Cooperative solutions to open access competition for land among municipalities

Elizabeth E.H. Garner, Andrew F. Seidl, and Dana L. Hoag[*]

Paper presented at the Western Agricultural Economics Association Annual Meetings, Vancouver, British Columbia, June 29-July 1, 2000.

[*] Extension Statistics Specialist, Assistant Professor and Professor, respectively, Department of Agricultural and Resource Economics, Colorado State University, Ft. Collins, CO, 80523-1172. E-mail for corresponding author: ehorbro@lamar.colostate.edu.

Cooperative solutions to open access competition for land among municipalities

Elizabeth E.H. Garner,

Andrew F. Seidl, and

Dana L. Hoag

Devolution of government power provides many benefits by putting local communities more in control of their own destinies. More local control however presents its own set of problems since there are usually externalities associated with local decisions. Economic and sociological influences of municipalities often reach beyond their own boundaries as resources and people flow freely with little regard to legal boundaries. Municipalities recognize that there are externalities and cooperate in a variety of physical, political, social and economic networks that transcend community boundaries, such as streets and highways, water and sewage disposal systems, and regional public institutions. Nevertheless, devolution and the subsequent reduction in federal support, restrictive local tax alternatives, and popular opposition to new taxes have forced local governments to increase their dependence upon local property and sales taxes as their primary sources of revenue. Where residential or commercial/industrial development does not compensate the local government for the cost of providing services to an area, the government must either increase the property tax base or the tax rate levied on that base to meet service demands. City centers are especially challenged because they often have fewer taxable resources relative to the number of people demanding services than do the suburbs. When the burden of demands for services become acute, and

externalities are high, municipalities often engage in inefficient land development patterns sometimes referred to as "sprawl".

Local (municipal and county) governments may be motivated to maximize tax revenues and, in order to meet community service demands for the least cost, minimize demands on government provided services. Maximizing tax base facilitates the revelation of resident preferences for services and provides maximum flexibility and opportunity for a municipality to supply those services (Schneider, 1989). At the same time, however, local governments compete with one another to attract commercial and industrial business to increase their tax base as well as to nurture a reputation as a center for employment and commerce. The Tiebout model (see Zodrow, 1983 and Schneider, 1989) showed that competition among municipalities through a market-like institution could improve the efficiency of local public good provision by allowing residents to "vote with their feet" (also known as "tatonnement") and live in a community that most closely approximates their ideal tax/services mix. Metropolitan "reformers" on the one hand and the "polycentrists" on the other have debated issues raised by Tiebout. The reformers argue for consolidation of (cooperation among) local governments due to potential economies of scale and coordination of services. The polycentrists emphasize the efficiency gains by competition among municipalities (Schneider, 1989). Local tax competition has lead to piecemeal growth, "over development" of some areas, and inadequate public services in others (Lyall, 1975). Fiscal competition also leads to the exploitation of land and open space resources for their short-run tax yield.

We show here that municipal competition for tax base can lead to an open access economic failure from a societal perspective. Taxable base can be seen as a common pool

resource because, to municipalities, taxable base is an open access subject to competition between municipalities either by acting first or by bidding for potential developments with lower tax rates than their neighbors. Just as it is in the case of private individuals competing for open access resources, the competitive solution will be inferior to the cooperative solution between two municipalities.

By casting competition between municipalities for taxable base in a traditional open access economic framework, we can formalize the problem of growth and look for solutions on familiar and well-trod turf. We proceed by demonstrating that competition for land is an open access problem and then, through a simple game theory example, show when cooperation improves welfare. Among the challenges in the efficient management of common pool resources is in creating an appropriate institution for their allocation. We conclude with an example that shows how tax base sharing may provide a tool for municipalities to take advantage of potential gains to cooperation by reducing the transactions costs of cooperation relative to competition (see, for example, Nunn and Rosentraub; Vogt; Reschovsky; McHone; Reschovsky and Knaff; Lyall; and Orfield).

Municipal competition as open access

The taxable base potentially available to municipalities can be viewed as a common pool resource of fixed magnitude. The taxable base or development can be managed via some common property management regime or left to mismanagement from a regional perspective as an open access resource. Problems with open access arise from free and unrestricted access resulting from lack of ownership of the resource by any person or group of people. When 'everybody's property is nobody's property' incentives

exist for each individual to under-invest in and overexploit resource stocks from a group, community or societal perspective. Often *de facto* property rights to exploit open access resources will fall to the party to first able to impose control over it (Bromley, 1991).

Taxable base demonstrates the requisite characteristics of subtractability (one person's use obviates the possibility of another's use) and non-excludability (difficult or costly to restrict access to use) for common pool resources. Just like with private goods, once a mushroom greenhouse has located in one municipality, it is no longer an option available for other regional municipalities. However, residents of surrounding municipalities will be able to purchase mushrooms as easily as residents of the municipality where the greenhouse is located. Also similar to private goods, it is difficult to exclude other municipalities from pursuing taxable base.

The layers of property rights involved in municipal planning make taxable base a unique common pool resource. Unlike a fishery, for example, land used for taxable base like commercial centers or subdivisions is typically privately owned. The owner holds the property rights to guide the use of the land. If landowners behave as economic firms (or agents), it can be expected that he will maximize his net financial returns (or utility) from the land. However, the degree of individual volition the landowner has and the set of opportunities presented regarding the use of his land depend upon the actions of neighbors and various layers of government that can influence land use on his property. Federal, state, and county government act on behalf of society at each scale to affect natural resource management to maximize collective utility. Managing common resources toward social objectives potentially attenuates individual property rights. Counties and municipalities can determine the level of services to provide to a location.

Municipalities can annex and zone land toward the community's goals, not necessarily toward the landowner's objectives. Although, the municipality may annex and zone a property, the change in the municipal tax base is largely dependent upon the willingness of private individuals to invest in the property under the rules of the municipality.

Typically, open access failures have two components that create inefficient resource management; a benefit/cost or appropriation externality and a strategic externality (see Steverson, 1991, Gordon, 1954, Ostrom,1994). These open access externalities combine to intensify municipal competition for tax base. Particularly within a nation, social systems, like environmental systems have little respect for most geo-political boundaries. In most cases, the negative and positive results of "development" do not confine themselves conveniently to one area but will overlap areas of jurisdiction and control. This is the basis for the cost/benefit externality. The annexing community does not capture all costs or benefits of developing taxable base. For example, increased traffic and road costs in adjacent communities whose transportation corridors are used to access new taxable base, like a mall.

Strategic externalities of development also stem from ill-defined property rights. The "rule of capture" governs the "ownership" of the resource, also known as the "first in place, first in right" property rule. Land not developed or annexed by a municipality may be lost to a neighboring community. The fear that municipalities cannot capture tomorrow what they do not develop today undermines their incentive to forgo current development for future development (Negri,1989, p. 9).

Non-optimality of open access

Open access externalities intensify municipal competition for tax base. Without a change of institutions, local governments, acting independently will economically overexploit the resource and underinvest in common improvements. Here, the resource is land where tax base generating activities can occur. Municipal competition as a failure of open access is illustrated using the "prisoners' dilemma" two-agent, incomplete information game and a simple mathematical example.

Two neighboring municipalities lie within an economic region. They are adjacent (assume transportation costs are not a decision factor), have equivalent fiscal policies, and of are approximately equal size and demography (competition for tax base between municipalities is unfettered by other factors). Each municipality chooses whether to attract more tax base generating activities or not. A municipality will choose to accept the costs of development if the increase in tax base compensates for it.

Each municipality, i, independently maximizes net tax base revenues ($NTBR_i$). Municipal net tax base revenues are equivalent to tax base revenues (TBR_i) less costs (C_i). Both revenues and costs are a function of the amount of taxable base (Y_i). Arguments in the revenue function include the tax rate implications of zoning and land attributes and any positive externalities captured from activities on neighboring lands. Arguments in the cost function include infrastructure, annexation, and planning costs and any negative externalities associated with the location of the parcel. Total net tax regional tax base (NTBR) is the sum of the individual or cooperative net tax base revenue maximization decisions made by municipalities within the region. From this framework

we can explore the implications of competitive or cooperative behavior among two municipalities for tax base as follows:

(1) $NTBR = NTBR_A + NTBR_B$;

(2) $NTBR_A = TBR(Y_A) - C(Y_A) + á_A TBR(Y_B) - â_A C(Y_B)$;

(3) $NTBR_B = TBR(Y_B) - C(Y_B) + á_B TBR(Y_A) - â_B C(Y_A)$;

(4) $Y = Y_A + Y_B$.

In this two-municipality game, the payoff to society is the sum of the net gain in the municipality that takes tax base Y, and the fraction of that net payoff that is received as an externality benefit, á , or cost, â, in the other municipality. If neither municipality decides to add tax base ($Y_i = 0$) there will be no gain or loss to either and both payoffs are zero (Figure 1). If municipality B does "not add" tax base, municipality A's decision is between "add" ($Y_A=Y$, $Y_B=0$), where A will gain $TBR(Y) - C(Y)$ and B will be affected by the externality $á_B TBR(Y) - â_B C(Y)$, and "not add" where A's gain will be zero (Figure 1). The magnitude of positive externalities associated with B's proximity to A's development relative to the negative externalities imposed by that development will determine whether B is helped or harmed by A's decision. Reverse payoffs exist if Municipality B adds tax base and A does not (Figure 1), although the externality parameters may differ across municipalities. When both municipalities add taxable base, their individual payoffs are $TBR_A (Y_A) - C_A (Y_A) + á_A TBR_B (Y_B) - â_A C_B (Y_B)$ and $TBR_B (Y_B) - C_B (Y_B) + á_B TBR_A (Y_A) - â_B C_A (Y_A)$, respectively.

When one municipality decides not to add tax base the clear optimal decision is for the other to add tax base unless the costs of adding is greater than the tax base revenue. If one municipality decides to add tax base the decision for the other is not as clear. Unless the net benefit of the externalities terms ($á_A TBR_B(Y) – â_A C_B(Y) - á_A TBR_B (Y_B) – â_A C_B (Y_B)$)is greater than the net benefit of securing taxable base by each municipality, unilateral securing taxable base (monopoly) is the preferred solution by each municipality and add-add is the dominant solution to the game, since Y is greater than either Y_A or Y_B if both municipalities choose to attract tax base.

Figure 1: Incentive to attract tax base: A two-municipality game, with incomplete information.[a]

		Municipality B	
		Adds	Does not add
Municipality A	Adds	$TBR_A(Y_A) – C_A(Y_A) + á_A TBR_B (Y_B) – â_A C_B (Y_B),$ $TBR_B (Y_B) – C_B (Y_B) + á_B TBR_A(Y_A) – â_B C_A(Y_A)$	$TBR_A(Y) – C_A(Y),$ $á_B TBR_A(Y) – â_B C_A(Y)$
	Does not add	$á_A TBR_B(Y) – â_A C_B(Y), TBR_B(Y) – C_B(Y)$	0, 0

a – The first expression in each cell represents municipality "A." The expression following the comma is for municipality "B."

The competitive solution ($NTBR_{NC}$) is only regionally optimal if the municipalities are precisely identical in preferences and ability to produce benefits from

taxable base. In that case, the competitive solution reduces to the cooperative solution (NTBR$_C$) as the externality effects are internalized ($á_A = á_B$ and $â_A = â_B$) and the cost-benefit ratio from development in either community is equivalent (TBR$_A$(Y) = TBR$_B$(Y) and C$_A$(Y) = C$_B$(Y)). As a result, the cooperative solution is strictly preferred except under very specific conditions when the municipalities should be indifferent between the two solutions. The competitive and the cooperative solutions are, respectively:

(5) NTBR$_{NC}$ = TBR(Y$_A$) – C(Y$_A$) + á$_A$TBR(Y$_B$) – â$_A$C(Y$_B$) + TBR(Y$_B$) – C(Y$_B$) +

    á$_B$TBR(Y$_A$) – â$_B$C(Y$_A$);

(6) NTBR$_C$ = TBR(Y$_{A+B}$) – C(Y$_{A+B}$).

Alternatively, the problem can be viewed in terms of a model commonly applied to fisheries (Hartwick and Olweiler, 1986)). In an open access situation, each firm receives the average value product of the industry's total effort (see also Gordon, 1954, p 136 and Stevenson, 1991, p 33). By harvesting the average value product, each firm imposes a cost or externality on every other firm. Each firm treats the stock (Y), as exogenous when the action of firm, i, leads to a lower stock and slightly higher costs for every firm. Applied to municipalities:

(7) TBR = AVP$_Y$Y,

TBR is municipal tax base revenue, which is a function of taxable base, Y. Tax base revenue equals the average value product (AVP), or average tax rate, of taxable base

multiplied by the amount of tax base developed. By differentiating this equation with respect to the marginal change in taxable base, we can look at the impact a marginal increase in taxable base from the development of an additional lot on tax base revenue.

(8) $dTBR/dY = AVP_Y + Y(dAVP_Y/dY)$.

The term $dTBR/dY$ can be interpreted as the marginal value product of taxable base which equals the average value product of taxable base plus the term $Y(dAVP_Y/dY)$. This term shows the change in the revenue from tax base per unit of tax base due to the development of an additional unit of taxable base. The term is negative because current development reduces the amount of taxable base available in the future. Development also limits what can be done with the remaining land. Once a regional mall is developed, not only is that land use decision irreversible (for certain land uses with varying time horizons), but the set of potentially optimal land use alternatives for surrounding parcels is limited by the decision. All regional municipalities in the region are affected by the marginal change in taxable base.

In this example, each municipality ignores the term $Y(dAP_Y/dY)$ in making its own land use decisions. It cannot enter into consideration for future land use planning alternatives because that tax base is not under the current control of the municipality and there is no reason to be certain that it will be. It is a portion of the cost externality previously described in the game theoretic example or what Hartwick and Olweiler call the stock effect since it affects the stock of taxable base. For each increment in taxable base, municipalities actually receive the industry average value product of effort minus

the stock effect. But because all municipalities feel the stock effect, no single one takes it into account when deciding how much taxable base to use. The municipalities ignore the effect an increase in development of tax base has on taxable base of the region and hence on the tax base revenue. The stock effect is ignored in the open access equilibrium, and this is the economic inefficiency induced by individual competitive behavior. (Hartwick and Olweiler, 1986).

Tax Base Sharing: An Optimal and Cooperative Solution

Property rights defining the rules of access, use and management of the resource base are required to prevent the "tragedy of open access". Six neoclassical economic solutions to open access have been suggested: privatization, input quotas, input rights, output quotas, output rights, and taxation (Steverson, 1991).   A discussion about all of these neoclassical prescriptions to open access problems is beyond the scope of this study.   We will focus on tax-base sharing or revenue sharing as a tool to provide incentives for local governments to cooperate.

Tax base sharing typically has been used to help alleviate fiscal disparities between municipalities within a metropolitan area. Tax base, tied to higher income properties and industry, have often left the central cities in search of lower land prices and to escape the perceived "social problems". This exodus to the suburbs usually leaves behind the groups of people who tend to place high demands on the local public sector, for instance, the poor and the aged (Reschovshy and Knaff, 1977). Many suburbs also face this problem of misallocation of resources due to the absence of commercial and industrial businesses in which they can levy taxes. Commonly, residential areas are a net

draw on resources and commercial and industrial developments are a net gain to local resources.

Tax base sharing has had multiple goals:

- Improve horizontal equity (fiscal disparity and mobility constraints);

- Stimulate more efficient patterns of metropolitan area development (production at the lowest social cost) (Reschovsky and Knaff ,1977), and

- Improve tax equity (receiving benefits of growth while only bearing a small fraction of the infrastructure cost needed to attract that growth) (Vogt, 1979).

Tax-base sharing could be a method of creating an institutional structure whereby making taxable base a well managed, common pool resource by reducing the incentives for non-optimal land development by individual municipalities and potentially providing greater incentives for the provision of other, less lucrative, regional benefits of land including open space, for example. With tax base sharing, local governments may strengthen their fiscal capacity to respond to local public service demands including demands for more rational land development, open space and environmental preservation (Lyall, 1975).

Tax base sharing usually has two parts; a formula for determining the contribution to the 'growth pool'; and a formula for determining the shares paid out of the pool each year. The pool does not accumulate. Payments into the pool are determined by applying the average commercial tax rate for the region to a certain percent of the difference in the assessed value of all commercial and industrial property within its boundaries between that year and the base year. Only communities that experience growth in tax base contribute to the pool but all governments in the region share in the distribution of the

pool. Those participating in the plan determine the formula for determining shares paid out. In Minneapolis-Saint Paul, Minnesota, for example, the value of each government's share of the area wide base is determined by each community's population and inversely related to the size of its fiscal capacity (the market value of all property, both residential and non-residential)(Reschovsky and Knaff, 1977). These formulae vary between plans. In San Diego, California, the share received varied directly with population size and inversely with the value of residential property value per capita (Vogt, 1979).

Adding tax base sharing to the prisoner's dilemma example leads to different results. The net benefit to municipality A for developing taxable base is shown in Equation 9. The tax revenue for a municipality is a function of the taxable base in year t, Y_{it} multiplied by the tax rate T_i, as shown in Equation 10. If tax base sharing were implemented, tax revenue would be subject to both contributing to and receiving from a "growth pool" of tax base. $Y_{At} - Y_{base}$ would be used to determine the change in taxable base between the base year and current year. Y_{base} is the base year taxable base and T_{TBS} is the tax base sharing tax rate, often an average regional rate. Additionally, there are tax base sharing "shares" that each community could receive which is determined by the size of the regional tax base pool and their share ratio, $TBPOOL*S_i$. The share contributed and received from the pool are both assumed to be zero or greater. The tax base revenue is now represented as Equation 11.

(9) $NTBR_A = TBR(Y_A) - C(Y_A) + á_A TBR(Y_B) - â_A C(Y_B);$

(10) $TBR(Y_A) = Y_{At} * T_A$

(11) $TBR(Y_A) = Y_{At} * T_A - ((Y_{At} - Y_{base}) * T_{TBS}) + TBPOOL*S_A.$

Figure 2: Incentive to attract tax base: A two-municipality game, with incomplete information and tax base sharing

		B Develops	B Does Not Develop
A Develops		$Y_{At} T_A - ((Y_{At} - Y_{base}) T_{TBS})+$ TBPOOLS$_A$ – C(Y$_A$) + á$_A$TBR$_B$(Y$_B$) – â$_A$C$_B$(Y$_B$), Y$_{Bt}$ T$_B$ – ((Y$_{Bt}$ – Y$_{base}$)T$_{TBS}$)+ TBPOOLS$_B$ – C(Y$_B$) + á$_B$TBR$_A$(Y$_A$) – â$_B$C$_A$(Y$_A$)	$Y_{At} T_A - ((Y_{At} - Y_{base})$ T$_{TBS}$) – C(Y$_A$), TBPOOLS$_B$ +á$_B$TBR$_A$(Y) – â$_B$C$_A$(Y)
A Does Not Develop		TBPOOLS$_A$ + á$_A$TBR$_B$(Y) – â$_A$C$_B$(Y), Y$_{Bt}$ T$_B$ – ((Y$_{Bt}$ – Y$_{base}$) T$_{TBS}$) – C(Y$_B$)	0,0

In the tax base sharing, two-municipality game, if neither municipality decides to add tax base ($Y_i = 0$) there will be no gain or loss to either and both payoffs are zero (Figure 2). For municipality A, if municipality B decides to add tax base, its payoff decision is between:

Y_{At} * T$_A$ – ((Y$_{At}$ – Y$_{base}$) * T$_{TBS}$)+ TBPOOL$_{A+B}$*S$_A$ – C(Y$_A$) + á$_A$TBR$_B$(Y$_B$) – â$_A$C$_B$(Y$_B$), andTBPOOL$_B$*S$_A$ + á$_A$TBR$_B$(Y) – â$_A$C$_B$(YA is faced with determining whether their net tax base revenue is greater than the net benefit of the externalities terms (á$_A$TBR$_B$(Y) – â$_A$C$_B$(Y) - á$_A$TBR$_B$ (Y$_B$) – â$_A$C$_B$ (Y$_B$)) plus their share of the tax base pool only contributed by B. . Unless it was a low profit project net tax base revenues should be greater than zero. What is uncertain is the size of their share of the pool only contributed by B and the net benefit/cost of the externalities. Tax base sharing creates a mechanism for internalizing the cost/benefit externalities of open access as well

as addresses the strategic externalities. Reducing the benefits of land development and increasing the benefits of providing open space or parks for example may provide enough incentive to work toward more rational land use patterns. Comparing the tax base sharing payoff and the original payoff for A if both municipalities develop, results in equations 12 and 13 respectively. The benefits of developing were greater and the costs smaller without tax base sharing. The size of the tax base share contributed and received depends on each project and the how the tax base is growing for the entire region.

(12) $\quad Y_{At}\, T_A - ((Y_{At} - Y_{base})\, T_{TBS}\,) + TBPOOLS_A - C(Y_A) + \acute{a}_A TBR_B(Y_B) - \hat{a}_A C_B(Y_B);$

(13) $\quad Y_{At}\, T_A - C_A(Y_A) + \acute{a}_A TBR_B\,(Y_B) - \hat{a}_A C_B\,(Y_B);$

The share of the tax base pool received helps to offset the costs, $\hat{a}_A C_B(Y_B)$, that B's development imposes on A but the relative size of the share received and costs are uncertain. However, in this two person game, if A decides not to develop, the tax base pool share it receives is a direct transfer from what B pays into the pool and in this way, tax base sharing provides a mechanism for internalizing the cost externality of open access.

The payoff decision for municipality A if B decides not to develop is between: $Y_{At}\, T_A - ((Y_{At} - Y_{base})\, T_{TBS}\,) - C(Y_A)$ and 0. In most cases, net tax base revenue minus their tax base contributed share will be greater than zero unless it was a low profit development. The decision for player A if B decides not to develop without tax base sharing is $Y_{At}\, T_A - C_A(Y_A)$ and 0. Under tax base sharing, the benefit of strategic development is diminished.

Unless the expected share of the tax base pool only contributed to by one municipality plus the net benefits of the externality terms $(\acute{a}_A TBR_B(Y) - \hat{a}_A C_B(Y)$ -

á$_A$TBR$_B$ (Y$_B$) – â$_A$C$_B$ (Y$_B$)) is greater than the net benefit of securing taxable base by each municipality, unilateral securing of taxable base, add-add, is again the dominant solution to the game. However, the difference between the payoffs is diminished with tax base sharing and in those cases where the benefits are low and costs are high for a development, not adding and accepting the transfer of tax base would become the dominant strategy. Tax base sharing primarily responds to the cost/benefit externality and strategic externality of open access failures by requiring participating communities to contribute to and receive from a tax base pool and by reducing the benefits of development and increasing the costs.

Conclusion

Regional and municipal planners face open access problems with unique levels of rights and complex sets of objectives and circumstances. Addressing tax base competition in an open access framework provides opportunities for better understanding the problem as well as an opportunity to build off a significant amount of research for potential solutions. Areas for further study include analyzing instruments other than tax base sharing that address the open access failure of seeking taxable base and analyzing the incentives of municipalities to cooperate depending on their relative "power". Additionally, the model can be complicated to take into account land use objectives other than tax revenue maximization. Since some of these objectives could be at cross purposes, depending on the perspective of the land user, the payoff matrix becomes more complicated and the optimal solution (the mix of objectives meeting goods and services) is less intuitively obvious.

References

Bromley, Daniel W., *Environment and the Economy: Property Rights and Public Policy*, Basil Blackwell Inc,Oxford, 1991.

Hartwick, J and Nancy Olweiler, *The Economic of Natural Resource Use*, Harper Collins, New York, 1986.

Lyall, Katharine, "Tax Base Sharing: A Fiscal Aid Towards More Rational Land Use Planning", *AIP Journal*, March 1975, 90-100.

McHone, W. Warren, "Highway Accessibility, Location Rents, and the Efficiency of Metropolitan Area Tax Base Sharing", *Growth and Change*, Spring 1990.

Negri, D. H., "The Common Property Aquifer as a Differential Game", *Water Resources Research*, 25:9-15.

Nunn, Samuel and Mark S. Rosentraub, "Metropolitan Fiscal Equalization: Distilling Lessons from Four U.S. Programs", *State and Local Government Review*, 28(2): Spring 1996, 90-102.

Orfield, Myron, *Metropolitics: A Regional Agenda for community and Stability,* Brookings Institution Press. Washington, D.C.,1997.

Ostrom, Elinor, Roy Gardner, and James Walker*, Rules, Games, and Common-Pool Resource Problems*, University of Michigan, 1994.

Reschovsky, Andrew, "An Evaluation of Metropolitan Area Tax Base Sharing",*National Tax Journal*, 23, 1980, 55-66.

Reschovsky, Andrew and Eugene Knaff, "Tax Base Sharing: An Assessment of the Minnesota Experience", *AIP Journal*, October, 1977.

Schneider, Mark, *The Competitive City: The Political Economy of Suburbia*, University of Pittsburgh Press, Pittsburgh, PA, 1989

Steverson, Glenn G*., Common Property Economics: a general theory and land use applications*, Cambridge University Press, Cambridge [Eng]; NY; 1991.

Zodrow, George R, edited by, *Local provision of public services : the Tiebout model after twenty-five years*, Academic Press, New York, 1983.

Vogt, Walter, "Tax Base Sharing: Implications from San Diego County"*, APA Journal*, April, 1979, 134-142.