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Tax assignment: does the practice match the theory?

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Abstract. This paper builds on the existing literature to better explain the tax assignment choices made by countries in different economic circumstances. In particular, we explain why the degree of tax autonomy given to subnational governments is significantly greater in industrial than in developing countries, even when adjustment is made for differences in income level. We consider several arguments for this disparity. First, electoral regimes are not in place for the accountability gains to be fully captured. Second, tax decentralization may result in unacceptable fiscal disparities, and, third, tax administration costs are higher for subnational governments and there is not enough incentive to take steps to lower them. Finally, and contrary to expectations, we do not find empirical evidence that giving more discretionary powers to subnational governments in developing countries will lead to a crowding out of central revenues, but we do find this result for industrial countries.

Most students of fiscal decentralization have been concerned with explaining why countries decentralize expenditure decisions (Oates, 1972) and with empirical analysis of the practice (Bahl and Wallace, 2005; Letelier, 2005). More recently, the tax assignment part of the story has drawn research attention (Bahl and Bird, 2008; López-Laborda et al, 2007).

Some countries—for example, the US and Canada—have carried tax decentralization quite far. In many other countries, particularly low-income countries and those in transition, tax assignment has not been an important part of the decentralization strategy. This difference between industrialized and lower income countries is usually explained by tax administration capacity, historical traditions of centralization, and macroeconomic policy concerns. In fact, the story is more complicated and there is much still to be learned about why governments (or constitutions) make the revenue assignment decisions that they do.

The goal in this paper is to build on the existing literature to better explain the choices actually made by countries in different economic circumstances. We begin with a summary of the theory of subnational tax autonomy, and the taxing rules that have been taken from this theory. We then turn to a review of how the practice follows the theory, and to four amendments to the existing theory that can help explain the international practice. These amendments to the existing model can help us understand better why tax assignment has gone no further than it has, particularly in low-income and transition countries. We conclude by viewing these findings in a perspective of political economy and suggesting the policy implications.

The theory

The traditional starting point for thinking about tax assignment is Musgrave's (1983) multilevel budget framework that would assign the stabilization and distribution functions to the central government and allocation responsibility to the local governments. This division of responsibility leads to general guidance about the placement of various instruments of taxation at the central, 'middle', and local levels of government.

Progressive taxes with a distributional goal and taxes containing automatic stabilizers would be left with the central government. Subnational governments would rely mostly on benefit taxes levied against relatively immobile bases.

Most economists still hold to the Musgrave rules as the basic organizing principles for a fiscal federalism. But the theory and certainly the practice have moved on, and competing hypotheses have been offered about the motives that drive governments to make the tax decisions that they do. This work has focused on the importance of competition among subnational governments as a way of controlling the size of governments (Brennan and Buchanan, 1980), on taxing nonresidents for benefits received (Oates, 1998), and on the political economy of tax assignment (Hettich and Winer, 1999). These views have helped make the case for a claim on mobile tax bases by subnational governments. In terms of the contemporary practice, some subnational governments now have taken on a substantial redistribution role, regularly use tax policy to stimulate their economies, and have been assigned major expenditure responsibilities. The case has been made that the prospect of economic dividends has become a driving force behind decentralization (Rodríguez-Pose and Sandall, 2008). Further, ‘things have changed’. Economic integration in Europe and the reality of elected subnational government in the developing countries have stimulated the demand for fiscal decentralization (Bahl, 2008; Stegarescu, 2009).

The evolving theory of tax assignment has led to a general set of taxing rules that many researchers and practitioners use as the take-off point in designing subnational government tax policy (McLure, 1998). These ‘rules’ include assigning enough taxing powers to local governments to allow them to cover the cost of locally provided services, relying on user charges whenever local services can be priced, restricting subnational governments from exporting more tax burdens than expenditure benefits, and devolving only those tax instruments that can be administered at reasonable cost.

If all of these rules were followed to the letter, there surely would be no subnational government taxes. Even taxes on the supposedly immobile bases involve some exporting to nonbeneficiaries (eg nonresidential property taxes), preferential treatments are unavoidable (eg small traders can evade the business license tax), and full cost recovery on essential services through user charges can bring social unrest. In some cases even the letter is not clear—for example, the meaning of ‘administration at reasonable cost’. So, there is an implicit qualifying statement for all of these rules—that a good local tax will ‘approximately’ pass these tests. The policy question is how far to push the envelope.

The practice

With these considerations and qualifications taken into account, can it be concluded that there are tax choices available to subnational governments that will generate adequate revenue? Are the choices more limited for developing and transition versus industrial countries? Do the choices that have been made conform with the principles for good revenue assignment?

Individual income tax

A residence-based individual income tax can meet most of the tests for a good subnational government tax. It can generate significant revenue from an elastic tax base. It is roughly consistent with economic efficiency goals in that the burden falls mostly on those who benefit from the services provided. However, correspondence problems do arise with respect to those who cross subnational government boundaries to reach their place of work, and some provision must be made for charging them for benefits received. If the tax is levied according to place of employment, some portion

of the tax burden will be exported from the taxing jurisdiction. The employment-based model would also provide an incentive for jobs to migrate to lower taxing jurisdictions. Since the residence-based model is much preferred, subnational government income taxes work best if levied by jurisdictions that cover most of the commuting range.

In the industrial countries subnational government income tax administration is feasible (OECD, 2006; Timofeev and Martínez-Vázquez, 2004). The pay-as-you-earn portion can be assessed and collected at the place of work with relatively little difficulty. The 'hard to tax' informal sector should be no more difficult a task for subnational governments than it is for the central government, and there is no reason to believe that the collection rate will be any lower under a decentralized than under a centralized tax system. Income taxes on capital sources (dividends, interest, rents) can be easily collected by states and provinces if there are information-sharing agreements with the central government. Moreover, administrative difficulties can be circumvented by a piggyback arrangement where the central government defines the base and takes responsibility for collection while allowing local governments to set surrates.

Slack (2006, pages 106–107) reports that income taxes represent the most important source of subnational government tax revenues in thirteen of the twenty-seven OECD countries. The approach to subnational government income taxation, however, varies among countries. The US model is for a state government tax, where there is discretion to define the tax rate and the tax base. Most US states begin with various lines on the federal income tax form, and build up their own base. In many states the tax structure is simple but in some cases it is complex and includes a progressive rate structure. In eleven states local third-tier governments are allowed to levy a further surcharge on the state base (Schroeder, 2006). In a handful of states there is no individual income tax. State (provincial) and local governments account for about 20% of all individual income taxes raised in the US, and about 40% in Canada where there are no local income taxes. Provincial personal income taxes in Canada are collected by the federal government except in Quebec province.

The Swiss model is similar to that of the United States. Cantons levy an individual income tax and also permit local governments (communes) to levy surcharges at locally established rates on the cantonal income taxes. Like some US state government income taxes, the Swiss subnational government income taxes are not fully harmonized with the central income tax.

The case of Spain is quite different. The regions are divided into a special charter group and a common regime group. The former may levy a personal income tax and have discretion to set the rate that applies to their share of total collections. But the tax base is common with the central government and collection is centralized. So, for these regions there is an element of piggybacking. In the case of the latter regions the subnational governments have autonomy over income tax policy and administration, much as is the case for US states (López-Laborda et al, 2007).

Under the Nordic model (Lotz, 2006; OECD, 2006) the central government collects the tax, but local governments have discretion to set their local tax rate. In Norway, however, local governments may not exceed a centrally set maximum rate and most local governments are at the ceiling. These local income taxes are levied at a flat rate on the same tax base as the national income tax except in Sweden where it is an earned income tax.

The German arrangement is unique. The Länder are responsible for collection, but have no authority to set the tax rate or determine the tax base. In effect there are no subnational government income taxes in Germany. State governments in Australia levy a payroll tax because they are denied access to broad-based income taxes (Freebairn, 2002).

Administrative considerations rule out residence-based subnational government income taxes in most low-income countries. Very few subnational governments have the ability to maintain a tax roll, or to do the necessary audit to police the compliance. Even under a piggyback arrangement—which gets around these administrative constraints—the tax base would be concentrated in a very few local governments and most local governments would be shut out. Two other forces push towards centralization of the individual income tax. One is that even central governments often have trouble collecting much from the personal income tax (Bird and Zolt, 2005). The second reason is that income tax policy often involves income distribution goals and this is perceived to be the exclusive responsibility of the central government.

In a number of transition economies, subnational governments have been assigned significant shares of income tax revenue. At present in Russia, for example, 100% of individual income tax revenues are assigned to subnational governments (Martínez-Vázquez et al, 2006). A 60% share is allocated to provincial governments in China. Dillinger's (2007) review of the practice in eight eastern European countries indicates that the individual income tax sharing rate varies from a 94% allocation to local governments in Slovakia to 30% in the Czech Republic and Poland. In none of these countries, however, do local governments have any significant freedom in establishing the tax rate.

Company income tax

Many who study revenue assignment argue that the company income tax is not a good choice for subnational governments (McLure, 1998; Martínez-Vázquez, 2008). To the extent that the incidence of the tax is shifted backwards to owners of the firms, or forward to consumers of the product, it is not likely borne by local residents. Hence it fails to match the beneficiaries of locally provided services with those who are burdened by the tax.

Countries usually try to trick the system out of this undesirable tax exporting effect by devising a formula to give every province where the company produces or sells its product a claim on some part of the tax base. But these allocation formulae give rough justice at best and few would argue that they are a good way to convert the company income tax to a destination-based levy. The United States has learned well the great problems that come with trying to prorate the net income of national companies across state boundaries (McLure, 1980). Similar allocation problems are observed in Switzerland (Spahn and Föttinger, 1997).

Other problems with a subnational government company income tax are no less worrisome: the tax base (profit) is cyclically unstable, capital is mobile, and provincial and local government revenues can be affected by changes in central government tax or industrial policy. These problems notwithstanding, some industrial countries do assign the corporate income tax to subnational governments. It accounts for about 4% of state and local government tax revenues in the United States. In Switzerland, Spain, Japan, Italy, and Canada, subnational governments tax business income.

The developing countries make little, if any, use of company income taxes at the subnational government level. Subnational governments in transition countries, however, do depend on enterprise income taxes. In China enterprise income taxes are a major source of provincial government revenues, but the central government determines the tax rate and the tax base. Such tax-sharing arrangements are better thought of as intergovernmental fiscal transfers.

Consumption taxes

General sales taxes might be levied on turnover, at the retail level, or against value added. In fact, general sales taxes in any of these forms are not often used by subnational governments, even in OECD countries, though the United States and Canada are notable exceptions. The practice suggests that the ‘decentralizing’ European countries have settled on assigning general consumption taxes to the center and allowing the subnational governments to share the income tax base. In the United States there is a de facto separation of sales tax powers: most states rely heavily on a retail sales tax and there is no national sales tax. In Canada the sales tax field is shared by the federal and provincial governments

General sales taxes of any type are a difficult proposition for subnational government in developing countries, mostly for administrative reasons (Bahl and Bird, 2008). A gross receipts tax levied on an origin basis (mostly on importers and manufacturers) can be revenue productive, but creates distortions by shifting tax burdens from producing to consuming regions and by its pyramiding effect. Relatively few subnational governments in the developing world rely heavily on general sales taxes, though Brazil and Argentina are important exceptions. Selective sales taxes and excises are more manageable for developing countries but still are little used by subnational governments.

Another version of the assignment of general consumption taxes is the revenue sharing practiced in transition countries, but, as noted above, these are more appropriately thought of as intergovernmental transfers.

General sales tax (VAT)

The only well-functioning, destination-based subnational value-added taxes (VATs) now in existence are those in Canada (Bird and Gendron, 2007). Canadian experience shows that, with good tax administration and an existing federal VAT, it is perfectly feasible to operate a VAT at the subnational level on a destination basis.

In most developing countries there is no realistic prospect that the tax administration will be able to support a subnational government VAT. In addition to the administration constraint, there are concerns about the tax treatment of international trade and problems arising from interstate trade. For most countries the issue is that subnational VATs are distortionary if levied on an origin basis, and unworkable if levied on a destination basis (Bahl and Bird, 2008).

Still, there are exceptions. Brazil relies heavily on an origin-based subnational government VAT. State governments have autonomy in rate setting and compete for investment by offering fiscal incentives. The resulting ‘fiscal war’ has been an important factor behind the call for reform of the Brazilian VAT (Rezende and Afonso, 2006). India has implemented a state-level VAT, but is still working out the details of how it will operate, particularly with respect to interstate trade (Babita et al, 2008; Rao, 2008). Pakistan is attempting to implement a subnational VAT on services while the VAT on goods will be a national tax.

Retail sales and gross receipts taxes

The retail sales tax is an important source of revenue in most US states. The tax rates and bases are determined by the individual states. In some states local governments also levy sales taxes. The major problems with this tax in the US have to do with the difficulties with taxing services and with the failure to tax internet purchases. With the shift in spending patterns toward the consumption of services, and with internet purchasing on the rise, there is considerable erosion of the state government revenue base (Mazerov, 2009). The taxation of electronic purchases is held back

by legal rulings.⁽¹⁾ The taxation of services is limited by administrative considerations and by a historical tradition of not taxing services, but this exclusion introduces significant horizontal inequities in the system.

Subnational governments in developing countries do make use of gross receipts taxes. The major own-source revenue of Brazilian municipalities is a gross receipts tax on services, *Imposto Sobre Serviços* (ISS), almost all of which is collected by the largest municipalities (Rezende and Garson, 2006). The ISS and the urban property tax together account for about 60% of total municipal government tax revenue. National law fixes the minimum rate at 2%. Maximum rates differ by type of service, with the usual maximum being 5% of gross revenue. Within this range local governments may choose the tax rate. Provincial governments in Pakistan are empowered to levy a sales tax on the consumption of services, but it yields little revenue.

Buenos Aires, both city and province, levies a gross receipts tax. The tax rate varies widely by type of product and there are the expected cascading problems. Colombian municipalities also derive much of their revenue from a gross receipts tax. The business tax in the Philippines is levied on gross receipts and accounts for about 30% of revenues (Taliervo, 2005).

All of these taxes are levied on an origin basis, so, depending on competition and demand elasticities, may be guilty of tax exporting. Moreover, there is the 'headquarters problem' which arises because national firms tend to pay tax for all branches at the headquarters location. The headquarters city therefore receives the revenues under an origin-based system. In fact, for years there have been calls for replacing the gross receipts tax in Buenos Aires with a VAT. But there has been little action, in part because of the important revenue role that this tax plays and the political strength of subnational governments.

Excise taxes

Selective sales taxes are a potentially significant source of regional government revenue (McLure, 1998). Such taxes can be easily administered by regional governments and lend themselves to regionally differentiated rate determination. Moreover, if applied on a destination basis, subnational government excise taxes can avoid the tax exporting problem. There also may be a social cost argument for subnational government excises—for example, on alcohol and tobacco—to the extent that regional governments are responsible for traffic safety, hospitals, and health expenditures—and on vehicles and fuel where subnational governments are responsible for road maintenance. In practice, subnational government excise taxes work well in industrial countries because administration capabilities allow taxation on a destination basis.

The case for assignment of excise taxes to subnational governments in developing countries is not so strong, for two reasons. First, special excises on petroleum, liquor, beer, and tobacco are of significant revenue importance to central governments, and not likely to be surrendered to decentralization. Second, administrative constraints limit the degree to which a destination-based excise could be implemented in most developing countries (Cnossen, 2006).

The strongest economic and administrative case for regional (and perhaps even local) excises is with respect to vehicle-related taxes (Bahl and Bird, 2008; Bahl and Linn, 1992). The most important tax on automobiles from a revenue perspective is the fuel tax, which, in fact, is used by subnational governments in some OECD countries.⁽²⁾

⁽¹⁾ The US Supreme Court ruled that state and local governments can require only sellers with a legal presence in the state to collect the sales tax [*Quill v. North Dakota*, 112 US 298 (1992)].

⁽²⁾ For a review of the practice, see Newbery (2005).

The case for provincial-level motor fuel taxes in developing countries is less easily made. States and provinces in developing countries could impose fuel taxes, but rates could not differ much from those imposed by neighbors because of the mobility of the tax base and because of evasion. Collection at the pump is usually difficult. Differential provincial fuel taxes can, as a rule, be imposed at the refinery or wholesale level, with the refiner or wholesaler acting as a collection agent for the states, remitting taxes in accordance with fuel shipments. In practice, provincial taxation of motor fuels has been constrained because central governments are reluctant to allow encroachment on its petroleum excise base, because fuel prices are so sensitive a political issue that the center desires complete control, and because provincial governments themselves are not anxious to take on the political cost that might come with heavier taxation of motor vehicle use. A shared tax with the provincial government might be a more feasible way to tap the motor fuel base.

Motor vehicles may also be taxed with a number of other instruments. These include tolls and an appropriate set of annual automobile (and driver) license fees. The annual license for operating a motor vehicle is easily administered and at an appropriate rate could be revenue productive. An alternative administrative arrangement is revenue sharing of license taxes with a higher level of government. For example, in Brazil the state government shares 50% of motor vehicle license revenues with municipalities according to the place of registration.

Property and land taxes

Virtually all countries assign the property tax to local governments. In the industrialized countries and in many developing and transition countries, these local governments are given rate-setting powers. Administration of the tax is often divided between the central (or state) government and the local government, but there is no one dominant pattern on the division of administrative duties. In some cases higher level governments develop the cadastre and even do the valuation work, while local governments focus on collections. In other countries valuation is a local function, especially in the larger cities. Most countries assign responsibility for collections to the local level.

The property tax passes many of the tests of a good subnational government tax. The base is broad and the tax can be revenue productive at reasonable levels of the statutory rate. Typically, revenues are stable over the business cycle. There is a rough jurisdictional correspondence between the benefits received from services financed by the tax and the burden distribution. The exception to this rule is the burden of taxes on some nonresidential properties that are not owned by local residents, and/or that sell products outside the local area. The property tax fails the tests for a good subnational government tax in terms of its high administrative cost and its unpopularity with voters.

There is always controversy about the revenue yield of the property tax—that is, about whether its burden is too high or about whether it contributes enough revenue to the financing of local public services. The revenue yield from the property tax in OECD countries is above 2% of GDP, nearly four times higher than the yield in developing countries.

The discussion about property tax practices in low-income countries is mostly pointed toward its almost uniformly weak revenue performance. On average, it accounts for well less than 1% of GDP in developing countries. Arguably the most important reason is that the property tax works best as a local government tax, and fiscal decentralization has not been as embraced in developing as in industrialized countries. Bahl and Martínez-Vázquez (2008) use data from a panel of seventy countries for 1990, 1995, and 2000 to show a significant positive effect of both expenditure

decentralization and the level of per capita GDP on the level of the effective property tax rate. Lower income countries are less decentralized and therefore use the property tax less.

The property tax offers several advantages as a good local tax in developing countries. Real property is visible and can be reached by local government administrations, and, with effort, effective administration is possible (De Cesare, 2004). The local governments have a significant comparative advantage in administering the property tax because of their familiarity with the local economy and their related regulatory powers (eg issuing building permits and business licenses, making land-use plans). The distribution of the tax burden is progressive because land ownership is concentrated in the upper income brackets. The revenue potential is well above amounts now collected in most developing countries. A major problem is that delays in general revaluation are commonplace, significantly lowering the revenue–income elasticity. Because the property tax is so unpopular in developing countries, it has few champions among elected officials.

Some unanswered questions

What we can learn from the above is that the practice of taxation more or less follows the theory in the industrialized countries, but does not match up as well in the developing countries. Moreover, while the subnational government expenditure share of GDP is about twice as high in industrial as in developing countries, the tax share is about five times higher (table 1).

Table 1. Subnational government tax revenues as a percentage of GDP (source: computed from IMF, 1980–2006).

	Decade			
	1970s	1980s	1990s	2000s
OECD	8.59 (15)	9.49 (15)	8.61 (20)	7.8 (15)
Transition		7.55 (3)	4.62 (19)	4.55 (21)
Developing	1.42 (18)	1.36 (18)	1.98 (25)	1.57 (23)

Note: The average value for the decade is reported in each cell; the number of countries reporting is shown in parentheses.

The existing theory could do a better job of explaining the practice in industrial versus developing countries if it were amended to account for four factors: (a) subnational governments in developing countries may not capture the efficiency gains from having more taxing power; (b) tax decentralization would lead to fiscal disparities that would require central intervention; (c) neither central nor local governments may be committed to lowering the high cost of subnational government tax administration; and (d) higher levels of revenue mobilization by subnational governments may crowd out central government taxes. These four considerations are discussed below.

Accountability

If consumer voters at the subnational government level can choose the package of services they want, they will be willing to pay a higher (tax) price for this package. If they are constrained to a lower level of taxation by administration weaknesses or by limited taxing powers, they will suffer a welfare loss. If they are able to pay for the services with local taxes, but receive a lesser quality of services than they contracted

for, they will suffer a welfare loss. Elected local officials will be held accountable for delivering the quality of services for which the voter paid. The model works by exit (more so in industrialized than in developing countries) and it works by voice vote.

The accountability model supports the efficiency case for fiscal decentralization, but it probably makes unrealistic assumptions about the extent to which citizens can vote public services to their desired levels (Lockwood, 2006). This is true everywhere but especially in the developing countries. The electoral process might not be open and contested (China and Vietnam) or elections may have been suspended (Nepal). Information is more imperfect, voters are less mobile, and in some cases voters have not learned how to use the vote to hold their officials accountable. In all countries voters are forced to choose among candidates based on a full line of issues rather than on simple issues such as the level of public output. However, it also can be argued that public officials can be graded according to their performance relative to that in other jurisdictions (Beasley and Case, 1995).

What we might conclude is that the efficiency gains from assigning more taxing powers to subnational governments are more likely to be realized in industrial than in developing countries. All else being the same, this would dampen the relative demand for subnational government taxing powers in less-developed countries and is another explanation for the large gap between revenue mobilization in developing and industrialized countries.

Another complication is that the central (or state) government may take policy actions that weaken the accountability of elected officials to voters. This might happen if local governments take on a role of enabling service delivery (Helmsing, 2002) rather than directly delivering services. Moreover, by providing financing to subnational governments through intergovernmental transfers, higher level governments can delink the tax and expenditure sides of the fiscal equation. Elected officials will no longer be as accountable to voters as would have been the case if the desired public service package had been financed by local taxes. In this case taxpayers will tie service benefits more to the level of grants from higher level governments than to the level of local taxes. Even more likely, the benefits from increased subnational government taxes could be so negligible as to go unnoticed. The same will be true in industrialized countries with highly centralized fiscal systems, such as Australia or Germany. Spahn and Föttinger (1997, page 245) note that the highly centralized German system is so complicated that it is “impossible for voters and taxpayers to identify which government spends or taxes, and for what purpose.”

Equalization

A concern with tax assignment in many countries is equalization—that is, the taxable capacity and the administrative capacity is significantly greater in the wealthy regions. More local taxing powers in this case would lead to greater fiscal disparities. This is most problematic in the case of low-income countries because regional variations in taxable capacity are greater (Hofman and Guerra, 2007). Countries have dealt with this issue in four different ways. First, in Denmark an equalization formula is in place whereby any revenue collected that exceeds a specified percentage of the difference between estimated revenue potential and estimated expenditure needs is paid to an equalization fund which is distributed to local governments whose needs exceed their revenue potential. In Sweden, Spain, and Japan a similar equalization formula is used.

While fiscal disparities can be significantly reduced under such a system, it comes at a cost. The tax retained from an additional dollar of income taxes raised is lowered. This has led to a dampening of local government tax effort (OECD, 2006).

Second, under a derivation-based sharing system, such as in China, the subnational governments have no taxing powers. However, in the 1980s and 1990s when they perceived that their share of VAT and income tax reached too low a level, they reacted by gaming the system to transfer revenues from shared taxes to informal levies that were dedicated to extrabudgetary accounts. In effect, the subnational governments were able to retain a greater share of the revenue collected. This practice was curtailed by a recentralization reform of the intergovernmental fiscal system in 1994 (Bahl, 1999).

Third, some countries use the disparities concern to deny significant taxing powers to subnational governments. The Netherlands and Germany are examples for the OECD. In the case of many developing countries the argument might be that higher central taxes are needed to support an equalization transfer.

Finally, some countries leave the tax-created disparities in place but attempt to resolve the disparities problem with a system of intergovernmental transfers from higher level governments, or by the direct assumption of expenditure responsibility by higher level governments. The South African government, for example, allowed cities to levy a payroll and turnover tax, but equalized with an 'equitable shares' grant that allocated about one half as great a per capita amount to rich than to poorer local governments.

Tax administration

In the industrial countries tax administration is not usually a binding constraint in the tax assignment decision. Subnational governments assess and collect even broad-based taxes. This is primarily because the state or province-level tax administration often is efficient, and where this is not the case the central government serves as the collection agent. The industrialized countries are able to take advantage of the formality of their economies to mix and match tax administration styles to find an administrative regime that works (Timofeev and Martínez-Vázquez, 2004). In the US, federal–state cooperation allows the state governments to effectively administer the personal income tax by tying into a particular line on the federal return. The Swiss cantons administer their income tax, and the German Länder collect the central income tax. In the Nordic countries, however, the subnational government income tax is administered by the central government.

By contrast, administration is usually the most binding constraint on the tax assignment decision in developing countries. Many policy analyses and country studies focus on the comparative advantage of the central government in tax collection as a reason why the level of subnational government taxation should be low. The tax administration costs can be factored into the constrained maximization model as a higher price for tax-financed local public services. The level of subnational government taxation, then, would depend on the price elasticity of demand for these goods. The higher the cost of local versus central tax administration, the less the demand, and the lower the level of tax assignment to subnational governments.

A second constraint to increased subnational government taxes is the perception that the learning curve for the development of administrative skills is not very steep. The resources necessary to finance these improvements are limited, there might be little new revenue mobilization from this investment for a number of years, and in many cases the weak central government tax administration is thought to have first call on any such investment. During the waiting period for subnational government tax administration efficiency to take hold, voters may lose patience and confidence.

Finally, there is the question of how one might monitor the performance of subnational government tax administration—for example, in order to assess the success of an investment in upgrading the local system. The question of a ‘reasonable’ administrative cost for subnational governments is rarely pinned down in research on this subject. Even the concept of collection cost is not generally agreed to. The common practice is to measure administrative cost against collections—for example, ‘the cost should be less than 3% of collections’. The thinking here is flawed. If the goal is to choose a tax based in part on its collection cost, the better measure would be the cost of collecting some normative, *target* amount.

What we conclude from this is that the higher cost of tax administration at the subnational government level in developing countries is an important reason for the low level of own-source revenues assigned to state and local governments. But, in some ways, poor tax administration is as much a ‘whipping boy’ as a justification. Central governments (and international agencies) could long ago have begun a serious investment in upgrading administrative capacity at the subnational government level, or installing piggyback arrangements with local rate-setting powers and no local administrative responsibilities. When one takes the long view, the administrative rationale for limited assignment of taxing powers to subnational governments may be less about administration than about a fear of the consequences of fiscal decentralization.

Crowding out

An important determinant of the level of revenue mobilization is intergovernmental tax competition. If subnational government taxation crowds out central government taxation (ie leads to central taxes being lower than they otherwise would have been), then the overall level of revenue mobilization is dampened. If subnational government taxes do not crowd out, total revenue mobilization is enhanced by higher levels of subnational government taxation. Crowding out can be an important determinant of revenue assignment to subnational governments.

How does crowding out happen?

Subnational government taxing power may lead to an encroachment on the tax base of the central government. The result of higher local government taxes may be that voters will resist future increases in central government tax rates. In effect, the introduction of tax-base sharing causes a reduction in the fiscal capacity of the central government. There may also be an output effect, depending on the price elasticity of demand for the goods that are taxed, and the elasticity of substitution between inputs. The underlying argument is that the voters are concerned with the total tax burden, rather than with the burden imposed by each level of government.

Crowding out might be argued for either industrial or developing countries, but the case is more plausible in higher-income countries. One reason is that tax systems are more transparent, and taxpayers better understand how to use the vote. Moreover, in some OECD countries the income tax (Spain and the Nordic countries) and consumption tax (the United States and Canada) bases are formally shared. This makes matters even more transparent. A related issue is that higher joint tax rates and dual administration might lead to reduced compliance rates. For example, Plamondon and Zussman (1998) estimate that a single administration of the Canadian federal and provincial business taxes would reduce compliance costs by 1.3% of collections.

Stimulative effects

A reason to expect that decentralization will have a stimulative effect on overall tax effort is that subnational governments have some comparative, administrative advantages in reaching even the traditional income, consumption, and wealth tax bases. Some of those who are hard to tax under central government regimes may be less hard to tax by provincial and local governments. The result of tax decentralization in such cases may be a net revenue gain. This argument better fits the case of developing and transition countries where the central government tax administration does not effectively reach the legal tax base (Bahl and Bird, 2008).

These ‘informational advantages’ of subnational governments can take many forms. Often, for instance, state and local governments oversee a variety of licensing and regulatory activities, and they track property ownership and land-based transactions. They thus have better opportunity to identify businesses in the community and to gain some knowledge about their assets and scale of operation. Because the potential revenue gain is much more important for them in relative terms, subnational governments have more incentive to carry out such activities than do national governments. This provincial and local government knowledge of the tax base may allow them to capture some of those who presently do not fully comply, or evade taxes altogether. This would include the self-employed—including small businesses—who often underdeclare taxable income and consumption.

There is another factor that suggests a revenue enhancement effect from decentralization. ‘New taxation’ might lead to an overall revenue increase. In many countries, provincial and local governments have broadened their tax net with a variety of special tax instruments and administrative measures such as levies on the sales of assets of firms, licenses to operate, betterment charges, and various forms of property and land taxation (Bird, 2008).

What is the verdict? Does increased subnational government taxation crowd out central revenues and reduce overall revenue mobilization, or is it revenue enhancing, and is there a difference in this regard between industrialized and low-income countries? There is not much empirical evidence on the question of whether subnational government taxes crowd out central taxes, or whether they stimulate overall tax effort. Apparently, intangible factors such as fiscal culture and fiscal education matter a great deal. Lotz (2006) has observed with impressionistic evidence from OECD countries that there is no clear conclusion as to whether decentralized taxation power leads to an increase in the overall level of taxation.

Empirical model and specification

We provide a systematic test of the crowding out hypothesis, using data from industrialized and low-income countries. Consistent with the hypothesis here, the dependent variable is specified as central government tax revenues as a percentage of GDP. Measuring the dependent variable in this way raises a comparability problem because the central government tax ratio will vary across countries depending on the tax assignment that they make. In this analysis we control for this problem by including subnational government taxes as a percentage of GDP as an (endogenous) independent variable.

The other independent variables are meant to capture differences in taxable capacity, as has been the tradition in the earlier tax effort studies. All else being held equal, we expect that industrial countries will mobilize a greater share of GDP in taxes, and so we introduce per capita GDP as an independent variable. The agricultural sector share of GDP is included to show the (presumed) lower taxable capacity in countries whose economies are more reliant on agriculture. The degree of openness

in the economy (the sum of imports and exports as a percentage of GDP) is used to capture the tax-base-enhancing effects of trade. In the case of developing countries, trade provides a 'tax handle' that helps circumvent tax administration constraints (Bahl, 1971; Lotz and Morss, 1967). In the case of industrial countries it reflects a stronger economy and greater taxable capacity. On the other hand, trade liberalization and the zero rating of exports might cause us to expect that the marginal effect of openness on central tax effort would be negative.

The ratio of subnational government taxes to GDP is introduced as the (endogenous) tax decentralization measure. If there is a crowding-out effect, there should be a significant negative effect of the subnational government tax variable on the ratio of central government taxes to GDP. Further, as argued above, the expectation is that crowding out will be more likely where there is a larger subnational government tax sector, because these countries will have assigned the broad-based taxes to the lower levels of government. Where subnational governments have been given less access to broad-based taxes, there may be no crowding out at all when subnational government taxes rise. Therefore, we also include a squared term for the subnational government tax variable.

Estimation and results

Consistent with the crowding-out hypothesis, the share of subnational government taxes in total taxes is treated as endogenous.⁽³⁾ The level of subnational government taxes is determined in part by the tax assignments they have been given.

Data are drawn from a panel of seventy industrialized and developing countries created for the 1990–2003 period. Fiscal data are from the International Monetary Fund (IMF) (1980–2006) and the independent variables are from the World Bank (2006). The IMF data have been criticized because of their limited coverage of subnational government taxes, and because they do not account for the amount of discretion that subnational governments have in revenue mobilization (Ebel and Yilmaz, 2003). Some observations were missing for some years and were dropped. This unbalanced sample was used in the estimation. Fixed effects were introduced to account for country-specific factors.

The instruments used for the endogenous variable, the subnational government share of GDP, are population density, the labor force participation rate, industrial value added, and electricity consumption per capita. All of these instruments may be thought of as tax handles that are associated with a higher level of taxable capacity for subnational governments. To test the validity of our instruments we calculate *F*-test values in the ranges of 14.96 to 7.91, and 16.70 to 10.08, for the first-stage regressions for the subnational tax ratio and subnational tax ratio squared following Bound et al (1995). The *F*-test values are greater than the critical values calculated by Stock and Yogo (2002; table 2) for a desired maximal size of a 5% Wald test. We also obtained *p*-values of less than 0.005 for the Anderson-Rubin statistic and concluded that the instruments were robust for inference (Baum et al, 2003). Statistics are robust to heteroskedasticity. For the exclusion restriction we obtained a *p*-value of 0.9010 for the Hansen *J*-test for overidentification and were not able to reject the null hypothesis that the instruments are orthogonal to the error term.

The results for the structural equation are presented in table 2. The nonlinear relationship between the level of subnational taxes and the level of central taxes is significant, with an inverted U shape. At lower levels of subnational government taxes, there is a positive (additive) effect, and at higher levels there is evidence of a crowding-out effect.

⁽³⁾In the Hausman test for endogeneity we obtain a χ^2 value of -48.28 but the model fitted on these data fails to meet the asymptotic assumptions of the Hausman test.

Table 2. Regression estimates of the determinants of variations in central government taxes as a percentage of GDP: instrumental variables estimates (second stage), 1990 to 2003.

Variables	Two-stage least squares		Limited likelihood
	specification A	specification B	coefficients
Subnational government taxes as a percentage of GDP ^a	2.139*** (0.00902)	2.653*** (0.00697)	2.157*** (0.00935)
Square value of subnational government taxes as a percentage of GDP	-0.124* (0.0728)	-0.160** (0.0357)	-0.125* (0.0743)
Agriculture sector share of GDP	0.280*** (2.04 × 10 ⁻⁵)	0.271*** (0.000427)	0.280*** (2.22 × 10 ⁻⁵)
Per capita GDP (US \$)	0.277*** (0.00227)		0.276*** (0.00239)
Value of imports plus exports as a share of GDP	-0.0364*** (0.00333)	-0.0459*** (0.00164)	-0.0364*** (0.00359)
First-stage <i>F</i> -test	14.56 7.91	16.70 10.08	14.56 7.91
First-stage <i>p</i> -value	0.0000 0.0000	0.0000 0.0000	0.0000 0.0000
First-stage partial <i>R</i> ² of excluded instruments	0.0854 0.0304	0.0736 0.0279	0.0854 0.0304

***Significance at 0.001 level; **significance at 0.05; *significance at 0.1 level.

Notes: Estimated with an unbalanced panel for fifty-five countries for the period 1990 to 2003; estimation with country fixed effects; *N* = 520; standard errors are given below the coefficients in parentheses.

^aInstruments are rural populations as a percentage of total population, population density measured as the population per square kilometer, electricity consumption measured as kWh per capita, and labor force participation rate measured as the percentage of population over 15 years of age.

As expected, the level of central government revenue mobilization is positively and significantly related to the level of per capita GDP. The trade variable is negative and significant, indicating that, for any given level of per capita income, open economies do not give up significantly greater levels of central tax revenues. The agricultural share of GDP is significant but does not have the expected sign. Bird et al (2006) obtained similar results for the agriculture and trade variables in their tax effort analysis.

The same analysis was repeated excluding the per capita GDP as an independent variable, and there was little change in the results, as reported in table 2. We also use a limited likelihood (LIML) estimation to control for weak instruments [in line with Fuller (1977)] but found little change in the results, also reported in table 2. We reestimated the model with the central and subnational taxes in logarithmic terms but there was no major change in the results.

From these results we can say that the estimated response of central government taxes revenues (CT) to a difference in subnational government tax revenues (SNT), both adjusted for the level of GDP and all else held constant, is

$$\frac{\partial CT}{\partial SNT} = 2.139 - 0.248SNT.$$

From this equation we estimate that crowding out occurs after the subnational tax ratio reaches 8.63% of GDP. When we drop the agricultural share of GDP from the

equation, the crowding out threshold drops to 8.29% of GDP. Raising local taxes in countries with a low effective tax rate at the subnational government level is likely to add to overall revenue mobilization, perhaps because the increased burden will not be so noticeable. But in countries where the local burden is high and transparent (for example, the Nordic countries), increased subnational government taxes are more likely to crowd out central government tax revenues.

Summary and conclusions

The economic theory of tax assignment leads to a conclusion that the level of subnational government taxes should more or less match the level of subnational government expenditures that are characterized by local benefits. Moreover, these expenditures should be financed by taxes whose burden falls on beneficiaries. This points toward residence-based individual income and payroll taxes, destination-based sales taxes, property and land taxes, and various forms of licenses and user charges as the best choices for local government taxes. It is up to the central government (or the constitution) to work out a tax assignment that gives this balance. Grants should be restricted to dealing with services where there are national or regional priorities, and with equalization.

The real world of tax assignment has drifted from the model. The overall level of subnational government taxes is much higher in most industrialized countries than in developing countries—that is, the vertical imbalance in the intergovernmental fiscal system is greater in the developing countries. Moreover, while subnational governments in many OECD countries use individual income taxes, destination-based sales taxes, and property taxes, as the theory would prescribe, the developing countries do not. The question raised in the above discussion is why the practice follows the theory in some types of countries but not in others.

The discussion in this paper considers four reasons. First, the accountability feature that is the basis for arguing the importance of local government taxation often does not lead to a capturing of the welfare gains from fiscal decentralization in developing countries. This is because a popular voting regime is not in place or because voters do not have the information necessary to effectively use the vote. Second, tax decentralization may lead to unacceptable fiscal disparities and in such cases equalization schemes become problematic. Third, tax administration costs are higher for subnational governments than for central governments, and narrowing this differential may not fit the interests of centralists. Fourth, there is a fear at the central level that giving more discretionary taxing powers to local governments will lead to a crowding out of central revenues.

The result of all of this is a kind of perfect storm where the elements have come together to dampen the relative level of subnational government taxation in developing countries. Central governments generally do not want to give up taxing powers for political or perhaps macroeconomic reasons. Elected officials in subnational governments are not enthusiastic about the accountability that comes with taxing power, and local voters have neither the information (nor perhaps even the vote) to push for such a change. The weak tax administration capabilities of subnational governments provide good cover for not moving toward the decentralization of taxation powers.

As a matter of public policy, however, tax centralization may exacerbate some fiscal problems in low-income countries. Fiscal discipline rules in industrialized countries are usually based on discretionary local taxing powers and an intergovernmental transfer system that forces a hard budget constraint on the lower level governments. Without significant taxing powers, the avenues to budget balance that are open to subnational governments are to reduce spending, to borrow, or to lobby the higher level government for additional transfers.

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