

I. A Short Review of What We've Covered to this Point

In part I of the course, we analyzed: (i) the positive properties of a single tax or expenditure program on single markets, (ii) the normative properties of such taxes and expenditures, and (iii) the normative "economic" case for government services and regulation (externalities and public goods problems). The aim of that part of the course was to demonstrate how rational choice models (e.g. economic models) can be used to predict (qualitatively) the effects of subsidy and tax programs and to illustrate conceptually how one can use cost-benefit analysis to assess the merits of such programs. Ideal policies would strive to maximize social net benefits, which would require the total benefit and cost functions to be estimated, but which could be done through estimating demand, supply, and external cost or benefit functions. Such cost benefit analysis should be considered to be an applied form of utilitarian ethics.

In part II of the course, we turned to positive explanations for public policies. Public policies are endogenous rather than exogenous variables from the perspective of political economy or public choice. Public politics are consequences of government decisions. The persons holding the positions entitled to make those decisions are no more or less rational than the consumers and firm owners of typical markets. Moreover, they are not necessarily any more idealistic or altruistic than the usual consumers and firms of neoclassical economics are. (iv) We next explored how rational choice models could be used to analyze electoral politics. (v) That analysis implied that competition between major parties and major candidates tend to converge toward the median voter's ideal policy position, much as market prices tend to converge toward marginal production cost in competitive markets. The median voter model is not a "representative voter" model, rather it is the Nash equilibrium of a contest for votes in mass elections. It is an implication of a pragmatic vote-maximizing competition among candidates/parties and voting decisions by millions of voters.

Just as in the competitive model, there are assumptions that allow that equilibrium to be characterized. The analysis that produced the median voter result assumes a well-informed electorate, the existence of a median ideal point in the distribution of voter ideal points, and significant competition among the parties in the electoral contests of interest. These are similar in spirit to those used to characterize competitive markets. Such models routinely assume well-informed firms and consumers and intense price competition.

We then examined cases in which voters were not well informed. (vi) Rational individuals, perhaps surprisingly, are rarely if ever perfectly informed because being so would not maximize their expected net benefits from gathering and processing information. Information gathering and processing take time and attention. Both time and attention are scarce resources. In many cases, voters would gather and process little or no information about policies, especially those that have little or no obvious effect on their welfare. (vii) "Rational ignorance" creates slack in the electoral model of policy formation. It allows candidates and government officials to take account of the interests of politically active interest groups in policy areas that voters remain completely uninformed about. Candidates need resources to conduct persuasive (informational subsidizing) campaigns and can trade positions on ob-

secure policy matters to such groups in exchange for campaign resources. (viii) Competition between interest groups for prizes may consume considerable resources and insofar as the policies desired (entry barriers and the like) reduce competition in markets and thereby reduce the extent to which potential gains to trade are realized. The resources invested seeking such rents are wasted as far as welfare economics is concerned. (They are referred to as rent seeking losses.)

(ix) The effects of interest groups efforts provide an explanation for policies that run counter to the interests of moderate voters such as sugar trade barriers that double the price of sugar in the US relative to most other countries. Other examples include various tax loopholes and targeted subsidies the benefit relatively small interest groups. (x) These rent-seeking effects are moderated to some extent by the Condorcet Jury Theorem which implies that if voters have the minimum information required to make unbiased estimates, the median voter's preferred policies will tend to maximize his or her interests—including with respect to the regulation of corruption. In addition, there are occasional "fire alarms" as scandalous behavior is discovered and reported by mass media. The latter induces those elected to high office to rein in their deals with interest groups to avoid being "caught" in scandalous behavior. Free riding by members of interest groups also tends to rein in interest group effects, but for different reasons. Some groups are too poorly organized to affect policies.

Having worked through some basic models of policy formation in democratic states, we next developed rational choice models of policy formation in authoritarian states. (xi) We found that secure "rational" dictators (with interests in personal consumption) tend to be net tax revenue maximizers. They provide government services to their citizens, but only those that tend to increase the tax base, and only up to the point where their marginal costs equal the marginal increase in revenues associated with expanding the tax base. (xii) This "encompassing" interest, is reduced by the uncertainty of the period in which they hold authority. The less likely they are to be in office for "T" years, the less they will invest in services that will increase tax revenue only after T years—as might be said of public education and many infrastructure projects. (xiii) We also briefly explored cases in which authoritarian rulers cannot single handedly make public policies. For example, European kings had to cope with the veto power of late Medieval parliaments over new taxes. That veto power tends to moderate policies and also provide a mechanism (constitutional exchange) through which such systems might liberalize their policies and political institutions through time. (xiv) The possibility of revolt was ignored in part for Olsonian reasons (free riding among potential revolutionaries), but also because of the assumption that security forces were reasonably efficient.

All of the models of policy formation to this point assume that the governments operate as if they are on an isolated island and so faced no competition from other governments for resources or citizens. Our models did not take account of possibilities for out-migration or "yard stick" competition that allows voters/citizens to evaluate the performance of their governments relative to others.

We now take account of competition among governments, although we only have time for just one instance of such competition, namely that which takes place within polycentric systems of government—as with federal or

confederal systems of governance.

II. Fiscal Federalism and Polycentric Governance

We now turn to settings in which governments are not monolithic organizations but include many more or less independent centers of policy-making authority that interact with each other in various ways. Such governments are “polycentric” in that policies emerge from multiple centers of policy making authority. Public policies within such systems are not simply the choices of a single elected person or parliament or some combination of the two. Rather a wide variety of policies are chosen within the same polity by various “sub governments,” as with the state, county, and local governments of the United States. Federal governments are an important special case of polycentric governance and the one that is focused on in this lecture.¹

Federal governments include a hierarchy of more or less independent governments. The central government generally determines the authority of the states in such cases, although there is a good deal of bargaining back and forth over that authority through time and thus the distribution of authority is not the same through time. Confederal systems, in contrast, delegate authority to the central government—which is to say the “member states” are supreme rather than the central government. Again, bargaining between the member states and the central authority takes place through time and again the balance of authority may change through time (For models and examples of this process see, for example, Congleton, Kyriacou, and Bacaria (2003) or Blankart (2000).)

Such hierarchical “polycentric” policy making structures are common around the world, even within countries that do not regard themselves to be federal or confederal in nature. Even within unitary states such as Sweden and Denmark there are independently elected regional and local governments with significant policy making authority. Some polycentric systems are more decentralized than others, which is to say some local governments have more control over taxes, expenditures, and regulation than others. Local governments may have a good deal of discretion over taxes, expenditures and local regulations, or little or no discretion. Some local governments are more independently elected than others. In some countries local officials are elected by town residents in others some or all local officials are appointed by higher levels of government. The latter gives higher levels of government direct influence over local policy making. Such systems resemble a bureaucracy more than a federal system of policy making.

Given a division of authority among levels of governments, there are a variety of ways in which the gov-

¹ It bears noting that the use of federalism by economists differs from that of political scientists to some extent. Each refers to the multiplicity of more or less independent policy making centers or governments, but political scientists tend to focus on the makeup of the legislature/parliament of the central government. If it has a chamber that represents state or provincial interests then it is a federal system. If not, then it is not. In this case, Germany and Spain are federal systems, but Sweden is not—even though its local governments are independently elected and have greater control over policy than the local governments of Spain and Germany. Economists focus on the degree of decentralization—the more decentralized a system is, the more “federal” it is. What matters for the purposes of this course is the existence of many independent levels of government that have significant tax, regulation, or expenditure discretion. The greater is the policy domain in which “lower” governments have discretion, the more “decentralized” a polycentric

ernments of a particular level interact with one another. There is, for example, competition for tax base and citizenry. There is also competition for intergovernmental grants from higher levels of government. The ability of residents and firms to move from the jurisdiction of one local government to another tends to reward useful policy innovations and punish policy mistakes.

The wants of voters are in a sense unbounded, but their satisfaction is limited by the resources available to them and their governments. There is always something else that could be done to advance voter interests if a government had more resources, just as there is something else that could be purchased if a consumer had more income. A government that is able to attract resources to its territory can easily expand its services, those that lose resources cannot. Scarce resources imply that there are tradeoffs among public services and between governmental and private services that must be accounted for. In democracies, the “best” tradeoff (ideal policy) is determined by voters—or more specifically the median voter.

The main implication of decentralized forms of fiscal federalism is that governmental services tend to differ among states and towns. They do so in part because of electoral pressures—which is to say because of local differences in preferences for government services. They also do so because of differences in the effectiveness and types of local interest groups. They also do so because of differences in the extent of competition among governments for residents and tax base in a given region. They also vary to some extent because of differences in information, talent, and policy innovations among towns, cities and states. Competition, innovation, and the ability to tailor services to fit local preferences are three advantages of “decentralization.” However, the benefits of decentralization come at a price. There are also problems associated with decentralization. Some of these arise because not all forms of competition are productive. For example, competition is the main source of losses from rent seeking. There are also a variety of policy externalities and prisoner-dilemma-like results that can be associated with independent centers of authority.

It is the consequences of decentralization (the policies adopted) rather than their normative properties that are the main focus of this lecture—although some normative issues are also discussed.

The classics of the literature on fiscal federalism are Tiebout, 1956, and Oates, 1972, who pioneered the economic analysis of the public finance implications of intergovernmental relationships. Additional pieces of general interest include:

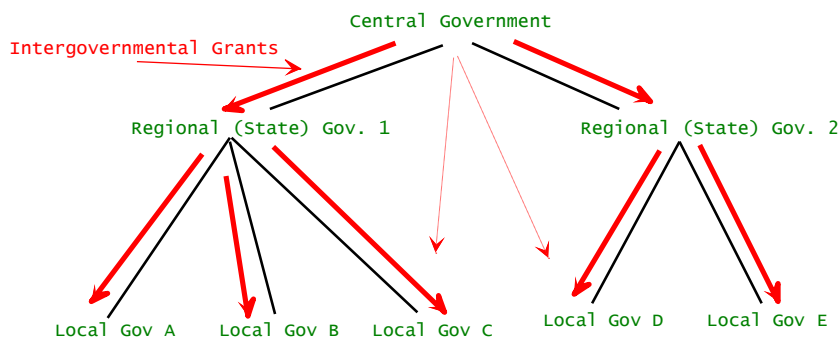
- a. Inman and Rubinfeld (1997) provide a nice survey of issues in the first 40 years after Tiebout’s innovative paper.
- b. Qian and Weingast (1997) elaborate the role that federalism can play in solving various commitment and information problems.
- c. Molander (2004) provides a more international overview of fiscal federalism in unitary states.
- d. Mueller (2006) and Kantorowicz (2019) provide more recent overviews of fiscal federalism.

III. Public Finance in Federal Systems

We begin our analysis of federal systems of government with an analysis of taxes and subsidies within such systems. The analysis thus parallels that of part I of the course except for the fact that the subsidies are often for different levels of governments and/or the services provided rather than provided directly to individuals.

Federal governments are hierarchical in several senses. Local governments are constrained in what they can do by state laws. State governments are, in turn, constrained in what they can do by national laws. In addition to restricting laws and mandates, there are often subsidies from "upper" levels of governments to "lower" levels of governments that create new opportunities for local governments to provide services without having to raise local taxes. In the diagram above, the red arrows can be thought of as "mandates" placed on local governments and/or as grants (subsidies, often conditional) paid to local governments.

Figure 1: Levels of Government



Relationships among governments in a fiscally federal system can be complex, but there are essentially three fundamental relationships of interest for the purposes of Public Finance. First, there are the fiscal relationships. Normally higher levels of governments make grants (provide subsidies) to lower levels of governments. One important strand of state and local public finance explores the effects of "intergovernmental grants" on state and local policy choices. Second, there are political effects that "states" have on higher levels of government, insofar as state voters and their representatives have "regional" rather than national interests. The existence of intergovernmental grants and targeted grants tend to induce local and state governments to lobby in favor of expanding such programs and to secure as much of the federal governments allocation of its budgets to such grants as possible. One possible result is "Pork barrel politics" a.k.a. the "fiscal commons problem" (discussed below). Third, there are relationships between governments at the same "level" within the hierarchy of governments. To the extent that "tax base" is mobile across local governmental jurisdictions, **intergovernmental competition** over taxes, expenditures, and regulation tends to emerge. For example, if community A has higher taxes than Community C, people

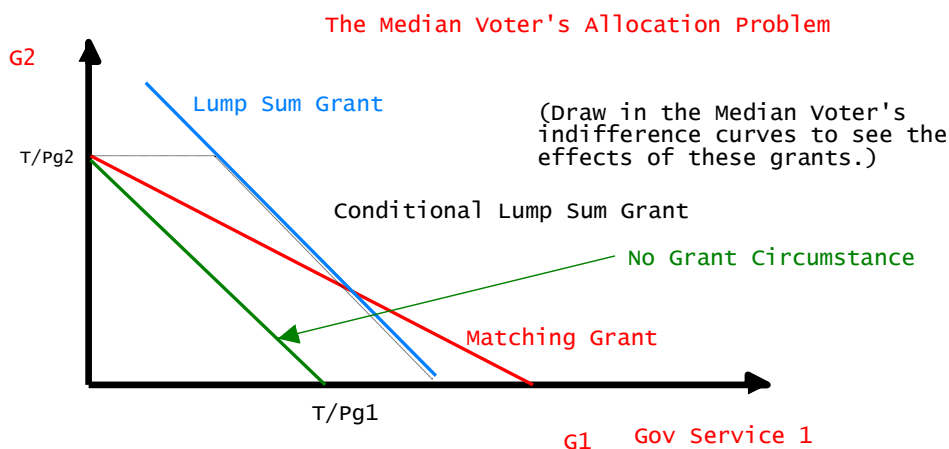
from community A will tend to move to community C--unless the services in community B are noticeably better than those in community C.

The economics and politics of these fiscal relationships not only allow us to understand federal governments operate but also help us analyze how federal systems should be designed if one wants to maximize the social net benefits from federal systems.

IV. The Effects of Intergovernmental Grants

Modeling the effects of intergovernmental grants requires a model of local governmental decision making. Within democracies, these can be based on the median voter model, perhaps augmented by the effects of interest groups and intergovernmental competition (see below). The median voter model (and median legislator model and governor models) allow the decisions of government to be modeled as if they were made by a single person. This, in turn, allows us to use diagrams from microeconomics to represent the effects of conditional and unconditional grants on local governments.

The median voter and intergovernmental grants. As was the case for ordinary subsidies, intergovernmental grants can be "lump sum" or "marginal" (block grants or matching grants), and they can be conditional or unconditional (buy two get one free). As true of ordinary subsidies, grants may also be conditional or not. Both conditional and unconditional matching grants affect the relative prices that voters confront for alternative government services. Both conditional and unconditional block grants have income effects but not relative price effects among government services. Both conditional and unconditional matching grants have both income and relative price effects. All such grants tend to reduce the cost of government services for residents and thereby increase a voter's "ideal" service levels—if one ignores the federal taxes used to finance those grants.



How intergovernmental grants changes a voter's "public budget constraint" is illustrated above. How such grants affect public policy require adding the indifference curves of the "pivotal policy maker." For most of our

purpose the relevant indifference curves are those of the median voter.² (Add the median voter's indifference curves to diagrams like that above to see how different kinds of grants tend to affect the level and distribution of government services within a community.) As in part I of the course, diagrams can also be constructed to show the superiority (larger net benefits or utility gains) of block grants over matching fund grants—unless there are externality problems that are being addressed.

For the most part, the empirical evidence on the effects of grants is consistent with such one-person (median voter) models of government decision making. There is however one puzzle, often termed the "fly paper effect." Block grants, which resemble lump sum grants, increase government services by more than one would expect based on standard consumer models. The grants "stick" to the programs they are aimed at, rather than inducing tax reductions that the median voter model seems to predict. That is to say, in a community that spends 10% of its income on government services why aren't 90% of block grants used to reduce taxes?

There are several theories that can be used to explain the flypaper effect, but all require more complex models of governance than our simple median voter model, and few are very convincing. However, the empirical results on flypaper effects is also less than fully convincing. Not all studies find such an effect.

V. The Fiscal Commons Problem (also known as the Pork Barrel Dilemma)

The existence of intergovernmental grants creates incentives for state and local governments (and state representatives and senators) to lobby for programs that benefit their own states—even if they do not benefit the nation as a whole. The federal government funds specific highway and water projects that benefit only a particular city or metropolitan area, but which are paid for by taxes imposed on everyone in the country. Programs that often have regional rather than national benefits include: flood insurance, hurricane relief, ports and harbor spending, railroad and airport subsidies. Many highway and irrigation projects, national parks, and museums also mainly produce local benefits.

Interest groups, state officials, and their elected representatives often press for targeted projects that generate benefits for them that are lower than their own tax costs. Such targeted programs (ear marks or "pork barrel" expenditures) can lead to inefficient policies at the national level, because central government expenditures are normally funded with general revenues, which reduces local costs, but the benefits are mostly realized by persons located near the public service provided or subsidized.

In such cases, the national funding of local projects induces a good deal more lobbying than would occur if the projects were funded at local levels, because local benefits are more likely to exceed local tax costs if other taxpayers are paying most of the cost. Most national funds are raised through broad-based taxes, as with the in-

² Several assumptions are necessary to produce such a diagram. First that there is an ideal budget B^* for the median voter that is not affected by the level of grants and therefore an ideal level of private consumption that is also not affected by the grants. Given these assumptions—more or the other things being equal variety—one can use geometric representation for governmental decisions that are similar to those used in Part I of the course to analyze the

come tax, corporate income tax, and sales (VAT) tax. This implies that the cost of targeted programs are spread over the nation or state as a whole, even if benefits are only locally distributed.

Adopting such targeted programs requires majority support within the central government's legislature. Thus, not every possible project that has local support can be funded. However, it is possible that a majority of voters (or legislators) receives net benefits that are smaller than the costs imposed on the minority opposed to the project or program of interest. It is also possible for majority coalitions to be assembled for a group of earmarks that have benefits that are smaller than their costs for the nation as a whole.

This problem is sometimes called the "fiscal commons" problem or the "pork barrel dilemma." The following game matrix illustrates the essential problem associated with funding local programs from national tax revenues. Consider two programs with negative social net benefits, but majority support from two narrow coalitions. Each project has total costs that exceed its total benefits, but that regional benefits are greater than regional costs. For the purposes of illustration, assume (i) that a regional **highway costs** 10 billion dollars and provides 1 billion dollars of benefits to region A and 6 billion dollars of benefits to region B. (ii) Assume also that a regional **water project costs** 12 billion dollars and generates 8 billion dollars of benefits for region A, but only 2 billion dollars of benefits for region B. If a project is adopted, the costs will be shared by the two regions.

The following game matrix illustrate the dilemma.

the Pork Barrel Dilemma		
Region B	Build Road	Don't Build Road
Region A	A, B	A, B
Build WP	(-2, -3)	(+2, -4)
Don't build WP	(-4, +1)	(0, 0)

The payoffs to the region B and region A coalitions consist of their own narrow benefits from their projects less half of the total cost of the projects adopted. If neither project is built, no benefits and no costs are realized. If just the road is built, then region A gets $(1 - 10/5) = -4$ in net benefits. Region B, on the other hand pays its share of the costs and receives only very small benefits $(6 - 10/2) = +1$. If just the water project is built, then region A gets most of the benefits but pays only half the costs, $(8 - 12/2) = +2$. Region B gets its small benefit at the cost of half of the water project, $(2 - 12/2) = -4$. If both projects are built, Region A gets $(1-4) = -3$ and region B gets $(2 - 4) = -2$ in net benefits.

Each coalition has incentives to press for passage of their project, regardless of what the other coalition does. Notice that the payoffs in this case resemble those of a Prisoner's dilemma game. Each group has a dominant strategy, namely to press for federal support for its project. As a consequence, each project is adopted at the Nash equilibrium of this game. **However, both coalitions would be better off if neither of the projects were actually built!**

The fiscal commons problem arises because of fiscal externalities. One region's centrally funded program

effects of taxes and subsidies on utility maximizing individuals.

impose costs on other regions, who have to pay for those projects even though they receive little if any benefit. This problem can be avoided by (i) making the regions fund their own projects or (ii) by rigorously using cost benefit analysis. (Note that neither project would be built under these rules.) (Puzzle: Are there other solutions that would also avoid the PD outcome while allowing projects with positive net benefits to be built? For example, suppose that both projects which are excludable local public goods had to be financed with tolls and other user fees? Would this solve the problem?)

VI. Overlapping Tax Bases: Another Fiscal Commons Problem

In cases in which government fiscal authority is decentralized, there can be competition between levels of governments, and in some cases governments at the same level, over a tax base. The problem of over using a given tax base is a fiscal externality problem is similar to the fiscal commons problem for expenditures outlined above, but in this case generates over taxation rather than over supply of services, and it is the result of separate decisionmaking rather than lobbying and cost sharing.

The common tax base problem is one possible rational choice explanation for taxation beyond the level that maximizes revenue in a Laffer Curve diagram (Flowers, 1988). Consider the case in which excise taxes are imposed by two tax revenue maximizing governments on the same product or service market, as with gasoline taxes, taxes on cell phones, and income taxes.

Suppose that the demand curve for this market is: $Q^D = a - bP$ and the supply curve is $Q^S = cP$, with $Q^D(P^*) = Q^S(P^*)$ in the pretax equilibrium. In the absence of an excise tax, the market equilibrium would have been:

$$P^* = a/(b+c) \text{ and } Q^* = cP^* = ca/(b+c)$$

In the case in which an excise tax of amount t is imposed, the condition for market clearing prices is $Q^D(P_c^*) = Q^S(P_c^* - t)$ and the consumer's price, output, and tax revenue is:

$$P_c^* = (a+ct)/(b+c) ; Q^* = (a-bt)(c)/(b+c) ; R = tQ^* = (at-bt^2)(c)/(b+c)$$

Note that prices are higher for consumers and market output is lower. (Students should work this linear taxation problem out as an exercise.) (Hint: note that $Q^* = cP_c - ct = c(a+ct)/(b+c) - ct = [ca + c^2t - bct - c^2t]/(b+c)$)

In contrast, a tax revenue maximizing government (leviathan) will set the tax rate to maximize revenue (at the top of the Laffer curve). Given $R = tQ^* = (at-bt^2)(c)/(b+c)$, the revenue maximizing tax can be found by differentiating R with respect to t and setting the result equal to zero:

$$t^* = a/2b$$

$$\text{which implies that } Q^* = (1/2)(ca/(b+c))$$

Market output under leviathan taxation is exactly half the untaxed market quantity. (Puzzle, do we often observe such taxation? Explain why or why not?)

Now suppose that the two taxes are imposed by independent revenue maximizing governments, in which case $t = t_1 + t_2$ and tax revenue for a single government is $t_i Q^*$ (where Q^* can be written as above).

For government 1 this is simply

$$R = t_1 Q^* = t_1 (a - bt)(c)/(b+c) = (a t_1 - bt_1^2 - bt_1 t_2)(c)/(b+c)$$

Differentiating with respect to t_1 , setting the result equal to zero, and solving for t_1^* , produces the best reply function for government 1:

$$t_1^* = (a - bt_2)/2b$$

A similar function can be derived for the second government: $t_2^* = (a - bt_1)/2b$

At the Nash equilibrium, both governments will be on their best reply functions. Solving, allows the Nash equilibrium taxes to be characterized:

$$t_1^{**} = a/3b$$

This implies a combined tax of $t = a/3b + a/3 = 2a/3b$ at the Nash equilibrium. Note that this is **higher than the revenue maximizing tax** found for leviathan, $(2/3)(a/b) > (1/2)(a/b)$.

(Puzzle: **work this duopoly taxation problem** out as an exercise. What happens if the number of governments is N rather than 2?)

VII. Intergovernmental Competition: the Tiebout Model

Charles **Tiebout** (1954) pointed out that intergovernmental competition between local governments can be very similar to competition between firms in competitive markets. That is to say, intergovernmental competition can generate patterns of local public services and taxes that are Pareto efficient. Tiebout uses migration and changes in local tax bases to characterize a **perfectly competitive** version of intergovernmental competition at state and local levels. He assumes that moving from one community to another is costless and motivated entirely by differences in local public services and taxes. Tiebout also assumes that competition for residents produces a wide range of fiscal packages to choose from.

Given these assumptions, "tax and service competition" are very similar to "price and quality competition" in private competitive markets. In the limit, "voting with one's feet" produces a competitive equilibrium among communities in which:

- a. Each community provides its bundle of public services at least cost.
 - b. Every community is ideally sized to produce its bundle of services.
 - c. Each community's residents are "homogeneous" in their demand for local public services.
 - d. Each voter-resident pays the marginal cost of his own services.
- iii. Such tax and service combinations meet the Lindahl conditions for efficient provision of public services (as well as the Samuelsonian ones).

Note that this process does not require an effective political system to achieve Pareto efficient results, only very mobile tax payers who can take their part of the tax base with them. Competition among leviathan governments are sufficient to generate this result as long as there are no barriers that prevent one from moving among communities.

In order to tax mobile resources, communities (towns, states, and countries) have to provide services commensurate with their tax costs. Otherwise "public consumers" will **vote with their feet** and move to other places that provide better value for their tax dollars (taking "their tax bases" with them).

Tiebout's model provides one of the strongest arguments in support of decentralized governance. Decentralizing the provision of local services potentially allows voters to get just what they want from government--no more and no less.

Although Tiebout may be a reasonable first approximation for competition between local governments (and condo associations) within a metropolitan area, clearly **there are limits to its applicability**--just as there are limits to the applicability of his theory of perfect competition in ordinary markets. For example, the cost of moving between governments is not trivial, and tends to vary with the level of government. It is easier to move from one condo association to another in the same town than it is to move between towns. It is easier to move between towns than among states. And it is easier to move among states than among countries. This implies that mobility is a more effective "check" on local government policies than on national government policies—although there are effects on national governments.

A second problem is that a large number of persons are moving for other reasons. A good deal of the moving that takes place is because of economics (jobs) rather than politics, and so the extent of competition for tax base may be less direct and so more difficult to assess than it would be if policies directly induced people to move from one community to another. When one arrives at one's new location, one may choose among communities within commuting distance, but the number of alternatives tends to be much smaller than required for a full Tiebout equilibrium.

A third factor that limits Tiebout competition is **economies of scale** or networks that reduce the number of competing "town-firms" that can be sustained in a "Tiebout world." The full Tiebout equilibrium requires one or more town with every possible configuration of local public services and taxes to choose among. As the number of alternatives fall, there is still pressure on towns and cities to accommodate their current and potential residents, but communities will no longer exhibit homogeneous demands for public services and their taxes will no longer resemble Lindahl taxes.

The effect of economies of scale parallel those in the microeconomic analysis of perfect competition vs. monopolistic competition, oligopoly, and monopoly. In such cases, local politics will again be an important determinant of public policies and citizen welfare.

A fourth factor that limits the efficiency effects of Tiebout competition is the existence of intergovernmental **externalities**—**externalities generated by local public policies**. Such public policies may imply that some services are under provided locally (services that generate positive externalities for nearby communities) and others are over provided (services that produce negative externalities for nearby communities). It is such externalities and associated economies of scale that Oates uses to justify a series of governments with different sized jurisdic-

tions that provide particular types of services or address different types of externality problems. (See Oates's (1972) decentralization theorem or Frey (1999).) The logic closely parallels our earlier analysis of externalities between individuals and/or firms. NIMBY problems are fairly commonplace among governments.

Solving externality and public goods problems may require "Coasian contracts" among communities or interventions by other levels of government.

If Tiebout worked perfectly and there were not externality or economy of scale problems, the ideal federal system would be highly competitive and be composed of a large number of local governments. The central government would be largely tasked with assuring citizen mobility among communities and the provision of nationwide public services like national defense.

VIII. The Normative Logic and Politics for Assigning Fiscal Responsibilities to Different Levels of Government

The Tiebout case for decentralization suggests that services should be provided by government's with the smallest jurisdictions (territories) sufficient to realize all economies of scale for the service of interest. Oates (1972) develops this point more formally with his decentralization theorem. The European Union adopts this idea with its "subsidiarity principle."

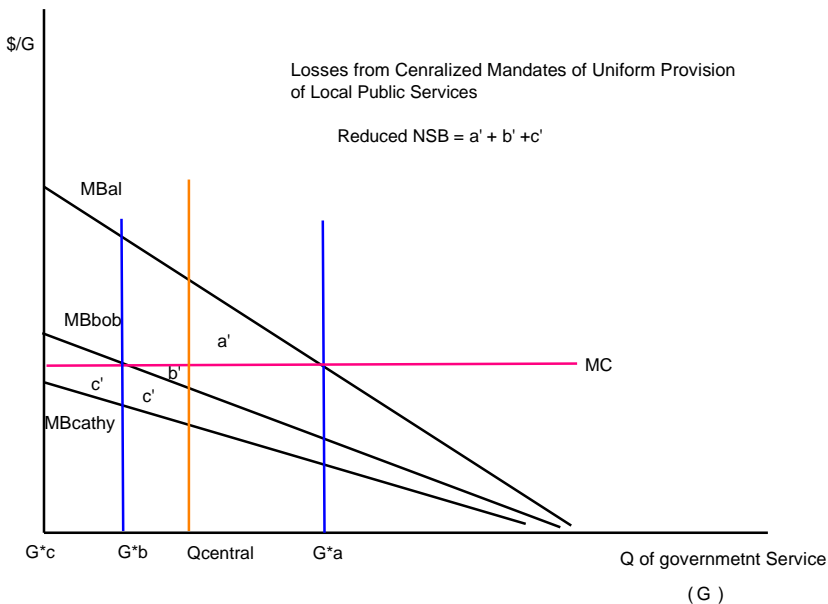
The optimal size of governmental that provide particular services can be analyzed by studying economies of scale in producing the services of interest. Communities, from this perspective, should be of sufficient size to realize all economies of scale. Insofar as economies of scale vary among public services, the assignment of services to levels of government would be determined by the economies of producing and distributing them. (This perspective is largely a-historical and does not consider how policy making authority emerges or is transferred in the real world, but is a typical "magic wand" exercise.)

Services with global economies of scale should be provided by the national government (national defense, macroeconomic policy, redistribution). Services with that require relatively large service areas or numbers of customers should be produced by state governments. (regional highways, higher education, etc.) And services that can be effectively provided in relatively small service areas or for relatively small customer bases should be provided by local governments. (police and fire protection, elementary education, local roads, sanitation services etc.) Note that the Oates' simple production-based arguments imply that particular services should be provided by only a single level of government.

Oates (1972) reaches a similar conclusion with respect to public services that affect persons in other communities. He suggests that if policy or service X has an effect on region Z, then the whole region should be managed by one government. For example, insofar as the advantages of free trade zones increase with size, so the national government should have responsibility for maintaining free trade within the nation. Large--but not national--externality problems, such as lake or river water pollution can be best addressed by state government or regional consortiums of states. (Ostrom 1990 book on managing commons problems reaches similar conclusions.)

Although a good place to start, there are a number of weaknesses associated with the Oates production cost line of argument—which is by now the mainstream perspective of many city planners. (i) Production-based economic arguments neglect the advantages of variation in the services provided. (ii) There are political costs associated with merging quite different areas into a single metropolitan area. The community becomes more heterogeneous and each voter has a smaller effect on service levels through his locational choice and voting behavior. (Some "community mergers" may be simply efforts to reduce competition so that policy makers have more discretion to adopt the policies that they like—whether they are good for their citizens or not.) (iii) Moreover, carefully assigning regulatory and production responsibilities to specific levels of government is only one method of addressing the externality problems. Other solutions also exist, as noted in our previous analysis of solutions to externality problems. One could also use mandates and Pigovian subsidies and taxes (conditional grants) to address intergovernmental externality and public goods problems. The federal structure can also be left a bit open ended so that communities and states can form "consortiums" or "regional authorities" to address regional interests. (Treaties or Coasian Contracts)

The diagram below illustrates why decentralization is generally better than centralization in cases in which there are diminishing or constant returns to scale. Suppose that there are three governments each with a uniform citizenry—more or less as predicted by the Tiebout model. If left to their own devices they would produce three different service levels (0 , G_b^* and G_a^*). Now suppose that central government provides a single uniform service level, possibly that which maximizes social net benefits or median voter benefits ($Q_{central}$) and for simplicity that each town pays for the services it receives through a central tax system—or equivalently the service level may be thought of as a mandate by the central government imposed on the local governments.



Note that the average resident of all three communities is worse off. The average resident of community c

loses $c' + b'$, the average member of community B loses b' and the average member of community A loses a' . All three would benefit from decentralization—as implied by Oate's *decentralization theorem*.

In general, the social net benefit maximizing assignment of authority for providing services to specific levels of government and the optimal size of those governments depend on the extent of the political competition, differences among communities in their tastes for government services, the extent of intercommunity externalities, and economies of scale for the service of interest.

IX. Externalities among Democratic Governments: International Public Goods and Externalities

The logic of policy externalities also applies to international politics as well, although there is no central “world government” that can wave the “magic wand” and create an ideal worldwide federal system. For example, there are many cases in which a national government cannot adopt Pareto efficient regulations or service levels—even if it wants to—because part of the problem is generated by persons or companies outside their jurisdiction. In such cases, regulation itself can be an externality generating activity. That is to say regulations in one nation state may impose benefits or costs on resident of other adjacent countries. Consequently, there may be unrealized gains to trade between governments regarding appropriate regulation.

There are two general methods for dealing with such externality problems. First, the affected parties may attempt to negotiate a "Coasian" contract that "internalizes" the externality. That is to say, the governments may negotiate a treaty where the countries "trade regulations." For example, in the various international environmental treaties, countries agree to strengthen various environmental regulations to deal with an international externality. Within polycentric systems of governments, similar methods are sometimes used by state and local governments who may negotiate with each other and sign agreements to coordinate policies or to create a "special use district" of the same "size" as the externality. (Examples include airport and transit authorities (NY, NJ and CN) and various international water management agencies (among for example US and Canada, Sweden and Denmark), and several multinational efforts to regulate emissions of various effluents.

VIII. Asymmetric Federalism

The Tiebout model is a useful characterization of many locational decisions in which production economies and competition may be presumed to play a significant part in the decisions reached. However, the assumption of uniform jurisdictional size and power is not always the correct assumption for analyzing county, city, and state competition. There are often significant differences in physical size, population, income, and political representation for state and local governments.

In the United States, California is physically the third largest state with 11% of the citizens, whereas Wyoming, the sixth largest state includes less than 1% of the U. S. population. Requejo (1996) notes that New South Wales includes 35% of the population of Australia, whereas Tasmania includes less than 3%. North Rhine Westfalia includes some 21% of the population of Germany, whereas Bremen includes less than 1% of the population. Uttar Pradesh includes 16% of the population of India, whereas Sikkim includes less than a twentieth of one per-

cent.

That population and population densities vary so widely implies that demands for local services also tend to vary widely among these regional governments and, moreover, implies that **political power** within their respective democratic central governments is also likely to vary widely by state, lander, and province.

That regional interests and bargaining power vary is important for fiscal federalism, because national constitutions do not fully specify the degree of decentralization within a nation at any single point in time or through time. Rather than being determined by some imaginary hopefully benevolent central planner, the degree of decentralization is generated by a series of political bargains within and between national and regional legislatures in which both the details of policy and the powers to make policies are negotiated and renegotiated through time. Thus, differences in the bargaining power and interests among participating governments is likely to affect the distribution of fiscal and regulatory authority adopted.

As a consequence of such bargaining, a good deal of asymmetry is observed within federal and confederal systems. For example, in Spain, Navarra and the Basque communities have formal tax and expenditure powers beyond those of the other "autonomous communities." Galicia and Catalonia have special authority over education, language, and culture. In Canada, Quebec has special powers to encourage the use of the French language and protect the French-Canadian culture. In the United Kingdom, the Scottish Parliament has significantly more policy-making authority than the Welsh Parliament. In the United States, Indian reservations have their own specific taxing and regulatory authority that differ from those of ordinary state governments. California, the most populous state, has unique powers of environmental regulation. In China, Hong Kong has been granted unique legal and political institutions: "one country, two systems."

Large cities in many countries often have powers of taxation and regulation that smaller cities lack or rarely use. New York City and Washington D. C. have their own income and sales taxes. Asymmetries are also common among the members of large international organizations. In the European Union, some members retain more autonomy than others inasmuch as they have opted out of or delayed membership in the menu of treaties that define the responsibilities of affiliated countries. The responsibilities of members of the United Nations with respect to military armaments, human rights, and environmental regulations are similarly defined through a series of treaties with quite different signatories. Different nations formally retain different degrees of autonomy both within and without these very decentralized confederations.

Service differences across communities may thus emerge in both decentralized and unified states, because communities may have unequal influence over the decisions of the central government because of differences in population, political heterogeneity, history, or size. For example, equal representation by population often implies unequal representation by regions or economic interests, and vice versa. In the US, some states have far more influence in the House than in the Senate, and these differences have been shown to influence the pattern of inter-governmental grants. Unequal influence within the central government implies that central government policies

will often favor some regions or communities over others.

Asymmetric federalism exists whenever governments at the same level of geographic responsibility—towns, counties, cities, or states—have different regulatory and fiscal powers. Such differences in policy authorities create a "supply-side" source of variation in government services, regulations, and taxes in addition to the standard demand-side variation in local demand stressed in models of local fiscal competition. For example, consider the case in which only a single city is granted authority to use eminent domain to produce "right of ways" for light rail transport services.

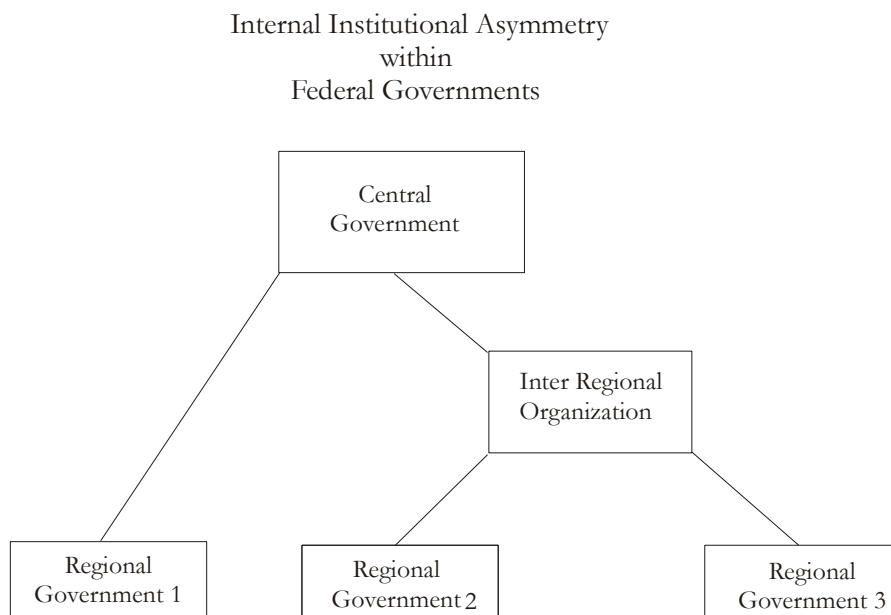
Suppose that the favored city sells or rents the right of ways to private railroad companies. This provides the city with a unique source of revenue and also a unique economic advantage. Both effects allow the more autonomous government to provide a more attractive fiscal and economic environment for its residents than possible for otherwise similar governments. Light rail has the effect of reducing transport costs to city apartments, shops, and factories that operate in an otherwise competitive market. Individuals prefer to work for firms that are close to the rail lines, and consumers prefer to live and shop at stores near the rail lines—other things being equal—because the net of transport real wages are higher and net of transport prices are lower along the rail lines. This increases net benefits and profits for consumers and firms located near the rail lines. Moreover, rental revenue from the right of ways allows the favored city to reduce other tax rates within the city. Given these economic advantages, persons and firms from within the favored city and throughout the country of interest will attempt to relocate near to the rail lines of the favored city.

In principle, the favored city continues expanding its rail network and attracting tax base up to the point where the marginal increase in revenue and tax base generated by an extra kilometer of new right of way equals the marginal cost of the right of way less any loss in tax base generated by investor fears concerning the use of eminent domain—or until no private firm is willing to expand its rail network because traffic densities are too low to recover its costs. The latter, of course, expands outward from the city center as immigration of capital and labor occurs. Although there is a limit to the urban growth encouraged by this city's unique power of eminent domain, the favored city becomes an important commercial and cultural center well before this limit is reached. Its internal market and population expands. Specialization increases; and wages and profits increase as productivity rise. Other cities that have to rely entirely upon private provision of rail services falter, because holdout problems make assembling long right of ways very difficult—indeed intractable—for private firms acting alone. Thus, the more autonomous city grows and prospers—while other similar cities that would have copied the strategy of the favored city are legally unable to do so.

Other local fiscal and regulatory "privileges" can have similar effects, insofar as the additional authority allows favored governments to provide a more attractive fiscal package than legally possible for other similar governments.

Asymmetric forms of federalism may emerge in three ways. Specific asymmetries may be created by a nation’s constitution by assigning different areas of “competency” (policy authority) to various regions of the country. Alternatively, various regional governments may negotiate directly or indirectly (through their elected representatives) with the central authority for additional authority in some areas—possibly in exchange for taking up additional expenses that the federal government has in interest in in others. Another possibility is that regional governments may bargain with each other to create new “special service districts” that are not mentioned specifically in constitutional documents, nor the statute laws of the central governments. New organizations—eg levels of government—may be formed in effect via “treaties” among state or urban governments to share the expense of major public services such as airport or trash disposal facilities or to coordinate environmental regulations, etc. The new organizations created to manage such fiscal and policy agreements are essentially new levels of government with a new assignment of policy making authority. (Similar arrangements are often made in international treaties that create organization to monitor and suggest policies to member states.)

These possibilities imply a domain of federal structures that is more complex than normally analyzed by economists. Many of the arrangements that emerge from such bargaining processes produce asymmetric assignments of policy making authority—which is to say asymmetric forms of fiscal federalism. The figure below illustrates one such internal structure. If we interpret the interregional government as another level of centralized control, it is clear that local government 1 retains more autonomy than local governments 2 and 3, because it is not bound by the decisions of the regional governmental organization.



Conclusions: Note that almost all variations of polycentric governance implies that the details of constitutional designs “matter,” which is to say they affect public policies. The last full lecture of the semester provide an overview of other features of constitutional design that also affect public policies.