefits as a potentially desirable public good that would attract or repel migration. Using OLS the authors estimate the determinants of net state in-migration using both a linear and logged dependent variable, the net number of in-migrants to a state over the period from July 2000-July 2008 expressed as a percentage of the year 2000 population of the state. They include independent variables not only to account for differences in Medicaid benefits per recipient, but also economic conditions in the state, fiscal factors of the state, and quality of life factors in the state. The economic variables include expected median family income, cost of living, and employment growth. The fiscal variables are the year 2000 average effective state income tax rate in the state, the average effective property tax rate, state spending on public schools per pupil, and the average Medicaid outlay per recipient. Finally, the quality of life variables used were population density, mean January temperature, and a dummy variable if the state bordered the Atlantic Ocean, Pacific Ocean, or the Gulf of Mexico.

The authors used two-stage least squares to avoid potential simultaneity bias caused by the endogeneity of the dependent variable net in-migration related to employment growth. Their results indicate that all of the variables had the expected sign and were statistically significant at the 10% level or better. In particular, the Medicaid variable was positive and statistically significant at the 2.5% level, lending support to their hypothesis that higher Medicaid payments per recipient was associated with larger net in-state migration flows. Other findings from their paper will be discussed later in the paper.

Enchautegui (1997) investigates the impact of welfare payments, as well as other variables, on the decision of females, aged 25 to 54, to migrate. The author uses micro-level data from the Census of Population for 1980 and models the decision of women to migrate as a function of the potential income gain by moving. Thus, she includes not just welfare payments, but also wages and employment opportunities in the decision to migrate. Further, Enchautegui (1997) estimates the parameters of a probit model on five different demographic groups: single mothers, low-educated women (did not complete high school), Anglos, African-Americans, and Puerto Ricans. She uses two different measures of welfare, AFDC payments only and a weighted sum of AFDC, Food Stamps, and Medicaid payments.

Overall, the results found in Enchautegui (1997) show evidence of a link between welfare payment differentials and in-migration of women aged 25-54. Not surprisingly, the welfare effect is strongest for single mothers with small children. For example, she finds that a 10% increase in the welfare package would increase in-migration of single women with young children by 2.7% (p. 543). Also not surprisingly, the welfare effects were larger for unmarried women vs. married women. They were smaller for African-American single mothers compared with Anglo single mothers. Further, the welfare differentials do not impact the migration of Puerto Rican women statistically significantly. The wage differential variable had mixed results.

The evidence presented in Kennan and Walker (2010) also investigates the "welfare magnet" hypothesis. They focused their analysis on young welfare-eligible women and examined the hypothesis that these women will choose to move to areas where welfare benefits are higher. Using data from the National Longitudinal Survey of Youth, they tracked the movements of young welfare-eligible women with no more than 12 years of education to determine what

factors influenced their migration. To measure benefits they used the combined AFDC and Food Stamp benefit for a family of three in 1989. They also excluded women who served in the military or enrolled in college and used data only during the time in which the women remained single and had no children in the household 18 years of age or older. They tracked these women's migrations from age 20 to the 1994 interview. The authors used the log likelihood function to predict moves based on the utility and disutility of the migration choice. They reported two sets of results, one for the women who completed high school and another for the women who dropped out of high school.

They find an even weaker link between differences in welfare payments and migration of young welfare-eligible women. While they did find that potential income differences were an important determinant of migration, it was potential wage differences that were more important. They also found that many of these women migrated back to where they started. The authors speculate that high moving costs may have prevented many of these women, especially those who never completed high school, from moving to areas with higher welfare benefits. One factor may be that many of these women were heavily reliant on family for support or child-care. The results may also suggest that these young women had a desire to find employment rather than remain on welfare, since wage differential was a statistically significant variable.

The authors speculate that this weak link between the size of welfare benefits and the migration of young welfare-eligible women may explain why, in the absence of national standards for welfare benefits, that states did not feel compelled to lower their welfare benefits if neighboring states had lower benefits. They also found that states which had welfare benefits tended to have other factors that provided a disincentive to migrate, perhaps lower wages, greater population, more unemployment, etc.

Hsing (1995) also examined the impact of welfare benefits on interstate migration. The author runs two regressions. In one he uses total benefits, AFDC + food stamps + Medicaid, as the independent variable. In the other he uses the three separate independent variables to measure welfare. He uses the interstate migration rate as the dependent variable and uses both ordinary and weighted least squares to estimate the parameters of his model. The model employed is based on human capital theory or the investment model. The analysis is run using state data from the

1990 Census for 47 of the 48 contiguous states. Arizona is excluded because of the lack of data for Medicaid payments. All variables are in log form. His results, as they relate to the Tiebout-Tullock Hypothesis, are that in all regression equations the coefficient on per capita state and local taxes was negative and statistically significant at the 1% level, the coefficient on total benefits with weighted least squares is positive and statistically significant at the 5% level, and the coefficients on the three separate measures of welfare benefits in the simple OLS regression are positive and statistically significant at the 1% level. However, when using weighted least squares none of the coefficients on the three measures of welfare payments were statistically significant. Given the high multicollinearity among the AFDC, food stamps, and Medicaid payments, the estimates of the standard error for the coefficients may be imprecise.

Cebula and Belton (1994) test the impact of public welfare on the migration decision of the American Indian, from 1985-1990. The authors emphasize that given the very high unemployment rates on Indian reservations (averaging close to 45% at the time of the study) and low levels of human capital, this group would be attracted to areas with higher potential welfare benefits. Their dependent variable was the net number of American Indian in-migrants to state  $j$  as a percentage of the population of state  $j$ , and the key independent variable of interest for the sake of this review is the average AFDC payments made in state  $j$ . Using OLS they find the coefficient on the welfare variable to be positive and statistically significant at the 1% level, giving evidence that higher welfare payments were a 'magnet' to the American Indian.

The papers reviewed in this section yield mixed results. Some papers, Cebula and Belton (1994), Hsing (1995), Enchautegui (1997), and Cebula and Clark (2013), affirmed the welfare/Medicaid magnet, i.e., that certain groups would be attracted to states with higher welfare or Medicaid payments. One paper, Kennan and Walker (2010), found evidence that does not support the welfare/Medicaid magnet hypothesis. They instead attribute the migration of young welfare-eligible women more to wage differentials than difference in welfare payments.

## 2.6. The quality of public schools and other variables and the Tiebout Hypothesis

The Tiebout Hypothesis presumes that people have different tastes and preferences for certain public goods. Among the public goods that certain households would value highly are good public schools. It is assumed that the households with a

stronger preference for good quality public schools are those households with school-aged children or expecting to have school-aged children in the near future, while groups like the elderly or empty-nesters would place less value of the quality of public schools, since these households do not have children attending public schools.

Several papers included in this review also tested the hypothesis that certain groups of people would be attracted to areas with higher quality public schools. In most of these papers this was not the central focus, but some measure of school quality was included in the empirical analysis and the coefficient and level of significance of the school quality variable was discussed. In most studies, the school quality variable was typically some measure of local government expenditure on public schools, either per capita or per pupil. Some studies included other measures. The discussion of school quality as a potential magnet for migration is given its own section because spending on public schools was, by far, the most prevalent public good included as an explanatory variable for migration.

Studies like Cebula and Belton (1994), Cebula et al. (2012), Bickers et al. (2006), Percy et al. (1995), Rhode and Strumpf (2003), Cebula and Nair-Richert (2012), Cebula and Clark (2013), Shuai (2012), Cebula (2002), Nechyba and Strauss (1998), and Clark and Hunter (1992) all found in-migration to be positively impacted by their measure of school quality, while Knapp et al. (2001) find no statistically significant relationship. In the case of Clark and Hunter (1992) they found public expenditure on education to be positive and statistically significant for certain age groups (20-24, 55-59, 60-64, 65-69, and 70-74), but for the other age groups the variable was not statistically significant. Overall, Clark and Hunter (1992)'s results run counter to most of the studies reviewed because they find that the elderly are attracted by higher spending on public education.

Some studies did find a negative effect of higher spending (quality) of public schools on migration. Mostly, those papers investigated the in-migration of the elderly, a group that is not likely to have school-aged children. Farnham and Sevak (2006) find that cross-state empty-nesters were deterred from migrating to areas with higher public expenditures on public schools. Conway and Houtenville (2003) find all age groups of those 65 or older were also repulsed by higher per capita spending on public schools. Interestingly, Conway and Houtenville (1998) find that higher spending on public education reduces both in-

migration and out-migration of the elderly. The result that it would reduce in-migration is expected, but, as the authors discuss, it is not clear why it also appears to reduce out-migration.

Grassmeuck (2011) also finds that those older than 60 who moved across school districts were deterred by higher per student spending on public education, but he also finds the same result for those aged less than 19. When he aggregates all age groups the difference in the quality of education from one district to the next was not statistically significant. Further, Grassmeuck (2011) used two separate measures of school quality, per student spending and difference in SAT scores. In none of his regressions was the difference in SAT scores statistically significant.

Cebula and Nair-Richert (2012) use statewide data on net migration from July 2000 to July 2008 to test the impact of public policy on migration. The paper also includes a cost of living variable and a measure for state income tax burdens. They estimate the parameters of their model using both OLS and 2SLS to account for possible endogeneity of public policy and migration. Their dependent variable is net number of migrants to the state as a percent of the year 2000 population. Since the paper uses both the net migration as a percent of population and the log of net migration, they transform the net migration in the log-linear regressions by adding 1 to all values of the net migration variable to avoid taking the log of a negative number. In their OLS estimations they find that the coefficient on the measure of per capita personal state income tax is negative and statistically significant at the 5% level; it is significant at the 1% level for the log-linear regression. The coefficient on per pupil spending on public education is positive and statistically significant at the 5% and 1% levels, respectively, and the coefficient on per capita local property taxes is negative and statistically significant at the 1% level in both cases. The results are similar in that all three measures of the fiscal variables have the expected sign and are statistically significant at the 5% level or better in the 2SLS regressions. These results are consistent with the Tiebout Hypothesis that people prefer higher quality public schools (measured as spending on public schools per pupil) but do not want higher taxes to pay for it.

Perhaps Shuai (2012) should not be included in this review since his paper is not explicitly a test of the Tiebout Hypothesis, but his empirical analysis does lend further evidence of the validity of the Tiebout Hypothesis. His paper examines the impact of commuting on in-migration using data from Virginia

from 2000 to 2006. The hypothesis under investigation was that longer commuting time or longer commuting distance leads to more out-migration, a desire to lessen the commute time. He postulates that despite the long commute, there may be other factors that keep a person from migrating closer to work. Among those factors is the difference in the quality of the public schools at the worker's current location versus the location where he or she works. He limited his study to include only migration of individuals within 100 miles, since he considered, along the lines of other studies, that commuters are not likely to travel over 100 miles each way every day. The migration data used was at the county level. Shuai (2012) used the time spent commuting as the cost of commuting. In all, Shuai (2012) estimated the impact of commuting using OLS on five different models. He had a model for the overall area, a model for the congested areas, a rural model, a low migration cost model, and a high migration cost model. In all five cases, the number of commuters was positive and statistically significant at the 5% level or better, and the commuting time was positive and statistically significant at the 5% level or better in four of the five cases, indicating that, in general, areas where there are many households commuting to that area for work will experience a higher level of in-migration. More relevant to this review, he finds that for four of the five models relative school quality, measured by per pupil spending on education, is negative and statistically significant at the 5% level, indicating that people are less likely to migrate to where they work if the quality of schools is better where they currently live. This result is consistent with the numerous other studies which found that higher spending on schools tends to attract migrants to the area. In the case of Shuai (2012), he finds that people are less likely to out-migrate from an area if the place they are considering moving to has lower quality schools.

While most of the papers already cited use either net in-migration or out-migration as the dependent variable in their analysis, Cebula (2002) investigates the Tiebout-Tullock Hypothesis by examining the impact of local fiscal variables, among other independent variables, on the rate of population growth of states. The author suggests that population growth is potentially a better measure of "voting with one's feet" because it reflects not only those who have chosen to migrate to the state, but also reflects those who have "voted" to stay. Further, the Tiebout-Tullock framework implies, *ceteris paribus*, that people are attracted to or will remain in states with higher public

expenditures on desirable public goods but will be repulsed or prompted to move from those states with higher taxes. Many previous papers found that spending on public education was a desirable public good. Thus, Cebula (2002) uses state and local government spending on public education as the measure of benefits from public goods and uses state plus local income taxes as the measure of taxes. Since there is the likelihood of strong collinearity between public spending and public taxes, he uses the ratio of public expenditure on education to state and local taxes expressed as a percent ( $PET_j$ ) as his independent variable to measure state and local fiscal policy of state  $j$ . Using both the ratio and log difference in population between 1990 and 2000 as the dependent variable, he finds that in both cases the coefficient on the variable  $PET_j$  to be positive and statistically significant at well below the 1% level.

Knapp et al. (2001) stress the importance of separating short-distance and long-distance moves, as they are likely to be motivated by different reasons. Long distance movers may be moving for employment opportunities or to take advantage of state amenities, while local movers may be more likely moving to seek better schools, safer neighborhoods, or better housing, for example. They employ a Random Utility Model to examine the choice migrants make in choosing where to move. They point out that there are usually some constraints on movers which prevent them from choosing from among all possible destinations. In other words, movers will choose a destination not from among all possible choices, but from a limited subset of those choices, as they may be constrained by employment, family, friends, etc. Using data from the 1990 Public Use Microdata Samples of the U.S. Census of Population and Housing, they estimate the parameters of their model using a nested logit procedure. Their results indicate that higher property and income taxes actually increased the probability to move to a particular MSA. As for the public spending variables, spending on education was not statistically significant, but per capita spending on police was positive and statistically significant at the 1% level. The biggest pull to the MSA, based on direct elasticities, was public spending on police. This result suggests that local movers were not moving to take advantage of better schools, but perhaps to take advantage of safer neighborhoods.

Cebula et al. (2014) test the statistical significance of the various Tiebout and other variables on in-migration before, during, and after the Great Recession of mid-2007 to mid-2009. They find that in all three periods the coefficient on the fiscal surplus variable

(per pupil outlay on public education minus per capita property tax) is positive and statistically significant at the five percent level or better and the coefficient on state personal income tax was negative and statistically significant at the five percent level or better. Again, the empirical results presented in this paper are consistent with the Tiebout Hypothesis. Further, their study provides some evidence that the forces that influence migration do not change based on the stage of the business cycle, nor did the financial crisis result in any structural change in the forces that attract or repel households to migrate.

## 2.7. In-migration of “go-getters”

Several authors were interested in the factors that would increase in-migration of young college educated, childless workers, a.k.a. ‘go-getters’ or the ‘power cohort.’ Cities trying to grow are often most interested in attracting this cohort because they are likely to be employed, add little to no strain on local public schools, and are unlikely to seek welfare benefits.

Edmiston (2009) uses a number of the independent variables typically used in the Tiebout-Tullock related literature to estimate migration of young college-educated persons to the 10<sup>th</sup> district of the Federal Reserve System. A long-debated issue in regional economics, according to Edmiston, is whether “people follow jobs” or “jobs follow people.” In other words, should regional economic development agencies be more concerned with attracting new job opportunities to their area or concentrate on attracting skilled workers to their region in the belief that employers with higher paying jobs will locate where skilled labor is easy to find. Within this context, the author sets out to determine the factors that significantly influence migration decisions of young, childless, college-educated men and women.

These people are not only attractive to employers but are typically more responsive to the quality of the urban milieu, which can be influenced by policy. Because singles are generally more mobile than families with school-aged children, much of the economic development effort is focused on that subgroup... (p. 69).

Using data from the *Current Population Survey's March Supplement*, published by the U.S. Census Bureau, for in-migration from the time period from 2003-04 to 2007-08, he tests several hypotheses related to the factors that will tend to attract this cohort. The empirical results indicate that in-migration of young, childless, college-educated workers is affected by, among other variables, per capita property tax rate

(negative effect), per capita spending on police (positive), sports establishments (positive), and performing arts (positive). Thus, this cohort is attracted to certain public goods or public-subsidized goods like police services, sports, and the performing arts, but are repulsed by higher property taxes. All of the variables were statistically significant at the 5% level or better except for sports establishments and police, which was significant at only the 10% level.

In comparison, Edmiston finds that property taxes were not a statistically significant deterrent of in-migration of young, not college-educated workers and workers aged 40 or older. The results provide further evidence that people may not be opposed to higher property taxes if it means better public schools. However, for the cohort of young, college-educated, childless workers property taxes were seen simply as a cost without benefit, since they did not have children in school.

Other interesting results from Edmiston (2009) that do not directly pertain to the Tiebout-Tullock Hypothesis were found. For instance, the cohort of young, college-educated, childless households were attracted to larger cities, whereas the other two cohorts were "repulsed" by larger cities. The young, college-educated, and childless were actually attracted to cities with higher unemployment rates while the other two cohorts were dissuaded by higher unemployment. This may be an indication that the young, college-educated cohort were confident they could find jobs because of their college education, and may even have migrated because of a job offer. This cohort was repulsed by a higher murder rate, as expected, but the murder rate was not statistically significant for either of the other two groups. The group of the young, college-educated, childless workers were attracted to a higher number of colleges and universities, while the cohort of older households (over 40 years old) were dissuaded by that. In conclusion, the empirical results presented by Edmiston (2009) provide evidence that publicly funded or publicly subsidized amenities are important to attracting the 'power cohort,' while higher property taxes were a deterrent.

Similar to Edmiston (2009), Watkins and Yandle (2010) focus on causes of migration by "go-getters" or, in this case, people aged 25-39 years old. Like Edmiston (1999) the authors focused only on in-migration, or the factors that help to induce migration of this group. In this study, the authors used the Knowledge Economy Index (KEI), which had been previously developed in Watkins (2008), as one of

their independent variables in the model of in-migration of this age group. The KEI reflects three indicators. The first indicator is the weighted educational attainment of the state's workforce. The second component is the dollar expenditures on industry research and development weighted by states' total worker earnings. The third element is the entrepreneurial component, which is the relative number of fast-growth firms based on Inc. 500 and Deloitte Technology Fast reports. Their results indicated no statistically significant relationship between in-migration of people aged 25-39 from within the U.S. and the KEI. However, they do find that international in-migrants were positively attracted by a higher KEI.

Mulholland and Hernandez-Julian (2013) find that, controlling for other variables, college educated in-migrants are attracted to states with higher levels of government spending per capita. As discussed in the next section of the paper, other results presented in the paper indicate that the college-educated preference for higher government spending is for better public goods as opposed to higher levels of transfer payments.

## 2.8. Economic and personal freedom and the Tiebout Hypothesis

Numerous papers examined the impact of economic and person freedom on migration. While there are several different indices of economic and personal freedom, most of the indices contained a similar mix of variables. These papers examined whether or not people are voting with their feet toward locales where there is less government involvement in the economy and their personal choices.

Ashby (2007) is the first paper to examine the impact of economic freedom on in-migration at the state level (excluding Alaska and Hawaii). The measure of economic freedom used in his study was that created by Karabegovic et al. (2005). Their index is based on ten variables which can be classified into three categories: size of government, takings and discriminatory taxation, and labor market freedom. Using a gravity model and taking the log-odds of migrants from an origin state to the destination state as a percentage of the population at risk in the origin state, they estimate the parameters of their model using a general spatial autoregressive estimator. The coefficient on the economic freedom index of the destination state divided by the economic freedom index of the origin state is positive and statistically significant at the 1% level. However, when he includes the natural log of income in the destination state divided by

the income in the origin state and the natural log of the percentage change in employment growth in the destination state minus the percentage change in employment growth of the origin state, the statistical significance of the measure of economic freedom disappears. Thus, it is likely that the economic freedom variable is highly correlated with greater employment growth and higher income per capita. From these results we may conclude that there is evidence that greater economic freedom induces in-migration, but because of its impact on per capita income and the growth rate of employment.

Watkins and Yandle (2010) also studied the impact of economic freedom, personal freedom, and the knowledge economy on in-migration of people aged 25-39. The key independent variables in their work were the Mercatus Overall Economic Freedom (OFI) and Personal Freedom (PFI) indices and the previously discussed Knowledge Economy Index (KEI) developed in Watkins (2008).

The OFI has two major components. One is economic freedom, which includes variables that measure government size, spending, regulation, and tax burden. The other component is personal freedom index used by Ruger and Sorens (2009) and includes variables such as land-use regulations, right-to-work laws, access to internet gambling, laws restricting the consumption of alcohol, campaign finance laws, rules requiring certain kinds of insurance, and motorcycle helmet laws.

The results of their regression analysis show that domestic in-migration of the "go-getters" was significantly positively impacted by the OFI. In another set of regressions where PFI replaces OFI and all other independent variables are removed, neither KEI nor PFI is statistically significant for the domestic "go-getters," but both are statistically significant at the 5% level for the international "go-getters." As their study related to the Tiebout-Tullock literature their paper presents mixed results. In the first set of regressions, which included cost of living, per capita income, and population among the independent variables, they find that the in-migration of domestic "go-getters" is impacted by overall economic freedom, in that greater economic freedom induced more in-migration. However, the statistical significance of this relationship disappears in their second set of regressions in which cost of living, per capita income, and population are not included among the explanatory variables.

Similarly, Cebula and Clark (2011) also examine the impact of economic freedom and personal free-

dom on migration using the measures of overall economic freedom and personal freedom developed by Ruger and Sorens (2009). Their dependent variable was the net in-migration to a state over the 2000-2008 time period. In addition to other economic variables to help explain net in-migration, including employment growth, they used average January temperature as a measure of quality-of-life and the number of pounds per capita of toxic chemical releases in year 2000 as a measure of the environment. They ran regressions using the dependent variable both in its linear form and in log form. Both variables measuring freedom had positive coefficients and were statistically significant at the 1% level in both regressions. Thus, their results provide strong evidence that people are voting with their feet for more personal, as well as economic, freedom. Their results are important in that they found that the coefficients on economic and personal freedom are still positive and statistically significant even with the inclusion of employment growth as an explanatory variable. This differs from the results found by Ashby (2007).

Mulholland and Hernandez-Julian (2013) is the first paper that explores the impact of economic freedom on migration by highest level of education attained. Using data from the Integrated Public Use Microdata Series (IPUMS) of the 2000 Census and the spatial Durbin estimation methodology on a modified gravity equation, they find that states which rank highest in economic freedom tend to attract people with at most a secondary education and those with some college experience. However, states with greater government expenditure as a percentage of Gross State Product are more attractive to those with college experience and see an out-migration of those with only an elementary education.

In their paper, the authors use the definition of economic freedom based on Karabegovic et al. (2005). Thus, what their results suggest is that college educated migrants are attracted to higher state government spending but less spending on transfer payments such as welfare payments, food stamps, and housing assistance.

Mulholland and Hernandez-Julian (2013) also discuss the possibility of spillover effects on migration by neighboring states. They give an example of new job opportunities opening up in Pennsylvania drawing new potential workers to the area. However, based on the bundle of public goods, taxes, and amenities, some of those new workers choose to live in areas nearby in New Jersey (pp. 67).

The most recent study, Cebula (2014), finds very strong evidence that net state in-migration is significantly impacted positively by both economic freedom and personal freedom. Among the independent variables used are Ruger and Sorens' (2009) measures of overall Economic Freedom and Personal Freedom, the air pollution index, two different measures of the state income tax burden, and a quality of life index developed by Bankrate.com (2013). The coefficients on both the overall Economic Freedom Index and Personal Freedom Index are positive and statistically significant at the 5% level or better. Further, the overall Quality of Life Index included in this a study also has a positive coefficient that is statistically significant at the 1% level.

Overall, the evidence is somewhat mixed on whether or not greater economic and personal freedom results in greater in-migration. The results may depend upon the variables included in the model and the characteristics (such as educational attainment) of the migrants.

## 2.9. Testing the level of Tiebout sorting

One of the important implications of the Tiebout Hypothesis is that, over time, communities should become more heterogeneous in their offerings of public goods and tax rates. This phenomenon is the result of the idea that if people are voting with their feet, i.e., moving to communities that offer the types of public goods desired and at desirable tax rates. Over time, as mobility costs decrease, migration should become easier so that people can better sort themselves into the communities they desire. This also implies that we should observe that the more localized governments are, the more they should vary in the levels of services offered and tax rates. Thus, it is hypothesized that people should be receiving greater satisfaction from public goods (or tax rates) the smaller or more localized is the government. Several papers set out to test this group of hypotheses.

Kelleher and Lowery (2002) postulate that if there is complete Tiebout sorting all consumers should be equally satisfied with the level of government services offered and the tax price of those services. We would expect that if people Tiebout sort then there should be more variance in the level of satisfaction in consolidated governments than with more localized or fragmented government. The authors used survey data to glean residents' satisfaction with 11 services commonly provided by local government. Those services included health services, parks and recreation, planning and zoning, police protection, social services, street lighting, road and street maintenance,

sanitary sewers, storm sewers, transportation, and trash collection. The authors used three different coding schemes to deal with the interpretation of "don't know" and "service not provided" issues. They compared standard deviations of levels of satisfaction between five jurisdictions in the fragmented Louisville-Jefferson-Jefferson County, Kentucky area with five jurisdictions in the consolidated Lexington-Fayette County area in Kentucky. Using a test for differences in the standard deviation of the level of satisfaction, they found that in less than half of the cases there was a statistically significant difference. The results imply that more fragmented government regimes did not provide more equal levels of satisfaction with public services as implicated in the Tiebout sorting model. The authors do suggest that it is difficult to generalize from their findings, as their test included only 10 jurisdictions and did not include any questions related to satisfaction with tax levels or other public goods.

Scully (1991) offers evidence to support his theory that fiscal regimes are converging, rather than diverging as implied by the Tiebout sorting mechanism. The dependent variable in his study is the growth rate of state plus local taxes per \$100 of income, and the independent variables are the growth rate of real per capita personal income, log of last period's taxes per \$100 income, and the growth in the Gini coefficient. The author ran two sets of regressions based on state data, one from 1929 to 1986 and the other for the period 1960-1980. He found the coefficient on the previous period's tax rate to be negative and statistically significant at below the one percent level, meaning that there was a convergence in rates of state and local taxes during these time periods. States that higher tax burdens had slower tax growth rates and states with lower tax burdens had higher tax growth rates. He concluded that

The spatial convergence of fiscal regimes has diminished the gains from Tiebout-type moves. As such, fiscal convergence diminishes the opportunity for citizen-voters to reveal their preference for collective goods through migration. (p. 58)

Scully (1991) also found that during those time periods, per capita income was also converging and income inequality decreasing. He concludes by writing:

Of course, at the limit where per capita incomes and the income distribution are invariant spatially, the spatial convergence of fiscal regimes makes the

Musgrave-Samuelson problem of revealed preference for collective goods as intractable at the state and local levels as at the national level. (p. 58)

It is not clear which factor is driving the other, but the implication from Scully (1991) is that at the state level fiscal regimes are converging, but so is the level of income per capita. Thus, one possible reason for the convergence of fiscal regimes is that tastes and preferences for public goods and taxes are converging.

Like Scully (1991), Rhode and Strumpf (2003) also empirically tests the hypothesis that over time local governments are becoming increasingly heterogeneous, as implied by Tiebout-sorting. Using data from a broad group of U.S. municipalities between 1870 and 1990 and from an analysis of data from the Boston area during the same period, the authors found little evidence of increasing heterogeneity among their proxies for public goods. Those proxies included race, age, nativity, and, from 1970 to 1990, education, home ownership, and income. The only evidence of stratification was racial composition of the inner city. Further, they found the heterogeneity of local taxes per capita and school taxes per capita declined significantly over time. They conclude that over time communities are actually becoming more and more similar in their mix of public goods and taxes, a result inconsistent with the Tiebout Hypothesis.

Taking a different approach to the same issue, Hoyt and Rosenthal (1997) tests the hypothesis that if households sort as Tiebout suggested, the marginal benefits derived from the local public goods by each family in a location should be the same. Using data from the American Housing Survey, the authors use data for clusters of houses in urban areas for 1985 and again for 1989. The data contains information from randomly selected houses and their 10 'closest neighbors.' Hoyt and Rosenthal (1997) tests whether or not the characteristics of the houses account for all of the significant differences in their value. If so, then the value attributed to the local amenities, level of public goods, and level of taxes are valued the same within all households in the cluster. Their empirical tests revealed that there were no statistically significant differences in the value of the houses once we account for the differences in housing characteristics, providing evidence that households are sorting efficiently, at least at the street level. This finding is consistent with Tiebout sorting but is not sufficient to ensure that households are efficiently sorting on the basis of preferences for locational amenities.

In yet another approach taken to the issue of increasing homogeneity within communities over time,

Bickers and Engstrom (2006) use Monte Carlo computer simulations to test whether the sorting of households into homogeneous communities is a result of Tiebout sorting or random chance. More specifically, they are interested in whether or not the degree of homogeneity in race and ethnicity is based on one's desire to avoid those of other races and ethnicities or a combination of racial/ethnic factors and other factors suggested by Tiebout, namely their preference for collective goods. They use data from two MSAs, Houston and Atlanta. They run computer simulations to randomly create a large number of metropolitan "jurisdictional" groupings, and based on those random sortings they find that observed levels of homogeneity are entirely consistent with the random sorting of households into clusters. Many earlier studies had found that as the number of jurisdictions increased, the level of heterogeneity typically decreased. The conclusion based on these observations was that people were sorting themselves, as Tiebout suggests, into communities that provided their desired level of public goods, amenities, and tax levels. The findings in Bickers and Engstrom (2006) further demonstrate the increasing homogeneity of communities. As the number of communities in an area increases, the level of desirable amenities is consistent with random statistical sorting.

The authors chose Houston and Atlanta as their test cases because the two MSA's are among the 11 largest MSAs in the 2000 Census (8<sup>th</sup> and 11<sup>th</sup> respectively) and are very close in size. Houston's population was approximately 4.7 million and Atlanta's 4.2 million. However, these two cities differed quite substantially in the percentage of the MSA population living within the main city's boundaries. For Atlanta, only 9.8% lived in Atlanta itself, but for Houston 41.4% lived in the city of Houston. Thus, these two cities varied greatly in their number of jurisdictions.

Their paper also deals with the divergent views of metropolitan area sorting. On the one hand, followers of Tiebout suggest that people are sorting themselves based on their preferences for public goods and taxes, among other variables, while others suggest that sorting is primarily based on segregation, the desire to live with those like themselves.

Their simulations provide conflicting evidence. On one hand, they find that the level of diversity is decreasing the more decentralized is the jurisdiction; in other words, people in smaller governmental units are more similar to each other, which is consistent with Tiebout. However, they also find evidence that the degree of diversity that exists is also consistent with random chance, indicating that there may be no

particular pattern to the sorting, which is counter to the Tiebout Hypothesis.

### 2.10. A test of the motives for migrating

Using a different approach, the papers below investigate the motives for moving by using actual survey data in which people revealed their reasons. Percy et al. (1995) address the issue of whether or not citizens actually move because of their desire for lower taxes or more amenable public services by surveying people who actually moved. An important implication in Tiebout is that people have information about the combination of taxes and public services available in other communities. The surveys asked people to identify all of the reasons they choose to move out of where they were located and all of the reasons they chose to move to their new location.

To account for the different groups of movers and to account for those who changed jurisdictions, the authors ran logistic regressions on the reasons for moving out of a jurisdiction and on the reasons to move into a jurisdiction. The dependent variable in their analysis was a dichotomous variable in which the variable was either "important" or "not important" in the decision to move. Each of the reasons to move was included as an independent variable. Other independent variables were added to control for different motivations such as the presence of school-age children, household income, location of previous home, a variable indicating if people perceived there were affordable homes in the community, and dummy variables for location of previous home.

The results of the logistic regressions lend strong support to the Tiebout Hypothesis. The factors that most changed the odds of moving out of a jurisdiction were "concerns about the quality of schools" and "taxes too high." In addition, both of those variables were statistically significant at well below the 1% level. The variable "dissatisfaction with public service" was positive but not statistically significant at even the 10% level. The results of the logistic regression for the reasons to move into a particular jurisdiction indicated that the variables that most changed the odds of moving into a jurisdiction were "lower taxes" and "good public schools." "Good Public Services" had almost zero impact on the decision and was not statistically significant, however.

Bickers et al. (2006) also use survey data to test the micro-foundations of the Tiebout model, namely the reasons why those who exit an area do so. Thus, their paper is investigating the same question raised by Percy et al. (1995), i.e., whether people have enough

information about combinations of public goods and taxes available in other jurisdictions to migrate to those areas that have their desired level of public goods and taxes.

Their data is drawn from the results of survey administered in April 2002 to 1,604 respondents in four metropolitan areas (New York, Houston, Chicago, and Los Angeles). The survey was conducted jointly by the University of Houston and Rice University survey research centers. Using a scale of -5 to 5, where -5 was a very negative about the area and +5 a very positive aspect of the area, the authors chose to investigate the response on the following variables: public transportation, local police protection, local fire protection, traffic and mobility, air quality, local public schools, arts and entertainment, parks and recreational facilities, the neighborhood in which they lived, the respondent's personal safety, the racial and ethnic diversity of the metropolitan area, the overall quality of life, and job opportunities. They considered the first five variables as publicly provided collective goods, the next two as jointly provided collective goods, the next two as coproduced collective goods, the two variables on racial and ethnic diversity and overall quality of life as miscellaneous, and the last variable, job opportunities, as a private good. Other independent variables included race, family income, family income on the block, and additional social capital variables like home ownership, interaction in the neighborhood, length of residence in the area, voter registration, and participation in public forums.

The authors conducted probit analysis using likelihood of moving as the dependent variable. Only two of the six Tiebout Hypothesis variables were found to be statistically significant. As expected, a higher rating of local fire protection reduced the likelihood of moving, but a higher rating of local police protection increased the likelihood of moving. The authors suggest that there was a greater presence of police in areas with higher crime rates. The analysis was repeated using a Heckman Selection Model, with the results finding that only one of the Tiebout Hypothesis variables was statistically significant. Higher quality schools reduced the likelihood of moving. This is consistent with most other studies which have found strong evidence that the quality of the local public schools was an important determinant of migration.

### 2.11. Does Tiebout sorting lead to segregation?

Bickers and Engstrom's (2006) paper, already discussed, examines the issue of whether Tiebout sorting

results in segregation. Their findings were that the diversity score of the local jurisdiction decreased the more fragmented the government, implying that having more, smaller local governments increased segregation relative to more centralized government in an area, all else equal.

Dawkins (2005) investigates whether segregation by race is a result of the Tiebout sorting process. While Bickers and Engstrom (2006) examined the connection between local government fragmentation (which is a result of Tiebout sorting) and segregation, Dawkins (2005) treats measures of racial segregation as endogenous "since the observed determinants of location patterns which affect residential segregation also have been shown to affect the demand for the number of governments" (p. 735). Dawkins (2005) investigates the link between Tiebout choice and black-white residential segregation using two different datasets and two different empirical strategies. In one study, data from the 1980-2000 U.S. Censuses of Population and Housing are used to estimate MSA-level segregation, and in the other household-level data is used from the 1980-1999 Panel Study of Income Dynamics (PSID). In both empirical investigations, the author uses instrumental variables to account for potential simultaneity bias. He uses two different sets of data and two different sets of instrumental variables to test if either the choice of instruments or the degree of aggregation of segregation might lead to a bias on the coefficient estimates. His empirical findings are consistent with his hypothesis that the greater number of local governments (increased Tiebout choice) leads to increased segregation, but only moderately. For example, he finds that for a 10% increase in Tiebout choice total segregation across neighborhoods increases by about 1%, while the segregation across jurisdictions increases between 4% and 7%.

Alesina et al. (1999) tests the link between the amounts and types of public goods provided by the city, metropolitan area, or county and the ethnic makeup of those jurisdictions. Their main conclusion is that in areas where there are large ethnic divisions, i.e., there is more than one dominant ethnic group, the local government provides a lower level of public goods, namely, public education, roads, sewer, and trash pickup. "Representatives of interest groups with an ethnic base are likely to value only the benefits of public goods that accrue to their groups, and discount the benefits for other groups" (pp. 1243-1244).

The authors use the ethnic fractionalization index as their measure of ethnic fragmentation. The fractionalization index is the probability that two people drawn randomly from the jurisdiction are not of the same ethnic group. Thus, the more ethnic fragmentation there is, the higher is the probability that two people chosen at random are not of the same ethnic group. The authors chose to perform their analysis at three different levels, metropolitan area, city, and county, because we would expect greater Tiebout sorting at the smallest jurisdictional level. In other words, we should find less ethnic fragmentation at the smallest levels of jurisdiction. Tiebout (1956) acknowledged perfect sorting of consumer-voters would not be achieved because of the realities such as limited job opportunities, consumer voters not having total knowledge of the choices of public goods in all communities, limits to mobility, moving costs, etc.

In their empirical analysis they conducted regressions on the provision of each public good tested as the dependent variable and the ethnic fractionalization variable (*ETHNIC*) as an independent variable, with other control variables to account for differences in income, education, elderly population, income distribution, and population. At the city level the coefficient on *ETHNIC* was negative and statistically significant at beyond the 1% level for spending on roads, sewerage, and trash pickup, and positive and statistically significant at the 1% level for share of spending on police. Thus, greater ethnic tensions led to less spending on roads, sewer, and trash pickup, but more spending on police.

For metro areas, they found the coefficient on *ETHNIC* to be negative and statistically significant for spending on roads, spending on education, and spending on welfare. The coefficient on *ETHNIC* is positive and statistically significant for spending on police and spending on health. At the county level, the coefficient on *ETHNIC* is negative and statistically significant for spending on roads, spending on education, and spending on welfare. It is positive and statistically significant for spending on police and spending on welfare. Thus, they find that greater ethnic tension leads to less spending on public goods such as education, trash and sewer, and welfare but more spending on health and police.

Further, the authors tested the coefficient and statistical significance of *ETHNIC* in determining the overall levels of local government spending and taxes per capita. They found that, using the model with all six control variables, the *ETHNIC* variable had no statistically significant impact on taxes per capita at the metropolitan level and at the county level. However,

at the city level, taxes per capita were higher given a higher level of ethnic fractionalization. Spending increases with higher ethnic fractionalization at both the city and county level, but not the metropolitan area level. Overall, the authors conclude:

These results suggest the following summary pattern. Total spending tends to go up with higher ETHNIC. Yet, local taxes go up much less with ETHNIC, or may even go down. So the higher local spending with higher ETHNIC is financed by a combination of higher debt and deficits, and more intergovernmental transfers. (pp. 1266-1267)

In the context of the Tiebout Hypothesis the analysis done in Alesina et al. (1999) illustrates that when there is more complete Tiebout sorting, there will be greater provision of desired public goods. This result is consistent with Tiebout. However, the fact that in the jurisdictions with greater ethnic fractionalization there is less agreement on the provision of public goods is a result of inefficient or incomplete sorting.

### 2.12. Tiebout-Hypothesis and environmental factors

The study by Cebula and Alexander (2006) uses data from the 2000-2004 time period on net state in-migration to explore the impact of “dis-amenities” on the in-migration rate. In their empirical analysis they include many of the usual independent variables used in migration studies, such as economic factors like expected income, cost of living, and employment growth, positive quality-of-life variables such as moderate climate and being on the coast, and fiscal factors such as per pupil spending on education, per capita death and gift taxes, and state income tax burden. In addition they include two measures of negative quality-of-life factors:  $HAZARD_j$ , which is the percent distribution of hazardous waste sites in state  $j$  on the National Priority List, and  $TOXIC_j$ , which is toxic chemical releases in state  $j$  expressed as pounds per capita. They estimate the parameters of their model using three separate equations, using two different measures for coastal states and two different measures of the state income tax burden. In all three models, the coefficients on  $HAZARD_j$  and  $TOXIC_j$  are negative and statistically significant at the five percent level. This result confirms the hypothesis that people are dissuaded from moving to places with ‘disamenities’, i.e., negative quality-of-life factors. In addition, they also find that the measure of school quality (per pupil spending on education) is positive and statistically significant at the 1% level and that both measures of the state income tax burden are negative and statistically significant at the 5% level or

better. The variable death and gift taxes was not statistically significant, perhaps because this study examined migration of all migrants, not just older migrants, the group that would be most impacted by the level of death and gift taxes.

Banzhaf and Walsh (2008) test the proposition that people vote with their feet in the context of environmental quality. The authors set out to test the Tiebout Hypothesis by examining actual responses to public good provision. Their theoretical model predicts that we should observe an increase in the relative population density of neighborhoods that experience an exogenous marginal improvement in public goods if people are sorting according to the Tiebout Hypothesis. Further, communities experiencing “large” improvements in public goods should have a relative increase in income. The authors use data from the Toxics Release Inventory (TRI) as their measure of environmental quality.

Banzhaf and Walsh (2008) use both linear regression, controlling for demographics and other location-specific factors, and a bias-corrected non-parametric matching estimator. Their results indicate that migration is correlated with TRI facility emissions. They also find that communities with higher toxic releases become poorer over time. These results provide some fundamental support for the notion that people vote with their feet.

Cebula and Clark (2011), already discussed above, not only addressed the attraction of personal and economic freedom on in-migration, but they also examined the impact of environmental factors on migration. In addition to economic variables to help explain net in-migration, they used average January temperature as a measure of quality-of-life and the number of pounds per capita of toxic chemical releases in year 2000 as a measure of the environment. They ran regressions using the dependent variable in both its linear form and log form. The variable measuring the level of toxic chemical releases was negative and statistically significant at the 5% level in one regression and the 10% level in the other, yielding additional evidence that people are also voting with their feet to move to places with better environmental quality as well.

## 3. Conclusions

During the sixty years since Tiebout (1956) first published his theory suggesting households vote with their feet and move to communities or cities where their desired level of public goods more closely matched their ideal assortment of public

goods, the theory has been tested and cited frequently. Researchers continue to ask whether public goods are really provided at an optimal level by private entities and jurisdictions through this process of sorting and investigate the process by which people sort themselves into local jurisdictions where the most desirous bundle of public goods are provided. While many questions remain, Tiebout's hypothesis continues to generate a great deal of interest and attention due to the increasing propensity of workers to change jobs more frequently. Additionally, demographic patterns such as the migration to the Sun Belt or the "graying" of the average U.S. worker raises a new and difficult public goods problem.

While this paper has limited its review both in scope, i.e., not including papers that addressed the capitalization of public goods in housing prices, and time period, from 1990 to the present, there are still 44 papers reviewed in the present study. This indicates that there is still a great deal of interest generated by Tiebout's famous work. Most studies presented in this review provide some evidence that households are indeed sorting themselves as predicted by Tiebout, given various constraints. An important issue not fully explored in this review is the cost-of-living comparisons between locales. Including these cost of living comparisons could avoid the risk of misspecification in the form of omitted variable bias. Of course, this can only apply in those cases where the data exist.

Perhaps, the main line of research giving the weakest evidence of the Tiebout Hypothesis is the research focusing on the heterogeneity of local governments and whether or not there is complete Tiebout sorting leading to greater differences in the composition of public goods and taxes among local governments. In the ideal Tiebout world, local governments would become more heterogeneous as more and more people migrated.

Clearly, the Tiebout Hypothesis remains a hot topic in economic and regional analysis. Some 200 papers were reviewed by Dowding et al. (1994) in addition to the more than forty papers in this review. Despite all of the attention given to the Tiebout Hypothesis there is still much that can be tested and debated in regards to whether or not consumers/voters are sorting themselves as suggested by Tiebout (1956). Any future study of the Tiebout Hypothesis should also include consideration of cost-of-living differentials, so a basis for the sorting process can be compared and contrasted to alternative theories.

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