

Policy Research Center

Research Paper No. 16

**TAX ADMINISTRATION IN DEVELOPING COUNTRIES WITH
PARTICULAR REFERENCE TO ROAD USER TAXATION**

Roy Bahl



College of Business Administration
Georgia State University
Atlanta, Georgia

May 1991

Policy Research Center

Research Paper No. 16

TAX ADMINISTRATION IN DEVELOPING COUNTRIES WITH
PARTICULAR REFERENCE TO ROAD USER TAXATION

Roy Bahl



College of Business Administration
Georgia State University
Atlanta, Georgia

May 1991

Georgia State University

Sherman R. Day President (Acting)

College of Business Administration

Thomas B. Clark Dean (Interim)

Policy Research Center

Roy Bahl Director
Sharon Weaver Administrative Manager

Senior Associates

Martin Grace (Visiting)
Julie Hotchkiss
Keith R. Ihlanfeldt
Jorge Martinez-Vazquez
Robert Moore
Penelope Prime (Visiting)
Rubin Saposnik
David L. Sjoquist
Paula E. Stephan
Mary Beth Walker

Graduate Research Assistants

Cavery Bopiah
Ding Chen
Jenny Chen
Nikki Finlay
David Green
Richard Hawkins
Michael Jordan
Salvador Lopez
Lu Rong
Sal Sehili
Loren Williams
Joe Zhu

Staff

| | |
|------------------|---------------------------------|
| Sharon DePeaza | Word Processing Specialist |
| John DuPuis | Student Assistant |
| Sonya Gaddy | Senior Administrative Secretary |
| Roderick Padilla | Systems Analyst |
| Jim Reteneller | Clerk |
| Mary Luz Stark | Administrative Secretary |

FOREWORD

The growth in motor vehicles is more rapid than the growth in population in many developing countries. The amounts spent for gasoline and diesel qualify these as big ticket consumer items and cars, trucks and motor vehicle parts are among the more important final goods imports. Not surprisingly the taxation of motor vehicle purchase and use has assumed a significant role in the general public financing in low income countries.

Most of the research on road user taxation has focused on the benefits aspect, i.e., the match between the payment by beneficiaries and the true cost imposed on the road network. In this paper, Professor Roy Bahl considers road user taxes as a general tax revenue and evaluates the relationship between the structure of the taxes and the more common administrative practices.

Roy Bahl is the Director of the Policy Research Center and Professor of Economics at Georgia State University. This work was originally carried out for the World Bank. Mr. Ian Heggie of the Bank not only provided guidance and general supervision, but he made helpful, substantive comments. The views expressed in this paper, however, are solely those of the author.

Jorge Martinez
June, 1991

TABLE OF CONTENTS

| | |
|---|----|
| TAX ADMINISTRATION IN DEVELOPING COUNTRIES WITH PARTICULAR REFERENCE TO ROAD USER TAXATION. | 1 |
| THE PROBLEM. | 5 |
| Fiscal Problems in LDCs. | 5 |
| Avoidance and Evasion. | 7 |
| Exemptions. | 8 |
| Sources of Evasion. | 8 |
| The Current Solutions. | 11 |
| TAX EVASION AND AVOIDANCE. | 14 |
| ROAD TRANSPORT TAXES. | 19 |
| Defining Road Transport Taxes. | 19 |
| Motor Fuels. | 21 |
| Revenue Performance. | 22 |
| Economic Justification. | 24 |
| Rate and Base. | 28 |
| Intergovernmental Sharing. | 32 |
| Administration. | 33 |
| Evasion, Avoidance and Revenue Potential. | 33 |
| Taxes on Purchase: Duties and Sales Taxes. | 37 |
| Revenue Importance. | 38 |
| Base and Rate Structure. | 38 |
| Intergovernmental Sharing. | 43 |
| Evasion, Avoidance and Revenue Potential. | 44 |
| Annual and Registration Taxes on Motor Vehicles. | 51 |
| Rate, Base and Administration. | 53 |
| Taxes on the Movement of Passengers and Goods. | 55 |
| Tolls. | 61 |
| REFORM OPTIONS. | 65 |
| The Level of Tax Rates. | 66 |
| Uniformity in Tax Treatment. | 70 |
| Simplification of the Tax Structure. | 72 |
| Do Incentives Matter?. | 75 |
| Compliance Costs. | 76 |
| Enforcement and Penalties. | 79 |
| Intergovernmental Relations. | 80 |
| REFERENCES. | 83 |
| ANNEX A. | 87 |

TAX ADMINISTRATION IN DEVELOPING COUNTRIES WITH PARTICULAR REFERENCE TO ROAD USER TAXATION

Roy Bahl*

Road User Taxation (RUT) is a surprisingly underutilized source of public financing in less developed countries. The base of the tax (the number and value of motor vehicles and motor fuel consumption) is growing, the general view is that road users have an ability to pay more taxes, a charge to the users of roads based on gasoline consumption or vehicle weight is generally seen as fair, higher transport taxes can reduce congestion and pollution, and at least motor fuel taxes are easily administered.

Despite meeting all of these maxims for a good tax, RUTs are a mainstay of the tax system in few developing countries. These are many reasons: political opposition, the fear that increased transport taxes would cripple economic development, assessment and collection difficulties with the non-fuel components of RUTs, and problems with the rate and base structure of transport taxes. This paper is principally about the latter two constraints to taxing motor vehicles and road use, and about the policy and administration options open to move taxes in this sector toward a full realization of their revenue potential.

*Professor of Economics and Director, Policy Research Center, Georgia State University, Atlanta, Georgia.

Three questions underlie this work. First, do successful country practice and normative principles tell us there is a "right" way to structure RUTs? The answer is "no", because these taxes and charges may play many different roles in the national revenue system. In one country, the objective of RUT will be the rationing of road use, in another it will be financing the construction and maintenance of the highway network, and in others it may be general revenue support. To complicate matters further, taxes on the transport sector may be driven by macroeconomic policies, e.g., the conservation of foreign exchange or the protection of domestic industry.

The second question is whether there are generic rules that will lead to better administration of RUTs. Based on the case studies reviewed here, there would appear to be correctable problems in all areas of the basic areas of tax administration: identification of the bases, recordkeeping, assessment and collection. Violation of the universal rule, that effective administration requires a good tax structure, also appears to be a problem with the transport sector.

The third question is the revenue potential of RUTs. In fact, the revenue stakes in improving the administration of transport taxes are greater than might be supposed. Though proper statistics are not always available (because governments tend to collect revenue data by type of tax rather than by object), the comparisons in Table 1 suggest that a share in total taxes of 11 percent is not unusual and a share in the neighborhood of 19 percent, as in India and Costa Rica, is possible. Some countries, five in this sample of 20, tax the transport sector at a rate greater than 2 percent of GDP. Using these benchmarks, and recognizing that even these higher numbers do not take into account

evasion and avoidance, one comes to the conclusion that many LDCs have a substantial capacity to expand RUTs.

In the next section of this report we turn to the general setting for evaluating tax administration in the transport sector. The topics covered include the nature of the evasion/avoidance problem for LDC taxes in general, the standard remedies to deal with non-compliance, and the directions in which tax policy has turned in recent years. Those interested in reform of the system of transport taxes would do well to start here. A general model of tax evasion/avoidance is summarized in Section III and presented in more detail in Annex A.

The present practice of taxation of the transport sector is described in some detail in Section IV, with particular reference to eight case studies prepared especially for this Project¹. These cases show a wide variation in the choice of tax instruments used, rate and base structure, administrative practice, compliance, and revenue performance. The final section of this report takes up the question of policy and administration reform. It raises the question of whether the LDC experience with tax administration in general, and transport taxes in particular, has taught us about how best to structure and administer a system of taxes and charges on motor vehicles and roadways.

Some caveats should be mentioned. This report discusses transport taxes but is primarily concerned with motor vehicles and road use. Airports are mentioned only in

¹Argentina, Bolivia, Ghana, India, Indonesia, Nepal, Tanzania and Yugoslavia.

passing, and rail and ports are not discussed. A second qualifier is that heavy reliance is placed on the results from a small number of case studies that may or may not be representative. Where possible, the results from other country studies are reviewed, but these are neither comparable in the sense of the questions asked, nor are they presented in the same level of detail. Finally, some of the discussion is a bit loose in the use of the terms "tax" and "charge". This is partly a shorthand convenience and partly because the traditional distinction is blurred with respect to several of the commonly used instruments of transport taxation. Where the distinction becomes important in the discussion below, it will be clearly made.

II. THE PROBLEM

The problem of evasion and avoidance of transport taxes should be set in a context of the broader fiscal problems and strategies in developing countries. The following questions, taken up in this section, can help set this context:

- To what extent is a more intensive use of these taxes consistent with the current thinking about how low income countries should finance public services? Is better enforcement of transport taxes a reasonable strategy for LDCs, given the alternatives?
- What is the magnitude of evasion in the transport sector, and are there significant gains to be had from better enforcement?
- What policy instruments are currently in vogue for dealing with compliance problems, and how would these seem to fit with the instruments that might be used to improve enforcement of transport taxes?
- How can policy makers reconcile the revenue raising and resource allocation objectives of transport taxes?

Fiscal Problems in LDCs

The World Development Report (1988, p. 182) describes the poor conduct of fiscal policy in developing countries as having led to "... heavy foreign borrowing, high inflation and stagnant private investment." It is difficult to describe "the" fiscal problem facing low income countries, because there is so much variation across countries. Some exert a very high tax effort, some a very low effort; some but not all are plagued with high rates of inflation; all do not have high debt burdens, or oil; and rates of economic growth are very different. Even with these very great differences, however, there are some fiscal situations that are observed so often that one is tempted to generalize.

A first commonality is that it is the expenditure side that drives the problems of budgetary imbalance in low income countries. In most cases, the ratio of taxes to GNP is remarkably stable, but the expenditure share may increase dramatically in short periods of time. This creates short run (and in some cases long run) situations of substantial deficits and inflationary financing. Are there common situations that explain the lack of controllability of government expenditures? The following are often observed in LDCs:

- The level of public services is deficient, and there is substantial pressure to upgrade and fill the most important gaps. Governments often spend for capital purposes to fill this gap when their intended level of taxes will not support the level of expenditures required to support these projects, i.e., they borrow without the capacity to repay, they do not adequately maintain the existing capital stock, and they do not operate certain facilities to proper standards.
- The general consumption budget of at least the central government is under pressure from a number of fronts: public employee compensation demands, pressure to increase transfers to local governments, and the increasing price of non-labor inputs (utilities, asphalt, gasoline, etc.). Inflation exacerbates these pressures.
- Debt repayment exerts a fixed and often substantial claim on available resources.
- Government budgets are politicized in that they tend to expand (sometimes beyond prudent levels) during elections, and public employment rolls are often expanded beyond necessary limits as governments take on a role of "employer of last resort".
- Public budgets are often larger than they should be for a particular level of services provided, because of inefficiencies in the delivery of the services.

There is also a revenue side to the problem. In some cases it is simply that the government is unwilling to exert a tax effort that will fill the public services gap. For

example, the Philippines and Guatemala are countries whose tax burden is inordinately low by world standards. A "normal" tax effort in either of these countries would all but eliminate the budget deficit problem.² In other cases the average tax rate relative to GDP, is not low. Here, one or both of two unhappy situations might hold. The first is that the deficit is primarily a problem of overspending relative to capacity to raise revenues. The other is that the high (or even normal) average tax rate translates into very high marginal rates because only a narrow segment of economic activity is taxed.

Avoidance and Evasion

The narrowness of tax bases in LDCs, and the failure to achieve revenue potential, comes about for two reasons. One is that the legal base of the tax provides for a set of exemptions that excludes important components of income, consumption, transactions or wealth from the tax base. To the extent taxpayers take advantage of these preferences, they avoid payment of tax. These preferences are usually placed in the tax system to achieve some efficiency or redistribution goal or to make administration more feasible, and are perfectly legal. The issues to be discussed in this case are the revenue cost of these preferences (the so-called "tax expenditures"), and whether they are, in fact, reachable by the administration if it desired to include them in the tax base.

The other reason for narrow tax bases is evasion. If the tax administration is unable to fully assess and collect the legal tax structure, taxpayers will be able to

²The United States faces much the same situation.

successfully evade **payment** of taxes through non-filing, underreporting or smuggling. This, of course, is illegal and has the consequence of costing the government revenues and compromising the efficiency and redistribution objectives of the tax system. Evasion (like avoidance) narrows the tax base, and the average rate on the now-narrower base must be increased to finance services. This gives further incentive for avoidance and evasion, further narrows the base, and so it goes.

Exemptions. Legal exemptions are a common source of base narrowing. Under the personal income tax, it is not uncommon for interest income from bank deposits to be free of tax. Other commonly exempted items are capital gains and income received in the form of fringe benefits. The company income tax base in virtually every country is eroded by tax incentive legislation, which grants several forms of preferential treatment to qualifying firms in an attempt to increase the rate of economic development.

The indirect tax base is also limited by exemptions and preferential tax treatment. A wide variety of imports are exempt from duty, or are taxed at preferential rates. The value added tax in most LDCs exempts a good part of the service sector, zero rates many commodities, and either does not tax smaller firms or taxes them at nominal rates.

Sources of Evasion. The problem of evasion can be tied to a number of shortcomings in government fiscal administration. The ones most often pointed to are inadequate staffing and procedures. The common situation is one of too few trained staff in every tax administration department. Moreover, the shift to modern tax structures has, if anything, increased the need for trained staff and possibly exacerbated the problem. For example, replacing excises charged at specific rates with ad valorem,

value added taxes has created a demand for tax officials capable of doing book audit rather than physical inspection. Modern property tax systems call for valuers, the company income tax everywhere requires a proper treatment of foreign branches and subsidiaries, and income tax audit and presumptive assessments are essential to broadening the individual income tax base. The training of LDC administrators has not yet caught up with the modernization of the tax structures; and it might not, in part because public sector salaries are so low for skilled persons in these areas that they are often bid away to the private sector,

Administration may also be weak because procedures are not up-to-date. Here the problem varies from country to country, but some examples can give the flavor of the kinds of shortcomings that create the problems.

- Oftentimes there is no unique taxpayer numbering system to use in cross-checking data and making use of third party information.
- Most of the self employed are not on the tax roll.
- The recordkeeping system is not usually computerized.
- Current information on the value of imported goods is often absent.
- Property values are badly out of date.
- No system of presumptive assessment is in place.

A different reason for evasion is the complexity of the tax structure itself. Three issues are important here. First, taxpayers may not have faith in a tax system that they do not fully understand, and may resist payment. Second, complexity may lead to high compliance costs another deterrent to paying taxes. Third, tax administrators may spend

so much time on the "routine" matters of assessment and collection of a complicated tax, that they have precious little time to pursue high return activities such as presumptive assessment or large taxpayer audits.

Evasion is also aided by the unwillingness of the government to implement draconian measures against those who illegally do not report or underreport. This holds for virtually all taxes, and seems to be a problem common among LDCs. For example, nearly every country has a seizure and auction provision for property tax enforcement, but few countries dare use this, even when property tax collection ratios fall well below 50 percent. It is common knowledge that many if not most of the "hard-to-tax" professionals and the self-employed in LDCs evade income taxes by non-filing, but strict measures are rarely taken against these people.³ Under invoicing and the claiming of ineligible credits is a common problem with value added taxes in developing countries (Tait, 1988). Too often, governments collect where the "tax handles" are convenient ~ formal sector wages, imports, big manufacturers, beer, cigarettes, petroleum - and ignore most of the evasion that occurs elsewhere in the economy.

Important to understanding non-compliance is understanding the balance between gains from evasion and the costs incurred if evasion is detected. Are the rewards great enough to encourage illegal behavior? In fact, the rewards to evasion do appear to be

³It was determined that less than 10 percent of high-paid professionals in Jamaica (doctors, attorneys, accountants, architects and veterinarians) filed returns in the mid-1980s. These are among the most educated and in some cases powerful people on the island. No vigorous program of enforcement had ever been brought to bear on these self-employed individuals. (Alm, Bahl and Murray, "Tax Base Erosion in Developing Countries".)

considerable in some countries. Marginal tax rates can reach over 50 percent on the individual income tax, and customs duty and advance sales tax can double the purchase price of some items. In such cases the rewards to evasion, and the bribes paid to public officials, can be quite large. The constraints to evasion are the probability of detection and the severity of the penalty if caught. A major difficulty in many developing countries is that neither detection nor penalty is a very serious deterrent. A model that more systematically explores the relationship among rewards, detection and punishment is presented below.

The Current Solutions

What are the current solutions to the revenue gap problem in LDCs, and how have the avoidance and evasion problems been approached? Though there is much variation among countries, a few common themes seem to underpin the kinds of reforms that have been undertaken in the recent past. These are base broadening, simplification, flatter rate structures, more use of user and benefit charges, and continued heavy reliance on the perennial favorites, i.e., excises on beer, liquor, petroleum products, and cigarettes.

Though it is difficult to document with aggregate figures, the experience with tax reform in recent years has been one of base broadening.⁴ Individual income taxes have been amended to eliminate some loopholes such as fringe benefits and certain personal

⁴This pattern is illustrated by the recent tax reforms in Jamaica (Bahl, 1990), Indonesia (Gillis, 1989) and Colombia (McLure, Mutti, Thuronyi and Zodrow, 1989).

allowances. And though not to the extent they should be, presumptive assessments are being used in many countries. The value added tax in many LDCs is gradually being expanded to include more of the service sector, and to reach further down into the distribution channel. The list of exempt imports is being reduced in many countries as part of tariff reform, and property tax bases are being updated. In many of these cases progress is slow, but there does seem to be a movement in the direction of base broadening.

Along with this base broadening has come a change in rate schedules toward flatter rates on the income tax and more uniformity in the rates of indirect taxes. Income tax reforms in both Jamaica and Indonesia reduced the nominal progressivity in the individual income tax rate schedule, and in the Jamaica case a flat rate was adopted (Bahl, 1989). The movement from turnover taxes to the VAT also was accompanied by greater uniformity in rate schedules. Tariff reform has as one of its major objectives the reduction in the number of different tariff rates, and dramatic reduction in the top nominal rates.

With broader bases and flatter rates, the tax system can become less complicated. With simplification, enforcement can become easier because limited administrative staffs are more able to handle assessment, collection and audit; taxpayers face less compliance cost and at the margin should be more willing to pay; and there is less opportunity to avoid payment of tax by reclassifying activities or transfer pricing. Not all systems are becoming more simple, however, and with good reason. More is demanded of the tax system as low income economies develop and become more complex. Perhaps the best

case in point is inflation adjustment, which is absolutely essential but quite clearly complicates the tax structure. There are other examples: presumptive assessments, special credits to reduce the regressivity or price effects of the value added tax, the special treatment of financial institutions, and income tax integration schemes.

Finally, one should mention the trend toward more use of user and benefit charges. This strategy is consistent with the goal of mobilizing more resources without increasing marginal tax rates. It usually has the virtue of easy administration and revenue productivity. Many have cited as a primary reason for lack of compliance with the tax system the inability of taxpayers to see the benefits they would derive from payment of the tax. User or benefit charges would seem to be an answer to this determinant of noncompliance,

III. TAX EVASION AND AVOIDANCE

The methods by which individuals and companies reduce their tax liabilities take a variety of legal and illegal forms. Such behavior hampers the public sector's efforts to generate adequate revenues, particularly in developing countries where tax enforcement is weak and where the informal sector of the economy is "hard to tax".⁵ The revenue loss from noncompliance exacerbates an already serious problem that is the result of low taxable capacity, deficient infrastructure, inadequate public services, and substantial debt repayment obligations. Developing countries often respond to the revenue shortfall by making use of highly progressive income tax structures, higher sales and excise tax rates and increased customs duty; however, high marginal rates of taxation are thought to discourage some productive activities, distort some economic decisions and provide further incentives for noncompliance. Virtually every fiscal reform program for developing and developed countries recommends lower rates of taxation, base expansion, and improved tax administration as a way out of this dilemma.

A key problem in designing tax reform, particularly income tax reform, is that the relationship between tax structure and tax compliance is not well understood. This is especially true for the case of developing countries. In this section we examine the role that the income tax structure plays in tax compliance, and consider this result in the context of the transport sector.

⁵Good statements of developing country fiscal and tax administration problems can be found in Richard Goode (1984), Richard Bird (1983), and G. K. Shaw (1981).

A formal model of the evasion choice, presented in Annex A, suggests a number of propositions about the determinants of tax evasion and tax avoidance. The rate of evasion (illegal activity) will increase with the tax rate, and it can be reduced with a greater probability of detection, a more severe penalty if caught, and the sacrifice of benefits associated with paying taxes. Tax avoidance, on the other hand, is legal and comes about because of loopholes in the system that enable a taxpayer to reduce liability by adjusting consumption or the composition of received income, or by making different investment or production choices. The policy routes to reducing tax avoidance include lowering marginal tax rates, broadening the tax bases to eliminate the preferential treatment of certain activities, increasing the transaction costs to taxpayers who use legal loopholes, and tightening control by the tax authorities in monitoring questionable cases.

Paradoxically, a reduction in the rate of evasion can, *cet. par.*, increase the rate of tax avoidance, and vice versa. If the "price" of evasion becomes too high, taxpayers look harder for other ways to reduce what they consider to be too high a tax burden. Closing down loopholes to reduce tax avoidance, on the other hand, will increase tax evasion in the absence of tighter enforcement measures. What this tells us is that the problems of evasion and avoidance must be approached simultaneously.

High marginal tax rates increase the rewards for both evasion and avoidance. It seems clear that at a lower tax rate, an individual or a business will be less willing to take the chance of being caught and punished for tax evasion. Avoidance at lower rates may also be a less interesting proposition since there are costs associated with using exemptions and deductions: the additional time necessary for the accountants and

lawyers to prepare the case, the administrative costs associated with changing the compensation package of employees toward non-taxable fringe benefits, the transactions costs of reallocating an investment portfolio, and the expense of shifting production activities into lines that are given preferential tax treatment under incentive legislation.

There are two qualifiers to the proposition that rate reduction will move compliance in the right direction. The first is that the increase in compliance may not be very large if there is not a simultaneous increase in enforcement. If an evader feels that there is an insignificant probability of detection in evading a 50 percent tax, he is not likely to be drawn into the tax net by a 25 percent tax rate if he feels just as good about his chances of not being caught. If anything, he might feel that because of the lower rate, the government will be even more lax in its pursuit. The second qualifier is that the rate reduction should not imply any reduction in public services provided. Rather, the discussion here is about a rate reduction accompanied by a commensurate increase in the size of the base, i.e., a "revenue neutral" adjustment. Otherwise, the rate reduction may be perceived as a reduction in the benefits to be received from taxes paid. Such a reduction in benefits would, cet. par., increase resistance to paying taxes.

There are many ways to increase the probability of detection, and most if not all are within the capabilities of tax administrations in less developed countries. The most promising is the identification of a full tax roll. The registration of all individuals, businesses, and properties subject to taxation can be accomplished by door-to-door surveys, the use of third party information (import licenses, property transfers, motor vehicle registrations, utility connections, and a host of other sources of information), and

the integration of records from all taxes. This requires the development of a unique taxpayer numbering system, something that is missing in all too many low income countries.

The detection of under reporting taxable income is as important as the detection of non-filing. Detection of under-declaration may be done by developing a presumptive assessment system for the hard-to-tax in general and for the self-employed in particular. A strong audit program is another important element of protection against underreporting. For customs and excise duties, the measures include better inspection procedures and the use of an up-to-date data system in the case of import valuation. Underlying all of these proposals should be a stronger training program, better advancement possibilities for the tax administration staff, and computerization of the system.

These detection methods will also reduce the amount of tax avoidance because taxpayers will note the increased probability that "border line" cases will be disallowed, and because of the added cost of preparing an adequate case to take advantage of a questionable tax preference.

An increase in the penalty rate is an essential part of any enforcement program that would reduce the degree of tax evasion. In too many low income countries, the penalty is nominal, or rarely applied. The interest penalty on underpayment of taxes can be below market rates, there is often very little penalty on under-declaration of imported goods, and though property tax delinquency can be penalized with seizure of real property, such a draconian measure is rarely if ever used. Another problem with penalty

rates is that the time lag for hearing a case in the courts in some countries makes it to the taxpayer's advantage to avoid payment as long as possible. The problem is not helped in countries where tax amnesties are frequent, or where those who do not pay are eventually dealt with under negotiated settlements.

The key to better enforcement of the tax system is the willingness on the part of government to impose severe penalties on those who do not pay. In most cases the law provides for adequate penalties -- the problem is generally an unwillingness to impose the penalties. The problem with the delay in the court system may be solved partly by making the taxpayer remit the assessed amount pending the legal decision. Another form of penalty is public announcement of the names of delinquents — a form of public embarrassment that may induce an increased compliance.

IV. ROAD TRANSPORT TAXES

There is no clear-cut definition of what constitutes a "road transport tax". The discussion below begins with this issue. And it is a more important issue than semantics if there is an intention to evaluate RUTs as taxes on a sector. Such evaluation might include the extent to which the taxes on the sector match the benefits from roadway expenditures, whether revenue collections are in step with the growth in the potential transport tax base, whether the various RUTs are having the desired allocative effects, and whether the right RUT "tax handles" are being used to make administration most efficient and fair. The following is an outline of the use of each of the forms of transport tax and charge. The discussion focusses on revenue yield and elasticity, the definition of rate and base, the revenue split between central and local government, administrative procedures, problems with the structure and administration of the tax, and the experience with evasion and avoidance.

Defining Road Transport Taxes

In this paper, and in the case studies on which this paper is based, the scope of transport taxes includes those related to the ownership and operation of motor vehicles, and the use of roadways. By this general classification, RUTs can be grouped into the following categories:

- motor fuel taxes;
- import duty, excise tax and sales tax;
- vehicle registration taxes and licenses;

- taxes on the movement of goods and vehicle tolls;
- income taxes on transport-related activities.

Within this set of tax categories, there are many types of specific levies that are used. A road transport study in Indonesia (World Bank, 1982) identified 22 RUTs in the revenue structure (Table 2).

Still, there are ambiguities about what should be properly counted as a tax on the transport sector. For example, there is a question about whether income taxes on companies involved in the production and sale of motor vehicles and transport services should be included. Some would argue that these are general taxes on the income earned by any business meeting the exemption test, and are not specific to any sector. Luthra (1989, p. 21) does not count company income taxes on road transport operators as a road user charge in his study of India because it "is not a tax levied on inputs or outputs of the road transport industry". The Indonesia study, by contrast, does count corporate income taxes on importers or domestic assemblers as transport taxes.

Another view is that it is necessary to separate those taxes that are general from those that are related to use of roads. The World Bank case study of Indonesia (1982) classifies transport taxes into two broad categories: general revenue taxes and road user charges. The former are levied on transport activities as part of national revenue policy while the latter are differentially higher taxes or charges levied on the transport sector. For example, the general rate of customs duty on an automobile or the general rate of value added tax on an automobile part comes under the heading of general revenue taxes. Any differentially higher rate of duty or VAT on the transport sector would be

classified as a specific user charge. The specific road user charges are then subdivided into fixed charges -- taxes levied periodically, such as an import duty, a manufacturer's sales tax, or an initial registration - and taxes that vary with vehicle use, such as fuel taxes.

Motor Fuels

Motor fuel taxes dominate the revenues received from the transport sector. As may be seen in the comparisons below, it is not uncommon that they account for half of all transport related revenues.

| | |
|-------------------|------------|
| India (1988) | 47 percent |
| Nepal (1985) | 37 percent |
| Bolivia (1988) | 62 percent |
| Argentina (1988) | 56 percent |
| Ghana (1988) | 90 percent |
| Yugoslavia (1988) | 63 percent |
| Tanzania (1986) | 32 percent |
| Guatemala (1988) | 49 percent |

The evidence presented in Table 1 suggests that, on average, motor fuel taxes account for about 6 percent of total taxes and are equivalent to around 1 percent of GDP. The reliance can be greater -- more than 16 percent of taxes and 3 percent of GDP in Costa Rica.

Revenue Performance. There is no question but that the potential base of motor fuel taxation is broad enough to yield significant revenues at feasible rates. Whether the rates can be set at a high enough level to yield a significant amount of revenues depends on the political constraints and on the possibility of keeping some of the high tax burden off non-road users of petroleum products.

The other dimension by which the revenue performance of a tax might be evaluated is its income elasticity, in this case whether the automatic growth in motor fuel revenues is more or less than in proportion to GDP. Most observers would believe that revenues from taxes on motor fuels are buoyant, i.e., they automatically increase at least in proportion to GNP. This is because of the expectation that over the long-run the monetary value of petroleum consumption will increase faster than GNP. However, motor fuel taxes are not always income elastic. For example, the income elasticity of motor fuel taxes in Guatemala between 1984 and 1989 was less than 0.9, and in real per capita terms motor fuel revenues were 30 percent lower in 1989 than 1986. There was a decline in the real value of the tax on a gallon of gasoline in Jamaica between 1978 and 1983 (Smith, 1984). Why is this? Consider that the revenue income elasticity of motor fuel taxes has three components, as described below:

$$\frac{dT}{dY} = \frac{dT}{dT B} \cdot \frac{dT B}{dB} \cdot \frac{dB}{dY}$$

where dT = percent change in motor fuel tax revenues;

dY = percent change in GDP;

dTB = percent change in the taxable base;

dB = percent change in the true market value base;

Buoyancy from the first term $\left(\frac{dT}{dT B} \right)$ has to do with the rate structure of the motor fuel tax. Under a flat rate ad valorem tax, the rate elasticity would be unity. One reason for the inelasticity of motor fuel taxes observed in many LDCs is that a specific (per gallon) tax rate is levied, hence periodic discretionary' adjustments are required for revenues to keep pace with the rising prices of imported petroleum.⁶ Such adjustments are politically difficult, and the failure to make them has frequently stalled the revenue growth of motor vehicle taxes. For example, the failure to adequately index the rate led to a reduction in the road user tax in Yugoslavia of about one-half between January 1987 and March 1988. This problem has led Yugoslavia, and also Argentina, to adopt ad valorem tax rates in recent years.

The second term in this simple formula is the taxable base elasticity, i.e., the extent to which the taxable value of motor fuel consumption increases in proportion to the market value of motor fuels consumed. This is, potentially, another source of revenue inelasticity. In most LDCs, central governments fix gasoline prices and in effect

⁶If a specific tax rate (t cents per gallon) is levied, then revenues from a tax at the pump will increase by tdG

where dG = change in gallons of consumption
no matter what is the increase in the value of the potential taxable base (PgG)

where Pg is the pump price
Since $tdG < d(PgG)$ in most cases, the rate elasticity will be less than unity for any given

average tax rate $\left(\frac{T}{TB} = \frac{tG}{PgG} \right)$.

determine the size of the taxable base elasticity. Is the taxable base elasticity less than unity in most LDCs? The answer to this question is "yes" if the government does not let the taxable price rise with increases in the market price. This seems to be the case. In Indonesia, for example, one nationally-owned oil company (Pertamina) is responsible for all production and the price of motor fuel is set by Presidential decree. In practice, the gas tax (subsidy) is set by the difference between the administered retail price of motor fuels and the production cost. The same is true in Argentina, where the government establishes the tax as the difference between the retail price and the "retention price" for the oil company. The situation of central governments setting and regulating the price of fuel holds for the countries in this sample.

The third component of the elasticity of motor fuel taxes is the base elasticity, i.e., the ratio of the percent increase in the market value of motor fuels consumed to the percent increase in GNP. Two factors effect this component of the revenue elasticity: changes in the market price of motor fuels, and changes in the amounts of fuel consumed. Since average fuel consumption has fallen during the past 18 years, the base elasticity has been dampened. This part of the elasticity is beyond the direct influence of the government.

Economic Justification. Three justifications are commonly given for the heavy use of motor fuel taxes in less developed countries. One is a straightforward revenue argument. Gasoline consumption is a large tax base, relatively price inelastic in demand, and administratively easy to reach at the point of importation or at the refinery level.

The second supporting argument is that since most countries are oil importers, a high tax on petroleum can be justified on balance of payments grounds.

The third justification, and the one most central to the concerns of those involved directly with the transport sector, is an efficiency argument: gasoline taxes are a rough proxy for the benefits received from the use of transport services. There is some rough justice in this approach to charging for highway use.⁷ But there are important weaknesses in the benefits justification for gasoline taxes, and these weaknesses are magnified in less developed countries. The result is that despite the rhetoric in most LDCs, the tax on motor fuels is not usually designed as a benefits levy.

A true benefits levy would approximate the following conditions:⁸

- Those who did not pay for highway services would be excluded from the benefits of highway services.
- Those who did consume highway services would pay according to the benefits they derived.
- The proceeds of the tax/charge would be spent on highway services.
- The population would be able to express its demand for more or less highway service through its willingness to consume the service at the price set by the public authorities.

The typical situation in less developed countries is that all of these principles are violated. First, though consumers and productive factors somehow share the benefits of

⁷In the United States, total highway expenditures at all levels of government are approximately equal to total gasoline tax collections (Musgrave and Musgrave, pp. 230-231).

⁸A good discussion is in Shoup, pp. 118-126.

business use of transport services, and the burden of the gas tax, other beneficiaries may not pay. These include those whose property values, business profits, and general quality of life are improved by better access to highway services. This is a problem with the use of the gas tax as a benefits charge in developing and developed countries alike.

Second, the gasoline tax typically does not recognize that different users of highway services impose different costs on the highway system, and that they may derive different benefits from each gallon consumed. Among the variables that are not usually taken into account are different speeds of travel, different levels of congestion imposed, and different road surfaces over which travel takes place. Another variable, different vehicle weights, is partly accounted for under motor vehicle license fees. A particular problem in this respect is the differential treatment of petrol and diesel in most LDCs. The typically lower rate on diesel is the reverse of what the benefits principle suggests, because of the greater mileage obtained with diesel and the differentially higher road use cost associated with heavier vehicles (see also the discussion under "rate and base", below). Third, the entire amount of gasoline tax collections is not always designated for the road fund. For example, only about 20 percent of the specific levy on gasoline is earmarked for the road fund in Ghana. The implication is that only a part of the gasoline tax is considered a charge for the use of transportation services, and the remainder is considered a general revenue tax and/or a penalty for using scarce resources for luxury consumption. The latter justification is in step with the argument in some countries that the gasoline tax is levied primarily to conserve foreign exchange or

to promote some other macroeconomic or industrial policy objective.⁹ The relationship between total collections from motor fuel taxes and total road expenditures varies widely as may be seen from the right column of Table I. Of the countries surveyed for this comparison, the median share is about 80 percent.

A fourth gap between the current practice and the proper use of motor fuel taxation as a benefits levy is that the tax rates on diesel and petrol are usually differentiated, and a range of exemptions is usually offered. This further separates the amount of tax paid by various users from the amount of benefits received.

Finally, the benefit charge is not used as a signal of the demand for more, less, or a different mix of transport services. It would be fair to say that gasoline prices are not set according to what is perceived to be the demand for highway services. If users want more services, they still must act through the political process. If they want lower gasoline prices (the pressure they are more likely to bring to bear on the political process), they may use the threat of strike or even public disturbances. Despite the fact that relatively few people in developing countries own automobiles, and the fact that the gasoline tax is progressive, the public is very sensitive to sharp increases in gasoline prices. This is because users of the transport system - automobile owners, taxi drivers and mini-van owners and their customers - are educated and often politically vocal and influential persons (see also Due, 1988, Chapter 4).

⁹Not all industrial countries earmark the gasoline tax. Tait and Morgan (1980) note that of ten OECD countries studied, only six devoted all or part of their excises on petroleum to finance highways.

What all of this means is that the motor fuel tax must serve many different masters: various policy makers will see it as an instrument to improve resource allocation, to redress an unequal distribution of income, and to raise revenues. It should not be surprising, therefore, to find that in most countries it is structured to provide preferential treatment for certain activities and penalties for others. And while ease of administration protects revenue from motor fuel taxes to a significant extent, preferential treatments and the political problems with raising gasoline taxes impose a heavy revenue cost.

Rate and Base. Motor fuels are taxed in several ways. Imported petroleum is subject to a customs duty, domestic refineries are subject to an excise tax, the state monopoly on petroleum products may be taxed on its retained earnings, a retail sales tax may be imposed on the pump price, and the pump price may be set above (below) production cost, implying a tax (subsidy).

Some countries use only one of these tax forms while others use a combination. For example, Bolivia taxes domestic production and use of motor fuels with a combination of a production tax, value added tax, transactions tax, a royalty and the required transfer to government of a specified share of the profit of the state oil monopoly, Indonesian law provides for a 10 percent excise tax and a 10 percent sales tax on motor fuel consumed, but in practice neither is levied. Instead the Indonesian government sets the tax (subsidy) rate in choosing a differential between production costs and retail price.

In most countries, the tax rate on motor fuels is specific rather than ad valorem. As noted above, the problem with a specific rate is that it must be indexed to the base price in order to maintain some degree of revenue elasticity, or the government must make periodic, unpopular decisions to increase the tax rate. For those countries which derive gasoline **tax** revenues from a tax rather than from the profits of the state monopoly, the solution to the elasticity problem has been to turn to an ad valorem rate. Assessment under a value-based tax need not become more complicated, because prices are fixed and physical methods of control may still be used, but revenue growth can become automatic.

Most countries continue to use a specific rate, but there would appear to be a trend towards establishing ad valorem rate structures. Of the countries covered by these case studies, Yugoslavia and Argentina have recently adopted an ad valorem rate; Nepal has established a percent rate on its sales tax on motor fuels (but not import duty); and Indonesia has an ad valorem rate in theory, but in practice levies the tax (grants the subsidy) through an administered price.

Some would argue that the downside of ad valorem rates is that revenues fall when petroleum prices are falling, and stimulate a general inflation when petroleum prices are rising. The instability argument seems correct, though the revenue declines are cushioned by the relatively price inelastic demand for motor fuels. However, the notion that fuel tax increases drive up general consumer prices may be less true. Hughes (1987) has compared the price effects of revenue neutral increases in fuel taxes and general consumption taxes in Tunisia, Indonesia and Thailand. His results are based in part on

input-output tables for those countries, and therefore take into account both direct and indirect effects. The results show that a general consumption tax leads to a larger rise in prices than does an equal yield tax on gasoline, i.e., a major portion of the burden in the motor fuel tax increase falls on factor incomes rather than on consumption. When he reruns the experiment using the various fuel taxes, he finds that only kerosene gives a significant price effect.

Rate structures in LDCs tend to be differentiated according to type of fuel.¹⁰ The typical practice is to keep the tax rate (price) on petrol at a higher level than that on diesel fuel (and fuel used for non-road purposes). From a standpoint of efficiency in road use, this is exactly opposite what should be the case. Diesel-powered vehicles tend to be heavier and impose a greater road maintenance cost and, cet. par., can travel greater distances per gallon of gasoline consumed. This suggests that, if anything, their cost to the consumer should be greater than that for petrol. Moreover, the introduction of the differential rate structure immediately complicates tax administration, encourages users to switch to diesel-driven vehicles, and opens the door for preferential treatments that were not intended.

In the face of these potential problems, why do governments feel it is necessary to differentiate the rate as between gasoline and diesel? Three reasons are often cited. The first has to do with income distribution concerns: (a) lower diesel rates subsidize public transportation, which is used principally by the poor, and (b) higher gasoline tax

¹⁰This is different from the practice in most industrialized countries, which tax both at the same rate. Singapore, however, has not taxed diesel fuel at all since 1979.

rates are borne disproportionately by the higher income who own and operate vehicles. The second reason is that the present system already charges motor vehicles at a rate which does not cover the short run marginal cost they impose on roadways, hence private transportation is underpriced. A reduction in the price of public transportation via lower fuel prices, therefore, keeps the relative prices in the right balance.

The third reason is to give favored treatment to give favored treatment to non-transport uses which rely on diesel (including home heating fuels) so as to protect low income families and not compromise industrial development. The argument against this third justification for a difference between gasoline and diesel prices is that a blanket subsidy to diesel fuel also implies a subsidy to all road haulers and shippers, and to beneficiaries of these services. It also distorts transportation choices against alternatives such as rail, and it may distort location choices for production facilities by lowering transportation costs for goods. Finding the correct rate structure is no easy task. For example, instituting the "correct" policy of lower rates for diesel used for off-highway purposes (farms, industry, railroad, electric power generation, etc.) but not transport use would create difficult administrative problems (Due 1988, pp. 78-79).

Exemptions are another departure from the broad base-flat rate maxim that characterizes efficient taxes. There seems no pattern or general rule as to exemptions given in the case of motor fuels. For example, Yugoslavia exempts use by the army, marine users and agricultural users, Nepal exempts only diplomatic use, and Ghana provides no exemptions. No data are available on how much the tax base is compromised by exemptions in the case study countries, but some analysts have taken

the view about exemptions that "... this is a prevalent practice, but not of a serious magnitude" ("Issues in the Administration of Transport Taxes," p. 4).

Intergovernmental Sharing. Motor fuel taxes are a central government tax in most developing countries. One might argue that there are many good reasons for this. Gas prices are a sensitive political issue with big national implications, and many would argue the dangers of allowing local governments to affect prices, even at the margin. Another problem is that if interlocal variations in gas prices were large enough, fuel carrying would result to avoid payment of the tax. Perhaps the most important constraint of all is that the gas tax is just too big a revenue producer to turn over to the local governments.

This said, the evidence is that local governments in some countries do benefit from motor fuel taxes. In Argentina, Guatemala, Indonesia and India, a portion of receipts is distributed by formula to the state and local government sector. There is much variation in how the total amounts for distribution are determined and in how these amounts are distributed among the local governments. In Argentina, an "excess" profit on motor fuels is defined as one-half of the difference between the government-defined market price and a "retention" price. The latter is roughly a breakeven price. Approximately 9 percent of the excess is distributed to the Provinces as their share of the fuel fund. Guatemala municipalities share in 2 cents per gallon of the gasoline tax.

In some cases, local/provincial governments are given the power to tax motor fuels and retain the revenues. In Indonesia, provincial governments are, in theory, allowed to levy a fuel tax, but they do not use this power. Bahl and Linn (forthcoming) have

surveyed the local government use of motor fuel taxes in the 1970s and 1980s, and find that a few large urban governments in less developed countries do levy fuel taxes.

Administration. One of the major attractions of motor fuel taxation is its ease in administration. There are relatively few points of distribution, and few distributors, hence the liable taxpayer is easily identified and policed. In Indonesia, for example, the nationally owned oil company (Pertamina) assesses and collects all domestic taxes on motor fuels. The situation is similar in Nepal. Taxes on motor fuels in Ghana are paid by a small number of distributors, based on their supplies from the National Petroleum Company, which is the sole importer. In Yugoslavia the tax is administered by a small number of petrol companies which own and operate petrol stations, but input and output prices are determined centrally. Even in India, where one always expects more complication, fuel prices are regulated by the central government and are collected at source as part of import or ex-factory prices. Because input and output prices are usually fixed, collection costs are borne by the distributors or factories responsible for collection. Collection costs are not very high, as the controls on compliance are straightforward. Due (1988, p. 79) notes that there is not even a need to post inspectors at the refinery level. In Bolivia it is estimated that collection costs are equivalent to less than one percent of collections.

Evasion, Avoidance and Revenue Potential. The countries in this sample indicate little or no problem with evasion or avoidance of motor fuel taxes - all report a

collection rate of 100 percent.¹¹ But a collection rate of 100 percent means only that all of the billed amount is being collected. This implies that tax evasion on the collection side is not a problem. Neither is assessment a problem, since taxpayers and petroleum suppliers are easily identified and straightforward physical methods of assessment may be used.

The bigger issues in the administration of transport taxes are whether the fuel tax base is being assessed at its full potential and whether some legal tax avoidance is taking place. There is some evasion of motor fuel taxes, especially in the form of smuggling, and this is also discussed below.

The first place where a gap between revenue potential and revenue collections arises is in the legal definition of the tax base, i.e., the level at which the market price is set. To the extent there is a common practice in fuel pricing, it is to price diesel and kerosene below world prices and gasoline at a higher level. One recent study ("Issues ...", p. 4) places the latter (on average) at 50 percent above international prices, and the former at 25 to 40 percent below. From the point of view of government revenues, a positive real motor fuel tax yield would be one large enough to cover the losses of the state monopoly and have an additional amount left over to contribute to the general financing of the transportation network or to the general budget.

When the net-of-tax economic price for fuel is above the net-of-tax administered price, the "financial" tax that is levied may be partially or fully offset by the subsidy

¹¹An interesting exception is Chad where the government failed to pay for its deliveries and the oil companies responded by withholding their tax payments.

element, The result may be a net subsidy to the transport sector, rather than a **tax** on road use. In Indonesia (1980, p. 11), a 9 percent subsidy to petrol and a 67 percent subsidy to diesel were only partially offset by the gas tax and led to real revenue losses from the taxation of motor fuels. Ghana is another country where all categories of fuel are subsidized. This is not an uncommon situation, and motor fuel taxes are far below their economic potential in most LDCs. This may be viewed as a cost of those objectives that led the government to adopt a policy of subsidizing gasoline prices.¹²

The other problem that causes fuel taxes to fail short of revenue potential is tax avoidance, made possible by a tax structure that allows users to reduce their motor fuel tax liability by altering their methods of doing business, e.g., claiming exemption, or switching to the use of cheaper fuel or different transportation modes. One example is fuel carrying - avoiding a higher rate of gas tax in an urban area by driving to a rural area to purchase motor fuel. There is no evidence that urban-rural fuel carrying is occurring in the cases examined here, but Bahl and Linn (forthcoming) argue that differentially higher urban fuel prices are quite feasible because of the high cost and low return of fuel carrying. Many of the other forms of economic adjustment to avoid paying higher motor fuel taxes are thought to be in the interest of the government, e.g., purchasing smaller vehicles, and making greater use of public transportation.

¹²Low fuel prices also give rise to other problems. For example, in Tanzania it is argued that the combination of low fuel prices and a low margin to cover transport costs discourage the hauling of fuel to inland locations.

Some features of the motor fuel tax structures in LDCs have provided an incentive for evasion, and have complicated the administration enough to increase the probability of successful evasion. One area is exemptions for certain classes of users. This provides an incentive to reclassify activities to the exempt categories. For example, marine, agricultural and public bus users of motor fuels are totally or partially exempt from tax in Yugoslavia. The result is that by comparison with fully taxed use of fuel, agricultural use is 40 percent cheaper, marine use is 47 percent cheaper, and bus use is 39 percent cheaper. Thus the incentives for illegally classifying other private sector activities as exempt, or engaging in some form of transfer pricing, are considerable. However, in the case of Yugoslavia, it is argued that little or no evasion occurs because social ownership of capital makes it difficult to translate such evasion or avoidance into personal gain, and because the penalties are severe enough to be an effective deterrent.

Differential prices for premium and regular gasoline, diesel, and kerosene open another door for evasion. Because the differentials are oftentimes large, there is some incentive for adulteration. One approach to dealing with this problem, taken by the government of Ghana, imposes a differentially higher excise on regular gasoline to equalize the wholesale prices. Other approaches to dealing with this problem are more purely administrative: coloring different types of fuel for easier identification, the use of suitable additives to discourage improper use, or restrictions on the quantity sold at any one time.

Finally, there are border price problems, i.e., differentials in fuel prices between contiguous countries, which lead to smuggling. This problem has arisen in Tanzania

where the price of gasoline is well below the level in neighboring Kenya. The **problem** in Tanzania was complicated in 1987 by an overvalued exchange rate. "... low **fuel prices** encourage smuggling; fuel is imported into Tanzania, paid for in foreign **currency and** then resold over the border for local currency." (Tanzania, pp. 14). The cost to **the** Tanzanian government is a revenue loss, assuming that the price of motor fuel is **set** below the market price. Fuel prices in Ghana are also relatively low, **especially with** respect to neighboring Ivory Coast. This leads to some fuel carrying **from Ghana to** Ivory Coast.

"... it is estimated that such leakage is around one percent **of total domestic sales** with a concentration on kerosene. Thus, rather than undercollecting the Government of **Ghana** is modestly overcollecting. However, with Ghana's ex-refinery prices **well below** world prices, it is doubtful if the tax revenue collected on illegally **exported fuels** compensates for the subsidy lost." (Ghana, pp. 2-12).

Taxes on Purchase: Duties and Sales Taxes

Taxes on the sale and purchase of motor vehicles, and parts, are **collected in four** different forms: import duty, excises on domestic production, general sales **taxes, and** income taxes on manufacturers and dealers. Though the motor vehicle share **of these** tax bases is significant, the question is still open as to the extent to which **full revenue** potential has been reached.

To answer this question it is necessary to review the practice in various **countries as** regards base definition and rate structure, and to match these against the modern norms for a "good" tax; to evaluate the administrative practice, and to explore the division of

responsibility for these taxes as among the central and subnational governments. Lastly, we take up the issues of avoidance and evasion, and how they may be reduced.

Revenue Importance. The revenue importance of sales and production taxes, as a share of GNP and as a share of total transport taxes, is described for a small sample of countries in Table 3. Based on this admittedly small sample, one might conclude that one-third of all revenues collected from transportation activities is a feasible level.

Revenues from these taxes are rarely earmarked for expenditures on transportation services. The evaluation of the practice in this area, then, centers on the contribution of these transport taxes to general revenues and general economic policy, and how improved administration might increase this contribution.

Base and Rate Structure. There are three points at which the value of motor vehicles and motor vehicle parts can be taxed: at the point of import, at the point of manufacture, and at the point of sale. Nearly all countries make use of all three stages. Beyond this, however, it is difficult to describe a common pattern for the taxation of purchases and production of motor vehicles and motor vehicle parts. Every country develops an approach that is consistent with its existing tax structure, the skills of its tax administration, its economic goals, the degree to which it is trying to protect the domestic manufacture or assembly of motor vehicles, and its foreign exchange position. The general flavor of rate and base variation can be had from a summary review of the practice followed in several of the case study countries. Indonesia takes possibly the broadest approach in terms of the numbers of tax instruments used. The following taxes are levied on the purchase and production of motor vehicles:

- customs duty;
- income tax on importers;
- sales tax on imports;
- manufacturer's sales tax;
- income tax on dealers;
- ownership transfer tax.

But Indonesia also may tax the narrowest base in that much of motor vehicle purchase is subject to preferential treatment. Most important, all commercial vehicles (all pickups) and all government purchases are exempt from both customs duty and from sales tax. Parts imported for assembly ("completely knocked-down units") also are exempt from customs duty. The rate structures for both customs duty and the sales tax are complicated, but generally favorable to the transport sector. Completely knocked-down units are given preferential rates under the sales tax. The highest rates are levied on completely built-up units ~ twice the rates on unassembled units.

India makes use of a combination of customs duty, sales tax, and excise duty to tax the production and purchase of motor vehicles and motor vehicle parts. The Indian system is perhaps the most complicated of those considered. The central government levies duty on all imported vehicles and parts, and an excise duty on the domestic manufacture of motor vehicles and parts. A credit is allowed vehicle manufacturers for certain taxes paid on inputs ~ excise duty, special excise duty, and additional customs duty. There are several restrictions on the use of this credit, e.g., it is valid for a particular manufacturing site rather than for a firm, and the inputs must be included in an identifiable output unit. Therefore, a great deal of complicated recordkeeping and classification is involved. The rates of customs and excise duty vary according to the

component being imported or produced, with the highest rates for imported, assembled vehicles.

Sales taxes in India are levied at the wholesale and/or retail level by both the state governments and the central government. State governments may set their own sales tax rate, subject only to the restrictions that (a) the tax rate may not exceed 4 percent on interstate transactions, and (b) the tax may not discriminate against goods produced outside the state. The base of the tax is commodities, and most services (including transport) are exempt. The central sales tax is levied on interstate trade at a rate of 4 percent, or at the level applied in the state in which the sale takes place, whichever is lower.

Three taxes are levied on vehicles and parts purchases in Tanzania. In theory, import duties are payable on all motor vehicles, but discretionary relief is granted. The result is that only about half the tax due on imports is collected. The rate structure varies, depending on the import, but the duty is 100 percent for vehicles with large engines. The sales tax is collected at the import stage, at the same rate as the customs duty, except for spare parts where the sales tax rate is twice the customs duty rate. The sales tax on vehicle transfers is based on a schedule, with the rate graduated according to engine size, age of vehicle, and weight.

Nepal derives about one-third of its taxes on the transport sector from import and sales taxes on motor vehicles and parts. Three levies are involved: import duty, import license tax, and sales tax. Customs duty is levied on vehicles, spare parts and tires at high rates relative to those observed for the other countries in this sample ~ except for

imports from India which are taxed at a lower rate. The law also provides for a refund of Indian excise duty for qualified imports. Import license fees are sold at three rates: 5 percent of c.i.f. (e.g., trucks and buses), 10 percent (e.g., jeeps and motorcycles), and 25 percent (automobiles). Vehicles and parts purchased by government or by privileged educational and social organizations are exempt from duty, license and sales tax. The sales tax base is the sum of c.i.f. value, customs duty, and a markup on c.i.f. plus customs. For most vehicles the markup is 100 percent, for Indian imports it is 15 percent and for government and government corporations, there is no markup, Sales tax rates vary from 20 percent on cars to 15 percent on trucks and buses to 10 percent on tires and spare parts.

The situation in Ghana is one of light taxation of motor vehicle purchases, and in recent years import duties have been reduced or abolished. There is no duty on small-engine cars, trucks, buses or commercial vehicles. Large-engine cars are subject to a 15 or 25 percent rate, depending on the size of the engine. Spare parts are subject to a 10 percent rate. All vehicles more than five years old are subject to import duty at ascending rates reaching 100 percent for vehicles more than 10 years old. In general, import duty rates on vehicles are in line with those levied on other imported commodities. Vehicles or parts subject to import duty are also subject to sales tax at a rate of 10 percent of c.i.f. value (or selling price, if domestically produced).

In Yugoslavia, the main objective of import duties is the protection of domestic industry. Import duty rates are in the range of 25 percent for automobiles and 20 percent for trucks, buses, parts and tires. There is, in addition, an equalization tax of 10

percent and a special tax of 4.8 percent, both applied to duty-paid value. Sales taxes are levied at the retail level except for direct sales from manufacturers, in which case liability for collection is with the manufacturer. Sales to commercial enterprises are exempt. There are separate sales tax levies at the federal, state and local levels. The federal rate is 15 percent on vehicles and 17 percent on spare parts. The state rates vary widely.

The system in Argentina is complicated in that six taxes are levied on the production or purchase of new vehicles. In general, the rates are relatively high. The structure of customs duties is driven more by the objective of import control than by the objective of revenue-raising. The import duty rates range from 20 to 55 percent for most products, with motor vehicles at the top of this range. In addition to the general rate of customs duty, all imports pay a statistical charge (3 percent of customs valuation) and an export promotion tax (0.5 percent of customs valuation). The Argentinean value added tax is levied at a basic rate of 15 percent. In addition, there are some special taxes on the purchase/production of new cars. The excise tax rate varies with fuel consumption, but generally is between 4 and 8 percent of list price. The highest rate on domestically produced automobiles is 12 percent, and all imports must pay a rate of 21 percent of list price. There is also a tax equivalent to 7 percent of purchase price which is earmarked for the National Highway Fund. Tires are subject to three sales taxes, with the consolidated rate of 27 percent of retail price. There is no central tax on used car sales.

About 20 percent of import duties in Bolivia were attributable to motor vehicles and spare parts in 1987. There has, however, been a wide variation in the number and types of imported vehicles in recent years, and in the effectiveness of the customs

administration. Hence, revenue yield has been volatile. Value added tax is charged on all new car sales, and the revenues account for about 5 percent of total VAT collections. A uniform VAT rate of 10 percent applies to all sales through the retail level (for covered firms). A transactions tax of one percent of the value of all commercial transactions also is levied on new car sales and transfers. Finally, before a new vehicle can be registered, municipalities charge a fee equivalent to 5 percent of the assessed import value.

Intergovernmental Sharing. For most countries, vehicle purchase and production taxes are a central government revenue. Import and excise duties, and general sales taxes except in large federations, are usually reserved for the central government. This still leaves room for local governments to benefit from vehicle purchase and production taxes -- from the property transfer tax, special levies, and shares of the central taxes.

The Indian federation is a case where state and local governments are heavily involved in vehicle purchase taxation. Approximately 25 percent of total purchase taxes are collected directly by the state governments, in the form of sales tax. As noted above, the states may set general sales tax rates (which also apply to motor vehicles) subject only to the constraints that they do not discriminate against interstate trade, and that they not exceed the 4 percent federal rate on interstate transactions. The liability for tax payment is with the seller, hence the states must register all dealers, oversee necessary recordkeeping, and be responsible for assessment and collection.

Yugoslavia also gives considerable revenue-raising latitude to its provincial and local governments with respect to sales taxes. There are separate rates for the central, state

and local governments, and some of the state rates are even higher than that levied at the center.

Bolivian municipalities impose a fee equivalent to 5 percent of assessed import value for registration of any new car. They also receive a ten percent share of the national government's one percent transaction tax. Local governments in Argentina gave up their claim on independent local taxing powers for a share in central revenues, though municipalities are still empowered to levy a transfer tax on the sale of used cars. Provincial governments in Indonesia also levy a tax on the transfer of ownership of motor vehicles. In aggregate, these taxes yielded less than 3 percent of provincial government revenues in 1982. This is somewhat surprising since the rates of tax are high -- 5 percent on ordinary vehicles and 10 percent on luxury vehicles. New car purchases are included in the base.

There is relatively little by way of local government in Tanzania and Ghana, and no significant participation in the taxation of the transport sector. In most developing countries, the participation of local government is largely in the area of annual licenses, registration, and toll charges.

Evasion, Avoidance and Revenue Potential. Vehicle purchase taxes are less easily collected and enforced than are taxes on motor fuels. This is because there are many more collection points, discretion is involved in establishing the taxable base, and a greater degree of active enforcement is required. Unfortunately, there are no detailed data that allow a study of the failure or success of each country in collecting its potential revenue from vehicle purchase taxes. From the case studies, however, it is possible to

gain a basic understanding of the reasons why tax evasion and tax avoidance take place, and of the steps that might be taken to bring revenues from purchase taxes closer to their potential.

Tax avoidance, in the case of motor vehicle purchase taxes, comes about for two reasons. The first is when the tax rates are high enough to give the seller/purchaser an incentive to escape a portion of the tax. That is, the savings are worth the cost of the adjustment. An example of the dangers of high tax rates (combined with weak administration) is reported for Tanzania. In the case of import duties and sales taxes on motor vehicles, the high rates encourages more applications for discretionary exemptions or preferential treatment (as well as an increased rate of outright evasion). The result, described in Figure 1, is that the amount of duty collected falls consistently as the duty rate increases. Though this analysis does not take any other factors into account, the results are striking. For example, when the duty payable is 20 percent, the average duty collected amounts to about 40 percent of the amount payable. This falls to only 13 percent when the duty payable is raised to 80 percent. The authors conclude from this that lower tax rates could actually increase revenue collections.

The second reason for avoidance is when the tax structure is complicated, with loopholes or ambiguities that offer avenues for avoidance. In particular, taxpayers look for the opportunity to shift their purchase or production to an exempt activity or to one subject to a lower tax rate. The situation as regards import duties on motor vehicles in Ghana is a case in point. There is an exemption for all cars with a cubic capacity less than 1600 (if petrol driven) and less than 1800 (if diesel driven). Because the duty rate

on non-exempt vehicles is fairly high, importers frequently act on this incentive to misdeclare cubic capacity. Another good illustration of how flaws in the tax structure can open the door for tax avoidance and evasion is the state sales tax structure in India. The tax rates are high and the system is complicated, suggesting that it is a good candidate for tax avoidance. Two examples illustrate the problem:

- State sales tax rates are generally higher than the central sales tax rate. In the case of an interstate sale, the seller is subject only to the central rate. Moreover, if goods are transferred to another site of the same trader or manufacturer, there is no tax, even if the other factory is in a different state. The incentives to make arrangements to purchase from out-of-state vendors, and to vertically integrate activities, are clearly present. These actions apparently occur with some frequency in India.
- To eliminate double taxation, the government provides for credit of taxes paid on certain inputs against tax paid on total output. But the mechanism is complicated as regards which taxes may be credited and an extensive recordkeeping system is involved. Moreover, there are a number of ambiguities in the system, e.g., some duties are variable depending on the final use of the input in production, hence the amount of credit is uncertain. Out of such complications comes ample opportunity to engage in various forms of transfer pricing to reduce overall tax liability.

The chief avenue for avoidance is exemptions. As noted above, discretionary exemptions from import duty and sales tax are frequently granted in Tanzania. It is estimated that the collection rate¹³ on import duties is only about 45 percent ~ not taking account of evasion - and about one-third of the shortfall is due to discretionary exemptions. In Indonesia, where there is a broad range of exemptions for various types of motor vehicles, only about 75 percent of "potential" tax revenues are collected.

¹³The collection rate is defined here as the ratio of collections to the full value of imported motor vehicles.

Tax evasion is another story, but its determinants overlap with those for tax avoidance. It is illegal and comes about because the taxpayer either does not file, underdeclares his tax liability, or fails to remit tax due. There are a number of characteristics of a tax regime that make it prone to high rates of evasion. They are:

- High rates of tax (and perhaps high compliance costs) that provide an incentive for evasion.
- Poor administration, or corruption, such that there is a low probability of an evader being detected.
- A complicated tax structure that is difficult to administer; tax legislation that is ambiguous.
- Low penalty rates for those who do not comply.
- An unwillingness of the government to enforce the tax and stringently apply the penalties.
- A history of frequent amnesties.

This list describes the tax systems in many developing countries, and it describes the practice with respect to the taxation of vehicle purchases described in some of these case studies.

The rate of tax evasion for import duties is legend, in many if not most developing countries. Clearly this evasion carries over to the assessment of duties on imported motor vehicles and vehicle parts. The problems with customs administration can be traced to four root causes, and there is evidence in these case studies that all of these causes have contributed to the failure to realize full revenue potential from import duties on motor vehicles. First, the tariff code is very complicated, making the administration of the import duties a costly, complicated and usually subjective affair. The complicated

tariff structure that exists most everywhere gives customs officers responsibility for making classification decisions which may result in quite different rates of duty. The greater the degree of rate differentiation, the greater the incentive to misreport contents, and the harder (more administratively difficult and time consuming) it is to detect misreporting. An important form of evasion of import duties is misclassification.

Second, staff are not fully trained and do not use proper procedures. This opens the door for undervaluation of imports, which is perhaps the most common form of evasion. The success rate on evasion by understating value is fairly high because customs inspectors in developing countries must rely on the method of reviewing invoices and making use of whatever information is available to them on current market values. Since these officers are not always trained in valuation and up-to-date valuation information is not always available, the undervaluation problem is likely to remain an important source of evasion of import duties. Inadequate staffing and procedures makes for possible another form of evasion: the importation of a vehicle on a temporary basis, but to keep it in country indefinitely. This form of evasion is more easily accomplished where there are entry points by land, such as in Central America. The policing of this form of evasion is very difficult, but can be done with adequate staff and proper procedures.

Third, there is often corruption.¹⁴ Smuggling can offer a return of more than 100

¹⁴Due, p. 51, makes a good statement of the special problems of corruption in customs. "Customs work is more vulnerable to bribery than most other types of tax collection. There are frequent chances for differences of opinion, and there is close contact between the importer (or his broker) and customs personnel. The importer

percent, hence is a lucrative "investment", especially if the probability of detection is low. In fact, this probability can be lowered if one enlists the collaboration of customs officials — too easy an enlistment in some cases because of the low pay of customs officers. Smuggling is also aided by the fact that the physical control of goods through customs is oftentimes quite lax.

Finally, the tax rates are high enough to provide an incentive for evasion. This is very important because there are transactions costs involved in all of the forms of evasion and avoidance.

There is a high collection rate on excises from domestically produced automobiles, in part because of the physical control of goods at the manufacturing site. The evasion of sales taxes is more problematic. Since a substantial portion of sales taxes is collected at the import level, evasion of import duties is compounded with like evasion of sales taxes. There are many ways that domestic traders (e.g., in parts and tires, particularly), might evade general sales taxes. Tait (1988, chapter 14) lists the more common approaches as: failure to register, exaggerated refund claims, unrecorded cash purchases, the claiming of ineligible credits, and underreported sales.

The state sales tax in India presents an especially difficult problem, because proper enforcement requires interstate cooperation. Some firms falsely declare their sales as interstate to avoid state sales tax. This form of evasion has a high probability of success

cannot obtain his goods until the assessed duty is paid; the officer is therefore in a position to seek a bribe, and the importer may regard the bribe as cheaper than higher duties and penalties and endless delay."

because officials have no physical proof that the goods did not pass out of the state. The control on this is that the importer must hold a license, issued by his home state, to make an interstate purchase. But the verification that there is a licensed importer requires the cooperation of the importing state, which stands to neither gain nor lose revenue since liability is with the seller. The result is that evasion is rampant. An evaluation of the Bihar sales tax system by the National Institute of Public Finance and Policy in 1981 found that in most years revenue collection from motor parts was less than half of the estimated tax potential (as reported by Acharya, 1985). A more recent study of the rate of sales tax collections in all of India shows a lower rate of revenue realization for state government taxes than for central government taxes (Vehicle Fleet Modernization..., 1989, Chapter IV). The "tax recovery rates" from this study, shown below, define the leakages from full taxation as the sum of exemptions and evasion:

"Tax Recovery Rates"
(in percent)

| | <u>Central Government</u> | <u>State Government</u> |
|--------------------|---------------------------|-------------------------|
| Tires | 90 | 80 |
| Maintenance, Parts | 50 | 40 |
| Vehicle Purchase | 100 | 85 |

The vehicle purchase taxes in Argentina are relatively simple and thought to be subject to a low rate of evasion. The main leakage on the new vehicle tax is in the area of concessionary sales by manufacturers. Otherwise the tax is collected with relative ease from a small number of manufacturers/dealers. There is some evasion in the case of sales of spare parts because of the more numerous establishments involved. The total

loss due to evasion is estimated at about 10 percent of the amount collected on the purchase of motor vehicles and parts.

Annual and Registration Taxes on Motor Vehicles

Motor vehicles must be registered when first purchased, and they are subject to an annual tax in most countries.¹⁵ The latter usually takes the form of a license, though Bolivia (among the countries in this sample) levies a property tax on the assessed value of automobiles.¹⁶ Revenues from registration and the annual tax on motor vehicles vary from insignificant in most of the countries studied here, to about one-fifth of transport sector revenues in India (see Table 4). However, it should not be overlooked that if the annual license is assigned to local governments - as it often is ~ it may be a significant revenue source for local governments. For example, the annual license accounts for nearly 20 percent of all local government transport tax revenues in Indonesia (transport taxes account for nearly half of all local government raised revenues). The automatic revenue-income elasticity of annual vehicle taxes depends on the base elasticity ~ whether the growth in the number of vehicles is faster than GNP - and the ability of the administration to register vehicles. The automatic revenue - GNP

¹⁵It is appropriate to consider registration fees and annual taxes together for two reasons. One is that enforcement of the annual taxes is very much dependent on registration statistics, and the administration of the annual tax and the registration (and perhaps the tax on the transfer of used vehicles) often overlaps. The other is that the registration fee may be considered a capitalized form of the annual tax. As noted below, India is considering converting its annual tax to a "one time payment".

¹⁶Personal property taxes are not an uncommon practice in industrial countries, for example, they are levied in several American States.

elasticity (E) is the ratio of the percent change in revenue (net of any discretionary actions) to the percent change in GNP. Since motor vehicles are subject to annual taxes on a specific rate basis, the rate elasticity (E_r) is the ratio of the percent change in revenues (R) to the percent change in the number of vehicles (V). A rate elasticity greater than unity means there is a faster growth in those vehicles subject to a higher tax rate. The base elasticity (E_b) is the ratio of the percent change in number of vehicles to the percent change in GNP. The total elasticity is the product,

$$E = (E_r)(E_b).$$

One might expect the base elasticity to be a source of revenue growth, though there is not a great deal of evidence on this point. Smith (1990, p. 19) reports, for example, that motor vehicle demand in Guatemala is "... highly income elastic, increasing at a substantially more rapid rate than GNP." The rate elasticity, as defined here, will be unity if the tax rate is stated in specific terms or about unity if the rate differentials are small or if all classes of vehicles are growing at about the same rate.

In practice, revenue growth seems to be dependent on discretionary changes in the rates, but the evidence on the success of rate increases is mixed. Higher rates may discourage compliance. This view would seem to be supported by the experience in Ghana, where it is reported that after a sharp increase in the annual license fee the collection rate dropped by 40 percent. On the other hand, license fees were raised 6 or 8 times since 1986 in the Yugoslavian Republics without concern about a reduction in collection efficiency.

Other than for some local governments, the registration fee is not a big revenue producer, nor is it meant to be. It is primarily a regulatory instrument, and it meets a need to annually inspect vehicles for safety and/or insurance coverage; and to know how many vehicles are on the road for planning and control purposes. Administration of registration fees is usually quite separate from the annual license, with the former often a responsibility (as in Ghana) of the police.

Rate. Base and Administration. Annual vehicle license taxes in developing countries violate the simplicity norm for a good tax. Because their structure is typically complicated, they are difficult to administer. Annual vehicle taxes do reach a broad and growing base, but usually with a very low specific rate, hence revenue yield is minimal; recordkeeping is usually quite poor; enforcement is lax and penalties are low; and compliance costs and administrative costs are high. Their chief virtue as a revenue instrument seems to be their availability -- and this is no small virtue, particularly to financially strapped local governments.

India is a case in point of a complicated structure. Though the motor vehicle annual tax is generally governed by a Federal Act, the setting of rates and administration are left to the states. The result is great variation, not only in rates but in the choice of a base. State governments tax vehicles according to weight, engine capacity, carrying capacity, flat rates, types of tires, whether or not they are diesel-driven, or some combination of these. There also are state registrations (valid forever, even if one changes state of residence or business location), national permits for interstate trade, driver's licenses, change of ownership fees, and an annual city "wheel tax."

The Indian state governments do have enforcement powers. They use mobile squads with the power to stop vehicles and inspect documents, fines may be levied, and in some cases registration and permits may be suspended. Yet evasion rates are high. It is estimated that 30 to 40 percent of private vehicles and "two-wheelers" do not pay. It appears that the reason for non-payment is that compliance costs are high, fines are low, and the probability of detection is low. Conversely, only about 2 percent of commercial vehicles are thought to be delinquent, in part because the fines are greater and there is a greater frequency of roadside checks.

A similar situation holds for the provincial and municipal annual vehicle tax in Argentina, where it is estimated that about 30 percent of all vehicles are unlicensed and up to 60 percent of the annual tax is evaded. The reasons are similar to those cited for India. Compliance costs are very high in that all documentation regarding ownership and registration must be in order before payment of the annual tax can be made. Moreover, enforcement is sporadic for the annual license tax, and if detected, individuals may make retroactive payment and some "consideration payment" to the detecting authorities. It is also noteworthy that there is no penalty for failing to register a vehicle. The issue of high compliance cost also arises in Nepal, where it is estimated that the total compliance cost to payers is equivalent to about 6 percent of the annual revenues collected (Nepal, p. 46). In Bolivia, it is estimated that about 20 separate transactions are necessary to register a vehicle ~ a prerequisite for the annual license.

Evasion of the annual license tax seems to be a common practice. The payment ratio in Nepal is 65 percent for cars, 55 percent for trucks, and 80 percent for buses.

Bolivia's annual vehicle capital tax has a collection cost equivalent to 5 percent of revenues collected and a collection efficiency of only 60 percent. The budget of the annual license division in Ghana is equivalent to 12 percent of revenues collected from the annual tax, but evasion is equivalent to more than one-third of collections. The tax is not complicated in Ghana - it is levied at a flat rate - but enforcement is known to be lax. Window stickers are not required.

Yugoslavia seems to be a special case. The annual tax is levied separately by three levels of governments at widely different rates. Vehicles are not required to display a sticker, nor are license plates dated. Moreover, there is relatively little data or effective recordkeeping. Yet authorities report (but cannot arithmetically document) an absence of evasion. The reasons cited are good enforcement and penalties. The police are involved in a thorough checking program, so the probability of detection is high, and penalties are severe. However, some avoidance is reported: some individuals purchase their licenses in other republics or municipalities to avoid high taxes in their home jurisdictions.

Taxes on the Movement of Passengers and Goods

The other road user tax of revenue significance is that on the movement of goods and passengers. The most important of these is octroi, a tax levied on goods entering a city for the purpose of local processing or final consumption.¹⁷ It is found in many

¹⁷Parts of this discussion on octroi are taken from Roy Bahl and Johannes Linn, Urban Public Finance and Administration in Developing Countries, (forthcoming).

local jurisdictions in India, Pakistan, Nepal and until 1981 in Bangladesh. Despite the revenue success enjoyed by octroi in India and Pakistan, there are strong movements to abolish this tax. Gujarat, Karnataka, and Madhya Pradesh States in India have all abolished octroi. However, in Calcutta, where the octroi was more recently adopted, it was introduced by the state government for the entire metropolitan area, with its revenues to be shared among the various local bodies and the Calcutta Metropolitan Development Authority. The octroi has been condemned regularly by analysts of local government finances, including numerous Government of India Study Commissions (Bahl and Linn, forthcoming, Chapter 8).

The base of the octroi is the value, weight, or number of items entering a local jurisdiction by road, rail, sea, or air. In Bombay, for instance, the tax is imposed according to value on some commodities, according to weight for others, and on a specific basis for oil entering the city via a pipeline. In Karachi, the tax is imposed according to weight for commodities entering on roads but according to value for commodities entering via the city's port. Rates vary according to complicated schedules, and some types of commodities and goods in transit are exempt. The taxes are collected at octroi stations: checkpoints on roads at the jurisdictional borders and at railway stations, airports, and docks. In Ahmadabad, India (a city of over 2 million), for instance (in the 1970s), there were 34 stations —18 rail, 15 road, and 1 air. There is usually no assessment problem when the levy is specific; however, an invoice is required and must be examined at the octroi station. Ahmadabad assessors are equipped with a manual of

market values which they use to double-check the invoiced amount. The taxes are collected directly from the driver by the attending clerks (Bahl and Linn, forthcoming).

A major problem with the octroi is that it may greatly increase transport time and cost, and therefore the price of "imported" goods. Many have estimated these costs as being quite substantial. A good example of the magnitude of lost time is the estimate from the Mysore Taxation Enquiry that "between Bangalore and Mangalore, about 800 km, a vehicle has to stop for 36 hours and 40 minutes at checkposts."

Other complications of the octroi, such as bribery of octroi staff by operators and spoilage of merchandise, are frequently mentioned. Nanjundappa (1973) estimated that in India the total nontax cost of reduced utilization of vehicles at border crossings was approximately 25 percent of variable vehicle operating costs. Not all of these costs can be directly ascribed to the local octroi, but the magnitude of the figure indicates that considerable losses in efficiency may be imposed.

The octroi therefore gives locally produced commodities a pricing advantage over commodities imported from outside the metropolitan area. If a metropolitan area has grown beyond the boundaries of the taxing jurisdiction, the octroi may curtail even intrametropolitan trade. And as the final irony, the tax can provide a cogent disincentive for metropolitan integration under an areawide authority, because consolidation of fragmented local authorities would automatically reduce the octroi tax base by detaxing intrametropolitan commodity flows. From the standpoint of efficiency, the octroi is therefore an unmitigated disaster.

In terms of equity the picture is more complicated and depends on local practice. In the cities of Pakistan, attempts have been made to structure the tax so that it does not fall heavily on food and other essentials consumed mainly by low-income groups, and to tax especially luxury items. In Ahmadabad and Bombay, where in the past less emphasis has been put on a progressive rate structure, the octroi was regressive and probably more so than state sales taxes.

In view of its many problems-costs of administration and road transport delays are considerable, collection efficiency is unknown but likely to be poor, and the method of collection invites corruption-why does the octroi continue to be used by local governments on the subcontinent? There are three reasons. First and most important, the octroi can produce substantial revenue for local authorities. In fact, in many Indian and Pakistani cities, it dominates the revenue structure. For example, octroi accounted for 80 percent of total taxes in Karachi in 1986. The corresponding statistic in Ahmadabad was 70 percent in 1984. In aggregate, the octroi still accounts for more than one-third of all local government revenues in India.

The octroi is also a highly buoyant revenue source. Between 1979 and 1986, octroi revenues increased by 239 percent in Karachi by comparison with 124 percent for the property tax. For Ahmadabad over the 1977 - 1984 period, the increases were 199 and 49 percent respectively. This buoyancy is caused in part by the underlying automatic growth in the base as intercity trade expands in value and volume, and in part by the efforts of local authorities to increase revenues by raising and restructuring octroi rates.

A second reason for the reliance on the octroi is the absence of a good alternative for cities and municipalities. Other potential sources, such as automobile taxes, income or sales taxes, and user charges, are generally of only minor importance in the revenue structures of cities in India and Pakistan.¹⁸ Moreover, the central and state governments of India and Pakistan have not provided sufficient grants or subsidies to enable local governments to move away from the octroi. The fact is that the octroi is the only major tax base (besides property values) not claimed by higher-level authorities. In fact, in Bangladesh and in those Indian states where octroi was abolished it was not replaced by an equally productive and buoyant revenue source.¹⁹

A third reason for the continued popularity of octroi is that, in the Indian and Pakistani fiscal tradition, the octroi has been politically more acceptable than user charges, and this has tended to reinforce its use.

Besides the octroi, some Indian local authorities levy taxes on intercity vehicle and passenger transport by charging according to the number of vehicles or passengers entering the city. Cities in other countries have comparable charges, but these appear to be linked mainly to the provision of public bus terminal facilities (e.g., Indonesia and

¹⁸Recent proposals have centered on the "entry tax" as a replacement. This tax would be collected from sellers as an ad valorem rate against goods imported from outside the taxing jurisdiction. It does eliminate the octroi checkpoints but still has the undesirable features of discriminating against goods that are not locally produced, and imposing a substantial administrative burden. A good discussion is in Nath (1988).

¹⁹Schroeder (1989) reports that the octroi was replaced with a compensating grant in Bangladesh, but that the grant was neither equal in yield nor was it as buoyant.

Jamaica) **and** to **airport** taxes. In evaluating these taxes one must distinguish between taxes **related to road transport** and to air travel.

If a terminal tax covers the marginal cost imposed by each bus or passenger using the public bus station, it is efficient. If it exceeds the marginal cost, it will introduce a bias in favor of the private automobile and reduce overall passenger traffic. The extent of such losses in efficiency depends on the price elasticity of demand for intercity transport. Even if this elasticity is relatively low and the efficiency losses are minimal, there is little reason to use this tax base. The tax base is narrow and subject to fluctuations, administration is difficult, and in the best of cases revenues will be negligible. Higher automotive taxation would be a much better alternative on both efficiency and revenue-raising grounds. Moreover, automotive taxation is likely to be less regressive because higher-income people tend to use automobiles whereas lower-income people are restricted to public transportation if they engage in intercity travel at all.

In a number of countries there is a charge for time spent in country by foreign vehicles. This is a minor source of revenues in Yugoslavia²⁰, and in Nepal, where it is primarily a tax on commercial vehicles with Indian registration. In Tanzania, the tax is levied at a flat rate (payable in \$US) for a short term permit, but commercial vehicles pay a variable fee according to truck size. The system is thought to be complicated for the amount of revenue raised, and there is considerable incentive for evasion.

²⁰In Yugoslavia, the proceeds are distributed among the Republics according to mileage of main road in each.

A number of minor taxes/licenses are levied on the movement of goods and people. India and Nepal charge "a goods" or "route permit" tax on commercial vehicles — either on a per kilometer basis or as an annual fee. Other examples are a special tax on heavy loads in Yugoslavia, provincial commercial route license fees in Indonesia, and a fee for driver's licenses in all countries. These charges are levied primarily for purposes of regulation rather than for purposes of revenue raising.

A related case is the administration of airport charges in Tanzania. Three sets of charges are levied: (a) civil aviation fees for regulation and certification of aircraft, pilots and mechanics, (b) fees for the use of airports, and (c) passenger departure service charges (Tanzania, 1989). The total amount due in 1986 was equivalent to about 10 percent of total road user taxes in that year. However, only about 53 percent of the amount due was actually collected (an estimated 30 percent for civil aviation fees, 51 percent for passenger departure fees, and 63 percent for landing and parking fees). The reasons cited for this poor revenue collection performance are a lack of incentives - there is no relationship between the amount of collection and airport expenditure -- and inadequate control procedures.

Tolls

Tolls may be viewed as either for the control of urban traffic or as a revenue instrument. With respect to the issue of traffic control, one could make a good case that they clearly are not the appropriate tool for implementing a system of congestion pricing. For a toll system to be operable, entry and exit points on the roadway must be limited in

number, which is typically not the case for congested urban streets, with the exception of a few limited-access expressways. Second, toll collection is costly to administer and may itself contribute to congestion by creating a bottleneck at the tollgate. New electronic metering systems avoid this problem, but the technology is too complicated for most low income countries. Tolls therefore should not be considered as efficient instruments for congestion pricing in less developed countries. With respect to the revenue-raising objective, tolls may be adequate for financing special urban expressways or bridges/tunnels, but careful consideration first needs to be given to their efficiency and administrative cost.

Tolls would not seem a likely candidate to generate significant general revenue support for road systems.

The survey presented here seems to support this general view. Tolls do not generate much revenue by comparison to other road user charges and their administrative cost appears to be relatively high. Yugoslavia has perhaps the most extensive national toll road financing system of the countries studied. Toll revenues generate about 18 percent of total road user charge revenues, with responsibility for the system divided between the central and local (Republic) governments. The experience of one contractor who operates a section of the Belgrade roadway is that collection costs are equivalent to about one-third of the total revenue collected. Evasion and operator errors are estimated by the government to have cost approximately 6 percent of revenues.

Tanzania also has an extensive system of toll roads. Toll stations are located at 13 points around the nation, and total revenues are equivalent to about 3.5 percent of total road user charge revenues. The collection rate is only 60 percent, owing to poor financial controls and to corruption, stemming from the low wages paid to collectors. The poor financial controls have to do with the difficulties of monitoring stations in remote locations, and with the virtual absence of any way of checking on the actual amount of automobile traffic. It has been suggested that the toll system be replaced with an increase in the rate of fuel tax. The proposal has the merit of cleaner administration and a 100 percent collection rate, but the (political) demerit of affecting the price of gasoline.

Bolivia makes relatively heavy use of tolls as a revenue source. There are 48 toll stations on interurban roads, and tolls collected account for 6 percent of total road user charges, even though the collection rate is only about 60 percent. Evasion is largely attributed to the abuse of power by toll booth operators. One estimate places the "additional" income of toll booth operators at six times the national average income. Compliance cost is estimated to be extremely high - it is estimated that the value of time lost waiting to pay toll is four times the revenue collected!

In most countries, tolls are related to the financing of a specific road or bridge project, or they are imposed on limited-access roads and bridges. They tend to be a relatively minor revenue source, and may or may not be earmarked for roadway expenditures. In India, for example, tolls on national roads are paid over to the national government general account, less a 12 percent collection fee, while tolls on certain state

roads or bridges are dedicated to the financing of those facilities. Administrative problems seem to be a common feature. The collection rate is reported to be about 40 percent on toll roads and bridges in Ghana, because of undercollection due to equipment failure and "informal exemptions" by collectors. Argentina makes minimal use of tolls, but the evasion is thought to be high because of the low salaries of toll booth operators and the absence of any monitoring of toll collection activities.²¹

²¹The collection rate in Hong Kong is 99 percent, though the tolls are electronically administered.

V. REFORM OPTIONS

Without question, the transport sector is a well of untaxed capacity. The median level of transport taxes is equivalent to 1.7 percent of GDP in the 20 countries compared. There is great variation around this average, and the effective tax rate is over 3 percent in Argentina and Costa Rica.

How can greater revenue potential from transport sector taxes be realized?

There is considerable room for administrative improvement in the taxation of the transport sector, but this is only part of the answer. The problem is this. While many of the kinds of administrative reforms necessary to increase the revenue take from the transport sector are feasible and well within the capabilities of the tax administration setup in most low income countries, the revenue impact from these actions alone will not lead to full realization of revenue potential. The big returns are from the combination of administrative and policy changes. This is because simplification of the tax structure will make administration easier -- and in some cases will reduce the rewards to evasion -- and because a broadening of the tax bases and a rationalizing of the rate structure will increase revenues significantly. However, such changes are no easy matter because many of the current policies were put in place to satisfy other macroeconomic and political objectives. For example,

- the pricing of motor fuels is controlled for equity and political reasons with the result that gasoline is subsidized rather than taxed in some countries,
- the taxation of automobile purchases is driven by foreign exchange and equity concerns as well as by revenue considerations,
- automobile registration has primarily a regulatory goal,

corruption in customs in some countries is so institutionalized that it is almost a national policy.

The major constraint to the "right" structure and administration of taxes in the transport sector may well be these considerations. Whether or not a government chooses to strengthen the taxation of the transport sector will depend on how it evaluates the tradeoffs between what would be "good" taxation of the transport sector and these macro policies.

In the discussion below, the best routes for improving the taxation of the transport sector are reviewed. Two basic themes underlie this discussion. The first is that policy and administrative reforms must march along together, but the proper order is to get the tax structure right before redesigning the administration. The second is the paradigm on tax evasion: that governments should think in terms of policies that reduce the incentives to non-compliance (high tax rates and high compliance costs) and increase the expected costs of evasion (a greater probability of detection and more severe penalties).

The Level of Tax Rates

An assessment of tax evasion/tax avoidance/revenue potential almost always begins with a consideration of whether tax rates have been set at the right level. High tax rates provide the incentive to evade or avoid taxes, they encourage corruption of public officials by making bribery viable, and they encourage smuggling. Increasing tax rates may also cause consumers or producers to curtail activities to a point where revenues are actually reduced. All of these ill effects of high tax and user charge rates are cited and documented in this review of the practice of taxation of the transport

sector. The policy questions to be answered are whether these rates can be lowered without compromising economic policy, and if they were, would the gains somehow be commensurate with the economic policy costs?

The major issue here is the price of motor fuels. One should view the real tax rate as the ratio of revenues collected to taxable sales valued at a non-subsidized level. When calculated this way, the tax rate on motor fuels is very low in many developing countries and negative in some. The reasons for the subsidies are well known, and have to do with some notions of equity, general price impacts and the potential political costs of allowing fuel prices to rise.

One might also pose this question: What would be the gains from allowing an increase in the real tax rate on motor fuel?

- Revenues from the gas tax would increase, with the amounts of increase depending on the price elasticity of demand for motor fuel. To the extent gasoline consumption was curtailed by making less use of private automobiles and truck hauling ~ by substituting public transportation and rail shipment - revenues from all other taxes on motor vehicles would be off.
- A foreign exchange gain could be realized in oil-importing countries.
- There would be a general shift of national resources away from transport to other sectors of the economy.
- Some border tax problems could be corrected, i.e., the return from smuggling lower priced fuel across national boundaries would be reduced or eliminated. Some other anomalies associated with low fuel prices might also be corrected, e.g., in Tanzania, carrying fuel to the countryside is not a profitable activity because transportation costs exceed the margin for fuel-carrying allowed against the petrol price.
- The shift to higher motor fuel taxes (and presumably lower taxes on something else) is a gain in terms of tax administration efficiency because

the collection rate on motor fuel taxes is virtually 100 percent, with low administrative and compliance costs.

A second pricing issue has to do with the tax rates on the purchase of motor vehicle purchase and parts. The reasons for the high rates that are typical in most developing countries are: (a) automobiles are a luxury in developing countries and a differentially higher rate on their purchase (versus other commodities) adds some progressivity to the tax structure; (b) high tax rates discourage automobile consumption and lead to a redirection of consumer savings into more productive investments; (c) the country may benefit from foreign exchange savings, less congestion, less use of imported motor fuels, and less demand for public investment in roadways; and (d) motor vehicles - imported or domestically produced ~ are easily reached by the tax administration system and in that sense are an "easy" source of revenue.

There is not a compelling argument to lower the tax rate on motor vehicles, at least not in every country. It is true that an incentive for evasion goes with higher rates, especially if the probability of detection is low or if penalty rates are not severe. In some countries, especially those with overland entry and proximity to an automobile producing country (e.g., Central America), high tax rates may encourage evasion of one kind or another. But this probably argues less for a reduction in rates than for a tightening of administration. Conversely, some countries already have very low rates of tax on motor vehicles (e.g., Ghana), and have great potential to realize greater revenues from the transport sector.

The **third issue concerning** rates has to do with the annual license and registration **taxes on motor vehicles**. On the one hand, there are arguments (Ghana) that increases in **the annual license reduces** compliance. There are real costs to this, including the loss of information **about** the motor vehicle fleet, controls on automobile insurance, a check on transfers of ownership, safety inspections, etc. On the other hand, there is evidence **(India) that a higher rate** (accompanied by proper enforcement) can increase compliance. Either way, the level of rates on both annual license and registration is low, and it is difficult to see how rates make much of a difference in the decision about whether or not to pay. One other consideration is important: some local governments already derive a substantial share of their revenues from such taxes and fees, and lower rates would compromise their financial position.

The conclusion one might draw from this discussion is that high rates do not appear to be a major problem area underlying the failure of transport taxes to realize their full revenue potential. The most important base, motor fuel, is probably undertaxed in most countries, and rate increases could likely be absorbed with little if any loss in collection efficiency. The switch to an ad valorem rate could preserve the revenue position of the gas tax, and spare the government from having to return periodically to the voters to request an upward adjustment in the specific rates. Motor ~~vehicle~~ tax rates might be lowered to reduce the incentives for underdeclaration of ~~inputs~~ and for sales tax purposes, and to reduce the incentive for smuggling, but *there* is a strong case that enforcement is the better route to reducing this type of evasion. An ~~importer~~ or dealer who is successful with evasion at 100 percent rates is not likely to

comply simply because the rate has been reduced to 50 percent. With respect to the other forms of transport tax, the rates/charges are presently so low that it seems unlikely that compliance will be affected by an even lower rate.

Uniformity in Tax Treatment

A broad tax base with few if any exemptions and a single rate would offer the best possibilities for ease of enforcement, and the fewest avenues for tax avoidance. When non-uniformities are introduced into the tax system in the form of rate differentiation and exemptions, taxpayers are given an opportunity to avoid taxes by changing their production or consumption behavior or to evade taxes by making it appear that they have done so. The more a system departs from uniformity, the greater will be the gap between actual collections and revenue potential.

This is not to say that there should not be rate differentiation in transport taxation. Indeed, differential rates and a program of exemptions are common, and there are important reasons for these special treatments. The following are non-uniformities that are more or less common:

- A higher rate for petrol than diesel.
- Exemption from motor fuel taxation for government, agriculture, and other "preferred" sectors.
- Preferential treatment under import duties and sales taxes for government; the commercial sector; diplomats and vehicles purchased for foreign-financed projects; and for small-engined, newer, or more fuel efficient cars.
- Exemption from tolls for government vehicles.
- Higher taxation of goods in transit than on those locally produced.

Perhaps the biggest issue is the differential tax treatment of different petroleum products. Most countries set prices and tax rates so that diesel, premium and regular petrol have different pump prices. This has two consequences. First, it would appear to encourage adulteration. However, through processes that vary from coloration to providing certain additives, this form of evasion is relatively easy to control. The other consequence is that by charging less for diesel fuel, the government is lowering the relative price of fuel to the group of users that imposes perhaps the highest cost on highway use.

The justification for this rate differentiation is equity, i.e., to subsidize diesel consumption (and therefore public transportation), kerosene, and other home fuels, with a higher price for gasoline. The problems with differential rates for different types of fuel are well-known: diesel also is used in private, expensive automobiles; some public transportation is also fueled by gasoline; diesel powered vehicles may also be fueled by kerosene; cheaper road transport costs both discriminate against the rail system and impose a high cost on road maintenance, and gasoline prices may also be set below market (meaning that the subsidy runs not only to diesel and home heating but to the entire road sector).

In the last analysis it is very difficult to justify the lower price and tax rate on diesel. It is not clear that the equity intent is achieved, there is a revenue loss, and it is inefficient to subsidize the largest beneficiary of road expenditures (per mile). This is another case where the political rationale is paramount.

An important nonuniformity in India grows out of the use of octroi, which imposes a tax on goods in transit but not on goods produced within the jurisdictional boundaries. Octroi encourages both evasion and avoidance. The high compliance cost and subjective method of assessment encourage the paying off of inspectors to evade the tax, and business activity has begun to develop outside the jurisdictional boundaries to avoid the tax. These are only a few of the flaws associated with octroi, but give the flavor of what is wrong. It is a tax whose abolition is long overdue.

Exemptions create major problems of nonuniformity that lead to evasion and avoidance. Evasion occurs when the buyer or seller falsely declares his activity as exempt. Avoidance occurs when the buyer or seller alters his method of doing business to qualify for the exempt status. The greater the number of exempt categories and the higher the rate on taxed categories, the greater the probability of evasion and avoidance. Quite apparent examples are Ghana's exemption from import duty of small engined cars, and Indonesia's exemption of commercial vehicles. Exemptions on vehicles, motor fuel and even tolls purchased by government are common, and give an incentive for overuse of transport services by government and for developing schemes to transfer the special treatment to other sectors. Such exemptions invite abuse and provide uncertain equity and efficiency gains to the government.

Simplification of the Tax Structure

The complexity of tax systems is a major reason why transport taxes do not reach their revenue potential. Complexity increases administrative costs and weakens the

effectiveness of the tax administration, and it imposes a high compliance cost on taxpayers. In short, it both gives a substantial incentive for evasion and lowers the probability of detection.

Complex systems usually impose a high compliance cost on taxpayers, either because the bookkeeping requirements are onerous, because they must seek outside help, or because they must spend inordinate amounts of time to pay the tax. All of these are reasons to expect increased avoidance or evasion of taxes. Among the major problems here are customs duties, sales taxes, annual license taxes, registration fees, transfer taxes, and tolls.

The tariff structure in most low income countries is very complicated, with numerous rates and classifications of goods. This means that customs officials spend inordinate amounts of time at classification, time that could be spent on more productive activities such as valuation. Complication in tax structures also opens doors for evasion, as importers can more easily escape detection when undervaluing goods and have more avenues open to reclassify to seek a lower rate of duty. A simplified structure with only a few rates and classifications would close these avenues.

There is also room for simplification of sales taxes, but this may involve some tradeoffs with other objectives of tax reform. Probably the easiest of the indirect taxes to administer is the excise. Because it is levied when the good is physically moved, its assessment and collection are most easily controlled. However, it is generally levied on a specific rather than an ad valorem basis, and because it is levied at an early stage of the production process, it is cascaded forward and creates price distortions. A

manufacturer's sales tax is also relatively easy to administer, is generally levied on an ad valorem basis and is therefore elastic, but is subject to the same cascading criticism. The more modern approach to general sales taxation is either the value added tax or the retail sales tax.

Of the countries in this sample, Yugoslavia and India make some use of retail sales taxation on automobile purchases. Argentina and Bolivia use a value added tax, and the others either impose a sales tax on imports or use a manufacturer's sales tax.

Most countries have some sort of sales tax on the transfer of used vehicles. These are often local government taxes, e.g., in Indonesia. Transfer taxes on used automobiles are notoriously difficult to administer, often are characterized by a complicated tax structure, and bring in little revenue.

The Indian, Pakistani and Nepalese octroi is a form of sales tax that is very complicated and difficult to administer. Almost all commissions that have studied the octroi have recommended its abolition, but the sticking point has been in choosing a replacement tax. Some have proposed replacing it with an equal yield tax on motor fuel, which would increase the simplicity of the local tax system. Others have proposed an "entry tax" which would place a sales tax surcharge on goods that are not locally produced, and a business property tax, neither of which would make the system any less complex.

Finally, the most complicated of the transport sector taxes are the license and registration taxes. These taxes require great administrative effort because so much manual checking is involved and because there are so many steps in the procedure. To

simplify the system of registration and license taxes, a number of proposals, or actual changes in administrative practice have been made. These are described below.

Do Incentives Matter?

Theory tells us that if a taxpayer sees a benefit attached to the tax or charge he must pay, and if he cannot act as a free rider, he will be more willing to pay. In this case, tax rates may be set higher and the rate of compliance might be expected to be higher. This has led many to pose the question of whether one route to increased tax collections in the transport sector is to earmark road user taxes to benefit road users.

From the data presented in these case studies, there is no evidence that collection efficiency is higher in countries where road user taxes cover a greater share of the cost of roadways (or lower where road user taxes cover more than the full cost of roadways). This would lead one toward the conclusion that the more basic cause of the evasion-avoidance problem is with the tax structure and the administration of the taxes, and these problems must be fixed before an effective program to stimulate a greater willingness to pay for road use can be developed.

Motor fuels are a different issue, since the collection rate is usually around 100 percent. But can governments base proposals for increased revenue mobilization for gasoline taxes on a user benefits argument? The answer, from Table 1, seems to be that it would be a hard sell. Motor fuel taxes already account for a substantial share of road expenditures in most of the countries considered here.

There is another way to look at the incentives argument. Earmarking may not increase the willingness to pay on the part of taxpayers, but it may increase the willingness to collect on the part of those agencies responsible for tax administration. A good case in point is the situation of airports in Tanzania where the collecting airport authority saw no relationship between the amount of tax collected and the expenditure allocation for airport services. There is a similar problem with respect to interstate cooperation in the collection of motor vehicle taxes in India - the policing state may receive none of the benefits of the increased enforcement.

Compliance Costs

Taxpayers will resist payment of taxes when the costs of compliance are high. There generally are two explanations for this behavior. The first is a complicated procedure, and the second is corruption. Motor fuel taxes and excise taxes on motor vehicle production imply perhaps the least compliance cost, and on that count are "good" taxes on the transport sector. With respect to procedures for compliance, one type of problem is with recordkeeping requirements. The Indian modified value added tax program, described above, is an example.

Corruption is another type of compliance cost that discourages payment (and collection) of taxes in the transport sector. In terms of the amounts of money involved, import duties on automobiles are probably the biggest problem. Tolls, surprisingly, are a problem because of the lack of supervision of toll booth operators. It was reported in the Bolivia case study that the compliance costs (measured in terms of time loss) were as

much **as four** times the revenue collected. There is no good solution to the toll problem for low income countries. Electronic metering devices can solve some of the evasion problems, but are not a cost-effective solution in developing countries. The substitution of a general tax for tolls, as has been proposed in Tanzania, is a solution to the administration problem, but it denies one of the main purposes of using the toll ~ that of charging users for the cost of a particular road service.

Registration and annual licenses impose a heavy time cost on those who comply. Numerous forms must be filled out and the taxpayer must have documentation that he has complied with several other regulations. Such cross-checking has the merit of being a good enforcement instrument, but it is burdensome enough that it discourages compliance with the tax. Rates of payment are very low in most countries. However, despite their obvious problems, annual vehicle taxes will continue to be levied. They are an available source of revenue and are levied on a base that is destined to grow. The question on the table would seem to be how to make the tax more productive and less costly to administer and comply with. Not surprisingly, reform efforts seem to have focused on simplification of the tax structure and improved administration.

To simplify these taxes and reduce both compliance and administration costs, a one-time payment has been proposed by several Indian states. Under this program, owners of private vehicles would pay a lifetime annual charge at the time they register the vehicle.²² There clearly is merit to this proposal: it dramatically reduces

²²Since 1987, the Government of Maharashtra has levied a one time charge on two-wheelers and tricycles. Gujarat and U.P. have adopted the one time system for personal

compliance and administrative costs; and when viewed next to the value of the vehicles, even much higher rates may seem less objectionable. This approach also has some important flaws: (a) governments could no longer use the annual license data to keep statistics on the number of vehicles on the road, (b) the annual tax could no longer be used to force the recording of ownership changes, and (c) it would not be as easy to do an annual check on insurance coverage. Whether these are damning criticisms or not depends on whether the annual license program is effective in achieving these goals in its present form. A more serious criticism is that the cost of this program would be prohibitive for most commercial vehicles, and would probably have to be limited to private automobiles and two wheelers. This means that some of the potential administrative savings would not be realized.

A suggested approach to simplification in Tanzania was to reduce the number of categories of vehicles in the annual tax structure, and to reduce the rate. Unification of several licenses, permits and registration certificates was recommended for Nepal, in order to reduce compliance cost and to eliminate some duplication of effort in administration. Neither of these proposals has yet been implemented.

Some inroads in improved administration have been made in Maharashtra State (India). Records on vehicle registrations and licenses have been computerized, billings are automatically generated, and delinquency lists are printed. Provision has also been made for payment at banks, to reduce compliance costs.

vehicles, and Tamil Nadu and U.T. Delhi will introduce this system soon (Vehicle Fleet Modernization, Chapter III).

There are other clues from the practice in these countries that might help improve the annual vehicle tax. Yugoslavia appears to be a case where tough enforcement generates a lower evasion rate. The same observation may be made for commercial vehicles in India, where enforcement is tougher than on private vehicles and the evasion rate is much lower. In the area of simplification, Ghana's flat rate tax may not be so appealing from a point-of-view of a benefits tax (i.e., heavier vehicles should pay more, etc.), but it may have much to recommend itself from a point-of-view of administrative ease and cost.

Enforcement and Penalties

Evasion is discouraged by a greater probability of detection and a more severe penalty. It is the combination of the two that will cause potential evaders to alter their behavior. Of the countries in this sample, Yugoslavia seems to have concentrated most on the penalty approach, and it is reported that there is little evasion ~ even of annual licenses when neither dated number plates nor display of registration stickers is required. The reasons for this success are not easily identified. They could be the result of any of three things: a no-nonsense approach to dealing with evaders, the fact that there is often little personal gain from evasion in a socialist state, or simply that the government's statistics are not accurate enough to identify the amount of evasion that is occurring. In none of the other countries were penalties reported to be effective deterrents of evasion.

Most efforts to control evasion have concentrated on increasing the probability of detection. This, in turn, implies improving the four basic steps in administration of any

tax: identification of those liable to pay the tax, recordkeeping, assessment of tax liability, and collection.

Intergovernmental Relations

What is the right division of responsibility between central and subnational governments in taxing the transport sector? Which of the transport taxes can be given to the state and local governments and which can be given to the center, and what constraints should be placed on their use? There is no absolutely right answer to these questions. In part, it depends on whether there is a tradition of local government taxation in the country. In India's federal system, where there is such a tradition, about 45 percent of all road user charges accrue to the local government. Where countries operate under highly centralized fiscal systems, local governments may not have well developed tax administration systems and the taxation of the transport sector remains with the central government.

Most low income countries are in process of decentralizing their revenue systems and governance and so there is a search for revenue sources that might better fit at the local level. In this regard, a first step in evaluating the feasibility of local level transport taxes is an identification of the problems that have arisen with local taxation in general and with local transport taxes in particular. In fact, the basic problems have to do with the inability of the local government to effectively administer the tax, problems arising from interlocal cooperation in enforcement, or the ease with which local residents or businesses can legally avoid payment by making purchases or sales in other jurisdictions.

From this, and from basic principles of multi-level finance, one might offer the following guidelines for defining a role for local governments in the taxation of the transport sector. First, local governments in developing countries can be most effective in taxing road use, and in controlling licensing and registration. Motor vehicle production and purchase taxes should be left to the central government. There is no place for the taxation of goods in transit at either level. The taxation of motor fuels presents a special case. Because of macroeconomic considerations — foreign exchange problems, revenue needs, the political sensitivity of gasoline prices — taxes on motor fuels will continue to be a central government levy in most developing countries. However, there is a case for local government sharing in these revenues and perhaps even participating in the setting of rates. The case for allowing local government participation rests on (a) this is a growing tax base that is related to urbanization, (b) in urban areas it likely fits the ability to pay norm for a fair tax, (c) the local governments must bear part of the street maintenance and traffic control costs associated with more vehicle use, and (d) responsibility for pollution and congestion control usually rests with the local government.

Second, local or state governments in low income countries should not have the authority to choose differential rates and bases. This is not because the idea of differential taxation in different regions of the country is a bad one, but because the local administration in low income countries may not be up to the job. India is an example of a country where leakages occur because of problems arising from interstate

trade. In Yugoslavia, where local governments are given similar freedom to set rates, it is reported that the problems with leakages are much less severe.

Third, it is useful to have some local government administered taxes on the transport sector. There are certain taxes where local familiarity and access is important to the identification and assessment process, e.g., annual licenses, vehicle transfers, and tolls. The alternative is a shared tax system where the central government assumes responsibility for all or most taxes on automobiles and in return guarantees the local governments a share of the proceeds. There are some problems with this approach:

- It does not enable local governments to tax their road users at higher rates as, for example, one would want to be the case in cities.
- Familiarity in the assessment and enforcement process is lost, as in the case of identifying those liable for motor vehicle license taxes and the use of "flying squads" to enforce registration, licensing, and the sale of special permits.
- The central government may withhold or reduce the local share, a problem presently being faced in Argentina.

REFERENCES

- Acharya, Shankar N., "Aspects of the Black Economy in India," Government of India, Ministry of Finance, New Delhi, 1985.
- Allingham, Michael G. and Agnar Sandmo, "Income Tax Evasion: A Theoretical Analysis," Journal of Public Economics, 1972, 1, 323-338.
- Aim, James, Roy Bahl and Matthew N. Murray, "Tax Base Erosion in Developing Countries," Economic Development and Cultural Change, forthcoming.
- _____. "Tax Structure and Tax Compliance," Review of Economic Statistics. forthcoming.
- Bahl, Roy, "Tax Reform in Jamaica: Evaluation and Lessons," Bulletin for International Fiscal Documentation, January 1990.
- Bhatt, V. V., "Tax Evasion and Avoidance: A Crucial But Neglected Aspect of Taxation," The World Bank, unpublished, undated.
- Bird, Richard, "Income Tax Reform in Developing Countries: The Administrative Dimension." Bulletin for International Fiscal Documentation, 1983, 37(1), 3-14.
- Clotfelter, Charles T., "Tax Evasion and Tax Rates: An Analysis of Individual Returns," Review of Economics and Statistics, 1983, 65, 363-373.
- Cowell, Frank A., "Tax Evasion with Labour Income," Journal of Public Economics, 1985, 26, 19-34.
- Due, John, Indirect Taxation in Developing Countries, revised edition, Baltimore, John Hopkins Press, 1988.
- Gillis, Malcolm, "Comprehensive Tax Reform: The Indonesian Experience," in Malcolm Gillis, editor, Tax Reform in Developing Countries (Durham: Duke University Press, 1989), pp. 79-114.
- Goode, Richard, Government Finance in Developing Countries, Washington, D.C.: The Brookings Institution, 1984.
- Government of India, "Vehicle Fleet Modernization and Road Use Charges," Ministry of Surface Transport, February 1989.

- Herschel, Frederico J., "Tax Evasion and its Measurement in Developing Countries," Public Finance/Finances Publiques, 1978, 33, 232-266.
- Holland, Daniel, "Measuring and Combating Tax Evasion," in Proceedings of the 38th Congress of the International Institute of Public Finance, Copenhagen, Detroit: Wayne State University Press, 1982.
- Hughes, Gordon, "The Incidence of Fuel Taxes: A Comparative Study of Three Countries," pp. 533-559, in The Theory of Taxation For Developing Countries, ed. by David Newbery and Nicholas Stern (Oxford University Press, 1987).
- IMF, Tax Administration in Developing Countries: Strategies and Tools of Implementation, August 1989.
- Louis Berger International, Inc., Nepal: Study of the Road Transport Industry, July 1987.
- Luthra, K.L., Issues in the Administration of Road Transport Taxes in India, The World Bank, July 1989.
- McLure, Charles, Jack Mutti, Victor Thuronyi, and George Zodrow, The Taxation of Income from Business and Capital in Columbia (Durham: Duke University Press, 1989).
- Musgrave, Richard and Peggy Musgrave, Public in Theory and Practice, fourth edition, McGraw Hill, Inc., New York, 1984.
- Najundappa, D.M., Road User Taxation and Road Financing in the Indian Economy. Bombay: Jawaharal Nehru Memorial Institute of Development Studies, 1973.
- Nath, Shyam, "A Substitute For Octroi: Entry Tax versus Business Property Tax," Economic and Political Weekly, July 30, 1988, pp. 1579-1581.
- Roth, Gabriel, The Private Provision of Public Services in Developing Countries, New York, Oxford University Press, 1987.
- Richupan, Somchai, "Income Tax Evasion: A Review of the Measurement Techniques and Some Estimates for the Developing Countries," International Monetary Fund Departmental Memorandum, July 23, 1984.
- Schroeder, Larry, "Strengthening Local Governments in Bangladesh" Chapter 9 in Financing Government Decentralization: The Case of Bangladesh, edited by Larry Schroeder (Boulder, Colorado: Westview Press, 1989).

- Shaw, G.K., "Leading Issues of Tax Policy in Developing Countries: The Economic Problems" in The Political Economy of Taxation edited by A.T. Peacock and F. Forte (New York: St. Martin's Press) 1981, pp. 148-162.
- Shoup, Carl S., Public Finance, Aldine Publishing Company, Chicago, 1969.
- Smith, Roger, "Motor Vehicle Taxation in Jamaica," Staff Paper No. 10, Metropolitan Studies Program, The Maxwell School, Syracuse University, 1984.
- _____, "Transport Taxes in Guatemala," (mimeograph), 1990.
- Srnivasan, T.N., "Tax Evasion: A Model," Journal of Public Economics, 2:1973, 339-346.
- Tait, A.A., Value Added Tax: International Practice and Problems, Washington, D.C., International Monetary Fund, 1988.
- Tait, A.A. and David Morgan, (1980), "Gasoline Taxation in Selected OECD Countries, (1970-79)," International Monetary Fund Staff Papers, 27(2), 249-279.
- TECNECON, "Issues in the Administration of Transport Taxes: Ghana and Yugoslavia," Draft Report, The World Bank, June 1988.
- Witte, Ann D. and Diane F. Woodbury, "The Effect of Tax Laws and Tax Administration on Tax Compliance: The Case of the U.S. Individual Income Tax," National Tax Journal, March 1985, 38(1), 1-13.
- Woodbury, Stephen A., "Substitution between Wage and Nonwage Benefits," American Economic Review, March 1983. 73(1), 166-181.
- The World Bank, "The Administration of Transport Sector Taxes, Case Studies: Argentina and Bolivia," (mimeographed), March 1989.
- _____, "Indonesia: The Administration of Transport Sector Taxes," 1982.
- _____, Indonesia: Selected Issues of Public Resource Management, March 1988.
- _____, "Issues in the Administration of Transportation Taxes in Developing Countries," (mimeographed), undated.
- _____, Tanzania: Financial Performance of the Public Transport Sector, January 1989.

_____, World Development Report. 1988 (Oxford University Press for the World Bank), 1989.

ANNEX A

General Model of Evasion and Avoidance

A general model of the determinants of tax evasion and avoidance is a good place to begin this work. A model gives some structure to the discussion of the problem and to the evaluation of alternative reform programs. The traditional approach to studying taxpayer compliance is focused on individual income tax compliance — because it is the easiest tax for which to develop a behavioral model — but its general conclusion can be extended to other parts of the tax structure.

The general economic model of income tax evasion is one built around the maximization of utility, or personal satisfaction, by each individual.²³ Each worker is assumed to have a fixed amount of total compensation (I) to allocate among reported income (R), evasion income (E), and avoidance income (A). Reported income is subject to income and payroll taxation at the combined rate (t). The contributor is entitled to payroll benefits at the rate (b). Avoidance income is not taxable under either the income or payroll tax. If the individual is caught evading with probability (p), then it is assumed that the individual is fined at the rate (f), where f includes evaded

²³The original work on modeling evasion was done by Allingham and Sandmo (1972) and Srivastava (1973). Significant improvements on the basic model were made by Clotfelter (1983), Cowell (1985), Woodbury (1983), and Witte and Woodbury (1985). This presentation is based on the more recent extensions by Alm, Bahl, and Murray (1990, forthcoming).

taxes and penalties. If he is not caught evading, then evasion income is neither taxed nor fined.²⁴

The utility of the worker is assumed to be a function both of avoidance income and of the sum of reported and evasion income net of taxes, benefits, and penalties. The utility function is written as $U(I,A)$, where I is net money income. The individual consumes the same amount of avoidance income regardless of whether he is caught or not caught evading. However, because of the uncertain prospect of detection, net money income (and thus utility) depends upon the state of the world. If he is caught, his income I^C equals $[(R-tR-bR)=(E-fE)]$, while if he is not caught, his income I^N is $[(R-tR+bR)+E]$. The individual therefore chooses R , E , and A so as to maximize expected utility (ψ).

The problem facing the worker is, then, one of portfolio compensation choice.

The worker faces the following optimization:

$$(1) \quad \text{Max}_{\{R,E,A\}} \quad \psi = pU(I^C,A) = (1-p)U(I^N,A)$$

$$\text{subject to } \bar{I} = R + E + A$$

where I^C and I^N are defined above.

Consider now the optimization process of the individual.²⁵ Substituting $(I-R-E)$

²⁴The tax, benefit, and fine rates are assumed to be proportional in order to simplify the exposition.

²⁵There are a number of important assumptions underlying this model. It is assumed that hours of work are fixed and predetermined. The behavioral responses of each worker are confined to portfolio reallocations among the components of total

- for A in equation (1) and denoting partial derivatives by subscripts, the first-order conditions for interior solutions are:

$$(2) \quad \Psi_R = p U_I(I^C, A) [1-t=b] = (1-p) U_I(I^N, A) [1-t=b] \\ - p U_A(I^C, A) - (1-p) U_A(I^N, A) = 0$$

$$(3) \quad \Psi_E = p U_I(I^C, A) [1-f] = (1-p) U_I(I^N, A) \\ - p U_A(I^C, A) - (1-p) U_A(I^N, A) = 0.$$

(The second-order conditions are assumed to hold.) Note that the sum of the first two terms on the right-hand side of equation (2) equals the expected marginal utility of reported income. Similarly, the sum of the first two terms on the righthand side of equation (3) equals the expected marginal utility of evasion income; and the last two terms in each equation are the expected marginal utility of avoidance income. The first-order conditions therefore indicate that the worker chooses R, E, and A in such a way that the expected marginal utilities of each type of compensation are equal.

These first-order conditions allow us to consider the "price" of each type of compensation, or the amount of total compensation that must be spent to obtain one unit of the compensation type, after paying taxes, fines and receiving benefits. Because avoidance income is not taxed, its price \hat{P}_A equals one. Note that P_A is the same

compensation. Related to this feature is the assumption that total compensation \bar{I} is fixed. The firm is assumed to equate the value of the marginal product of labor to gross labor expense, which is taken to equal \bar{I} for each worker. Implicit here is the assumption that all taxes are borne fully by labor. The firm is therefore assumed to have no preferences for one type of compensation over any of the others.

regardless of the state of the world (i.e., whether or not an evader is caught), so that its expected price (\hat{P}_A) also equals one.

The prices of reported and evasion income are more complicated. An individual pays taxes (t) and receives benefits (b) on each dollar of reported income. In order to receive one unit of income after paying taxes and receiving benefits, the worker must allocate $1/(1-t+b)$ to R . The price of reported income P_R is therefore $1/(1-t+b)$, and can be decreased by either a reduction in the tax rate or an increase in the benefit rate. The expected price of reported income \hat{P}_R is independent of the state of the world; it is the same whether the individual is or is not caught evading. Unlike P_A and P_R , the price of evasion P_E depends upon the state of the world. If the worker is caught evading, then the price of evasion income is $1/(1-f)$; if he is not caught, then the price is one. The expected price of evasion \hat{P}_E therefore equals these two prices weighted by the probability of each occurrence, or $\hat{P}_E = p[1/(1-f)] + (1-p)$. Note that the expected price of evasion increases with an increase in either the probability of detection or the fine.