Improving Intergovernmental Finance: A Message From the Northland

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Despite its notoriously chilly winters, Minnesota is a very friendly state. At least, it seems so from the way the state's government treats its local governments. All 50 U.S. states have some sort of *intergovernmental finance system*—programs through which the state provides funds and other assistance to its counties, cities, and school districts. But Minnesota's system is exceptional. This state offers its local governments just about every type of finance program available elsewhere, including payments to governments that must be spent on particular services, payments that can be spent on anything, and payments to local governments' taxpayers rather than to the governments. Though Minnesota's system is arguably the most complex in the nation, that doesn't seem to deter its local governments. According to a recent study, in only four other states are local governments "more dependent on state aids" (Bell 1986, p. 335).

This generous complexity makes Minnesota a good state to use to illustrate a critical study of intergovernmental finance systems. With intermittent references to Minnesota, I here describe what seem to be the objectives and forms of such systems, evaluate how successful they likely are, and propose a specific change that could make them more successful. My general message to all states is to simplify—and be friendlier to your ultimate constituents. For Minnesota illustrates that, in general, these systems would be more effective if states paid less to their local governments and more to their taxpayers.

Intergovernmental Finance: Why and How?

A Tradeoff . . .

Traditionally, economists evaluate the actions of state governments, like those of all other public policymaking bodies, in accord with some selected mix of two conflicting objectives.

One is *economic efficiency*. This notion is very different from the common idea of efficiency as getting the biggest bang for the buck (cost effectiveness). It involves instead acting in ways that affect people as positively as possible.

The two basic actions of government—taxing and spending—affect people both directly and indirectly. Their direct effects are easily visible; for example, someone pays a large tax bill and soon thereafter is treated by a public hospital for cardiac arrest. But their indirect effects are perhaps more far-reaching. These include changes in the amounts people spend, save, and invest, which then change the amount of income they earn. The sum of direct and indirect effects on each person determines whether or not that person is better or worse off as a result of some tax and spending policy. Policymakers usually propose new policies that will make some people better off and others worse off; that is, there are both winners and losers. If that is the best they can do—there is no other policy that will make no one a loser—the proposed policy is considered efficient. Thus, inefficient policies are those which could be changed some way to make some people better off and no one worse off. A policy is said to be more efficient

than another when some people prefer the former to the latter and no one prefers the latter. Adoption of the former policy is then said to increase efficiency.

The other traditional objective of public policies is *equity*. This is the common concept of fairness or justice, but in order to apply that to government actions, it has been refined into two operating concepts. One is known as *vertical equity*, the proposition that taxes should be directly related to the taxpayer's ability to pay, or more simply, those who have more should pay more. With the ability to pay measured by personal income or wealth or both, vertical equity is often equated with the adoption of progressive taxes, or a system in which the tax burden, expressed as a percentage of the ability to pay, rises with that ability. Decreased reliance on the opposite type of system, regressive taxes, has also been equated with vertical equity. However, note that this equating of vertical equity and progressivity may be somewhat arbitrary and, indeed, is not universally accepted. After all, mildly regressive taxes can still require a wealthy taxpayer to make larger tax payments than a less wealthy taxpayer, despite the fact that the former's average tax rate is lower than the latter's. Some argue that this is still vertically equitable. Attempts to justify progressive taxation on economic or philosophical grounds have been only moderately successful (Stiglitz 1987, Young 1987).

The other way of operationally defining equity is to equate it with the proposition that similar taxpayers in similar circumstances should bear the same tax burden, a concept dubbed *horizontal equity*. This, of course, requires decisions about what *similar* means in terms of taxpayers and their circumstances (not to mention their tax burdens). For example, one might argue that two residents of equal ability to pay who receive the same amount of public services in the cities they live in should pay the same amount of city taxes. One would then be arguing that differentiating tax burdens only on the basis of the city lived in is not horizontally equitable.

Unfortunately, attaining efficiency and equity simultaneously is often difficult for public policymakers. That is because few policies affect just one or the other of these objectives or both in the direction desired. Often, policies desirable on equity grounds are inefficient. For example, some have argued that highly progressive personal taxes, while perhaps highly vertically equitable, cause disincentives to work and save. These disincentives may lower the rate of economic growth. If an alternative policy promoting higher economic growth and sharing the wealth could benefit everyone, the highly progressive tax would be inefficient. Similarly, policies that are efficient may be inequitable. Policymakers usually, therefore, trade off some degree of one objective for some degree of the other, to achieve what they consider the best possible, or *optimal*, mix of the two.

To represent tradeoffs involved in trying to simultaneously attain efficiency and equity, economists often use the concept of a social welfare function. To simplify a bit, this concept assumes that policymakers choose their optimal policies as if they weighed individuals' own opinions about the alternatives. But individual opinions are not necessarily assumed to be equally weighted in this process. Policymakers with a strong preference for vertical equity, for example, can be assumed to attach much higher weights to the views of the poor than to those of the rich. By assuming that policymakers act as if they choose a policy which maximizes a social welfare function, economists can capture the notion that policymakers strive to attain their most desired mix of efficiency and equity.[1]

. . . *Across Governmental Boundaries*

One way to strive for that end in a state is for the state's government to help finance its local governments. For if local governments tax and spend independently, and the state intervenes in no other way, the desired mix of efficiency and equity for all the state's residents is not likely to be achieved. This is because, in a decentralized system, the actions of local governments will be chosen with only the welfare of its local residents in mind, but those actions will nevertheless also affect the welfare of others in the state.

To formalize this general problem, Gordon (1983) assumes that each governmental unit in a decentralized public finance system adopts its own tax policy to finance the provision of services collectively consumed by society (public goods).[2] In doing so, each governmental unit adopts a tax/service provision policy as if it maximizes the welfare of only residents of its community. Gordon contrasts the resulting decentralized tax and spending policy with what he calls the "fully coordi-

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[1]Normally, economists recommend avoiding the tradeoff by choosing the most equitable policy among policies that are efficient. However, that is not possible here or wherever there are distorting taxes and constraints requiring that individuals of identical type receive equal utility in equilibrium. Tradeoffs will have to be made.

[2]The viewpoint here is that user fees could and should be used to finance *excludable* public services, like garbage collection (public services that can easily be provided only to those who want to pay for them). Property and other taxes are assumed to be used to finance *nonexcludable* public services, such as public safety (those that if provided to some will unavoidably benefit all).

nated" policy resulting from a central government maximizing the welfare of all communities' residents. This lets Gordon identify seven types of side effects of the taxing and spending of a representative local governmental unit in a decentralized system, side effects that are likely to reduce efficiency and equity in the larger society (Gordon 1983, p. 580):

1. Nonresidents may pay some of the taxes.
2. Nonresidents may receive some of the benefits from public services.
3. Congestion costs faced by nonresidents may change.
4. Tax revenues received in other communities may change due to the spillover of economic activity.
5. Resource costs for public services in other communities may change.
6. Output and factor price changes may favor residents over nonresidents.
7. Distributional effects among nonresidents would be ignored.

These side effects are perhaps best illustrated by a single, albeit somewhat contrived, example. Suppose a city council decides to build a convention center, financed by a tax levied on bar and restaurant sales in the city. Nonresidents who regularly entertain in the city will, indeed, pay this sales tax (Gordon's side effect 1). But the city council argues that this really is not so bad because many of these nonresidents have long benefited, free, from the fine city parks maintained by city residents' taxes (2). After the convention center is built, heavy conventioneer traffic between the airport and the center causes traffic congestion and noise, harming nonresidents as well as residents (3). But some nonresidents who used to travel to the city to entertain now avoid the traffic and the new sales tax by entertaining in their hometowns instead, thus stimulating the growth of commercial tax revenues there (4). Of course, this new wining and dining near home creates a need for a few more police near the busier bistros (5). Back in the city, the convention center creates a heavy demand for low-skilled, part-time workers, slightly driving up wages paid to all similar workers, most of whom live in the city (6). Because nonresident drinkers tend to have lower-than-average incomes, the city sales tax on bars and restaurants regressively taxes nonresidents (7).

In this example, the decentralized decision to adopt a local selective sales tax won't be part of the tax and spending policy that would maximize the welfare of all state residents unless the seven effects on the well-being of nonresidents of the local community sum to zero. This is quite unlikely—here and more generally. So some intergovernmental policy that confronts those side effects may increase aggregate social welfare, that is, will help attain a more desirable mix of efficiency and equity in the society as a whole. In the example, an appropriate intergovernmental policy might be to simply prohibit the adoption of the selective sales tax. But the existence of the intercommunity side effects doesn't justify any arbitrary intergovernmental finance system. To be an improvement, such a system would have to prevent or neutralize the side effects without introducing more severe inefficiencies and inequities of its own.

The Minnesota Sample

In the United States, a variety of intergovernmental finance programs have developed which have the potential to improve efficiency and equity in a state. Minnesota may have adopted them all at some time in the past 20 years, so a thumbnail sketch of its evolution will reveal at least their major forms.

One of the first programs Minnesota adopted (in 1967) is the *homestead credit.* In this program, the state pays local governments a fixed percentage of a homeowner's property tax bill (up to a ceiling amount) before the homeowner receives the bill. The local government then credits the homeowner for this payment, which lowers the amount of the tax bill. This way, the property taxpayer cannot convert the credit into cash. Minnesota has changed, several times, both the percentage of property taxes paid and the ceiling amount. The homestead credit cost the state over $580 million in 1986.

In adopting the homestead credit, Minnesota was substituting the progressive state income tax (the source of the state payments) for what was presumed to be a sharply regressive local property tax, a substitution which the state hoped would improve the vertical equity of its tax system.[3] That such a credit is justified—that local residents wouldn't pay taxes that are vertically equitable statewide without state intervention—is not immediately obvious. For in a decentralized system, local governments would be free to adopt their own

[3]When Minnesota adopted its homestead credit, the property tax was generally believed to be quite regressive. (See, for example, Netzer 1966.) Since then, the degree of regressivity has been questioned on the basis of flaws in empirical studies and the suggestion that the burden may also be partly borne by relatively wealthy owners of nonresidential capital. (See Peterson 1973.)

local taxes, including progressive income taxes. But again, in doing so, each local government would only worry about vertical equity among its own taxpayers, an illustration of Gordon's side effect 7. As such, wealthier taxpayers in a state's wealthier communities would not be tapped to help pay for the services used by less wealthy taxpayers in less wealthy communities. In fact, in a decentralized system, the possibility of being more heavily taxed simply to distribute a community's wealth more equitably might encourage the wealthy to congregate: after all, the vertically equitable tax burden of a wealthy person would no doubt be lighter in a community of wealthy people than in a more diverse community. This movement of the wealthy to such enclaves, in order to minimize their tax burdens, illustrates Gordon's side effect 4. And in some communities with broad wealth distributions, just the fear of this potential tax base loss might impede the implementation of taxes considered vertically equitable.

So, to the extent a state wants to attain a statewide notion of vertical equity, it may need to use a statewide, vertically equitable tax to help finance local government services, as Minnesota has tried to do with its homestead credit. Of course, any state's ability to achieve its desired degree of statewide vertical equity is limited by the ability of wealthier taxpayers to move to other states, another illustration of Gordon's side effect 4. If federal policymakers believe that such movement stymies vertical equity nationally, the federal government could substitute federally raised vertically equitable taxes for state and local taxes.

Since its adoption of the homestead credit, Minnesota has added *other property tax credits* as well. Like the homestead credit, these are paid directly to local governments in an attempt to lower some groups' net payments. Taxpayers cannot convert these into cash, either. The costliest of these other credits is the state school agricultural credit, eligible to farmers and owners of private vacation cabins. It is intended to remedy a perceived inequity that these groups pay more than their fair share of school costs.[4] This credit cost the state over $126 million in 1986.

An even costlier program than property tax credits is Minnesota's *categorical aids* to local education, that is, funds which the state specifies must be spent on education. These effectively began in 1971 when the state started paying a big share of local school district costs. Put very roughly, it does this by paying districts funds intended to bring spending per pupil in the state up to a target level. In 1986, categorical aids to local school districts cost Minnesota over $1.1 billion.

Like its credits, Minnesota's categorical aids were partly motivated by state officials' desire to substitute state taxes for local property taxes, which were thought to be less vertically equitable. These state aids can also be viewed as an attempt to remedy a perceived horizontal inequity of a decentralized system. In that system, the property tax rate necessary to educate identical students would differ across school districts in the state. With the cost of education services identical, districts with low property tax bases would have higher property tax rates than districts with high property tax bases. Identical households would therefore pay more for identical education services in a poorer district than in a wealthier district, an apparent horizontal inequity. Decentralized systems may have no mechanism for remedying this.[5] Minnesota attempts to remedy it by providing more aid to the needier districts so that per-pupil spending across school districts is more equal. While other states have adopted this type of aid, by the way, they have not always done so voluntarily; it has been strongly encouraged by judicial decisions (Long 1973).

Finally, and perhaps most importantly, state aids to education can be viewed as an attempt to remedy inefficiency. Once educated, students are free to move anywhere they want, including outside their school

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[4]This credit is difficult to justify as a remedy for any of Gordon's side effects. The rationale for farm relief in Minnesota was that farmers own large amounts of taxed land, so would pay higher property taxes than the typical resident or small business owner who shares roughly the same personal benefits from local public spending. A similar rationale was used to justify relief for owners of private vacation cabins. But this argument could also be used by owners of large office buildings and factories or by residents without children to justify paying no school taxes, since they also pay disproportionately compared to the direct personal benefits received. The principle of the property tax is that ability to pay is measured, at least in part, by property wealth. Vertical equity requires that those with more wealth pay more tax, in order to finance nonexcludable public services like education. The state's rationale for the state school agricultural credit seems to imply that taxes should not be based on ability to pay, but rather on direct benefits received.

[5]Hamilton (1976) disagrees. He has argued that full market capitalization of the intracommunity differences in residents' property values would prevent the horizontal inequity. To see this, suppose a school district has only one family that lives in a big house; all its other families live in small houses. Someone might argue that the big-house family's schoolchildren are disadvantaged because their school district property tax base is almost wholly made up of low-valued homes, which keeps their school tax rate higher than it would be in a homogeneous district of big houses. But if that were true, why wouldn't the family move to a district filled with big houses? If such moves aren't observed, Hamilton argues, it is probably because the market value of the big house has already fallen to reflect the disadvantage of the higher tax rate; that is, full capitalization has occurred. As such, the owner of the big house was already fully compensated (by a lower home price) for this disadvantage, freeing sufficient resources for the owner to remedy the horizontal inequity. This argument depends on fiscal differences being fully capitalized into home values. While Oates (1969) presents some empirical evidence that local expenditures are capitalized, the issue is not yet settled.

district. People in one district may thus benefit from the presence of people educated in another district, which nevertheless would bear the full cost of education in a decentralized system. This is an illustration of Gordon's side effect 2. In addition, residents without children may have an incentive to move to communities with lower education taxes, thereby becoming nonresidents who can reap the benefits from people educated elsewhere. The resulting movement of tax base from school districts with higher education taxes to those with lower education taxes is an illustration of Gordon's side effect 4. Due to effects 2 and 4, the likely result of decentralization would be underfunding of education in a state, that is, lower school spending statewide than is efficient.

Minnesota also provides categorical aids to county governments for the provision of public health and welfare programs, such as medical assistance and income maintenance for the poor. In 1986, the state paid counties over $600 million to assist programs like these.

The justification for such aids is by now familiar. In a decentralized system, nonpoor taxpayers would have an incentive to move to communities with few poor residents, thus escaping local taxes levied for health and welfare services. In order to prevent this, communities with a mix of nonpoor and poor would probably have to tax and spend less for these services than would result in a fully coordinated system; these services, too, would be underfunded. This is another illustration of Gordon's side effect 4. Some form of state categorical aid for these services might therefore produce a more desirable mix of efficiency and equity than a decentralized system would.

Besides categorical aids for education, public health, and welfare, Minnesota also gives its municipalities (and to a much lesser extent, its counties) *lump-sum appropriations* which can be spent on most anything the local government chooses. The main appropriation, called simply *local government aid,* is a formula-based revenue-sharing system. In 1986, the state paid close to $300 million in lump-sum appropriations.

Minnesota started its local revenue-sharing system in 1971 and since then has changed its formula three times, so the intent of the aid is hard to determine. But two reasons for it are often still given. One is the aforementioned desire to relieve local property taxes, by substituting state revenue sources presumed to be more vertically equitable. The other reason is the desire to help remedy the type of horizontal inequity that seems to justify school aids. Due to the geographic dispersion of property, communities with substantial property wealth can spread the property tax burden more thinly over their residents than other communities can. In a decentralized system, then, residents of different communities may bear different tax burdens, even when their personal income, wealth, and use of public services are the same. This perceived inequity has been invoked to justify local revenue-sharing formulas, which are tailored to remedy such inequity. (But look back at footnote 5 for an alternative view.)

While all the credits and aids detailed so far are paid to local governments, Minnesota has one much smaller program that pays funds directly to people. That program is called the *property tax refund,* and it pays renters and homeowners who have relatively little income and wealth. Payments are determined by a formula based on the person's income and property tax bill. That bill is strongly correlated with the homeowner's property value and is imputed for renters from landlords' tax bills. The property tax refund cost the state around $160 million in 1986. It is clearly yet another attempt to increase vertical equity.

How Well?

A Likely Inefficiency . . .

So, Minnesota's intergovernmental finance system illustrates the variety of state programs used generally to try to improve statewide equity and efficiency. Again, these include categorical aids paid to local governments and earmarked for particular services, lump-sum appropriations and property tax credits paid to local governments but not earmarked, and property tax relief funds paid directly to less wealthy residents. Recall, though, that for such programs to be an improvement over a decentralized system, they must not have more severe side effects of their own. That may not be true for some of these programs.

To begin to see why this is so, imagine you are invited by a stranger to a posh French restaurant for lunch. After being seated at Monsieur Kelly's, the stranger insists on paying for your lunch, no matter what it costs, as long as you agree to pay for the stranger's. Not wanting to go hungry, you agree to the terms and decide to order a more desirable, expensive lunch than you would have otherwise. After all, you reason, the stranger is paying for it and will probably do the same because you are paying for the stranger's lunch. If you don't order a more desirable, expensive lunch, you run the risk that the stranger will anyway, and you will have paid for more than you got. Neither of you wants to run that risk. So the total bill for the two of you exceeds what it would have had you gone Dutch.

A similar result can be expected when hungry governments and their taxpayers are involved. In a state that offers to finance some local government spending, the cost of the services provided primarily for any community's residents is spread among all the state's residents. Thus, each community's residents only pay, through local tax levies, for a small share of their own local government lunch. But at the same time, each community's residents must pay, through state tax levies, for a share of the spending of other local governments on services provided in other communities. With all of a state's local governments striving to serve their communities lunch, this system, just like the stranger's at Monsieur Kelly's, encourages more total spending than would occur otherwise.

Of course, this analogy is not flawless. But you needn't buy the analogy in order to swallow its point. For there is a substantial amount of theoretical and empirical support for the proposition that intergovernmental payments increase total government spending.

The theoretical arguments attribute the increase to two basic phenomena. One is known as the *price* or *matching grant effect.* This simply is that when services cost a local government less (when their "price" drops) because the state pays a part of their cost (de facto provides matching funds), the local government is likely to buy more. (See, for example, Wilde 1971.) The price effect may have occurred, for example, with property tax credits like Minnesota's. In the past, when Minnesota local governments have increased spending for local services, the state has paid part of the extra cost by increasing property tax credit payments to local governments. The rest of the cost has been paid for by local taxpayers. The homestead credit payment for homeowning taxpayers, for instance, has reduced the extra taxes they would otherwise have been charged by more than 50 percent (up to a maximum amount). By reducing the price of additional local services, credits structured in this way theoretically made it easier for local governments to spend more than they would have without the price reduction.

In an attempt to end this price or matching grant effect, Minnesota's legislature recently changed its homestead and agricultural school property tax credits. Again, previously the state agreed to pay a fixed percentage of taxpayers' property tax bills (up to a ceiling amount). This guaranteed that the state would pay a sizable percentage of the property tax increases adopted by local governments. The change converts this open-ended commitment to a closed-ended appropriation.

While the intent of this change is to end the matching grant effect, I doubt it will. Recall that one of the main motivations of the property tax credits is the state's desire to substitute state taxes for what it considers to be very regressive local property taxes. As long as this substitution is a priority, the legislature will respond to a credible threat of statewide local property tax increases by providing more property tax relief. While the relief might be delayed until after the property taxes increase, the result will still likely be higher appropriations for property tax credits to reduce property tax bills—a matching grant effect.

But suppose that property tax credits were structured in another way, so that they don't have a matching grant effect. Then would the credits—or any other intergovernmental finance program without obvious matching features, such as Minnesota's local government aid to municipalities—still result in higher local spending? Some say yes, primarily because of the other basic phenomenon, the intriguing *flypaper effect.* This theory rests on the general notion that, due to imperfections in the political process, local officials can easily spend a larger share of intergovernmental aid than the taxpaying local electorate would like.[6] Officials can do this, the argument goes, because they set the agenda for public discussion about the disposition of revenues in their possession; they can simply structure this agenda to let them spend more than the public desires.[7] In other words, as long as intergovernmental aid is paid directly to local governments, it will tend to stick there (like flypaper), to support more spending, rather than be passed back to local taxpayers as tax relief. The local government spending that results is likely to be more than would occur if the funds were instead paid directly to local taxpayers, as an addition to their disposable income, so that local officials had to explicitly increase taxes in order to increase spending.

Largely independent of these theoretical arguments, statistical analyses have confirmed their conclusion. These studies have separated the effects of intergovernmental finance from other plausible factors influencing government spending. Gramlich (1977) surveys 35 such studies, which included a variety of federal and state intergovernmental finance programs that involved

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[6]See, for example, McGuire 1973 or Niskanen 1975 for expositions of the view that public officials may have goals which conflict with the public's.

[7]Romer and Rosenthal (1979) have developed a theory of agenda-setting officials. Craig and Inman (1986) examine the empirical implications of Shepsle's (1979) more elaborate model of the political process, which includes agenda-setting. Alternative theories for this phenomenon have been proposed by Courant, Gramlich, and Rubinfeld (1979) and Hamilton (1983).

aid both with and without obvious matching grant features. He finds no evidence that intergovernmental aid paid to state and local governments was used solely for state and local tax relief. Rather, the governments receiving the aid always increased their spending. In fact, often intergovernmental aid resulted in no tax decreases at all. Rather, governments receiving aid actually increased their spending by more than the amount of aid, requiring tax increases. This prospect seems to be less likely for intergovernmental aid without obvious matching grant features. But that aid typically still resulted in higher government spending than occurred when taxpayers' income rose by an equal amount, as it would have, had aid been paid directly to them.

A recent study of how Minnesota's intergovernmental finance system has affected its local governments is consistent with Gramlich's nationwide survey. Bell and Bowman (1986) examine the effects of both Minnesota's property tax credits and its local government aid (its local lump-sum revenue-sharing system) on the property tax levies of 174 Minnesota municipalities. While both of these programs may have been intended, in part, to relieve property taxes, Bell and Bowman's results indicate that both instead actually increased them—here, the municipal property tax levies net of credits, the bottom-line payment required of municipal property taxpayers. Furthermore, Bell and Bowman find that the tax increase associated with credits, which have matching grant effects, exceeded the increase associated with local government aid. These tax increases suggest, of course, that these forms of Minnesota's intergovernmental finance system have increased local government spending in the state well beyond what it would have been otherwise.

This increased local government spending may not be a negative side effect if it is all on services that, without state intervention, would be systemically underfunded because of their intercommunity side effects—education, public health, and welfare services, for example. Then, besides remedying inequities, as defined by the state, the increased spending could be improving statewide efficiency by raising the level of these services to the desired optimal level. However, that would not be true if the state funds are spent on other local services instead—on things like local garbage collection and fire protection—which would not likely be underfunded otherwise because they primarily benefit only the residents/taxpayers of the community providing them. While state aid that increases local government spending on such services might improve equity in the state, it would reduce efficiency by systemically overfunding them. State taxpayers could then be made better off by some pattern of tax reductions or rebates giving them the freedom to spend the extra dollars as they choose—which may or may not include higher levels of these services.

As Minnesota's intergovernmental finance system illustrated, many of the types of programs that states now use to provide funds for local government spending do not specify how their funds are to be spent. Many U.S. intergovernmental finance systems thus provide quite a lot of funds that have the potential to be spent inefficiently.

Indeed, this potential seems to be realized in Minnesota. The Bell and Bowman study, remember, suggests that local government spending in the state is greater than it would be without state intervention. The local governmental units in this study are Minnesota municipalities—those which, along with counties, are primary providers of the types of local services that mainly benefit local residents, so are not likely to be systemically underfunded. The increased spending suggested by this study—as well as others cited by Gramlich (1977)—therefore also suggests that some services are being overfunded in Minnesota.

That seems to be corroborated by the most recent data available on state and local government spending (U.S. 1986, pp. 199–250). That data show that per capita municipal and county government spending for all services other than public welfare, health, and hospitals was 45 percent higher in Minnesota than in the nation's median state. This has occurred despite levy limitations placed on Minnesota municipalities. The high ranking must be interpreted cautiously, though. It may partly reflect cost differentials or public preferences for higher spending. Or in some states, municipal and county spending might be less than in Minnesota just because these governmental units shoulder less of the service burden there. Yet, if this were a widespread phenomenon, the per capita spending of municipal, county, and state governments combined should not have been higher in Minnesota than in the median state. And it was, by 25 percent. Meanwhile, per capita property taxes in Minnesota—which many of its intergovernmental programs were intended to lower—were still 21 percent higher than in the median state. It thus seems reasonable to infer that some of this higher-than-average local government spending in Minnesota is excessive.

. . . With a Simple Solution

The remedy for intergovernmental finance systems that encourage inefficiently high levels of local government spending is fairly simple, but sweeping. Basically, it is to separate the funds intended to improve efficiency in a state from those intended to improve equity and to redirect funds so they are more likely to achieve their goals.

States can continue to give funds intended to improve efficiency to their local governments. States should require local governments to spend additional funds only on services that are likely to be underfunded otherwise. Again, public education, health, and welfare services come to mind.

Such a change should leave many local governments with smaller amounts of state funds than they receive now and less ability to inefficiently overspend them. Presumably, the excess amount of state funds was provided to improve equity among residents, and this goal can still be pursued. Rather than giving such funds to local governments, which could result in excessive local spending, however, states should give them directly to their residents. After all, the funds should be used to help people, not their governments. Practically, if states want to try to preserve whatever degree of equity they now enjoy, they could transfer from local governments to their residents whatever share of their existing funds they do not give to local governments for efficiency purposes. If states want to try to attain some other degrees of equity, they could design an appropriate formula for making direct payments to residents. One way to design such a formula is described in my Appendix, but the general idea of paying people instead of governments is not new. In Minnesota, for example, it has been proposed by the highly respected Citizens League (1987).

In Conclusion

Some type of intergovernmental finance system can be justified on both efficiency and equity grounds. But some current state systems let local governments inefficiently overspend. Transferring some state aid from these governments to local residents could solve that problem while preserving or enhancing equity.

Appendix
How to Pass the SALT

A state that wants to improve equity among its taxpayers by giving them state funds faces a difficult task. It obviously can't just budget a fixed amount of funds and give equal shares to all residents. It will have to decide how to distribute funds to try to achieve each type of equity: horizontal and vertical. (See the preceding paper.) And it likely can't achieve both of those completely; some tradeoff of the two will usually be necessary. Here I describe a general method states can use to construct a formula for distributing the aid so that, given their equity budget, they can attain whatever tradeoff they choose. Forgive me, but for ease in reference, I call this a formula for passing the SALT (state aid to local taxpayers).

Assumptions

In deriving this method, assumptions about the burden of local taxes are crucial. As discussed in the preceding paper, besides horizontal and vertical equity, states must also trade off their equity and efficiency objectives. Tax changes motivated by equity objectives affect efficiency in a state, thus adding to the public's tax burden. If a state considers this and still wants to pursue equity objectives, its assumptions about who actually bears the tax burden will determine the equity it will try to achieve. For instance, the usual case mustered for vertically equitable property tax relief for poor renters assumes that rental property taxes are fully passed forward into aggregate rental payments, rather than backward into the landlord's return on investment. And one view of horizontal inequity depends on tax and spending differentials not being fully capitalized into property values (as described in footnote 5 of the paper).

My purpose here is to merely describe a general method for constructing a SALT formula, not to recommend a particular formula. Still, to illustrate the method, I must make some assumptions about tax burdens in a hypothetical public finance system. I simply choose three that are often used (but not necessarily valid): taxes on rental housing are wholly borne by tenants; property taxes on other business property are wholly borne by business, not shifted to consumers or workers; and tax and spending differentials are not capitalized into property values.

Due to that last assumption, property tax base differences among local taxing units in the system create the horizontal inequity described in the paper. To see how to remedy it, consider a central taxing unit with a system that has no classification or credits. For simplicity, lump all property into two categories—housing and business—and assume that the central taxing unit wants to pay SALT only to residents and not to business owners. Let k represent a particular local taxing unit, and adopt the following notation for its pertinent characteristics:

I_{ik} = the current taxable income of the ith resident

H_{ik} = the taxable assessed value of the ith resident's owner-occupied housing (if any)

B_k = the taxable assessed value of the business property

R_{ik} = the SALT payment to resident i

m_k = the property tax rate

pop_k = the population size

T_k = the total property tax collections

V_k = the per capita property tax base $= (\Sigma_i H_{ik} + B_k)/pop_k$.

Consider the state as a hypothetical central taxing unit containing the total property tax base $\Sigma_k V_k pop_k$ and raising total property tax revenues $T = \Sigma_k m_k V_k pop_k$. Dividing the latter by the former yields a statewide average mill rate $\bar{m}$.

Aiming for Horizontal Equity

To achieve one concept of horizontal equity among residents, the state must equalize the effective net (of SALT) property tax rate paid by residents of all local taxing units. To do so, the state should first compute what a resident's effective tax rate would have been had the local taxing unit spent the same amount per capita as the state. Per capita spending in the state is

$$(1) \qquad T/\Sigma_k pop_k = \bar{m}\Sigma_k V_k pop_k/\Sigma_k pop_k$$

while per capita spending in taxing unit k is

$$(2) \qquad T_k/pop_k = m_k V_k.$$

Equate (1) and (2) and solve for the hypothetical tax rate m_k^* which would have given unit k the statewide aggregate per capita spending:

$$(3) \qquad m_k^* = \bar{m}(\Sigma_k V_k pop_k/\Sigma_k pop_k)/V_k.$$

For horizontal equity (h), the state must provide a SALT payment R_{ik}^h to make $m_k^* = \bar{m}$. The net (of SALT) effective property tax rate paid by resident i is $(m_k^* H_{ik} - R_{ik}^h)/H_{ik}$, or

$$(4) \qquad m_k^* - (R_{ik}^h/H_{ik}).$$

Equating (4) and $\bar{m}$ and substituting (3) yields the SALT transfer R_{ik}^h required to achieve horizontal equity:

$$(5) \qquad R_{ik}^h = H_{ik}\bar{m}\left[(\Sigma_k V_k pop_k/\Sigma_k pop_k) - V_k\right]/V_k$$

or

(6) $R^h_{ik}/H_{ik} = \bar{m}\left[\left(\Sigma_k V_k pop_k / \Sigma_k pop_k\right) - V_k\right]/V_k.$

Thus, to achieve horizontal equity, SALT payments must be proportional to the residents' home value. The proportionality factor is the product of the statewide average mill rate $\bar{m}$ and the percentage deviation of the statewide average per capita tax base from unit k's per capita tax base. Were this formula adopted, residents of units with below-average tax bases would receive positive SALT payments while residents of units with above-average bases would be docked. States that want to avoid negative SALT transfers can do so, but only by accepting more horizontal inequity for any fixed budget or by expanding the budget to attain more horizontal equity.

Aiming for Vertical Equity

Under my simplifying assumptions, the property tax system is proportional without SALT. Another purpose of SALT is to achieve the state's concept of vertical equity, perhaps serving as an alternative to property tax credits. For example, the state may strive to use SALT to achieve some target level of progressivity.

To show how this can be done, I must first define what is meant by a *target level of progressivity.* And in doing so, I must settle on a reasonable measure of ability to pay. For that measure, rather than either current income or current property wealth, a combination of the two could be used. Taxpayer income could be estimated from individual income tax filings (in states that levy income taxes), but estimating taxpayer property wealth is not so easy. While local property tax assessors estimate the value of taxpayer homes, they don't estimate the value of the taxpayer's equity in those homes, and increases in that are what increase the taxpayer's wealth. Because of this difficulty, property wealth could just be ignored or, as an approximation, national estimates of the equity share of housing value could be used for homeowner property wealth. The resulting estimated property wealth could be converted into a flow of imputed property income (by multiplying it by a suitable current market interest rate) and then added to ordinary taxpayer income to get what I'll call *full income.* This process results in an imputed property income proportional to property value. If c is the proportionality constant, then full income is

(7) $Y_{ik} = I_{ik} + cH_{ik}.$

To define the level of progressivity, the state may choose any increasing function f for the net (of SALT) effective tax rate:

(8) $\bar{m}H_{ik}/(Y_{ik}+R_{ik}) = f(Y_{ik}).$

Solving for R_{ik} yields the solution for vertical equity (v):

(9) $R^v_{ik} = [\bar{m}H_{ik}/f(Y_{ik})] - Y_{ik}.$

A substitution from (7) makes this

(10) $R^v_{ik}/H_{ik} = [\bar{m}/f(Y_{ik})] - (I_{ik}/H_{ik}) - c.$

This can be manipulated to achieve a state's particular goals. For example, if the state wants the net effective tax rate to rise at a linear rate per dollar of full income, denoted a, it would make this SALT payment:

(11) $R^v_{ik} = (\bar{m}H_{ik}/aY_{ik}) - Y_{ik}.$

Here R^v_{ik} clearly falls with increases in the current income component I_{ik} of Y_{ik}.

Just as did (5), (9) might require negative transfers, that is, payments from some state residents. Those residents would have sufficiently high ratios of current income to imputed property income to make (10) negative. Again, states that want to avoid negative SALT transfers could do so at the cost of less vertical equity or additional budgetary outlays.

Weighting the Equities

A comparison of (5) and (9) reveals the likelihood of a tradeoff in achieving both horizontal and vertical equity: they require different formulas. Furthermore, the state has only a fixed budget of state revenues Q to distribute and, suppose, doesn't want to allow negative SALT transfers. How, then, can the state produce a desirable distribution of SALT?

The best it can do is to produce a SALT distribution by solving this large quadratic programming problem:

(12) $\min_{R_{ik}}(1/2)\Sigma_i\Sigma_k[(R_{ik}-R^h_{ik})^2 + w(R_{ik}-R^v_{ik})^2]$

subject to

(13) $\Sigma_i\Sigma_k R_{ik} \leq Q$

(14) $R_{ik} \geq 0$

for all i, k, where w is the state's desired weighting of vertical equity relative to horizontal equity. Problem (12) minimizes the (weighted) sum of squared deviations of nonnegative SALT payments from their ideal target levels.

The Kuhn-Tucker conditions, which are sufficient for a global minimum to the convex problem (12), are

(15) $(1+w)R_{ik} - (R^h_{ik} + wR^v_{ik}) + \lambda - \mu_{ik} = 0$

(16) $\lambda\left(\Sigma_j\Sigma_l R_{jl} - Q\right) = 0$

(17) $\mu_{ik}R_{ik} = 0$

(18) $\lambda, \mu_{ik} \geq 0$

for all i, k.

Multiply (15) by R_{ik} and substitute (17) to obtain

(19) $\lambda R_{ik} = (R^h_{ik}+wR^v_{ik})R_{ik} - (1+w)R^2_{ik}.$

For all residents receiving positive SALT payments $R_{ik} > 0$, dubbed *eligible* residents, divide (19) to obtain

(20) $\lambda = (R^h_{ik}+wR^v_{ik}) - (1+w)R_{ik}.$

Thus, for any two eligible residents, use (20) and rearrange to obtain

$$(21) \qquad R_{ik} - R_{jl} = [(R^h_{ik} + wR^v_{ik}) - (R^h_{jl} + wR^v_{jl})]/(1+w)$$

which proves that eligible residents with a higher target sum $(R^h_{ik} + wR^v_{ik})$ receive a larger SALT payment than those with a smaller target sum. Number eligible residents in order of the size of their respective target sums, denoted S. Then (21) can be rewritten as

$$(22) \qquad R_{i+1} = R_i + D_i$$

where

$$(23) \qquad D_i = (S_{i+1} - S_i)/(1+w)$$

is the difference in payments between residents $i+1$ and i and R_1 is the SALT payment (yet to be determined) to the resident with the highest target sum. Note that (22) has a simple solution:

$$(24) \qquad R_j = R_1 + \Sigma_{k=1}^{j-1} D_k$$

for $j = 2, \ldots, N$.

The only part of the solution remaining is to determine R_1 and N, the number of eligible residents. Rao Aiyagari has recently proposed a simple algorithm for determining this: search for N such that

$$(25) \qquad S_N > (1/N)\left[\Sigma_{i=1}^{N} S_i - (1+w)Q\right] > S_{N+1}.$$

Then all residents numbered N or lower receive aid calculated by (24). Those numbered higher than N, which include those with negative target sums, are ineligible for payments. It can then be shown that $(1+w)R_1$ equals S_1 minus the middle term of (25).

Implementation and Modification

To implement this scheme, the state need only gather information sufficient to compute the target levels (5) and (9) or (11). This is easily done by having residents file for SALT when they file their state income taxes. Their property tax records, an estimated equity share factor, and current interest rates can then be used in conjunction with the income tax filings to impute full income for each resident. The taxing unit for a resident would be the overlapping districts containing the resident. After settling on a measure of the desired degree of progressivity—for example, the constant a in (11)—and the desired weight factor w, the state would calculate (5), (11), and the solution to (12)–(14). Finally, the state would mail to its residents the checks determined by the solution.

This general method can be adjusted in many ways to construct formulas valid for assumptions other than those in my illustration. Five types of adjustments quickly come to mind:

- Change my early simplifying assumptions. For instance, more sophisticated assumptions about who actually bears the tax burdens could be adopted to more accurately assess those burdens.
- Change my implicit assumption about service cost differences among taxing units. I assumed they don't matter for horizontal equity. If they do, less aid would be needed for residents in lower cost districts. To reflect that, formula (5) could be rederived to incorporate estimated service cost differentials.
- Use more complicated objective functions. For example, a quadratic penalty term penalizing large deviations from residents' previous net tax bills could be added. Experimenting with different penalty weights would let the state achieve a politically feasible mix of horizontal and vertical equity, should the optimum prove impossible to adopt.
- Use other important structural features of the tax system to derive (5) and (9). Obvious ones are the deductability of the property tax from state income taxes and the existence of classification and credits.
- Use other well-posed concepts of horizontal and vertical equity.

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