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Arindam Das-Gupta

Georgia State University
ANDREW YOUNG SCHOOL OF POLICY STUDIES

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International Studies Program
Andrew Young School of Policy Studies
Georgia State University
Atlanta, Georgia 30303
United States of America

Phone: (404) 651-1144
Fax: (404) 651-4449
Email: ispaysps@gsu.edu
Internet: http://isp-aysps.gsu.edu

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Implications of Tax Administration for Tax Design: A Tentative Assessment

Arindam Das-Gupta[*]

[*] Professor, Goa Institute of Management, Ribandar, Goa 403006, INDIA
Email: oldmonk87@yahoo.com

1. Introduction and overview

Richard Bird, recently made the following very perceptive comments about what economists know about tax administration[1]

"We know very little about tax administration.

There is no "one size fits all" policy (OSFA).

"The devil is in the details".

Implementation is as important as design.

Political will, support and non-interference in operations are indispensable prerequisites."

If his first observation is taken to mean "we probably know quite a bit about tax administration, but what we know is a small fraction of what we need to know", then these five observations taken together accurately describe the extent of knowledge and the likely scope at present for general propositions in the analysis of tax administration. The objective of this paper is to discuss major aspects of what is known about how tax administration influences tax design. The discussion draws on both theory and practice. Though empirical evidence is also examined where possible, its rarity in relation to tax administration implies that a lot of what is discussed in this paper is what we *think* we know, rather than what we can confidently say we *do* know. The paper's tone is tentative and has become increasingly so during its writing. As a result, the discussion in this paper may equally well be seen as suggesting hypotheses as part of an agenda for theoretical research and rigorous empirical testing.

In section 2, working definitions of the terms "tax administration" and "tax design" are proposed. The position taken is inclusive, in that all but a small specified set of activities connected with raising tax revenues are taken to fit into either tax administration or tax design. Benchmarks for judging "good" tax administration and tax design are then briefly described.

This discussion serves as a backdrop to an examination of properties of tax administration and their implications for the design of taxes in section 3. These lessons or conjectures are termed "propositions", though they bear little relation to propositions in

[1] In his introductory remarks on tax administration in the course " Practical Issues of Tax Policy and Tax Administration in Developing Countries" organized by the World Bank, March 22-25, 2004, New Delhi.

theoretical economics. After presenting three key insights about the impact of administration on the public budget and tax design, another 26 propositions are presented, and support for them from theory, evidence, and practice (and educated guesswork) are reviewed. These propositions are summarized in Annex 2.

Section 4 draws on the analysis of section 3 to attempt to identify important administrative constraints on the design of four major taxes and two cross-cutting areas of tax policy. In Section 5, bearing in mind Richard Bird's observations on the absence of "one-size-fits-all" administration rules and the importance of finer details, an attempt is made to identify sensible process features in designing administration friendly taxes. Section 6 points to some issues not covered in the paper and concludes with a plea for more research.

The paper focuses on how administration influences tax policy: It does not go into prescriptions on how tax administration effectiveness and efficiency can be increased through other institutional, incentive and management reforms. An illustrative selection of such reforms are stated in Annex 3.

2. "Tax administration" and "tax design": working definitions

Imagine that in an economy alternative, economically costless, revenues became available to replace tax revenues. Compared to this situation, in principle, all activities, organizations and institutions in an economy that would not exist in the absence of taxes fall within the ambit of what may be termed the economy's *tax system*.

In simpler times, one can imagine a ruler of a country telling her soldiers "get me as much money or money's worth as you can from my subjects" (the tax design). Soldiers would then do the ruler's bidding (tax administration). Neither this tax design nor this tax administration would be acceptable in modern economies, if indeed such a tax system were feasible. Nevertheless this example captures the essence of what is encompassed in the elaborate tax systems of today. Anticipating the evaluation of tax systems below, this tax system has several problems: There is no relation between tax revenue and public expenditure, it does not (ex ante) satisfy Adam Smith's canon of "certainty", is potentially inequitable and distorting of resource allocation including investment, and leaves the tax administration with a great deal of discretion facilitating corruption. It also starkly

illustrates how *tax* simplification can be carried too far. Nevertheless, the tax system does have the virtue of *administrative* simplicity illustrating the pervasive trade-off in tax systems between economic efficiency and equity on one side and administrative simplicity on the other.

Compared to this system, the variety of activities which a modern economy's tax system encompasses can conceptually be divided into four sets:

- First, defining *normal and penal tax rates*, *tax bases*, *tax concessions*, *taxable entities*, *non-compliance penalties* and the *timing of tax payments*. This is what is referred to here as *tax design*. Taxes so designed are formalized as laws of the land in tax laws proper, but also such things as bilateral tax treaties.
- Second, the *institutional process* of translating a tax design into law, or what may be termed tax policy institutions. This covers activities such as public debate and discussion, executive branch tax proposals, legislative debate and legislating tax laws. Tax laws themselves are excluded.
- Third, *education and research* related to tax systems, both in general and specific to a particular tax system. Included are such things as academic research and teaching and expert advice to governments. In the intersection between this and the previous set lie government appointed tax commissions. To prevent overlap with tax administration, educating taxable entities of their specific obligations to comply with tax laws, or what is commonly termed taxpayer education, and training government officials who collect taxes about tax laws and procedures are excluded.

All other activities within an economy's tax system are taken here to fall within the ambit of *tax administration*. Seen in this way, the scope of tax administration is quite large. A partial list of important components of tax administration is in Table 1.

Table 1: Important Components of Tax Administration (TA)	
Institutions and organizations	**Role and function**
The "Tax Ministry"	Monitor, forecast and set targets for tax revenue collection. Formulate administrative law which facilitate the implementation of tax law
The Tax Department(s) (TDs) or tax administration in the narrow sense	Facilitating and enforcing compliance by taxable entities with legislated tax laws. Key *taxpayer related* activities include Identification of taxable entities, registration, information collection on tax bases with taxable entities, goods and asset valuation, physical checks and searches, investigation, tax liability determination, ensuring payment of tax dues, facilitating compliance via taxpayer education, taxpayer services and grievance redressal, administrative rulings, representation in tax disputes, enforcing compliance, imposing administrative sanctions in case of non-compliance. Key *internal* activities include Obtaining and deploying labour, capital and managerial resources, organising and motivating staff to administer tax laws, monitoring staff, appointing and coordinating agents in case of outsourced activities, sanctioning unauthorised conduct, reporting to the Minister, coordinating with other TDs (within the economy and in other economies).
Independent audit, anti-corruption and (usually legislative) oversight bodies.	Ensure that the TD discharges its functions in accordance with the law ("effectively") and at the lowest possible cost to society ("efficiently").
Agents and third parties to whom tax activities are outsourced (e.g. banks, tax withholders, tax farmers, tax form printers)	Performing outsourced activities.
Civil courts, arbitrators, tribunals	Resolving disputes between TDs and taxpayers or third parties.
Police and the criminal justice system	Providing protection to TD staff. Legal proceedings and judicial sanctions in non-compliance cases.
Tax practitioners (preparers, accountants, tax lawyers), their associations and their organizations.	Assisting taxpayers in complying with legal tax obligations and minimizing tax dues Representation in case of disputes.
Legally taxable entities (including individuals) and their associations	Complying with tax laws or undertaking activities to facilitate non-compliance. Associations: Coordinating with TDs, tax practitioners and tax policy institutions.

This brief description of tax systems merits three immediate comments: First, there is much cross-country and historical diversity in each of the activity sets and TA components. Second, several components of tax systems, particularly of tax administration as defined here, have not been adequately analysed and studied. Third, there are no adequate estimates of the social cost of raising tax revenue (discussed further below).

Most, but not all, properties of TA discussed in this paper will pertain to TDs (Tax Departments) or "tax administration in the narrow sense", since this area has been most widely examined.

What features can be considered desirable and so used as benchmarks when examining tax design and TA? Ideally, a good tax system is one that is part of a welfare maximizing public budget. The standard optimal tax criterion that the tax system should minimises the welfare loss associated with raising a given amount of revenue is partial, in that it assumes that the expenditure side of the budget, and indeed the mix between tax and non-tax finance is already optimally determined. Since an adequate solution to this problem is not yet available, a number of rules of thumb are perforce used here, which are identified as they are used.[2] Broadly, tax design features that increase the social cost of TA for raising a given amount of revenue (*collection efficiency)* or which constrain the ability of a TA to administer tax laws are identified as administratively undesirable and conversely. Related to the second criterion is the concept of TD *effectiveness.* The two dimensions of *in*effectiveness are the extent to which actual revenue collected by the TD fall short of potential revenue per prevailing tax law (or the *tax gap*) and the extent of inequity across citizens due to TD procedures and administrative law.

3. What we know or think we know

Before turning to the impact of the TA on tax design *per se*, its implications for the public budget are first pointed out. To do so, the evaluation framework of Slemrod

[2] For example, Adam Smith's canons of taxation of 'Certainty', 'Convenience', 'Economy', and 'Equity'. Note that the first three relate directly or indirectly to TA costs. For optimal policy criteria encompassing the entire public budget see Atkinson and Stern (1974), Feldstein (1997) and Slemrod and Yitzhaki (1996, 1998, 2002).

and Yitzhaki (1996, 1998, 2002) is used. The framework, already useful as an aid to conceptual thinking, has promise as a tool for empirical policy evaluation.

3.1 Tax administration costs and the public sector

Proposition 1: If TA costs increase, there should be less reliance on tax finance, less government expenditure or both.

Intuitively, at the margin, social costs of different sources of finance in the public budget, including non-tax revenues (user charges, fees, dividends and interest from government assets), debt and money finance, should be equated to minimize the total cost of financing public goods and services. Furthermore, if the tax price of government provided goods and services increases, the optimal ratio of private goods to public goods should increase as well.[3]

These rules, but only for marginal changes in tax design and administrative procedures, are formalized in Mayshar (1991).[4] A simple exposition of the Mayshar rules is in Slemrod and Yitzhaki (1998): Suppose the welfare function which the government seeks to maximize is V(U(E,w),G)), where U(.) is the indirect utility from private goods of citizens, w is the wage rate, G is the quantity of public goods and E is a vector of policy instruments used to raise finance for G. The optimum choice of G and E is given by MBF = $MECF_i$, where MBF is the social marginal benefit from funds in terms of foregone private consumption and $MECF_i$ is the marginal efficiency cost of funds of the ith financing instrument. The MECF of the ith tax instrument incorporates TA costs.[5]
This formula can also be used to examine specific tax design or TD procedures, not just tax and non-tax instruments. For example, Poapongsakorn et. al. (2000) apply the MECF

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[3] It should also be borne in mind that recent attempts to measure the excess burden of taxation suggest that these are much higher than earlier estimates suggest (Bird and Zolt, 2003), though this is addressed here.
[4] See also Atkinson and Stern (1974) and Slemrod and Yitzhaki (2002).
[5] Private sector costs and TD costs do not have additive effects on the MECF. The equation derived by Slemrod and Yitzhaki (1996) for the case where distribution is not taken account of is $MECF_i = \frac{\gamma(X_i - MR_i) + C_i + MR_i}{MR_i - A_i}$, where X_i is the potential increase in tax revenue if the tax base remained unchanged after the marginal increase in the ith tax instrument, MR_i is the marginal revenue actually collected: $(X_i - MR_i)$ is therefore termed by them as the "leakage" out of the tax system. γ is a valuation parameter which will be above unity if taxpayer's optimal responses are constrained ("at a corner"), C_i is the marginal private sector compliance cost, and A_i is the marginal administrative cost – so that $MR_i - A_i$ is the net revenue raised. Distributional affects, both on the resource and expenditutre sides is incorporated in Slemrod and Yitzhaki (2002).

framework to the evaluation of taxpayer surveys to discover non-filers in Thailand.[6] They compare this to the benchmark alternative of raising tax rates proportionately in revenue neutral fashion.[7]

3.2 The major implication for tax policy

Proposition 2: Without taking into account administration costs, the efficiency cost and the equity impact of a real world tax system cannot be assessed.

This is uncontroversial. Nevertheless, some examples will make to scope of this proposition clearer.

The lump-sum tax, that essential benchmark in economic theory, is subject to lobbying costs.[8] The nearest real-world equivalent, the poll tax, entails TD costs and, as illustrated by the Thatcher tax, additional resource costs stemming from taxpayer resistance and political instability.

In the presence of tax evasion and invoice fraud (evasion reflects imperfect enforcement capacity of a TD), intermediate inputs may continue to bear tax under a VAT so that production efficiency does not obtain.[9] The extent of input taxation is directly dependent on the effectiveness of invoice-matching by the TD.

As discussed below (in the section on tax farming), a taxing scheme which, in theory, greatly reduces TD costs and avoids the excess burden of taxes, may turn out to have little or no impact on TD costs when implemented.

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[6] See also Fortin and Lacroix (1994) who analyse Canadian taxes.

[7] It would be of great interest to apply the MECF approach of Slemrod and Yitzhaki (1996, 1998) to the choice between different financing instruments, to assess their relative desirability from a "public finance" perspective. While usable parameter estimates are not yet available, it is very likely that both A_i and C_i will be smaller for marginal increases in money or bond finance as compared to, say, revenue from stepped up tax audits.

[8] Tollison? reference?

[9] For a theoretical analysis, see Das-Gupta and Gang (2003). The analysis of international experience in Ebrill et. al. (2001) does not find clear evidence of growth benefits from the VAT, though this could be due to data limitations.

3.3 The key tax administration insight

Proposition 3: Tax designs which economise on information requirements are least costly to administer.

The main functions of a TD and most of TA are concerned with information.[10] While information collection and interpretation are most important and most costly for administration, information storage, communication and dissemination is also necessary.[11] Consequently, a leading hypothesis in the literature, that has appeared repeatedly in different guises, is that *tax designs which economise on information requirements are simplest to administer*.[12] The implications of this for tax design, particularly for developing countries, are widely accepted and are part of the standard advice package given to most governments:

"A tax system with *few taxes*, *a limited number of rates for each tax*, *limited exemptions*, and *a broad base* has proven, in the context of many developing countries, to be much easier to administer and to result in higher compliance levels than a complex tax system". (Silvani and Baer, 1997, emphasis added).[13]

It is worth examining these design features in relation to their information conserving properties.

Information economies achieved from *few taxes* not only assist TA, but also make *effective tax incidence* on different goods or entities easier to determine and so facilitate

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[10] This hypothesis has been put forward repeatedly in the literature. For a recent example, see Bird (forthcoming). Or consider Slemrod and Yitzhaki (1998): "An important set of generic aspects of income tax structure, non-taxation of imputed rents of consumer durables, taxation of capital gains (if at all) on a realization basis, and pre-set depreciation schedules, are undoubtedly largely driven by practical concerns of administratability."

[11] As Lasheras and Herrera (1991) put it, costs increase if more information needs to be collected, used and stored, not if more revenue needs to be collected.

[12] This does not justify the neglect of necessary information. For example, tax return form simplification achieved by drastically reducing their information content will reduce the accuracy of tax determination by the TD. However neither does this condone the collection of excessive information, usually a much more serious problem (see Bird forthcoming).

[13] Or consider Wallschutzky (1989) as quoted in Bird (forthcoming): Keep the tax laws as simple as possible; - Aim for a global tax with few exemptions, credits, rebates, or deductions; - Do not try to use the tax system to achieve too many social and economic goals; - Continually monitor the tax system; - Concentrate on basic tasks such as collection of tax at source and an ID number system; - *Do not collect more information than can be processed; — Actively encourage good record keeping; and — Aim, as a long term goal, for self-assessment*" (emphasis added). Additional references are cited in Bird (forthcoming).

tax designs with limited economic efficiency and equity costs in addition to directly lowering TA costs.[14]

Few rates of tax, in the case of taxes on goods, reduce the possibility of non-compliance through misclassification. While no misclassification is possible with a single tax rate, with N tax rates there are $\frac{N(N-1)}{2}$ ways to misclassify goods subject to a high tax rate as goods subject to lower tax rates. This increases the information verification burden of a TD for tax determination.[15]

Few exemptions also limit the number of *effective* tax rates and the need to verify, case-by-case, compliance with the conditions under which exemptions are granted.

The rationale for broad bases comes from the indirect information saving due to lower non-compliance opportunities and incentives. With few exclusions from the tax base, tax evasion or avoidance by claiming to belong to an excluded category becomes harder. Furthermore, for a given revenue requirement, tax rates can be lower than is the case with a narrow tax base.[16] This reduces the incentive not to comply, as expected gains from non-compliance are directly related to the tax thereby saved. Both reduced non-compliance and the likely positive impact on the tax base due to lower economic efficiency costs from low tax rates, lead to secondary, reinforcing, base effects.

Nevertheless, where there is a conflict between information economies and the "standard advice", exceptions arise. For example, for a global income tax, information is needed more to verify the tax base (income), than to verify the applicable tax rate. In fact, when it is possible and cheaper to outsource tax determination and collection via *tax withholding*, information needs of the TD and overall tax collection costs can be reduced by instituting *final withholding taxes*. This fragments the tax base, making it schedular, and goes contrary to the standard advice of few taxes. Furthermore, if gross payments and net income from each source differ, multiple effective rates of tax become likely even with a common withholding tax rate. There is, inevitably, a caveat to this caveat:

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[14] A recent government commission in the state of Karnataka in India determined that the number of commodity tax rates on different goods, due to multiple levies and differing bases, was potentially infinite! See Finance Department, Government of Karnataka (2001).

[15] For a recent evaluation of the impact of misclassification on customs revenue, see Fisman and Wei (2004).

[16] Unless tax rates with a broad base are inefficiently high being beyond the rate(s) at which the Laffer curve peaks.

progressive income tax rates create the incentive to split taxable entities below their economically efficient or least cost size, a problem that arises in the case of unincorporated business firms in some countries.

The implication of administration cost saving due to information economies is a "pervasive trade-off between accuracy and cost of complexity".[17] The inadequate recognition to date of costly information in optimal tax theory is possibly an important reason for optimal tax prescriptions in the literature continuing to be, by and large, without practical appeal.

3.4 Information and basic tax administration

Proposition 4: TD costs decrease with presumptions.

This follows from the information economies achieved by presumptions and presumptive taxes. Presumptions are pervasive in tax designs even in developed countries, via tax depreciation schedules, fixed schedules for entertainment deductions and ceilings or fixed allowances for other deductions. Alternative minimum tax regimes for corporations (see Tanzi and Sadka, 1993) and turnover based simplified tax regimes in lieu of the VAT for small firms, are other examples.

The selective use of presumptions is unavoidable if taxes are to be administratively feasible. Two criteria can be suggested for replacing "normal" tax laws by presumptions: First, other things equal, presumptions are more likely to be efficient the higher is the TA's (not just TD's) cost of information to determine or verify normal taxes and the lower are the social losses due to equity and efficiency costs. Examples are depreciation schedules, informal or farm sector value added and prices of imports. Second, presumptions that can be used immediately are more likely to be desirable on revenue ground if normal tax determination procedures require information not immediately available and if the TDs future ability to collect tax from the entity is uncertain. Examples are on-the-spot fines and final withholding taxes.

For presumptive taxes which substitute for "normal" taxes, a key design issue is the alternative tax base on which presumptions are to be based: The base(s) for presumptive taxes should ideally be closely correlated with the normal tax base, but

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[17] Slemrod and Yitzhaki (1998). Tax complexity is discussed below.

should, at the same time, be relatively immutable and not subject to manipulation or concealment from the TD by taxpayers. For example, profession or sector of operation, location, physical business assets and how old the business is can together serve as a joint proxy for income.[18]

Proposition 5: Effectiveness in low capacity TDs is increased by selectively exempting the hard-to-tax, including the informal sector, from normal tax compliance obligations.

Intuitively, large resource expenditure by the TD chasing after meagre revenue gains if it attempts to verify the, typically unrecorded or poorly recorded, income, sales or other tax base of the hard-to-tax cannot be optimal.[19] Theoretical support for this position is in McLaren (1998).[20] Practical advice to deal with the hard-to-tax suggests the use of presumptive taxes, particularly in less developed countries with large informal sectors.[21] The same is true of self-employed professional, who are among the hard-to-tax in the formal sector.

Proposition 6: TA procedures (withholding and advance tax) can increase administration effectiveness and efficiency.

Both tax withholding and advance taxes according to a laid down advance tax rate schedule have been found to have revenue benefits, while lowering tax collection costs and so are to be strongly advocated unless horizontal and inter-sectoral equity violations outweigh TA benefits.

Of different privatized activities, evidence suggests that most important for TA effectiveness is tax withholding.[22] Besides increasing compliance in general, tax

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[18] This was the rationale of the Israeli *tahshiv*. See Tanzi and Casanegra de Jantscher (1987) and Rajaraman (1995) for discussion and evaluation of this and other presumptive tax schemes.

[19] However, Terpker (2003) points to an inevitable caveat: Resources expended to tax the hard-to-tax may optimally be more than pure revenue and efficiency considerations dictate, if tax morale or compliance by others is adversely affected by the existence of lightly taxed sectors. Such inefficient use of resources is less costly in developed countries which have smaller proportions of hard-to-tax taxpayers according to preliminary evidence in Alm and Martinez-Vazquez (2003).

[20] Complete exemption of the informal sector is found to be optimal, in some cases, for low capacity TDs in McLaren (1998). In the model he constructs, capacity is measured by the number of audits a tax inspector can conduct. One of two optimal commodity tax designs, given identical households, evasion and endogenous black markets is a zero tax rate on black market sales. This is due to enforcement costs being intrinsically non-convex in his model.

[21] For recent reviews see Alm and Martinez-Vazquez (2003) and Terpker (2003).

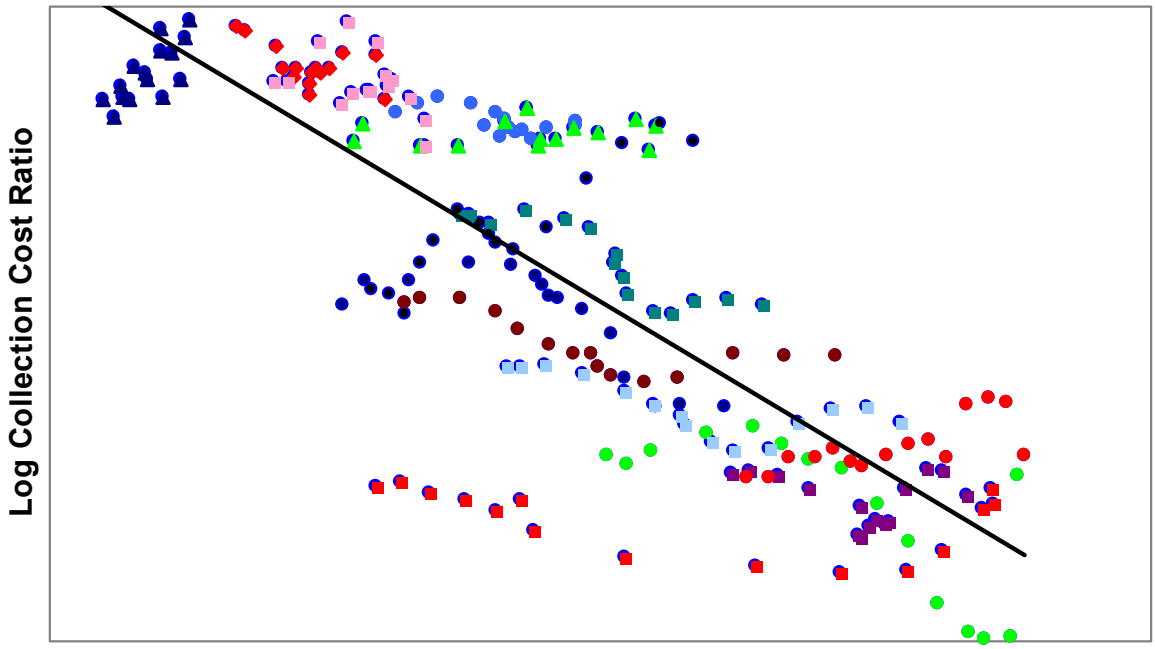
[22] Evasion of taxes by individuals who have taxes withheld has been found to be lowest among different groups in the Taxpayer Compliance and Monitoring Surveys conducted periodically by the United States

withholding may be the only way to collect at least some taxes from small non-resident taxpayers and from "ghosts" who do not file returns and who have not been identified by the TD.

The compliance increasing property of advance tax payments has been empirically supported by studies of the United States and some European countries.[23]

Proposition 7: TD costs decrease with concentration of the tax base across entities

Figure 1: Tax Collection costs and per capita GSDP in major Indian states, 1985/86-2001/02 (3-year moving averages)



Direct evidence for tax base characteristics which reduce TD costs is difficult to come by. Differences in government accounting conventions make TD cost data across

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Internal Revenue Service. See, for example, Kamdar (1995) and Slemrod and Bakija (1996). For indirect evidence see the discussion of the "balance due effect" in Jouljaian and Rider (1998) and references cited there. For theoretical analysis of withholding, including evasion out of withheld taxes, see Yaniv (1988, 1998) and Das-Gupta (2004).

[23] See Yaniv (1999) and the reference cited there. Yaniv (1999) seeks to explain this finding using the prospect theory hypothesis. In particular, non-rational taxpayers who have had to pay advance taxes according to schedules laid down in the tax law are assumed to focus on "out-of-pocket" gains at the time of filing.

jurisdictions non-comparable.[24] Even if cost data could be made comparable, differences in tax mixes and individual tax designs would still pose a problem.[25] Given common budget accounting rules in Indian states and broadly similar tax structures, data on collection costs and its correlates for the 14 major Indian states for fiscal years 1985/86 to 2000/01 may shed some light on the question.[26] In Figure 1, collection costs as a percentage of own tax revenue of states is graphed against Gross State Domestic Product (GSDP) per capita (different colours are used for different states). The graph suggests a systematic association between the two variables.[27] This accords with intuition, which suggests that administration costs would increase with the number of taxpayers rather than taxes per se, a point made by Lasheras and Herrera (1991).

Other tax base characteristics which should tend to reduce TD collection costs as a ratio of tax collected are population density (or state area and population), urbanization, literacy, and a lower sectoral share of agriculture and possibly a higher share of manufacturing. In regression experiments, higher literacy rates did not appear to increase collection efficiency. While this preliminary statistical evidence (Annex 1) is not conclusive, all the other variables appear to be statistically associated with increased collection efficiency.[28]

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[24] In the language of production functions, these tax base features can be identified either as productive inputs or components of the "residual", in the spirit of Denison, in a TD production function. Production functions of tax administrations are examined or described in Lasheras and Herrera (1991), Bagchi, Bird and Das-Gupta (1995), Hunter and Nelson (1996), Das-Gupta and Ghosh and Mookherjee (2004) and Bird (forthcoming).

[25] Earlier cross-country evidence on collection costs, though not of scale economies, is in Lasheras and Herrera (1991) and Das-Gupta and Mookherjee (1998). The former present data on 10 member countries of The Inter-American Association of Tax Administrations (CIAT) while the latter present data on 19 countries from different sources.

[26] Even these data are not fully comparable: Though all states follow the same modified cash accounting system and though major accounting heads are common to all states, local minor heads variations exist. The data used here, on "expenditure on collection of taxes and duties" , are taken from the World Bank which, in turn, are taken from Annual Financial Statements of states. Permission from the World Bank to use the data is gratefully acknowledged. For Maharashtra, data have been "cleaned" using government of Maharashtra data to remove some transfers to reserve funds booked under the account head. Regarding tax structures, four taxes, the sales tax, stamp duties and registration fees, state excises on liquor and motor vehicle taxes contributed between 72.3 and 99.4 of own tax revenue in different years during this period, with a mean of 90.4 and a coefficient of variation of 0.07.

[27] A simple double-log regression has an R-squared of 0.26. This rises to 0.99 on either including other hypothesized determinants or on using weighted least squares and a first order autoregressive error specification.

[28] An additional variable, the share of central government transfers to states in their total revenue, proved to be highly significant in most cases, suggesting a negative impact of transfers on state tax collection

The implications for tax design, if these results can be generalized, is that jurisdictions with higher per capita income will find it less costly to collect a greater proportion of their taxes from income taxes and other direct taxes. In terms of reform, moving to greater reliance on direct taxes with development is likely to be cost efficient. This broadly accords with cross-country evidence on actual tax structures.[29]

Proposition 8: TA costs increase with complex tax bases.

A precise definition of "complex tax bases" being elusive, a practically useful general discussion is difficult to provide and only brief remarks are made here.[30] Nevertheless, some cost increasing features which contribute to complexity figure in the propositions discussed below, with respect to multiple tax entities, international tax bases and non-revenue objectives. Several tax design features leading to complexity are widely accepted and most of these features require more information.[31] In practice, tax provisions having one or more of the following properties can be conjectured to contribute to complexity: (a) they involve greater than average expenditure by the TA (not just the TD) per unit of tax revenue; (b) they lead to frequent tax disputes; (c) the number of pages of tax law, including administrative law and judicial rulings, devoted to qualifications, exceptions or computational instructions is high; and (d) only tax law experts fully understand the provision. Among specific tax design features that are likely to contribute to complexity: Values (which require both prices and quantities) rather than quantities alone; bases for which a greater number of dates and locations of different events is needed for tax

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effort, as reflected in cost efficiency. This is similar to findings for some other countries though the specific channel through TD collection efficiency has not been previously noticed.

[29] An OLS regression of the (log) share of "income, profits and capital gains taxes" in total taxes on (log) GDP per capita and dummy variables for oil producing and transition economies, using data on 101 countries from the World Bank's World Development Indicators for 2001, has a positive coefficient, significant at 99% but an R-squared of only 0.288. This is similar to findings of earlier cross-country tax structure studies. Earlier work is in Hinrichs (1966), Bahl (1971), Chelliah et. al. (1975), Tait et. al (1979), Tanzi (1992) and Das-Gupta and Mookherjee (1998).

[30] Discussions of complexity are in McClure (1989), Glassberg and Smyth (1995), Kaplow (1996), Slemrod and Bakija (1996), and James, Sawyer and Wallschutzky (1997). According to Bagchi, Bird and Das-Gupta (1995): "Complexity refers to the possibility of the base being wrongly estimated even if all components are fully observable". They point to the measurement of complexity as an important task for research. A recent attempt by Gale and Holtzblatt (2002), who define complexity as the total resource cost of the tax system, partly following an earlier suggestion of Joel Slemrod, is unsatisfactory, as it assumes as true the hypothesis that complexity, and complexity alone, leads to high costs.

[31] For example, McClure (1989) identifies five causes of income tax complexity: (a) rules to precisely define real economic income; (b) tax expenditure clauses; (c) provisions to counter abuse of tax concessions or resulting inequity; (d) rules covering the transition between existing and new provisions; and (e) a general lack of logical coherence of the tax law.

determination; and bases for which a greater number of entities from whom or about whom information is needed for tax determination.

Proposition 9: TD Costs increase with the number and variety of taxable entities.

The number of types of entities subject to different taxes, particularly the income tax, tends to be large. Entities are distinguished by residency status, ownership, whether they are incorporated or not, profit or not-for-profit organizations, by the nature of their economic activity (financial sector, trade, production, real estate), by the amount of the tax base in their hands (large taxpayer, small business) and so on. To some extent this is inevitable in modern economies, despite equity violations and the scope for tax avoidance this creates. Nevertheless, since types of information for tax determination by the TD typically differ across entities, sometimes because tax design provisions are tailored for particular entities, this increases TD costs. A possible exception to this, especially in low capacity TDs, is targeting TD effort to assess large taxpayers.[32]

The obvious implication for tax design is to reduce the number of tax entities recognized or treated differently in the tax law, though this rule is difficult to apply in practice, especially where more than one tax jurisdiction is involved.

Proposition 10: TD capacity in closed economies increases with financial development

The extent of adoption of modern accounting methods by business and the extent of use of modern, bank mediated, payment mechanisms (cheques, book-transfers and credit cards) is of importance to the TD. With modern payment technology transactions leave an "audit trail" which permits easier detection and verification of payments in tax investigations by the TD. To encourage adoption of modern accounting and cheque usage, particularly among small traders, taxpayer education and even a cost-based deduction from taxes, could be considered.

On the other hand, as Slemrod (1990) points out, sophisticated financial systems coupled with openness increase the ease with which funds may cross international borders to escape taxes (discussed further below).

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[32] For example, see Baer (2002). As usual "the devil is in the details": A caveat to this exception is that the *reported* tax base of a taxpayer is not the correct criterion to identify large taxpayers: as with presumptive taxes, characteristics which are easy for the TD to observe and which are hard for the taxpayer to manipulate should instead be used. See Das-Gupta, Ghosh and Mookherjee (2004).

Both these observations suggest that appropriate tax designs at different levels of financial development and openness differ. To repeat a now familiar point, design solutions should take account of differences in information availability and economies for the TD.

Proposition 11: It is efficient for countries with low literacy levels and underdeveloped accounting professions to rely relatively more on commodity taxes.

That reliance on commodity taxes, particularly on international trade in goods (though not services), tends to vary inversely with per capita GDP is a well known empirical regularity. That this is due to the relative ease with which goods can be taxed, particularly at national borders, is also widely accepted. This is well illustrated by customs administration, where border checks continue to be of importance.[33] In contrast, income and value added are intrinsically accounting concepts, especially where there are both receipts and expenses and where these are subject to timing differences. Second, with sales or other payment transactions between citizens that affect tax bases, the information available to the TD from the payment technology in use becomes important. Direct cash or barter payments which do not involve third parties are difficult for a TD to detect. Goods production and sales are least affected by this information constraint.[34] As countries develop, to move smoothly to greater reliance on income taxes, and also the VAT, it is useful for them to focus on developing accountancy capacity and modern payments channels.

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[33] This advice is to be found in the context of the VAT by Ebrill et. al. (2001). For example, the removal of border checks in the European Union has resulted in falling VAT revenue from cross-border goods sales (Chang Woon Nam et. al. 2003). For discussion of the case of India, see Das-Gupta (2003).

[34] Physical asset sales and ownership also fall into this category. Property and asset taxes are of limited importance in most countries, except for local government finance and some city states (Hong Kong, Singapore) where they can be a major source of revenue. Why an economically efficient base like immobile land is not more heavily taxed is not a question which this paper is competent to deal with. Furthermore, while the logic of the argument being presented here would apply to property and asset taxes, it is difficult to conclude that increased reliance on property taxes is possible or desirable without taking into account alternative potential sources of local government finance. This issue is not pursued further here.

3.5 Information access and the law

Proposition 12: TD effectiveness decreases with restricted access to information (including privacy laws)

This point is made in Bagchi, Bird and Das-Gupta (1995) who also provide a brief review of restrictions on TD access to information in different countries and their link with widely recognized human rights. As with many of the propositions in the paper, rigorous theoretical analysis and empirical evidence is still lacking on the impact of restricted information access of different kinds. Restrictions apply particularly to financial information from banks and for information that can only be discovered by searches of persons or private records by the TD. Relaxation of privacy laws to increase TD access has costs via violation of basic human rights and possibly reduced effectiveness of financial intermediation.[35] The implication for tax design is that financial transactions involving banks, unrecorded assets, and transactions involving difficult to verify expenses (e.g. business entertainment) or receipts by individuals or firms should either be excluded from the tax base, or taxed or allowed as deductions using presumptions.

With increased information technology and particularly internet penetration, financial development and adoption of modern accounting, information once considered private is increasingly becomes publicly available. So, once again, the efficient tax base will vary with these characteristics of financial development and adoption of information technology. In terms of the tax mix, indirect taxes particularly on cross-border transactions, typically rely less on private information to verify tax compliance and so should be relied on relatively more when privacy laws impede TD effectiveness in collecting income taxes.

Proposition 13: TD costs increase and effectiveness decreases with stringent evidence standards

Related to the previous proposition is the question of standards of evidence. The quality and sufficiency of evidence required by a TD to establish non-compliance is

[35] For a recent discussion of these issues in the context of tax information exchange treaties see Zagaris (2003).

determined by standards of evidence applicable to tax matters in a country.[36] This can range, in legal terminology, between "preponderance of probability" usually adopted in civil cases to "beyond reasonable doubt" applicable in capital crimes. Furthermore, whether the burden of proof is on the TD ("innocent until proven guilty") or on the taxpayer ("guilty until proven innocent") is also relevant for TD costs. Presumptions and presumptive taxes are an extreme example of relaxation of evidence standards. Low standards of evidence increase the likelihood of taxes being only imperfectly related to the designed tax base, and tax offences being only imperfectly related to tax sanctions.[37]

The first general tax design issue of what standards of evidence are appropriate and feasible in different countries given social preferences and the capacity of courts. This will directly affect the revenue potential of the tax system via its impact on TD effectiveness. The second issue is for penalty design which, in turn, depends on the extent to which societies are willing to tolerate wrongful punishment versus letting tax offenders go free.

3.6 Information and TA organization

Proposition 14: TA costs can decrease with selective tax farming and outsourcing.

There are a wide variety of TD functions which can be privatized or outsourced, ranging from producing tax forms, to mandatory financial audits, to tax withholding, to semi-autonomous revenue boards to outright tax farming. Even self-assessment of taxes can be viewed as a form of outsourcing. In terms of tax design, two examples can be given to illustrate the potential for selective privatization to increase TA efficiency or even economic welfare, while giving rise to changed tax designs.

Changing the taxable entity to groups of taxpayers: Such a scheme has been proposed by Ueng and Yang (2000). In the first stage of their scheme, the TD makes a tax demand from a group of taxpayers based on what it knows about the aggregate tax base of the group, leaving contributions by members to be decided within the group.

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[36] See Bagchi, Bird and Das-Gupta (1995), Bird (forthcoming) and, for the VAT, Das-Gupta and Gang (2003).

[37] In case of non-compliance, a Type I error is where a tax offender remains uncaught and a Type II error is where a taxpayer is incorrectly found guilty of a tax offence. Holding constant TD capacity, low standards of evidence increase the incidence of Type II error and stringent standards increase Type I error. The possibility of error is one resolution to the Becker paradox of low penalty rates proposed in the literature (Bolton, 1996, Boadway and Sato, 2000).

Normal tax assessment and procedures are adopted towards group members by the TD if the group fails to meet the tax demanded by the TD. In their framework, TA effectiveness is increased and the excess burden of tax evasion and taxation is eliminated. Unfortunately, such a scheme may have costs in practice, since within-group coercion is assumed away and the TD's ability to determine taxes in the second stage is assumed to be unimpaired by their lack of knowledge about group members in the first stage. Clearly, both assumptions lack realism, the first in some cases, the second in almost all cases.

Nevertheless the authors give examples of where similar tax farming variants have been used. To take a related example from *non-tax revenue* in India, irrigation charges are recovered in the states of Maharashtra and Andhra Pradesh through local Water Users Associations of farmers, with irrigation departments only billing the entire group. Since association members together have information from direct observation of water use by members, this economizes on additional information needed to assess dues. Furthermore, since associations retain a substantial proportion of dues they collect, for maintenance of local irrigation works and other expenses, they also have the incentive to collect dues.

Substituting auction revenue for excise duty on liquor in India: Several states in India periodically auction local monopoly rights to sell liquor at the retail level instead of levying an excise tax on producers. This can be viewed as a variant of tax farming. The arrangement reduces TD and TA costs, and increases TA effectiveness. Revenue from auctions is also among the most buoyant state revenue sources. Furthermore, efficiency loss from conferring local monopoly rights is not a major issue given that a commodity considered socially undesirable is involved.

Complete privatization of collection of major taxes is clearly not a desirable option, given the potential for harassment and over-assessment of taxes by private agents.[38] Nevertheless, all modern tax systems involve privatization to some degree, via tax withholders, banks as tax collection agents, and in several countries, semi-autonomous revenue authorities.[39] The general principle is to privatize or outsource

[38] A general discussion is in Bagchi, Bird and Das-Gupta (1995). See also Ramirez Acuna (1992).
[39] Discussion of revenue authorities is in Jenkins (1994), Devas, et. al. (2000) and Talierco (2003).

activities whenever the social costs of doing so, due partly to information economies but also due to collection incentives of the TD versus private agents, are less than the cost of the TD carrying out the activity directly.[40]

3.7 Tax information and globalization

Proposition 15: Globally mobile tax bases and entities reduce TD effectiveness.

This problem is becoming increasingly serious with globalization. Key areas where cross-border mobility erodes national tax bases include globalization of financial asset markets, multinational corporations, footloose industries, international outsourcing, skilled labour mobility, tax havens and off-shore banking.[41]

Globalization of financial asset markets facilitates evasion or avoidance of interest, dividend income and capital gains taxation. An instructive case of the impact of mobile financial savings on tax design is the German interest tax withholding reform in 1991.[42] A 10 percent withholding tax on interest income introduced in 1991 to curb an estimated 80 percent tax evasion rate, led to a massive outflow of saving and even more evasion. Following a Constitutional Court of Germany ruling, a substantial annual allowance was introduced for interest income. In effect, Germany tacitly admitted its inability to tax this mobile base and introduced a base narrowing tax amendment so as not to decrease the domestic availability of savings. Several countries have, for similar reasons, exempted capital gains and some have extended this to dividends.[43]

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[40] See Toma and Toma (1991). An important issue in outsourcing is the nature of the contract signed between the government and the private agent. A general survey of contract forms is in McAfee and McMillan (1987). For tax farming, the issue is discussed briefly by Toma and Toma (1991). The importance of contract forms in practice is discussed for private pre-shipment inspection services for customs administration by Low (1995). Though not directly related to tax design, the contract form is crucial and largely determines government and social benefits from out-sourcing, both in theory and practice. For related analysis, see Mookherjee and Png (1995), Mookherjee (1997) and Wane (2000).

[41] Increased tax competition, another consequence of globalization, does not directly involve tax administration issues. There is a large body of writing on the subject. Owen (1993), Tanzi and Zee (2000), Lodin (2002), Dwyer (2002) and Zagaris (2001, 2003) are samples. The discussion of issues that do concern this paper also draws largely on these papers.

[42] This discussion is based on Lodin (2002).

[43] Three common tax avoidance practices are "double dipping" through different characterizations of cross-border transactions in jurisdictions involved, exploiting differences in entity characterization in host and home countries, and exploiting differences in tax accounting rules in host and home countries. These can, to an extent, be reduced by harmonizing tax laws. See Asian Development Bank Institute (2001).

The taxation problems associated with transfer pricing by multinational corporations, and continuing international attempts to deal with this issue via legislation based on multilateral models, are widely written about and not discussed here.[44]

Footloose industries, international outsourcing and mobile skilled labour result in tax base erosion under existing tax rules which base taxability on residence rather than nationality (the United States being a major exception). Countries which have nationality rather than residence based tax bases must contend with tax evasion and avoidance, which TDs generally find hard to cope with. Several countries have capitulated and introduced lenient tax regimes so as not do drive productive resources away.

By incorporating in a tax haven jurisdiction, or routing transactions through shell entities resident in havens, businesses seek to escape national taxes of their "true" home country.[45] Dealing with tax havens both unilaterally and via multilateral action is emerging as a major battle ground to protect domestic tax bases.[46] So far, despite some progress, the advantage appears to be with tax havens.

There are four important implications of these developments for tax design. First, administratively feasible taxation of capital income and also earnings of mobile labour and production will increasingly have to be source rather than residence based. Second, final withholding taxes on interest, dividends and other payments to mobile factors are increasingly being seen as least cost.[47] Third, cooperative tax harmonization will reduce the incentive for cross-border flows.[48] Nevertheless, fourth, given that not all countries have the incentive to enter into tax harmonization agreements – particularly tax havens – concessional tax rates relative to immobile factors may be inevitable. Inequity in the taxation of mobile and immobile factors and other entities is likely to persist and further base erosion with increasing globalization can be expected.

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[44] See, for example, Owens (1993), Bagchi, Bird and Das-Gupta (1995) and references cited there, and Muten (2002).

[45] Tax havens and off-shore financial centres also facilitate financing and profiting from criminal and terrorist activity and weaken national policing and control efforts.

[46] Among the important responses are unilateral Controlled Financial Corporation (CFC) legislation pioneered by the USA, common definitions of "harmful tax competition" and codes of conduct or multilateral action, even coercive action, against tax havens, multilateral guidelines for transparent financial reporting by offshore banks, information exchange or tax collection agreements. See Zagaris (2001, 2003), Lodin (2002) and Muten (2002).

[47] Zee (1998) and Lodin (2002).

[48] For the inevitable argument against tax harmonization, this time from theory, see Cremer and Gavhari (2000). Also see Fuest and Huber (2001).

Proposition 16: E-commerce reduces TD effectiveness

E-commerce, since it need not leave paper trails, decreases the accessibility of enforcement information TDs have access to in cross-border transactions. The information problem is most serious for cross border sales to final consumers.[49] Nevertheless, only the volume of such transactions is growing and no new issues, relative to, say, mail order sales arise.[50]

To cope with TD ineffectiveness, source and residence definitions and may have to be refined to take account of areas of ambiguity. Without far grater violation of privacy than exists today, systematic taxation of direct sales to final consumers is unlikely to be possible.

Proposition 17: TD effectiveness increases with inter-jurisdiction information sharing and cooperation

This is a major area of institution building to increase TD and tax system effectiveness in the face of globalization. However, given opposing incentives in different countries, globalization is still likely to cause diminished TD effectiveness. Furthermore, while there are exceptions, particularly in the Americas, cooperation between developing countries is at a lower stage than between developed countries.

Cooperation and information sharing are greatly facilitated by common tax definitions (of the definition of types of income and other receipts, taxable entities, residence, permanent establishment, sale, and so on).[51] In addition avoidance opportunities are reduced with common tax periods and timing of tax obligations. Therefore, besides tax rate and base harmonization to reduce the incentive for cross-border tax avoidance and evasion, cooperative harmonization of basic tax law categories is of importance.

Not all information cooperation areas relate to sophisticated tax transactions: One basic area of cooperation is to protect tax revenues from leakages associated with cross-

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[49] Asian Development Bank Institute (2001) and Lodin (2002).

[50] The major tax design problem arises with apportioning the potential tax base and establishing the jurisdiction which has the right to tax a particular sale or income under either existing source or residence rules (Lodin, 2002). An example from Peha and Strauss (1997) illustrates this: If a doctor from the US gives advice via the internet to a medical team in the UK while on vacation in the Bahamas, where did the transaction take place?

[51] Though the main purpose of bilateral tax treaties is to avoid double taxation of income, they help to bring about uniformity of terminology. Furthermore, many treaties also have information exchange clauses.

border trade in goods. Information exchange between customs authorities on both outbound and inbound shipments (or the possibly less effective alternative of private pre-shipment inspection) can help curb evasion not only of trade taxes but also of the sales tax or VAT. The case of the VAT in the European Union (EU), however, suggests that it is important to distinguish among different types of information in exchange agreements. Using the EU's VAT Information Exchange System (VIES), member countries exchange domestic, tax return and tax invoice based, records of cross-border VAT sales. The system was put in place just prior to removal of physical border checks between member countries in 1993. VIES has not been able to substitute for border-checks. The lesson suggested is that substituting exchange of information of poor quality (i.e. accounts based information – given the benefit of hind-sight) for good quality information (from border checks and control procedures) may not help increase TD effectiveness.[52]

What does this have to do with tax design? The discussion in Chang Woon Nam et. al. (2003) points to (a) the weakness of the current, primarily destination based VAT due to abuse of zero-rating of exports but (2) the difficulty in moving to a destination based VAT but with tax collection on the basis of origin as planned. This is due to incentives stemming from the likely change in the shares of different countries in VAT revenue given differing evasion rates. So the planned clearing house mechanism whereby countries collect the VAT on behalf of other members and then redistribute revenues on the basis of destination is being resisted by some member countries. At present, due to these administrative problems, continuation of the present system with re-introduction of border controls appears to be the only way to combat VAT evasion: But this would be a retrograde step in setting up a single market within the EU.[53]

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[52] For a description of the VIES see Hutchison (1996) and European Union (2002). Chang Woon Nam, et.al. (2003) estimate VAT evasion in the EU. For general conclusions of the desirability of border controls, despite their trade impedicng costs, see Ebrill et. al. (2001).

[53] For discussion of clearing house mechanisms and alternatives see Ebrill et. al. (2001), including references to a debate in *International Tax and Public Finance* (2000).

3.8 Tax information and non-revenue objectives

Proposition 18: TA costs increase if the tax system is used as an instrument to achieve non-revenue objectives.

This has already been referred to above and is widely accepted. Tax concessions are possibly the major cause of tax base narrowing. Besides redistribution, investment and saving incentives are most common in tax design,[54] though there is a long list of other non-revenue objectives that tax systems have been used for. More than generally applicable tax provisions, exemptions or concessions for specific groups of taxable entities (end-user provisions) are not uncommon.

Besides base-narrowing, reduced equity, and price distortions, differential treatment of entities greatly increases TA information requirements, increases opportunities for misreporting and complicates tax compliance requirements on taxpayers and third parties. In particular, TD costs can greatly increase if there are new types of activities that have to be verified to ascertain eligibility for concessions: Examples are investment allowances for setting up production units in remote, backward areas, export incentives (requiring information for verification from other countries), installation *and use* of pollution control equipment and tax relief related to the duration or severity of disabilities. In such cases, concessions often end up being poorly targeted and abused: The social return to tax revenue foregone can be low and, at the margin even zero.[55]

It is also important to note that the MECF of other tax instruments, say changing tax rates or an efficiency enhancing reform in TD enforcement procedures, will increase on account of the greater leakage due to tax concessions.

The lesson is clear: Use tax concessions for non-revenue objectives very selectively and only after comparing their effectiveness with alternative, expenditure/subsidy or regulatory instruments which can potentially serve the same objectives.

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[54] An extensive analysis with several country studies is in Shah (1995), though administrative aspects are given limited attention. The studies also provide a comparative assessment of the effectiveness of different types of tax incentives such as tax holidays versus investment allowances.

[55] Se for, example, Tanzi and Zee (2000) For a recent Indian example, see Rajaraman et. al. (1999).

3.9 Tax rates and compliance incentives

Proposition 19: High marginal and average rates of tax decrease TD effectiveness.

As discussed, this is an important justification for broad based taxes. This is one proposition for which there is a wealth of empirical evidence and some theoretical support.[56] Though the evidence suggests a negative relation between tax rates and either compliance or revenue, this has a direct implication for TD effectiveness since one of two important dimensions of TD effectiveness are reflected in the tax gap.

Clearly, lower tax rates must ultimately result in low revenue as tax rates move into the positively sloped region of the Laffer curve, so the implied tax design lesson is for moderate rather than zero tax rates!

Five remarks are needed to impart greater precision to this design suggestion. First, tax rates here refer to effective tax rates, taking into account tax concessions, exclusions and the timing of tax payments. Second, both high average and high marginal tax rates for taxpayers have been found to have negative effects on tax revenue and TD effectiveness. Third, however, whether low *expected* effective tax rates, taking into account the extent of tax evasion and the TD's ability to detect evasion and impose penalties, or low effective tax rates *per se* – that would apply to honest taxpayers – increase TD effectiveness, requires further empirical investigation.[57] Nevertheless, since low effective rates of tax reduce the tax burden of all taxpayers, honest or dishonest, these are advisable. Fourth, when combined with the advice to reduce exemptions and concessions, this amounts to suggesting low *nominal* tax rates. Fifth, lowering tax rates, as with most tax structure reforms discussed here, should form part of a package of reforms. For example, as emphasized by Alm, Bahl and Murray (1990), lowering marginal tax rates in the Jamaican case examined by them without simultaneously strengthening the TD could result in lower revenue – despite increased TD effectiveness.

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[56] For example, empirical evidence is in Clotfelter (1983), Alm, Bahl and Murray (1990, 1991), Bahl and Martinez-Vazquez (1992), Das-Gupta, Lahiri and Mookherjee (1995), Joulfaian and Rider (1998) and all nine papers surveyed in De Juan, Lasheras and Mayo (1994). While the basic tax evasion model of Allingham and Sandmo (1972) predicts a *positive* relation between tax rates and tax revenue with penalties proportional to evaded taxes (Yitzhaki, 1974), extensions to allow leakage of the tax base weaken the relation allowing for a "Laffer curve" response.

[57] The analysis in Marelli (1982) suggests low effective rates for risk averse taxpayers but low expected rates for risk neutral taxpayers.

The discussion here leaves open the question of what moderate tax rates, which would maximize TD effectiveness and revenues are. Unfortunately, the no OSFA rule applies to this and there is little information even in cases where systematic empirical work is available.[58] Relevant factors include tax rate effects on economic activity in different economies, the size of the informal sector, the extent of tax withholding and many more. A "seat-of-pants" range for marginal tax rates of a broad- based personal income tax is between 15% and 35% and between 5% and 20% for a broad based VAT.

Proposition 20: In the presence of tax evasion redistribution as a goal of the tax system should optimally be given less weight.

This is the prescription emerging from a number of recent papers on optimal tax theory, which incorporate tax evasion.[59] When the TD can commit to an audit strategy in advance, these papers find that the optimal, redistributive, income tax structure is influenced by auditing effectiveness. The broad result is that income taxes should optimally be *regressive*.[60] Though these papers are still too abstract to serve as complete guides to policy, for practical tax design a conservative lesson appears warranted, even at this stage of knowledge: Highly progressive income taxes should not be advocated: besides increasing evasion incentives and reducing TD effectiveness, they are not optimal even from the point of view of redistribution and economic efficiency.

Proposition 21: In a low capacity TD, effectiveness may not increase either with ad valorem or specific tax rates on goods.

Ad valorem taxes on commodities have the potential advantage of being linked to sales value and so are inflation proof and elastic with respect to demand increases. Specific taxes, on the other hand economise on the information needed for base determination and so are considered harder to evade. Both these hypotheses are appealing, but need not hold good in practice as the following example shows.

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[58] For example, Alm, Bahl and Murray (1991) report simulations to determine individual income tax rates for Jamaica, but not the results. Das-Gupta, Lahiri and Mookherjee (1995), report results of small perturbations but do not examine large changes in tax rates.

[59] See Cremer and Gavhari (1996), Chander and Wilde (1998) and also Boadway and Sato (2000). The relation to tax administration is direct: Tax evasion can only occur if a TD is unable or unwilling to eradicate tax evasion.

[60] Furthermore, Cremer and Gavhari (1996) find that a result of earlier general income tax models without tax evasion, that the top marginal tax rate should be zero at a high enough income level, continues to hold.

The state of Maharashtra in India switched over from a regime of specific excise duties on liquor production to an ad valorem regime in 1997. Under this "MRP" (a ceiling or Maximum Retail Price) system, excise duty and MRP are fixed as a multiple of the cost of production declared by distilleries and breweries to the Maharashtra Excise Department. Specific floor rates are also fixed for different categories of liquor. The MRP is required to be printed along with the production batch number on all liquor bottle labels and cases. The MRP system led to an immediate increase in excise duty collection which was, however, quickly eroded. Table 2 shows that this increase was eroded even in unit terms, with duty as a percentage of the wholesale price returning to its pre-reform level for two categories within 1 to 5 years and showing a downward trend for the third.

Table 2: The Impact of Maharashtra's Switch from specific to ad valorem excise duties on liquor in 1997

	1996-97 (Pre reform)	**1997-98**	**1998-00**	**1999-2000**	**2000-01**	**2001-02**
Unit realization of excise duty (Rupees per bulk litre of sale)						
"Indian Made Foreign Liquor"	72.63	136.91	131.48	123.43	115.30	101.47
"Country Liquor"	42.88	44.27	45.39	39.81	33.91	29.49
Beer	11.30	20.58	21.56	18.50	19.90	16.87
Index of excise unit realization to All India Wholesale Price Index by product category (1996-97 = 100)						
"Indian Made Foreign Liquor"	100.0	175.6	156.6	136.3	122.6	100.4
Country Liquor	100.0	100.4	98.9	86.1	77.8	72.0
Beer	100.0	164.5	156.4	126.9	134.5	114.1
Data sources: Excise Department, Government of Maharashtra, except Wholesale Price Index: Centre for Monitoring the Indian Economy.						

This example suggests a negative lesson for tax design: rate (and base) reform, specifically the choice between ad valorem and specific tax rates, may not lead to revenue gains if the TD is unable or unwilling to enforce these rates.

Proposition 22: TA effectiveness is increased if, without greatly increased complexity, tax design and procedures take money amounts as equivalent if they are equal in present value terms.

Tax design provisions to prevent inflationary revenue loss are well known and not examined in detail here.[61] The essential principles in highly inflationary situations involve shortening the tax period and ensuring, to the extent possible, that tax laws specify dues in present value terms, that is, include interest provisions. In practice, inflation proofing increases the complexity of the tax code and taxpayer compliance costs, establishing a trade-off between revenue and both economic efficiency costs and TA costs. Thus, the extent of inflation proofing that is advisable will depend on taxpayer sophistication and the rate of inflation, and no OSFA rule is available.[62,63]

Proposition 23: TA costs decrease with well designed (effective) penalties

One puzzle is why practical tax designs pay so little attention to the design of penalties for tax non-compliance. A wide ranging discussion of good penalty design is in Oldman (1965). As Bird (forthcoming) puts it:

"Experience suggests that penalties should increase with (1) the potential revenue loss due to the tax offence; (2) the difficulty and cost of detecting the offence; (3) the effect of the offence on other taxpayers; (4) the offender's state of mind (a higher penalty should apply if the offence is deliberate and pre-planned); and (5) recidivism."

Other desirable design features of penalties are:

a. In elaboration of Bird's first principle, penalties for lesser degrees of non-compliance should, following the principle of marginal deterrence, be less than the marginal social loss so that taxpayers have the incentive to substitute away from higher levels of non-compliance (Mookherjee and Png, 1994).

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[61] For example, see Casanegre de Jantscher (1992) and Bagchi, Bird and Das-Gupta (1995).

[62] Bird (forthcoming) views 30 to 35 percent inflation per year as high.

[63] An example from India illustrates how conceptually simple present value adjustments can be viewed as complex by taxpayers even if they are beneficial to the taxpayer: Long term capital gains in India were required to be computed as $S - P(C_S/C_P)$, where S is the sale price in rupees, P is the purchase price in rupees and C_S and C_P are "Cost Inflation Indices" announced for each year in a year-end notification (these merely reproduces a Consumer Price Index) by the Income Tax Department. C_S is for the year of sale and C_P for the year of purchase. This "complicated" system was recently reviewed by an expert committee and reformed.

b. Penalties for "technical offences" with no direct revenue impact, such as a failure to keep mandatory records or provide information to the TD, should be high enough to reflect both the direct and indirect revenue impact (Das-Gupta and Mookherjee, 1998).
c. Non-monetary penalties, including garnishment, closing of business establishments, public shame and even jail sentences should be selectively employed if culturally permissible.[64]
d. The *procedure* for levy of penalty should be transparent and not subject to TD discretion.
e. Penalties for corruption or inaction by bureaucrats should be high enough to reduce opportunities for non-compliant taxpayers ("gainers") to compensate bureaucrats who are punished ("losers").

Proposition 24: Well designed penalties may include negative penalties[65]

If, after a tax audit by the TD, no non-compliance is detected, then a negative penalty has been found to be optimal in the literature on optimal income taxes. To be practically implementable a precondition must be met: It should be difficult for auditors to falsify the results of audits: else greater bribes and revenue loss will result from negative penalties.

Proposition 25: Well designed penalties should not be too high – or revenue may decrease via tax avoidance.

This empirical finding in the case of Jamaica by Alm, Bahl and Murray (1990), complements the optimal tax literature which finds non-maximal penalties in the presence of taxpayer and TD mistakes to be optimal (footnote 37).

Further empirical research is required before it will be possible for the exact structure and numerical levels of penalties, as opposed to qualitative results, to draw on existing research.[66]

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[64] Fir an analysis of jail sentences in tax cases see Chu and Jiang (1993), Polinsky and Shavell (2000) and also Garoupa and Gomez-Powar (2000).

[65] Mookherjee and Png (1989), Cremer and Gavhari (1996), Chander and Wilde (1998) and Boadway and Sato (2000).

[66] Empirical results (reviewed in Andreoni, et. al., 1998) suggest that existing penalties do deter non-compliance. However, discouraging experimental results on the deterrent effect of existing levels of

3.10 The magnitude of TA costs

Proposition 26: TD and TA Costs are not accurately measured – even in principle

First consider TD costs. Since government expenditure accounting in developing countries and also many developed countries is cash based, and since there is seldom a system of user charges by one department for goods (e.g. buildings constructed or occupied) or services (e.g. police protection or judicial proceedings, audit services of the government audit, tax legislation by law departments) provided to other departments, true resource costs of the TD are not captured by government budgets. This is exacerbated by non-market values used to value government assets or asset rentals.

For TA costs, it is probably fair to say that the cost of collecting taxes has not been adequately conceptualised. For example, Slemrod and Yitzhaki (1996) identify five component costs of taxation. They are administrative (TD) costs, deadweight efficiency loss from taxation, the excess burden of tax evasion, avoidance and compliance costs of taxpayers. The latter is a part of TA costs. Even if these cost components are defined as inclusively as possible, the classification at least omits the cost of tax policy institutions, tax education and research. In addition, it should be noted that some activities within a tax system may have offsetting benefits so that net cost may differ from gross costs.

The implications for tax policy are firstly, that comparison of different tax design options will, for the time being, continue to be based on experience and seat-of-pants reasoning which may fail to take account of true TA costs.[67] To improve cost estimates, at least for the TD, reform of government accounting is needed, a difficult reform to implement in many developing countries. For example, the move to accrual accounting and partial inter-department charging in Australia, New Zealand and the United Kingdom helps improve the accuracy of TD cost estimates.

Proposition 27: TD costs are substitutes for private sector costs: Measured TD costs are just the tip of the iceberg.

Estimates suggest that despite probably understated TD costs due to current government accounting conventions, taxpayer and third party compliance costs are much

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penalties has been obtained by Alm, McKee and Jackson (1992). A theoretical result on the limited deterrent impact of penalties on the hard-to-tax is in Das-Gupta (1994).

[67] This is also true of excess burden costs as discussed by Feldstein (1997).

higher, in some estimates by a factor of 10 to 15, even in developed countries. And these are total costs, not costs at the margin.[68]

For example, Slemrod and Venkatesh (2002) estimate the compliance cost of small and mid-sized business in the United States at around 27 to 28 percent of taxes paid by them, which are around 10 times as high as the compliance cost of large firms with the corporation income tax reported in Slemrod and Blumenthal (1996).[69] In contrast, the cost of collection of taxes by the United States Internal Revenue Service is under 2 percent of taxes collected. For India, recent estimates put the compliance cost of the corporation income tax at between 5.6 percent and 14.5 percent of corporation tax collection compared to imputed administration costs for the corporation income tax of the Indian Income Tax Department of below 1 percent of tax collected. For the individual income tax, Slemrod and Sorum (1984) estimate the compliance costs at between 5 to 7 percent of taxes.[70] Indian tax compliance costs of taxpayers and third parties are estimated, though with a small sample, at a massive 57 percent of taxes compared to administration costs of 2.5 percent. Both in the United States and India compliance costs were found to be regressive for individuals and businesses. Costs were substantially higher for the self-employed, with private compliance costs often exceeding taxes paid in the Indian estimates.[71]

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[68] All compliance cost studies during the past 70 years on which information was found are listed in Chattopadhyay and Das-Gupta (2002, 2002a) along with their main features. Unfortunately, almost all studies to date have been for developed countries.

[69] Slemrod and Venkatesh (2002) also estimate that US companies with international operations had compliance costs 143 percent higher than other US companies, which suggests that TD information requirements can act as a hidden cost of openness. It may not be a coincidence that earlier work by Joulfaian (1993) finds that firms with foreign operations, specifically links with tax havens, have significantly lower rates of compliance.

[70] Information to express more recent compliance cost estimates for the US in Blumenthal and Slemrod (1992) as a percentage of tax paid was not available.

[71] Indian compliance cost estimates are from Chattopadhyay and Das-Gupta (2002, 2002a). The impact of compliance costs on compliance behaviour of individuals and estimates of non-compliance costs of non-filers are examined in Chattopadhyay and Das-Gupta (2002b). Some observations about the estimates are in order. The estimates are to be considered preliminary and subject to a large error margin, due to small and biased samples owing to non-response. Nevertheless, estimates for individuals were deliberately biased downward, to reduce the possibility of overestimation, both for individual responses and during aggregation. Various steps taken to do this are described in the studies. Estimates presented here net out bribe costs, since these transfers do not involve additional resource costs. Conversely, tax deductible compliance expenditures are not netted out. The first two studies also attempt to identify "hot spots" or high compliance cost tax provisions and administrative procedures. The estimates do not include "psychic" costs of tax complexity, ambiguity and instability to avoid possible double counting. These are reported separately.

An important feature of tax costs are the substitutability between TD and private sector costs. Extending a point made with respect to outsourcing of tax functions, social cost minimization would dictate that different activities needed to collect the tax be carried out by the TD, private third parties or taxpayers depending on who has the lowest cost.[72] A self-interested preoccupation of TDs and governments with direct TD costs, and the limited attention paid to private compliance costs, makes it more than likely that compliance obligations burden taxpayers more than social cost minimization would dictate. For example, in developing countries, it may be the case that, contrary to prevailing wisdom, self-assessment is more costly than official assessment.[73]

The implications for tax policy are to decrease reliance on high compliance cost taxes and tax provisions. Specific measures that would do this have already been suggested in other propositions: One way is to replace high cost provisions with presumptions, particularly on the self employed. A second is to reduce taxpayer and third party reporting requirements by introducing final withholding taxes. If the results for India are replicated by other developing country studies, which typically have relatively inefficient TDs and unsophisticated taxpayers, then consideration should be given to replacing the individual income tax in similar developing countries with other sources of finance including final withholding taxes. At the very least, the tax threshold should be raised above current levels.

Proposition 28: Costs increase with tax instability.[74]

Chattopadhyay and Das-Gupta (2002a) report preliminary willingness-to-pay estimates of the cost of tax instability at around 4 percent of corporation tax paid and 3 percent of individual income tax paid. In contrast, willingness to pay for reduced tax complexity was well under 1 percent of taxes for individuals, while few corporations saw

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[72] Tax deductibility or rebating of costs can, in principle be used to ensure that the compliance burden on individuals and third parties is not excessive. As usual, since this can make the tax system more complex and open a loophole for inflated deduction claims, general rules are not available.

[73] Singapore has official rather than self assessment of the income tax. Taxes for income earned during a year are calculated by the Inland Revenue Authority at the end of the year and paid by taxpayers during the following year in instalments. If there was no income fluctuation, this would merely reduce the tax due in present value terms which could be made good by tax rate adjustment. With fluctuating incomes, the certainty, convenience and taxpayer compliance cost saving this system imparts to tax dues has to be balanced against the risk of high tax dues when there is a negative shock to income. For a relatively recent examination of self-assessment and further references see Sandford (1994).

[74] See Bahl and Martinez-Vazquez (1992), Talib (1996), Bardsley (1997) and Chattopadhyay and Das-Gupta (2002 and 2002a).

tax complexity as costly. That tax loopholes increase with complexity possibly explains why corporations, who are relatively sophisticated taxpayers, do not find complexity costly.

The policy implication is for fewer tax policy changes particularly administrative (TD or Finance Ministry) notifications and rulings. Pre-announcement of changes and public discussion, while not always possible, is a second measure. Real distortions are also caused, for example in India, by annual budgets since many tax policy changes are announced during budget speeches. Fourth, when policy changes are announced, carefully designed transition procedures should be considered and their benefits weighed against the increased complexity this entails.

Proposition 29: TA Costs increase with tax ambiguity.

Chattopadhyay and Das-Gupta (2002a) report preliminary willingness-to-pay estimates of the cost of tax ambiguity at around 10 percent of corporation tax paid and 4 percent of individual income tax paid.[75] Tax ambiguity has also been identified as a cause of high compliance costs by Sandford (1994a), Glassberg and Smyth (1995), Kaplow (1996) and James et. al. (1997). Tax ambiguity while facilitated by complex tax concepts, is more directly related to unclear legal definitions and tax provisions. Nevertheless, the battle to define tax concepts unambiguously is likely to be never-ending, if the tax is complex, given sophisticated tax practitioners.[76]

The major implication for tax policy is, once again, reduced tax complexity. Nevertheless, attempts at clear legal drafting, and simplified tax forms, are likely to reduce ambiguity costs to some degree. Transferring of a part of the compliance burden to administration, for example via official assessment rather than self assessment, also reduces the scope for taxpayer mistakes.[77]

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[75] The high willingness-to-pay of corporations, in relation to measured private compliance costs suggests that part of the cost arises from business opportunities which become excessively risky due to tax ambiguity and not just direct compliance activity. While small sample bias is also possible, Chattopadhyay and Das-Gupta provide some case studies of decreased business investment.

[76] See Kaplow (1996) and Erard (1993, 1997).

[77] Two other important measures, given that tax dispute are inevitable are, first, streamlining of appeals and dispute resolution procedures, though this is not directly a part of tax policy. On the other hand, appeals and court fees of different types need to be aligned with social costs so that overuse of disputes to delay tax payments is not resorted to by taxpayers or to delay tax determination by the TD: These measures seldom receive attention in practice.

4. Administrative properties of important taxes

Drawing on the discussion in the previous section, administrative properties of six taxes or related instruments along with reforms to enable more effective administration are summarized in the table below. It should be noted that only tax structure measures are included in the "reforms" column of the table, omitting administration responses without a tax implication. Note also that the table focuses solely on administrative properties of the taxes and takes no account of efficiency and equity implications. As discussed, there is a trade-off between administration and other desirable features of tax systems.

Tax or related policy instrument	**Bases and entities**	**Impediments to administration**	**Reforms or alternative taxes on the same base and entities**
Penalties and evidence standards	All	Penalties not covering all possible tax offences or not aligned with non-compliance incentives. Discretionary penalties. Difficult to prove non-compliance with stringent evidence standards.	Strengthen penalty structure. Streamline penalty imposition procedure.
Concessions to pursue non-revenue objectives	All, particularly income taxes and the VAT.	Increased scope for non-compliance. Greater information needed to verify compliance and eligibility.	Severely limit concessions. Examine relative merits of alternative (expenditure, regulatory) policy instruments
Individual Income Tax	Different types of income all requiring accounting definitions. different tax provisions needed for entities distinguished by residence. incorporation status. sector of activity.	Overwhelming reliance on paper (or electronic) information not always available on "hard-to-tax" entities and cross-border income or trade flows. Many potential taxpayers. Valuation disputes. Tax avoidance and evasion facilitated by timing	Moderate tax rates. Limit tax concessions. Presumptions and presumptive taxes. Schedular withholding taxes. Shortened tax periods in inflationary environments. High tax thresholds in developing countries. Official instead of self-assessment of taxes.

Tax or related policy instrument	Bases and entities	Impediments to administration	Reforms or alternative taxes on the same base and entities
		differences, understating receipts *or* overstating deductions, and cross-border activity. Mobile capital and skilled labour income.	International and inter-entity tax harmonization.
Corporation income tax	As for individual income tax.	Possibility of tax arbitrage between related corporations. Residence determination difficult due to tax havens. Valuation disputes. Tax avoidance and evasion facilitated by timing differences, understating receipts *or* overstating deductions, and cross-border activity. Footloose production activity.	Moderate tax rates. Limit tax concessions. Presumptions. Lenient taxation of mobile factors. Source rather than residence taxation. Multilateral international tax harmonization.
The VAT	Sale of goods and possibly services by firms. Tax rebating of intermediate and possibly capital purchases. Zero-rating of exports. Tax determination dependent on accounting.	Small firms and selected sectors difficult to tax. Retail sector in developing countries difficult to tax. Evasion through misclassification. Evasion possible by under-reporting sales or over-reporting purchases. Evasion of cross-border sales and electronic sales difficult to detect.	Moderate tax rates. Special (non-VAT) simplified regimes for small firms and hard-to-tax sectors using presumptions or presumptive taxes ("forfaits").

Tax or related policy instrument	**Bases and entities**	**Impediments to administration**	**Reforms or alternative taxes on the same base and entities**
Excises	On production of specified goods: usually "sin" commodities, petroleum products.	Smuggling. Understated production. Black markets. Inflation sensitivity with specific rates, valuation problems with ad valorem rates.	Partial privatization. Substituting non-tax revenue (auctioning vending rights). Public monopoly of wholesale trade.
Property taxes	Annual property (land, buildings) value or property sales	Valuation problems and mis-declaration. Non-identification of new properties.	Moderate tax rates. Presumptive valuation.[78]

5. Taking account of tax administration in designing tax reforms: Suggestions

The discussion in the paper identifies, however tentatively, a variety of administrative implications for tax design. Many of these conflict with economic equity and efficiency goals which would be considered important for ideal tax systems, absent administrative considerations. Here an attempt is made to provide ten process guidelines for reformers on how to take account of tax administration in designing tax reforms. Inevitably, suggestions are very general. This is a consequence of the absence of OSFA.

1) Before identifying tax reforms plan TD effectiveness and efficiency enhancing reforms (automation, internal capacity and incentive reforms) which can strengthen the TD: Suggestions for this have not been discussed in this paper (but see Annex 3).
2) Identify tax reforms which can make TA more effective without large economic or equity costs and implement these first. This includes penalties, evidence standards, clear laws, and tax stability.
3) Attempt to strengthen international cooperation and information exchange.

[78] An alternative to presumptive valuation is self-assessment with pre-emptive acquisition or sale by the TD, proposed four decades ago by Arnold Harberger. However, this is not a tax design issue.

4) Identify administrative impediments and costs of the existing tax system, paying special attention to TD and TA information requirements.
5) Examine, if possible estimate, the extent of non-compliance and tax base erosion due to narrow tax bases: Identify scope for rate moderation, base broadening and reducing the number of taxable entities.
6) Examine the nature and extent of legal disputes, dispute resolution procedures and costs. Identify and implement cost reducing reforms to tax provisions and dispute resolution procedures and pricing.
7) Identify and selectively implement reforms which reduce information needs of the TD after weighing their likely efficiency and equity costs.: Presumptions, presumptive taxes, final withholding taxes.
8) Identify privatization opportunities, weigh their costs against costs of the TD carrying out the same activity and selectively implement them.
9) Implement lenient taxation of mobile and hard-to-tax bases which cannot be tackled by final withholding taxes and presumptions.
10) Prospectively take account of likely future trends in economic activity.

6. Concluding comments

There are at least 3 potentially important ways in which TA affects tax design that are not dealt with in this paper. The first is the link between optimal tax enforcement, particularly tax investigations and audits, and tax design. Recent theoretical work suggests that the two are intrinsically related (see Annex 3). However, further contributions must be awaited as it appears difficult to extract practical lessons from this literature at present. The second is the important issue of bureaucratic inertia as an impediment to tax reform. The problem appears to be related to the issue of political will as a prerequisite for reform, one of Richard Birds observations noted at the start of this paper. The reason for omission of this important topic is simply my own ignorance: While there are suggestive pointers in the literature and from experience, I did not feel sufficiently sure of my ground to draw even tentative conclusions about the nature and significance of this impediment. The third issue is the implications of TA for tax assignment and intergovernmental transfers in federations of different types. This topic is

inadequately researched. So while several tentative hypotheses can be identified, the issue merits detailed treatment which would greatly expand this already long paper.

How to increase the knowledge base on characteristics of administration that are covered in this paper? How to sharpen our understanding of administrative constraints in the design of taxes?

The emergence of a coherent, information and incentive based, theory of tax administration effectiveness and efficiency will be a great help. Nevertheless, neither the predictions of such a theory, nor less formal propositions such as those in this paper can be accepted with any degree of confidence unless rigorous empirical testing is possible. Adequate cross-country or historical information is needed for this: This suggests a crucial role for multi-lateral institutions such as the IMF, the World Bank the OECD and certain UN organs: Only these institutions are in a position to put together a data base which can be used to subject tax administration and its impact on tax policy to rigorous examination.

Annexes

Annex 1: Regression results for correlates with collection costs in Indian states.

Table A1: Tax collection cost ratio and correlates: Regression results (Data on 14 major Indian states, 1985-86 to 2000-01)

	Significance level of regression coefficients										
Regression Number	Constant	GSDP per cap	Urban share	Area	Transfer share	Agri share	Manu share	Population	R-square	D-W	Method
Aggregate regressions											
1A (basic)	-99	-99							0.258	0.076	OLS
1B (full)	-99	**50**	-99	99	99	97	98		0.884	0.701	OLS
1B-a (full exc sector shares)	-99	91	-99	99	99				0.806	0.450	OLS
1C (full exc GSDP/pop)	-99		-99	99	99	97	99		0.883	0.691	OLS
1D (Sig only)	-99		-99		90				0.991	2.195	WLS, AR1
1E	-95	-95	-99		98	**88**	**40**		0.992	2.054	WLS, AR1-S
1F	-66	-99	-99		97				0.991	2.041	WLS, AR1-S
1G	-99		-99	99	94				0.961	2.096	WLS, AR1-S
1H	-99	-99							0.993	2.167	WLS, AR1-S
Fixed Effects											
2A (basic)		-99							0.941	0.817	OLS
2B		-97	-97		96				0.943	0.848	OLS
2B-a		-99	-97		97			94	0.944	0.880	OLS
2C			-99		99	96			0.943	0.859	OLS
2D			-99		**84**				0.962	1.965	OLS, AR1
2H		-99							0.993	1.879	WLS, AR1
Fixed Effects, State Specific GSDP Effects											
3A (basic)		-ive, 90+: 9 +ive, 90+: 1 -ive: 2 +ive: 2							0.965	1.352	OLS
3B (full, sig only)		-ive, 90+: 8 +ive, 90+: 2 -ive: 2 +ive: 2			98				0.966	1.413	OLS
3C (full, sig only)		-ive, 90+: 6 +ive, 90+: 1 -ive: 4 +ive: 3			98				0.992	1.900	WLS, AR1

Notes: (1) AR1: First order autoregressive error specification. AR1-S: First order autoregressive error specification allowing for separate processes in each state. (2) Transfer share: Share of Central government transfers in total revenue of the state.

Annex 2: Summary of TA properties and implications for tax design

	Tax administration proposition	Implication for tax policy
	1. TAX ADMINISTRATION COSTS AND THE PUBLIC SECTOR	
1	If TA costs increase, there should be less reliance on tax finance, less government expenditure or both.	Assess desirable extent of reliance on tax finance
2	Without taking into account administration costs, the efficiency cost and the equity impact of a real world tax system cannot be assessed.	Take account of administrative costs when designing tax reforms
	2. INFORMATION AND BASIC TAX ADMINISTRATION	
3	Tax designs which economise on information requirements are least costly to administer.	Assess information needed to administer different taxes: chose a tax design balancing limited information with efficiency and equity
4	TD costs decrease with presumptions.	Use presumptions unless other costs outweigh TA cost saving
5	Effectiveness in low capacity TDs is increased by selectively exempting the hard-to-tax including the informal sector from normal tax obligations.	Selectively exclude hard-to-tax and informal sector entities from normal tax compliance obligations.
6	TD procedures (tax withholding and advance tax) can increase TA effectiveness and efficiency.	Use advance tax and withholding
7	TD Costs decrease with concentration of the tax base across entities	Relatively more taxation of commodities?
8	TA costs increase with complex tax bases.	Simplify tax laws
9	TD costs increase with the number and variety of taxable entities	Limit differential treatment of tax entities
10	TD capacity in closed economies increases with financial development	Limit tax provisions requiring financial information at low levels of financial development
11	It is efficient for countries with low literacy levels and underdeveloped accounting professions to rely relatively more on commodity taxes.	Assess information needed to administer different taxes: Choose a tax design which puts greater weight on limited information
	3. INFORMATION ACCESS AND THE LAW	
12	TD effectiveness decreases with restricted access to information (privacy laws)	Trade-off between privacy and administrative effectiveness
13	TD costs increase and effectiveness decreases with stringent evidence standards	Trade-off between Type I and Type II error
	4. INFORMATION AND TA ORGANIZATION	
14	TA costs can decrease with selective tax farming and outsourcing	Substitute some taxes; farm out others; change tax structures

	Tax administration proposition	Implication for tax policy
	5. TAX INFORMATION AND GLOBALIZATION	
15	Globally mobile tax bases and entities reduce TD effectiveness.	Final withholding taxes
16	E-commerce reduces TD effectiveness	As for hard-to-tax groups?
17	TD effectiveness increases with inter-jurisdiction information sharing and cooperation	Negotiate international agreements and provide incentives
	6. TAX INFORMATION AND NON-REVENUE OBJECTIVES	
18	TA costs increase if the tax system is used as an instrument to achieve non-revenue objectives.	Use tax concessions for non-revenue objectives selectively, after comparing them to alternative non-tax instruments for the same objectives.
	7. TAX RATES AND COMPLIANCE INCENTIVES	
19	High marginal rates of tax decrease TD effectiveness.	Moderate marginal rates of tax.
20	In the presence of tax evasion redistribution as a goal of the tax system should optimally be given less weight.	Tax rates more regressive (less progressive) than with costless TA
21	In a low capacity TD, effectiveness may not increase either with ad valorem or specific tax rates on goods.	Administrative concerns in selection of tax rates are not key with a low capacity TD.
22	TA effectiveness is increased if, without greatly increased complexity, tax design and procedures take money amounts as equivalent if they are equal in present value terms.	Careful incorporation of interest for delays, revaluation and timing provisions in tax design in inflation prone economies balancing complexity costs
23	TA Costs decrease with well designed (effective) penalties	Optimise penalties and imposition procedures
24	Well designed penalties may include negative penalties	Assess feasibility of negative penalties
25	Well designed penalties should not be too high – or revenue may decrease via tax avoidance	Legislate moderate penalties
	8. THE MAGNITUDE OF TA COSTS	
26	TD and TA costs are not accurately measured – even in principle	Reform government accounting for tax administration
27	TD costs are substitutes for private sector costs: measured administrative costs are just the tip of the iceberg.	Consider combined TD and private costs when evaluating tax proposals.
28	TA costs increase with tax instability.	Avoid frequent changes to tax laws, including administrative laws
29	TA costs increase with tax ambiguity	Clear legal drafting; define scope of appeals; align cost of appeals with social costs

Annex 3: Some TA properties without implications for tax design

	Proposition	**Reform implication**
1	TA effectiveness decreases with administrative corruption[79]	Provide administration with incentives
2	TD Effectiveness increases when its goals are aligned with social goals[80]	Provide administration with incentives
3	If the size of a TD is optimal, its marginal budgetary costs will be well below the marginal revenue gain.[81]	Monitor trends in TD cost of collecting taxes and implicitly limit size of the TD in accordance with a cost-revenue benchmark
4	TD audit probabilities and strategy should be jointly determined with optimal taxes (see below)	Modify audit strategy when tax laws change
5	Long run TD effectiveness is reduced by tax amnesties – as are effective tax rates. Permanent tax amnesties have no offsetting benefits.	Declare few, if any, tax amnesties, and even then only in very specific situations. The scope and duration of the amnesty should be clearly demarcated.
6	TD effectiveness but also TD costs, decrease with sophisticated taxpayers[82]	Selectively educate taxpayers. Regulate tax practitioners
7	TA Costs decrease with taxpayer education and assistance	Taxpayer education and assistance functions are essential TD functions
8	TD Effectiveness is increased with explicit performance orientation	Introduce performance orientation (Table A3.1)
9	TD Effectiveness decreases with fragmented administration	Consolidate administration
10	TD effectiveness and efficiency are increased, when there are many potential taxpayers and given information technologically enabled intra-TD coordination, with functionally specialized organizations[83]	Automate and organize TDs functionally where there are sufficiently many potential taxpayers.
11	TD effectiveness is increased if information from third-parties is mandated	Selectively introduce third-party reporting requirements
12	Tax complexity and instability decrease the accuracy of revenue forecasts.	Reduce complexity and instability

[79] See Mookherjee (1997).
[80] See Mookherjee and Png (1985) and Kahn, Silva and Ziliak (2001).
[81] See Slemrod and Yitzhaki (1987X)
[82] See Erard (1993).
[83] For example, see McLaren (2003), Silvani and Baer (1997).

TD audit probabilities and strategy should be jointly determined with optimal taxes.

The optimal audit strategy of the TD is still an area in which a consensus is to emerge, despite considerable research effort.[84] One important issue is whether it is empirically reasonable to assume that the TD can commit in advance to an audit strategy or not. Optimal audit strategies, but given a predetermined tax schedule, differ depending on which assumption best approximates practice. Practical advice is typically for a commitment strategy, with "risk-based" selection of taxpayers for audit by computer software serving as a pre-commitment device. If commitment ability is the more realistic approximation, then within a group which for which the TD has identical information prior to audit about incomes of group members ("audit class"), audit probabilities should optimally be decreasing in reported income.[85]

Thus the observed practice in some countries, of auditing with greater frequency taxpayers who report high incomes, reduces TD effectiveness: Audit frequencies should be decreasing with reported incomes within audit classes.[86]

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[84] A balanced review is in Andreoni et. al. (1998).

[85] Examples of papers with this result are Cremer and Gavhari (1993, 1996), Mookherjee and Png (1994) and Chander and Wilde (1998). The audit results assume risk neutral taxpayers and, in Chander and Wilde, have a particularly simple form: that the marginal expected tax rate and audit probability functions are identical up to an additive constant. With risk averse taxpayers Mookherjee and Png (1989) show that the audit rule may not be monotonic in reported income. In the case of a corrupt TD and non-compliant taxpayers, Chander and Wilde's results suggest that tax schedules should be even more regressive than in the case of an honest TD.

[86] This does not mean that taxpayers who are not observationally identical to the TD must have audit probabilities decreasing in reported income. Two important cases are: If the same tax code applies, less TD effort should be spent on those who are harder to tax. Second, Large Taxpayer Units, widely advocated by policy experts, can increase TD effectiveness, *provided they are identified by characteristics other than reported income*. A theoretical and empirical analysis for India of the negative impact on TD effectiveness when large taxpayers are in fact identified by reported income is in Das-Gupta, Ghosh and Mookherjee (2004).

Table A3.1: Institutions for Effective Tax Departments[87]	
Objective	**Operational implementation**
Clarity of goals	(a) Mission and Vision statements (b) Citizen's Charter (c) Medium range modernization plan
Measure goal achievement or performance	Systems of Performance Indicators reflecting effectiveness, efficiency and citizen's service quality, that enable achievement of the administration's mission and modernization plan to be quantitatively assessed[88]
Enable performance	(a) Operational autonomy for tax departments. (b) Functional organization
Communicate performance	(a) Annual Reports to government on the administrations effectiveness and efficiency in delivering performance. (b) Performance Reports for individuals, functional units and field offices based on performance indicators
Reward and motivate performance	Administration budgets linked to performance Positive and negative individual and unit performance incentives

[87] This is a revised version of a table in Pradeep Apte and Das-Gupta (2002).

[88] For an introduction to and assessment of numerical performance measurement, see Carter (1991). See also Baer , Castro and Vehorn (1997), Febres, et. al. (1998) and Silva (2003).

References

Allingham, M. G. and A. Sandmo (1972): "Income tax evasion: A theoretical analysis," *Journal of Public Economics*, 1, 323-388.

Alm James, Betty R. Jackson, and Michael Mckee (1992), "estimating the determinants of taxpayer compliance with experimental data", *National Tax Journal* 45, 107-114.

Alm, James and Jorge Martinex-Vazquez (2003), "'Sizing' the problem of the hard-to-tax" Draft paper, Andrew Young School of Policy Studies, Georgia State University.

Alm, James, Roy Bahl and Matthew N. Murray (1991), "Tax base erosion in developing countries", *Economic Development and Cultural Change*, 849-872.

Andreoni, James, Brian Erard and Jonathan Feinstein (1998), "Tax compliance", *Journal of Economic Literature,* 36, 818-860.

Apte, Pradeep and Arindam Das-Gupta (2002), 'Improving Maharashtra's own revenue Performance', Report prepared for the World Bank, mimeo., Mumbai: Indira Gandhi Institute of Development Research.

Asian Development Bank Institute (2001) "Millennium Tax Conference, 20−29 September 2000", Executive Summary Series, No S33/01, Tokyo: Asian Development Bank Institute. Available at http://www.adbi.org/PDF/ess/ES33.pdf

Atkinson, Anthony and Nicholas Stern (1974) "Pigou, taxation, and public goods", *Review of Economic Studies*, 41, 119-128.

Baer, Katharine, (2002), *Improving Large Taxpayers' Compliance: A Review of Country Experience,* Occasional Paper, Washington, D.C. The International Monetary Fund.

Bagchi, Amaresh, Richard M. Bird, and Arindam Das Gupta, (1995), "An economic approach to tax administration reform," University of Toronto Faculty of Management, International Centre for Tax Studies, Discussion Paper No. 3.

Bahl, Roy (1971), "A regression approach to tax effort and tax ratio analysis", *IMF Staff Papers,* 18, 570-612.

Bahl, Roy and Jorge Martinez-Vazquez, (1992) "The nexus of tax administration and tax policy in Jamaica and Guatemala" Richard M, Bird and Milka Casanegra de Jantsher, editors, *Improving tax administration in developing countries*, Washington DC: International Monetary Fund.

Barbone, Luca, Arindam Das-Gupta, Luc De Wulf and Anna Hansson (1999), "Reforming tax systems: The world bank record in the 1990's," Policy Research Paper WPS 2237, Washington D.C.: The World Bank.

Bardsley, Peter (1997) “Simplifying the tax law: some implications for small business”, *Australian Tax Forum*, 13, 91-113.

Binh, Tran-Nam, Chris Evans, Michael Walpole and Katherine Ritchie (2000) "Tax compliance research: Research methodology and empirical evidence from Australia, *National Tax Journal*, 53, 229-251.

Bird, Richard M. (1982), "The costs of collecting taxes: Preliminary reflections on the uses and limits of cost studies", *Canadian Tax Journal*, 30: 860-65.

Bird, Richard M. (forthcoming), “Administrative dimensions of tax reform” *Bulletin for International Fiscal Documentation*.

Bird, Richard M. and Eric M. Zolt (2003), "Introduction to tax policy design and development", paper prepared for the course "Practical Issues of Tax Policy in Developing Countries", Washington D.C., The World Bank. Available at: http://www1.worldbank.org/publicsector/tax/practicalissues.htm.

Bird, Richard M. and Milka Casangera de Jantscher, Editors, (1992) *Improving Tax Administration in Developing Countries*, Washington: International Monetary Fund.

Blumenthal, Marsha and Joel Slemrod (1992), " The compliance cost of the U.S. individual income tax system: A second look after tax reform", *National Tax Journal*, 45, 185-202.

Boadway, Robin and Motohiro Sato, (2000), The optimality of punishing only the innocent: The case of tax evasion. *International Tax And Public Finance, 7*(6), 641-664.

Bolton, Patrick (1987), "The principle of maximum deterrence revisited", Working paper 8749, Dept. of Economics, University of California, Berkeley.

Brown, Karen B. (2003), "U.S. international tax administration & developing nations: Administrative policy at the crossroads", *The George Washington International Law Review*, 35, 393-399.

Casanegra de Jantscher, Milka, (1990), “Administering a VAT,” in M. Gillis, C.S. Shoup, and G.P. Sicat, Editors, *Value Added Taxation in Developing Countries*, Washington, D.C.: The World Bank.

Casanegra de Jantscher, Milka, Isaias Coelho and Arturo Fernandez, (1992) “Tax administration and inflation,” in Richard M. Bird and Milka Casangera de Jantscher, Editors, *Improving Tax Administration in Developing Countries*, Washington: International Monetary Fund.

Chander, Parkash and Louis Wilde, (1998) “A general characterization of optimal income taxation and enforcement”, *Review of Economic Studies*, 65, 165-183.

Chang Woon Nam, Andrea Gebauer and Rüdiger Parsche (2003), "Is the completion of EU single market hindered by VAT evasion? Cesifo Working Paper No. 974, available at www.CESifo.de.

Chattopadhyay, Saumen and Arindam Das-Gupta (2002) "The compliance cost of the personal income tax and its determinants", Mimeo, New Delhi: NIPFP, available at http://www.planingcommission.nic.in/reports.

Chattopadhyay, Saumen and Arindam Das-Gupta (2002a) " The income tax compliance cost of Indian corporations ", Mimeo, New Delhi: NIPFP, available at http://www.planingcommission.nic.in/reports.

Chattopadhyay, Saumen and Arindam Das-Gupta (2002b) "The personal income tax in India: Compliance costs and compliance behaviour of taxpayers", Mimeo, New Delhi: NIPFP, available at http://www.planingcommission.nic.in/reports.

Chelliah, Raja J., Hessel J. Baas and Margaret R. Kelley (1975), "Tax ratios and tax effort in developing countries", *IMF Staff Papers,* 22, 187-205.

Chu, C.Y. Cyrus and Neville Jiang (1993), "Are fines more efficient than imprisonment?", *Journal of Public Economics*, 51, 391-413.

Clotfelter, Charles T. (1983): "Tax evasion and tax rates: An analysis of individual returns," *Review of Economics and Statistics*, 65, 363-373.

Cremer, Helmuth and Firouz Gahvari, (1993), Tax evasion and optimal commodity taxation. *Journal Of Public Economics, 50*(2), 261.

Cremer, Helmuth and Firouz Gahvari, (1994), Tax evasion, concealment and the optimal linear income tax. *The Scandinavian Journal Of Economics, 96*(2),

Cremer, Helmuth and Firouz Gahvari, (1996), Tax evasion and the optimum general income tax. *Journal Of Public Economics, 60*(2),

Cremer, Helmuth and Firouz Gahvari, (2000), Tax evasion, fiscal competition and economic integration. *European Economic Review, 44*(9), 1633-1657.

Das-Gupta, A., R. Lahiri and D. Mookherjee (1995): "Income tax compliance in India: An empirical analysis," *World Development*, 23, 2051-2068.

Das-Gupta, Arindam (1994) "A theory of hard to tax groups", *Public Finance* 49, (Supplement), 28-39, Proceedings of the 49th Congress of the International Institute of Public Finance, Berlin 1993.

Das-Gupta, Arindam (2003), "Internal trade barriers in India: Fiscal check-posts" available at http://papers.ssrn.com/paper.taf?abstract_id=436240.

Das-Gupta, Arindam and Dilip Mookherjee (1998), *Incentives And Institutional Reform In Tax Enforcement*, New Delhi: Oxford University Press.

Das-Gupta, Arindam and Ira N. Gang (2003), "Value added tax evasion, auditing and transactions matching", in John McLaren, Editor, *Institutional Elements of Tax Design and Reform*, Technical paper no. 539, Washington D.C.: The World Bank.

Das-Gupta, Arindam Michael Engelschalk and William Mayville (1999), *An anticorruption strategy for revenue administration*, PREM Note 33, Washington DC: The World Bank.

Das-Gupta, Arindam, Shanto Ghosh and Dilip Mookherjee (2004), "Tax administration reform and taxpayer compliance in india", *International Tax and Public Finance*, 11, forthcoming.

De Juan, A., M. Lasheras and R. Mayo (1994), "Voluntary compliance behaviour of Spanish taxpayers," *Public Finance/Finances Publiques*, 49(Supplement), 90-105.

Devas, Nick , Simon Delay and Michael Hubbard (2001), "Revenue authorities: Are they the right vehicle for improved tax administration?", *Public Administration and Development*, 21, 211-222.

Dwyer, Terry (2002), 'Harmful' tax competition and the future of offshore financial centres. *Journal Of Money Laundering Control, 5*(4), 302-317.

Ebrill, Liam, Michael Keen, Jean-Paul Bodin and Victoria Summers (2001), *The Modern VAT*, Washington D.C: International Monetary Fund.

Erard, Brian (1993), "Taxation with representation: An analysis of the role of tax practitioners in tax compliance", *Journal of Public Economics,* 33, 163-197.

Erard, Brian, (1997), Self-selection with measurement errors: A microeconometric analysis of the decision to seek tax assistance and its implications for tax compliance. *Journal Of Econometrics,* 81(2), 319-356.

European Union (2002), "VIES (VAT Information Exchange System) enquiries", available at http: //europa.eu.int/comm/taxation_customs/databases/vies_en.htm.

Export-Import Bank of India (1998) "Transactions costs of Indian exports: An analysis", Occasional Paper No. 64, Bombay: Export-Import Bank of India.

Feldstein, Martin (1997), "How big should government be?" *National Tax Journal*, 50, 197-213.

Finance Department, Government of Karnataka (2001) *First Report of the Tax Reforms Committee*, Bangalore: Finance Department, Government of Karnataka.

Fisman, Raymond and Shang-Jin Wei (2004), "Tax Rates and Tax Evasion: Evidence from "Missing Imports" in China", J*ournal of Political Economy*, 112(2), 471-496.

Febres, Jorge, Marcio Gomes Da Cruz, and Martín Bès (1998) "Management indicators for tax administration in Latin America and the Caribbean", processed, Washington, D.C: .Inter-American Development Bank.

Fortin, Bernard and Guy Lacroix (1994) "Labour supply, tax evasion and the marginal cost of public funds: An Empirical Investigation", *Journal of Public Economics*, 55, 407-431.

Fuest, Clemens and Bernd Huber, (2001), Why is there so little tax coordination? The role of majority voting and international tax evasion. *Regional Science And Urban Economics,* 31(2,3), 299-317.

Gale, William G. and Janet Holzblatt (2002), "The role of administrative issues in tax reform: Simplicity, compliance, and administration", in Goerge R. Zodrow and Peter Mieszkowski, Editors, *United States Tax Reform in the 21st Century*, Cambridge: Cambridge University Press.

Garoupa, Nuno and Fernando Gomez-Pomar (2000), "Punish once or punish twice: A theory of the use of criminal sanctions in addition to regulatory penalties",

Gill, Jit B.S., (2000), *A Diagnostic Framework for Revenue Administration*, Technical Paper No. 472, Washington, D.C. The World Bank.

Glassberg, Barry and Christina Smyth (1995), "Tax compliance costs: the problems and the practice – Inland Revenue" in Cedric Sandford (Editor), '*Tax Compliance Costs Measurement and Policy'*, Bath, U.K: Fiscal Publications in association with The Institute for Fiscal Studies.

Hinrichs, Harvey H. (1966) *A General Theory of Tax Structure Change During Economic Development* Cambridge, Mass: Harvard Law School International Tax Program.

Hite, Peggy A and Adrian J. Sawyer (1997): "A comparison of compliance cost estimates for the tax system in the United States and New Zealand", *International Bureau of Fiscal Documentation*, February, 93-97.

Hunter, William J. and Michael A. Nelson (1996), "An IRS produciton function", *National Tax Journal*, 49, 105-115.

Hutchison, Ian (1996),'The value-added tax information exchange system and administrative cooperation between the tax authorities of the European Community', in *Information Technology and Innovation in Tax Administration*, Glenn P. Jenkins, (Ed.),. Amsterdam: Kluwer Law International.

International Fiscal Association (1989), *Studies in International Fiscal Law: Administrative and Compliance Costs of Taxation*, Cahiers De Droit Fiscal International, Volume: 74b, Rio de Janeiro, International Fiscal Association.

James, Simon., Adrian Sawyer and Ian Wallschutzky, (1997), "Tax simplification – a tale of three countries", *Bulletin for International Fiscal Documentation,* November, 493-503.

Jenkins, Glen, (1994), "Modernizing of tax administration: Revenue boards as an instrument for change," *Bulletin for International Fiscal Documentation*, 48(2),

Joulfaian, David (1993), "Corporate income tax evasion", paper presented at the 49th Congress of the International Institute of Public Finance, Berlin.

Joulfaian, David and Mark Rider (1998), "Differential taxation and tax evasion by small business", *National Tax Journal*, 51, 675-687.

Kahn, Charles, Emilson C.D. Silva and James Ziliak (2001), "Performance-based wages in tax collection: The Brazilian tax collection reform and its effects", *Economic Journal*, 111, 118-205.

Kamdar, Nipoli (1995), "Information reporting and tax compliance: An investigation using individual TCMP data", *Atlantic Economic Journal*, 23(4), 278-292.

Kaplow, Louis (1996), "How tax complexity and enforcement affect the equity and efficiency of the income tax", *National Tax Journal*, 49, 135-150.

Lasheras, Miguel and Carlos Herrera (1991), "Tax administration and fiscal system: A comparative analysis, processed, Madrid: Instituto de Estudios Fiscales.

Lodin, Sven-Olaf (2002), "What ought to be taxed and what can be taxed: A new international dilemma", in M. Govinda Rao, Editor, *Development, Poverty, and Fiscal Policy: Decentralization of Institutions* (Essays in honour of Raja J. Chelliah), New Delhi: Oxford University Press.

Low, Patrick (1995), 'Preshipment inspection services', World Bank Discussion Papers 278, Washington DC: The World Bank.

Marelli, Massimo (1984), "On indirect tax evasion," *Journal of Public Economics*, 25, 181-196.

Mayshar, Joram (1991), "Taxation with costly administration", *Scandinavian Journal of Economics*, 43, 263-89.

McAffee, P.R. and J. McMillan (1987), "Auctions and bidding", *Journal of Economic Literature*, 25, 699-738.

McLaren, John (2003), "Corruption and the organization of tax administration: Non-Smithian benefits from specialization", in John McLaren, Editor, (2003), *Institutional elements of tax design and reform,* Technical Paper No. 539, Washington,D.C., The World Bank.

McLaren, John, Editor, (2003), *Institutional Elements of Tax Design and Reform,* Technical Paper No. 539, Washington,D.C., The World Bank.

McLure, Jr., Charles E. (1989), "The budget process and tax simplification/complication", *Tax Law Review,* 45, 25-96.

Mookherjee, Dilip (1997), "Incentive reform in developing country bureaucracies: Lessons from tax administration", *Annual World Bank Conference on Development Economics*, 103-125.

Mookherjee, Dilip and I.P.L. Png (1989) "Optimal auditing, insurance and redistibution," *Quarterly Journal of Economics*, 104 (2), 399-416.

Mookherjee, Dilip and Ivan P.L. Png (1994), "Marginal deterrence in enforcement of law", *Journal of Political Economy*, 102, 1039-1066.

Mookherjee, Dilip and Ivan P.L. Png (1995), "Corruptible law enforcers: how should they be compensated?", *Economic Journal*, 105, 145-159.

Muten (2002), "Fiscal relations between rich and poor countries" in M. Govinda Rao, Editor, *Development, Poverty, and Fiscal Policy: Decentralization of Institutions* (Essays in honour of Raja J. Chelliah), New Delhi: Oxford University Press.

Oldman, Oliver, (1965), "Controlling income tax evasion," in Joint Tax Program, *Problems of Tax Administration in Latin America,* Baltimore: Johns Hopkins University Press.

Owens, Jeffrey (1993), "Globalisation: The implications for tax policies", *Fiscal Studies*, 14(3), 21-44.

Peha, Jon M. and Robert P. Strauss (1997), "A primer on changing information technology and the fisc", *National Tax Journal,* 50(1), 607-621.

Poapongsakorn, Nipon, Kovit Charnvitayapong, Duangmanlee Laovakul and Bev Dahlby (2000), "A cost benefit analysis of the Thailand taxpayer survey", *International Tax and Public Finance*, 7, 63-82.

Polinsky, A.Michael and Steven Shavell (2000), "The economic theory of public enforcement of law", *Journal of Economic Literature* 38, 45-76.
Pope, Jeff (1994), "Compliance costs of taxation: Policy implications", *Australian Tax Forum*, 11, 85-121.

Rajaraman, Indira (1995), "Presumptive direct taxation: Lessons from experience in developing countries", *Economic and Political Weekly*, 30, May, 1103-1124.

Rajaraman, Indira and M. J. Bhende (1998), "A land based agricultural presumptive tax designed for levy by panchayats", *Economic and Political Weekly*, 33, April 4, 765-768.

Rajaraman, Indira, Hiranya Mukhopadhyay and Namita Bhatia, (1999), "Fiscal industrial incentives of the government of Madhya Pradesh: Costs and benefits", New Delhi: National Institute of Public Finance and Policy.

Ramirez Acuna, Luis Fernando (1992), "Privatization of tax administration", in Richard M. Bird and Milka Casangera de Jantscher, Editors, *Improving Tax Administration in Developing Countries*, Washington: International Monetary Fund.

Rhoades, Shelley C., (1999), The impact of multiple component reporting on tax compliance and audit strategies. *The Accounting Review, 74*(1), 63-85.
Roy Bahl and Matthew N. Murray (1990), "Tax structure and tax compliance", *The Review of Economics and Statistics,* 72, 603-613.

Sadka, Efriam and Vito Tanzi (1993), "A tax on gross assets of enterprises as a form of presumptive taxation", *Bulletin for International Fiscal Documentation*, 47(2), 66-73.
Sandford, Cedric (1994), "Self assessment for income tax: Another view". *British Tax Review,* 3, 674-680.

Sandford, Cedric (1994a), "International comparisons of administrative and compliance costs of taxation". *Australian Tax Forum,* 11, 291-309.

Sandford, Cedric, Michael Godwin and Peter Hardwick (1989), *Administrative and compliance costs of taxation*, Bath, UK: Fiscal Publications.

Sandford, Cedric, Editor, (1995), *Tax Compliance Costs: Measurement and Policy,* Bath, UK: Fiscal Publications.

Shah, Anwar Editor, (1995), *Fiscal Incentives for Investment and Innovation*, Washington D.C.: Oxford University Press.

Silva, Emilson C.D. (2003), "Incentive effects of performance-based rewards in tax administration," in John McLaren, Editor, *Institutional Elements of Tax Design and Reform*, Technical paper no. 539, Washington D.C.: The World Bank.

Silvani, Carlos and Katherine Baer (1997), "Designing a tax administration reform strategy: Experiences and guidelines", IMF Working Paper, Washington D.C.: International Monetary Fund.

Slemrod Joel (1990), "Optimal taxation and optimal tax systems", *Journal of Economic Perspectives*, 4, 157-178.

Slemrod, Joel (1995), "The simplification potential of alternatives to income tax." *Tax Note,* 66 (27 February), 1331-1340.

Slemrod, Joel and John Bakija (1996), '*Taxing Ourselves – A Citizen's Guide to the Great Debate Over Tax Reform*', London: MIT Press, 1996.

Slemrod, Joel and Marsha Blumenthal (1996), "The income tax compliance cost of big business", *Public Finance Quarterly,* 24, 411-438.

Slemrod, Joel and Nikki Sorum (1984), "The compliance cost of the U.S. individual tax system" *National Tax Journal*, 37, 461-74.

Slemrod, Joel and Shlomo Yitzhaki (1987), "On the optimal size of a tax collection agency", *Scandinavian Journal of Economics,* 89, 183-92.

Slemrod, Joel and Shlomo Yitzhaki (1996) The cost of taxation and the marginal efficiency cost of funds, *IMF Staff Papers*, 43, 172-198.

Slemrod, Joel and Shlomo Yitzhaki (1998), "Tax avoidance, evasion and administration", Working paper, University of Michigan, Ann Arbor. Forthcoming in Alan Auerbach and

Martin Feldstein (Editors) *Handbook of Public Economics*, Amsterdam: North Holland.

Slemrod, Joel and Shlomo Yitzhaki (2002), "Integrating expenditure and tax decisions: The marginal cost of funds and the marginal benefit of projects", Working paper, University of Michigan, Ann Arbor.

Slemrod, Joel and Varsha Venkatesh (2002), "The income tax compliance cost of large and mid-sized business" (A Report to the IRS LMSB Division), Ann Arbor: Office of Tax Policy Research, University of Michigan Business School.

Smith, Adam (1776), *An Enquiry Into the Nature and Causes of the Wealth of Nations*, (see, e.g., New York, Modern Library, 1937).

Tait, Alan A., Wilfrid L.M. Gratz and Barry J. Eichengreen (1979), "International comparisons of taxation for selected developing countries, 1972-76", *IMF Staff Papers*, 26, 123-156.

Talib, Amin Ali (1996): "The compliance costs of taxation", *Bulletin for International Fiscal Documentation*, 50, September, 418-421.

Taliercio, Roberto, (2003), "Semi-autonomous revenue authorities: Benefits and costs," Washington D.C. The World Bank.

Tanzi, Vito (1992), "Structural factors and tax revenue in developing countries: A decade of evidence", in Ian Goldin and L. Alan Winters, Editors, *Open Economies: Structural Adjustment and Agriculture*, Cambridge: Cambridge University Press.

Tanzi, Vito (1977), "Inflation, lags in collection, and the real value of tax revenue", *IMF Staff Papers*, 24, 154-167.

Tanzi, Vito and Howell H. Zee (2000), "Tax policy for emerging markets: Developing countries", Working paper, Fiscal Affairs Department, Washington D.C.: International Monetary Fund.

Tanzi, Vito and Milka Casanegra de Jantscher (1987), "Presumptive income taxation: Administrative, efficiency and equity aspects", IMF Working Paper No. 87/54, International Monetary Fund, Washington D.C.

Terpker, Seth, (2003) "Managing small and medium-sized taxpayers in developing countries," *Tax Notes International*, 29, 13 January, 211-234.

Toma, Eugenia Froedge and Mark Toma, (1992), "Tax collection with agency costs: Private contracting or government bureaucrats?" *Economica*, 59, 107-120.

Ueng, K. L. Glen and C. C. Yang, (2000), Taxation with little administration. *Journal Of Public Economics, 75*(1), 145-156.

Wallschutzsky, Ian, (1989) "Achieving compliance in developing countries," *Bulletin for International Fiscal Documentation*, 45,

Wane, Waly (2000), "Tax evasion, corruption, and the remuneration of heterogeneous inspectors", Development Research Group, Washington D.C.: The World Bank.

Yaniv, Gideon (1988), "Withholding and non-withheld tax evasion", *Journal of Public Economics,* 35, 183-204.

Yaniv, Gideon (1999), "Tax compliance and advance tax payments: A prospect theory analysis", *National Tax Journal,* 52, 753-764.

Yaniv, Gideon, (1998), Tax evasion by misinforming withholding agents. *Public Finance Review, 26*, 362-375.

Yitzhaki, Shlomo, (1974): "A note on income tax evasion: A theoretical analysis," *Journal of Public Economics*, 3, 201-202.

Zagaris, Bruce (2001),"Tax havens beware, fiscal transparency, and what else? The rules are changing and it's crazy out there!", *Journal of International Banking Regulation*, 3(2), 111–144.

Zagaris, Bruce (2003), "The procedural aspects of U.S. tax policy towards developing countries: Too many sticks and no carrots?" *The George Washington International Law Review*, 35(2), 331-370.

Zee, Howell H. (1998), "Taxation of financial capital in a globalized environment: The role of withholding taxes", *National Tax Journal*, 51(3), 587-599.