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Tax Administration Assessment
in Latin America

by

Jaime Vazquez-Caro and Gary Reid
with Richard Bird

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### Abbreviations

<table>
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<th>Abbreviation</th>
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<tr>
<td>DGI</td>
<td>Dirección General Impositiva, national tax service, in Argentina.</td>
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<tr>
<td>DIN</td>
<td>Dirección de Impuestos Nacionales, national tax office, in Colombia.</td>
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<td>IRS</td>
<td>U.S. Internal Revenue Service.</td>
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<td>PISTA</td>
<td>Programa de Incorporación al Sistema Tributario Anual, Colombia. DIN system using computerized records of financial intermediaries to identify large financial transactions and possible nonfilers or underreporting.</td>
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<tr>
<td>RUT</td>
<td>Registro Unico de Contribuyentes, Colombia.</td>
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<tr>
<td>SITER</td>
<td>Sistema Integrado de Transacciones Economicas Relevantes, Argentina. System established by the DGI to maintain records of large-scale financial transactions.</td>
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Contributions to this regional study were made by Hernando Garzon, Constanza Valdes and William Mayville. The study also benefitted from technical papers prepared by Viviana Duran and Jose Ruben Eidelman in Argentina and Jorge Ortiz and Cesar Tobo in Colombia.
Preface

Tax administration has long been neglected by analysts at the World Bank and elsewhere, but is now being recognized as one of the keys to improving the fiscal health of Latin American governments. In an era in which developing nations are being encouraged to rely more heavily on broad-based taxes, such as the income and value added taxes, rather than on more narrowly based trade and commodity taxes, efficient and effective tax administration takes on heightened importance. Those more broadly based taxes are considerably more difficult to administer than the taxes they replace. Tax administration agencies must be strengthened and adapted to meet this challenge and to assure fair, effective and efficient performance in environments that in many cases have long traditions of low taxpayer compliance. The starting point for successful reform and modernization of tax administration is careful analysis of existing institutions, laws, and practices, and the intended purpose of this report to assisting analysts and decision makers in making these assessments.

It is important to point out that much of the work on which this report is based has already been put to good use by the Argentine and Colombian authorities. Reform programs have been designed and implemented, with assistance from a World Bank project in the case of Argentina. The case studies included in this report should therefore be read for their value as methodological demonstrations rather than as descriptions of current conditions in these countries.

David Hughart
Principal Economist
ABSTRACT

The report presents practical tools for assessing the performance of tax administration agencies in Latin America and demonstrates the use of these tools in parallel case studies of Argentina’s Dirección General Impositiva (DGI) and Colombia’s Dirección de Impuestos Nacional (DIN).

A brief chapter on environmental factors influencing an agency’s ability to collect taxes includes discussion of cultural factors, economic conditions, and legal mandates. The report also includes an introduction to the principles of tax administration including sections covering organization, institutional infrastructure, and operations.

Three general approaches to performance assessment are discussed: the marginal conditions approach, the average cost-effectiveness approach, and the use of cross-country and time-trend comparisons using average indicators. Data requirements and other limitations on the usefulness of these techniques are covered, as are the interpretation and practical implications of the results obtained from each.

The use of these evaluation tools is demonstrated with multi-dimensional assessments of the DGI and DIN including side-by-side comparisons with respect to economic environmental factors, legal factors, facilitation of taxpayer compliance, monitoring of taxpayer compliance, prevention of taxpayer non-compliance, and allocation of agency resources.

Annexes include a review of the literature on tax administration and discussions of the use of national accounts data to estimate the tax base, and of the organization of procedural law in the context of tax administration.

About 130 pages including annexes. Bibliography.
# TAX ADMINISTRATION ASSESSMENT IN LATIN AMERICA

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Executive Summary

This report has two objectives: to present a practical methodology for assessing the performance of tax administration agencies in Latin America, and to demonstrate the application of this methodology to the national tax offices of Argentina, the Dirección General Impositiva (DGI), and Colombia, the Dirección de Impuestos Nacionales (DIN). Based on extensive field research, it presents new information in an area long neglected by analysts at the World Bank and elsewhere—the constraints and costs of tax administration. The findings should be of use to ministers of finance and tax directors who want to improve the management of revenue systems—whether designing information systems, examining the results generated by such systems, or generally making better use of administrative resources.

Improving tax administration is a pressing concern because the economic adjustment under way in several Latin American countries places a premium on the ability to increase tax revenues without raising tax rates or adding taxes. The reforms involve shifting the tax base from trade- and commodity-based taxes towards less distortionary income and value-added taxes. The fact that these changes need to be implemented during a period of economic belt tightening only makes them more difficult. To succeed, the administration of such taxes must be based largely on taxpayer compliance—which in turn depends on culture and on the incentives created by the tax administration, including enforcement. Broad-based taxes are especially difficult to administer in the low-compliance environments of most Latin American countries.

The assessment of tax administration requires some measurement and some judgment of the specific traits that characterize specific tax administrations. The report identifies environmental factors that influence any tax administration—including cultural issues, economic conditions, and laws. The principles of tax administration—and their relevance to Latin America—are outlined. These include applying the legal mandate—the laws, as influenced by environmental factors—to develop the organization, institutional infrastructure, and operations in the public and private sectors.

The principles are applied to measurement of some environmental factors—economic conditions, such as the highly volatile inflation and the long string of tax amnesties of the last decade in Argentina, and the stability and complexity of tax law. Then, different approaches to the measurement of some aspects of performance are discussed—chiefly the marginal conditions and average cost-effectiveness methodologies. Inadequate data in Latin America—and most developing countries—effectively rule out the use of the marginal approach. Thus the average cost-effectiveness methodology is used, first, as if it were a marginal approach—to assess the cost-effectiveness of one tax agency’s targeting of audits. Because the average cost-effectiveness methodology is most likely to prove useful for time-trend and cross-country comparisons, those are demonstrated for the DGI and the DIN. Four key aspects of tax administration are covered: facilitating compliance, monitoring compliance, preventing noncompliance, and allocating an agency’s limited resources. Five distinct types of measures are required to apply this methodology, each of which is illustrated via applications both to the specific tax administration activities identified in the previous sentence, and to the overall task of administering a system of taxes. These are, for each activity: demands placed on the activity (including economic and other environmental factors affecting these demands), resources employed, quantities of each of its outputs, quality of outputs, and cost-effectiveness ratios.

Perhaps the most noteworthy achievement of the DIN’s operations in Colombia has been its implementation of a procedure by which third party information is employed to spot tax returns with high probabilities of having under-reported taxable transactions. The most important part of this system, however, is how the DIN uses this information. Instead of using this preliminary evidence of non-compliance as a trigger for a labor-intensive audit, the DIN simply sends the taxpayer a notification that he has a limited time to correct his return without being subject to the normal
penalties for under-reporting. Failure to correct within this grace period results in a phasing in of the normal under-reporting penalties. This procedure appears to have resulted in considerable direct revenues and substantially altered the pool of auditable returns. In short, this device amounts to a dramatically more efficient technology for detecting non-compliance and enforcing compliance than the more traditional audit-followed-by-taxpayer-appeal pattern. While this is clearly a laudable innovation, the DIN has apparently failed to reduce its allocation of resources to its traditional labor-intensive audit activities to reflect the fact that auditors have, unavoidably, become less cost-efficient, both in absolute terms and, more importantly, relative to this new technology.

Perhaps the most salient institutional detail of Argentina's DGI at the time this study was initiated was its almost total inability to identify at any given time any given taxpayer’s current account balance. This made it virtually impossible for the DGI to figure out which taxpayers to pursue most vigorously and which to ignore. It made it impossible for the DGI to make any well-informed resource allocation decisions regarding its enforcement activities. The creation of a current accounts system, at least for the 2000 largest taxpayers, since that time is probably the single most important improvement in its operations in the last decade. Expansion of that current accounts system to cover all taxpayers should be a high priority for the DGI.

Other significant substantive recommendations include:

- The DGI could dramatically improve its audit targeting if it would (a) employ its new current accounts system to reliably track tax revenues resulting from audits and (b) use that data, in conjunction with data that it already regularly generates on audit activities, to target its audits on those types of returns with the highest expected net direct revenue gains.

- The DIN should also seriously examine the cost-effectiveness of its appeals processing in light of its recent reforms and the success of its “self-corrections” generating procedures. Just as the DIN may be allocating too large a share of its resources to labor-intensive audits, so might it be overstaffing its appeals boards, given the apparent decline in demand for the services of those boards.

- In line with the immediately preceding two recommendations, both the DIN and the DGI (or the Tribunal Fiscal in Argentina) should undertake to regularly and reliably monitor appeals of tax deficiency determinations by cohorts, rather than simply tracking the number of judgments handed down each year (the Tribunal Fiscal in Argentina doesn’t even maintain this modest amount of data). Tracking cohorts of appeals would allow these agencies to better judge both the actual level of demand for their services and the quality of those services (e.g., the average length of time required to hear cases of a given type).

- Related to this recommendation, the study contains numerous recommendations regarding information each of these tax administering agencies should regularly monitor as part of their management information systems so that they can more effectively and efficiently manage their agencies. Perhaps the most important example is that both of these agencies need to devise more detailed cost accounting systems—cost accounting systems that isolate costs by type of agency activity, so that the cost-effectiveness of each activity can actually be identified whenever measures of activity-specific quantity or quality of outputs are available. Such output measures are, in fact, available much more frequently than one might have expected.
Chapter 1

TAX ADMINISTRATION IN CONTEXT

1. In Latin America, persistent fiscal crises appear to be endemic, with virtually all country economic assessments stressing the need to restrain spending and temper revenue expansion. Public expenditure reviews, analysis of pay and employment policies, and appraisal of tax policy in developing countries continue unabated. But, a focus on tax administration is rare. To often, the effectiveness of tax administration performance has simply been judged by the bottom line: when revenues have been up, overall tax administration has been considered adequate.

2. The importance of tax administration theory (Glemrod 1990) and policy development (Casanegra 1990; Bird 1989) is widely acknowledged. Moreover, tax administration is an important part of structural adjustment. Improved tax administration can help reduce debt by increasing revenues—without increased tax rates, which can literally be counterproductive. And tax administration is one of the few government activities for which output—tax revenue—can be directly measured. Thus, the lack of a holistic approach to the assessment of tax administration performance is surprising. One reason performance assessment is not attempted may be that it would require careful analysis of a myriad of judicial and administrative relationships. Changes in tax revenues result from actions by tax administrators but also from changes in the level and pattern of compliance, the economic performance of tax bases, the inflation rate—especially if a tax law does not adjust for inflation when determining tax liabilities, or does so improperly—and the tax laws.

3. This report is intended to fill a gap in the assessment of tax administration. Its objectives are to elaborate a conceptual framework for the appraisal of tax administration, and to demonstrate its application to the tax administrations of Argentina and Colombia. Although this report focuses on Latin America, the concepts and application described should be of use to any ministers of finance or tax directors anywhere who want to improve the management of revenue systems—whether designing information systems, examining the results generated by such systems, or generally making better use of administrative resources. This report also should prove useful for World Bank analysts and others comparing tax administration among countries. Thus, examples are provided of tax administrations other than those of Argentina and Colombia addressing aspects of the issues presented here.

1.1 Tax Administration Reform as Part of Structural Adjustment

4. A government’s decision to undergo structural adjustment—and to cut large public sector deficits—is determined by a mix of considerations apart from tax administration. Yet tax administration affects—and is affected by—such an adjustment effort. An increase in tax collections—not taxes per tax rates—is one of the best ways to achieve adjustment. So, increased pressure is placed on a tax administering agency to reform—and to maintain or increase tax collections—even as the structure of the economy and potential revenue sources may be changing. Increased compliance with the laws governing existing broad-based taxes—such as value added and income taxes, which are less distortionary—can spread the tax burden more fairly. More effective enforcement of existing tax laws also can breed greater respect for those laws and the agency administering them—and can increase the cost-effectiveness of tax administration. Holding the line on existing tax rates helps to demonstrate the government’s commitment to living within its means.

1.2 Environmental factors

5. In addition to the need for structural adjustment, other large priorities strongly influence a tax administration agency’s capacity to collect taxes. Many of these factors—cultural, economic, and legal—are outside the agency’s direct control. But others are at least partly influenced by the agency—for example, in some countries, laws setting procedures. The categories are not always clear-
cut; a substantive law that taxes 30 percent of income, for example, creates an economic condition. In any case, the possible permutations among these factors make the appraisal of tax administration performance complex and country-specific.

Cultural issues

6. The influences of cultural factors on taxpayer behavior and on a tax agency’s effectiveness should be considered, even though such factors cannot be systematically measured or compared with any precision. Taxpayer behavioral traits result partly from cultural norms, but also partly from incentives in the tax laws and from past and expected actions of the tax agency. A country’s tendency to rely on external grants for, say, a 40 percent share of its governmental budget is one cultural issue that can influence tax administration. Another such issue is corruption.

7. The damage resulting to state revenues from corruption can be large. In countries as diverse as Colombia and Indonesia, the state may lose twenty times as much in revenue as tax officials gain in bribes (Bird 1991). Besides involving the “transfer” of money to the wrong pockets and (in the case of bribery) the expenditure of resources used in subverting officials, corruption—or the awareness of it—increases the public’s cynicism about government.

8. Corruption is determined by many factors beyond the power of even the most dedicated minister of finance or director of taxes. Nonetheless, several important factors may be influenced by such officials. Corrupt tax administration is facilitated by an administrative environment that combines a large degree of discretion with a low degree of accountability. Laws that reduce the degree of discretion (Bird 1989) and administrative practices that reduce the degree of accountability (Klitgaard 1988) may thus reduce the scope for corruption. Low salaries are also conducive to corruption. An official unable to feed his or her family on the salary will be tempted to bend the law. Unfortunately, the need for a tax agency to stay within civil service salary structures may make it difficult to circumvent this salary problem.

Economic conditions

9. The level and composition of economic activity—combined with the tax base and rates—determine potential tax revenues. In addition, the stability of the economy—both the level and stability of real economic growth and the level and volatility of inflation—can dramatically affect tax administration performance. Other characteristics of the economy—such as its openness, the extent to which the economy is monetized, the advancement and ubiquity of the banking sector, the dominance of the formal economy, and industrial concentration—also can significantly affect how efficiently the tax agency can be expected to do its job.

10. Real economic growth. Sustained, stable economic growth assures a stable and growing source of revenues and a stable and predictable set of demands on the public sector. These two consequences tend to alleviate political pressures for frequent or major restructuring of national tax policies, thus easing the tax administration’s burden.

11. Inflation. Stable, low inflation rates reduce the need for complicated and frequent adjustments in the calculation of tax liabilities, reduce the Tanzi-Olivera effect when such adjustments are imperfect, reduce the number of required interviews and documents to be processed, and reduce incentives for taxpayers to delay or avoid meeting their tax obligations.

12. High rates of inflation in some countries generate such large distortions in tax liabilities that specific measures must be introduced to identify inflation-associated gains and losses—in Chile, for example (Casanegra 1985). Even with such adjustments, however, inflation moves activities away
from the real sector toward harder-to-tax financial and speculative activities, rendering tax administration more difficult. And, with higher rates of inflation, unless the authorities increase the frequency of payments—and, in extreme cases, index tax payments—real revenues can decrease substantially (Box 1.1).

**Box 1.1. Two Attitudes toward Inflation Adjustment**

**Brazil: Automatic Instrument of Inflation Adjustment**

In spite of the aggregate consequences of inflationary adjustment, the Brazilian tax system has alternated between a system highly vulnerable to Tanzi-Offner effects and an almost Tanzi-proof system. In mid-1990, when the inflation adjustment system was in full operation, taxpayers and tax withholding payments had to present returns twice a month with estimated-tax withholding payments. The estimated payments covered the week prior to that being paid and the following one. In addition, the outstanding balances of taxes were converted into the BTN, pegged to the consumer price index if not paid in three days. Because of the time needed to produce the consumer price index to adjust the BTN, a short-term financial index was used to update outstanding balances for the days not included in the consumer price index.

**Venezuela: Negative real interest rates on overdue balances of taxes**

Venezuela has not been adequately adjusting tax arrears for inflation. The interest rate on overdue tax balances has been fixed at 18-30 percent for the last eight years while inflation rates ranged from 20-80 percent.

13. **Openness of the economy.** The openness of a nation’s economy to trade can affect the complexity of tax administration and the pressures on the tax agency for revenue production. As the number of international transactions increases, the application of taxes to those transactions becomes increasingly difficult. Bird and McLure (1990) believe this is an increasingly important limitation on the taxing power of even the most developed countries. Low-compliance countries are even less likely to achieve much success in taxing foreign-source income of their residents, or capital income in general, without considerable—and as yet unobservable—support from tax administrations in other countries. As McLure (1989) has shown, recent changes in U.S. tax policies make the United States an even more attractive haven for "flight capital" from Latin American countries than in the past, further undermining the already weak efforts of some of those countries to enforce their tax laws on foreign-source income of residents. Thus, it can be misleading to focus exclusively on the actions or inactions of national governments as the sole determinant of policy outcomes.

14. In prosperous times, factors related to the economy’s openness may lighten demands on tax administration: reduced external indebtedness; exportable goods, which—in developing economies—are usually natural resources; and international grants. When funds come too easily from domestic or foreign lenders—for example, during the upswing of a trade cycle, when revenues are pouring in and lenders are happy to lend more funds on the basis of this revenue windfall—governments can increase spending without the painful levying of taxes. In effect, tax administration and enforcement may be overlooked. Similarly, the endowment of natural resources may also be highly relevant to the composition and stability of a tax system. If resources are abundant—as is oil in Ecuador, Mexico, and Venezuela—some countries may choose to support the public sector largely without broad-based taxes. Thus, despite Colombia’s and Venezuela’s having similar income tax laws, the yields of these taxes are much higher in Colombia than in Venezuela. Along similar lines, Argentina’s penchant for taxing grain exports means that the availability of this tax handle as an immediate source of revenue may be shaping Argentina’s tax policy. In addition, the dependence on significant international grants as quasi-permanent elements of the revenue structure—as in some
countries in Central America—simulates an environment of financial solvency, enabling the government to postpone reforming its tax system.

15. **Monetization of the economy.** A monetized economy is a precursor of an advanced financial sector. The difficulties in taxing transactions in a barter economy are not an issue in Latin American countries.

16. **Advancement of the banking sector.** A sophisticated and widespread banking sector can greatly facilitate tax administration. Economic transactions involving banks or other financial intermediaries generally leave traceable, relatively easily monitored records. And, such financial intermediaries, besides consolidating records on large numbers of transactions, provide economies of scale in the reporting of such transactions and some assurance of accountability; it is in the interest of such intermediaries to record such transactions accurately.

17. The prevalence of the banking sector in a country may be conveniently summarized by measuring the ratio of demand deposits to money held outside the banking system. A higher ratio indicates greater reliance on banks for holding liquid assets required for daily transactions. Although other measures are possible, this measure is readily available from national income accounts data.

18. **Dominance of the formal economy.** That the ease of collecting taxes depends largely on how much economic activity occurs in the organized sector has long been recognized in the literature (Hinrichs 1966; Musgrave 1969). Formal economic enterprises have increasingly become the key administrative tax handle—or substitute taxpayer—in modern tax systems (Drazen 1978).

19. The formalization of an economy in part determines the attitudes of economic agents toward compliance with tax laws. When individuals or businesses see governmental actions as arbitrary, with no benefit to themselves from public spending, a large, self-perpetuating informal sector can develop. This observation can be traced back to Adam Smith and continues, as in the recent work of de Soto (1989). The large informal sector and generally skeptical attitude toward government in most Latin American countries are typical of low-compliance countries.

20. Moreover, in some economies—such as Colombia and El Salvador—administration competes with informal "tax systems" that obtain forced payments in areas not effectively controlled by the Government. These "systems," which finance subversive movements and organized crime, may in part explain the traditionally low contribution of the agricultural sector to the formal tax system in those countries. The administrative approach—including enforcement—needed in a low-compliance country differs from that needed for a high-compliance environment.

21. Several approaches have been advanced for estimating the magnitude of economic activity outside the formal economy. But, despite extensive efforts, no reliable measure exists.

22. **Industrial concentration.** Concentration of production or ownership allows the tax agency to focus its tax collection efforts on a small number of large taxpayers. Such a strategy poses certain risks, such as forgoing revenues due from smaller taxpayers, and undermining the willingness of those smaller taxpayers to comply with tax laws. Focusing on the largest firms can also compromise the fairness of the tax system by imposing different effective tax rates according to the amount of taxes due, thus encouraging large companies to break themselves into smaller units to reduce their taxes. Although, such a focused strategy can be extremely attractive because of its short-term cost-effectiveness, the long term cost-effectiveness of such a strategy is, as yet, unknown.

23. Industrial concentration is readily measured—for example, using the four-plant concentration ratio (known as CR4), the Herfindahl index, and the entropy index.
The legal mandate

24. Tax administration takes place at three levels (see Shoup 1991). The first level is the legal mandate—the actual power to collect taxes—a mix of laws with the economic and cultural environment that influences the laws' effectiveness. The laws set the ground rules—which are mainly substantive, procedural, and general administrative law. Tax laws are generally distinct from others, but the boundary can be indistinct when, for example, a labor law exempts workers in a given industry from some or all taxes—or a "tax" law promotes a specific industry.

25. The laws form the plan for organization, which is implemented as the institutional infrastructure—the investment in capital, including expertise. The delivery of services—operations—includes registration, support for compliance, and enforcement. Some of the infrastructure and operations are determined by agency actions not specified in law. Like the laws, the infrastructure and operations are affected by the cultural and economic environment. (Organization, infrastructure, and operations are discussed in chapter 2.)

26. Proper assessment of a tax administration requires consideration of the effects of the legal mandate and the differences between institutional infrastructure and operations. In many instances, the laws—taken from another country—may appear sound and fail completely when imposed on the wrong institutional infrastructure and operational context. This is common in many Latin American countries, which have adopted legal models from other countries but lack the corresponding institutional capacity required to implement them.

27. Tax system failures are often ascribed to as "poor administrative performance" without further explanation. Yet, performance indicators can be devised that discriminate between problems traceable to economic or political roots (legal mandate) and problems encountered in implementing policy (infrastructure and operations).

28. Even the smallest details of the laws can influence tax administration. For example, the size of paper specified—in a procedural law—for tax returns may unintentionally prevent implementation of a rational computerized tax system. In some instances the mandate may be too rigid, in others too flexible, and, in still others, incomplete. The delegation of authority to define parts of the mandate—such as rates, criteria for inflationary adjustments, and the organizational design of tax administration—can mean a more important role for institutional infrastructure. When the laws and infrastructure are not enough, the tax administration must, in effect, define the infrastructure during its operations.

29. Substantive law. Substantive legislation prescribes which taxes apply, to whom, and when. Such law also sets the structure of the tax system—for each tax, a base, periodicity, exemptions, and a set of targeted taxpayers exceptions, and a tax rate. This codification of the magnitude and complexity of tax administration largely determines the system's manageability (Box 1.2). And, the compliance environment flows from substantive law.

30. Procedural law. Much less discussed but in some ways more important than substantive law, procedural laws are the plans for implementing substantive legislation (Box 1.3). Procedural laws establish dates to file, pay, appeal, and receive reimbursement. They provide collection rules, give audit powers to the government, set time limits to exercise those powers, specify penalties (and when they may be assessed), and determine the rights of taxpayers to administrative and judicial review.

31. Procedures should minimize time and operating costs for the taxpayer and the administration, while providing for due process. As with substantive laws the design of procedural laws affects manageability. Excessive attention to due process, for example, may make the tax system vulnerable
Box 1.2. Two Examples of Tax Reform

Mexico: Simplification and consistency of substantive law

Reforms introduced in Mexico by the Salinas de Gortari administration since late 1988, have covered a broad range of topics. The income and value added taxes were simplified—rates were reduced and special regimes were eliminated. The goal was to encourage taxpayer compliance. Reforms also released the tax administration from the onus of providing special forms for transportation, agriculture, taxi drivers, border vendors, tortillas producers, and a host of differentiated treatments that were considered "simplification" instruments when enacted.

Ecuador: The perpetuation of special regimes

In 1989 and 1990 the Government of Ecuador undertook a tax reform that included all levels of the tax law. Substantive law changes included a deliberate effort to standardize and simplify the tax system in the wake of modernization efforts in other Latin American countries. In parallel, however, the creation of special regimes under different legal definitions was under way. First, oil related activities received special treatment. Second, the mining lobby produced its own set of special regimes for mining. Third, forestry activities obtained government support through the tax system. Fourth, the tourist industry received special benefits. Given the benefits that taxpayers and tax advisors can obtain by combining regimes, such a system could lead to sizeable revenue losses.

Box 1.3. Procedure: A Multidisciplinary Concern

Once substantive definitions are set, policymakers usually let lawyers define procedures. But implementation implies the definition of roles shared by society and tax administrators, and is the collective responsibility of many disciplines. Compliance and administrative costs are defined in the procedural rules; yet, in many cases, taxpayer attitudes also may result from procedural definitions.

As with other laws, the drafting of procedures requires legal principles—such as due process—and legal drafting skills. But procedural law is also governed by a set of political principles—respect for life, liberty, and property—and by the administrative possibilities in a given technological environment. To a great extent, the definition of procedure is not an abstract exercise in law but the agreement of computer experts, economists, and accountants, on instruments of implementation.

The divorce of law from its context is exemplified by the development in the 1960s of the Organization of American States-Central Inter-American Estudios Tributarios Model Tax Code using principles developed by Argentine and Uruguayan tax specialists. The code has been adopted by Costa Rica, Peru, and Venezuela—with predictably poor results. First, the definitions used in the model code are related to the stage of development of the countries that drafted the code—and not those adopting it. The code is foreign to the operation of many countries' tax systems and fails to address country-specific structural issues that may be destroying a tax system, such as loopholes in procedural law.

to abuse by taxpayers. But an unduly short statute of limitations for audits may reduce the legal capacity of the tax administration.

32. Revenue from compliance may be obtained at relatively low cost—for example, when withholding deposit funds directly into the treasury through banks, as is common throughout Latin America. On the other hand, enforcement revenues can involve substantial administrative costs—the collection of delinquent accounts from evaders who must be detected, identified, and assessed through field audits. Thus, an important distinction in assessing tax administration performance is the extent to which revenues are obtained through compliance or enforcement. The compliance-enforcement
dichotomy is especially important in developing countries, where the environment usually is not conducive to tax administration.

33. **Administrative law.** Administrative law—the rules for bureaucrats—comprises the general law of public administration, and some substantive and procedural law. Among other things, administrative law assigns jurisdiction for different laws to specific government agencies, including the main tax administering agency. At issue are personnel management, accountability, budgeting, and procurement.

34. To a large extent, the rules of the legal system used to interpret public tax administration performance are analogous to the rules of the market for interpreting economic performance. Tax administration legislation, then, becomes a touchstone for studying and interpreting tax administration performance—the theory compared with the reality. The laws define the tax administration production function. But, because of the environmental—political—influences on tax administration, microeconomic tools of analysis alone may not bring a full understanding of tax system performance.

35. Efficiency, vulnerability, complexity, and stability are useful performance indicators for laws, institutional infrastructure, and operations. To apply these performance indicators, weights could be assigned relative to their perceived importance—which can vary for each tax administration. Weak tax administration performance may be the result of poor definition and operation at one level or a combination of problems at two or three levels. The weighing will depend on the causes established as a tax administration is reviewed. A useful rule, however, is to begin with the administrative reading of the law. Some notions to be addressed are obvious—such as tax incentives—but tax law is also plagued by subtleties less easy to detect.

36. General **public administration legislation** covers the organization of the state apparatus, human resource management, procurement, and budgetary management, and accountability rules in the public sector. Ideally, this legislation provides a coherent set of public sector management rules to enable administrators fulfill their duties. In addition to being internally consistent, these rules should be consistent with the organizational design specified by the substantive and procedural tax law.

37. Public administration law has no directly measurable outputs—its role is purely instrumental. However, it does contribute, along with the other legal elements to the tax administration production process. For example, a legal obligation to train personnel may result in training, which itself is an intermediate product in tax administration. Likewise, accounting legislation provides the framework for maintaining accountability within a tax administration agency.

38. The incentives for government officials to fulfill their duties—salary scales and the implicit or explicit rewards or penalties for high or low performance—are embedded in the law. These laws may be part of a labor union agreement (as in Argentina), part of statutory civil service legislation (as in Colombia), or unwritten (as in Mexico).

39. A stable civil service builds tax administration staffing into the basic structure of the tax administration. Otherwise, concern over staffing issues becomes a major concern of tax system administrators. Building staffing into the structure permits the tax administration to plan the long-term development of its human resources but may also saddle the administration with inefficient and corrupt personnel, over which it can exercise little or no control.

40. An increased role for the private sector in tax administration necessarily implies sharing specialized human resources—trained accountants—with the tax administering agency. On the other hand, public sector human resource management in developing countries is often inadequate. Over:
time, public tax administration may end up being staffed by low-quality employees and apprentices who encounter a private sector continuously replenished by the best of the former tax administrators.

41. Accountability rules for the public sector generally also have important implications for tax administration. They provide the yardstick by which evaluation of performance—overall or individual—is measured. In general, accountability rules have not been applied to tax administration except for the daily counting of cash collected. The fact that in some countries some tax collections never reach the treasurer’s office suggests there is an important accountability gap not widely recognized in the analysis of tax administration. Although taxpayers must support their returns with substantive information when officially requested to do so, there is a surprising lack of accountability governing public officials in charge of tax administration. When the salary structure of tax administration units is partially linked to performance, an accountability design may be needed to measure rewards. In principle, a system of rewards and penalties necessitates accountability for officials.

42. Budgetary laws specify how the financial resources available to tax administration must be managed. In countries where fiscal management is dominated by cash considerations, it may be difficult to finance expenses other than salaries. Procurement laws define the legal requirements that must be satisfied in purchasing goods and services. Such laws tend to include detailed procedures governing such areas as conflict of interest to reduce the risk of corruption and resulting inefficient procedures. Corruption and inefficiency may, for example, prevent the government from obtaining necessary equipment—computers—in time to implement a tax reform. In general, a basic requirement for the appropriate operation of procurement and budgeting laws is compatible design.

43. As with other procedural tax law, in many cases in Latin America public administration legislation undermines tax systems. The main features, to check when determining the operational feasibility of administrative law for the tax system are the overall consistency and completeness of content, number and conditions of procedures that may undermine or foster the legal mandate, the incentive structure, definitions of accountability, and adaptability of the specifications to technology.

44. Stability. Whatever the law’s content, if the body of tax law is not stable, tax administration is hampered. Stability is particularly important for the substantive and procedural laws—because they directly involve the public. Tax reforms—mainly changes in the substantive law—have been used by economic policymakers to ameliorate many problems: to mitigate Tanzi-Olivera effects following an inflationary upsurge, to promote specific activities through tax exemptions, and to mobilize funds to close a budget gap. In many countries, frequent recourse to such changes has led to overly complex and inherently contradictory—unmanageable—tax systems (see World Bank 1990a).

45. Frequent changes in the laws can be costly—forcing tax administering agencies to redesign tax filing procedures, redraft taxpayer forms, publicize the changes and their effects on taxpayers, change reporting requirements, alter their record-keeping procedures, retrain staff, and so on. And, such tax law changes can undermine compliance if taxpayers believe the laws are arbitrary and likely to be short-lived.
Chapter 2

PRINCIPLES OF TAX ADMINISTRATION

46. The organization of tax administration is specified in administrative tax law and implemented through institutional infrastructure. Infrastructure comprises the total capital investment, including staff and computer resources and their interactions. Tax administration delivery—operations—includes registration, support for compliance, and enforcement. The private and public sectors are both part of implementation and delivery of tax administration with their relative roles determined by historical factors and current level of development. (Box 2.1)

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<thead>
<tr>
<th>PRIVATE SECTOR</th>
<th>LEGAL MANDATE</th>
<th>PUBLIC SECTOR</th>
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<tr>
<td>Delivery</td>
<td>Implementation</td>
<td>Laws</td>
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<tr>
<td>Tax rules for everyone (substantive law, procedural law, other relevant laws)</td>
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<tr>
<td>Compliance</td>
<td>Private-sector tax infrastructure (Attorneys, banks, corporate departments) Rules for bureaucrats (Public administrative law, some substantive and procedural law)</td>
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<tr>
<td>Organization</td>
<td>Institutional infrastructure (Capital investment including expertise)</td>
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<td>Operations</td>
<td>Registration, support of compliance, enforcement</td>
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2.1. Organization

47. The administrative law transforms the rules for taxpayer compliance into rules about how the tax administration bureaucracy should be organized. The structure established may be centralized or decentralized—defining the work by tax, process, client, or other criterion. Technological considerations—such as the feasibility of computer support—can influence the organizational design.

48. Tax administrations in Latin America oversee many more taxes—and functions within each tax—simultaneously than those in developed countries and tend to have correspondingly complex organizational structures. This complexity is compounded by substantive and procedural laws that require specific organizational forms. Except for customs and social security contributions, which are usually administered separately, other national taxes are generally administered by a single authority.11

49. The organization of tax administration in Latin America has evolved. Initially, the pattern was to divide the work in accordance with substantive law—by tax. In a second stage, organization followed procedural law and used the main stages of the tax process—collection, audit, and administrative review—for the division of labor. Recently, organization has been structured following managerial concepts—for example, planning, operations, and support—or clientele (by size or sector or the degree of formalization) (see Annex A).
50. The boundaries between law creating organizations and its subsequent implementation vary. Some countries, such as Argentina, give tax authorities discretion over how to organize their operation, but many countries—including Colombia and Uruguay—have developed detailed organizational legislation.

Compliance

51. The literature shows that improving tax compliance is not the same as discouraging noncompliance (see Annex B). First, attitudes matter—because they affect behavior. Second, increased enforcement actions—including amnesties—may have quite different effects on those who normally comply than on noncompliers. So may increased efforts at public education about taxpayer rights and obligations or increased efforts by tax authorities to provide improved service to taxpayers.

52. The third consideration is that the size and nature of the factors motivating compliers may vary considerably in different countries. Attitudes are formed by such context-specific factors as the perceived level of evasion, the perceived fairness of the tax structure, its complexity and stability, how it is administered, the value attached to government activities, and the legitimacy of government. Government policies affecting any of these factors may thus influence taxpayer attitudes and compliance.

53. Private tax administration. In many countries, recent trends—including rising inflation—have led to a redefinition of compliance and of the organization of tax administration. The literature views the tax game as having two players—the taxpayer and the government. But in many Latin American countries, withholding has become the definitive tax payment. Public tax administration has focused increasingly on the management of third-party transactions instead of on individual taxpayers (Box 2.2). Private tax administration—involving taxpayers and third parties—is organized by the private sector. There are thus three players, or—if the possibility of dishonest officials is taken into account—possibly four.

54. The reliance on third parties in Latin America is the latest stage in the continuing search of tax authorities for an administrative handle. Most taxes use the records kept by the formal private sector. The extent to which data in tax returns are supported by private-sector records varies with legal obligations. Not all taxpayers are obliged to maintain accounting records. For those who are, the individual taxpayer's accounting system becomes the basis for tax returns and determines transactions with related taxpayers. Often, the retention of certified public accountants to verify bookkeeping provides enough evidence of the validity of information reported to satisfy tax authorities—although they may contest the information if they suspect its veracity. This can be the case with the Mexican certifications ("dictámenes") of certified public accountants or, in Colombia, the endorsement of the return by a certified public accountant.

55. Public tax administration. The follow-up and control of large private entities that pay the most taxes has become a fundamental issue for public tax administration in Latin America. This situation explains the trend—begun in Argentina in the 1970s—to split the organization between large taxpayers and the rest (Box 2.3).

56. The more incomplete and contradictory the initial laws, the greater the need for effective regulations. If the legislation is complex or imprecise, taxpayers may attempt evasion or demand official clarification about the laws.

57. The law can be specific about what the taxpayer ought to do, but it cannot be as specific about how the administration makes the tax system work. Specific rules may empower the tax commissioner to interpret the law and answer taxpayer queries about individual situations. Some rules may prescribe
Box 2.2. Using Banks to Collect Taxes

The use of the banking system as a private support for tax collection has long been a practice in Latin America. In the early 1950s, Argentina was the first country to establish a system under which banks would collect taxes, deposit the funds in a central treasury account, and report to the tax administration who had paid.

The rationale for bank collection is usually to increase "taxpayer services" by offering more options for tax payments, to have a more reliable system for the security of cash and checks, and to provide the banks with additional financial resources.

The arrangements for obtaining the services from banks may vary from using them as cashiers or teller offices (as in Argentina) to the most recent approach, under which, in addition to receiving cash, banks are responsible for the filing of returns and the basic capture of data—a model established in Colombia and being exported to Ecuador and Venezuela.

Colombia did not have a systematic registration of taxpayer tax accruals and payments—a taxpayer current account—because the institutional infrastructure was inadequate to support it. The current account is a fundamental instrument of the relationship between the taxpayer and the tax administration. The outstanding balances of the current account are the basis for initiation of the collection of overdue taxes. To a large extent, having the orderly and retrievable information on each taxpayer is as fundamental to the tax administration as it is for a bank regarding its clients' accounts. Although the client deposits and draws from the client's account, the client generally only deposits into a tax administration account. If payments due are not known the taxpayer may remain silent and perhaps benefit from the statute of limitations after some time. For this reason, the administration needs to have an accurate current account of each taxpayer.

Paradoxically, the lack of current accounts in Colombia before implementation of the new bank collection model was in part a result of the inaccurate data provided by banks. The resolutions that authorized banks to collect tax payments were more concerned with the conditions of profitability being offered to the banks than with banks' reciprocal obligations. Although the banks were supposed to fulfill their registration and reporting obligations, there were no penalties if they did not. In this legal environment, data on taxpayer identification, taxable periods, and tax types—the fundamental codes for a current account—were filled in carelessly and late payments were treated as involuntary bank errors.

The improvement in Colombia consisted of the establishment of a very rigorous system of bank discipline that treated the management of individual taxpayer information as equally important as managing the money collected by the banks. Although tax administrators were to receive validated computer tapes daily to support bank filing and collection, banks could hold the money for a number of days—from eighteen to twenty-five, depending on the volume of taxpayer transactions. Under the new conditions the current account could theoretically be updated the day of the transaction. Universal quality controls are not in place, although the system is moving in this direction.

general behavior—such as empowering the administration to take all necessary steps to grant taxpayers the pertinent information and measures to facilitate compliance. But most actions related to this administrative function are inevitably discretionary.

Enforcement

58. Control of noncompliance is legally determined by procedural laws. Noncompliance may consist of evasion in the self-assessment of taxes or tardiness in the payment of established tax obligations—whether privately or officially determined.

59. Tax authorities are given discretion about whom to audit. The taxpayer's self-assessment, in effect, is legal recognition of the tax administration's jurisdiction over all taxpayers. The circumstances, selective auditing of returns is the administrative method of controlling evasion. When legally codified, the organization of work in this area has moved along two axes: the separation of
Box 2.3. Organizational Segregation of Large Taxpayers

The introduction of a division of work based on the relative importance of the clientele led Argentina to establish in the mid-1970s a special unit to serve and control large taxpayers. The rationale was that the importance of these taxpayers to total collections made close monitoring crucial. This focus of collections on a few taxpayers resulted from the high concentration of income in a few hands—and because of the increasing transfer to the private sector of tasks previously handled by tax officials. From being considered large taxpayers, these companies became large collectors of income taxes (withholding) and the value added tax. The problem was that this strategy was accompanied by the near elimination of the management of the rest of the taxpayers.

The Argentine model has been exported to several Latin American countries. Peru and Uruguay adopted the model in the 1980s. Peru is clearly the extreme case: 9,500 tax administration staff deal with 1,200 large taxpayers that collect or pay about 75 percent of total revenues. Of these revenues, 30 percent comes from taxes collected by Petróleos del Perú, the state oil company. Given the scant attention paid to the rest of the taxpayers, it is perfectly feasible that compliance by the other taxpayers may be shrinking. In Uruguay a very sophisticated on-line system for the large taxpayer group compares with near chaos for the remaining taxpayer accounts.

Colombia has established a unit to control large taxpayers. But, in contrast to the other three countries mentioned, the computerized taxpayer current account system covers all taxpayers. Under these circumstances, large taxpayers receive additional attention without affecting the average quality of services provided to any taxpayer.

Mexico approached the problem of large taxpayers through the substantive law by assigning small taxpayers special taxable bases, thus excluding a sizable number of taxpayers from the mainstream. Under this approach, what the administration calls “dwarfs”—large taxpayers posing as small taxpayers—became commonplace. Many taxpayers in the transportation and agriculture sectors thus found a way out of the tax system.

programming and control from execution, and the use of computer routines to perform certain audits or parts thereof.

60. Taxpayers to be audited may be chosen randomly or selectively (Box 2.4). Completely random audits never happen. Priorities always are set to select the sample of taxpayers to be inspected. Tax administrations also use informants for detecting evasion. Thus, the problem is to find ways to most effectively use the scarce financial and informational resources available.

Box 2.4. Audit Selection

The United States and the Federal Republic of Germany illustrate two fundamentally different approaches to evasion detection. In the last forty-five years, the United States has perfected a set of mathematical formulas to guide the selection of likely evaders in the light of “peer” reference group comparisons. The Internal Revenue Service compares the data of a taxpayer to those of a reference group and selects taxpayers whose declared taxes are below a given criterion. The historical experience of the IRS is accumulated in the models and the comparison is done at the taxpayer level. Under this approach, one taxpayer may never be audited, while another may be audited many times.

The Federal Republic of Germany has been classifying taxpayers by size and establishing differentiated frequencies for audits using the importance—size and status (as corporate or individual taxpayer)—of the taxpayer. Large taxpayers have been inspected at least once every three years, mid-size taxpayers at least once every seven years, and all taxpayers at least once every twenty years.

61. The administrative law defines the organizational approach to audit selection through its division of work. The law may define audits by groups of taxes (as in Argentina), by tax (as in Colombia), or
by a generic audit function. The law usually distinguishes between desk and field audits. The intermediate products of desk audits are citations to clarify a tax return or information requests based on taxpayer and third-party (cross-checked) information on the auditor’s “desk.” Field audits are verifications of taxpayer returns based on accounting records of the taxpayer and third parties. The intermediate product of the field audit is the “proof” of evasion that may lead to official reassessment. The final institutional product is either a reassessment or the shelving of a case because of lack of evidence.

62. Overdue taxes present a second problem for organizational design. In this case, the goal is to collect all taxes—not to select some taxpayers for audit. This work may be divided according to the states of the collection process—first the persuasive functions, and then the jurisdictional ones. The law may also empower the tax administrator to act as a judge to obtain payments. Under these circumstances, the collection unit of tax administration may seize and auction property without court intervention. The productivity of tax administration is thus attested by the degree of authority conferred by these types of laws.

63. The problems of internal organization have, to a large extent, been left to the permanent bureaucracies in tax administration—combining bureaucratic interest with insider knowledge. This combination may not lead to the most desirable results. Like substantive law, administrative law may affect attitudes about compliance—sometimes providing a hidden institutional support for corruption (Box 2.5). Assessing the administrative feasibility of the law covers its consistency and the completeness of design, and whether the organizational design undermines or fosters tax collection through details such as the number of organizational steps, authority to decide outside the process, adequacy of territorial delegation, length of the production cycle, and incentives to terminate the cycle (Box 2.6).

**Box 2.5. How the Laws May Encourage Corruption**

Until recently, tax administration officials advising taxpayers was a legally approved practice in many Latin American countries. In one country, a special provision authorizes tax administration staff recruited before the enactment of a 1967 law to privately advise up to three taxpayers. The existence of such a clause has generated a demonstration effect on tax officials who have no legal right to advise taxpayers. So, most tax administration staff are private tax advisors. The resulting conflict of interest has led to tax inspection programs that focus on public enterprises instead of on the offfice clientele from the private sector.

Moreover, the practice is justified and reinforced by the actual economic conditions of tax administration staff. The combination of low salaries, lack of institutional motivation, and a market for tax advisory services creates an ideal environment for perpetuating the scheme. Under these conditions, the likely loser of any arrangement is the public treasury.

2.2. The Institutional Infrastructure

64. The institutional infrastructure—public and private—comprises the resources that make the system work. These include—human resources, buildings and other physical elements (vehicles, computers, and communications equipment), the development of these facilities, administrative records, the forms used for compliance and enforcement, managerial technologies, training, and any other features that may facilitate (or complicate) compliance and enforcement. The private sector
includes accountants and lawyers specialized in managing individual tax obligations, and withholding agents and banks involved in tax collections—all responsible for keeping records to be conveyed to the official administration.

65. The public sector components of institutional infrastructure consist of units to facilitate and monitor taxpayer compliance; enforce the laws, insure accountability and internal control of the system, manage the system, and provide office space, and technical and staff support for operation of these units (Box 2.7).

Box 2.7. Two Examples of Tax Infrastructure Reform

Bolivia is a widely known example of an integrated effort to reform the tax laws and organization as cornerstones of decisive change. First, the elimination of the existing tax administration was considered a precondition to developing a new tax system. A Ministry of Revenues was created to replace the existing tax administration in 1987. The government believed that it could not implement tax reform with the existing tax officials. Once a new administrative apparatus was in place, the next step was tax reform to support stabilization.

In Ghana, the National Revenue Secretariat was set up in 1985 under a cabinet-level secretary. The National Revenue Secretariat formulates tax policy and supervises revenue collection by the Internal Revenue and Customs Services. Implementation of a more realistic exchange rate policy coupled with a stronger organization has improved revenue performance. Tax revenue rose to 13 percent of GDP in 1989, compared with 5.5 percent of GDP in 1983. As an integral part of the adjustment program, the government restructured the tax system. Reforms include personal taxation relief, rationalization of indirect taxes, expansion of consumption taxes, reduction of the implicit tax on cocoa, higher taxes on petroleum and motor vehicles, and lower corporate tax rates. The emphasis was expected to shift from revenue generation to the promotion of economic growth through a more favorable climate for investment—without incentives for activities that contribute to the most efficient use of resources and factors of production.

66. Each element is critical to the proper operation of a tax system. Inadequate physical facilities, for example, appear to be part of the problem of poor tax administration in many Latin American countries. More important, modern tax administration increasingly depends on the efficiency, coverage, and integration of the computerized support system. Adequate infrastructure in this respect requires what may be called the “computerization” of tax laws and procedures—and effective tax administration organizational design and managerial and information inputs (Box 2.8). Information systems must be considered first, before reviewing other elements of the institutional infrastructure.

67. Many aspects that are not defined in the law can be developed by management. Conversely, an inappropriate conception of the institutional infrastructure of a tax system may lead to its failure regardless of the quality of the laws.
Box 2.8. The Institutional Infrastructure In Practice

One indicator of the development of institutional infrastructure in tax systems is the capacity of the system to effectively capture and use taxpayer-provided information for subsequent steps. Chile provides an excellent example of institutional capacity to massively register and produce data critical to the issuing of checks for excess withholding payments. Based on a computer program to detect inconsistencies, taxpayers not fitting given rejection criteria (filters) are automatically issued checks. Rejections are processed case by case; any taxpayer whose case is stopped is asked to provide the information the filter is signaling. All of these operations are done routinely by Servicio de Impuestos Internos, the Chilean tax administering agency. The management of Servicio de Impuestos Internos constantly improves the sampling techniques to detect attempts to deceive it. The effect of this strategy is curative and preventive.

By contrast, the Colombian infrastructure is still out of phase with the forty-five-day time limits for producing tax rebates on excess withheld taxes. In practice this suggests an enormous vulnerability to fraudulent attempts to obtain tax rebates. Under the current institutional infrastructure, no safety registration, classification, or reporting features have been developed to deal routinely with excess payments. Thus, Colombia’s DIN faces an enormous problem of fraudulent cases in the value added tax and income tax.

Information systems infrastructure

68. To foster compliance, the tax administration requires a system that can identify all taxpayers responsible for each tax, determine how many taxpayers have filed by type of tax and amount, identify those who fail to submit returns, evaluate filed returns, and determine which have inconsistencies.

69. The main inputs, the intermediate products, and the final output of tax administration are all fundamentally information—as cases in which collection is done fully by banks demonstrate. The information system determines the quality of individual administrative functions and the overall outcome of tax information. Moreover, the system determines the nature, content, organizational design, and required staffing of the tax administration. For example, if inflationary adjustments are not made automatically as part of maintaining current accounts, the task of the person in charge of determining inflationary adjustments changes, as do the tasks of all other staff. More generally, if some functions are computerized but others that could be computerized are done manually, tax administration inevitably develops operational bottlenecks (Box 2.9).

70. The transfer of cash operations—and sometimes also substantial data processing—to the banking sector increases the number of available payment sites, and thereby improves taxpayer service. More important, it reduces the opportunities for dishonest officials by permitting tax collection to piggyback on well-established banking systems that can ensure cash accountability. But, banks do not provide these services free; service charges must be paid.

71. Tax forms. Forms are the official language of the tax system. They represent tax laws as applied to and by taxpayers, as well as an information link to the computer system. The content and use of forms are thus critical to efficient tax system operation. Information that goes beyond the capacity of tax administration to use should be removed from forms. Conversely, oversimplified forms can create administrative problems—as with Brazil’s unique document of payment that contained no tax coding. Well-conceived forms can serve several purposes; for example, a multiple-transaction form accompanied by the signature of the responsible officer, and including the entry and exit dates, may reduce compliance and registration costs and generate information useful for accountability and internal control (Box 2.10).

72. Two types of forms are used in tax administration: compliance forms required from individual taxpayers or third parties, and internal administration forms that combine individual data such as
Box 2.9. Mexico: Organization and Management of Computer Services

The problems with computer services are so vast that a complete analysis would require a separate study.

Computerization of tax operations in Mexico has been judged unsuccessful by many, although Mexican data processing is better than in many Latin American countries. However, changes are under way to substantially correct the architecture of data processing established in 1979. The bold decentralization decisions of 1988 are, in fact, a unique experiment.

The decentralized computerization of tax operations—in the office of the Undersecretary of Revenues (SII)—that oversees tax administration and policy—is the conclusion of a long process. Between 1962 and 1978, mechanical data processing began to be substituted for manual procedures to cater to a fast-growing universe of tax transactions. Computers were by definition centralized units that substantially changed the day-to-day workings of the organization. Although the speed and capacity of computers could solve the problems of volume, the gigantic tax administration operations posed severe problems of massive movements of paper for data processing. Security and information-storage capacity were low and unreliable. From 1979 to 1987, a more integrated model of computerized collections was put in operation. The government made substantial investments to establish regional computer services following the organizational design of the U.S. Internal Revenue Service. However, the infrastructure that was needed to correctly operate the system was beyond that available in Mexico, and system performance was severely limited.

Federal Registry of Taxpayers, 1962-79. The centralized equipment meant, in practice, a divorce of operations from data processing, as two tax registries—manual and automatic—were created, based on the same documents. A manual registry was maintained by the local tax offices to support the administration-taxpayer day-to-day relations and a registry was processed with the central computer to produce statistics and nonoperational outputs. The two registries showed considerable inconsistencies.

Integral Collection Model, 1979-87. The decisions made in 1978 were a turning point in the development of data processing in the Mexican tax administration. Nine data processing centers were created to support collections. The new approach was expected to solve most problems, as the local registry was eliminated. However, the new strategy meant furthering the split between operations and data processing, thus lowering the quality of the service to the taxpayers. The community felt the full weight of an inefficient semicentralized tax administration.

Local Taxpayers Account, since 1988. The data processing function is now to be handled by local computers which will be integrated to the existing network for purposes other than individual taxpayer transactions (consolidated accounting, internal control, statistics, audit programming, and so on). The local administration can now provide much better—instantaneous—service at the individual level while the center is not encumbered with information irrelevant to its functions. In addition, local offices are able to operate and control applications related to registry, control of taxpayers' formal obligations, local accounting, overdue taxes, and operational controls.

The main features of the proposed program are (1) data are structured in one way—unified current account—for all federal taxes, including customs; (2) access is possible from any system to all others; (3) information is co-validated when entered into the system; (4) information is entered only once on tax returns and payments; (5) inconsistencies are not included in the unified current account; (6) the entry point for all systems is the fiscal registry, which will be managed centrally by the national processing center; (7) the operations base is the local-level taxpayer current account (Cuenta Unica Local). This scheme extends data processing to local levels with the installation of 2,500 microcomputers throughout Mexico. It redefines the roles of the regional and national levels in consonance with the concept of Cuenta Unica Local.

In addition, computerized support for select taxpayers is being implemented. The computerized system is based on simple indicators to detect likely evaders. To support this system a complementary set of computers has been provided to the audit department.

accounting documentation, a listing of taxpayers for general action, and reports for management information systems.

73. Taxpayer compliance forms in effect combine the registration system of the taxpayer with that of the tax administration. Compliance instruments include forms for taxpayer registration, return and payment, payment only, and rebate and transfer. Return and payment forms should include basic data to
determine tax liability (tax base information) and any tax liability changes (current account information).

Other forms accommodate unique situations that may emerge. In some instances, instead of submitting a return, making a payment, and receiving a receipt, the taxpayer takes the payment form to a bank—like a deposit slip—with the receipt stamped on the form. In other cases, magnetic and electronic media are used for processing tax data.

**BOX 2.10. Using Tax Return Data in Management**

**Colombia: Initial steps in the development of managerial accounting in tax administration**

A conceptual framework developed and prescribed by the Office of the Comptroller General for the activities of the Colombian tax administration divided the reporting of revenues between those derived from compliance (contabilidad de cumplimiento) and those coming from enforcement activities (contabilidad de gestión). This division has enabled the ministry to negotiate targets of enforcement activities with the DIN, based on previous performance—a minimum "scientific" principle nonexistent in most Latin American countries, where revenues are measured in total. The system is based on the previous codification of transactions based on compliance and enforcement criteria. This means that only spontaneous compliance is classified as compliance revenue. All other compliance is considered enforcement revenue. If, for instance, a taxpayer "complies" after the visit of a tax inspector to take advantage of reduced penalties, the collection from such action is classified as enforcement revenue because it required an intervention from the administration. As it currently operates the system is the accounting system of the DIN and not a parallel reporting feature.

**Brazil: Development of economic data based on income tax returns**

In the last ten years Brazil has prepared an annual series of statistics obtained from income tax returns. The data have had an effect on economic policy decisions. In addition, they have been used to define the sample of taxpayers to be audited.

74. The number of taxpayer forms largely determines the number of internal administrative processes required. Well-designed taxpayer forms may substantially reduce processing volume and costs. Conversely, as more forms are created, more differentiated internal treatment is required for processing the information.

75. **Financial accounting.** The tax administration registers and reports the financial results of the operation of the tax system. In a cash system, financial accounting registers the amounts collected by tax, region, and other dimensions. If a system separates returns from payments, tracking of individual accruals and payments is required to determine the size of overdue taxes, the age of delinquent accounts, and to satisfy other operational information requirements. The classification of the separated accounts depends on the administrative uses of the information.

76. **Accounting by individual taxpayers.** The institutional infrastructure of any tax administration is to some extent decided by how it maintains records—for example, by tax, individual taxpayer, and region. Perhaps the most efficient system is to keep the records of all tax transactions by taxpayer, which relies on the unique taxpayer identification numbers for all taxes. If the relationship with the individual taxpayer is categorized by tax, the taxpayer is not able to consolidate tax obligations and the administration similarly cannot monitor compliance in an integrated way.14

77. **Automation of operations.** When the institutional product is completed by a single entry of data, as in a well-integrated current-account system, computerization alone can complete the initial operational phases of tax administration—registration and recording of compliance. In addition, the
control of evasion may be based on computer programming that selects taxpayers on the basis of deviation from standards. Basing audits and investigations on computer-processed criteria contributes to administrative efficiency and enhances equity—because taxpayers are selected using the same yardstick. Computer-processed criteria also may become an instrument for performance measurement and internal control.

78. Operations support may also be part of the information management infrastructure. Compliance forms can be preprocessed with basic data and sent to every taxpayer. Audits can be assisted by cross-checking information. After identification of an overdue account, the information system can generate periodic reminders—and calculate appropriate interest charges—before legal action is taken.

79. **Accountability and internal control.** An important aspect of information management is to follow activities by employee and by administrative unit. This is particularly important to reduce the vulnerability of the tax system to corrupt practices (Box 2.11). One way is to include the code of the employee and the dates of arrival and departure of the processed document.

80. **Economic data.** Various combinations of the information submitted on taxpayer forms may be used to estimate future collections and to build models simulating the effects of changes in tax design.

81. **Managerial functions.** In its simplest formulation, the efficient allocation of resources across all tax administration activities requires that marginal revenue gains per dollar spent be uniform for all activities (See Chapter 3). For activities that affect current-year revenues directly and independently of other agency activities, the marginal revenues are simply the additional revenues directly generated by those activities during the current budget period. The calculation is more difficult for activities whose revenue effects also depend on other activities (for example, management, data processing, information systems, and overhead) and for activities whose revenue effects extend beyond the budget period (such as investments in information systems, the deterrence effects of enforcement activities, and the compliance effects of long-term management or policy decisions). For such activities marginal revenues can be reliably identified only by careful modeling of total output—tax revenues—for the entire agency as a function of all activities of the agency, including any of the previous year's activities that have long-term effects on the environment in which the agency operates. Ideally, information systems should generate the data needed for such estimates.15

**Compliance infrastructure**

82. A good tax administration should design and maintain a compliance system that has satisfactory policies and objectives—and that minimizes private-sector compliance costs. In addition to computerization, facilitating compliance also involves attention to regulations, taxpayer information, management of deadlines, physical ease of filing and paying, time constraints on filing a return and paying taxes, and motivation to improve taxpayer attitudes toward compliance.

83. **Regulations.** Regulations are issued at the executive branch level. Tax legislation often empowers tax managers to issue legal interpretations. The need for regulatory action may arise from the dynamics of taxpayers' interpretations—usually biased against the tax system—or from imprecise legislation. Regulations issued for the first reason may indicate adequate performance, but those issued for the second reason likely indicate a weakness in system design.

84. In fact, some tax administrations are allowed to unilaterally define a substantial part of tax law, although, in principle, they should not be involved in setting policy. The tax agency's role should be limited to commentary on the feasibility, convenience, and implications of policy proposals.
85. **Taxpayer information.** Taxpayer information refers to all updates of compliance information required of taxpayers. It includes information on deadlines and compliance sites along with a detailed listing of obligations, indexes used to adjust data for inflation, changes in the legal and regulatory systems, and court decisions. Such information is essential to improve the quality of the raw material received for processing by the tax administration.

86. **Management of deadlines.** Payment deadlines must reconcile the interests of the tax administration, taxpayers, and budget authorities—who use the funds—with the administrative capacity of the tax administration. When taxpayers can declare and postpone payment, the cash flow to the treasury will differ significantly from the cash flow under a return-and-mandatory-payment scheme.

87. **Physical and filing facilities.** Regionalization of tax administration organization is one approach, as is use of the banking network as the taxpayer’s first point of access to the tax system. In addition, taxpayer waiting time can be minimized, for example, by mobile collection points in remote areas that have no tax office. In the private sector, taxpayers may obtain professional help in preparing their returns.

88. **Taxpayer motivation.** People like to know where their taxes go. In addition to keeping taxpayers informed about tax matters, the tax administration may want to work to improve the social acceptance of taxes by publicizing the positive benefits received from public spending.

**Enforcement infrastructure**

89. Dealing with noncompliance involves auditing and the collection of unpaid taxes. The institutional products of auditing are reassessments required of noncompliers—or legal action when tax liabilities are contested. The product of collections is the delinquent taxes collected.

90. Three major tax gaps can be identified: potential taxes versus declared taxes; declared versus paid taxes; and taxes paid compared with tax revenues going to the treasury.

91. The first of these is the most important but analytically the most intractable. It can be divided into a tax base that is never reported because no returns are filed and a tax base that is underreported on returns. Estimates of the gap between potential and actual tax bases may be generated using data already in the tax administration, from national accounts or monetary data, or in other ways. Such estimates are inevitably crude and aggregate, however, and the success of auditing programs can seldom be evaluated in terms of the portion of the “evasion gap” closed. More commonly, the amount of additional tax assessed is used as a measure of “success,” with no reference to the amount of potential tax that was not captured.

92. Audits are an after-the-fact system of control of the universe of taxpayers and third parties. Because of the expense of audits, this control cannot be universal. Tax administration has to choose a few likely noncompliers out of a large number. The essential managerial function is thus to determine the best sample of likely evaders. The effectiveness of the sampling processes may be measured by the quality of targeting of potential cases of noncompliance.

93. Additional taxes collected because of audits are more readily identifiable than funds obtained from other collection activities. Aside from the long-term deterrence effects of audits, the marginal product of an audit is simply the additional tax revenues generated. Examining the additional tax revenues generated per dollar spent by type of audit, allows an assessment of whether the tax administration is efficiently allocating its audit resources, or which types of audits should be increased or decreased.
Box 2.11. A Case of Electronic Fraud in Collection Operations

In 1977-87, bank collection operations in Colombia became a major source of fraud because of the system's laxity and deficiencies in security—the institutional infrastructure. The basic flaw was the elimination of a reconciliation of receipts as reported by banks with actual bank deposits as received by the Colombian treasury. This occurred when computerization was implemented. Although an audit package controlled the operation of bank payments, its design and coverage was easily bypassed using programs whose only purpose was to accommodate the fraudulent transaction without unbalancing the audit program. A false taxpayer credit would be passed by the system showing as many zeroes as necessary to keep the audit program in balance.

Investigations by the comptroller's office established a major fraud in two parts. First, many tapes with false payments were introduced as reflecting collection in a given bank. Upon spot checks, the auditors from the Office of the Comptroller determined that the tapes were not part of bank records. Second, open access to the mainframe computer allowed many "intruders" to apply false payments to individual taxpayers. The shared computer facility allowed "payments" from the terminals at the customs, budget, and other computerized facilities—without enabling investigators to track the person entering the data.

Reports from taxpayers whose false payments were detected indicated that the "system" was promoted by middlemen—tax officials—offering to erase the outstanding balance by charging 50 percent of the balances to be erased. The middlemen would show the taxpayer the total outstanding balance, which included all taxable years, and the next day would show the taxpayer the outstanding balance for the last five years after having erased the balances from previous years. This was to show the middlemen's absolute control of the computer. At this point, they would negotiate the bribes.

94. The second gap identified above is the "collection gap" and the third is "theft gap"—the difference between what taxpayers pay and what the treasury receives. Measuring these gaps requires a good registration system to identify and keep track of taxpayers and their payments. Unfortunately, in Latin America, most countries do not have comprehensive and accurate enough systems to show who owes, and whether the treasury receives all money collected. These minimum accounting features are a prerequisite to a workable tax system.

2.3 Operations

95. Most of the relevant tax administration products have already been discussed. Given the environment, the laws, and the institutional infrastructure, all that remains is to deliver tax administration—operations. Evaluating operations requires a clear understanding of the other elements of tax administration. The less adequate the infrastructure, the more critical the day-to-day operation of the tax administration becomes in determining results (Box 2.12).

96. Operations means behavior of the agents within a set of laws and an institutional setup. Although theoretical studies generally focus on the rational behavior of a taxpayer in a given compliance system, similar effort has not been spent exploring the different layers of tax administration in light of the potential behavior of the agents involved. Agent behavior, in the end, will determine the effectiveness of tax administration.

97. Compliance. Compliance may be viewed as synthesizing the response of taxpayers to the enforcement of a given set of rules. The legal design of the internal organization of tax administration becomes the necessary complement of procedural tax law, without which substantive laws would be empty mandates.

98. Compliance operations depend on more than a legal obligation to keep records, prepare documents, file, and pay. Factors determining compliance include public acceptance of the legitimacy of the tax system, compliance facilitation by the tax authorities, and the indirect effects of or feedback from enforcement. The perceived legitimacy of the tax system, in turn, depends on the balance
Box 2.12. The Effects of Frequently Replacing Tax Directors

When tax administrators are replaced often, operations may vary widely. Tax administration lends itself to piecemeal solutions that may be efficient in themselves but lack institutional effectiveness and projection. In many Latin American countries, new tax directors attempt to play a major role in the short time they hold office. This type of intervention can severely damage the tax administration in the long term.

Moreover, frequent transfer of tax managers often indicates the vulnerability of the administrative system to the political system. Under such circumstances, the agenda of the managers may be in opposition to the revenue system’s goals. Additional political appointees, leniency in the application of the laws, and changes in emphasis in the strategy are the likely results of this kind of vulnerability.

perceived by the taxpayer community between public expenditure and tax burden, their perception of equity, the composition of public expenditures, and the stability of the tax system. Taxpayer perceptions of previous actions—or inaction—with respect to evaders and delinquent accounts also are important.

99. Total collections and the relative size of these components depend on environmental factors and enforcement efforts. If there is no enforcement, compliance is likely to be low. Low-compliance countries paradoxically collect most of their revenue as a result of compliance, but they do not collect much revenue.¹⁸

100. As the quality of enforcement increases, revenue increases, because of the direct effects of audits and their deterrence effect on noncompliance. The relative share of enforcement revenues increases over time; as compliance increases in response to improved enforcement, a new high-compliance state can be achieved. Once again, compliance revenues dominate overall collections, which now reach a higher level. The role of audits in a high-compliance country is thus to maintain the level of compliance; by contrast, the role of audits in a low-compliance country is to raise the level.

101. Noncompliance. The control of noncompliance implies much more than its legal determination. For audits, this control requires a tangible relationship with taxpayers, usually with discreet negotiations. The power to affect the taxpayer’s finances is in the hands of the tax official. Depending on the available evidence, the official can reassess taxes and impose penalties. In these circumstances, corruption becomes a possible alternative “product” of the audit operation. The institutional setup of auditing is thus important, ensuring that someone—or a computer—is adequately informed about the context in which negotiation takes place.

102. In the collecting of delinquent accounts, legally there is the possibility of negotiating installment payments, although there seldom is discretion to reduce the outstanding balance or the penalties. Again, there is an obvious need to build in controls on the actions of officials wielding discretionary powers.

103. In many countries, the increased involvement of third parties in tax administration has often occurred without adequate organizational redesign, with the result that significant transactions—accounting, the management of withholding, and bank collections—are poorly regulated. In most Latin American countries, it is especially important to monitor the compliance of withholding agents and banks—increasingly the linchpins of tax administration.
Measurement of intermediate outputs

104. A tax administering agency's operations can be categorized as activities, subactivities, and tasks. Activities, the broadest of these three categories, include facilitating taxpayer compliance, monitoring taxpayer compliance, preventing taxpayer noncompliance, and managing the agency's limited resources (Table 2.1). Within each activity the tax administering agency undertakes several more-specific subactivities. Taxpayer compliance is facilitated by providing services to taxpayers and collecting compliance-generated tax revenues. Taxpayer compliance is monitored by creating and maintaining a taxpayer information system, and generating and maintaining third-party information. Taxpayer noncompliance is prevented by detecting noncompliance and enforcing compliance. Limited agency resources are managed by creating, maintaining, and using an effective management information system—and allocating the resources across agency activities.

105. Subactivities can be further divided into more specific tasks. For example, taxpayer services are provided through at least five separate tasks: designing tax-filing requirements, designing taxpayer forms, distributing taxpayer forms, responding to taxpayer inquiries, and publicizing tax law provisions and tax-filing requirements. Each task could be further divided, as needed. The specificity is limited only by the aims of the analysis and the availability of data.

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<th>Table 2.1 Tax Administration Activities and Tasks</th>
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Chapter 3

PERFORMANCE ASSESSMENT PRINCIPLES

106. There are at least three ways to assess the performance of tax administering agencies: best practice, marginal conditions, and average cost-effectiveness. A best-practice approach compares observations on the technologies and organizational arrangements used by a given tax administering agency with the best examples of what is being done in other countries. However, this approach depends on the quality of the expert employed, tends to focus on tax administration activities instead of agency costs and outputs, and often fails to make clear the reasons for its conclusions (some best practices are noted in Chapter 2). Thus, this study spells out two other approaches to judging agency performance: using marginal conditions and average cost-effectiveness.

107. The marginal and average cost-effectiveness approaches require much more detailed data about the agency being studied than the best-practice approach. The marginal approach requires multiple observations on agency outputs—final outputs, such as total tax revenues, or intermediate outputs, such as numbers of audits completed—and a modest amount of data on some environmental factors, such as statutory tax base and rate definitions, plus reasonable tax base measures. Instead of multiple observations, the average approach needs only one or a few observations—of output and cost data. However, the average approach requires much more detailed information on environmental conditions and how they affect average performance.

108. Aside from the different data requirements, the marginal and average cost-effectiveness approaches require different types of expertise to evaluate an agency’s performance. The marginal approach uses managerial microeconomics and econometrics. The primary expertise requirement under the average approach is familiarity with international norms of tax administration performance. Combining the two approaches allows an evaluation team to tailor an approach to the availability of data.

109. This chapter provides a guide for evaluating how well tax administering agencies in Latin American countries allocate their resources, and for collecting the data needed for such evaluations. These guidelines are intended to be general enough to accommodate variations in the mandates and environments of tax administering agencies across countries, yet specific enough to yield clear yardsticks of agency performance. The guidelines must be able to provide yardsticks if existing data on agency activities and performance are inadequate—yet specific enough to rule out inappropriate measures. The recommended information collection also must be feasible and in the interest of the agency managers. Otherwise, the data will not be collected in a useful form.

110. To do this, Section 3.1 posits a general formal model of tax administration outputs. Models such as this yield empirically identifiable marginal relationships between agency choice variables and outputs, whose magnitudes depend on the relative importance given each output and constraint relevant to the tax administering agency. Because data rarely are adequate for an analyses of marginal measures, Section 3.2 advances ways to use data on average cost-effectiveness to assess agency performance. The section spells out the conditions under which average measures of cost-effectiveness can be considered analogous to marginal measures. Then Section 3.3 considers how recent changes in the magnitudes of such measures—and cross-national comparisons—can provide touchstones for evaluating agency performance. This latter section also considers the difficulties of interpreting such average performance indicators—in particular, their general inability to weight the relative importance of multiple agency outputs and their greater sensitivity to economic and tax policy conditions.
3.1. The Marginal Conditions Approach

111. Several approaches exist for assessing the efficiency with which a public agency, such as a tax administering agency, uses available resources. One simple and useful approach relies on the basic microeconomic insight that, to get the greatest possible output from the limited resources at its disposal, a decisionmaking unit must combine those resources so that a small increment in the use of any resource yields the same increase in output per unit of currency spent on that input as would a small increment in any other resource—the marginal product per unit of currency spent per unit of input must be the same across all inputs. But, because many of the activities of a tax administering agency are likely to have these difficult-to-detect cumulative effects, this insight is likely to be more usefully employed to assess the performance of tax administering agencies in meeting their intermediate goals—such as facilitating taxpayer compliance—than to assess agency performance generating tax revenues in the long term.

112. Evaluation of overall agency performance. A tax administering agency produces at least two distinct products: tax revenues and equity. An efficient tax administration will assure that the appropriately weighted sum of the marginal contributions of any of its activities to these two aims is the same as that weighted sum for any other of its activities, per unit of currency spent on each activity.

113. In practice, of course, the equity outputs will prove difficult to measure. And it will be difficult to decide what weight to place on equity compared with revenue goals. In practice, therefore, it is usually necessary to focus solely on the revenue consequences of agency activities.

114. But even with this simplification the methodology may prove too demanding for existing data and knowledge—because of the cumulative (indirect) effects. Tax revenues depend to an extraordinary degree on taxpayer cooperation—which responds very slowly to the cumulative experience taxpayers have with the tax administration. To reliably estimate the marginal revenue effects of tax agency activities, then, requires modeling the lag of these cumulative effects. This is a formidable task even in the face of a stable set of taxes and tax policies. In the typical Latin American context, involving rapid, frequent, and dramatic changes in tax policies, such modeling is likely to prove impossible.

115. For these reasons, it makes sense to focus on the intermediate outputs of agency activities. The marginal conditions methodology just spelled out for final outputs is more easily and fruitfully applied to intermediate outputs precisely because of the more direct link between agency resource use and these intermediate outputs.

116. Each activity aims to produce an immediate result—an intermediate output—to further the agency’s ultimate aim of generating tax revenues. The marginal-conditions methodology can be used to assess the performance of the tax administering agency in any activity, subactivity, or task by focusing on the production of intermediate outputs. To do so requires data on the key output produced, each resource used to produce the output, and the cost per unit of each resource.

117. With these data, the marginal contribution of each resource to the output of the activity being assessed must be estimated. Second, the ratio of this estimated marginal contribution to output to the cost per unit of that resource must be constructed for each resource.

118. Equality (inequality) of these ratios across resources used will provide strong evidence of efficiency (inefficiency) when each measured resource usage is devoted to producing one key output, and when the key output for each activity is the only output of importance for that activity—or is highly correlated with any other important outputs of that activity.
119. The first assumption is essentially a cost-accounting measurement issue. It requires that a measured resource usage in an activity's production function include only units of that resource devoted to producing that activity's output. Thus, if certain clerical employees spend part of their time maintaining the taxpayer current-accounts system and another fraction of their time processing taxpayer returns, only the former hours should be included in a model of current-accounts system production. Sensible evaluation requires appropriately detailed agency cost accounting.

120. The second assumption assures that the efficiency measure of output per cost captures all the important dimensions of output for the activity being examined—such as quality and quantity. If more than one dimension is required to reliably measure the key outputs of an activity, the ratios should be adjusted to incorporate the additional dimensions. Each numerator is a weighted sum of the outputs for the activity. In general, it is easier to define activities for the second assumption than to attempt to assign appropriate weights to different outputs of each activity. In any case, this is the approach used below.

121. **Data required for the marginal conditions approach.** As has already been noted, the marginal conditions methodology requires three types of data to evaluate a tax administering agency's production of these intermediate outputs: activity-specific outputs, activity-specific inputs, and activity-specific unit input costs. When data limitations do not permit separate measurement of inputs and input costs, data on expenditures—the product of these two variables—can be used instead.

122. **Illustrations of the marginal conditions approach.** One tax administration activity that is particularly amenable to the marginal conditions evaluation methodology is auditing. Audits produce two important consequences. Direct additional tax payments—or the audits' direct enforcement effects—are easily measured. The difficult-to-measure consequence is the audits' deterrence effect—upon future noncompliance by the audited taxpayer and other taxpayers.\(^{22}\) Although it would clearly be desirable to base audit resource allocation decisions on assessments of direct enforcement and deterrence effects, practical considerations almost always require that such decisions be based solely on estimates of direct enforcement effects. Such is the case with the in the U.S. Internal Revenue Services (IRS).\(^{23}\)

123. The Internal Revenue Service's IRP Underreporter Program is a good example of the marginal conditions methodology that might be applied to a Latin American country. That model compares third-party information—such as employer-submitted forms on wage earnings—on taxpayer income with information on the taxpayer's return to identify discrepancies in reported income. After these discrepancies have been reviewed to eliminate easily identified and benign sources—for example, a taxpayer reporting dividend income on the wage and salary line of the tax return—the remaining returns with discrepancies are put into several homogeneous classes. These classes are based on the type of income that is the main source of the discrepancy and the magnitude of the discrepancy. For each class of return discrepancies, data from the previous year are used to estimate the yield-to-cost ratio of pursuing the taxpayers in that class. The classes are then rank-ordered by the expected yield-to-cost ratios, and audited until all available resources have been committed.

124. This methodology is used to review the efficiency with which the DGI in Argentina targets its audits (see section 4.2). Although this methodology uses average yield-to-cost ratios for each class of discrepancy, the similarity of average yield-to-cost ratios to marginal yield-to-cost ratios increases as the homogeneity of the yield-to-cost ratios in each class increases. In the extreme case of complete homogeneity within classes, this approach would equal basing decisions on marginal yield-to-cost ratios. This approach has two very important advantages for Latin American tax administrations. First, it is relatively simple to implement, because its data requirements are modest and readily generated from the normal operations of an agency. Second, this approach's average yield-to-cost ratios can always be made to more-closely approximate marginal ratios by restructuring the
classification system to reduce the within-class variation in the yield-to-cost ratio. Thus, an agency can continuously improve its use of this approach, based on the agency's experience.

3.2 The Average Cost-Effectiveness Approach

125. When data limitations preclude identifying marginal conditions, an alternative is to use average performance. Which of three average cost-effectiveness approaches can be used depends on data availability and on whether a set of inputs produces mainly one output or contributes significantly to multiple agency outputs. Each approach requires some standard against which to compare the value of an indicator to assess whether the agency in question fares well or poorly by that standard. One approach assumes that under certain circumstances average magnitudes mirror marginal magnitudes of these performance measures and checks for equality of the average productivity measures across inputs. A second approach examines changes in average productivity at two times to see if productivity has improved or declined. A third approach compares the magnitudes of a country's average productivity measures with their magnitudes in other countries with known reputations about the efficiency of their tax administrations.

126. Whichever of these average approaches is used, the performance measures will be ratios of outputs to inputs. Thus, the types of measures required to execute the marginal conditions methodology also are the types of measures required for the three average performance indicator approaches. The only important difference between the data demands in the marginal and average approaches is the marginal approach's need for multiple observations—time series—on each of these measures to be able to estimate the marginal productivities of the inputs. The average approaches require far fewer observations, because they do not isolate the partial effect of input upon outputs, holding constant all other inputs.

127. Equality of average cost-effectiveness across inputs. Average productivity indicators can be treated as marginal indicators—to evaluate agency performance by checking for equality of average productivity per unit of currency spent across inputs—when (1) the inputs compared produce the same output—final or intermediate—and only one significant output is believed to be produced by these inputs; (2) the data reflect only variable—not fixed—costs; (3) marginal costs are constant or rising—or, equivalently, marginal productivity of the inputs is constant or falling; and (4) the ratio of marginal to average productivity across inputs is either roughly constant or positively correlated with average (or marginal) costs.

128. Unless the inputs being compared produce the same output, the outputs of each input must somehow be weighted and added up for comparison with a similarly weighted sum for any other input. Although formal model estimation allows the marginal approach to do this, only the analyst's judgment guides the weighing and summing when a formal model cannot be estimated.

129. An example of when it would be reasonable to assume that the first condition is satisfied is in the targeting of audit resources. Auditors can audit a wide variety of taxpayer accounts. And, audits can be triggered by a wide variety of factors. But regardless of the type of taxpayer account or the trigger, the primary output of an audit is always the same, namely, the deficiency determined or the additional tax payments generated. Thus, it would be reasonable to compare the relative productivity of different audit triggers. This sort of analysis was done for the audit function of the Dirección General Impositiva (DGI), the national tax office, in Argentina (see chapter 4).

130. Second, because an efficient use of agency resources requires that the marginal productivity of each input per unit of currency spent on that input be the same as for any other input, good tracking of average and marginal indicators requires that the ratio of average productivity per unit of currency spent on an input closely track this marginal ratio. It can be readily shown that the average
indicator will track the marginal indicator quite well: whenever the marginal productivity of an input is constant or falling and the marginal costs of that input are constant or rising, the ratio of average productivity to average costs will rise as the ratio of marginal productivity to marginal costs rises, and be larger than the ratio of marginal productivity to marginal costs. Because marginal productivity often falls as output expands—and marginal costs often rise or are constant as output expands—average indicators often can be interpreted as if they were marginal indicators.

131. In short, average cost-effectiveness ratios do mirror marginal cost-effectiveness ratios whenever marginal productivity is constant or falling and marginal resource cost is constant or rising—with the important proviso that the average ratios overstate cost-effectiveness. Because average cost-effectiveness ratios overstate marginal cost-effectiveness under these conditions, it is not possible to use unity as a yardstick for distinguishing between input usages that are "cost-effective" and those that are not.24

132. Third, if ratios of average cost-effectiveness are to be used as if they were ratios of marginal cost-effectiveness, variations in the ratio of the average and marginal ratios across inputs must be roughly constant or at least positively correlated. This condition is likely to hold when major capital costs in any function are omitted from the calculations, because such investments typically bring large economies of scale that dramatically alter the relationships between marginal and average productivity and cost measures. Because the omission of major capital costs is needed also to satisfy the second and third points, omitting such costs imposes no serious additional limitations on this approach.

3.3 Cross-Country and Time-Trend Comparisons Using Average Indicators

133. The marginal conditions methodology—and the use of average output-per-cost measures as proxies for marginal output-per-cost measures—are limited where there are weak links between particular current tax administration activities and current compliance-generated tax revenues. The limitations are more serious when coupled with the volatile tax policies, unstable economic conditions, and frequently changing administrative practices typical in Latin American countries.

134. When the marginal-conditions approach or the average-conditions-with-marginals approach cannot be applied, indicators of a tax administration activity can be used to assess agency performance. The magnitudes of the indicators are compared with those of other tax administrations—or with previous experience in the same tax administration. Which institutional details to review can only be determined after close examination of an agency. However, those indicators should cover seven dimensions of a tax administration activity: environmental factors, institutional descriptors, demands on the activity, resources used, quantity and quality of outputs, and cost-effectiveness.

135. Environmental factors. The factors likely to affect tax administration performance include the legal mandate, economic conditions, and cultural factors (for which no very reliable indicators have as yet been documented). (See chapters 1 and 4.)

136. Institutional descriptors. Institutional descriptors of each tax administration activity—policy and management changes likely to affect performance—will generally have to be unearthed case by case. Key administrative reforms in one tax administering agency may be unheard of in another agency. A good analyst must sift through the wealth of detailed information about a tax administering agency and extract the most telling institutional details—those that provide the greatest insight into the data that can be systematically collected.
The remaining five categories of data needed to compare cross-national and time-trend agency performance identified in paragraph 135 will often be generated by agency activities. When this is not the case, one inference is that the agency should regularly generate and maintain such data to better assess its own performance (see chapter 4).

Demands on the activity. Demands on each activity need to be measured to provide a benchmark against which to judge the agency's performance in meeting the demands. For example, a reliable measure of potential tax revenues—to compare with actual revenues—helps show how much the tax administration has met its tax collection goals. Other measures of the size of the tax base—for example, the number of potential taxpayers, and the volume of taxable transactions—could help place in perspective the magnitudes of the tasks facing a tax administering agency.

Some demands on a tax administration are more readily measured using agency-generated records—if the agency maintains thorough, accurate records. The demands on the enforcement section collecting tax arrears can be measured by tracking the currency value of tax deficiencies—determined by the agency's auditors, by any of a variety of simple arithmetic checks of tax return information, or by cross-checks of returns against third-party information. The demands for appeals processing can be measured by monitoring the number and currency value of appeals filed each year by type of appeal—for example, type of tax, type of taxpayer, currency value of the appeal, and basis of appeal.

Resources used in the activity. It is important to track the quantities and costs of resources used—labor, materials and supplies, and capital assets, such as computers and buildings. This study found—at the Dirección General Impositiva (DGI) and at the Dirección de Impuestos Nacionales (DIN), the national tax offices in Argentina and Colombia, respectively—that cost-accounting records suffered from one or more of the following weaknesses: were not maintained in a format that permitted identification of costs by activity; failed to identify nonlabor resources and costs; identified costs or resource quantities, but not both; were not available for more than a few years; and were so difficult to use that management rarely—if ever—consulted them.

Activity-specific cost data are needed to assess if the cost-effectiveness of specific activities is to be assessed. Nonlabor resources must be identified to assess their contributions to performance and to appropriately assess labor's contribution—which partly depends on the capital and material resources available. For example, computerized records can greatly enhance the productivity of auditors.

If both costs—spending—and quantities of resources used are identified, price effects can be separated from productivity effects when examining cost-effectiveness measures. If only one of these measures can be maintained, the cost measure is preferred. This is because normal budget-keeping requirements generally dictate that spending be recorded. And, ratios of outputs per activity cost are more readily and usefully compared across activities than are some other ratios of outputs per inputs; some other inputs will not always be comparable across activities, but costs are.

Data covering multiple time periods permit more-reliable assessment of agency performance than do data for one or very few time periods. Because of the wide variety of factors affecting tax administration performance, and the inherent lags in taxpayer responses to changes in tax administration practices and tax policies, it is almost essential that evaluations of that performance cover as long a time as is practicable.

Quantity and quality of outputs. Outputs—quantity and quality—must be measured to evaluate performance. Although total revenues provide a ready measure of overall agency output, each agency activity also generates at least one intermediate output (see table 2.1).
145. Good taxpayer services facilitate taxpayer compliance by keeping the compliance costs borne by taxpayers as low as possible. These compliance costs include the time and money spent learning tax-filing requirements, and abiding by those requirements—including maintaining records of taxable activities and tax-exempt activities, filling out forms, filing returns, and paying taxes.

146. The compliance cost should be measured directly. In Argentina, where an active market for providing tax preparation and filing services exists, the tax administration could regularly survey such firms to ascertain market prices for preparing and filing tax returns for prototype taxpayers. Neither agency examined for this report does so, although, the DGI did recently begin surveying taxpayers about their perceptions of DGI services.

147. Without such a direct measure, correlates of the quantity and quality of those services should be measured. This report uses two types of such correlates as proxies of taxpayer compliance costs, namely, proxies for the magnitudes of the tasks that the DGI imposes on taxpayers and their agents, and proxies for the ease with which taxpayers and their agents can understand what is required of them. Indicators of the quantity of the tasks imposed on taxpayers include number of forms, number of pieces of information required on each form, number of records taxpayers must keep, detail with which taxpayer records must be kept, and length of time over which taxpayers must maintain records. Indicators of the complexity (quality) of the tasks imposed on the taxpayers might include complexity of tax forms, whether required tax forms are automatically distributed to each taxpayer (based on the forms used for the taxpayer’s previous year’s returns), number of taxpayer inquiries fielded by agency, and average time required for a taxpayer inquiry to be answered.

148. The quantity of compliance-generated revenues is readily measured if the tax administering agency tracks whether revenues are obtained directly by enforcement. The key quality dimensions of the processing of tax returns are the accuracy with which tax filing information is recorded and credited to the proper accounts and the speed with which this is accomplished. The DGI and the DIN maintain aggregate records on the quantity of compliance-generated revenues. While no records of the quality of that data were available for the DGI, the DIN has, in recent years, monitored the quality of its compliance-revenue data.

149. A taxpayer current-accounts system must identify and maintain records on all taxpayers—and potential taxpayers—in a format that permits the agency to easily and reliably ascertain each taxpayer’s tax liability under any tax at any time. The taxpayer identification system should be comprehensive, flexible, useful, and cost-effective.

150. A good current-accounts system is built around a good taxpayer registration system. And it must be up-to-date and be able to track individual taxpayer tax payments, tax refunds, and tax liabilities over time. A current-accounts system also must be able to calculate totals and averages for such things as tax payments, tax liabilities, and tax account balances—across taxpayers and within categories relevant to administrative decisions; for example, by type of tax; by year, quarter, or month; by type of taxpayer; and by method of payment. If a country—such as Argentina—is subject to highly variable inflation, the current-accounts system must be designed to automatically and reliably adjust all monetary figures for inflation.

151. Aside from noting whether a current-accounts system exists, useful measures of a current-accounts system include the number of taxpayers covered, the average lag between tax payment and updating of the record, the incidence of errors in the data base (based on a sampling of returns and payments), and whether the system integrates information on a single taxpayer across taxes to which that taxpayer is subject. Other useful measures include: whether the current-accounts system can separately track compliance- and enforcement-generated tax payments, the average time required to
answer an intra-agency request for information from the system, and the number of intra-agency information requests made and answered by the system.

152. **Third-party information** bears on the taxable transactions or tax liability of one taxpayer but is provided to the agency by some agent other than that taxpayer. Examples of sources of third-party information that might be tapped are withholdings; bank transactions above some threshold such as withdrawals, and interest or dividend payments; transactions in publicly traded financial instruments above some threshold, such as sales or purchases, or capital gains distributions of mutual funds; foreign currency exchanges above a threshold; large transactions that are already systematically recorded, such as real estate sales and vehicles bought using loans; credit card transactions above a threshold; social security payments; customs transactions; and any transactions that are tax-deductible for one of the parties and taxable for the other. Information on the existence of potentially taxable entities might also be obtained from such sources as telephone directories, utility customer lists, or trade association membership lists.

153. The benefits of using third-party sources of information rest in identifying nonfiling and unregistered taxpayers, and unreported taxable transactions. The cost-effectiveness of this activity might be captured if current spending on the third-party information system is tracked. Then—with other data—it should be possible to calculate the ratio of costs of this activity per new taxpayer added to the tax registry or the ratio of costs of this activity per currency value of unreported taxable transactions identified.

154. A more modest indication of this activity's cost-effectiveness would be how often the third-party information data base is used by agency staff to identify unregistered taxpayers or audit taxpayer returns. Because it should be simpler to monitor usage of a third-party information system than to monitor the consequences of that usage, such measures may provide an appropriate compromise between ideal data and data that are feasible to obtain and reasonably probative. In either case, the costs of maintaining the third-party system must be reliably tracked.

155. Without such data, only crude indicators for performance are available: the extent of this activity (for example, how many and what types of third-party information sources are used, and how many records are in the third-party information system) and the technologies used—for example, whether the information is maintained manually or electronically.

156. **Detecting noncompliance** involves checking returns against registrations and taxpayer current-accounts, checking returns for consistency, and auditing returns. Measures of the quantity of outputs of noncompliance detection activities are the number of returns checked for arithmetic errors, the number of audits, and the number of returns cross-checked with third-party information to detect likely underreporting. Other measures of the quantity of output are based on each of the above three activities: the value of additional tax liabilities determined, the number of taxpayers found to owe additional taxes, and the number of nonfilers detected.

157. Measures of the quality of these activities include

- Fraction of audit-assessed tax liabilities uncontested by taxpayers (measured per return or per assessed liability)
- Fraction of appealed audits that are upheld (measured per appeal or on a per appealed assessment value)
- Fraction of audit-assessed tax liabilities collected (measured per return or per assessed liability)
- Fraction of detected arithmetical errors collected
- Fraction of cross-checked discrepancies collected
- Fraction of audits that yielded audit-assessed tax liabilities above some benchmark
- Average audit-assessed tax liability per audited return.

The first two of these quality measures capture the accuracy of audits executed, while the final two measures capture the quality with which audits are targeted. The remaining three capture a combination of audit, arithmetic-checking, and cross-checking accuracy and the effectiveness of follow-up collection efforts.

158. **Enforcing compliance** consists of collecting delinquent taxes and reviewing appeals administratively or judicially. The former task consists largely of notifying delinquent taxpayers of their arrears and processing their payments. Recalcitrant taxpayers may require more forceful notification—such as, a threat of legal action—than cooperative taxpayers. The tax revenues generated are the output measure for these enforcement activities. The appeals review process, however, is susceptible to other measures of the quantity and quality of its outputs—all classified by type of case and date of initiation of appeal. Measures of appeals output (quantity) might include the number of appeals resolved, value of appeals resolved, and appeals resolved per judge or per appeals employee—or, judge-days or staff-days per resolved case. Measures of appeals quality might include average length of appeals process, fraction of the appeals board’s decisions that are appealed, fraction of appeals board’s decisions that are overturned. And, cost-effectiveness can be measured either as the ratio of appeals resolved to the administrative costs of appeals or cost per resolved appeal.

159. The primary outputs of a management information system are the data it makes available to management to assist management’s resource allocation decisions. Measures of the quantity and quality of services provided by management information systems would be how much the systems track each piece of activity-specific information identified above on demand, resource usage, and output quantities and qualities. Other considerations are the reliability with which each piece of activity-specific information is tracked, the accessibility of that information to middle-level and higher-level managers, the ease with which those managers can get to access each piece of information, and the ease with which the data base can be used for particular management questions.

160. Ultimately, the output of management activity is the efficiency with which the agency operates. No separate output measures need be specified for the allocation of resources. Once an adequate analysis of the performance of each activity of the tax administration has been conducted, the outputs of the agency’s overall management activity will not need to be separately measured. Instead, the analyst will need to summarize and integrate the judgments rendered on each line activity to reach an overall assessment of the agency’s management.

161. The cost-effectiveness of each activity is the ratio of its quality-constant outputs per unit of costs incurred by that activity. When multiple outputs exist, the analyst may need to review multiple measures of the activity’s cost-effectiveness. This is true whether the outputs are different products or varying qualities of one output. Once measures of resource use and of output quantities and qualities have been obtained, the construction of cost-effectiveness ratios is straightforward. What may not be so straightforward is the interpretation of those ratios—because multiple output dimensions (such as quality and quantity) usually exist and because the environmental and institutional factors identified above must be considered when evaluating these cost-effectiveness measurements.
3.4 Summary

162. The efficiency of tax administering agencies can be assessed in at least three ways. One is to check whether an agency has allocated its resources so that the marginal increase in its intended output per unit of currency spent on each activity is the same across activities; this applies whether the outputs are final or intermediate. The second method is to examine indicators of average cost-effectiveness to see how the agency stacks up against some clearly specified standard. The third approach is to ascertain whether the agency uses what would be considered best practice by knowledgeable tax administration experts.

163. The test of performance when averages are compared is the magnitude of some average performance indicator. The basic test of performance when marginal conditions are checked is the equality of a performance indicator across inputs. Changes in environmental conditions may change the magnitude of the performance indicator at which their equality holds, but such changes in no way alter the efficiency requirement that those marginal performance indicators be equal across inputs. Thus, the test for equality of marginal conditions and the average performance indicator approach that treats average measures of performance as if they were indicators of marginal cost-effectiveness should be considerably less sensitive to fluctuations in environmental conditions—legal, economic, and cultural—than will the time-trend and cross-country approaches based on average performance indicators.

164. Treating average cost-effectiveness measures as if they reveal marginal cost-effectiveness requires data on input-specific outputs and output-specific inputs or costs. The cost or input data also should reflect operating or variable costs, not capital costs. And, important economies of scale should be unlikely to occur near the level of production of the output being examined.

165. Time-trend analyses and cross-country comparisons require data on environmental factors, institutional factors, and—for each activity—demands placed, resources used, the quantity and the quality of the outputs, and cost-effectiveness. Time-trend analysis can address whether performance has been improving or deteriorating, but gives no guidance about how to continue improving performance or to reverse a deteriorating trend. Cross-country comparisons can be made even when no time series data are available. But whether such comparisons can be used to assess agency performance depends on how the standards were drawn from the international comparisons and on how well the average indicators used have been purged of the effects of myriad environmental factors. Expert judgment and statistical techniques provide ways to purge indicators of non-tax-administration influences on their magnitudes. The reasoning behind any expert judgment alone, however, must be clearly spelled out.

166. When using the time-trend approach, two important caveats must be kept in mind. First, changes in output measures and in efficiency measures must be examined jointly. This is because efficiency measures may improve not so much because an agency has improved its resource decisions, but because it has increased or decreased output and thus changed the average cost per unit of output. Second, the choice of the time to compare with the current period is crucial. Conclusions are often quite sensitive to this choice. For example, if the base year is the bottom of an economic cycle and the current year is near the peak of an economic cycle, the comparison will probably reflect unduly favorably on the agency.

167. These caveats are examples or special cases of the sensitivity of simple time-trend analyses to environmental factors such as economic conditions. Unless the time trends in performance measures are purged of the effects of important environmental factors, simple changes in performance indicators can be seriously misleading.
Cross-national comparisons of average performance indicators rest—more or less explicitly—on a set of accepted norms among tax administration experts about what are "high-quality," "average," and "low-quality" levels of the indicators. Such norms may reflect expert judgments about best practice or may be constructed using data from comparator countries.
Chapter 4

APPLICATIONS: ASSESSMENT OF TAX ADMINISTRATION
IN ARGENTINA AND COLOMBIA

169. This chapter measures some environmental factors and uses the average cost-effectiveness approach for three types of assessments of tax administration in Argentina and Colombia.

4.1 Economic environmental factors

170. Real economic growth. In the 1980s, Argentina’s real growth rate averaged a negative 0.8 percent, while Colombia’s averaged a positive 1.08 percent. And, variance in Argentina’s and Colombia’s growth rates in the 1980s were 17.84 percent and 3.45 percent, respectively. Lower and more volatile growth rates in Argentina (Figure 4.1) were reflected in more frequent tax policy changes, as the Argentine government sought short-term remedies for declining tax revenues—and undermined the efforts of the DGI.

171. Inflation. Figures for Argentina, where inflation in the 1980s ranged from 77 percent in 1986 to 3,285 percent in 1989, show a significant negative relationship between inflation and tax collections per gross domestic product (GDP). A simple regression of total DGI collections on Argentina’s inflation rate revealed that the average inflation rate in Argentina in the 1980s of 712 percent accounted for a shortfall of total DGI revenues of approximately 1.11 percent of GDP. Had the central government been able to keep inflation down to 100 percent per year, total DGI collections could have risen by 0.96 percent of GDP.

172. Colombia’s experience with inflation has been quite different. Colombia’s inflation at the consumer level averaged 21 percent between 1980 and 1988 and never went above 27.2 percent. Although inflation appears to have increased somewhat, neither its level nor its volatility remotely approaches that found in Argentina. Nor is there a detectable relationship between inflation in the 1980s and Colombian tax revenues per GDP—regardless of whether total, direct, or indirect tax revenues are modeled.

173. Openness of the economy. The openness of an economy is readily measured with available national income accounts data. Typical measures include the ratio of exports to GDP, imports to GDP, or the sum of these two. Those figures for 1970-89 reveal that although Colombia had a noticeably more open economy in the 1970s than did Argentina, imports plus exports accounted for a roughly equal fraction of each country’s GDP in the 1980s. In the 1970s, imports plus exports accounted for an average of 18.9 percent of Argentine GDP, while they accounted for 29.8 percent of GDP in Colombia. By the 1980s, however, these shares were 26.6 percent and 27.8 percent, respectively. Thus, in the 1970s, Argentina’s DGI faced fewer demands on its resources—from multinational taxpayers than did Colombia’s DIN. By the close of the 1980s, the two tax administrations faced roughly equal numbers of complex tax returns from taxpayers having international sources of incomes and expenses. However, neither Argentina’s nor Colombia’s tax administrations face as high an incidence of tax returns complicated by international sources of taxable transactions as do most other Latin American countries.

174. Argentina’s DGI relies on the banking sector to provide data and withholdings on taxable transactions that they process. The DGI also is expanding a current accounts system—DOSMIL—that relies on banks to receive and record tax payments by taxpayers covered under that current accounts system. Colombia’s DIN has used the prevalence of financial intermediaries to set up a system for detecting nonfilers by monitoring large financial transactions recorded by financial intermediaries. The
DIN’s Programa de Incorporación al Sistema Tributario Anual—known as PISTA—relies on computerized financial intermediary records to identify, for instance, owners of current accounts in the financial sector with deposits greater than US$250,000, sales through credit cards greater than one million pesos (about US$2,000), sales by car dealers, property transfers greater than ten million pesos (about US$20,000), and payments through a financial intermediary greater than one million pesos (about US$2,000).

175. Argentina and Colombia, are examples of how a sophisticated, widespread financial sector can greatly ease the task of administering tax laws. The more extensive reliance on the banking sector for tax administration in Colombia, compared with Argentina, probably reflects the greater role the banking sector plays in the Colombian economy.

176. Industrial concentration. Colombia’s four-plant concentration ratio—62 percent—ranks it among the more industrially concentrated nations. However, the four-plant concentration ratio—using the individual plant instead of the firm as the unit of observation—can understate concentration of ownership. This is probably especially true in Colombia, where small numbers of firms often own very high fractions of the plants in an industry. For example, the Santo Domingo Group owns every brewery in Colombia. It also owns—as of 1987—about 100 companies in key sectors of the economy. Thus, ownership is much more concentrated in Colombia than is production. These data suggest that Colombia’s economic concentration—which appears to be at least half again as large as Argentina’s—should give the DIN in Colombia a cost-effectiveness edge over the DGI. By focusing collection efforts on a few firms, the DIN can collect most of the revenues owed it.
4.2 Legal Mandate

177. Substantive and procedural tax laws affect the size of the demands on a tax administering agency by wholly or partially determining the number of taxes and taxpayers, the volume of taxable transactions, and the variety and frequency of returns required. These indicators can thus be used to help assess the size of a tax administering agency's legal mandate. For example, as of 1989, Argentina imposed taxes on thirty-four different national bases. The number of bases taxed by the Argentine national government varied between twenty-eight and forty-four in 1970-89 (see Table 4.1). Of these taxes, the vast majority—in number and value—are collected by the DGI, which administered about thirty taxes in the mid-1980s, and about twenty-two taxes by 1989. This is a large number of taxes by any standard.

178. Large numbers of taxpayers require many actions by the tax administering agency to register the taxpayers, collect their tax payments, and record their taxable transactions and tax payments. For example, Argentina and Colombia have roughly equal populations—between 30 and 31 million—yet the Argentine tax authorities must monitor almost twice as many taxpayers (Table 4.2).

179. But actual taxpayers are the tip of the iceberg when it comes to measuring taxpayers. Potential taxpayers often greatly outnumber actual taxpayers. And although a tax administering agency will have fewer interactions with each potential taxpayer than with each actual taxpayer, the existence of potential taxpayers means that the tax administering agency must decide which of those nonfilers should register, file returns, and make payments.
180. Significant differences exist among countries and across tax bases in the numbers of potential taxpayers. Although the Argentine labor force exceeded that in Colombia by only 13 percent in 1988, the Argentina gross national product exceeded Colombia’s by more than 113 percent. On a per capita basis, Argentina’s GNP equivalent to US$2,520 was more than twice Colombia’s US$1,240 in 1988. Thus, not only the number of registered taxpayers, but also the level of economic activity—a crude proxy for the number of potential taxpayers—is almost twice as large in Argentina as in Colombia (Table 4.3). This suggests that the task of monitoring potential taxpayers is substantially larger in Argentina than in Colombia.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>DGI</th>
<th>ANA*</th>
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<tr>
<td>1970</td>
<td>28</td>
<td>19</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>1971</td>
<td>29</td>
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<td>1</td>
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<td>1973</td>
<td>29</td>
<td>20</td>
<td>8</td>
<td>1</td>
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<td>1974</td>
<td>30</td>
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<td>1988</td>
<td>36</td>
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<td>1</td>
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<tr>
<td>1989</td>
<td>34</td>
<td>22</td>
<td>11</td>
<td>1</td>
</tr>
</tbody>
</table>

* Customs Administration

Source: Ministry of Finance. World Bank calculations.

181. The discrepancy between potential and actual taxpayers is not so striking for the tax on bank debits in Argentina as it is for the income and value added taxes. In 1988, the first year in which the tax on bank debits existed, 149 banks were registered debit taxpayers. About 210 private financial institutions—including about 130 private commercial banks—existed in Argentina then.29 Thus, every potential debit taxpayer is probably a debit taxpayer. The workload for the DGI to administer the tax on bank debits, thus is quite small both because the number of taxpayers is small and because the DGI need not ascertain for large numbers of potential taxpayers whether this tax should apply to them.
Table 4.2. Argentina and Colombia: Registered Taxpayers, by Tax Base

<table>
<thead>
<tr>
<th>Tax Base</th>
<th>Individuals</th>
<th>Firms</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value Added</td>
<td>537,138</td>
<td>200,884</td>
<td>738,022</td>
</tr>
<tr>
<td>Income</td>
<td>1,081,897</td>
<td>160,773</td>
<td>1,242,670</td>
</tr>
<tr>
<td>Capital</td>
<td>263,692</td>
<td>208,634</td>
<td>472,326</td>
</tr>
<tr>
<td>Net. Wealth</td>
<td>139,404</td>
<td>52</td>
<td>139,456</td>
</tr>
<tr>
<td>Total</td>
<td>1,882,727</td>
<td>570,343</td>
<td>2,453,070</td>
</tr>
<tr>
<td>Colombia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value Added</td>
<td>51,344</td>
<td>50,214</td>
<td>101,558</td>
</tr>
<tr>
<td>Income</td>
<td>799,514</td>
<td>159,331</td>
<td>958,845</td>
</tr>
<tr>
<td>Withholders</td>
<td>3,118</td>
<td>87,818</td>
<td>90,936</td>
</tr>
<tr>
<td>Total</td>
<td>853,976</td>
<td>297,363</td>
<td>1,151,339</td>
</tr>
</tbody>
</table>

* Registered as of December 31, 1990.
* Registered and active as of January 30, 1991. Inactive registered taxpayers in Colombia were 49,011 (value added), 224,436 (income), and 27,265 (withholders).

Source: DGI and DIN

182. As the volume of taxable transactions increases, so must the monitoring of taxable transactions to assure compliance with the tax laws. Although direct measures of numbers of taxable transactions are generally not available, measures of overall economic activity provide crude proxies for these. Just as the numbers of actual and potential taxpayers in Argentina appear to be roughly twice as large as in Colombia, so too does it seem likely that the number of taxable transactions to be monitored must be roughly twice as large in Argentina as in Colombia.\

183. The size of the demands on a tax administering agency also is affected by the number of returns the agency must process. This number reflects the number of taxes and the frequency with which returns must be submitted for each tax. Frequent filings are important both to maintain a steady flow of revenues and as one way to limit losses in the real value of tax collections because of inflation. But these frequent filings increase the tax agency’s workload.

184. The DGI in Argentina processed more than 4 million returns for four major taxes, and the DIN in Colombia processed more than 6 million returns under its income and value added taxes (Table 4.4). Thus, although the DGI is responsible for more than twice as many registered taxpayers as is the DIN, it actually processes only about two-thirds as many returns. This point can also be appreciated by observing the numbers of returns processed per registered taxpayer by each agency. On average, the DGI processes 4.1 returns per value-added taxpayer, while the DIN processes more than ten times that number—44.45 filings per registered value-added taxpayer.

185. The complexity of the demands on a tax administering agency can be examined by looking at, for example, the number of pieces and types of information that must be examined to determine a
taxpayer’s liability under each tax, the number of steps that must be completed to identify a taxpayer’s liability under each tax, and the number of other agencies with which a tax administering agency must coordinate its tax collections.

186. The information that must be examined to determine direct excise taxes general or applied to particular goods or services—is much more simply measured than for a value added tax. The former require only that sales be measured. Value added taxes require that sales be measured, and that purchases of inputs be measured and—when applicable—separated into those that are deductible and those that are not. An income tax requires many pieces and types

Table 4.3 Argentina and Colombia: Measures of Economic Activity, 1988

<table>
<thead>
<tr>
<th>Measure*</th>
<th>Argentina</th>
<th>Colombia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>31,506</td>
<td>30,007</td>
</tr>
<tr>
<td>Labor Force</td>
<td>11,283</td>
<td>9,914</td>
</tr>
<tr>
<td>GNP</td>
<td>79,395</td>
<td>37,209</td>
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</table>


Table 4.4 Argentina and Colombia: Tax Returns Processed

<table>
<thead>
<tr>
<th>Tax</th>
<th>Returns processed</th>
<th>Returns per taxpayer</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Argentina</td>
<td>Colombia</td>
</tr>
<tr>
<td>Income</td>
<td>527,634</td>
<td>1,537,000</td>
</tr>
<tr>
<td>Individuals</td>
<td>467,045</td>
<td>na</td>
</tr>
<tr>
<td>Firms</td>
<td>60,589</td>
<td>na</td>
</tr>
<tr>
<td>Value added</td>
<td>3,049,717</td>
<td>4,514,000</td>
</tr>
<tr>
<td>Net wealth</td>
<td>220,975</td>
<td>na</td>
</tr>
<tr>
<td>Capital</td>
<td>237,252</td>
<td>na</td>
</tr>
<tr>
<td>Total</td>
<td>4,035,578</td>
<td>6,051,000</td>
</tr>
</tbody>
</table>

Note: Argentina returns processed data are for 1990 (value added) and fiscal year 1989 (all others). Registered taxpayers data reflect December 31, 1990 registrations. Source (Argentina): DGI.

Colombia returns processed data are for 1988. Value added returns and taxpayer registrations include excise taxes as well. Taxpayer registrations reflect registrations as of January 30, 1991. Source (Colombia): DIN.

187. Because of these differences in the data needed to determine tax liabilities under different taxes, it is important when assessing tax agency performance to examine tax-specific performance or adjust the performance measures for the taxes administered. For example, tax-specific comparisons

of information—revenues from all sources (for example, wages, salaries, sales, interest, dividends, capital gains, stipends, and gifts), deductible expenses, and taxpayer characteristics that qualify the taxpayer for or exemptions of certain amounts of income from taxation. Net wealth taxes and taxes on capital also require many different types and pieces of information to determine taxpayer liabilities. But bank debits, are readily and simply measured.
between Argentina and Colombia show that Colombia relies more heavily on the income tax than does Argentina, the countries rely on value added and excise taxes to about the same extent, and Argentina levies a considerably wider variety of taxes than does Colombia (Table 4.5). Colombia's heavier reliance on an income tax could easily increase the complexity of the DIN's mandate compared with that of the DGI. This conclusion, however, must be qualified by the observation that Colombia greatly simplified the determination of taxable income for individuals in 1987 by eliminating many deductions, allowances, and tax credits. And, the DIN does not have to determine tax liabilities for a wide variety of taxes that the DGI must monitor: capital income, net wealth,31 debits, fuels transfer taxes, and others. It appears, then, that the DGI administers a set of taxes requiring more-complex information to ascertain tax liabilities than does the DIN. This conclusion is reinforced the steps required to calculate tax liabilities are considered.

188. Tax policies can make the calculation of tax liabilities more complex by creating complicated formulas for determining an individual taxpayer's liability. Colombia has been simplifying the formulas for calculating tax liabilities, but Argentina has complicated them. First, inflation adjustments have been introduced. Second, industrial promotion incentives have been built into the value added and income tax laws. And, some rate structures apply different rates to taxpayers in different categories.

189. Partial inflation adjustments to the Argentine tax bases were introduced in the tax reforms of 1974-76. Nominal tax rates were indexed to inflation to reduce the inexcusable rise in real income tax rates resulting from inflation-driven rising nominal incomes being subject to a progressive income tax rate structure. Inflation adjustments for calculating tax bases were enacted subsequently to eliminate the distortions from inflation in the choice of how to finance capital investments. Revisions in 1978 introduced inflation adjustments in the calculation of net wealth—allowing losses to be indexed to inflation and carried forward to future periods.32 Subsequent revisions of inflation adjustment procedures have added yet more complications to the calculation of tax liabilities.

190. Argentina also adjusts for inflation any tax liabilities that are paid early or unpaid. As early as April 1976, indexing of late tax payments was introduced by law. But, the periods to apply adjustments for inflation vary by tax, by concept in a given tax, and by taxpayer. For instance, until 1990, payment limits for tobacco and cigarette producers were sixty days after collections. On the other hand, excessive prepayments of excise taxes by gasoline producers must be adjusted for inflation before they can be claimed as tax refunds.
191. The provincially administered—and thus variegated—rules for industrial promotion further complicate the calculation of value added and income taxes. The other complicated rules include the varying of rates with the taxpayer’s taxable base but also according to other taxpayer characteristics (Table 4.6). That table reveals that under many of these taxes, the applicable rate depends on the magnitude of the taxable base or taxpayer characteristics. In a number of ways, then, the Argentina tax structure is very complex.

<table>
<thead>
<tr>
<th>Table 4.6. Argentina: Summary of Tax Rates, 1988</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tax</strong></td>
</tr>
<tr>
<td>Net income and profits</td>
</tr>
<tr>
<td>Individual income tax</td>
</tr>
<tr>
<td>Tax on occasional income and capital gains</td>
</tr>
<tr>
<td>Personal tax on net wealth</td>
</tr>
<tr>
<td>Tax on transfers of financial assets</td>
</tr>
<tr>
<td>Value added tax</td>
</tr>
<tr>
<td>Excise taxes</td>
</tr>
<tr>
<td>Import duties</td>
</tr>
<tr>
<td>Import duties</td>
</tr>
<tr>
<td>Tax on foreign-exchange transaction</td>
</tr>
</tbody>
</table>

Source: DGI

192. Overlapping tax jurisdictions can significantly complicate tax administration—for example, in the assignment of responsibilities for administering the industrial promotion schemes in Argentina’s tax laws. The administration of these tax incentives is mainly the responsibility of the Secretariat of Industry and Commerce, the benefiting provinces, and Tierra del Fuego National Territory. But these industrial promotions bestow their primary tax benefits by exempting qualifying firms or their investors from specified value added tax liabilities. The value added tax is administered by the DGI. The overlapping-jurisdiction problem derives from these other agencies’ independent authority for determining the sizes of the exemptions—from the base of the added tax, which the DGI must administer. The DGI’s task is complicated by the fact that it must apply the guidelines established by
these various agencies to determine whether each firm that claims exemptions under any of these industrial promotion schemes is entitled to the exemptions. Not only does the DGI have to perform more calculations; it also has to decide which calculations must be used for each firm claiming each exemption.

193. In addition to making it difficult for the DGI to assess the size of a given tax liability, the overlapping responsibilities create perverse incentives for the government agencies granting the tax benefits to ignore the costs their decisions impose on the national treasury; reduced value added tax revenues do not enter into measures of those agencies’ performance. The DGI’s measured performance, however, is directly compromised by agencies’ excessive liberality in granting benefits. The division of responsibilities in Argentina precludes a balancing of costs and benefits—and thus virtually assures that tax benefits will be more liberally bestowed than intended by the central government.

194. An agency’s workload is also directly affected by the clarity of the substantive or procedural laws. The complexity of the demands on a tax administering agency, thus, can be examined by looking at such things as how clearly the substantive tax law defines the taxable base and the applicable tax rates, and how clearly the procedural tax law specifies taxpayer compliance obligations and agency enforcement actions. One approach would be to subjectively judge the tax laws’ clarity. Second, indicators of activities likely to be negatively or positively correlated with such clarity can be measured. It is beyond the scope of this study to directly assess the clarity of the substantive tax laws in Argentina and Colombia. However, in a 1991 ruling, one Argentine judge deemed the complexity, contradictions, and frequent changes in Argentine tax law and administrative directives so large as to absolve the taxpayer from the normal judicial presumption that ignorance of the law is no excuse for failure to abide by those laws.

195. Clearer substantive tax laws should generate fewer challenges to tax administration—and measures of the incidence of such challenges should provide evidence of the clarity of the laws. But the number of challenges to a tax administering agency’s decisions about taxpayer liabilities depends also on the care with which the agency’s personnel interpret and apply laws, and individual taxpayers’ expected net benefits for challenging tax liability determinations. The latter factor depends on the ease with which tax liabilities can be determined, the costs of challenging agency determinations, the penalties imposed for unsuccessful challenges, and the likelihood of success.

196. Two possible correlates are the number of legal challenges to the tax administration’s determinations of tax liabilities in excess of those declared by the taxpayer, and the fraction of such additional tax liability determinations that are paid without challenge or paid at all.

197. A measure of the willingness of taxpayers to challenge the tax administration’s audit determinations exists for Argentina—the fraction of additional tax liabilities determined by DGI auditors that were collected (Table 4.7). In 1986-89, only 15.2 percent of DGI’s audit determinations were collected, leaving almost 85 percent uncollected—in dispute. This high level of taxpayer unwillingness to abide by the tax administrator’s audit determinations surely reflects factors other than the clarity of the laws, but clarity in those laws must be at least partly responsible for these outcomes. This conclusion is reinforced by data gathered by the World Bank that reveal that among a random sample of 591 tax appeals decided by the Tribunal Fiscal de la Nación in Argentina in 1989, almost 40 percent of the cases were found against the DGI. (The tribunal is the tax court in the administrative branch.) This suggests either that the DGI auditors are hard-pressed to make defensible deficiency determinations or that taxpayers who appeal those deficiency determinations represent a sample of audited taxpayers heavily biased toward those whose tax liabilities are most difficult to reliably and accurately assess. In any case, these data are cause for concern about the clarity of Argentina’s tax laws.
198. Data on the number of appeals of audit determinations are available for Colombia by type of tax—value added and sales compared with income (Table 4.8). The generally low levels of appeals suggest that tax laws in Colombia are relatively clearly specified, thereby inhibiting challenges of the DIN’s interpretation and application of those laws. The sudden surge of challenges to DIN deficiency determinations under the sales and value added taxes in 1988 seems likely to reflect more volatile factors than clarity of the law.

199. Just as unclear substantive tax laws can undermine a tax agency’s ability to do its job, so can unclear procedural laws. As with substantive tax laws, the clarity of procedural tax laws can be assessed subjectively and using measurable correlates of the clarity of procedural tax laws.

200. Another factor in the complexity of an agency’s mandate is its internal consistency. Having multiple aims forces management to make difficult trade-offs and leaves an agency open to criticism from quarters whose priorities do not coincide with those of the agency’s management.

201. The internal consistency of the demands on the tax administering agency can be examined by looking at such things as the number of goals the agency is expected to pursue and whether any goals contradict each other.

202. For Argentina and Colombia, no evidence suggests that the DGI or the DIN is required to pursue a dramatically different set of tax administration aims than is any other tax administering agency in a developing country. Except that each must collect a wide variety of taxes, the tax agencies’ aims look like the aims of any other developing nation’s primary tax administering agency. These include generating net revenues, assuring due process in the determination of individual tax liabilities, and providing accountability for its activities—preventing corruption among its employees. It seems unlikely that much variation will exist across tax administering agencies in the number of aims included in their mandates.

203. Conflicting goals can mean that some of an agency’s activities directly reduce the productivity of resources devoted to another activity. For example, greater due process safeguards may directly reduce an agency’s ability to force taxpayers to settle deficient accounts.

204. Most tax administering agencies—including the DGI and DIN—presumably face these two contradictory aims. There is, in fact, no evidence to suggest that either the number of such contradictory goals or the extent their counter-productive effects on each other is significantly different for the DGI or the DIN than for other central tax administering agencies in comparable developing countries.

205. Whatever the laws, frequent, significant changes in them can be costly. A crude way to measure stability is to count the number of changes in tax laws, decrees, and resolutions. To obtain a clearer picture of the significance of the changes tax law changes that are more likely to seriously disrupt the tax agency’s administrative capacity should be singled out: the imposition or cancellation of a tax, and temporary tax amnesties. A politically motivated suspension of procedures—and
income tax reform eliminated most deductions, allowances, and tax credits, thereby increasing the income tax base. The reform also reduced marginal income tax rates and dramatically increased the zero-tax bracket level of income (from about US$14 to US$5,086) (Table 4.10). Because GNP per capita in Colombia was US$1,280 in 1986—or about US$3,800 per member of the labor force—this jump in the zero-bracket amount meant that much of the labor force was in fact exempted from the income tax by this reform.

208. Colombian tax law changes in the 1980s appear to have been relatively few, especially in comparison with Argentina. In addition, the changes in Colombia have generally simplified tax administration. The VAT rate structure was simplified in 1983. The determination of income tax liabilities was simplified by the elimination of most deductions, exemptions, allowances, and credits in 1986. And, the number of taxpayers having to be monitored was dramatically reduced when the zero-bracket level of income was lifted from the equivalent of US$14 to US$5,086 in 1986. Since 1986 that zero-bracket income has been increased annually by almost exactly the rate of inflation over the previous year, thus assuring that low-income workers who were exempted would not find themselves back on the income tax rolls. In addition, top marginal tax rates have been significantly reduced twice in the 1980s: from 56 to 49 percent in 1983, then to 30 percent under the 1986 reform. This, too, should have eased the task of the DIN, because lower tax rates should reduce incentives to evade taxes.

209. When the most disruptive changes—the number of taxes imposed or repealed, and the incidence of temporary amnesties—are considered, the instability of the Argentine tax system continues to be striking. Despite the costs of setting up a new structure for administering any new tax, Argentina has instituted an extraordinary number of taxes in the last two decades. The number of taxes administered by the DGI has fluctuated between nineteen and thirty annually between 1970 and
1989. Argentina also has granted twenty-one tax amnesties in the past thirty-five years—or more than one amnesty every other year (Table 4.11). These frequent amnesties besides complicating the DGI's administrative tasks, have undermined compliance by providing strong incentives for taxpayers to postpone tax payments until the next amnesty. An econometrical model of value-added tax revenues collected by the DGI during 1974-87 reveals that these amnesties have decreased value-added tax revenues relative to the value-added tax base.


<table>
<thead>
<tr>
<th>Year</th>
<th>Laws</th>
<th>Decrees</th>
<th>Resolutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>7</td>
<td>30</td>
<td>57</td>
</tr>
<tr>
<td>1987</td>
<td>10</td>
<td>20</td>
<td>44</td>
</tr>
<tr>
<td>1988</td>
<td>11</td>
<td>26</td>
<td>16</td>
</tr>
<tr>
<td>1989</td>
<td>15</td>
<td>36</td>
<td>3</td>
</tr>
<tr>
<td>1990</td>
<td>7</td>
<td>53</td>
<td>33</td>
</tr>
<tr>
<td>1991*</td>
<td>3</td>
<td>31</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>196</td>
<td>164</td>
</tr>
</tbody>
</table>

* Through June.
Source: DGI

Table 4.10. Colombia: Changes in Income Tax Rates and Brackets, 1982-88

<table>
<thead>
<tr>
<th>Year</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Marginal tax rate*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Maximum</td>
<td>Minimum</td>
</tr>
<tr>
<td>1982</td>
<td>1,098</td>
<td>43,283</td>
<td>10.00</td>
</tr>
<tr>
<td>1983</td>
<td>25</td>
<td>82,349</td>
<td>5.00</td>
</tr>
<tr>
<td>1985</td>
<td>14</td>
<td>45,788</td>
<td>3.91</td>
</tr>
<tr>
<td>1986</td>
<td>5,086</td>
<td>38,657</td>
<td>0.08</td>
</tr>
<tr>
<td>1987</td>
<td>3,334</td>
<td>21,114</td>
<td>0.07</td>
</tr>
<tr>
<td>1988</td>
<td>3,174</td>
<td>22,110</td>
<td>0.06</td>
</tr>
</tbody>
</table>

* Current US$  
Percent
Source: Colombia, Directorate General of National Taxes (DIN).

Assessment using economic and legal environmental factors.

211. If data on all of the constraints identified above could be coupled with data on resource use and tax revenues over long enough periods to permit reliable econometric estimation of parameters, the extent to which each constraint affects the productivity of a tax administering agency could be empirically determined. But because such detailed data are not available, the second-best approach—used in this study—is, where possible, to examine data on each constraint to assess the relative magnitude of that constraint on a country's tax administering agency compared with its effect on tax administrations in comparator countries, and whether that constraint has become more or less binding over time in the given country (see Chapter 3, Section 3).
4.3. An application of the equality of average cost-effectiveness approach

212. After environmental factors have been measured as much as possible, the next step is to try to apply measurements to specific tax administration functions. The marginal conditions methodology was illustrated with an enforcement resource allocation example drawn from the U.S. Internal Revenue Service (Chapter 3). However, that approach can rarely be attempted for a developing country because of insufficient data. The next-best approach, the use of equality of average cost-effectiveness, can be illustrated with an audit-targeting example from Argentina's DGI.

213. The DGI conducts three general types of audits: in-depth (ordinary) external, preventive external, and internal. The in-depth external audits are the most comprehensive, the external preventive less comprehensive, and the internal audits most cursory. In 1987, auditors spent 84.6 hours on each in-depth external audit, 14.9 hours on each external preventive audit, and 5.5 hours on each internal audit. (See Section 4.5 for details about these audits.)

214. To target these types of audits, the DGI does not use a set of well-specified rules. Audit managers may decide to audit returns to households that have children in private schools to be sure they report enough earnings to afford a private school tuition, or to audit all businesses on a block, with no specific rules enunciated for selecting the block to "sweep" in this way. But the decisions about which returns to audit appear to be mainly discretionary. It was not clear to the study team, however, precisely who exercises that discretion—individual auditors, their direct supervisors, regional audit managers, or national audit managers. For this report, the rules governing the selection of returns to be audited by the DGI are implicit in the selections made.

215. Fortunately, it is possible to identify a number of features to evaluate whether these implicit rules efficiently target audit resources. These features include the number of each category of audit undertaken and the number completed in a given month, the average number of hours spent on each category of audit, the additional taxes the auditor determined were owed, the government (the amount of taxes the taxpayer originally claimed were due), and the additional taxes the taxpayer agreed to pay. These data can be used to construct—for each category of audit—ratios that provide some evidence about the efficiency of DGI's targeting of audits.

216. Two crude measures of the productivity of audits—per value of human resources used—can be constructed: the ratio of additional tax liabilities determined per hour spent auditing a category of tax returns, and the ratio of additional tax liabilities that audited taxpayers agreed to pay per hour spent

Table 4.11. Argentina: Tax Amnesties by Type, 1956-91

<table>
<thead>
<tr>
<th>Type/Year</th>
<th>Number of beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forgiveness</td>
<td></td>
</tr>
<tr>
<td>1956</td>
<td>96,495</td>
</tr>
<tr>
<td>1962</td>
<td>451,250</td>
</tr>
<tr>
<td>1970</td>
<td>905,446</td>
</tr>
<tr>
<td>1971</td>
<td>908</td>
</tr>
<tr>
<td>1974</td>
<td>612,028</td>
</tr>
<tr>
<td>1977</td>
<td>313,654</td>
</tr>
<tr>
<td>1987</td>
<td>224,907</td>
</tr>
<tr>
<td>Moratoriums</td>
<td></td>
</tr>
<tr>
<td>1966</td>
<td>113,224</td>
</tr>
<tr>
<td>1970</td>
<td>82,211</td>
</tr>
<tr>
<td>1973</td>
<td>28,109</td>
</tr>
<tr>
<td>1984</td>
<td>207,586</td>
</tr>
<tr>
<td>1987</td>
<td>31,554</td>
</tr>
<tr>
<td>Ready Compliance</td>
<td></td>
</tr>
<tr>
<td>1976</td>
<td>186,715</td>
</tr>
<tr>
<td>1981</td>
<td>88,707</td>
</tr>
<tr>
<td>1982-83</td>
<td>134,811</td>
</tr>
<tr>
<td>1989</td>
<td>3,402</td>
</tr>
<tr>
<td>1990-Jan</td>
<td>79,900</td>
</tr>
<tr>
<td>1990-Nov</td>
<td>76,300</td>
</tr>
<tr>
<td>1990-Nov</td>
<td>5,300</td>
</tr>
<tr>
<td>1991-March</td>
<td>74,600</td>
</tr>
<tr>
<td>1991-March</td>
<td>5,600</td>
</tr>
</tbody>
</table>

Source: DGI.
auditing a category of returns. These measures have weaknesses. First, neither measure is based on actual additional taxes paid. Second, both measures reflect only human resources—and only a subset of that, namely, auditors’ time. Third, neither measure adjusts hours spent on audits for the hourly wage rate of auditors.

217. First, whether the auditor’s finding or what the taxpayer agrees to pay results in additional tax payments is an open question. As much as half the audit findings that are appealed result in findings of no additional tax liabilities. This result may reflect random inaccuracies in audits or systematic over-assessment by auditors. If the former is correct, this measure will contain sizable errors in individual cases, but these errors will be largely washed out by the averaging procedure used here. If the latter is correct, these data will systematically overstate true additional tax liabilities. In either case, these two suggested measures of productivity will overstate true additional tax payments. However, if the extent of overstatement is roughly constant across types of audits, differences in these ratios across audit types will still provide strong evidence of inefficiently targeted audits.

218. These ratios also mismeasure additional revenues created by audits because they do not measure the long-term deterrence effects of audits. Unless there is reason to believe that these deterrence effects are unlikely to differ significantly across audit categories, this omission may be important.

219. The second weakness of these measures is that their denominators measure only the time spent by auditors. If some types of audits are highly computerized and others are not, this could be a serious problem. It appears—from information made available to the study team for this report—that few audits in the DGI use computers, except audits of returns of the nation’s largest taxpayers. These ratios thus will overstate the productivity of audits of such large taxpayers. Accordingly, this study will qualify any results in which such audits are reflected. But because the other audit work is done by hand, these ratios should not seriously bias the conclusions. Once again, because the test of efficiency is whether these ratios are equal across audit categories, uniform under-measurement of the value of resources used across audit categories should not bias the conclusions. The third weakness—the omission of an adjustment for auditors’ wage rates would be a problem for comparing different types of labor. But it is not a problem in the focus of this study—comparing the efficiency with which auditors are assigned to audit tax returns.

220. The most important qualification to be kept in mind is that these ratios will systematically overstate the relative productivity of audits of the largest taxpayers, because the nonhuman resources omitted from the denominators of these ratios account for a larger share of the costs of such audits than of other categories of audits.

221. Summary data for these two ratios and related measures for audits of value added, income, and related tax returns are presented for internal audits, external in-depth audits, and preventive audits, respectively (Tables 4.12, 4.13 and 4.14). The data reveal several important facts. First, and most to the point, the DGI does not target its audits to achieve equal yields per audit resource across categories of audits. If it did, there would be little or no variation in the yield-per-audit-hour within each of these broad classes of audits. Instead, in almost every case, the standard deviation of the additional taxes promised to be paid by audited taxpayers is nearly as large as or larger than its average. For instance, in 1987 the average additional promised tax payment of taxpayers subjected to internal audits was US$488, while the standard deviation was US$553. Means and standard deviations for external in-depth audits were roughly equal to each other for both years for which data were available, and standard deviations easily exceeded means for preventive audits.

222. Additional evidence that DGI audits are poorly targeted is evident in the large ranges between minimum and maximum additional promised tax payments. For instance, internal audits yielded
<table>
<thead>
<tr>
<th>Measure</th>
<th>1987</th>
<th>1988</th>
<th>1989</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of audits done</td>
<td>26,759</td>
<td>17,738</td>
<td>4,778</td>
</tr>
<tr>
<td>Hours spent on completed audits</td>
<td>103,448</td>
<td>104,458</td>
<td>33,427</td>
</tr>
<tr>
<td>Average audit hours per completed case</td>
<td>5.33</td>
<td>11.83</td>
<td>12.7</td>
</tr>
<tr>
<td>Average deficiency determination per audit hour</td>
<td>$306.29</td>
<td>$167.08</td>
<td>$37.64</td>
</tr>
<tr>
<td>Measures of additional tax payments promised by audited taxpayers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>$488.40</td>
<td>104.81</td>
<td>62.86</td>
</tr>
<tr>
<td>Minimum</td>
<td>$28.01</td>
<td>$25.77</td>
<td>$0.00</td>
</tr>
<tr>
<td>Maximum</td>
<td>$1,713.93</td>
<td>$181.91</td>
<td>$439.15</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>$353.50</td>
<td>$70.81</td>
<td>136.00</td>
</tr>
</tbody>
</table>

* Total audits in those DGI audit-assignment categories for which at least twenty audits were done. All data in this table reflect this sample limitation.
* In June 1990 US$.
Source: DGI.

between US$28 and US$1,714 per hour of audit in 1987 and between US$0 and US$439 in 1989—dramatic variations in yield-to-cost ratios within the categories of audits.  

223. The summary data show how much the DGI misses opportunities to better target its audits—in averages, and in the relationships between variations in audit cost-effectiveness across broadly similar audit categories and DGI’s audit allocation decisions. If the DGI efficiently targeted its audits, all internal or external audit-target categories would yield roughly equal returns per hour of an auditor’s time—or audit-target categories exhibiting consistently higher-than-average yields per hour of audit should absorb more auditors’ hours. Neither pattern can be found. The yield-per-hour of audit time clearly varies significantly across audit-target categories displayed in these figures. Moreover, there is no apparent tendency for the number of hours of audit time devoted to categories of audits to rise with the yield per audit hour.  

In short, simple summary measures identifying the amount of variation in audit cost-effectiveness and more detailed data revealing the relationship between audit-target category cost-effectiveness and the amount of human audit resources devoted to each category provide strong evidence that the DGI is not efficiently targeting its audit resources.

224. These conclusions should only be considered provisional because the audits summarized in these tables include only those for which complete annual data were available; the key measure was additional taxes that taxpayers agreed to pay, not actual payments; and the denominator measures only one cost time spent by auditors.
Table 4.13. Argentina: External In-Depth Audit Cost-Effectiveness Measures, 1987-89

<table>
<thead>
<tr>
<th>Measure</th>
<th>1987</th>
<th>1988</th>
<th>1989</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of audits done^c</td>
<td>9,453</td>
<td>8,051</td>
<td>na</td>
</tr>
<tr>
<td>Hours spent on completed audits</td>
<td>466,158</td>
<td>369,636</td>
<td>na</td>
</tr>
<tr>
<td>Average audit hours per completed case</td>
<td>58.27</td>
<td>114.98</td>
<td>na</td>
</tr>
<tr>
<td>Average deficiency determination per audit hour^b</td>
<td>$90.27</td>
<td>$167.08</td>
<td>na</td>
</tr>
<tr>
<td>Measures of additional tax payments promised by audited taxpayers^c</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>$78.98</td>
<td>$144.67</td>
<td>na</td>
</tr>
<tr>
<td>Minimum</td>
<td>$0.00</td>
<td>$5.07</td>
<td>na</td>
</tr>
<tr>
<td>Maximum</td>
<td>$247.37</td>
<td>$440.23</td>
<td>na</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>$76.13</td>
<td>$144.92</td>
<td>na</td>
</tr>
</tbody>
</table>

^c Total audits in those DGI audit-assignment categories for which at least twenty audits were done. All data in this table reflect this sample limitation.

^b In June 1990 USS.

Source: DGI

225. Nonetheless, these results suggest three important conclusions. First, the large variation in additional promised tax revenues per audit hour across categories of audits suggests that the DGI should reallocate audit hours to the higher-payoff audit categories. Second, the DGI should determine the full hourly costs of conducting audits and use that figure for deciding which audits are cost-effective. Third, the DGI should modify these procedures for allocating audit resources for preventive audits, whose primary purpose is to increase compliance instead of directly generate additional tax payments from the audited taxpayers. With a fixed level of audit resources committed to these preventive audits, the DGI should maximize the number of audits. This requires that the additional—marginal—number of audit hours required to complete a case be the same for all categories of preventive audits. DGI is not meeting this condition. The number of hours per completed preventive audit ranged between 1.1 and 28.7 in 1987, between 20.8 and 30.5 in 1988 and between 6.3 and 14.6 in 1989. These variations in hours must be reduced if the DGI is to most efficiently use the resources it devotes to preventive audits—just as the variations in promised revenues per audit hour among external in-depth and internal audits should be reduced.

226. Using the marginal conditions methodology—or average output per-cost measures as proxies for marginal output-per-cost measures—is likely to prove feasible and useful in assessing and guiding the allocation of enforcement efforts—such as using third-party data to generate dunning letters to taxpayers who are likely to have understated their tax liabilities. Another potentially effective
enforcement activity using these methodologies is taxpayer appeals processing. These activities produce immediate and directly observable consequences—cases resolved—that can be readily tracked.

4.4 **Facilitating Taxpayer Compliance**

The average cost-effectiveness methodology may prove most useful for developing countries in time-trend and cross-country comparisons. These are applied to aspects of the four major activities of tax administration. Because the data requirements overlaps for the time-trend and cross-country comparisons, they are not treated in separate sections.

227. Efficient tax administration requires that the vast majority of tax revenues be collected through the compliance of taxpayers and third parties without specific prompting of individually targeted enforcement actions by the tax administration. Argentina and Colombia have reasonably good records in this respect, with more than 80 percent of collections in Argentina and 90 percent in Colombia derived from compliance. (see Tables 4.15-4.17).

228. This record of course reflects to a large extent the quality of taxpayer services provided by the tax administration agencies in designing tax-filing requirements and taxpayers forms, making tax forms available, publicizing tax-filing requirements, and responding to taxpayer inquiries. The collection of compliance-generated tax revenues consists largely of two tasks—processing taxpayer
Table 4.15. Argentina: Percentage of Total Tax Collections Derived from Taxpayer Compliance by Major Tax, 1986-89

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Value added</td>
<td>94.0</td>
<td>98.8</td>
<td>83.3</td>
<td>82.6</td>
</tr>
<tr>
<td>Income</td>
<td>94.4</td>
<td>94.1</td>
<td>96.5</td>
<td>96.4</td>
</tr>
<tr>
<td>Net wealth</td>
<td>84.2</td>
<td>86.0</td>
<td>92.3</td>
<td>95.2</td>
</tr>
<tr>
<td>Capital</td>
<td>94.3</td>
<td>93.5</td>
<td>94.1</td>
<td>93.1</td>
</tr>
<tr>
<td>Excises</td>
<td>50.5</td>
<td>50.0</td>
<td>100.0</td>
<td>99.8</td>
</tr>
<tr>
<td>Bank debits</td>
<td>na</td>
<td>na</td>
<td>100.0</td>
<td>99.2</td>
</tr>
<tr>
<td>Other</td>
<td>27.4</td>
<td>49.4</td>
<td>28.7</td>
<td>52.3</td>
</tr>
<tr>
<td>Total revenues</td>
<td>63.3</td>
<td>72.6</td>
<td>79.6</td>
<td>83.6</td>
</tr>
</tbody>
</table>

Source: DGI

returns and processing withholdings.

Table 4.16. Colombia: Compliance and Enforcement Income Tax Revenues, 1984-89

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Millions of Co$</th>
<th>Percentage of collections</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Compliance</td>
<td>Enforcement</td>
</tr>
<tr>
<td>1984</td>
<td>110.62</td>
<td>93.16</td>
<td>17.45</td>
</tr>
<tr>
<td>1985</td>
<td>135.24</td>
<td>117.15</td>
<td>18.08</td>
</tr>
<tr>
<td>1986</td>
<td>169.01</td>
<td>140.34</td>
<td>28.67</td>
</tr>
<tr>
<td>1987</td>
<td>217.79</td>
<td>193.72</td>
<td>24.07</td>
</tr>
<tr>
<td>1988</td>
<td>215.37</td>
<td>205.01</td>
<td>10.36</td>
</tr>
<tr>
<td>1989</td>
<td>590.37</td>
<td>541.43</td>
<td>49.27</td>
</tr>
</tbody>
</table>

Note: 1989 figures are estimates.
Source: Colombia, Finance Ministry, World Bank calculations.

Providing Taxpayer Services

Providing taxpayer services includes tasks such as designing tax-filing requirements, responding to taxpayer inquiries, and designing and distributing taxpayer forms.

229. Argentina. In Argentina the DGI is vested with broad powers to establish the requirements under which sworn returns are filed and tax payments remitted. For example, to verify the accuracy of returns the DGI may require taxpayers and third parties to register and keep accounting records showing transactions related to the taxable base. The DGI also can require taxpayers to issue specified
vouchers and keep copies of these and other documents for ten years—or longer. All taxpayers, withholding agents, and third parties who use computers to register their transactions must keep the magnetic records containing data for two years from the closing date of the period in which the magnetic records have been used. The DGI has exempted taxpayers from filing annual income tax returns if they are resident individuals or undivided inheritances who derive Argentine-source income entirely from employment and the tax has already been withheld—or if their taxable income is less than their available allowances. The DGI may require estimated tax payments from taxpayers—calculated as the fraction of the taxable period already elapsed times the tax due for the preceding period or some other index of the taxpayers’ anticipated tax liability for the current period—such as receipts, capital, sales, supplies, or investments.  

Table 4.17. Colombia: Compliance- and Enforcement-Generated Value Added and Excise Tax Revenues, 1985-88

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Compliance</th>
<th>Percentage of collections</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>662.7</td>
<td>662.1</td>
<td>99.9</td>
</tr>
<tr>
<td>1986</td>
<td>881.1</td>
<td>880.3</td>
<td>99.9</td>
</tr>
<tr>
<td>1987</td>
<td>1,203.8</td>
<td>1,203.2</td>
<td>99.9</td>
</tr>
<tr>
<td>1988</td>
<td>1,599.0</td>
<td>1,598.7</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: DIN

230. Does the DGI use the broad powers at its disposal to deliver exceptional taxpayer services? The study team was able to gather data on only two of the five types of taxpayer services—the design of tax filing procedures and the design of taxpayer forms. The design of tax filing procedures includes identifying what forms must be filed by whom and how often, specifying what documentation taxpayers must submit, and specifying what documentation taxpayers must maintain and retain—and for how long. Designing taxpayer forms consists of specifying what information must be reported by taxpayers or their agents on each form. Because it is often difficult to separate the design of tax filing requirements and procedures from the design of taxpayer forms, the following discussion examines these two tasks as if they were one task.

231. Ideally, an evaluation of how effectively a tax administering agency facilitates taxpayer compliance through these two tasks would focus on the relationship between particular agency decisions—such as the creation of tax filing procedures or forms—and the level of taxpayer compliance. Or, a second focus could be to clearly measure the costs these agency decisions have imposed on taxpayers and their agents—such as, measuring the time required by representative taxpayers to complete and submit required tax forms. Unfortunately, data limitations in Argentina preclude either approach. Instead, the following discussion uses two types of criteria as proxies of taxpayer compliance costs, namely, proxies for the magnitudes of the tasks that the DGI’s requirements impose upon taxpayers and their agents, and proxies for the ease with which taxpayers and their agents can understand what is required.

232. By any measure, the DGI requires that taxpayers and their agents complete large numbers of complicated forms. As of 1990, individual taxpayers had to file up to one income tax form each month plus up to seventeen additional income tax forms each year (Table 4.18). Taxpayers also faced a variety of transaction-specific tax form requirements: people who settled new land had to file an additional two forms upon settling; taxpayers qualifying for a tax rebate because of a move, transfer, or loss of ownership of goods had to file another form; and newly hired employees had to file a
separate return with their employers at the beginning of their employment. Corporate income taxpayers faced up to thirteen separate annual form submissions. Large-value-added taxpayers faced up to another seven annual VAT forms and up to twelve other transaction-specific forms. Small-value-added taxpayers—subject to "simplified" VAT rules—had to file up to six separate annual VAT returns, and faced ten additional transaction-specific VAT forms.

<table>
<thead>
<tr>
<th>Table 4.18: Argentina: Income and Value Added Tax Forms by Type of Tax Filer and Frequency of Submission, 1990</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tax and taxpayer or agent</strong></td>
</tr>
<tr>
<td>Individual income tax</td>
</tr>
<tr>
<td>Corporate income tax</td>
</tr>
<tr>
<td>Large value added tax (general rule)</td>
</tr>
<tr>
<td>Small value added taxpayers</td>
</tr>
<tr>
<td>Income tax withholding</td>
</tr>
<tr>
<td>VAT withholding</td>
</tr>
</tbody>
</table>

233. Before 1987, Argentina taxpayers faced even more required forms. Eight of the income tax forms required now replaced twenty-seven pre-1987 forms (Table 4.19). And, the average number of lines per form did diminish. Thus, although Argentine taxpayers face substantial compliance costs in the sheer number and length of forms they must complete, these compliance costs seem to have been reduced by the DGI's reduction and simplification of forms in 1987.

<table>
<thead>
<tr>
<th>Table 4.19: Argentina: 1987 Simplification in Number of Tax Return Forms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Status</strong></td>
</tr>
<tr>
<td><strong>Numbers of Form</strong></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

234. One important simplification of the 1987 reforms of taxpayer compliance procedures was the creation of a single taxpayer registration form, Form 600 Registry Petition, to be used for any tax.
There are, however, two reasons for believing that this reform does not simplify taxpayers’ tasks significantly. First, this form is not simply a registration form, establishing the taxpayer’s existence in the DGI’s records. Instead the form must be completed and submitted as often as a taxpayer’s status changes—for example, from active to nonactive status. Second, this form is difficult to fill out. It has 112 lines to complete—including 34 lines for taxpayer identification alone, and another 15 for identifying the taxes to which the taxpayer is subject.

235. Because of the large variety of taxes in Argentina and the heavy reliance on several taxes—income, value added, and net wealth—for which considerable information is required to assess tax liabilities, it would be unreasonable to expect the DGI to function without an extensive battery of forms, including some that are detailed. It is difficult to ascertain whether any particular form keeps the taxpayers’ compliance costs as low as possible—and facilitates compliance—without a detailed analysis of the content of the full set of taxpayer forms required by the DGI either for a particular tax or from any taxpayer. Unfortunately, such a detailed analysis was beyond the scope of this study.

236. Colombia. In Colombia, the burdens on taxpayers have been noticeably reduced in recent years. The considerably lower inflation rates in Colombia than in Argentina have permitted the Colombian tax system to rely on considerably less-frequent tax filings than in Argentina. The largest taxpayers—corporate or individual—must pay their annual tax obligations in three installments, corporations in two, and small individual taxpayers, in one. Equally important, Colombia has reduced the complexity of the forms required of taxpayers. In the late 1980s the DIN reduced the number of lines on the corporate income tax return from 420 to 55, and it reduced the number of lines on small and large individual income taxpayer returns from 210 to 41. Colombia appears to require taxpayers to make fewer submissions and to fill out fewer and shorter forms than does Argentina.

Collecting compliance-generated tax revenues

237. Collecting compliance-generated tax revenues mainly involves the essentially clerical tasks of processing, recording, and depositing taxpayer returns and payments, and withholding payments by third parties. The cost-effectiveness of these operations depends on environmental factors and on how the agency’s resources are deployed to accomplish this subactivity.

238. Argentina. Records maintained by the DGI identify the number and monetary value of four types of compliance-generated tax payments: withholdings, taxpayer sworn returns, estimated tax payments, and payments to balance (Table 4.20). The first of these is a third-party payment; the second and third are taxpayer payments; and the fourth can be a third-party taxpayer payment.

239. Third-party withholding tends to generate large tax-paying transactions, taxpayer returns and estimated tax payments tend to generate average-size tax payments, and payments to balance tend to generate considerably smaller-than-average tax-paying transaction amounts.

240. In addition to having to decide how to allocate resources across compliance-generated collections, DGI management also can design or redesign the procedures for any or all of those collection efforts—to improve productivity. For example, in 1988 DGI management reduced the holding period between banks’ receipt of a taxpayer’s payment and the bank’s remittal of that payment to the DGI.

241. More important, that same revision, Resolution 10/88, changed the index used to adjust and penalize late tax payments. The change meant that delayed tax payments would be adjusted upward not only to correct for inflation but also to charge the taxpayer—or withholder—an interest rate reflecting the opportunity cost of borrowing from the government.
Table 4.20. Argentina: Compliance-generated Tax Payments, 1986-89

<table>
<thead>
<tr>
<th>Type of Payment</th>
<th>1986</th>
<th>1987</th>
<th>1988</th>
<th>1989</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Withholding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of</td>
<td>62,800</td>
<td>144,092</td>
<td>221,659</td>
<td>227,592</td>
<td>164,036</td>
</tr>
<tr>
<td>payments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total value</td>
<td>1,830.8</td>
<td>1,209.4</td>
<td>1,233.6</td>
<td>1,844.1</td>
<td>1,604</td>
</tr>
<tr>
<td>Average value</td>
<td>29.15</td>
<td>8.39</td>
<td>6.92</td>
<td>8.10</td>
<td>9.78</td>
</tr>
<tr>
<td>Sworn return</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of</td>
<td>314,718</td>
<td>1,365,726</td>
<td>1,406,054</td>
<td>985,470</td>
<td>1,017,992</td>
</tr>
<tr>
<td>payments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total value</td>
<td>449.6</td>
<td>1,656.7</td>
<td>1,473.8</td>
<td>1,397.5</td>
<td>1,244</td>
</tr>
<tr>
<td>Average value</td>
<td>1.43</td>
<td>1.21</td>
<td>1.05</td>
<td>1.42</td>
<td>1.22</td>
</tr>
</tbody>
</table>

* Millions of December 1989 U.S. Dollars
† December 1989 U.S. Dollars
Source: DGI

242. Although the total number of compliance-generated tax payments fell by more than 42 percent between 1987 and 1989, total revenues from these payments fell by only 3.3 percent, thanks to the significant 67 percent increase in the size of estimated tax payments (Table 4.7).

243. However, reduction in the number of all but withholding payments is disquieting.

244. During this time gross domestic product was declining by 8.9 percent but the economically active population was growing slowly (Table 4.21). It is difficult to reconcile the slowly growing economically active population with the 42 percent decline in the number of registered taxpayers. The declining numbers of registered taxpayers may partly reflect national tax policies and DGI policies exempting many small taxpayers from formal registration and filing requirements. This possibility is consistent with the rising average tax payment value over this same period. But declining numbers of registered taxpayers may also partly reflect refusal to report taxable transactions or movement of economic activities out of the formal economy.

245. Although the fall in GDP resulted from several factors—including high rates of inflation—it is perhaps noteworthy that compliance-generated tax revenues declined by less than half as much, in percentage terms, as the domestic economy—a 3.3 percent decline versus the 8.9 percent drop in GDP. This resilience of the tax system may reflect adroit administration or clever policy decisions by the government.

246. Colombia. Between 1984 and 1989 compliance-generated revenues in Colombia accounted for 88.3 percent of total revenues, on average (see Table 4.22). Moreover, compliance-generated revenues were increasing—in real terms and as a fraction of total revenues.
Table 4.21. Argentina: Changes in Compliance and Tax Base Indicators, 1987-89

<table>
<thead>
<tr>
<th>Compliance indicators</th>
<th>1987</th>
<th>1989</th>
<th>Percentage change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of taxpayers</td>
<td>739,228</td>
<td>421,413</td>
<td>-42.9</td>
</tr>
<tr>
<td>Number of compliance-generated tax payments</td>
<td>3,804,392</td>
<td>2,201,547</td>
<td>-42.1</td>
</tr>
<tr>
<td>Average value per compliance-generated tax payment (December 1989 US$)</td>
<td>0.98</td>
<td>1.63</td>
<td>66.3</td>
</tr>
<tr>
<td>Total value of compliance-generated tax payments (millions of December 1989 US$)</td>
<td>3.72</td>
<td>3.60</td>
<td>-3.2</td>
</tr>
</tbody>
</table>

Table 4.22. Colombia: Compliance and Enforcement Income Tax Revenues, 1984-89

<table>
<thead>
<tr>
<th>Type of liability</th>
<th>1984</th>
<th>1985</th>
<th>1986</th>
<th>1987</th>
<th>1988</th>
<th>1989&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-enforced</td>
<td>651.3</td>
<td>819.0</td>
<td>981.0</td>
<td>1,354.2</td>
<td>1,433.2</td>
<td>3,784.9</td>
</tr>
<tr>
<td>Enforced</td>
<td>122.0</td>
<td>126.4</td>
<td>200.4</td>
<td>168.3</td>
<td>72.4</td>
<td>344.4</td>
</tr>
<tr>
<td>Total</td>
<td>773.3</td>
<td>945.4</td>
<td>1,181.5</td>
<td>1,522.5</td>
<td>1,505.5</td>
<td>4,129.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-enforced</td>
<td>84.2</td>
<td>86.6</td>
<td>83.0</td>
<td>89.0</td>
<td>95.2</td>
<td>91.7</td>
</tr>
<tr>
<td>Enforced</td>
<td>15.8</td>
<td>13.4</td>
<td>17.0</td>
<td>11.0</td>
<td>4.8</td>
<td>8.3</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

1989 data are estimates.
Note: Source: Colombia, Finance Ministry.
247. The composition of compliance-generated revenues has also changed in the last decade. Colombia has dramatically increased its reliance on withholding as an instrument for collecting compliance revenues in the 1980s (Table 4.23). While increasing its reliance on withholding, the DIN has dramatically reduced its use of advanced installments to collect compliance revenues. The constant value of advanced installment collections did not move up or down, but averaged about US$340 million in 1984-88. The balance of DIN revenues were from payments to balance, which include compliance and enforcement revenues. These exhibited no clear trend as a share of total revenues in 1984-88, but increased slightly more than 3.6 times over that same period in constant U.S. dollars.

<table>
<thead>
<tr>
<th>Table 4.23. Colombia: Composition of Income Tax Payments, 1984-89</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Millions of 1985 US$</strong></td>
</tr>
<tr>
<td><strong>Form of payment</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>Advanced Installments</td>
</tr>
<tr>
<td>Withholdings</td>
</tr>
<tr>
<td>Payments to balance</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

**Percentage of revenues**

| Advanced Installments | 30.4 | 28.4 | 25.4 | 19.9 | 9.7 | na |
| Withholdings | 32.3 | 39.8 | 46.1 | 50.8 | 52.0 | 49.7 |
| Payments to balance | 37.3 | 31.8 | 28.6 | 29.3 | 38.4 | na |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

na = not available  
* Source: Colombia, Finance Ministry

248. Although revenues from tax filings—from advanced installments and payments to balance—have declined as a share of DIN revenues, they still are a significant part of DIN collections. To assess the DIN's performance at collecting revenues from tax filings requires data on the quantity and the quality of the output and on the quantity and value of resources used.

249. Three important tax policy changes in the 1980s dramatically changed the quantity of the tax processing workload of the DIN (see Table 4.24). First, the zero-tax-bracket level of income under the income tax, after dropping so low as to make virtually every employed household subject to that tax between 1983 and 1985, was raised enough to exempt a sizable majority of households from the income tax in 1986. The zero-tax-bracket income, which was about US$1,098 in 1982, had fallen to about US$14 by 1985, but was raised to Col$1,000,001—or about US$5,086—in 1986. GNP per capita in 1986 was US$1,280, which, given Colombia's average household size of five persons, translates into about US$6,400 per household. Thus, the zero-tax level of income was set somewhat lower than average per-household income. These policy changes probably largely account for the
pronounced increase in income tax filings in the early 1980s and their dramatic reduction in the late 1980s—although the sudden drop in income tax filings in 1985 remains a puzzle.

<table>
<thead>
<tr>
<th>Year</th>
<th>Income Tax</th>
<th>Value added and sales tax</th>
<th>Total returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>2,296</td>
<td>123</td>
<td>2,419</td>
</tr>
<tr>
<td>1982</td>
<td>2,533</td>
<td>118</td>
<td>2,651</td>
</tr>
<tr>
<td>1983</td>
<td>2,654</td>
<td>122</td>
<td>2,776</td>
</tr>
<tr>
<td>1984</td>
<td>3,307</td>
<td>554</td>
<td>3,861</td>
</tr>
<tr>
<td>1985</td>
<td>1,336</td>
<td>1,244</td>
<td>2,580</td>
</tr>
<tr>
<td>1986</td>
<td>1,284</td>
<td>1,384</td>
<td>2,668</td>
</tr>
<tr>
<td>1987</td>
<td>1,120</td>
<td>1,298</td>
<td>2,418</td>
</tr>
<tr>
<td>1988</td>
<td>1,537</td>
<td>4,514</td>
<td>6,051</td>
</tr>
</tbody>
</table>

Source: Colombia, Ministerio de Hacienda, Dirección General de Impuestos Nacionales.

250. Second, in 1984 the number of filings per year under the sales tax was increased from six to twelve. This helps to explain the sudden surge in sales and value-added-tax filings in 1985. Third, the computerization of the taxpayer registration system, which began in 1987, helps to explain the dramatic increase in tax filings under the income, sales, and value added taxes after 1987.

251. The quality of agency performance is hampered if information provided on the tax return is incorrectly entered into the agency’s records. Taxpayer errors can, in turn, be those easily identified by checking the returns for internal inconsistencies on errors that require detailed auditing to detect. Detecting the former can easily fall within the purview of tax returns processing, while the latter is an auditing subactivity of the agency.

252. Measure of the accuracy with which tax returns are processed include the incidence of data coding errors, and the incidence of inconsistencies in the entries in a given tax return. The DIN does not have information on either of these measures of accuracy over an extended period. However, after the agency began computerizing its tax returns processing in 1988, it did begin keeping records. Those records show that between 1988 and 1990 the data entry error rate fell from 8 to .03 percent of returns.

253. This impressive improvement undoubtedly reflects changes in the DIN’s strategy for processing tax returns. First, the DIN, in discrete steps, has increased its reliance on the private banking sector to receive and record tax filings. A 1974 strike by DIN employees prompted the Colombian government to allow taxpayers to file tax returns through specific commercial banks. In 1986 the government required that all tax returns be filed with commercial banks contracted by the government to receive tax payments. Contracts with those commercial banks required that they record all tax return information on magnetic tapes and turn over the revenues and the information to the tax administration daily. The DIN remains responsible for verifying the information received from contracting banks and updating taxpayers’ current accounts using that information.44
Second, the contracts the DIN has written with the commercial banks for receiving and recording tax returns include penalties for inaccuracies; the most recent error rate was 0.03 percent. Third, the DIN checks every tax filing record for data entry errors. The combination of penalties for coding errors and DIN checking of every record has provided strong incentives for the banks to accurately record all information received by them on the tax returns.

DIN records on the incidence of internal inconsistencies in taxpayer returns, however, are less enlightening than their records on data entry errors. DIN administrators estimate that the incidence of such inconsistencies is less than 5 percent, although this estimate appears to be subjective instead of from reliable data. Because the tax filing system is computerized, such internal inconsistencies could be detected and summarized readily with some relatively simple software. It is, thus, recommended that the DIN invest in such software—both to improve their detection and correction of such inconsistencies and to provide reliable data on the incidence of such errors.

The second dimension of tax return filing quality comprises the speed with which data are recorded and taxpayer accounts credited. Because in Colombia two separate actors—the commercial banks and the DIN—play important roles in tax return filing, it is worthwhile to distinguish between the speed with which each actor accomplishes its tasks. Tax returns are gathered by the main regional offices of the commercial banks. They must submit this information to the main regional offices of the DIN for further verification and processing within five working days for large taxpayers and fourteen working days for others. Magnetic tapes must be submitted separately one day earlier than these limits for handing over tax forms. On average, however, banks take about twenty calendar days to submit the tapes and the tax forms. Tax payments, on the other hand, may be retained by the banks for eighteen to twenty-five calendar days, depending on the volume of forms and the magnitude of collections.

After receiving data from the DIN, the DIN takes roughly two more months to verify that information. If the DIN checked only a random sample of filings, this long lag could be significantly reduced.

The above arrangements for processing tax returns in Colombia have led to several benefits. These include combining tax filing and payment steps into a single procedure, speeding up the recording and data processing of tax returns and tax payments, increasing the accuracy of tax return information, simplifying cash management, and facilitating the effective updating of the taxpayers’ current accounts. These tasks were further facilitated both by the drastic simplification of tax forms and of the income tax—and the significant reduction in the number of individuals and firms required to file returns.

The DIN’s cost accounts do not separately identify the processing costs for taxpayer returns. The best available proxy in their accounts is the total of operating and administrative costs of the DIN’s Systems and Information Center, which processes all tax returns and maintains taxpayer current accounts, overall agency revenue accounts, the audit data base, and third-party records—and tracks delinquent accounts and appeals. Those costs show that per-tax-return costs tended to decline in the 1980s and that total costs also declined until the number of returns more than doubled in 1988 (Table 4.25).

It appears, then, that by taking advantage of the well-developed commercial banking system in Colombia and by eliminating excessive documentation requirements for tax returns, the DIN improved its tax filing processing performance and reduced its unit costs. Improved performance can also be seen in reduced error rates and increased numbers of tax returns processed. And, involving a third-party—typically a manufacturing firm—in withholding significantly improves the chances of obtaining reliable information on—and payments—of these tax obligations. The program under which
the DIN can authorize particular firms to withhold tax obligations from their payments to suppliers, provides a unique means of enforcing compliance among a subset of taxpayers—rural suppliers of raw materials. Allowing third parties to reap some benefit from withholding encourages those third parties to comply with the withholding requirement. In addition, enforcement measures further reinforce these incentives.

4.5. Monitoring Taxpayer Compliance

261. The monitoring of taxpayer compliance provides information used to target and conduct tax enforcement activities, such as audits and collections of delinquent accounts. Monitoring compliance also facilitates regular assessment of the agency's management, and can point up needed changes.

262. To facilitate tax enforcement, a taxpayer information system should provide accurate and timely information both on the current accounts of individual taxpayers, and on records of third-party activities that can be used to corroborate or question the accuracy of information provided by taxpayers.

Creating and maintaining a taxpayer current accounts system

263. An effective taxpayer current-accounts system must identify all economic agents who should be taxpayers and maintain records on their tax liabilities. The current accounts system provides key information upon which the tax administering agency must base its decisions about which taxpayers to pursue for possible failure to pay their full tax liabilities, and whether and how to reallocate agency resources.

264. Taxpayer Identification. Key performance criteria for a taxpayer identification system include comprehensiveness, simplicity, flexibility, usefulness, and cost-effectiveness. A comprehensive system accurately identifies all economic agents who should be taxpayers. A simple system is easy to implement and permits easy access to the information on any given taxpayer that is stored in the affiliated taxpayer current accounts system. A flexible system can easily handle changes in tax laws and taxpayer characteristics or identities without requiring major changes in the registration system. A useful system makes it possible to cross-reference and merge all of the information available within the tax administering agency bearing on any taxpayer. The unit cost of a taxpayer identification system may be measured as the cost of operating and maintaining the taxpayer registry per registered taxpayer.

265. How well does the taxpayer identification system of the DGI in Argentina meet these criteria? To address this question, it is helpful to sketch the procedures used by the DGI to register taxpayers. Before 1987, the DGI assigned a unique taxpayer identification code to each registered taxpayer for each of the nineteen (in 1970) to thirty (in 1983, 1985, and 1986) DGI-administered taxes to which that taxpayer was subject. Thus, it was possible for a single taxpayer to have up to thirty separate
taxpayer identification codes in DGI's records. Taxpayers were also assigned additional identification codes for taxes administered by other government agencies—for example, the social security tax administered by the social security administration, the export taxes administered by the customs service, and provincial taxes. In 1987, with the help of the World Bank and new legislative authority, the DGI overhauled this system. It replaced the taxpayer-and-tax-specific codes with a single taxpayer identification number—the Clave Unica de Identificacion Tributaria (CUIT)—to be used for all taxes to which a taxpayer was subject.

266. The six-digit CUIT includes a one-digit prefix to indicate whether the taxpayer is an individual or a corporation, a one-digit base that indicates gender or type of corporation, and a randomly assigned four-digit suffix. Foreign taxpayers are assigned an eight-digit CUIT code, whose first three digits indicate their foreign status.

267. The DGI uses three strategies to identify taxpayers who should be registered. First, taxpayers under the value added tax and a number of excise taxes have been required for some time to file taxpayer registration forms.43 Second, the submission of a sworn return under any other DGI-administered tax routinely triggers the DGI to assign the taxpayer an identification code—if one is not on record. Third, the DGI has also routinely identified potential taxpayers and assigned them identification codes by making cross-checks with other taxpayer returns.

268. As of 1987 all taxpayers were required to submit one standard registration form, regardless of the tax or taxes for which they were liable. After the 1987 reform, all taxpayers identified by any of the just-mentioned strategies were mailed that form. Of the 1,390,000 forms mailed in May 1987, 1,060,000 were returned, resulting in 950,000 CUITs being assigned by the DGI.

269. Is the DGI's taxpayer registration system comprehensive and accurate? It is difficult to ascertain just how comprehensive the DGI's CUIT registration system is. However, the number of registered taxpayers under each major tax administered by the DGI began to decline after the CUIT registration system was instituted. The magnitude of these declines far outstripped the 8.9 percent decline of the GDP. Value added taxpayer registrations dropped by 23 percent and 22 percent in 1988 and 1989, respectively, and income taxpayer registrations dropped by one-third in each of these years (Table 4.26). It thus appears that the CUIT system has been somewhat less than fully successful in registering all potential taxpayers.

270. Another issue is simplicity—whether the DGI taxpayer registration system is easy to implement and whether it permits easy access to the information on any given taxpayer that is stored in the affiliated taxpayer current accounts system? The switch to the CUIT is clearly a step toward simplicity. Having a single identification code for each taxpayer makes it immeasurably easier to cross-reference data on each taxpayer across taxes. Having a single code also can make it easier to cross-reference information from a taxpayer's filings with any information about that taxpayer submitted by third parties—as long as the third-party information includes the taxpayer's CUIT code.

271. The CUIT system is not, however, as simple as it might be. Although the six-digit CUIT code for a domestic taxpayer will generally be straightforward, it does add to the information demands of registration. These are already complicated by the detailed taxpayer registration form.

272. In addition, accessibility of information in the CUIT registry is limited by a too-small computer system. The computerized registry relies on the support of a computer center at the DGI, located in Buenos Aires. In 1988 an obsolete, small-capacity machine was replaced by an IBM mainframe and a network of terminals and microcomputers. The network consists of twenty-two terminals distributed among capital and regional offices, forty-eight terminals in the computer center, and seventeen microcomputers outside Buenos Aires and connected to the main system through
Table 4.26. Argentina: Number of Registered Taxpayers, by Tax, 1986-89

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Value added</td>
<td>232,228</td>
<td>205,380</td>
<td>158,052</td>
<td>123,311</td>
</tr>
<tr>
<td>Income</td>
<td>43,214</td>
<td>169,304</td>
<td>111,127</td>
<td>74,360</td>
</tr>
<tr>
<td>Net wealth</td>
<td>50,824</td>
<td>25,328</td>
<td>24,188</td>
<td>18,848</td>
</tr>
<tr>
<td>Capital</td>
<td>95,457</td>
<td>63,332</td>
<td>67,176</td>
<td>63,642</td>
</tr>
<tr>
<td>Bank debits</td>
<td>na</td>
<td>na</td>
<td>149</td>
<td>142</td>
</tr>
<tr>
<td>Other</td>
<td>153,864</td>
<td>274,883</td>
<td>9,532</td>
<td>141,110</td>
</tr>
<tr>
<td>Total taxpayers</td>
<td>555,587</td>
<td>738,228</td>
<td>370,224</td>
<td>421,413</td>
</tr>
</tbody>
</table>

na = not applicable (tax did not exist)

Note: The number of taxpayers by CUIT represents the maximum number in any month during the year.

telephone lines. The latter are used to enter data from sworn returns received in the regions. Only the Buenos Aires location can change data; the others have read-only and input capacity.

273. These computer resources are inadequate for registering and keeping current data on all taxpayers. For example, the thirty-nine terminals and microcomputers outside computer centers are distributed among fifteen regions and Buenos Aires. This gives each region fewer than three terminals or microcomputers, on average. Most regions probably have only one personal computer, linked to the central database solely through a modem and telephone line. Alternatively, the thirty-nine non-computer center terminals and personal computers plus the forty-eight computer-center-based terminals had to register more than 735,000 taxpayers in 1987, or slightly fewer than 8,500 per terminal or personal computer—about thirty-two registrations per personal computer or terminal per working day.

274. This level of demand upon these personal computers and terminals doesn't seem excessively large, but the additional demands of recording information from all taxpayer and third-party returns make the demands on these personal computers and terminals begin to look overwhelming. For example, in 1988, the first year the DGI had its upgraded computer system operating, taxpayers filed 2,889,397 returns, which included 3,706,000 forms (see Table 4.27). To record information from all these forms, the 87 personal computers and terminals operated by the DGI would have to process 161 forms per working day per personal computer or terminal. To achieve this level of production, the operators of these personal computers and terminals would, on average, have to devote less than 3 minutes to the recording of the information from each of those 3.7 million forms. The 2.6 million forms submitted in 1989 would only have been allowed an average processing time of 4.2 minutes if the DGI terminal and personal computer operators were to record at least some information from each one of those submitted forms. These levels of productivity are clearly unrealistic, because since the typical tax form in Argentina may contain up to 60 separate pieces of information. Clearly, the computer resources cannot maintain a comprehensive, up-to-date registry of Argentine taxpayers—especially because those computer resources also must maintain a current-accounts system and a useful management information system.
Table 4.27. Argentina: Enforcement Personnel Costs and Collections, 1986-89 (Costs and revenues in millions of December 1989 US$)

<table>
<thead>
<tr>
<th>Measure</th>
<th>1987</th>
<th>1988</th>
<th>1989</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staffing</td>
<td>3,013</td>
<td>3,271</td>
<td>3,497</td>
</tr>
<tr>
<td>Enforcement personnel cost</td>
<td>13.2</td>
<td>14.1</td>
<td>13.3</td>
</tr>
<tr>
<td>Enforcement revenues</td>
<td>56.7</td>
<td>22.0</td>
<td>20.0</td>
</tr>
<tr>
<td>-VAT</td>
<td>3.0</td>
<td>11.0</td>
<td>1.3</td>
</tr>
<tr>
<td>-Income</td>
<td>22.4</td>
<td>4.66</td>
<td>0.5</td>
</tr>
<tr>
<td>-Net wealth</td>
<td>1.6</td>
<td>0.3</td>
<td>0.04</td>
</tr>
<tr>
<td>-Capital</td>
<td>9.1</td>
<td>3.1</td>
<td>0.16</td>
</tr>
<tr>
<td>-Excise</td>
<td>0.41</td>
<td>0.27</td>
<td>2.64</td>
</tr>
<tr>
<td>-Debits</td>
<td>na</td>
<td></td>
<td>0.003</td>
</tr>
<tr>
<td>-Other</td>
<td>20.2</td>
<td>2.6</td>
<td>15.3</td>
</tr>
<tr>
<td>Active taxpayer</td>
<td>3,406,034</td>
<td>2,889,397</td>
<td>1,889,778</td>
</tr>
<tr>
<td>Returns (thousands)</td>
<td>4,97</td>
<td>3,706</td>
<td>2,620</td>
</tr>
<tr>
<td>Enforcement personnel costs per revenues</td>
<td>.232</td>
<td>.641</td>
<td>.667</td>
</tr>
<tr>
<td>Enforcement personnel costs per taxpayer</td>
<td>3.87</td>
<td>4.87</td>
<td>7.04</td>
</tr>
<tr>
<td>Enforcement revenues per taxpayer</td>
<td>16.65</td>
<td>7.60</td>
<td>10.56</td>
</tr>
<tr>
<td>Enforcement personnel cost per return</td>
<td>2.93</td>
<td>3.80</td>
<td>5.08</td>
</tr>
</tbody>
</table>

275. Is the DGI’s taxpayer registration system flexible—can it easily handle changes in tax law and taxpayer characteristics or identities? The CUIT system is not as flexible as it should be. As already noted, the CUIT code includes two digits to indicate taxpayer status. This seemingly innocuous feature is likely to undercut the CUIT’s flexibility as tax laws change in ways that change particular taxpayers’ status or as individual taxpayers change their legal status—for example, from a partnership to a corporation. In such cases, a taxpayer might have to be assigned a new CUIT code, which could complicate tracing the account over the pre- to post-status-change period.

276. This inflexibility in the CUIT system can be fixed by eliminating from the code any digits that convey information about the taxpayer. That information should be coded in separate fields, so that changes in the values of any of those codes will not affect the individual’s identification code. Such a change would also simplify the assignment of CUIT codes.

277. Is the DGI’s taxpayer registration system useful—does the system permit cross-referencing and merging of information available to the tax administering agency about any taxpayer? The answer to this question is mixed. The switch to a one-code-per-taxpayer system has undoubtedly improved the ability of the CUIT system to cross-reference and merge information on any taxpayer from different sources, which is a great slide forward. However, the overwhelming magnitude of the registration task facing the DGI—and the limited resources the DGI has devoted to this task—have prevented the agency from regularly recording enough information on each taxpayer to make the system useful.
278. In Colombia the DIN began computerizing its income-tax current accounts system in the 1960s. Computerization of the current accounts system for excise and value added taxes began years later. With the establishment of widespread reliance on withholding—initiated in 1968 and significantly expanded in 1983, 1984, and 1985—and the 1986 shift of responsibility for receiving and recording tax returns to the commercial banks, maintaining the current accounts system became more unwieldy. This was both because the current accounts systems weren’t completely automated and because the DIN hadn’t established a well-functioning procedure for merging records from multiple sources. Between 1987 and 1988 all manual updating was finally eliminated and a new computerized master file was created. This was made possible by significant tax reforms—effective 1987-88—that eliminated most deductions, allowances, and tax credits, thereby reducing the complexity of tax returns. The reforms also eliminated the requirement that all supporting documents be submitted with each tax return—a requirement that had paralyzed the DIN’s returns-processing capacity. These reforms were followed by a major cleaning of the master file 1989-90.

279. The taxpayer registration system now in place is based on type of tax. Individual income taxpayers are automatically registered when they first file a tax return. Businesses subject to the sales taxes—VAT and excise taxes—are required to register directly with the tax administration. Once a taxpayer files a tax return, the system automatically checks electronically whether the taxpayer is in the register. Unregistered tax filers are automatically registered in the master file, the Registro Unico de Contribuyentes (RUT). Besides the annual updating of registrations on the basis of tax return filings, each of the thirty-one regional offices can electronically update taxpayer accounts in response to information obtained from taxpayer submissions of required change-of-status forms (daily), audits (quarterly), the Civil Register (biannually), or the Chamber of Commerce Association (annually).

280. The master file is divided into active and inactive. Accounts are considered inactive if they have shown no activity for more than four consecutive years. The master file includes the following information: the full name of the taxpayer (individual or firm), a taxpayer identification number and the taxpayer’s full address, type of economic activity, and type of tax obligations (for example, income tax, VAT, withholder, and self-withholder) (Table 4.28).

<table>
<thead>
<tr>
<th>Concept</th>
<th>Active Individuals</th>
<th>Corporations</th>
<th>Total</th>
<th>Subtotal</th>
<th>Inactive</th>
<th>Registered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income tax</td>
<td>799,514</td>
<td>159,331</td>
<td>958,845</td>
<td>224,436</td>
<td>1,183,281</td>
<td></td>
</tr>
<tr>
<td>Sales tax</td>
<td>51,344</td>
<td>50,214</td>
<td>101,558</td>
<td>49,011</td>
<td>150,569</td>
<td></td>
</tr>
<tr>
<td>Withholders</td>
<td>3,118</td>
<td>87,818</td>
<td>90,936</td>
<td>27,265</td>
<td>118,201</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>853,976</strong></td>
<td><strong>297,263</strong></td>
<td><strong>1,151,339</strong></td>
<td><strong>300,712</strong></td>
<td><strong>1,452,051</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: DIN

281. Access to registered taxpayer records is obtained using the taxpayer identification numbers. The DIN is working on a program to be able to retrieve records through their taxpayer identification numbers or their names. Normally a person’s taxpayer identification number is the taxpayer’s civil registry identification number. Businesses are issued separate taxpayer identification numbers. Each taxpayer in Colombia has a credit-card-type identification card issued by the DIN showing the taxpayer’s name and taxpayer’s identification number. This system has reduced multiple identification problems from multiple names for the same taxpayer, spelling errors, duplication of numbers,
homonyms, and so on. In addition, this identification card must be submitted when making tax payments. A required automatic computerized digital check of the taxpayer identification number on this identification card against the taxpayer identification number entered by the tax collector prevents completing a transaction until the entered taxpayer identification number passes this check. This procedure should greatly reduce errors in crediting tax payments to the correct-taxpayer accounts.

282. A comprehensive and accurate taxpayer registry must avoid errors of commission and of omission. Errors of commission occur when taxpayers are incorrectly registered or nontaxpayers are registered as taxpayer—for example, multiple entries for a single taxpayer, or entries for inactive taxpayers, such as defunct firms or deceased individuals. Errors of omission arise when taxpayers—such as new taxpayers—are not included in the registry. Avoiding errors of commission requires a systematic screening of existing registrations to check for data-entry errors or changes in status. Avoiding errors of omission requires a systematic search for additional entities to add to the roster. The DIN has procedures in place designed to monitor and reduce the incidence of both types of errors.

283. Since the reforms of 1987-88, the DIN attempts to minimize errors of commission and omission by its procedures for updating the tax registry, including the computerized checking of taxpayer identification numbers when tax payments are made. The DIN also automatically deletes any entry from the active taxpayer file that has been inactive for more than four years. This procedure still left a pool of roughly 95,000 registrations that had been inactive for one to four years—out of about 1.5 million total registrations as of January 30, 1991—whose status remained unclear.

284. Since 1989, the number of taxpayer registry errors has been drastically reduced. As of early 1991, such errors had been virtually eliminated. For instance, in May 1990 there were 24,553 detectable errors, but as of January 1991 the number of taxpayer registry errors had been reduced to 65. These figures represent just 2.1 percent and 0.005 percent, respectively, of all taxpayers in the active file. While these figures can only identify errors of commission, the significant jump in taxpayer registrations between 1988 and January 30, 1991—from 940,860 to 1,151,339 active taxpayer registrations, an increase in registrations of more than 22 percent—suggests that errors of omission also have been reduced.

285. The procedure for assigning taxpayer identification numbers exhibits the simplicity and flexibility advised by tax administration experts. Instead of trying to embed taxpayer information in the taxpayer identification number, the DIN uses an individual’s citizen or foreign identification number—as that individual’s taxpayer identification number. Businesses are assigned separate taxpayer identification numbers, but no attempt is made to use particular digits of the taxpayer identification number to convey particular bits of information. These procedures for assigning taxpayer identification numbers eliminate the problems that can arise when taxpayer characteristics change and information on those characteristics is part of the taxpayer identification number. Additional information is, as noted above, contained in the taxpayer file.

286. Not only is the assignment of taxpayer identification numbers kept deliberately and admirably simple, the DIN has also devised a particularly effective on-line computerized system for providing ready staff access to a taxpayer’s records. On-line access to the master file is possible through terminals in any of the thirty-one branches of the DIN serving twenty-nine cities in Colombia. This access is accomplished using the taxpayer identification number.

287. Indicators of the usefulness of the taxpayer registration system would include some measure of how much that system is used in other agency activities, such as checking of taxpayer current accounts. Unfortunately, the DIN does not appear to track taxpayer record usage. The recent reforms in the procedures for checking and updating records, and the recently implemented procedures for
validating taxpayer identification numbers with each tax return filing, however, should improve the usefulness of the information stored on that system by improving its accuracy. And, the simplicity of the taxpayer identification number assignment routine—the ready access to records in the master file—surely contributes to the usefulness of that system.

288. The number of registered taxpayers each year is recorded by the DIN, but the DIN does not separately track costs of specific activities, such as operating the master file system. It thus is not possible to directly assess the cost-effectiveness of this activity.

289. **Taxpayer current accounts.** In addition to being built on a good taxpayer registration system, a good current accounts system must be up-to-date, be able to track individual taxpayer tax payments, tax refunds, and tax liabilities, and be able to identify every taxpayer's current account balance at any time. The system also must be able to calculate totals and averages for such things as tax payments, tax liabilities, and tax account balances across taxpayers and within categories relevant for administrative decisions—for example, by type of tax; by year, quarter, or month; by type of taxpayer; and by method of payment. Where there is highly variable inflation, as is in Argentina, the current accounts system must be designed to reliably adjust all monetary figures for inflation.

290. As of 1990, the DGI in Argentina had no current accounts system. This was perhaps the single most serious shortcoming of the DGI's overall performance. By mid-January 1991, however, the DGI had implemented a current accounts system, known as DOSMIL, for its largest Buenos Aires-region taxpayers. This system is being replicated to accommodate the 40,000 largest taxpayers by March 1992. This is one track. It also is implementing a current accounts system—known as SICOFI—for smaller taxpayers.

291. The current accounts system is being implemented under contract with a private firm and will be managed by DGI's collections division. The contracting agency is to provide hardware and software to centralize all the information available to DGI collection agents. Every collection agent is to have access to a complete, up-to-date file on every taxpayer who might be the target of a collection effort.

292. However, the DGI has failed to make use of much of the information, that it requires taxpayers and their agents to provide. The typical tax form contains up to sixty items to be filled in by the registered taxpayer, but only a few of these items are maintained in a database. These include—for each tax administered by the DGI—the number of returns filed, tax revenues owed the government, tax revenues retained by the government after refunds, refunds to taxpayers, and tax revenues, by method of payment.

293. The recent reforms by the DIN in Colombia have significantly improved coverage and accuracy, allow almost instantaneous access to current accounts records, and have dramatically reduced the time required to update current accounts—although more improvement seems achievable. The average twenty-day period between a bank's receipt of tax filings and submission of that information to the DIN may prove difficult to reduce substantially, because that lag provides the compensation used to get the banks to cooperate. But the two-month lag between the DIN's receipt of those bank-submitted records and its updating of the current accounts could be dramatically reduced—if the DIN changed its procedures to verify only a sample of records from each bank.
Generating and maintaining third-party information

294. Third-party information is information made available to the tax administering agency that bears on the taxable transactions or tax liability of one taxpayer but is provided to the agency by some agent other than that taxpayer.

295. Argentina. The DGI has two sources of third-party information: SITER—the relevant economic transactions system—and withholdings. SITER is an on-line computer system that maintains records of all transactions exceeding a minimum threshold by the 200 largest firms in Argentina. These records identify the amount of the transaction and the identity of the reporting firm and the other firm or individual involved in the transaction. Minicomputers operated by DGI can use the system by entering an enterprise code or an individual tax identification code. SITER allows auditors to cross-check individual-firm tax returns for consistency with the transactions information reported by other firms. It is an auditing tool.

296. The basic idea behind SITER was sensible but it has proved impractical to implement. The small data base has limited SITER usefulness. As of July 1990, only the 1987 data base was available because the existing rented software can maintain only one year’s data at a time. Not surprisingly, few auditors have used SITER.

297. Colombia. Colombia began systematic checks of third-party information to identify tax evasion at least as early as 1974. The DIN’s "Red Light Program," initiated then was phased out after several years. Serious systematic checking of third-party information did not resume again until the Programa de Incorporación al Sistema Tributario Anual began in 1988. The PISTA is designed to compare taxpayers’ current accounts data with third-party data generated by such transactions as deposits in financial intermediaries equivalent to more than US$20,000, credit card transactions in excess of one million pesos (about US$2,000), auto sales through registered dealers, real property transfers in excess of 10 million pesos (about US$20,000), and payments to or by "large" taxpayers of more than one million pesos (US$2,000). By the end of 1990, however, only the first of these sources had actually been used—to identify about 5,000 nonfilers.

4.6. Preventing Taxpayer Noncompliance

298. Preventing taxpayer noncompliance requires that the tax administering agency direct noncompliance and enforce compliance. This section focuses on the two activities that require the tax administration to exercise the most discretionary judgment and that overlap least with previously discussed activities—auditing taxpayer returns and reviewing audit appeals.

Auditing

299. Using average indicators to assess the auditing performance of a tax administering agency requires—in addition to consideration of various institutional details—requires data on the level of demands placed on the auditing branch of the tax administration, audit resources used, the quantity and the quality of audit activities, and cost-effectiveness of those activities. Data on the level of demands on the audit section might include number of tax filers, and number of tax returns. Data on audit resources used might include number of auditors employed, spending on auditors, and spending on all audit activities. Data on the quantity of audit outputs might include number of audits, number of audits per return (audit incidence), audit-assessed tax liabilities, number of taxpayers found to owe additional taxes, and number of nonfilers detected. The first two of these output measures capture the level of audit activity, while the latter three measure different dimensions of the outputs of those activities.
300. Measures of the quality of audit activities might include the fraction of audit-assessed tax liabilities that are uncontested by taxpayers (measured either per return or per assessed liability), or the fraction of appealed audits that are ultimately upheld (measured either on a per-appeal basis or on a per-appealed-assessment-value basis). These data capture the accuracy of audits executed. Other measures of quality might include the fraction of audit-assessed tax liabilities that are collected (measured either on a per-return basis or on a per-assessed-liability basis), fraction of audits that yielded audit-assessed tax liabilities in excess of some benchmark, and average audit-assessed tax liability per audited return. The former measure captures a combination of audit accuracy and the effectiveness of follow-up collections efforts, while the last two capture the quality with which audits are targeted. Audit cost-effectiveness also can be measured as the ratio of tax revenues collected as a result of audits per the costs of resources used for audits.

301. Argentina. In addition to using average cost-effectiveness indicators to target audits, the DGI uses time-trends and cross-national comparisons of enforcement activities to improve productivity.

302. According to measures of quantity, audit performance appears to have deteriorated somewhat between 1986 and 1989, but made a major turnaround in 1990, when total audits, audits per auditor, total deficiency determinations, and deficiency determinations per audit all moved dramatically upward (table 4.16).

303. The few available measures of audit quality, however, undermine any sanguine view of the performance of the DGI's audit system during this time (table 4.29). First, from 96 to 100 percent of the tax collections that followed upon deficiency determinations in Argentina between 1986 and 1989—except in 1988, when this percentage fell to 53.3 percent—occurred only after an appeal or penalty—inducing delay by the taxpayer. Moreover, only a very small fraction of DGI-determined deficiencies result in additional tax payments in any given year. In 1990, when all of the measures of the quantity of audit activity peaked, this measure of the quality of the DGI audit system dropped to its lowest level—0.6 percent. It appears that DGI auditors have sacrificed quality to achieve quantity. This finding suggests that either the incentive structure that must face DGI auditors or that their work is being undermined by an ineffective collections system.

304. The most direct measure of the overall cost-effectiveness of the DGI's enforcement activities is enforcement personnel costs as a percentage of enforcement-generated tax revenues. In 1986-89, on average, the DGI brought in 100 Australes as a direct result of every 42.6 Australes it spent on enforcement.

305. But these revenues understate the full costs of generating tax revenues from enforcement activities, because the cost measure includes only personnel costs. Assuming that personnel costs are about 80 percent of the full enforcement costs, by 1989, the costs were 83.4 percent of revenues.

306. These average ratios for revenues as a percentage of total costs over 1986-89—ranging from 38.5 to 83.4 percent—can be compared to norms for tax administrations known for the efficiency of their enforcement efforts (table 4.30). Cost-effectiveness ratios for 1985-87 for enforcement activities of the Inland Revenue in the United Kingdom and the U.S. Internal Revenue Service rarely range above about 20 percent. The U.S. average for 1985-87 is 6.1 percent, and the United Kingdom Special Investigations average is 7.8 percent. The United Kingdom Local Offices Investigations average, on the other hand, is 14.8 percent.

307. Using these figures, a reasonable standard of enforcement performance would require a cost-yield ratio of less than 20 percent—less than one-fourth the DGI's 83.4 percent in 1986-89. Compared with the usual 6 to 8 percent ratios for the United Kingdom and the United States, the DGI's performance is more than ten times as inefficient.
Table 4.29. Argentina: Audit Performance Indicators, 1986-90

<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Audit Demands</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Returns*</td>
<td>3,870</td>
<td>3,902</td>
<td>3,279</td>
<td>2,375</td>
<td>998</td>
</tr>
<tr>
<td>Filers*</td>
<td>2,736</td>
<td>2,791</td>
<td>2,192</td>
<td>1,338</td>
<td>562</td>
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<tr>
<td><strong>Resources Employed</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Number of Auditors</td>
<td>1835</td>
<td>1876</td>
<td>1895</td>
<td>1918</td>
<td>1797</td>
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<tr>
<td><strong>Quantity of Audit Outputs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audits (Number)</td>
<td>171,190</td>
<td>113,912</td>
<td>65,073</td>
<td>56,870</td>
<td>111,435</td>
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<tr>
<td>Audit Incidence*</td>
<td>6.3%</td>
<td>4.1%</td>
<td>3.0%</td>
<td>4.3%</td>
<td>19.8%</td>
</tr>
<tr>
<td>Audits per Auditor</td>
<td>93.3</td>
<td>60.7</td>
<td>34.3</td>
<td>29.7</td>
<td>62.0</td>
</tr>
<tr>
<td>Assessed*</td>
<td>210,395</td>
<td>46,018</td>
<td>89,564</td>
<td>171,1089</td>
<td>662,802</td>
</tr>
<tr>
<td>Liabilities*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenue from audits*</td>
<td>21,629</td>
<td>36,109</td>
<td>19,050</td>
<td>1,976</td>
<td>3,880</td>
</tr>
<tr>
<td>Income</td>
<td>10,724</td>
<td>22,440</td>
<td>4,661</td>
<td>510</td>
<td>1,542</td>
</tr>
<tr>
<td>Value Added</td>
<td>2,314</td>
<td>2,965</td>
<td>10,964</td>
<td>1,269</td>
<td>2,312</td>
</tr>
<tr>
<td>Tax</td>
<td>6,718</td>
<td>9,081</td>
<td>3,080</td>
<td>158</td>
<td>20</td>
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<tr>
<td>Net Wealth</td>
<td>1,874</td>
<td>1,623</td>
<td>345</td>
<td>40</td>
<td>6</td>
</tr>
<tr>
<td>Uncollected Revenues*</td>
<td>188,767</td>
<td>9,909</td>
<td>70,414</td>
<td>169,133</td>
<td>658,922</td>
</tr>
<tr>
<td><strong>Quality of Audit Outputs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Targeting: Assessed</td>
<td>1229</td>
<td>404</td>
<td>1376</td>
<td>3009</td>
<td>5948</td>
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<tr>
<td>Liabilities per Audit (US$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy: Collected</td>
<td>10.3%</td>
<td>78.5%</td>
<td>21.3%</td>
<td>1.2%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Revenue as % of Assessment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Targeting and</td>
<td>126.3</td>
<td>317.0</td>
<td>292.7</td>
<td>34.7</td>
<td>34.8</td>
</tr>
<tr>
<td>Accuracy: Collected Revenue per Audit*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cost-Effectiveness:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enforcement</td>
<td>48.9%</td>
<td>23.2%</td>
<td>64.1%</td>
<td>66.7%</td>
<td>na</td>
</tr>
<tr>
<td>Personnel Costs as % of Audit Revenues</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Thousands
* Thousands of individual and corporate taxpayers. Many taxpayers file multiple returns.
* Number of audits per number of filers.
Source: World Bank staff calculations based on DGI data.

308. One way is to focus on the three types of audits conducted by DGI auditors. Internal audits (fiscalizaciones internas) are simple checks for internal consistency of the entries in a tax return or for consistency across years in what are typically stable tax-filer characteristics—for example, the number of dependents. In the last fifteen years, the average time required by DGI auditors to complete such
### Table 4.30. Tax Enforcement Cost-effectiveness Measures: U.K. and U.S.

<table>
<thead>
<tr>
<th>Enforcement Activity</th>
<th>1985</th>
<th>1986</th>
<th>1987</th>
</tr>
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<tbody>
<tr>
<td><strong>U.K. Investigations¹</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local Offices:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company Accounts</td>
<td>.137</td>
<td>.147</td>
<td>.145</td>
</tr>
<tr>
<td>Unincorporated Accounts</td>
<td>.185</td>
<td>.185</td>
<td>.172</td>
</tr>
<tr>
<td>Other</td>
<td>.083</td>
<td>.053</td>
<td>.063</td>
</tr>
<tr>
<td>Schedule D²</td>
<td>.270</td>
<td>.270</td>
<td>.278</td>
</tr>
<tr>
<td>Schedule E²</td>
<td>.083</td>
<td>.053</td>
<td>.062</td>
</tr>
<tr>
<td>PAYE audit</td>
<td>.179</td>
<td>.159</td>
<td>.156</td>
</tr>
<tr>
<td><strong>Special Operations:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special Investigations⁴</td>
<td>.0128</td>
<td>.0286</td>
<td>.0128</td>
</tr>
<tr>
<td>Enquiry Branch⁵</td>
<td>.0476</td>
<td>.0526</td>
<td>.0588</td>
</tr>
<tr>
<td>Special Office⁶</td>
<td>.0323</td>
<td>.0294</td>
<td>.0286</td>
</tr>
<tr>
<td>Section 739 Group⁷</td>
<td>.100</td>
<td>.0769</td>
<td>.0833</td>
</tr>
<tr>
<td>International Section⁸</td>
<td>.00909</td>
<td>.0111</td>
<td>.00351</td>
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<tr>
<td>Finance Division⁹</td>
<td>.250</td>
<td>.500</td>
<td>na</td>
</tr>
<tr>
<td><strong>U.S. Examinations¹⁰</strong></td>
<td>.0613</td>
<td>.0572</td>
<td>.0655</td>
</tr>
</tbody>
</table>

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² Active pursuit of ghosts and moonlighters.

³ Inspections of wage records of employers and construction industry contractors to check compliance and discourage fraud in the operation of PAYE and subcontractor deduction schemes.

⁴ Aimed at countering large scale tax avoidance.

⁵ Concentrates on detecting cases of fraud relating to business accounts, both for criminal prosecution and for money settlements.

⁶ Covers a variety of types of cases ranging from tax avoidance devices to evasion, persistent non-compliance and complex cases beyond the resources of local tax offices.

⁷ To prevent avoidance of income tax by the transfer of assets abroad.

⁸ Deals with major cases involving transfer pricing and controlled foreign companies.

⁹ Audits the systems operated by financial institutions making bulk claims for reimbursement of tax deducted at source from payments received.


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Audits have ranged from the 1987 low of 5.5 hours to a high of 28 hours in 1985. These audits averaged 16.2 hours over this 1975-87 period. These are not impressive figures for such perfunctory audits. Nonetheless, the dramatic reduction in 1987 is impressive. It is to be hoped that the 5.5-hour average of 1987 will be further improved.
309. To this end, the DGI should reconsider the technology it uses for these internal audits. From the information made available to the study team, it appears that most, if not all, internal audits are manually performed.

310. *External preventive audits* (fiscalizaciones externas preventivas) are cursory audits intended mainly to induce businesses to keep their tax returns honest. As explained to the study team, these audits consist mainly of visiting firms and visibly—but briefly—monitoring aspects of their operations and books to ensure that no obvious infractions of the tax laws exist. The audits should not be expected to yield as much additional tax revenues in the current period as other types of audits. Furthermore, these audits require personal visits if they are to have the desired impact on taxpayer behavior.

311. *External in-depth audits* (fiscalizaciones externas ordinarias) are detailed audits of returns that the DGI strongly suspects understate the taxpayer’s true tax liability. When such a taxpayer is among the largest in the nation, the audit includes a computerized cross-check of all the taxpayer’s transactions in the tax year against records of such transactions by other members of this same set of taxpayers. When the taxpayer is not among this set, the audit is accomplished entirely by hand, according to information made available to the study team.

312. The computerized cross-checking of the largest taxpayers is well-developed. But the omission of small taxpayers from the data base leaves large holes in the ability of this system to accurately peg discrepancies. These holes are likely to result in both too many discrepancies being unearthed and in auditors finding it difficult to discriminate between promising discrepancies—those likely to lead to the detection of tax evasion—and misleading discrepancies.

313. The measures suggested to reduce the risk of collusion in preventive audits apply here. And, a management information system designed to allow DGI to regularly—annually—assess the cost-effectiveness of preventive audit policies would also serve to assess the cost-effectiveness of external in-depth audits.

314. *Colombia.* Many DIN auditing procedures were dramatically revamped in 1986-88. The most important reform uses a computer cross-check and automatically generate better when discrepancies are found to encourage taxpayers to correct understatements of their tax liabilities without the DIN having to conduct a full-scale audit. This procedure provides significant incentives for taxpayers to confess to underreporting of their taxable base, because doing so reduces underreporting penalties. The procedure also encourages taxpayers to confess earlier instead of later, because the underreporting penalties increase at each round of this procedure—as does interest on late tax payments. And, this procedure does not penalize honest taxpayers who accurately state their taxable base in their initial tax return. Insofar as this procedure succeeds in inducing underreporters to accurately report their taxable bases—without costly audits—it should dramatically increase the cost-effectiveness of DIN’s enforcement.

315. The DIN supplements this procedure for soliciting “voluntary” taxpayer revisions with computerized arithmetic checks of returns and checks of its taxpayer information system to identify stop-filers—taxpayers failing to file returns in one year after having filed returns the previous year. Both of these computerized checking procedures—and the procedure for inducing “voluntary” taxpayer revisions by use of the DIN’s third-party information system—appear to be quite productive (of quantity) (table 4.31).
### Table 4.31. Colombia: Tax Enforcement Activities and Products

<table>
<thead>
<tr>
<th>Activity responsible for tax returns corrections</th>
<th>Number of taxpayers with corrections</th>
<th>Revenues due to corrections (millions of US$)</th>
<th>Revenue per corrected return (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Computerized Checks</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Third-party information cross-checks(^a)</td>
<td>17,475</td>
<td>126.2</td>
<td>7,224</td>
</tr>
<tr>
<td>Arithmetic checks(^b)</td>
<td>9,353</td>
<td>67.4</td>
<td>7,206</td>
</tr>
<tr>
<td>Stop-file checks(^c)</td>
<td>31,407</td>
<td>146.7</td>
<td>4,671</td>
</tr>
<tr>
<td><strong>Total Computerized Checks</strong></td>
<td>58,235</td>
<td>340.3</td>
<td>5,844</td>
</tr>
<tr>
<td><strong>Audits(^d)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income Taxes</td>
<td>9,203</td>
<td>34.5</td>
<td>3,753</td>
</tr>
<tr>
<td>Value Added and Consumption Taxes</td>
<td>1,266</td>
<td>4.6</td>
<td>3,610</td>
</tr>
<tr>
<td><strong>Total Audits</strong></td>
<td>10,469</td>
<td>39.1</td>
<td>3,735</td>
</tr>
</tbody>
</table>

Source: DIN  
Note: All currency figures are in 1988 US$.

\(^a\) Figures reflect numbers of self-corrections of 1988 returns resulting from third-party information cross-checks.  
\(^b\) Figures reflect arithmetic corrections of 1987 returns.  
\(^c\) Figures reflect stop-filers detected for 1987 returns.  
\(^d\) Figures reflect audits of 1988 returns that yielded additional revenues. Non-revenue-yielding audits are not included in these figures.

### 316. However, by the end of 1988 the DIN had not yet adjusted its allocation of resources to audit activities to reflect the auditors’ reduced productivity. Implementing the three types of computerized checks of taxpayer returns in 1988 replaced labor-intensive audits with a cheaper, more efficient way to locate the easy-to-identify underreporters. Auditors are left with more time-consuming and less remunerative returns to audit (tables 4.32 and 4.33).

### 317. This pattern of dramatically declining input is to be expected when a new technology creeps off the easy-to-detect underreporters, and management does not respond by reducing resources devoted to the older, less efficient technology—in this case, labor-intensive audits.

### 318. Three pieces of information do shed some light on the quality of DIN audit activities. First, if assessed liabilities per audit suggest anything, it is that the targeting of income tax audits may have improved slightly in 1981-88, but the targeting of VAT audits exhibited no clear trend.

### 319. Second, value added audit appeals tended to be upheld much less consistently than income tax appeals in the early 1980s, but by 1986 deficiency determinations under both the VAT and the income taxes were upheld at roughly equal rates. Such a measure produces a lag in DIN auditing output by
Table 4.32, Colombia: Income Tax Audit Performance Indicators, 1981-88

<table>
<thead>
<tr>
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<td></td>
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<tr>
<td>Filers*</td>
<td>2296</td>
<td>2533</td>
<td>2654</td>
<td>3307</td>
<td>1336</td>
<td>1284</td>
<td>1120</td>
<td>1537</td>
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<td>Resources used</td>
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<tr>
<td>Number of auditors</td>
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<td>1191</td>
<td>1191</td>
<td>1192</td>
<td>1192</td>
<td>1192</td>
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<tr>
<td>Audit costsb</td>
<td>4.55</td>
<td>4.46</td>
<td>4.45</td>
<td>4.71</td>
<td>4.30</td>
<td>4.03</td>
<td>4.04</td>
<td>4.30</td>
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<tr>
<td><strong>Audit outputs</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audits*</td>
<td>106.2</td>
<td>113.6</td>
<td>231.5</td>
<td>67.4</td>
<td>86.7</td>
<td>68.0</td>
<td>49.4</td>
<td>9.2</td>
</tr>
<tr>
<td>Audit incidencec</td>
<td>4.6</td>
<td>4.5</td>
<td>8.7</td>
<td>2.0</td>
<td>6.5</td>
<td>5.3</td>
<td>4.4</td>
<td>0.6</td>
</tr>
<tr>
<td>Audit per audit</td>
<td>89</td>
<td>95</td>
<td>195</td>
<td>57</td>
<td>73</td>
<td>57</td>
<td>41</td>
<td>8</td>
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<tr>
<td>Assessed liabilities</td>
<td>na</td>
<td>220.8</td>
<td>183.6</td>
<td>133.0</td>
<td>112.4</td>
<td>149.0</td>
<td>101.8</td>
<td>34.5</td>
</tr>
<tr>
<td><strong>Accuracy:</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Percentage of value</td>
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<td>of appealed audit</td>
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<td></td>
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<td>nation upheld</td>
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<td>37.8</td>
<td>44.7</td>
<td>27.6</td>
<td>31.7</td>
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<tr>
<td><strong>Targeting:</strong></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
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<td>Assessed liabilities</td>
<td>na</td>
<td>1944</td>
<td>793</td>
<td>1973</td>
<td>1297</td>
<td>2191</td>
<td>2062</td>
<td>3753</td>
</tr>
<tr>
<td>per audit (US$)</td>
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</tr>
<tr>
<td><strong>Cost-Effectiveness</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enforcement Costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>as percent of assessed liabilities</td>
<td>na</td>
<td>2.02</td>
<td>2.42</td>
<td>3.54</td>
<td>3.82</td>
<td>2.70</td>
<td>3.97</td>
<td>12.45</td>
</tr>
</tbody>
</table>

* Thousands.

b In millions of 1988 US dollars.

c Thousands of audits completed yielding positive deficiency determinations.

d Number of audits per number of filers.

Source: DIN data. World Bank staff calculations.

about one to two years during this period—because of the legally allowed time for appeals to be filed and to be resolved in Colombia. In 1982-84, 42.5 percent of the value of VAT appeals that were resolved were resolved in favor of the DIN, but only 25.7 percent of the value of income tax appeals were resolved in the DIN’s favor. In 1986-88, however, these ratios were more nearly equal.
<table>
<thead>
<tr>
<th>Table 4.33. Colombia: Value Added and Consumption Tax Appeals Performance Indicators, 1981-88</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Appeals Demands</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Audits</td>
</tr>
<tr>
<td>10,649 10,144 11,654 5,605 5,203 3,973 4,053 1,266</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Resources Employed</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Appeals staff</td>
</tr>
<tr>
<td>43 43 44 44 46 46 46 46</td>
</tr>
<tr>
<td>Appeals admin. costs*</td>
</tr>
<tr>
<td>251.4 255.0 248.8 259.0 236.2 223.5 207.3 236.7</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Quantity of Appeals Outputs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Number of appeals rulings</td>
</tr>
<tr>
<td>658 689 437 833 850 1,048 467 2,067</td>
</tr>
<tr>
<td>Appeals rulings per staff</td>
</tr>
<tr>
<td>15 16 10 19 18 23 10 45</td>
</tr>
<tr>
<td>Staff-days per appeals ruling</td>
</tr>
<tr>
<td>14.7 14.0 22.7 11.9 12.2 9.9 22.2 5.0</td>
</tr>
<tr>
<td>Value of appeals cases resolved</td>
</tr>
<tr>
<td>na 7.93 5.76 12.12 15.37 11.45 6.67 22.88</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Quality of Appeals Outputs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Average length of appeals process</td>
</tr>
<tr>
<td>unknown</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Cost-Effectiveness</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Cost per appeal resolved</td>
</tr>
<tr>
<td>382 370 570 311 278 213 444 115</td>
</tr>
<tr>
<td>Value of appeals resolved per appeals cost</td>
</tr>
<tr>
<td>na 31.1 23.1 46.8 65.1 51.2 32.2 96.6</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Source: World Bank staff calculations based on DIN data.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>** Assuming 225 working days per staff per year.</td>
</tr>
<tr>
<td>** In 1988 US$.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>to each other: 34.4 percent of VAT appeals and 38.2 percent of income tax appeals were upheld. In short, DIN auditors appear to have been making increasingly more defensible deficiency determinations under the VAT and consumption taxes, but to have been making increasingly less defensible deficiency determinations under the income tax. This is despite the fact that the number of audits completed per auditor has declined dramatically over this period both for VAT audits and for</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
income tax audits. It is unclear precisely what accounts for these differential changes in this measure of the accuracy of VAT versus income tax audits in Colombia.

320. A third piece of information exists for income tax audits but not for VAT audits. Separate data compiled by the DIN identify total income tax audits and the numbers of income tax audits that yielded positive values for additional assessed tax liabilities. These data reveal that between 1984 and 1987 targeting of DIN income tax audits steadily deteriorated, but 1988 saw a dramatic improvement in that targeting (table 4.34). It is likely that the computerization improvements in the current accounts system and in the third-party information tracking system (PISTA) were at least partly responsible for this dramatic improvement. This appears especially likely, because the difficulty of detecting deficiencies through audits should have increased significantly by 1988 because of implementation of the aforementioned procedures that, by 1988, screened out the easy-to-identify underreporters without the use of an audit.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total audits</th>
<th>Audits with positive deficiency determinations</th>
<th>Percentage of audits with positive deficiency determinations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>65,297</td>
<td>27,128</td>
<td>41.5</td>
</tr>
<tr>
<td>1985</td>
<td>84,993</td>
<td>22,601</td>
<td>26.6</td>
</tr>
<tr>
<td>1986</td>
<td>66,069</td>
<td>18,372</td>
<td>27.8</td>
</tr>
<tr>
<td>1987</td>
<td>48,267</td>
<td>7,826</td>
<td>16.2</td>
</tr>
<tr>
<td>1988</td>
<td>12,980</td>
<td>9,203</td>
<td>70.9</td>
</tr>
</tbody>
</table>

Source: Colombia, Finance Ministry. World Bank calculations.

321. The conventional measure of the cost-effectiveness of auditing activities of tax administering agencies is the ratio of audit costs to additional tax revenues generated as a consequence of those audits and data from the United States and the United Kingdom suggest that cost-to-yield ratios of 6 to 8 percent—certainly not more than 20 percent—are reasonable.

322. Unfortunately, the DIN does not track enforcement-generated revenues, so these ratios cannot be constructed. Instead, the DIN maintains data on the deficiency determinations of their auditors. Because not all these deficiency determinations are collected, such data certainly will overstate audit-generated revenues. Those ratios for VAT and income tax audits are generally within international standards of audit cost-effectiveness throughout most of 1981-87, but fall well outside the range of acceptable cost-effectiveness in 1988 for audits of returns under both of these taxes. Moreover, because the denominators of the ratios reported in these tables overstate audit-generated revenues, there is reason to question whether—at least for the VAT—the DIN has met international standards of audit cost-effectiveness during most of the 1980s. Once again, the pattern of cost-effectiveness revealed in these tables fits the hypothesis that by phasing in a new, more efficient technology for
detecting underreporters in the late 1980s, the DIN has skimmed off the easy-to-detect underreporters, leaving only the more difficult cases for its auditors.

**Enforcing compliance**

323. Enforcement compliance consists of collecting delinquent taxes and reviewing appeals—administratively or judicially. This section focuses on the appeals process. Precisely which institutional details to review can only be determined upon close examination of a given agency. But, for example, the magnitude of demands on the appeals arm of a tax administering agency can be measured using indicators such as number of audited taxpayers, number of appeals filed, and value of appeals filed. Resources used to meet these demands can be captured by measures such as number of appeals staff and total administrative costs of appeals processing. Measures of appeals output include number of appeals resolved, value of appeals resolved, appeals resolved per judge or per appeals employee—or, judge-days or staff-days per resolved case. Measures of appeals quality include average length of appeals process, fraction of the appeals board’s decisions that are appealed, and fraction of appeals board’s decisions that are overturned. And, cost-effectiveness can be measured either as the ratio of appeals resolved to appeals administrative costs or cost per resolved appeal.

324. **Argentina.** Whenever the DGI determines that a taxpayer owes additional taxes, the taxpayer must pay that additional tax liability, appeal it, or face fines for noncompliance. Judging by the available data on tax payments by taxpayers determined by the DGI to owe additional taxes, most such taxpayers choose to appeal or pay fines. From 96 percent to almost 100 percent of the tax collections that followed deficiency determinations between 1986 and 1989—not except in 1988, when this percentage fell to 53.3 percent—occurred only after an appeal or penalty-inducing delay by the taxpayer. Moreover, only a very small fraction of DGI-determined deficiencies result in additional tax payments in any given year. Although that fraction jumped to 78.5 percent in 1987, it averaged only 15.2 percent over this period.

325. Taxpayers in Argentina can appeal a DGI tax or penalty determination within fifteen days of receiving notification of that determination. Formal appeals must be lodged with the Tribunal Fiscal and the DGI must be notified of the appeal. Decisions of the Tribunal Fiscal can be appealed to the national court of appeals—an administrative court.

326. Appeals of tax determinations can be lodged with the Tribunal Fiscal prior to paying the DGI-determined tax bill. Appeals of the tribunal’s judgments, however, can only be made upon payment of the tribunal-determined tax liability. Appeals of fines or penalties can be made to both bodies without prior payment of the fines or penalties.

327. An appraisal of the Tribunal Fiscal’s performance can shed light not only on how well that agency satisfies its mandate, but also on how accurately DGI’s auditors have determined taxpayer arrears. The Tribunal Fiscal produces a complex service—judgments of appeals by taxpayers about the DGI’s determinations of their arrears, penalties, or both. No simple measure can capture all the dimensions of this service. The Tribunal Fiscal generates very little information on measurable demands—resource usage, output quantities or qualities, or cost-effectiveness. Two pieces of information that the tribunal does record are the number of judgments rendered each year, and the number of its employees, by type of employee. But additional data would be needed to assess performance.

328. Thus, the World Bank study team’s random sample of 591 cases resolved by the Tribunal Fiscal in 1989—to generate additional data—partly to illustrate the types of data the tribunal should regularly compile to effectively monitor its own performance (table 4.35). The capital, income, and value added taxes generated disproportionate numbers of appeals. This pattern is consistent with the
hypothesis—mentioned earlier—that capital, income, and value added tax liabilities are substantially more difficult to determine, and, thus, are much more likely to be disputed than are bank debit and excise taxes. Such differences in the difficulty of determining tax liabilities are also likely to influence the difficulty of adjudicating appeals. This underscores the importance of maintaining data by type of tax on judgments and resources devoted to making those judgments, to be able to control for differences in the demands placed on the Tribunal Fiscal by different types of appeals.

<table>
<thead>
<tr>
<th>Tax</th>
<th>Appeals</th>
<th>Total tax revenues</th>
<th>Multiple</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Added</td>
<td>32%</td>
<td>18.5%</td>
<td>1.7x</td>
</tr>
<tr>
<td>Income</td>
<td>30%</td>
<td>10.0%</td>
<td>3.0x</td>
</tr>
<tr>
<td>Capital</td>
<td>15.8%</td>
<td>4.7%</td>
<td>3.4x</td>
</tr>
<tr>
<td>Excises</td>
<td>9.7%</td>
<td>30.4%</td>
<td>0.3x</td>
</tr>
<tr>
<td>Debits</td>
<td>&lt;2%</td>
<td>10.0%</td>
<td>&lt;0.2x</td>
</tr>
<tr>
<td>Net Wealth</td>
<td>&lt;2%</td>
<td>0.6%</td>
<td>na</td>
</tr>
</tbody>
</table>

na = could not be calculated
Source: World Bank sample of Tribunal Fiscal files.

329. If the Tribunal Fiscal were to collect data such as this each year, variations in these averages over time could show, say, whether the tribunal’s judges’ productivity was increasing or decreasing.

330. The World Bank’s random sample revealed that slightly more than 60 percent of the DGI audits were upheld. To ascertain whether 60 percent shows good or poor performance by DGI auditors would require comparable figures for other administrative tax appeals boards or for the Tribunal Fiscal in other years.

331. Colombia. Before 1970 appeals of DIN tax deficiency determinations could languish in the DIN’s administration for up to four years without the taxpayer having any legal recourse. Moreover, if that appeals body failed to make a finding by the end of the four years the appeal was automatically considered to have been resolved against the taxpayer. If the DIN did not find in the taxpayer’s favor, the taxpayer could appeal to the Litigation Administration (Contencioso Administrativo) or the State Council (Consejo de Estado), either of which was allowed four more years to resolve a case. Because DIN’s appeals court apparently tended to pone ruling on appeals before it, appeals could easily take four to eight years to resolve. This might be viewed favorably by taxpayers with spurious appeals—especially during periods of rapid inflation—these long delays and the legal presumption against the taxpayer might not be so desirable to taxpayers with legitimate appeals.

332. Between 1970 and 1977 the legislature reduced the period allowed for the administrative review board to consider an appeal to two years and shifted the presumption of correctness—failure to reach a judgment—to be in favor of the taxpayer. These legislative changes also required that judges be randomly assigned to cases—to undermine the ability of those in charge of assigning cases to engage in corrupt practices. But the system still left sizable incentives for spurious appeals, because those appeals could still postpone payment of tax liabilities for up to four years—two years in the initial appeal and an additional two years upon appeal of a negative finding in the first appeal.
333. To reduce the incentives to use appeals simply to postpone payment of tax deficiencies, Colombian tax law was rewritten to require taxpayers filing appeals to deposit with the DIN the full amount of taxes being disputed before to filing an appeal. The DIN is required to reimburse the taxpayer when the appeals process is complete—for any amounts deposited exceeding the amount determined by the appeals process to be due.

334. These reforms also limited taxpayers to a single appeal. The combination of a two-year limit on appeals, a limit of one appeal per case, and the required deposit of all appealed deficiency determinations have apparently contributed to a reduction in the number of appeals—and the appeals backlog. The DIN process—previously discussed—that allows taxpayers to make self-corrections before being formally audited, also has apparently helped reduce the number of appeals in the opinion of DIN officials.

335. The DIN does maintain data that can be used to assess the performance of its appeals arm. But no measures of appeals quality could be found. And, these available data fail to sort according to date of initiation of an appeal and type of appeal—except that they distinguish between appeals of income tax deficiency determinations, and value added and other consumption tax deficiency determinations.

336. The DIN completes roughly ten times as many income tax audits each year as VAT and other consumption tax audits. Moreover, the patterns of changes in completed audits over 1981-88 suggest that demands on the DIN appeals arm DIN probably declined dramatically between the early and late 1980s. Total income tax audits completed—and VAT and consumption tax audits—fell after 1983. Because completed audits represent the base from which appeals are likely to arise, it is likely that the number of appeals initiated has declined as well, although there may be up to a one-year lag between the pattern of audits completed and appeals initiated.

337. Although the magnitude of demands on the DIN appeals arm has apparently been declining since about 1983, the DIN management has kept resources devoted to this task virtually unchanged during 1981-88. Total appeals staff devoted to income tax appeals has remained virtually fixed at 165 to 168, and appeals staffing devoted to VAT and consumption tax appeals also has remained essentially fixed at 43 to 46. Real costs have also fluctuated little for these appeals boards.

338. The ratio of income tax audits to VAT audits completed has hovered around 10:1 in 1981-88, but the ratio of income tax appeals resolved to VAT appeals resolved has fluctuated between 1.7:1 (1988) and 13.4:1 (1983). The number of income tax appeals judgments has fluctuated much more in 1981-88 than have VAT and other consumption tax appeals judgments.

339. The fact that judgments under both types of taxes bottomed out in 1987 and increased dramatically in 1988 appears to reflect the untenable appeals situation that helped to prompt the 1988 reforms altering the incentives for taxpayers to file appeals—and the initial impacts of those reforms. Reasons for the 1983-84 peak in income tax appeals judgments and the 1984-86 peak in VAT and other consumption tax judgments are unclear, especially because those peaks cannot be attributed to greater-than-average resources being devoted to those kinds of appeals in those years.

340. The pattern of cost-effectiveness of the appeals arm of the DIN mirrors its output and productivity patterns in 1981-88. The cost-effectiveness of VAT appeals procedures has fluctuated in 1981-88 much more than that for income tax appeals procedures. Cost-per-case ratios for VAT appeals were higher than cost-per-case ratios for income tax appeals at the beginning of the period, but were lower than those for income tax appeals by 1988.
4.7 Allocating Agency Resources

341. This section focuses on tax administration tasks that bridge the activities already analyzed. Management must decide how much of the agency’s resources to devote to each activity and subactivity.

342. **Productivity measures.** The DGI does not maintain accessible data on its full costs. Instead, its maintains personnel records reveal that total personnel costs in 1986-89. DGI personnel costs averaged 0.94 percent of revenues, beginning the period at 0.71 percent of revenues and ending at 1.08 percent of revenues. But personnel costs are only part of operating costs. Assuming that labor costs account for about 80 percent of all DGI costs, total DGI costs would have averaged about 1.25 percent of tax collections—or, total administration costs averaged 1.38 percent of revenues. These levels of costs relative to revenues are not out of line with the tax administration experience of other countries. In developed countries, administration costs are generally around one percent of collections.40

343. The DGI and DIN fail to identify activity-specific costs for a long enough time series to permit estimation of the marginal contributions of each activity to total tax collections. Thus, it was not possible to analyze whether the DGI’s management has efficiently allocated its resources. So, this section sets a more modest agenda to give some sense of the cost-effectiveness of agency operations.


345. DIN tax administration costs ranged between $1.72-$1.29 (constant-1988 US$) in 1985-88, and were 1.33 percent of total revenues in 1988 (table 4.37).

346. **A management information system.** A useful management information system must be able to provide accurate data on outputs (for example, tax revenues) and on inputs (for example, number of staff-hours of work, wage rates, rental values of capital equipment, and costs of various supplies). The system must be able to flexibly combine these data by the type of management decision or issue at hand—for example, by activity or subactivity. The system must keep all data current. In Argentina this requires updating the data file continuously as new data on input usage or tax receipts become available—and also systematically and automatically adjusting all monetary values inflation. The system must be user-friendly—readily available to managers and easy enough for them to use that they do so.

347. The DGI has no management information system. Because it has no current accounts system, it cannot easily generate systematic and comprehensive data on taxpayer current-account balances. The agency does have computerized records of its employees, categorized in a number of ways. But these data are not easily used. In fact, DGI management makes very little use of the few computerized data bases on a sizable mainframe computer. Most data used for management decisions are compiled by hand. Often, inaccurate or misleading information is used for important management decisions—for example, tax revenues or other monetary measures are often totaled without any adjustments for inflation.

4.8 **Summary of Findings about the Agencies’ Performance**

348. The DGI faces an extraordinarily difficult task. It must collect a wide variety of taxes for which the procedural and the substantive laws change often—and significantly. Inflation in Argentina has added difficulty to the agency’s mandate—by complicating the procedures that must be used to
Table 4.36. Argentina: Overall Tax Revenue and Cost Comparisons, 1986-89

<table>
<thead>
<tr>
<th>Measure</th>
<th>1986</th>
<th>1987</th>
<th>1988</th>
<th>1989</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Revenue(^a)</td>
<td>6,621</td>
<td>5,189</td>
<td>4,611</td>
<td>4,356</td>
<td>5,194</td>
</tr>
<tr>
<td>Total Personnel(^b) costs</td>
<td>46.7</td>
<td>49.9</td>
<td>51.8</td>
<td>46.9</td>
<td>48.8</td>
</tr>
<tr>
<td>Personnel costs per tax revenue(^b) (%)</td>
<td>.71</td>
<td>.96</td>
<td>1.12</td>
<td>1.08</td>
<td>.34</td>
</tr>
<tr>
<td>Total Number of tax returns(^b)</td>
<td>4,241</td>
<td>4,49</td>
<td>7,706</td>
<td>2,620</td>
<td>3,766</td>
</tr>
<tr>
<td>Personnel costs per tax return(^b)</td>
<td>11.02</td>
<td>11.09</td>
<td>13.96</td>
<td>17.88</td>
<td>12.90</td>
</tr>
<tr>
<td>Number of registered taxpayers(^b)</td>
<td>555.6</td>
<td>738.2</td>
<td>370.2</td>
<td>421.4</td>
<td>521.4</td>
</tr>
<tr>
<td>Personnel Costs per Registered Taxpayer(^b)</td>
<td>84.14</td>
<td>67.53</td>
<td>139.79</td>
<td>111.18</td>
<td>93.60</td>
</tr>
</tbody>
</table>

\(^a\) In million pesos, December 1989 (US$).
\(^b\) Per tax return.
\(^c\) In December 1989 US$.

Determine tax liabilities (and make their records comparable over time) and by undermining the willingness of taxpayers to voluntarily comply with the tax laws. In addition, the thriving underground economy in Argentina makes tax collection even more difficult.

349. The task of the DIN is not quite as daunting as the DGI's task—because Colombian tax law has been more stable. And, recent changes in the Colombian income tax laws have both reduced the complexity of the income tax laws and returns that DIN must administer—and dramatically reduced the number of individuals required to file income tax returns.

Facilitating taxpayer compliance

350. A tax administering agency facilitates taxpayer compliance by providing taxpayer services and collecting compliance-generated tax revenues.

Table 4.37. Overall Cost-effectiveness of the DIN, 1985-88

<table>
<thead>
<tr>
<th>Year</th>
<th>Costs</th>
<th>Revenues</th>
<th>Cost/Rev</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>29,520</td>
<td>1714.149</td>
<td>1.72</td>
</tr>
<tr>
<td>1986</td>
<td>27,678</td>
<td>1937.866</td>
<td>1.43</td>
</tr>
<tr>
<td>1987</td>
<td>27,772</td>
<td>2160.376</td>
<td>1.29</td>
</tr>
<tr>
<td>1988</td>
<td>30,098</td>
<td>2257.486</td>
<td>1.33</td>
</tr>
</tbody>
</table>

\(^a\) Total administration and operating costs in millions of 1988 US$.
\(^b\) Total tax revenues in millions of 1988 US$.
\(^c\) Costs expressed as a percentage of revenues.
351. **Argentina.** Several important points can be made about the DGI’s performance. The large number of forms that taxpayers and their agents in Argentina must file, and the fact that many of these forms must be filed biweekly or monthly, is likely to inhibit taxpayer compliance. The number and frequency of these forms results from the large numbers of taxes and the highly unstable and inflationary environment. But the forms pose a significant burden upon taxpayers and their agents—which seems likely to undermine voluntary compliance. The DGI dramatically reduced the number of forms required of taxpayers and their agents in 1987. While this revision of DGI procedures and forms may have reduced compliance costs borne by taxpayers and their agents, it was beyond the scope of this study to definitively measure the effects of this reform on those compliance costs. The four basic transactions through which taxpayers and their agents make voluntary tax payments—withdrawals, sworn taxpayer returns, estimated tax payments, and payments to balances—do not appear equally cost-effective. It is thus recommended that the DGI figure out its costs for processing each of those types of transactions, and—if they are found to differ in cost-effectiveness—reallocates the agency’s compliance-collections resources. The DGI appears to have dramatically increased the average compliance-generated tax payment by enforcing a revised adjustment formula for late tax payments, which adjusts liabilities for inflation and the opportunity costs imposed upon the Treasury for having to make implicit loans to delinquent taxpayers.

352. Although it is not possible with the limited information available to the study team to reach an unequivocal assessment of the DGI’s performance in facilitating taxpayer compliance, the available evidence seems to suggest that the DGI is doing a good job, given the tumultuous environment in which it operates. Although the GDP has declined markedly in recent years, and the number of registered taxpayers has declined precipitously since 1987, total compliance-generated tax revenues have declined only slightly.

353. **Colombia.** In Colombia, the burdens on taxpayers have been noticeably reduced in recent years. Colombia appears to require taxpayers to make fewer submissions and to fill out fewer and shorter forms than does Argentina.

354. **By taking advantage of the well-developed commercial banking system in Colombia and by eliminating excessive documentation requirements for tax returns, the DIN also has been able to both improve its tax filing processing performance—with reduced error rates and increased numbers of tax returns processed—while reduce overall systems costs per tax return. This improvement has been accompanied by increased equity in the tax system because of the dramatic increase in the zero-tax-bracket level of income—from the rough equivalent of US$14 to US$5,086 between 1985 and 1986—and reductions in the marginal income tax rates applying to people in the lowest taxable income brackets (from 10 percent in 1982 to 0.05 percent by 1989). However, the DIN’s practice of checking every single tax return record submitted to it by the commercial banks could probably be made more cost-effective by resorting to sample checks of returns.

355. **Last, the DIN does not maintain data that would allow direct identification of the cost-effectiveness of its withholding arrangements. But, the tax withholding system, which covers about 90,000 withholding, appears to have evolved into a fairly effective system for facilitating taxpayer compliance. That system has been responsible for an increasing share of the DIN’s revenues in the 1980s—increasing from 32 percent of revenues in 1984 to roughly 50 percent in 1987-89. A 32 percent increase in withholding revenues between 1988 and 1989 probably partly reflects the 1989 implementation of the DIN’s unique system allowing withholding of tax obligations of suppliers by designated firms purchasing inputs from those suppliers. The DIN’s heavy reliance on the private sector to accomplish withholding probably means that DIN’s costs per withholding filing, and per withheld tax revenues, are low.**
Monitoring taxpayer compliance

356. To monitor taxpayer compliance, a tax administering agency must create and maintain a taxpayer current accounts system—and generate and maintain third-party information.

357. The cost-effectiveness of exploiting third-party sources of information might be captured through measures such as the ratio of costs of this activity per new taxpayer added to the tax registry as a direct result of the third party information system, or the ratio of costs of this activity per currency value of unreported taxable transactions identified through this third-party information system. Unfortunately, neither Argentina nor Colombia maintained records that allow either of these cost-effectiveness measures to be calculated. It is, thus, recommended that the DGI in Argentina and the DIN in Colombia devise means of recording and summing by date (year and month) three types of information: the number of taxpayers registered as a direct consequence of being identified through the third party information system (coded in the taxpayer registry system), the currency value of unreported taxable transactions detected by the third party information system (to be incorporated in the taxpayer auditing management information system), and current period expenditures made on the third party information system (To be tracked in the agency’s management information system).

358. Argentina. The DGI’s efforts to monitor taxpayer compliance receive mixed reviews. The DGI’s performance at both identifying taxpayers and transactions has improved in recent years, and plans to implement a current accounts system promise to improve that performance more. The DGI must, however, proceed carefully with the design and implementation of that current accounts system to assure that it will provide timely, reliable, useful information that is appropriately adjusted for inflation.

359. The 1987 law requiring that all taxpayers be assigned a single taxpayer identification code provided an important step toward improving the taxpayer registration system in the DGI. Unfortunately, the DGI’s implementation of that mandate has not simplified that process as much as it could have. By requiring registrants to file a 112-line form, the DGI posed probably-unnecessary impediments to voluntary compliance with the universal tax registration requirement. And, by including fields in the taxpayer identification code—the CUIT—that indicate taxpayer status characteristics, the DGI unnecessarily reduced the flexibility of its tax registration system. Changes in tax laws or taxpayer status characteristics can conceivably require changing individual taxpayer CUITs, thereby undermining the ability of the DGI to track such a taxpayer’s account over time.

360. Furthermore, data on the number of registered taxpayers for the years 1986-89, compared with GDP data for this same period, suggest that the DGI has, since the adoption of the CUIT system, been failing to register an increasing portion of taxpayers.

361. Although less than stellar implementation of a uniform taxpayer registration system is somewhat disquieting, the total absence of a taxpayer current accounts system is a considerably more serious impediment to monitoring taxpayer compliance. To its credit, however, the DGI does have on the drawing boards a planned current-accounts system. It is recommended that that plan be subjected to a thoroughgoing assessment by an outside reviewer and that the DGI carefully monitor and periodically evaluate its execution.

362. Finally, the DGI’s major effort at compiling data on taxpayer transactions from third parties—its SITER system—is incapable of maintaining more than a single year’s transactions and the data base appears to be difficult to keep current; in mid-1990 SITER had only a 1987 data base. These shortcomings seriously undermine the usefulness of the SITER system and should give the DGI cause to wonder if SITER is really worth the resources it requires.
363. *Colombia.* The DIN appears to be doing a better job at monitoring taxpayer compliance than the DGI—but also could significantly improve its performance. The DIN’s taxpayer registration system—the masterfile, or RUT—appears to be simple and flexible. Whether it is comprehensive is difficult to assess because the universe of potential taxpayers cannot be easily and reliably measured. The simple device of giving each registered taxpayer a credit-card-type identification card, which must be used every time a tax return is filed or a tax payment made, appears to have dramatically reduced filing and payment error rates and problems of multiple taxpayer identification numbers for the same taxpayer—or common taxpayer identification numbers for different taxpayers.

364. The 1986 tax reforms enabled the Colombian tax administration to solve one of the most chronic problems in the tax system: the inability to manage the taxpayer’s current accounts. This has been made possible mainly through the drastic simplification of tax forms, the elimination of the requirement that all supporting documentation be submitted with each tax return, the substantial reduction in the number of individuals with an obligation to file, the hiring of commercial banks to handle tax collection and recording of tax filings data, and the expansion of the tax-authority system. The full computerization of the current accounts system in Colombia, an outgrowth of the reforms, has also significantly improved the accuracy and timeliness of that system. By 1990 the DIN had reduced its current accounts error rate to just 0.03 percent—an astonishingly low rate. While this level of accuracy is laudable, it comes at a cost that would appear to be largely avoidable. In particular, the DIN’s checking of every taxpayer return record submitted to it by the banks who receive and record those returns could probably be replaced by spot checks of random samples of returns from each bank without substantial deterioration in the quality of those data. The DIN could save resources and increase the timeliness of its current accounts by being able to update current accounts in a few weeks, instead of the two months now needed. At least DIN management should pilot-test such a random-checking system to see whether its benefits—reduced DIN costs and increased current accounts timeliness—outweigh any ill effects it might have on accuracy.

365. Last, the PISTA system that the DIN first installed in 1988 appears to provide a promising means of monitoring third-party information to help the DIN locate nonfiling and unregistered taxpayers, and detect underreported taxable transactions. To date, however, that system appears to be singularly underused. Only one of the five third-party information sources included in that system—bank deposits—was used by the end of 1990 to locate nonfilers. The DIN should be encouraged to make more use of the data it already collects in its PISTA system and to consider tapping additional sources of third-party information—such as interest payments by private banks and dividend payments by publicly held private corporations.

**Preventing taxpayer noncompliance**

366. Preventing taxpayer noncompliance requires that tax administering agency detect noncompliance and to enforce compliance on noncomplying taxpayers. This section focuses on the latter—auditing taxpayer returns and reviewing audit appeals.

367. At the DGI, the costs of audits had consumed more than 80 percent of the tax revenue they generated by 1989. At the DIN Colombia the ratio of audit-determined tax deficiencies to audit costs had risen to 38.4 percent for VAT audits by 1988 and to 12.4 percent for income tax audits by that same year. Given that the DIN ratios overstate audit productivity—because so much of the “revenues” are lost on appeals—both agencies appear to be performing well below international standards of cost-effectiveness for auditing. Argentina’s poor performance reflects, at a minimum, poor targeting of its audits, as can be seen from the wide variation in cost-effectiveness ratios across categories of audits done by DGI auditors. The study team did not gather information necessary to address choosing which aspects of the audited businesses to scrutinize during external preventive audits. However, the targeting of external preventive audits can be expected to improve with an auditor’s increased
experience with a particular type of business—which suggests the importance of maintaining industry-specific audit teams. One device that can reduce the risk of complicity of the auditor in evasion by the firm is to require audits in such industries to be done by teams, instead of by individual auditors. Or, firms in such industries might be subjected to independent preventive audits by auditors who are not familiar with each other. Argentina’s poor performance also reflects the complete lack of effective computerization of taxpayer and third-party records at the DGI when these figures were constructed.

368. The poor audit performance at the DIN, on the other hand, reflects not so much poor targeting—audit targeting, in fact, appears to have improved significantly in 1988—but instead results from the implementation of more cost-efficient computerized procedures for identifying underreporters. These computerized cross-checks left DIN auditors with a more difficult pool of returns to audit, thus reducing their cost-effectiveness.

369. The DGI and the DIN should improve their processes by maintaining records on the magnitudes of audit-generated revenues, but recommendations about how each should allocate its audit resources differ. The DGI should seriously consider following the lead of the DIN to implement effective cross-checking of returns for all taxpayers—to more efficiently locate easy-to-identify underreporters. The DGI also should set up a system for more efficiently targeting its audits. Such a computerized system would allow every return to be checked for internal consistency—in effect increasing the incidence of internal audits from less than 4 percent as of 1987 to 100 percent. Such a system would also substitute inexpensive clerical labor for expensive auditor labor, thereby reducing DGI expenses. Third, such a system should significantly reduce human error—because only the entering of the information from the tax forms would require human hands. These gains should more than compensate for the initial investment required to obtain the required hardware and software. The DGI also should design a system that will generate the data required to monitor whether audit policies designed to reduce auditor corruption are cost-effective. The design of such a system is beyond the scope of this report, but should be given serious consideration by the DGI. The DIN should seriously consider significantly reducing the resources it devotes to labor-intensive auditing of taxpayer returns, because its computerized cross-checking has proved to be an extremely cost-effective way to locate most easy-to-identify underreporters. Once again, both agencies need to reliably track audit-generated revenues—so they can more efficiently manage their limited resources.

370. Enforcing compliance includes reviewing appeals—administratively or judicially. Neither the DGI nor the DIN maintains regular records adequate to reliably assess their appeals processing arms. In Argentina, blame for this must rest more with the Tribunal Fiscal—the national tax court. Nonetheless, both countries could significantly improve the performance of their appeals processing arms if they would regularly and reliably record data on case loads and outputs that separately tracks appeals initiated and judgments reached by type of case. Colombia’s DIN comes considerably closer to accomplishing this than does the Tribunal Fiscal. No time series data on appeals demands, resources absorbed in processing appeals, the quantity of appeals initiated and processed, the quality of appeals processed, or the cost-effectiveness of appeals processing activities were available in Argentina—in the Tribunal Fiscal or in the DGI. Only a special sampling of the Tribunal Fiscal’s case records allowed the study team to draw even tentative conclusions about that tribunal’s performance.

371. Colombia’s DIN, on the other hand, does maintain regular records on resources used to process appeals, measures of the quantity of appeals outputs, and some measures of the cost-effectiveness of its appeals processing. But the DIN does not, maintain records that directly measure the demands on its appeals arm (for example, the number of appeals initiated by year and by type of appeal) or the quality of its outputs (for example, average elapsed time between an appeal being filed and a judgment on that appeal reached, or the number and fraction of appeals initiated each year that were resolved one, two, three, and four or more years later).
372. Based on the evidence that could be brought to bear, the following conclusions and recommendations can be advanced. Data from the 1989 sample of Tribunal Fiscal judgments permitted World Bank researchers to identify the time required to obtain a judgment—2.8 years, on average, for cases resolved. This poor performance may reflect the very limited resources with which the tribunal must function, coupled with a heavy case load. Unfortunately, no data were available on the number of cases initiated each year, so it is impossible to assess just how heavy the case load is. And, this average fails to control for type of tax—the difficulty of the case mix. It would be helpful to have both the case load information and the average length of time per resolved case by type of case for more than one year—to show trends in each and any systematic relationships among case loads, case mix, numbers of judges, and average case-gestation period.

373. The tribunal should compile annual summary records of not only the number of cases resolved by their proceedings, but also of the average amount of the DGI-determined deficiency upheld by the tribunal, and the fraction of appealed cases upheld. Furthermore, because many cases apparently are resolved as a result of an appeal to the tribunal but without a final formal judgment, it would also be useful if the Tribunal Fiscal would keep similar records on cases initiated but resolved prior to judgment.

374. These recommendations are intended to provide information that will help the DGI better allocate its resources. The Tribunal Fiscal, however, has little incentive to undertake resource-absorbing activities that provide the tribunal with no immediate, tangible benefits. The Tribunal Fiscal also apparently has very limited resources for its case load. It is thus very unlikely that the Tribunal Fiscal will heed recommendations to regularly compile information on the outcomes of its hearings.

375. The DGI or the government should structure incentives that will make it advantageous for the Tribunal Fiscal to generate the needed information. One incentive might be to have the DGI provide the Tribunal with an employee, paid by the DGI, to generate data that bear on the performance of DGI's auditors and the data that about on the tribunal's performance. A second possibility would be for the DGI to contract with the Tribunal Fiscal to provide the data that bear on the DGI's auditors' performance. Or, the national government could offer the Tribunal Fiscal additional funds earmarked for the generation of the needed data about the DGI auditors' and the Tribunal's performance.

376. The DIN has taken a number of steps in the late 1980s that appear to have dramatically reduced the demands on its appeals boards. Despite this, DIN management has kept resources devoted to processing taxpayer appeals constant throughout the 1980s. The result of this strategy is evident in the data on the outputs and cost-effectiveness of its appeals arm over this period. Although the DIN's processing of VAT appeals appears to have improved, its processing of income tax cases deteriorated in the mid-1980s—but attained its early-1980s level by 1988.

377. Whether this pattern of changes in outputs and cost-effectiveness reflects improved appeals processing performance is unclear, because the DIN does not maintain data that directly measure the magnitude of the demands on it or the quality of its outputs. It may be that the appeals arm of the DIN was overburdened in the early 1980s and is only now appropriately staffed to satisfy the demands being placed upon it. To ascertain which conclusion ought to be drawn requires knowing whether demands on the DIN's appeals arms have, indeed, been dramatically reduced of late, and whether the quality of its appeals outputs have improved or deteriorated in recent years. The DIN readily could and should generate the data required to answer these questions.

378. These data should be maintained in such a manner that they can be used to identify the total number of cases appealed by year by type of case—for example, by type of tax, type of taxpayer (individual or corporation), and magnitude of appealed deficiency determination; the average length of time required to resolve cases initiated in a given year, by type of case; the number and fraction of
cases initiated in each year that are resolved within one, two, three, and four years of the initial filing date of the appeal, by type of case; the total number of cases resolved each year, by type of case; and average number of DIN staff-days spent each type of case resolved in a given year.

379. Such data, when coupled with data already generated by the DIN, would allow DIN managers to reliably and accurately judge the performance of its appeals arm and to assess the efficacy of management decisions undertaken to improve that performance.

Allocating agency resources

380. Overall, this study estimates total DGI costs have risen to approximately 1.35 percent of revenues by 1989. Because even developed countries appear to spend about 1 percent of revenues to operate their tax administrations, this does not appear out of line—especially because of the extremely volatile tax laws in Argentina and the rapid, highly variable rates of inflation in that country.

381. The total absence of an effective management information system in the DGI, however, poses a serious threat to the ability of DGI management to efficiently allocate resources across agency activities. One of the most important recommendations in this report is that the DGI design and implement a thorough and well-designed management information system—one easily used by managers and that can provide timely, consistent, reliable, inflation-adjusted, and appropriately detailed information on the agency’s resource usage and outputs.

382. In 1985 DIN costs amounted to 1.72 percent of total revenues, but by 1988 they had fallen to only 1.33 percent. Given the higher rates of inflation in Colombia than in countries like the Australia, Canada, United Kingdom, and the United States, these ratios do not appear to be unreasonably high. Furthermore, the 23 percent improvement in this ratio between 1985 and 1988 suggests that the DIN has been improving its overall performance in recent years. This improvement reflects, in part, legislative changes that have reduced the complexity of the income tax laws and reduced the number of individuals required to file income tax returns. It also surely partly reflects DIN’s implementation of its computerized taxpayer information system (SITER) and third-party information system (PISTA), and its use of these to solicit taxpayer self-corrections and identify nonfilers with taxable transactions. It probably also reflects the DIN’s implementation of computerized checks of all returns for arithmetic errors. In short, part of the overall improvement in DIN’s ratio of costs to total revenues surely reflects tax policy changes outside the direct control of the DIN, but partly reflects improvements in DIN practices.

383. Further improvements in the DIN’s performance appear possible. In particular, increased DIN reliance on computerized cross-checking of returns should have reduced the need for resources devoted to labor-intensive auditing of returns, but the DIN has not reduced its audit resources. From the data examined in this study, it would appear that significant reductions could be made in audit activities without seriously undermining audit output. Those resources could be redeployed elsewhere in the DIN with possible significant gains in output.

384. Similarly, the computerized cross-checking procedures recently implemented appear to have indirectly reduced the need for resources devoted to processing tax appeals. Thus, DIN management should seriously consider redeploying resources devoted to processing taxpayer appeals.

385. Last, the DIN could significantly improve its management’s ability to assess the cost-effectiveness of resources devoted to its various activities by carefully designing a management information system that would regularly and reliably track several pieces of information that it does not currently track. Examples include measures of activity-specific costs, revenues generated by the DIN’s procedure for soliciting taxpayer self-corrections, revenues generated by the DIN’s
computerized arithmetic checks of taxpayer returns, revenues generated by the DIN’s computerized process for identifying nonfilers with taxable transactions, and audit-generated revenues by type of audit—for example, by tax, type and size of taxpayer, and any other aspect of a tax return that could be used to better target audits. It is also important that the DIN begin monitoring the numbers of appeals initiated each year—by type of appeal—and the time needed to process each appeal. The number of completed audits does not necessarily have a simple one-to-one relationship with the number of appeals. In particular, important changes in the incentives facing taxpayers to file appeals—such as those occurring in 1970, 1977, and 1988—almost certainly alter the ratio of appeals initiated to audits completed.

386. The DGI and the DIN should make sure their management information systems regularly and reliably generate the following types of information for each major type of activity: demands on that activity, resources used, quantity and quality of outputs, and cost-effectiveness.
ENDNOTES

1. Taxpayer compliance is the cooperation of taxpayers or third parties in keeping track of and reporting taxable activities or holdings, in calculating tax liabilities, and in making tax payments.

2. The Tanzi-Olivera effect is the reduction in real value of tax revenues resulting from any lag between when a tax obligation is incurred and the time it is paid—because of inflation during the lag (Tanzi 1977). The phenomenon was first described by Olivera in 1954.

3. This is, of course, the Tanzi-Olivera effect. Note that government revenue in real terms is both increased (through seignorage and the "inflation tax") and decreased (through the Tanzi-Olivera effect on the real value of explicit tax revenues) by inflation. The net effect in any country at a given moment is not easy to determine.

4. The World Bank (1990b) documents this process in Argentina in recent years.

5. See also the extensive econometric literature on tax levels and structures in developing countries: for example, the series of IMF studies reported in Chelliah (1971); Chelliah, Baas and Kelly (1975); Tait, Gratz, and Eichengreen (1979); Tanzi (1987); Schulthess (1989); and Hinrichs (1966).

6. "In those corrupted governments where there is at least a general suspicion of much unnecessary expense, and great misapplication of the public revenue, the laws which guard it are little respected" (Skinner and Stenrood 1985, p. 353).

7. One approach is to use a measure that can be expected to vary in line with the sum of national accounts measures of the tax base and the irregular or underground economic activity that would be within the tax base—if the activity were in the formal economy. Changes in such a measure can, then, be compared to measures of changes in national income accounts data that measure formal economic activity. Examples of this approach include the ratio of currency in circulation to demand deposits (Cagan 1958; Macesich 1962; Kimball 1981; Laurent 1979; Guttmann 1981; and Henry 1983); the ratio of currency in circulation to personal consumption expenditures (Henry 1983); and the transactions ratio—the ratio of total money payments to GDP (Feige 1979; Porter and Thurman 1979; Cramer 1983).

These indirect approaches all have a number of serious problems. Although such measures could prove useful in assessing tax administration performance, it is extremely difficult to adequately purge them of the influence of of non-tax-evasion factors.

A second approach to measuring tax evasion relies on auditing data generated by the tax administering agency. Within this approach, two options exist. The best option is to obtain estimates of the incidence and currency magnitude of deficiencies from audits of a random sample of all taxpayer accounts. Alternatively, estimates of the incidence and currency magnitude of deficiencies from all audits can be made; but this latter approach will yield biased overestimates of deficiencies and their incidence as a direct function of the quality with which the tax administering agency targets its audits. Both audit-based approaches suffer the same weakness as the national accounts approach in that they fail to identify tax liabilities evaded by shifting economic activity to the informal or underground economy.
8. The CR4 is the proportion of production produced by the largest four plants in each industry. The Herfindahl index is the sum of the squared shares of output of each plant in each industry. The entropy index is as the negative sum of the logs of the shares of output of each plant in each industry. The CR4 and the Herfindahl index increase with industrial concentration, and the entropy index decreases as concentration increases.

9. The literature on taxation customarily distinguishes sharply between "tax policy"—tax laws to obtain revenues and related objectives—and "tax administration," the implementation of those laws. This oversimplified distinction misleads because it strongly suggests that a tax structure can be designed independently of how it is—or is intended to be—implemented. (See Pressman and Wildavsky 1977, and Bird 1989.) This distinction also incorrectly implies that tax administration performance can be assessed simply by measuring tax law compliance. The relation between the "legal tax potential" implied by the structure of tax laws and the "real tax potential" achievable by an administration operating at maximum efficiency is tenuous. This becomes clear in any examination of the operation of most income tax systems in developing countries. Some years ago, it was alleged that the aggregate "legal" tax base of Italy's schedular income taxes probably exceeded the country's GDP. Whether true or not, calculations of "potential" tax bases that assume the size of the base is invariant to the tax rate fly in the face of reality. The interdependence of bases and rates is especially clear in the case of wealth and property taxes; however, it holds more generally as well, as the Laffer curve demonstrates.

10. The word audit is used to describe a variety of enforcement actions. It is equivalent to "fiscalization" and inspections in Argentina, "pesquisa" in Brazil, "audit" in Colombia, "control fiscal" in Venezuela, and examinations and inspections in the United States. Audits can range from simple arithmetic verifications, through matching information on tax-specific documents, to extensive field audits.

11. Exceptions are Chile, where assessments and collections are managed by separate agencies, and Paraguay, where the old format of organization by tax remains.

12. For this study, regulations developed by the administration to fill gaps in the laws should be considered part of the institutional infrastructure.

13. Registration refers to the set of entries that record and aggregate over time the transactions and identity of all people liable for taxes. This definition differs from others where it refers simply to the roster of taxpayers (the tax rolls) or to the roster plus current accounts.

14. An analogy might be to public enterprises that work independently on a city street. The same street is dug up separately by the telephone company, the electric company, the water company, and the sewerage company. Similarly, a taxpayer is first audited for income tax; next the excise tax auditor comes; then the people from the stamp tax department; then a value-added tax audit is launched.

15. Making such calculations is difficult, even in the information-rich environment of the U.S. Internal Revenue Service 1990.

16. See, for example, the various papers in Tanzi (1982), as well as Richupan (1984); Herschel (1978); Holland and Oldman (1981); and Alm, Bahl, and Murray (1990).
17. Other factors affecting compliance identified in the literature (see annex B) include the complexity of the tax system, the degree of commitment people have to their nation or community, the degree of stigma (or approbation) attached to tax evasion, the expectation of amnesties, individual perceptions of the relation between taxes paid and benefits received, opportunities to evade at low risk (type of income), tax rates, the uncertainty of tax enforcement, past taxpayer behavior, the perceived fairness of penalties, and so on. With so many factors identified, it is not surprising that there is little agreement on the relative importance of these factors—specifically in the relatively unexamined territory of Latin America.

18. Of course, all such statements are made primarily with respect to such modern "mass" taxes as income and value-added taxes. The traditional excise and trade taxes—including taxes on such exports as oil, which may appear in the revenue statistics as "income" taxes—are, in fact, likely to dominate the revenue structure of such countries.

19. Agency costs can be modeled as a function of output and the prices of resources used by the agency. Or, agency output can be modeled as a function of resources used by the agency. In either case, statistical methods or nonstatistical optimizing routines—such as data development analysis or similar linear programming techniques—can be used to extract the needed parameter estimates from the available relevant data.

20. This distinction between intermediate and final outputs of a tax administering agency is essentially the same as the distinction drawn by Bradford, Malt, and Oates (1969) between D-outputs (direct outputs) and C-outputs (final or consumption outputs) of public-service producing agencies.

21. The terms "activity" and "resource usage" are used interchangeably.

22. Although the U.S. Internal Revenue Service has not yet premised any audit allocation decisions on estimates of the deterrence effects of different types of audits (IRS 1990), several empirical researchers have estimated average deterrence effects of income tax audits by the IRS. See, for example, Dubin and Wilde (1988); Dubin, Graetz, and Wilde (1986); and Witte and Woodbury (1985).

23. To allocate enforcement resources, the IRS uses several marginal-conditions algorithms. The Examination Resources Allocation Model ranks taxpayer returns by their expected marginal net revenues per IRS-incurred audit cost. The Information Returns Program Underreporter Program ranks expected average net revenues per IRS-incurred cost of pursuing taxpayers falling in a homogeneous class of underreporters. The Information Returns Program Nonfiler Program ranks expected average net revenues per IRS-incurred cost of pursuing taxpayers in a homogeneous class of nonfilers. The Resources and Workload Management System ranks taxpayer delinquent accounts based on their expected yield—amount determined to be in arrears times the probability of its being collected—per IRS-incurred cost for pursuing the account. Separate models exist for the delinquent returns (Delinquent Returns Program) and the accounts receivable (Accounts Receivable Program).

The Examination Resources Allocation Model is the most sophisticated of these IRS models. Using extraordinarily detailed data obtained from a stratified random sample of all taxpayer returns, the IRS first uses discriminant analysis, a statistical technique, to construct a discriminant function that can be used to rank-order tax returns on the likelihood that they would, if examined, result in a tax change. Based on these scores, marginal revenue yield curves are constructed to allocate audit resources. By walking down these marginal yield curves—by allocating audit resources such that the expected marginal revenue yield per dollar of audit
resources is the same across returns—the IRS can maximize its expected net revenues from audits.

Although this procedure is the clearest and most sophisticated application of the marginal conditions methodology available, its data requirements are likely to exceed the capacity of most developing countries. In particular, the large random sample of taxpayers that is audited in extraordinary detail—once every three years—to calibrate the discriminant function model requires both more resources than tax administrations in most developing countries can afford and more acquiescence by taxpayers than is likely to be forthcoming in most Latin American countries. Consequently, some of the other IRS marginal conditions models, which are simpler to apply, are likely to be more feasible in Latin America.

The IRP Nonfiler Program is identical to the IRP Underreporter Program, except that it is used to pursue nonfilers identified from third-party information. The Resources Workload Management System Model is another variant of the methodology used in the IRP Underreporter Program. It is used to allocate resources to pursue delinquent returns and to accounts receivable, based on their expected yields. The expected yield of a particular class of delinquent returns and accounts receivable is estimated as the product of the amount determined to be in arrears times the probability of its being collected if pursued. Once again, classes of returns are rank-ordered according to their expected yields per IRS enforcement costs, and IRS resources are allocated across classes by walking down this rank ordering until all resources are used.

24. It also should be noted that with the measures proposed here, which ignore the excess burden of the taxes being collected, and the compliance costs borne by taxpayers, it does not necessarily follow that the optimal level of tax agency resource use is that level at which marginal revenues just equal the agency’s marginal costs. For further discussion, see Slemrod and Yitzhaki (1987).

25. In simple bivariate regressions of tax collections per GDP on the inflation rate, the estimated on the inflation variable is statistically significant in every case. These simple regressions explain between 36 percent and 54 percent of the variation in DGI collections of each of these taxes.

26. The Argentina data cover this full period, although the Colombia data were available only through 1988. Argentina data were obtained from the World Bank; Colombia data were obtained from World Bank (1990d).

27. Costa Rica headed this list, while only Brazil ranked below Argentina, at .177; and only Mexico (at .274), Argentina, and Brazil rank below Colombia.

28. At the end of 1987, 231 private financial institutions existed in Argentina (Source: World Bank, 1990), p. 267, table 6.5). Furthermore, the number of private financial institutions had been consistently declining since at least 1979. The 210 and 130 estimates are simply rough extrapolations of that downward trend.

29. This assumes, of course, that the average transaction size is roughly constant across these two countries. If transaction sizes are larger on average in more productive economies, the increase in transactions monitoring demands placed on the tax administering agency will not be a simple linear function of tax base size, but instead a positive but attenuating function of the tax base.
30. The large number of returns processed by the DIN reflects, mainly, the expansion of the coverage of the value added tax to include, in addition to manufacturers, many small businesses. This expansion began after 1983, at which time total tax filings numbered roughly 2.8 million, of which only 122,000 were attributable to the value added tax. By 1988, more than 4.5 million of the 6.05 million returns processed were attributable to the value added tax.

31. The net wealth tax in Colombia is being phased out and was to be eliminated by 1992.

32. For a detailed analysis of the problems of the inflation adjustment formulas that have been employed in Argentine tax law, see World Bank, (1990b), especially appendix 4.1, pp. 132-35.

33. For a detailed analysis of the structure of and difficulties introduced by the various industrial promotion incentives offered by Argentine tax law, see World Bank (1990b), especially pp. 26-33 and appendix 2.2, especially pp. 128-31.

34. A 1991 tax case ruling provides a concise summary of a judge's assessment of the clarity of Argentine tax laws:

En definitiva, no admito la excusa de la ignorancia o error de la ley en sentido propio o restringido — ley del Congreso — y sí lo admito en la ignorancia o error de derecho — conjunto de resoluciones y/u otras normas de jerarquía inferior o que no sean ley del Congreso —; y admito esta excusa por equidad, sinceridad, y realidad social e individual ya que si vulneramos estos aspectos la ficción resultaría totalmente immoral, injusta, contraria al sentido común, a la seguridad jurídica, etc., factores que sumados — tarde o temprano — atentarían contra la paz y orden social, que fue casualmente el argumento impuesto por nuestros maestros los juristas romanos para sostener la ficción de que la ley se presume conocido por todos.

Nosotros ahora también estamos en una situación excepcional donde nuestro ordenamiento está saturado de normas jurídicas de jerarquía menor que una ley del Congreso, resoluciones éstas que a veces se contradicen entre sí, a diario nacen, se derogan, modifican, etc., y que evidentemente no pueden ser conocidas por el contribuyente, el simple ciudadano, por añadidura son desconocidas por los propios técnicos. Tan grave es esta realidad, de tal magnitud, que más de un especialista se niega a evacuar consultas o dar consejos para eventualmente evitar responsabilidades sobre todo de tipo moral.

35. The apparent decline in the zero-tax bracket level of income (table 4.10) reflects exchange rate changes. When these zero-tax brackets are maintained in Colombian pesos, they track Colombian inflation—lagged one year—extremely well in 1986-89.

36. These tables report data for all audit category combinations for which at least twenty audits were undertaken in the year in which the data apply and for which monthly data were available for the entire year.

37. These figures, as with all figures reported in these tables, reflect within-class averages for DGI audit-target classes. As such, they understate the full variation in actual yields-per-audit-hour. But they should provide reasonable estimates of expected variation in these yield ratios across these classes.
38. Simple bivariate regressions of audit hours on promised additional tax payments per audit hour are insignificantly different from zero in four of the five cases presented in these figures. Only the 1989 internal audits exhibited a significant positive relationship between DGI audit resource commitments and this yield-per-cost measure.

39. Data for 1989 apply only to the non-Buenos Aires portion of the country, because no data for the Buenos Aires region were available. All of these figures were extracted from the data from which the summary statistics reported in tables 3.2, 3.3 and 3.4) were derived. Source: DGI. World Bank calculations.

40. Regulation to the Law Number 2,353, Article 1, December 1986.

41. Law 11,683, Article 28.

42. Payments to balance include direct payments by a taxpayer other than payments made with the annual return or estimated tax payment form, payments by third parties of tax liabilities resulting from transactions between the taxpayer and that third party, or payments by the taxpayer during the Tribunal Fiscal adjudication of the taxpayer’s tax liability.

43. The zero-tax-bracket income, which was approximately US$1,098 in 1982, had fallen to approximately US$14 by 1985.

44. Before 1986, taxpayers were required to submit complete documentation for every entry on their income tax returns. This requirement flooded the DIN with paper, which far exceeded the DIN’s ability to review and process the information provided in those submissions. This requirement was eliminated as of 1986 and replaced with the requirement that taxpayers maintain—but not submit—those records and be able to provide those records, if and when requested by the DIN.

45. Tobacco (except cigarettes), alcohol, alcoholic beverages, rubber tires, lubricant oils, wines, soft and carbonated beverages.

46. This calculation assumes the terminals are employed without interruption eight hours per day. If the DGI operates these machines 24 hours per day by employing three shifts, the time allowed per form could be tripled—to 9 minutes per form in 1988 and 12.6 minutes per form in 1989.

47. In 1983 withholding coverage was extended to include various interest earnings not previously covered, rents, and some economic activities of the service sector, such as freight transport and other services. Professional fees and commissions for the self-employed were added in 1984. Passenger transport services and transfers of fixed assets and motor vehicles were included in 1985.

48. In 1976-77 tax administration costs averaged .56 percent of revenues in the United States, .96 percent of revenues in Australia, 1.1 percent of revenues in the Philippines and 1.01 percent of revenues in Canada. (U.S. Congress 1980, p. 125)

49. The usefulness of the ratios reviewed in of this report could be improved if DGI would keep records of the actual additional tax payments generated by its audits, not simply records of the auditor’s determination of the additional tax liability and the amount the taxpayer agreed to pay. Those ratios could also be improved by matching data on auditor wage rates with the data on hours of work per audit and additional tax revenues generated per audit.
50. The computerized SITER system at the DGI did not represent an effective computerization of taxpayer or third-party information, because its data base never included more than one year of data.

51. Conversations with people in the Tribunal Fiscal and the DGI indicate that some of the most significant elements that effect the functioning of the Tribunal Fiscal are the lack of physical resources; for example, courtrooms—some of which have been without a judge for several years. Another important feature of the Tribunal’s problems is apparently the constant desertion of the young professional staff and the lack of professionalism of middle management. These problems may be caused, in part, by the low salaries and undesirable working conditions.
Annex A

ORGANIZATION OF PROCEDURAL LAW

1. Legal tax specialists in Latin America have distinguished three stages in the tax process: assessment, payment, and review. This approach corresponds to the simple tax model, in which there are no intermediaries between the taxpayer and the tax administration—and thus must be expanded (depending on the country) to include all relevant actors. But the approach is a useful way of organizing procedural law.

Assessment

2. Procedural law may approach tax assessment in two ways: the administration goes to the taxpayer or the taxpayer goes to the administration. The first approach is the way land taxes are assessed in many countries. The second approach, discussed here, requires some self-assessment by the taxpayer and the tax administration’s organizing of compliance and enforcement in cases of noncompliance—and is the way most national taxes are assessed.

3. With respect to compliance, procedures define the legal capacity of the tax administration to request information from taxpayers and determine payment schedules and many other regulatory aspects. Procedural law commonly delegates the design of registration and filing systems to tax authorities—often with little guidance. Law covering compliance generally deals more with what to do with how to do it. The main exception is when the law establishes special rules for taxpayers to keep accounting records, such as for value-added tax debits and credits.

4. The first step toward compliance is self-assessment. Compliance thus requires keeping relevant records, transcribing information onto tax forms, submitting tax returns, and paying taxes due. It also includes verifying the accuracy of the information submitted if requested to do so by tax officials. The main records required of taxpayers are accounts of transactions and registries to isolate individuals involved in financial transactions with taxpayers—such as withholding, cosigners, and guarantors of obligations.

5. For enforcement, procedures define both intermediate administrative products—such as citations and proofs, to adjust declared taxes—and final administrative products, such as payment orders, adjustments to self-assessed taxes, impositions of fines and other penalties for noncompliance, and decisions of administrative reviews. Or, auditors may conclude that there is no reason to increase the values declared by taxpayers—in which case, the final product would be the filing of the case. From an operations viewpoint, collecting a tax may integrate several institutional products if there are different processes for different taxpayers.

6. The most important point with about the administrative intervention is that it empowers a tax administration to select whom to audit. The use of this discretion is perhaps the main tax-management duty of a tax director. It is also a measurable parameter for evaluating performance: whether the fight against evasion succeeds or whether the law is misinterpreted defines if a tax administration uses its discretion correctly.
7. Three variables of the procedural design define the administrative task and the organizational design required to implement payments: the person responsible and the time and place of payment.

8. There are three choices for the person responsible for payment: the tax is paid by the taxpayer, by the taxpayer and a third party, or, by a third party alone. The first case is the classic income tax in the absence of withholding; the second is typical in the United States, which has both withholding and a final direct filing by the taxpayer; and the third—sometimes called the "substitute taxpayer"—is where tax returns are not required for some types of withheld income. In recent years some of systems in Latin America have adopted the third option (Pardo and McLure 1989).

9. There are two options for time of payment: the tax is paid at assessment or other than when assessed. These two options represent a cash system and a savings or credit system, respectively. The choices also determine whether the role of tax administration is that of a simple treasury teller or a bank accepting deposits and granting credit. Although the credit approach in principle facilitates compliance, its management is much more complex.

10. The time dimension also poses the problem of adjusting overdue balances for inflation. In some instances the interest rate for payments delayed is enough to cover the erosion in value due to inflation. However, when inflation is volatile, instead of changing the interest rate, balances may be adjusted for inflation before interest on arrears is computed. Unless these adjustments completely follow the inflation path without redefining administrative processes—as was the case in Brazil—the administrative implications of calculating the inflation adjustment at the moment of the payment transaction can be enormous.

11. There also are three options with respect to place of payment: the tax is paid at the tax administration, either at the tax administration or in authorized banks, or only at banks. Increasingly, tax administrations in Latin America are shifting from the first to the second, but especially to the third of these options.

Review

12. Administratively determined taxes and penalties may be contested by taxpayers by appealing to the tax administration (administrative review), the judicial system, or both. Often specialized tax or fiscal tribunals are involved. The existence of judicial review means that if taxpayers disagree, most products of tax administrations are subject to change by authorities outside the institutional boundaries of the tax administration.

13. Review may address substantive matters or procedural failures—for example, lack of due process) that would invalidate administrative assessment. The general rule for administrative review is that if the responsible authority does not make a decision in a specified time, the taxpayer may assume a negative verdict and appeal the case to the courts. (In some countries, however, a lack of decision is considered a verdict in favor of the taxpayer). In turn, as a precondition of review, taxpayers are bound to fulfill their formal procedural obligations.
Annex B

THE LITERATURE OF TAX ADMINISTRATION

14. Few studies have systematically analyzed tax administration in Latin America or other developing countries. Nonetheless, several studies provide points of departure for this study. In addition to some studies of tax administration generally, the relevant studies cover performance indicators, economic analysis of tax evasion, tax compliance, and cost/yield.

15. Perhaps the most important lesson of the general literature on public administration in developing countries is that no administration can be viewed apart from its social context—in particular, public attitudes about taxation. First, a critical design feature of any tax system is its vulnerability to corruption. Recent discussion has emphasized the importance of designing taxes in developing countries to minimize opportunities for taxpayers to escape their fiscal obligations. Such devices as withholding and presumptive taxation have been especially stressed in this regard (Bird 1989). The other side of the coin, however, is that any presumptive—minimum tax—features in the system should be designed to protect taxpayers from extortion by officials (Webber and Wildavsky 1986). The vulnerability of a tax system to corruption is thus an important dimension in appraising the productivity of any tax administration.

16. Second, it is not possible to appraise the productivity of tax administration without examining both the complexity of the tax structure to be administered and its stability. Complexity and its implications for tax administration have long been a concern even in the most developed countries. Even the most sophisticated tax administration can easily be overloaded with impossible tasks. These concerns are especially important in developing countries where less well-equipped administrators are often asked to tackle inherently complex tasks in a generally hostile and information-poor environment. The life of the tax administrator is complicated even more by the propensity of many developing-country governments to alter tax legislation annually, or even more often.

Performance Indicators

17. The major internal attempts to assess the productivity of tax administrations in developed countries have focused on setting performance indicators. In the United States, for example, productivity indicators are used to monitor the Internal Revenue Service’s performance of ten functions—for example, taxpayer service, tax examination, tax processing, and delinquent tax collection. An "intermediate output" measure—to use the terminology of this report—is specified for each function; for example, for the four functions listed, respectively, number of calls answered and correspondence handled, number of returns examined, number of documents processed, and total dollars collected. In addition to these quantitative indicators—which in some instances are weighted in various ways—standards of quality and timeliness are specified for most functions. In the United Kingdom the focus is more on cost as a percentage of yield and yield per employee for different taxes; in particular, considerable effort has been devoted to allocating cost by taxes.

18. Studies of performance indicators serve two purposes. First, operational performance indicators mainly assess trends in administrative performance. Such indicators are especially important in developing countries, where a central administrative problem is to monitor tax officials. As Slemrod (1989) has emphasized, even in developed countries, the most neglected aspect of tax analysis is how tax officials act: What are the rules they use? What is the evidence on which such
rules are based? How reliable and valid are the results? For centuries, governments in the now
developed countries had to spend almost as much effort trying to control revenue officials as trying to
squeeze more revenue out of an unwilling populace (Webber and Wildavsky 1986). The circumstances
in many developing countries today are not all that different. The need to keep tight control over the
handling of cash and to monitor closely the gathering and use of information by tax officials is still a
high priority.

19. This both suggests a number of such intermediate-product measures that should be used to
monitor performance over time and illustrates these indicators from the case studies. However, such
measures are not only highly country-specific but very sensitive to changes in substantive and
procedural tax law—for example, are value-added tax forms submitted annually, quarterly, or
monthly?). The indicators must thus be developed and used with care.

20. A second use of performance indicators is to provide evidence in support of the budgetary
requests of the tax administration. In its cruelest form, this use may consist of showing that, on
average, the cost of collecting revenue is only, say, 1 percent of the amount of revenue collected, so
that additional funds allocated to tax administration could be returned a hundredfold. But revenue
estimates are of little analytical use. Not only are they sensitive to tax rates but the marginal revenue
collected as a result of adding another dollar to the administrative budget need bear no relation to this
average. 12

21. More refined marginal estimates may be made in some circumstances, however, and have
helped to estimate the revenue yield of specific administrative initiatives and assess the revenue effects
of shifting resources in a fixed administrative budget. By far the most developed modeling along these
lines is that done by the U.S. Internal Revenue Service, although even these results leave a good deal
to be desired, even according to the Internal Revenue Service. 13 When developed to this level of
sophistication, however, such studies are really closer to the economic studies of enforcement efforts
than to simple performance indicators.

Economic Analysis of Tax Evasion

22. The productivity of a tax administration—even solely in revenues terms—depends not only on
what tax officials do but also on what taxpayers do. The taxpayer's decision whether to comply with
fiscal obligations is the subject of the formal theoretical literature on the economics of tax evasion.
Launched by Allingham and Sandmo (1972) as an application of Becker's (1968) model of the
"rational criminal," this literature has grown to such proportions that it has recently resulted in a
book-length survey and summary by Cowell (1990). Although the empirical literature has by no
means kept pace with this theoretical explosion, it too has grown considerably, as evidenced not only
by the many references in Cowell (1990) but also in several other recent books (Roth and Scholz
1989; Roth, Scholz, and Witte 1989; Slemrod 1990). Four points about the relevance of this
literature, which dominates the formal academic treatment of tax administration, are useful here.

23. First, as the theoretical framework of the economics of tax evasion becomes richer—for
example, considering the effects of rewards, attitudes, and punishment on compliance (Hite 1989,
1990)—it moves closer to the conceptual framework developed in this report, which emphasizes a
distinguishing between the factors determining tax compliance and noncompliance.
24. Second, the formal modeling developed in the literature is highly relevant to some problems addressed by this report, particularly the allocation of resources to enforcement. This report thus lays out the limitations of formal economic modeling in this field, given the present knowledge of the subject and the generally poor quantitative data available (even in the United States). The preliminary attempts at formally modeling the allocation of resources the Argentine tax administration performed as a part of this study appear to be the first such attempt in a developing country, apart from the even more preliminary work of Yitzhaki and Vakneen (1989) on Israel.14

25. Third, the empirical evidence of the strength of the deterrence effect on which this literature focuses is not only far from conclusive but highly model-specific and restricted almost entirely to the country-specific circumstances of the United States. As some of the papers in Stavropoulos (1990) argue, to make real progress in this field, not only are much better data needed (even for the United States) but the emphasis should be less on how to control noncompliance and more on how to foster compliance. It is not entirely clear to what extent these conclusions can be carried over to the low-compliance world of Latin American taxation.

26. Fourth, although some progress has been made in incorporating the strategic aspects of the evasion decision in a game-theoretic framework and in modelling it in principal-agent terms, much remains to be done before the results of such analysis can tell much about the real world of developing countries.15 For example, apart from the pioneering paper of Virmani (1987), virtually the entire economic literature on tax evasion assumes that tax officials are completely honest. If they are not honest, the game is very different from that usually modeled. "Leakage costs," as Shaw (1981) calls the tax revenues that flow into the pockets of officials, may simply be transfers in economic terms, but they can still cause significant distortions as new taxes are invented and tax rates increased to compensate for revenue losses. McCulloch (1852) suggested as much as three-quarters of the revenues collected in sixteenth century France were diverted in this way. Equally suspect and partial estimates for some contemporary developing countries are of similar magnitudes (Gillis 1990). As Cowell puts it, "If the venality of tax officials is a significant feature of a country's bureaucracy, then combating corruption in the public sector may be a more effective way of controlling tax evasion in the private sector than conventional sanctions against evaders."16

27. In addition to this serious gap in the existing formal analysis, the literature has not yet managed to model very well either the long-term, repetitive nature of the tax game or the role of "norms" in determining how people play the game. Consideration of the time dimension of tax administration emphasizes the importance of the interaction of officials and taxpayers and of changes in "tax technology" and taxpayer attitudes toward government.17 The time dimension of the analysis is especially important in the context of the present report, because the focus of Bank concern with tax administration is essentially how to alter the outcomes of administrative effort by appropriate investment in developing new legal and organizational frameworks, adopting new technology (computerization), and altering the allocation of administrative resources.

Studies of Tax Compliance

28. Improving tax compliance is not the same as discouraging noncompliance. This apparently paradoxical conclusion emerges from the numerous recent sociological and psychological studies of taxation.18 First, central to this literature is the belief that attitudes affect behavior. This proposition is not "proved" satisfactorily.19 What is clearer is that attitudes are formed by such factors as the perceived level of evasion, the perceived fairness of the tax structure, its complexity and stability,
how it is administered, the value attached to government activities, the degree of deference to authority, and the legitimacy of government. Government policies affecting any of these factors may influence taxpayer attitudes and thus the observed level of taxpayer compliance. For this reason, this report sets out a number of "indicators" intended to help gauge the importance of such factors.

29. Second, although most tax compliance in most countries might better be characterized as "quasi-voluntary" (Levi 1988)—because taxpayers have little choice about whether tax is withheld from their income sources—there appear to be two distinct groups of taxpayers. Some comply and some do not—almost regardless of whether they can get away with it. Some compliers comply not just because they do not have the opportunity to evade or because they are exceedingly risk-averse but because they think it is the right thing to do and they think other "right-thinking" people are also complying. By definition, there are more such people in high-compliance countries than in low-compliance countries. Even in the latter, however, it is a gross oversimplification to pretend that every taxpayer views the decision about whether to pay taxes as a gamble to be decided independently of in and loyalty to the community. Some always pay; some always cheat; and some cheat when they think they can get away with it. Nonetheless, a good case can be made that the optimal enforcement strategy should include rewards (support) for compliers and penalties for noncompliers.

30. Third, all of the results found in the literature are country specific. Almost all of the available studies are written, explicitly or implicitly, in a U.S. context. The few exceptions—for example, for the Netherlands—suggest that the attitudes of officials and taxpayers may differ in some significant respects from those found in the atmosphere of "adversarial legalism" that characterizes U.S. taxation. The limited international comparisons that can be made using the existing literature suggest that considerable care must be exercised in extrapolating results from one context to another. In particular, although noncompliers may be similar in some respects everywhere, the factors inducing compliance may differ among countries. Aspects that differ among countries may include the value attached to fairness (and its meaning), the deference to authority (and the legitimacy attached to that authority), and the extent to which contributing to the finance of government activities is seen as socially desirable—as opposed to individually desirable as in the economic model.

Cost/Yield Studies

31. The most comprehensive study of the total costs, private and public, of operating a tax system has been conducted in the United Kingdom (Sandford 1989). Less comprehensive studies have been published for Canada, Australia, and the United States. Two points important in the present context emerge from these studies. First, it is critical in evaluating the public administrative costs of the tax system to take into account the private administrative—individual compliance—cost. This is particularly important for this report because the most significant trend in Latin American tax administration in recent years may have been the shift of operating costs from the public to the private sector.

32. Although there appear to be no studies of private compliance costs in developing countries, the evidence from studies in developed countries is that these costs exceed public costs and are largely substituted for public costs—and their incidence is different. The complex cumbersome administrative methods used for some taxes in some developing countries—for example, stamp taxes and the minor excises—suggest that the compliance costs may well be very high. Moreover, compliance costs have been found to be particularly sensitive to the stability of tax legislation and to external changes, such as the inflation rate. All of these factors are more important in the low-compliance environment of
Latin America than in the high-compliance environment of the few developed countries where such costs have been studied. Low compliance may thus to some extent be a function of high compliance costs.

33. Second, the studies mentioned (especially Sandford 1989) emphasize the importance of carefully defining the relevant administrative costs. In particular, it is important both to distinguish the costs of changing tax laws from the costs of operating a stable system and to distinguish real resource costs from simple transfers. Both of these aspects are important in developing countries. This report emphasizes the importance of clearly distinguishing the "investment" decisions in designing and setting up the "infrastructure" of tax administration from the "management" decisions of operating the system once it is in place. In addition, although corruption may appear to involve "only" a transfer, its minimization is a critical dimension in appraising the performance of any tax administration. To the limited extent possible, the framework developed in this Bank report tries to take this into account.23
Annex C
USING THE GROSS DOMESTIC PRODUCT TO ESTIMATE THE TAX BASE

34. An important dimension of the performance of a tax administration is the extent to which it eliminates any gap between potential and actual tax collections. Measuring such a tax evasion gap requires devising some methodology for estimating potential tax revenues—the product of a tax base and a tax rate. Thus one must measure the level and composition of economic activity within the statutory definition of the taxable base.

35. The simplest approach is to use Gross Domestic Product (GDP) as a measure of the underlying tax base. GDP data are also generally available by economic sector, should tax rates vary across sectors—for example, agriculture, industry (including manufacturing), and services—and separately for imports and exports.

36. Using GDP in this way, it appears that Argentina’s tax bases declined precipitously between 1980 and 1982, then rebounded for most of the rest of the decade, until they again fell significantly during 1989; and Colombia’s tax bases showed no particular trend early in the decade, but began a pronounced upward trend after 1985 (figures A-1 and A-2).
37. Although such GDP figures do not directly measure the actual taxable bases, they provide a readily available measure that can roughly track changes in those bases. It is, of course, possible to tailor such national income accounts data to more accurately reflect the tax bases of interest. But a simple GDP measure can help assess whether tax revenues reflect changes in economic activity—by examining variations over time in the ratios of tax revenues to GDP for the major tax bases. Although Argentina’s tax collections per GDP from these major bases—total, income, value added and excises—have declined in the 1980s, Colombia’s have been doing the reverse (figures A-3 and A-4). These trends could represent either changes in the gaps between potential and actual revenues or changes in potential revenues. The latter would be caused by tax policy changes that altered the taxable base or statutory tax rates; the former would be caused by changing tax administration performance (deteriorating, in the case of Argentina; improving, in the case of Colombia).

38. Major tax law changes in this decade can account for much of Colombia’s upward trend in the ratio of tax collections to GDP. The 1983 expansion of the tax-base coverage of the value added tax from the manufacturing sector to small businesses and the commercial sector probably explains most of the increase in this ratio after 1983. (Notice that the sharpest increase occurred between 1984 and 1985 in the indirect taxes, which include the value added tax. A one-year lag in full implementation of the tax base expansion is entirely plausible.) It is not clear, however, whether income tax reforms of 1986 in Colombia should have increased or decreased tax revenues per GDP.
Those reforms expanded the income tax base for high- and middle-income taxpayers, by eliminating most deductions, allowances, and tax credits. The reforms also reduced the tax base for low-income taxpayers, by substantially raising the zero-tax-bracket level of income, and lowered tax liabilities by dramatically reducing marginal tax rates. Not surprisingly, the rapid upward trend in total tax collections per GDP between 1984 and 1985 was essentially halted after 1987. In sum, the pattern of increasing tax revenues per GDP in Colombia in the 1980s reflects, at least in part, changes in tax policies—in tax bases and rates.

Figure A-2.

39. In Argentina, the most important revenue source over this decade has been the value-added tax. Its base was substantially expanded at the beginning of the decade, only to be dramatically reduced in 1983. The 1983 reforms also reduced general and special VAT rates from 20 and 8 percent, respectively, to 18 and 5 percent. A reduction of the allowable payment delay from fifty-five to thirty-five days should have increased revenues, but not nearly as much as the base-narrowing and rate-lowering should have reduced revenues. Additional reforms in 1988 should also have reduced VAT revenues. These included more rapid reimbursement to taxpayers of taxes paid on capital goods and a reduction of the general rate from 18 to 15 percent. In short, Argentina’s pattern of declining VAT revenues per GDP during the 1980s reflects, at least in part, policy changes that have reduced the VAT’s base and rates.
40. Income tax policies in Argentina have vacillated in the 1980s. The zero-tax-bracket level of income rose from roughly 98 percent of average household income 1980-84 to more than 147 percent in 1985. It was then lowered dramatically to only about 64 percent of average household income in 1986, but was again moved up to 81.2 percent of average household income in 1987. These changes reduced the taxable income base up until 1985, then dramatically increased it the following year, only to begin reducing it again the following year. Exemptions of interest and profits on external assets, interest income on instruments deposited with financial institutions and on bonds issued by the central government (such as the BONEX); deferral of income tax payments of up to 75 percent of the investment in a promoted industry for up to five years, with up to five more years to pay that deferred liability; and excessively generous inflation adjustment procedures allowed within the corporate net income tax laws, have all reduced the taxable income base in the 1980s. Although the industrial promotion laws have been tightened, reducing that particular source of income tax base reductions, most other exemptions and deductions have remained in place throughout the decade. In short, the considerably smaller fluctuations in income tax revenues per GDP over the 1980s than in VAT revenues per GDP probably results both from the smaller statutorily determined tax liabilities under the income tax, as well as from the more modest changes in income tax policies—both base and rate definitions—over that decade.
The previous paragraphs are intended to illustrate how measures of GDP can be used to indicate potential tax revenues, given statutory definitions of tax bases and rates. Variations in the ratios of tax collections to GDP can reflect variations in potential tax revenues because of changes in tax base and rate definitions, and variations in the gap between actual and potential tax revenues—for example, tax evasion.

More advanced methods can be used to capture the effects of economic activity on potential or actual tax revenues. Instead of simple measure of GDP as a proxy for any and all national tax bases, an accounting model of a particular tax base can be constructed, using statutory-tax-base and rate definitions with more-detailed national income accounts data. Such an approach is more readily applied to taxes based on flat rates, instead of the graduated rate structures used for Argentina’s and Colombia’s income taxes. A particular tax base is also more easily modeled when the base definition is not complicated by large numbers of exemptions, deductions, and credits, such as those found in the Argentine VAT and income taxes, and in the Colombian income tax before its 1986 revision.

When data limitations, excessively complicated tax structures, or graduated tax rate schedules preclude estimating these more sophisticated accounting models of potential tax revenues, the simple GDP proxy for potential tax revenues illustrated above can be used. When doing so, it is of course
important to appropriately qualify the interpretation of temporal changes in the ratio of tax revenues to GDP to account for important changes in statutory definitions of tax bases and rates.
1. See, for example, Valdes Costa (1984), Jarach (1980), and Ramírez Cardona (1967).

2. Advance tax payments and withholding are generally the savings or deposits aspect, depending partly on whether such payments are adjusted for inflation; deferred installments paid with a return are the credit aspect. At any point, each taxpayer would thus have the equivalent of a loan or credit line for each tax.

3. Inflationary adjustments enter into the design of tax procedures as a way to deter taxpayer payment deferral. Appropriate mechanisms may be explicitly determined or incorporated into the interest charged on delayed payments.

4. Most of the existing literature on tax administration in developing countries is normative or descriptive. See Surrey (1958) for a comprehensive early review of the issues and Goode (1981) and Bird (1989) for more recent reviews of the literature. Particularly useful earlier discussions of tax administration in Latin America may be found in Joint Tax Program (1965), Colombia (1985), and World Bank (1990b).

5. An early summary of the public administration literature may be found in Heady (1966); for a sample of the more recent literature, see the journal Public Administration and Development. The outstanding example of a study of tax administration in developing countries is Radian (1980), which contains both a stimulating general discussion and case studies of four countries (Jamaica, the Philippines, Thailand, and Trinidad).

6. For an interesting recent analysis of attempts to control corruption in contemporary developing countries (including a—transitorily—successful cleanup of tax administration in the Philippines), see Kitzgaard (1988).

7. See, for example, the papers in Internal Revenue Service (1988), as well as Slemrod (1989), and White (1990).

8. See the interesting discussion of two British cases (land development taxes and gambling taxes) in Hood (1976).


10. The U.K. measures are described briefly in Sandford (1989). Canada also provides some data of both types, focusing on "intermediate products" like the United States for some purposes and on cost/yield figures, like the United Kingdom, for others (Vaillancourt 1989).

11. For a good example, see Hessing (1990) who reports that Dutch tax officials examine all income tax returns and select some for further investigation; however, apparently no formal selection criteria are used and no system of monitoring and evaluating the performance of different officials, except the subjective judgment of their superiors. Such a system may work satisfactorily in the Netherlands. When transplanted to Indonesia, it left much to be desired. See Lerche (1980), Gillis (1985, 1989, 1990), Asher (1989), and Nasution (1989), for discussions of tax administration in Indonesia.
12. Although this report does not consider the appropriate size of the tax administration budget, but takes it as given, the optimal size of a tax administration is almost certain to be at a point where marginal revenue exceeds marginal cost, perhaps by a large margin (Slemrod and Yitzhaki 1987). Among the reasons for this result are the need to take (private) compliance costs into account (Goode 1981), the real resource costs involved in avoidance and evasion efforts (Usher 1986), and perhaps even the psychic costs imposed by the uncertainty of enforcement efforts (Sandmo 1981; Skinner and Slemrod 1985). Even assuming—as do most authors cited—that the costs imposed on evaders should properly be taken into account (see Spicer 1990), the conclusion that the cost of tax administration should properly be equated at the margin to the reduction in welfare cost of evasion only holds for a benevolent government concerned with maximizing the welfare of its citizens (including evaders). In this case, taxes are only a transfer and the welfare calculus works out as shown in Slemrod and Yitzhaki (1987). The appropriate marginal calculation for an "absolute" government (de Viti de Marco, 1936) or a revenue-maximizing Leviathan (Brennan and Buchanan 1980; Kau and Rubin 1981) would be quite different. Indeed, if such a government is influenced by budget-maximizing bureaucrats (Niskanen 1981), it may even strive to maximize revenue gross of collection costs! But, if government is a tyrant, taxation is theft, and tax evasion takes on quite different welfare connotations.

13. For the most recent discussion of this question, see Internal Revenue Service (1990).

14. Gillis (1990) reports that a special audit team focusing on large firms reporting losses in Indonesia produced a direct revenue return of 340 times the audit cost. Similar snippets of information occasionally surface for other countries, but there appear to be no formal studies of the allocation of audit resources in developing countries. There are a number of studies of the extent of tax evasion in developing countries. For an early survey, see Herschel (1978) and, for a later survey, Richupan (1984). Other recent country studies of the quantitative dimension of tax evasion include Alm (1988) and Alm, Bahl, and Murray (1989) on Jamaica, and Rao and Pradhan (1985) and Archaya and others (1986) on India. In addition, there are a number of theoretical analyses of tax evasion in developing countries. See, for example, Chu and Chu (1990) and especially Virmani (1987), which stands almost alone in the literature in incorporating dishonest officials as well as dishonest taxpayers.

15. See Graetz, Reinganum, and Wilde (1986) and Reinganum and Wilde (1985).

16. Cowell 1990, p. 191. Tellingly, only one paragraph of this 267-page summary of the economic literature even mentions this possibility!

17. See, for example, the historical discussion in Webber and Wildavsky (1986), the predator-prey analogy in Boyd (1986), and the Darwinian analogy in Mayshar (1986).

18. For numerous examples, see Roth and Scholz (1989) and Slemrod (1990). An accessible general introduction to this literature, and a comparison with the economic literature, is Smith and Kinsey (1985). For an earlier review, see Lewis (1982).
19. For a recent example, which appears to be the only formal survey of taxpayer attitudes in a developing country, see Mann and Smith (1988) on Puerto Rico.

20. In addition to the general sources cited in note 14 above, see the specific proposals in Falkinger and Walther (1991) and Hite (1989), and the studies reported in Hite (1990) and Alm, McKee, and Beck (1990).


22. On the United Kingdom, see Sandford (1973) Sanford and others (1981, 1989); on Canada, see Vaillancourt (1989); on Australia, see Pope (1989) and Pope and Fayle (1990); on the United States, see Slemrod and Sorum (1984). These studies consider the administrative and compliance costs of taxation but do not take into account the efficiency costs that have recently been emphasized in many economic studies. See, for example, Stuart (1984), Ballard, Shoven, and Whalley (1985), and Browning (1987) on the United States. They also omit the evasion costs emphasized in Usher (1986; forthcoming).

23. The only published study of collection costs in a developing country appears to be that on Indonesia by Lerche (1980). This study was subsequently updated and expanded in an unpublished paper (Lerche 1982). Vaillancourt (1989) suggests some potentially useful methods of allocating costs when they are not provided in the sort of tax-specific detail found in, respectively, the United States and the United Kingdom, while Shaw (1981) and Bird (1982) set out the uses and limits of such cost/yield studies with particular reference to developing countries.

24. Data for 1989 were not available for Colombia at press time.

25. For an example, see Duran's (1989a) accounting model of value added tax revenues in Argentina.

26. See World Bank (1990b) for a detailed analysis of recent tax policy changes in Argentina.

27. Durán (1989b) and World Bank estimates. See also World Bank, 1990b, table 4.4, p. 76.

28. See Durán (1989b) for an example.
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