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INTERGOVERNMENTAL TRANSFERS: THE VERTICAL SHARING DIMENSION

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1. INTRODUCTION

There is both a horizontal and a vertical dimension to the structure of an intergovernmental transfer (Bahl and Linn, 1992). The vertical share is the total pool of funds to be allocated to subnational governments, while the horizontal shares are the amounts received by individual subnational governments. Most research (and most political attention) is devoted to the latter.[2] The subject of this paper is vertical sharing. We are interested in the question of whether the claim of subnational governments (SNG) on national revenues has been increasing over time. This research paper therefore investigates three issues. The first is the trend and cross-country variation in the level of the vertical share. The second is the range of the practice in vertical sharing. Third, we offer some criteria by which the practice of vertical sharing might be evaluated.

2. DETERMINING THE VERTICAL SHARE

How should the total amount of transfers to the subnational government sector be determined? Is there a good normative rule? This is one of the first questions to be answered in designing or reforming an intergovernmental transfer system, and it is arguably also the most politically charged question. In fact, there is no one "best" way to determine the vertical share. Where you stand on the answer will depend on where you sit. A central government official is likely to have a very different view to a subnational government official about the best approach to vertical sharing. However, whether or not the question is explicitly raised or nationally debated, every country makes a decision about vertical sharing, and it makes that decision every year.

One might begin the search for the "right" approach to vertical sharing by estimating the size of the gap that is to be filled by intergovernmental fiscal transfers. The gap for the subnational government sector is the difference between (a) the amount it must spend to provide a minimum acceptable level of government services, and (b) the amount it can raise from own revenue sources if it exerts a "normal " revenue effort. This needs-resources gap (G) might be defined more precisely as

$$G = \sum_i (\tilde{E}_i - \tilde{R}_i) \qquad (1)$$

where $E;$ = the amount of expenditure needed to provide a minimum acceptable level of (assigned) services in local government ***i.***

$\tilde{R};$= the revenue that would be raised from own sources at "normal" effort in local government *i.*

The vertical share (VS), is equal to

$$VS = \frac{aG}{CR} \qquad (2)$$

This norm of vertical balance in an intergovernmental system is more easily conceptualized than it is measured. Particularly, the measurement of the cost of providing a minimum level of services is difficult. There have been numerous attempts to make such a measurement but few countries are successful at using this approach to defining the vertical share.[3] In addition, the definition of a normal level of tax effort by subnational governments is very hard to establish when tax bases cannot be measured as is often the case in developing countries. The result is that few countries use a direct, objective measurement of (G) to establish a vertical share. While a vertical share certainly will be established, it is more likely to be determined subjectively than objectively.

A second issue surrounding the determination of the vertical share is affordability. Expenditure need is a subjective matter and always far outweighs the capacity (or willingness) to finance these services. So, not only must the central (or state) government take the expenditure needs of subnational governments into account, but it must also estimate the extent to which these needs can be covered by available central and local resources. Whatever the true gap between needs and resources at the subnational government level, it is unlikely to be filled completely from central government revenues. Ultimately the vertical share will almost always be determined by a bargaining over what the subnational governments want and what the central government thinks it can afford. Political consideration will always enter into the bargaining. The result of the bargaining is shown as. A in equation (2), and might be thought of as a parameter of affordability.

3. MEASUREMENT OF THE VERTICAL SHARE

One could take a purely positive approach to answer the question of whether the vertical share has been increasing. Following equation (2),

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empirically, the vertical share may be defined as

$$\left(\frac{Tr}{Tx}\right)$$

where

Tr = intergovernmental transfers[4]
Tx = taxes raised by the government making the transfer

We would like to track the size of the vertical share, over time and across countries. A first question is how one defines an intergovernmental transfer, i.e., the numerator of the vertical share ratio. Our definition of an intergovernmental transfer is a grant of funds from a government that raised the revenues of another level of government. The only database that can be used for broad international comparisons of fiscal choices (that we know of) is the International Monetary Fund (IMF) compilation, *Government Finance Statistics* (2003, 2003a). The IMF uses the term "grant" and defines it as "a noncompulsory transfer from one government unit or international organization to a second government unit or international organization" (IMF, 2002). This definition appears to be close to the concept we want, hence we make use of the *Government Finance Statistics* (GFS) database in this comparative analysis. But there are qualifications to this use of the data. It is not clear from so aggregated a definition that each fiscal instrument that we would have identified as a transfer was so identified by the IMF.[5] A random comparison of the IMF data against that reported in case studies where the definitions appear to be correct, give approximately the same results in some instances but not in others.[6] We will assume that in general, the classification made in GFS is correct.

The ratio, $\frac{Tr}{Tx}$, in an indicator of the priority that central governments give to intergovernmental transfers. In column 1 of Table 1, we present data on intergovernmental transfers a share of total tax revenue of the granting government for all countries for which *Government Finance Statistics* reported information during the 1990s[7]. Using the latest year for which data are available, we estimate that for industrialized countries, the vertical share is equivalent to about 19 percent of total taxes collected by the granting government(s), although there is a great deal of variation around this average. In Denmark and Australia, for example, the vertical shares are above 20 percent, while in France and Portugal, they are reported to be less than ten percent.[8] The average vertical share has remained approximately the -same over the past three decades. Only 9 of the 22 industrialized countries for which data-are available showed an increase in the vertical share.

For developing countries, the average vertical share is 13.3 percent. That the vertical share is lower in developing than in industrialized countries is no surprise.[9] The budget pressures on central governments and the limited tax collection capacity of SNGs would cause us to predict a flypaper effect: the higher level governments have the more productive tax bases and the money sticks where it hits. However, on

average and in 46 of the 72 countries reporting, there has been an increase in the size of the vertical share in less developed countries. The increasing claim of SNGs on central tax revenues suggests the importance placed on their budgetary support.

The vertical share for transition countries is only slightly higher than that for developing countries (Table 1). On average, it has fallen over the past two decades. A plausible explanation is that there has been an increase in reliance on subnational governments in the transition countries to raise revenues.[10]

4. DETERMINANTS OF THE VARIATIONS IN THE VERTICAL SHARE

To better understand changes in the vertical share, and differences in the ratio across countries, we make use of the following identity:

$$\frac{Tr}{Tx} = \left[\frac{Tr}{SE} \bullet \frac{SE}{Y}\right] / \frac{Tx}{Y} \qquad (3)$$

where SE= subnational government expenditures[11]

Y=GDP.

Tr, Tx are as defined above.

Equation (3) allows us to decompose the vertical share into a transfer dependency effect, a fiscal decentralization effect, and a revenue mobilization effect, respectively. An increase in the first two drive the vertical share up, but an increase in the third will dampen it.

Table 1. Alternative Measures of the Size and Determinants of Intergovernmental Transfers

	Intergovernmental Transfers as Percent of				
	Total Tax Collections of the Higher Level Governments	Subnational Government Expenditures	GDP	Subnational Government Expenditures as a Percent of GDP	Taxes as a Percent of GDP[c]
Average for Industrialized Countries	19.0	38.1	5.5	15.4	31.3
Average change per year[b]	0.0	-0.1	0.0	0.1	0.3
Number of countries[c]	22	25	25	21	23
Number of countries with an increase	9	7	16	15	21
Average for Developing countries	13.3	40.1	2.2	6.4	17.5
Average change per year	0.1	0.5	0.0	0.1	0-1
Number of countries	72	18	7.3	32	80
Number of countries with an increase	46	11	48	16	50
Average for Transition countries	14.2	29.4	2.9	9.5	239
Average change per year	-0.2	-0.2	-0.1	-0.1	-0.3
Number of countries	22	23	22	22	20
Number of countries with an increase	10	8	10	10	7

Source: Computed from IMF (2003a).

Notes:

a) Number of countries for which data are available.
b) Based on data from 1972-2001. The earliest and latest years of available data were used for each country.
c) Taxes of higher level governments making transfers to lower level governments.

4.1 The Transfer Dependency Component

The vertical share will be higher, *cet. par.*, if transfers are the primary revenue source for SNG, i.e.,if $\frac{Tr}{SE}$ is higher. This component of the vertical share describes the fiscal dependence of SNGs on transfers from higher level governments. The results of our analysis indicate that the transfer dependency effect increased the vertical share in developing countries, but drove it down in industrialized and transition countries.

In column 2 of Table 1, we present the average values for the ratio of intergovernmental transfers to SNG expenditures for all countries which reported GFS information during the 1990s. In general we find that SNGs in industrialized countries rely on intergovernmental transfers to finance about 38 percent of expenditures. Again, however, there is a substantial variation in these shares, ranging from nearly 80 percent in Ireland to ten percent in New Zealand. Subnational governments in industrialized countries became more self sufficient during the past 25 years. Note that the average reliance on grants declined by about 0.1 percent per year, but that 7 of the 25 countries in the sample actually showed an increase. This is an unexpected result since the revenue raising powers of subnational governments tend to be greater in the industrialized countries.

The opposite pattern may be observed for the less developed countries in this sample. The average dependence on transfers is slightly higher than in industrialized countries, but this average hides a very wide variation. The share of transfers in SNG spending varies from over 70 percent in Peru and Indonesia to less than 5 percent in Paraguay. Over time, the average dependence on intergovernmental transfers in developing countries has increased (Table 1). Transfers were about 30 percent of SNG expenditures in the 1970s and 1980s and rose to nearly 40 percent by the beginning of the 2000s. Fiscal dependency increased in 11 of the 18 countries for which data were available (Table 1). This pattern is partly explained by the slow growth in per capita real expenditures by SNGs. Another view of this finding is that central governments in developing countries were not willing to relinquish taxing powers to SNGs, but chose instead to finance increased decentralization from centrally raised taxes.

The case of the transition countries is more difficult to translate because of the blurred lines between what is a transfer and what is a local tax, and because of possible misclassifications in GFS. Using the available data, however, we show in Table 1 that the reliance on transfers for financing local government expenditures is about 30 percent in transition countries, and this reliance has been declining in favor of own source revenue mobilization over the period for which data are reported. Of the 23 countries in the sample, only 8 showed an increased reliance on transfers for financing SNG expenditures.

4.2 The Fiscal Decentralization Effect

The second component in equation (3), (SE/Y), is the subnational government expenditure share of GDP. All else equal, a larger subnational government share of national output will be associated with a larger vertical share. In industrialized countries, the subnational government share of GDP averages more than 15 percent and has increased slightly over the past three decades (Table 1, column 4).

In the developing countries, the subnational government expenditure share of GDP is considerably lower, averaging only 6.4 percent. The expenditure share of SNGs in GDP has increased in these

developing countries, therefore having a positive effect on the vertical share. In the transition countries, the subnational government spending share of GDP is

9.5 percent on average, and has declined over the period since data have been recorded suggesting, if anything, a decreasing influence on the vertical share.

4.3 The Revenue Mobilization Component

At the margin, the vertical share will be inversely related to the level of revenue mobilization by higher level governments. To explain this, let us assume that the sequencing of government decisions is to first identify the level of fiscal decentralization (SE/Y), and second to decide on the extent to which subnational governments will be financed by transfers (Tr/SE). At the margin then, a higher level of revenue mobilization will leave more resources for central government purposes and lead to a lower vertical share.

The data in Table 1 show that, on average, the rate of revenue mobilization by governments making transfers has been considerably larger in industrialized countries than in developing economies. One might interpret this as showing that, at the margin, slow improvement of revenue mobilization efforts had a dampening effect on the vertical share in the developing economies. In the transition countries, by contrast, the reduction in revenue mobilization by transferring governments has resulted in an increase in the size of the vertical share.

5. EXPLAINING THE VARIATION

As noted above, there is a great deal of variation among countries within these three groupings. This moves us to a more micro analysis to address the question: Why do some . countries choose larger vertical shares than others?

There is a substantial variation across countries in the percent of taxes of higher level governments that are devoted to intergovernmental transfers. We have used a regression analysis to explain the variation in vertical share as defined in equation (2) and measured as reported in column 1 of Table 1. The dependent variable in this analysis is measured as the average for each country over the 1990s. Data are available for 20 developed and 51 developing countries.

The explanatory variables that drive the explanation of variations in the vertical share are the fiscal decentralization effect, the transfer dependency effect and the revenue mobilization effect. We treat the expenditure decentralization ratio[12] as an exogenous· independent variable in this estimation to capture the *decentralization effect*. We use several specifications of exogenous variables to explain the variation due to the *transfer dependency effect*.

- A dummy variable to indicate whether a country is less developed (LDC) or industrialized. We would expect that, *ceteris paribus*, an LDC would allocate a lower share of central taxes to intergovernmental transfers because the needs of the central budget are thought to be more pressing.

- A dummy variable for federal structure, which would be expected to predict a lower dependency by SNGs on transfers and therefore a lower vertical share. Federal countries are higher income and tend to give a greater degree of taxing power to their SNGs.
- A higher level of corruption should be related to a greater transfer dependence because the enhanced possibility for bribery that comes with intergovernmental transfers may cause some countries to hold to this pattern.[13]

Finally, the revenue mobilization effect, with an expected negative marginal effect on the vertical share, is treated as an endogenous variable. The instruments used in the first stage equation are the agricultural share of GDP, the population growth rate and the openness ratio (the ratio of imports plus exports to GDP).

The results of our analysis are shown in Table 2. All of the explanatory variables have the correct signs. The ratio of transfers to central government taxes is most strongly correlated with expenditure decentralization. The vertical share is significantly higher in countries that have committed to a greater degree of fiscal decentralization. The revenue mobilization effect has the expected significant, negative effect.

Table 2. The Determinants of the Vertical Share3: Two Stage Least Squares Estimates[c]

	Equation (1)	First Stage Equation for Revenue Mobilization
Constant	10.86	37.90
	(2.79)	(16.88)
Expenditure	0.67	…
Decentralization	(8.16)	
Share of GDP in Agriculture	…	-0.47
		(5.78)
LDC Dummy	-2.40	…
	(1.00)	
Federal Dummy	-4.68	...
	(1.47)	
Population growth rate	…	-4.72
		(5.24)
Corruption Index	1.34	…
	(1.95)	
Revenue Mobilization[a]	-0.57	…
	(3.23)	
Openness[b]	…	0.01
		(0.61)
R. 2	0.53	0.59
N	69	69

Notes:

a) Endogenous, measured as the ratio of tax to GDP.
b) Import plus export value as a percent of GDP.
c) t-statistics shown in parenthesis.

6. THE PRACTICE

The shares of higher level government revenues allocated to subnational governments are determined primarily by the institutional arrangements that are used for vertical sharing. These institutional arrangements may be determined as much by historical practice as by the demand for decentralization in a country. In fact, institutional arrangements for intergovernmental transfers differ widely from country to country. In some countries the intergovernmental transfer "system" is an amalgamation of several different types of transfers that may or may not fit together in a coherent way. In other countries, one form of transfer is dominant e.g., shared taxes in Indonesia and the Philippines. Either way, there is an implicit or explicitly defined vertical share for each type of intergovernmental transfer.

Governments seem to have taken three basic approaches to defining the vertical share of SNGs (Bahl and Linn, 1992). The first is to share a defined percent of revenues(or taxes) of the higher-level government. This is effectives a revenue entitlement for SNGs, and it may or may not bear a relationship to expenditure needs or to local taxable capacity. The second is to use an ad hoc approach where the vertical share is defined by a discretionary decision and may vary from year to year. The third approach is for the higher-level government to agree to cover a portion of "allowable" costs. In fact, these are three very different approaches in terms of how they are administered and in terms of their impact.

6.1 The Shared Tax

Arguably, the form of vertical revenue sharing that is most in step with the goals of fiscal decentralization is the shared tax approach. In this case, the higher level government allocates a share of its tax collections to the lower level governments. As may be seen in Table 3, there are many different versions of tax sharing.

Vertical sharing by this method can significantly strengthen the fiscal position of the SNG sector. In effect, this gives state and local governments a claim on some share of national revenues and makes them partners in the central tax system. It provides some degree of certainty to the revenue flow to local governments, and it could give local governments access to broad-based and income-elastic taxes. From the point-of-view of the central government, the shared tax approach could seriously limit fiscal flexibility. Even in the face of a serious fiscal deficit, the center would be obligated to pass down a share of its revenues to support subnational government spending.[14]

Two major design questions arise here. The first is the tax to be shared and the percentage of collections to be shared. The second is for the granting government to design a system that it can support by following the revenue sharing rules that it makes.

The choice of a shared tax will depend in part on the commitment of the central government to tax sharing. Countries that are pushing subnational governments to be important players in the public service delivery system might choose major revenue sources with income-elastic tax bases. At one extreme, countries may share all tax collections with their local governments. The cornerstone of the Indonesian decentralization program that took effect in 2001 was a 25 percent sharing of all "domestic" revenues. The Philippines allocates 40 percent of the total internal tax collections (in the third preceding year) to local governments. As may be seen in Table 3, this approach is not an uncommon choice among developing countries.

A middle ground is to share specific taxes, but to choose those that are revenue productive and elastic. China, for example, designates 100 percent of the enterprise income tax, 60 percent of the individual income tax and more than 25 percent of the VAT for provincial governments. Latvia earmarks 75 percent of the revenues from the personal income tax for local governments.

A third approach is to assign the revenues from less productive central taxes to subnational governments, or to assign only a small percent of collections. The property tax is a central government tax in Indonesia. All revenues, however, are turned over to the local governments. A similar situation exists in Jamaica, though less than 100 percent of property tax revenues are shared.

It is not a big surprise that many advocates of fiscal decentralization are enthusiastic about shared taxes as the best approach to vertical sharing. It gives subnational governments a fixed claim on central revenues, and perhaps access to an income-elastic tax base. From the point of view of local politicians, it offers the prospects of seeing increased revenues without having to ask the voters for permission. An added desirable feature is that shared taxes are very often passed to SNGs as unconditional grants.

There are, however, some significant drawbacks to using the shared tax method of determining the vertical share. First, SNG revenues will be sensitive to central government tax policy changes. For example, China shares enterprise income tax revenues with the provincial governments on a basis of origin of collection. Changes in Chinese industrial policy directly effect the revenue flow from enterprises and hence revenues received by the subnational governments. Second, a high tax-sharing rate may dampen the enthusiasm of the central government for vigorous enforcement of the tax (if it is the collection authority) thereby reducing the revenue flow to local governments. Moreover, a shared tax may limit the incentive for the central government to reform the structure of the tax administration if the central government itself does not receive any of the revenue from the enhancement. The central government property tax in Indonesia is a case in point where the center administers the tax but the revenues accrue to the local governments. There is little incentive for the center to invest in administrative or structural reform. A similar situation arises for individual and company income taxes in China, and for the individual income tax in Russia.[15]

Third, there is the issue of whether the subnational government share is measured against budgeted or actual central government revenue. If the base is actual revenue and if the central and local fiscal year calendars are the same, there is some degree of uncertainty in the revenue flow and fiscal planning may be compromised. If the base is the budgeted amount, both the central and subnational governments assume some risk, especially in the case of countries that are revenue dependent on products sold in world markets. The Philippines has taken an interesting approach to this issue by sharing 40 percent of central revenues collected three years earlier, i.e., 2002 sharing is based on 1999 collections.

Fourth, shared taxes are a tempting target for tax avoidance. If a SNG receives only a partial share of collections within their jurisdiction, there is incentive to find ways to understate the actual amount of taxes paid. In China, local officials have found creative ways to channel collections to extra budgetary accounts and therefore avoid a portion of the tax sharing payments to the center. Some estimates place the revenues transferred to these extra budgetary accounts as being equivalent to 50 percent of budgetary collections (Bahl, 1999a). In Russia, the "dual subordination" of tax administration has resulted in a tendency of subnational governments to hold onto shared revenue instead of sending it to Moscow, thus under- minding the central government (Martinez-Vazquez, 2001).

Fifth, Keen (1998) makes the point that changes in the centrally controlled tax rate of a shared· tax may induce subnational governments to substitute higher local taxes if central tax rates fall. In many countries, this behavior may not be relevant because subnational governments have little revenue autonomy, but it may be relevant in other cases. Keen's argument does bring into question the impact of tax reform at the central level on the transfer policy. If central tax rates are reduced, is the vertical share reduced as well?[16]

Finally, tax sharing raises political problems. What happens when the higher level government, who makes the tax sharing rules, runs into a tight fiscal situation? Will it view the sharing rates as an inviolate contract, or will it cut them back to preserve some of its own programs? The record is mixed on this. In some past years, the Philippine government has provided less than its full commitment to subnational governments. Capuno, Manuel and Salvador (2001) calculate that during the 1995-1999 period, the actual grant allocation averaged only about 12 percent vs. the 40 percent entitlement. The same kind of default on the tax sharing arrangement has occurred in Ecuador (Frank, 2003). In most industrialized countries, by contrast, the percentage sharing arrangements seem to have been protected, even in difficult economic times.

The tax sharing approach addresses some issues but not others. It can be used to significantly improve vertical balance in the intergovernmental fiscal system and, if income-elastic taxes are shared, to maintain this new balance. It also has the advantage of giving the subnational governments a vested interest in the revenue performance of the central government tax system. Whether or not this feature can be used to stimulate collections at the local level is an open question.

Tax sharing is not a good instrument to address the externality issue. For example, if subnational governments as a group are under-investing in primary education, a shared tax will be a less effective remedy than a conditional grant. Nor is it likely to significantly increase the accountability of local politicians to their constituents because it allows local politicians to divorce themselves from the political pain of setting the tax rate.

The tax sharing approach might produce a larger pool of funds for equalization, but whether or not it leads to more equalization will depend on the method of horizontal sharing that is chosen.

6.2 Ad Hoc Transfers

A second approach to vertical sharing is for the central government to decide on the amount of transfers on a discretionary basis. Whereas the shared tax approach gives subnational governments an entitlement, in effect an ownership of some share of central revenues, the ad hoc approach sends an opposite message: the center owns all of its revenues and may or may not choose to grant some share to the local sector. This is a centralizing approach to determining fiscal balance. At one extreme, the Parliament or the President will decide annually on an allocation to the subnational government sector. This approach to determining the vertical share often involves more negotiation and political consideration than subjective analysis and both the approach taken and the amounts agreed upon may vary from year-to-year. Hence it might be labeled an "ad hoc approach."

Obviously, there are great drawbacks to this approach. First, it is not transparent and it is susceptible to political manipulation. This leads to uncertainties on the part of the local government sector as it does

not know what it will receive each year. Fiscal planning and effective budgeting are more difficult, if not discouraged.

Second, the ad hoc approach makes it easier for the central government to treat the expenditure needs of the subnational government sector as having a lower priority than its own. When there is no statute or constitutional mandate for vertical sharing, the central government may view intergovernmental transfers as just another competing expenditure request (just as those from line agencies) and cuts (and expansions) are more easily made than in the case where the vertical share is defined as a percent of central government taxes. In this setting, the reduction in transfers can be another way to offload central government budget deficits.

Finally, the ad hoc approach makes it easier to deny the link between expenditure responsibilities and revenue resources. While the central government may cut or increase the local revenue share each year, they are less likely to change the expenditure functions assigned to local governments. The result can be a growing vertical imbalance that can produce harmful effects on the level of public services provided. Another result is that subnational governments are likely to be discouraged from increasing efficiency and from becoming self-reliant if all grants are made on an ad hoc basis. Local officials will feel less in control of their budgets and less accountable to their voters for the level of services provided. It becomes very convenient to blame any service delivery shortfalls on the inadequate resources provided by the center. For this reason, many elected local government officials will look kindly toward the ad hoc approach.

On the other hand, the ad hoc approach offers some advantages, particularly in developing and transition economies. First, from the point of view of the central government, it provides maximum flexibility in carrying out macroeconomic fiscal planning. The government can implement a fiscal program with a minimum regard for a fixed committed share to the local government sector. For example, if a deficit reduction program calls for a tax increase of x percent, the increase can be accomplished without having to pay a fixed share of the increment to the local government sector. If an expenditure austerity program calls for cuts in subnational government spending, the central government can accomplish this by simply reducing the transfer since it is not bound to a guaranteed tax share. In Sierra Leone, the decentralization legislation allows for this to be done "equitably" by specifying that any reduction in subnational government funding cannot be greater than the reduction in funding provided to central government budget agencies.[17]

A second advantage is that this approach will enable the central government to change national spending priorities without changing the expenditure assignments of each level of government. For example, subnational governments are more likely to spend for consumption than for infrastructure purposes. An ad hoc grant will allow the center to reduce the flow of revenues to the local sector and use the funds directly to spend on central infrastructure or other projects.

Third, the ad hoc approach allows an adjustment of the subnational government claim on revenues, as the situation in the country changes. Shared tax provisions, particularly when placed in constitutions, are not easily changed.

In sum, the ad hoc approach to determining the size of the distributable pool is the most centralizing approach to designing an intergovernmental transfer system. Despite some very apparent flaws it is widely used, even in some countries that feature decentralization as part of their development plan.

Table 3. **Shared Tax Determination of Vertical Structure**

Country	Year	Shared Tax	Comments	Source
Pakistan		37.5 percent of federally collected taxes	Customs duties included in the base	
Indonesia		25 percent of domestic tax revenues collected	Base does not include customs revenue	Hofman (2003).
Philippines		40 percent of internal revenue collections in the third preceding year	Base does not include customs revenues.	Diokno (2003).
Argentina	2000	58.05 percent of net co-participated funds	Base does not include customs revenue.	Rezk, Ernesto (2000).
Brazil	1988 Constitution	20 percent of federal revenues: 47 percent of income taxes and 57 percent of federal VAT Taxes	Base does not include customs revenue	Afonso, Jose Roberto R. and Luiz de Mello (2000).
Ecuador	2003	11 percent of current revenue and 25 percent of income taxes	Base includes foreign trade taxes	Frank, Jonas (2003).
Germany	2000	49.5 percent of VAT and 50 percent of the revenue from income taxes	Base does not include customs revenue	Spahn, Paul Bernd and Oliver Franz (2000).
India	2000	87.5 percent of income tax and 47.5 percent of union excise tax	Base does not include customs revenue	Rao, Govinda and Nirvikar Singh (2001).
Kazakhstan	1999	Sharing rates for VAT, excise, enterprise income, and individual income are set annually. Rates differ for each Oblast	Base does not include customs revenue	Mclure, Jr., Charles E. (1999).

Country	Year	Shared Tax Arrangement	Comments	Source
Korea	1997	13.27 percent of the national tax revenues		Ma, Jun (1997).
Mexico	1999	20 percent of "assignable taxes:" revenues collected from most domestic taxes (main components are federal income tax, VAT, and the ordinary fees from oil).	Base does not include customs revenue.	Courchene, Thomas and Alberto Diaz-Cayeros (2000).
Nigeria	1999	24 percent of the Federation Account and 50 percent of VAT revenues.	Base includes customs revenue if they flow into the Federation Account	Martinez-Vazquez, Jorge and Jameson Boex (2001).
Russia	1998	15 percent of federal collections	Excludes import duties and 10 percent federal share of PIT.	Martinez-Vazquez, Jorge and Jameson Boex (2001).
South Africa	2000	Equitable share of nationally collected revenues		Smoke, Paul (2000).
Switzerland	1992	30 percent of Federal tax on income and profits, 10 percent of withholding tax, 20 percent of tax on exemption from military.	Does not include customs revenue. It is required that 85 percent 85 percent of the co-participated revenues must be used towards investment expenditure (defined as all new expenditures of municipalities except for wages, salaries, and other personnel expenditure.	Spahn, Paul Bernd.
Bolivia	1996	20 percent of taxes collected by the national government	Base includes customs duties.	Mackenzie, GA and Jose-Luis Ruiz (1997).

Country	Year	Shared Tax Arrangement	Comments	Source
Columbia	1991 Constitution	*Situado Fiscal*: 24.5 percent in 1996 *Participación Municipal:* According to this figure should have increased to 22 percent in 2022.	*Situado Fiscal*: Total amount determined as a minimum share of the nation's total current revenues. *Participación Municipal:*Transfer is determined as a share of total current revenues of the national government.	
Ethiopia	1995/1996	Shared revenues of taxes jointly levied and collected by federal and state government is still to be defined. General non-conditional grants extended until 1997.	General non-conditional grants are determined by a formula and ad hoc adjustments. Resources come from total tax and non-tax revenues, counterpart funds, and foreign assistance to the states.	Brosio, Georgio, and Sanjeev Gupta (1997).
Latvia	1995	100 percent of personal income tax and property tax. 75 percent of natural resource tax revenues.	Base does not include customs revenue.	Martinez-Vazquez, Jorge and Jameson Boex (2001).

Country	Year	Shared Tax Arrangement	Comments	Source
China	1994 Revenue Sharing Arrangement	100 percent of Personal income taxes and enterprise income tax on locally owned enterprises, collectives, private enterprises, and joint ventures; 25 percent of VAT on domestic transactions; 50 percent of Securities and exchange tax. Resource taxes.	Base does not include customs revenue.	Bahl (1999a).
Thailand	FY03	4.3 percent of total government revenue was shared taxes.	The only certainly in the transfer system is that the local governments will receive at least last year's amount of shared tax.	Weist, Dana (2003).
Japan	2003	32 percent of personal income tax. 35.8 percent of company income tax. 29.5 percent of consumption tax. 25 percent of revenue from to	Base does not include customs revenue.	Ihori, Toshihiro (2003).
Jordan	1995	“Fuel tax”	Base includes customs revenues. Distribution determined by formula.	World Bank (1995).
Papua New Guinea	1995 Provincial Reforms	Starting in August of 1999, no more than 30 percent of VAT revenues and 30 percent of mining levies	Base does not include customs revenue.	Edmiston, Kelly. (1999).

Country	Year	Shared Tax Arrangement	Comments	Source
Australia	2001	Starting in Jully 2000, all collections of Goods and Services Tax (less collection costs) are distributed as untied grants to States and Territories.	The GST is a VAT applicable to all activities except some educational and health related expenditures.	Searle, Bob (2002).
Canada	1995	Personal Income Tax and Corporate Income Tax are shared	*Personal Income Tax:* Tax on Tax rate ranges from 40 to 60 percent among nine provinces that participate. Quebec receives 16.5 percent of federal PIT. *Corporate Income Tax:* Provinces use federal tax base, but determine their own rates and credits which ranged from 14 to 17 percent.	
Hungary	1995	35 percent of the PIT collected by central government	Does not include customs revenues	Lutz, Mark, Edgardo Ruggiero, Paul Bernd Spahn, and Emil M. Sunley (1997.

Examples abound of the ad hoc approach to vertical sharing (See Table 4). The FFSR (Fund for Financial Support of the Regions), which is Russia's premier system of intergovernmental transfers, was in the past stated each year as a percent of central government revenues.[18] However, the percent chosen was an annual central government decision, presumably based on the fiscal position of the central government. The funding rate (as a percent of total tax collections less import duties) was 15 percent in 1996 but had fallen to 13 percent in 1999. Such changes are large enough to compromise the budgetary stability of local governments.

6.3 Cost Reimbursement

A third approach to determining the size of the revenue pool for distribution to local governments is the cost reimbursement approach. Under this approach, the central government defines a service for which it will guarantee to cover some portion of the cost incurred by SNGs in delivering certain services, for example, teachers' salaries, drugs and dressings, highway construction and maintenance, infrastructure projects, etc. (Table 5).

The program could be "open-ended," i.e., the reimbursement could be unlimited and cover all expenditures on the functions made by SNGs. In this case, once the eligibility and reimbursement rules are established, the vertical share may be determined by simply adding up the entitlements of the eligible units. In effect the SNGs determine their horizontal shares and this determines the aggregate vertical share.

Probably the more common approach is to first determine the total amount that will be spent to reimburse costs incurred on the specified functions, based on affordability, then "cut the cloth" in terms of reimbursement and eligibility. The grant typically is "closed-ended" as far as its size to each recipient and the definition of the function being funded. The cost reimbursement approach is likely to involve a large number of conditional grants that are controlled by the line ministries and are continued from year-to-year.

The great advantage, and disadvantage, of the cost reimbursement approach to vertical sharing is its conditional nature. It specifies how much the national (state) government desires to spend on a particular public service area. Thus the cost reimbursement grants can be used to direct investment to high priority national needs. Local governments, left to their own devices, will ignore externalities and under spend on services with regional and national benefits.

The disadvantage of the cost reimbursement approach to determining vertical shares is that it compromises local choice. This can retard true fiscal decentralization because it limits the budgetary discretion of local governments. The true-believer decentralist would much prefer an unconditional grant. Moreover, the cost reimbursement approach imposes an administrative cost on the central government, who must monitor the program, and a compliance cost on the recipient SNGs who must do significant reporting on their use of funds and their adherence to standards. It is more cumbersome and more costly to administer than is either the shared tax or the ad hoc approach.

7. EVALUATION OF VERTICAL SHARING

How does a country evaluate its practice of vertical sharing? Are there criteria for a "good" practice that might be used? Are there norms, similar to those used for taxation, that might be applied? The answer on all counts is that there are not easily defined indicators of “good" or "bad" practice. It is possible to

regularly reconsider the practice by benchmarking it against some important indicators of performance. Arguably the four most important, discussed below, are whether there is the right balance between transfers and local taxes, revenue adequacy, revenue elasticity and administrative costs.

7.1 Transfers versus Local Taxes

Determination of the right balance between locally raised revenues and intergovernmental transfers is a key decision in designing an intergovernmental fiscal system. A solution that is weighted more heavily toward autonomous SNG revenue-raising powers introduces more accountability at the local level, and can make it possible to impose a hard budget constraint on local governments. Because certain tax bases can be more easily assessed and collected by local governments, the overall rate of revenue mobilization might be enhanced. These are desirable features in a system of fiscal decentralization. The major drawback to relying more heavily on local taxation (vs. grants) is that fiscal disparities might be increased to unacceptable levels. Moreover, SNGs might be induced to go on a search for taxes, the burden of which they might export to other jurisdictions. Since labor is not fully mobile within developing countries, the market may not automatically correct such policy moves by SNGs.

The argument to weigh local government financing more heavily toward transfers can be made in terms of the greater efficiency of the central government as a tax collector. The problem with this justification for transfers is that over time it can become a self-fulfilling prophesy: if SNGs are not given taxing powers, it is not clear that they ever will improve their tax administration capabilities. Moreover, it is not clear that the central government is a more efficient collector for all taxes (McLure, 1998). Some argue that familiarity with the local economy might give an advantage to local governments in the case of property taxes and taxes on small businesses.

7.2 Revenue Adequacy

A primary justification for intergovernmental transfers is to correct vertical imbalance. If SNGs are assigned expenditure responsibilities that cannot be financed with the potential yield of the revenue sources they have been assigned, then transfers are called on to fill the gap. A first evaluation criteria for the intergovernmental transfer system is whether this gap has been filled according to government intentions. Evaluation is especially difficult here because the degree to which expenditure needs are satisfied is a very subjective matter. The government might define a floor level of expenditures to be covered, as in South Africa or some education spending in the U.S., and the coverage of these levels might be monitored. Or, the "adequate" vertical share might be defined in terms of an entitlement from centrally collected taxes, as in Indonesia and the Philippines, and this might be monitored. However, the best evaluation of the adequacy of the vertical share is whether the allocation is sufficient to permit the targeted minimum service levels to be met.

Table 4. Ad Hoc Determination of the Vertical Share

Country	Year	Ad Hoc Arrangement	Comments	Source
Argentina	1997	Non-reimbursable transfers mostly in the form of grants; and “reimbursable” discretionary transfers consisting of transfers made through FONAVI (National Housing Fund) and Treasury advances against future revenues	Non-reimbursable grants: mainly used to fill resource gaps at the provincial level. Reimbursable transfers: effectively non-reimbursable because of their low rate of repayment (loan recovery rate is less than 10 percent).	Schwartz, Gerd, and Claire Liuksila (1997).
Columbia	1997	Co-financing funds.	Has an ad hoc nature because the 1991 constitution did not require that these funds increase at a rate in relation to the central government current revenue.	Ahmad, Ehtisham and Katherine Baer (1997).
Brazil	1997	Covenios	Ad Hoc grants used to fund education, health and social areas	Teresa Ter Minassian (Ed.) (1997). "Brazil."
India	2000	Finance Commission decides on tax shares. In addition, the Union Excise Duty share is optional. Various ministries give grants to their counterpart states for specified projects; this amounted to 20 percent of transfers.	In 1998 Grants to States were 16.3 percent of total revenue.	Rao, Govinda and Nirvikar Singh (2001).
Mexico	1999	President's discretionary fund for natural disasters and salary increases (is being phased out).	3.5 percent of total transfers to subnational governments	Courchene, Thomas and Alberto Diaz-Cayeros (2000).

Table 4. Ad Hoc Determination of the Vertical Share (continued)

Country	Year	Ad Hoc Arrangement	Comments	Source
Nigeria	1999	Discretionary Recurrent Transfers and Discretionary Capital Transfers	Discretionary Recurrent Transfers: made to meet specific recurrent needs. Discretionary capital transfers: federal grants given for specific purposes in the context of the national development plan to finance expenditures, or transfers that represent on-lending of borrowing by the federal government.	Mered, Michael (1999).
Ecuador		Significant discretionary transfers	Sometimes transfers are actually bailouts.	Frank, Jonas (2003).
Tanzania	2003	Total amounts are determined annually as part of the budgetary process.	Numerous conditional grants	Boex, J., R. Bahl, J. Martinez-Vazquez, and L. Rutasitara (2003).
Pakistan	1997	Recurrent Grants	Recurrent Grants: higher level of government may subsidize a particular activity (e.g. primary education).	Ahmed,Qazi (1997).
Russia	2001	Mutual settlements	Employed to compensate subnational governments for tax changes or the imposition of expenditures. Dominant form of non-equalizing transfers that are most often not budgeted.	Martinez-Vazquez, Jorge and Jameson Boex (2001).
Thailand	FY03	All yearly transfers are in a sense ad hoc.	There is no allocation rule nor formula in their yearly transfers.	Weist, Dana (2003).
Indonesia	2003	Ad hoc transfer for regional wage increases		Hofman, Bert (2003).
Jordan	1995	Distributes ad hoc grants (or zero interest loans)	Determined each year based on budget availability	World Bank (1995).
Malawi	2001	Resource Supplementary Grant	Main grant distributed on a formula basis. However, it's timing and frequency is erratic.	Martinez-Vazquez, Jorge and Jameson Boex (2001).

Table 5 **Cost Reimbursement Determination of the Vertical Structure**

Country	Year	Cost Reimbursement	Comments	Source
Argentina	2000	Earmarked transfers under the form of diverse funds (energy, housing, regional disequilibria, education); as well as transfers for decentralized services, road construction, or provincial social security regimes		Rezk, Ernesto (2000).
Brazil	1997	Revenue from COFINS (special contribution levied on enterprise turnover)	Earmarked for financing health and some other social programs.	Teresa Ter-Minassian (Ed.) (1997) "Brazil.".
Colombia	1997	Situado Fiscal, Participacion Municipal, Co-financing Funds, and National Royalties Fund	*Situado Fiscal*: Transfers earmarked for expenditures on health and education. Participacion Municipal: Special transfers to local governments earmarked for education, health, water provision, sports, recreation and culture. *Co-financing Funds:* Transfers made mostly on a matching basis *National Royalties Fund:* distributes natural resource royalties to producing regions for investment purposes.	Ahmad, Ehtisham and Katherine Baer (1997).

Table 5 **Cost Reimbursement Determination of the Vertical Structure (continued)**

Country	Year	Cost Reimbursement	Comments	Source
Bolivia	1992 Census/1996 Decentralization Law	1992 Census mandates that 5 percent of national government revenue to be transferred automatically to public universities. 1996 Decentralization law reforms established prefecturas (departmental governments) that are assigned royalties from forestry and petroleum and minerals extraction, as well as 25 percent of Special Tax on Hydrocarbons.	Revenue going to prefecturas is earmarked for road construction, rural electrification, irrigation infrastructure, environmental preservation, tourism, social assistance programs, institution building (for municipalities), other projects in conjunction with municipalities, human resource management, administration in the health, education and social assistance areas.	Mackenzie, G.A., and Jose-Luiz Ruiz (1997).
India	2000	Matching transfers from Finance Commission were almost 15% of total state expenditures. Planning Commission makes grants and loans for implementing development plans. National Development Council calculates Planning Commission grants on the basis of the Gadgil formula, which is currently at 30 percent of plan outlay.	In 1998 Grants to States were 16.3 percent of total revenue.	Rao, Govinda and Nirvikar Singh (2001).
Mexico	1999	Aportaciones-Conditional Grants	46.3 percent of subnational government revenue. Earmarked transfers for education, health, social infrastructure, and other uses.	Courchene, Thomas and Alberto Diaz-Cayeros (2000).
Pakistan	1997	Development Grants	Takes place out of the Annual Development Plan	Ahmed, Qazi (1997).

Table 5 **Cost Reimbursement Determination of the Vertical Structure (continued)**

Country	Year	Cost Reimbursement	Comments	Source
Russia	2001	Subventions	Earmarked for capital expenditures or current expenditures allocated by the State Duma	Martinez-Vazquez, Jorge and Jameson Boex (2001).
Thailand	FY03	25 percent of grants were specific	Grants were roughly 8 percent of total government revenues.	Weist, Dana (2003).
Japan	2003	National Disbursements and Specific traffic safety grants.	National Disbursements: Allocated to finance part or all of the expenses related to specific expenditure programs (education, social welfare, public works, transportation, regional development, etc.)	Ihori, Toshihiro (2003).
Philippines	1991 Local Government Code	At least 20 percent of Internal Revenue Allotment (IRA) block grant	The only conditional nature of the IRA transfer program is that at least 20 percent must be spent on local development projects contained in the local development plans.	Diokno, Benjamin E. (2003
Jordan	1995	Central governments pay 70 percent of the cost for building and maintaining major highways.		World Bank (1995).
Papua New Guinea	1995 Provincial Reforms	Administrative Grants; Staffing Grants; Infrastructure Grants; Village Services Grants; District and Provincial Support Grants.	Administrative Grants: Administrative Costs other than salaries and allowances. Staffing Grants: Covers salaries and Allowances of provincial and district staff. District and Provincial Support Grants: Intended to support rural action programs and urban rehabilitation programs.	Edmiston, Kelly (1999).

Table 5 **Cost Reimbursement Determination of the Vertical Structure (continued)**

Country	Year	Cost Reimbursement	Comments	Source
Australia	1997	Specific purpose payments that cover both recurrent and capital needs	Conditions for expenditures fall into the following categories: 1)General Program Requirements (e.g. requirement that states provide free public hospital treatment to Medicare patients); 2)Requirements that the payment be spent for a specific purpose (or passed on to other entities such as Universities, nongovernmental schools, and local governments);3) Agreements covering service provision and program delivery; 4) Detailed conditions on the operation of joint expenditure programs. The main functional expenses financed by these grants are education, health, and housing.	Craig, Jon (1997).
Malawi	1997/1998	Special Grants and Health Grants. District Development Fund (DDF)	Special Grants and Health Grants: Issued to operate clinics. DDF: Financing facility established by the government and donor organizations to provide grants to community- driven projects initiated at the district-level.	Martinez-Vazquez, Jorge and Jameson Boex(2001).

Table 5 **Cost Reimbursement Determination of the Vertical Structure (continued)**

Country	Year	Cost Reimbursement	Comments	Source
Canada	1996	Specific Purpose Transfers comprised of the Established Programs Financing (EPF) and Canada Assistance Plan (CAP)	EPF: Allocated Solely to health care and post-secondary education. CAP: open-ended and matching at 50 percent *Note: These programs were replaced at the end of fiscal year 1996 with the Canada Health and Social Transfers program.	Krelove, Russell, Janet Stotsky and Charles L. Vehorn (1997).
Germany	1997	Federal co-financing of specific state projects	Conditional grants that operate within a complex network of interstate cooperation	Spahn, Paul Bernd and Wolfgang Fottinger (1997).
Hungary	1994	Normative Grants; targeted grants; transfers from social security; grants for distressed	Normative Grants: The budget specified a unit costs for 27 norms (e.g. Public Housing, Social day care, cultural activities, education, etc.). After the local governments have fulfilled the criteria for these norms, the local governments can use the remainder at their discretion. Targeted Grants: earmarked for investment. Social Security: Expenditure related "soft" financing.	Lutz, Mark, Edgardo Ruggiero, Paul Bernd Spahn, and Emil M. Sunley (1997).
Italy	1997	Conditional grants are the largest source of revenue for ordinary regions (around 44 percent of total revenues in 1993).	Two main earmarked funds provide funding for health services and local public transportation	Emiliani, Nicoletta, Sergio Lugaresi and Edgardo Ruggiero {1997).
Switzerland	1997	Transfers dominated by conditional grants-in-aid	Usually close ended with matching requirements.	Spahn, Paul Bernd and Wolfgang Pottinger {1997b).
United Kingdon	1997	Specific Grants		Potter, Barry(1997). "United Kingdom."

Table 5 **Cost Reimbursement Determination of the Vertical Structure (continued)**

Country	Year	Cost Reimbursement	Comments	Source
United States	1997	U.S. relies mostly on conditional grants	Four most important categories are health, income security, education and training, and transportation.	Ma, Jun (1997).

7.3 Revenue Elasticity

An often overlooked dimension of revenue adequacy is revenue elasticity, i.e., do transfers grow in step with the increase in SNG expenditure needs?' This is an important consideration. If transfers do not grow with expenditure needs, vertical balance in the system may erode. This has been a problem in many countries. It is particularly problematic when SNGs must rely on the higher level governments to make discretionary changes each year to maintain revenue adequacy.

We have calculated the elasticity (buoyancy) of intergovernmental transfer revenues with respect to GDP[19] for all those countries for which data are available. As may be seen in Table 6, this elasticity would appear to be greater than unity for most developing countries in the sample. On average, it is 2.7 for a period covering roughly the decade of 1990s. It is, however, significantly higher for developing than for industrialized economies.

To better understand the pattern of growth, we decomposed the elasticity of intergovernmental transfers with respect to GDP $\left(\frac{\dot{Tr}}{Y}\right)$ into

$$\frac{\dot{Tr}}{Y} = \frac{\dot{Tr}}{Tx} \times \frac{\dot{Tx}}{Y}$$

where Tr = intergovernmental transfers
Tx = tax revenue of the granting government

The first component is the elasticity of transfers with respect to the tax revenue of the granting govemment(s). We might think of this as a kind of "rate effect," i.e., a central or state government that increases the share of its tax revenue paid to the distributable pool for local governments might be thought of as increasing the rate of distribution of intergovernmental transfers. This would result from discretionary actions such as increasing the tax sharing rate, or increasing the ad hoc allocation of transfers to the distributable pool.

The second component is the elasticity of higher level government tax revenues with respect to GDP. We might think of this as a base elasticity. An elasticity greater than unity implies an automatic increase in the effective tax rate, due to some combination of a progressive tax structure, improved administration and the development of easier tax handles. So, a country with a shared tax system that makes no discretionary changes in the sharing rates would see an increase in transfers driven by the increase in GDP.

As can be seen from the data presented in Table 6, the elasticity of transfers with respect to GDP is about unity for most countries in the sample. There are some significant outliers but these would appear to be mostly due to policy changes in intergovernmental transfers rather than to built-in changes in the system. The elasticity is unity or higher for 29 of the 39 countries for which data are available, though it averages 0.9. One could argue that most countries have more or less maintained their share of transfers in GDP over this period. The implication is that central (and state) governments are satisfied with the level of the vertical share and most have not been willing to reduce it dramatically. Nor have they been receptive to programs that would pass a greater share of tax collections by higher level governments to

subnational governments. This probably indicates a continuing support of subnational government finance in development strategies, but also may indicate a hesitance to give up taxing powers to lower level governments. The fact that the overall average is less than unity suggests a drag on the vertical share in some countries and less enthusiasm about increasing the share for SNGs.

Table 6. **The Growth of Intergovernmental Transfers as a Percent of GDF: Rate and Base Effects for Selected Countries**

Country	Rate Elasticity	Base-Elasticity	Total Elasticity
Algeria	0.7	1.3	0.9
Australia	0.9	1.4	1.2
Azerbaijan	0.7	0.6	0.4
Bahamas, The	4.5	1.4	6.1
Belize	034	1.4	0.6
Botswana	8.2	1.1	8.8
El Salvador	9.5	0.1	0.6
Ethiopia	-0.3	1.0	-0.3
Fiji	0.1	1.5	0.2
Gambia, The	2.5	1.0	2.5
Georgia	3.4	0.9	3.0
Ghana	5.4	0.9	1.1
Guatemala	1.5	1.3	1.9
Guinea	1.2	0.9	1.1
Guinea-Bissau	0.4	2.5	0.9
India	1.6	0.8	1.3
Jordan	-0.2	1.6	-0.3
Kenya	-0.2	1.8	0.4
Kyrgyz Republic	-0.1	0.7	-0.1
Latvia	0.2	1.2	0.2
Lesotho	1.7	1.6	2.6
Malawi	4.7	1.0	4.5
Malaysia	0.5	1.1	0.5
New Zealand	0.4	1.5	0.6
Nigeria	-1.7	0.6	-1.0
Oman	1.5	0.7	1.0
Pakistan	2.4	1.2	2.8
Papua New Guinea	3.5	1.8	6.1
Philippines	1.8	2.0	3.7
Portugal	2.8	1.4	3.9
Senegal	5.8	1.3	7.7
Solomon Islands	0.7	1.4	0.9
Sri Lanka	2.2	1.0	2.3
Sudan	0.4	0.0	0.0
Swaziland	5.0	1.2	6.2
Turkey	0.1	1.1	0.1
Uganda	3.2	0.6	2.1
United Kingdom	0.2	1.3	0.3
Zambia	0.2	1.2	0.3
Zimbabwe	1.9	1.7	3.3
Average	2.0	1.2	2.1

The (potential) natural growth in transfers, the base elasticity, is shown in column 2 of Table 6. In most countries in the sample used, the level of taxation increased either in proportion to GDP or at a greater rate. The implication of this result is that even if subnational governments had only maintained a constant percent of the tax revenues of higher level governments (i.e., no rate effect), the vertical share would have increased. SNGs in countries with a "fixed percent" tax sharing system might be expected to maintain revenues in such a case, whereas those in countries that rely on ad hoc systems or closed-end reimbursement system would need to depend on discretionary actions to maintain the vertical share.

The rate. elasticity of the vertical share averages less than unity. On average, countries took discretionary actions that kept the growth in transfers to a level below the growth in taxes collected by higher level governments. For most countries in this sample, however, elasticity was about unity. Discretionary actions taken by higher level governments more or less indexed the overall elasticity to GDP. But was there a pattern to this indexing? As revenue mobilization was driven up (or down), how did countries react with respect to the effort they made in allocation to intergovernmental transfers?

We describe the pattern in Table 7 where we have placed countries into four groups. Countries in the bottom right quadrant had both a base and rate elasticity greater than unity. This means that there was automatic growth in tax revenues that was more than proportionate to GDP, and discretionary increases in intergovernmental transfers stimulated decentralization financing even further. Countries in the bottom left quadrant compensated for a strong base growth by making discretionary cuts (or attrition cuts) in intergovernmental transfers. Countries in the top left quadrant deemphasized decentralization altogether by passing on part of a slow growth in taxes to local governments with a discretionary cut in the sharing rate.

Finally, those countries in the top right quadrant compensated for a slow growth in the base by increasing the sharing rate. There seems no rhyme to this classification. Neither industrialized nor developing countries cluster in any one category, nor do countries with high vs. low levels of fiscal decentralization.

Table 7. **Rate and Base Elasticity Cross-Classification**

		Rate Elasticity	
		Below Unity	**Above Unity**
Base Elasticity	**Below Unity**	Azerbaijan Kyrgyz Republic Sudan	El Salvador Georgia Ghana Guinea India Malawi Nigeria Oman Uganda
	Above Unity	Algeria Australia Belize Ethiopia Fiji Guinea-Bissau Jordan Kenya Latvia Malaysia New Zealand Solomon Islands Turkey United Kingdom Zambia	Bahamas, The Botswana Gambia, The Guatemala Lesotho Pakistan Papua New Guinea Philippines Portugal Senegal Sri Lanka Swaziland Zimbabwe

7.4 Administrative Costs

Vertical sharing schemes need not impose a large administrative cost. Tax sharing schemes impose relatively little administrative cost because the matter is straightforward: the distributable pool receives an earmarked share of collections. So long as tax collection data are accurate and up to date, the SNG share is easily determined. Neither is an ad hoc determination of the distributable pool a complicated issue, in that the amount is fixed by political decision. There may, however, be considerable costs associated with the bargaining that accompanies this determination, and there may be delays in arriving at the awards because of the difficulty in reaching a decision.

Conditional, cost reimbursement grants are another matter. Whether the vertical share is based on an open-ended or closed-ended conditional transfer, it implies a significant administrative cost. Determination of the total amount for the distributable pool in the case of an open-ended scheme would require an estimate of the eligible expenditures made by each participating local government. Properly done, the monitoring of "eligible" expenditures can be a costly exercise under both an open-ended and a closed ended conditional transfer.

8. CONCLUSIONS

The vertical share component of an intergovernmental transfer is the claim of the subnational governments on" the revenues raised by the higher level government that makes the transfer. Available data suggests that vertical share is, on average, about· 19 percent in industrialized countries and between 13 and 14. percent in developing and transition countries. It has been stable in the industrialized·countries over· the past two decades, increasing in the developing countries and declining in the transition countries.

The results of our analysis show that the commitment to expenditure decentralization is a prime reason why the vertical share larger- in some countries than others. All other things being equal (i.e., the level of fiscal decentralization and the dependence of subnational governments on transfers), higher levels of resource mobilization tend to dampen the vertical share.

There is a wide variation in the practice of vertical sharing. The most decentralized version gives subnational governments a guaranteed claim on central government taxes. Many countries use this form of revenue sharing and there are many different variations in terms of the taxes shared and the sharing percentages. The more centralized approaches to vertical sharing are ad hoc (political) distributions and cost reimbursement (conditional) grants.

One way to evaluate vertical sharing in an intergovernmental transfer system is to measure its revenue GDP elasticity (buoyancy), just as one would for a tax. Our analysis shows that the buoyancy is greater than unity for most countries but there seems to be no pattern to identifying the determinants of the variation in this elasticity, i.e., whether it is due to a base effect (growth in revenues of the central government) or a discretionary effect.

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[1] We are grateful to Robynn Cox and Bayar Tumennasan for valuable research assistance.

[2] See, for example, Ma (1997), Martinez-Vazquez and Boex (2001) and Boadway (2004).

[3] The system of expenditure "norms" of the transition countries was theoretically an attempt to estimate expenditure needs at all levels of government. However, the expenditure "needs" calculations were pushed aside by budget pressures and were often ignored (Bahl, et al 1999, Martinez-Vazquez and Boex, 2004). In some countries such as Japan, and the United Kingdom, more explicit needs calculations are made each year (see Alm, 1999). South Africa uses an index of expenditure needs in its formula for distributing its "equitable shares" grant among local governments (Reschovsky, 2003.)

[4] Where there are three levels of government, as in a federalism, we define the level of transfers as being the sum of those made by central governments to state governments, and those made by state governments to local governments. We define the level of taxes analogously in such a case, i.e. as the sum of central plus state taxes.

[5] Particularly bothersome is the possibility that an intergovernmental transfer may be mis-classified as a SNG tax. We define an own source revenue as the case where the local government is free to determine either the tax rate, the tax base, or both. So, for example, we would treat a central government tax, that is allocated in part or fully to the local government where collection takes place, as an intergovernmental transfer. If a SNG is given some freedom to levy a sur-rate on a central government tax base or central tax collections, we would treat this as a local own source revenue.

[6] In some cases, e.g., China, GFS (IMF, 2003) classifies shared taxes where there is no local autonomy in rate or base determination, as "local taxes". To the extent this is widespread in the GFS volume, the results here understate the importance of intergovernmental transfers in fiscal systems.

[7] The definitions used in this paper for data extracted from GFS are as follows: Intergovernmental transfers (Tr) are the amounts shown as "grants from other levels of government" in the revenue table

for subnational governments. If grants from other levels of government are not shown in the subnational government revenue , we use the variable "grants to other general governments", taken for the expenditure table of the granting government, as the measure. This may introduce some error, because "other general level of government" might not be subnational governments. In most cases where there were data reported for both, however, the reported amounts for transfers made did match up with the reported amounts for transfers received.

[8] The detailed Appendix tables that show actual data used are available from the authors.

[9] Again, however, note that there is a substantial variation in these shares, ranging from 50 percent in India to less than 3 percent in many countries (Appendix Table 2).

[10] Another explanation is that the revenue sources are misclassified.

[11] Subnational government expenditures (SNE) are "state plus local government expenditures" (as reported in the expenditure table) net of any transfer from the state to the local government, where the amount of the transfer is taken from the local government revenue table.

[12] The "expenditure decentralization ratio" is the percent of SNG expenditures in total government expenditures.

[13]For a good discussion of the relationship between corruption and decentralization, see Tumennasan (2005).

[14] In practice, central governments sometimes have changed or ignored current legislation when difficult times arrived.

[15] See Dahlby (1996) and Keen (1998) for a discussion of other potential strategies of subnational governments.

[16] Andersson et. al. (2004) provide an interesting case study of the vertical externality hypothesis for Sweden.

[17] Sierra Leone, Local Government Act 2004, Section 47(3).

[18] For a good discussion of the Russian FFRC, see Martinez and Boex (1999).

[19] These are calculated as arc elasticities over the beginning and end period for which data are available.

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