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**Increasing Revenue and Efficiency
Reforming the Colombian Tax System**



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Second Year Policy Analysis

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Reform of the Colombian Tax System**

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Abstract:

Facing a difficult fiscal situation caused both by structural factors such as budget rigidity and decentralization of public expenditure, but also the Latin American financial crisis of 1997-98, Colombia's government has to be able to raise more revenue. Even with greater efficiency in spending, this should be necessary since Colombia has to spend more than double the Latin American average in the military to be able to improve its security situation which we consider to be an important constraint on growth. We focus on taxation and contribute to work already conducted on this issue with further analysis. In particular, by exploiting a rich panel of individual Colombian taxpayers and variability in tax rates in the nineties, we estimate for the first time elasticities of changes in personal taxable income to changes in tax rates. Our main policy proposals include changing brackets in personal income tax to focus on those individuals with lower elasticities, removing exemptions in corporate income taxes and reducing the number of rates in VAT combined with broadening it to more product categories. Finally, we analyze the political process and past reforms in order to provide guidance on how to make such a project politically supportable.

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Resumen

Frente a la difícil situación fiscal causada por dos factores de orden estructural, como la rigidez del presupuesto nacional y la descentralización del gasto público, y aún con la crisis financiera de América Latina de 1997 -98, el gobierno colombiano ha sido capaz de incrementar sus ingresos. Con una gran eficiencia en el gasto, Colombia desde hace tiempo tiene el doble de gasto militar en América Latina con el propósito de garantizar su seguridad, lo cual se considera como un importante factor para su crecimiento. Nuestro análisis se centra en la tributación y contribuye a trabajar en la búsqueda de salidas más allá de otros análisis. En particular, se explora con un panel importante el comportamiento tributario de las personas naturales y los cambios en las tasas de tributación en los noventa; se estima en primer lugar las elasticidades de los cambios en los ingresos gravables por modificaciones en las tasas de tributación. Nuestra principal propuesta considera cambios en los niveles de ingreso gravado para centrarse en aquellas personas naturales con elasticidades bajas, eliminar exenciones a los ingresos gravables de las empresas y reducción en el número de tarifas del impuesto al valor agregado (IVA) unido con la ampliación de la base gravable. Finalmente, analizamos el proceso político y las reformas anteriores con el propósito de ofrecer pautas de lo que se debe hacer políticamente sostenible.

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Nota Editorial: Los puntos de vista expresados de este documento son responsabilidad exclusiva de sus autores y no comprometen la posición institucional de la Dirección de Impuestos y Aduanas Nacionales (DIAN) de Colombia. Se publica con expresa autorización de los autores.

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Executive Summary

The country's fiscal situation started to deteriorate sharply in the second half of the 1990s, resulting in a substantial public debt which reached 56.2% of GDP in 2003. This resulted in a fiscal crisis being the main macroeconomic risk currently affecting Colombia. Several factors contributed to this deterioration of the fiscal accounts, most importantly the rigidity of the budget process, the decentralization of public expenditures (but not revenue collection) and the financial crisis that hit Latin America in 1997-98. In addition, recent efforts by President Uribe to fight drug trafficking, crime and guerrilla warfare, have added pressure to the budget by increasing military expenditure to 4.5 % of GDP. Insecurity has also been mentioned as a binding constraint to Colombian economic growth by several analysts and our application of growth diagnostics to Colombia confirms such results. This in turn means that despite needed efforts to improve expenditure efficiency, Colombia needs to maintain over the medium term a high level of spending relative to other Latin American countries.

In this paper we focus on taxation for two main reasons. First, the rigidity of the Colombian budget process and the above mentioned expenditure needs make revenue generation a key issue for avoiding a crisis, but also to contribute to economic growth. Moreover, tax revenues account for a substantial part of total revenues. In 2003, they represented 63% of Non-Financial Public Sector Revenues in Colombia. Second, the Colombian tax system suffers currently from several inefficiencies. It can be characterized as consisting of high, complex and unpredictable taxes. As we observe, this is mostly the result of successive small reforms aimed at temporarily correcting fiscal problems. Tax reform has therefore been a recurrent topic in Colombia and just the most recent administration has already passed three changes to tax law. In 2004, the Uribe Administration started a process of structural reform of the tax system to raise around 0.7% of GDP but it failed not only for political but also technical reasons. Fundamentally, the reform proposal did not take into sufficient consideration, constitutional constraints namely on the need for an overall progressivity principle in designing the reform.

In abiding by the tradition of fiscal reforms in Colombia, several positive and normative contributions have been made on the topic recently, the most important of which is the Mission for Public Income organized by Fedesarrollo and the Ministry of Finance and headed by Professor Alberto Alesina

that resulted in a series of studies and proposals. Our paper builds on this existing rich literature to produce more relevant analysis of the Colombian tax system in order to develop concrete proposals for reform. We focus our attention on three of the main taxes in Colombia, i.e. VAT, personal and corporate income tax, which account for almost 90% of total tax revenue in the country and we structure the paper accordingly.

Empirical strategy and reform proposals

In terms of technical analysis our main innovation and contribution is on personal income taxes, where we make use of a rich panel dataset of Colombian taxpayers over ten years, as well as variability in tax rates to estimate the elasticity of taxable income (the relevant policy variable) to changes in tax rates. The estimation is also done over the whole income distribution, allowing us to estimate elasticities of taxable income for income deciles of the population and providing valuable policy results on how to change the system. Our results suggest that unlike some of the most recent policies undertaken, increases in the Colombian personal income tax should actually target those taxpayers in high income brackets. We also emphasize the need for measures to increase the tax base through improvements in enforcement through better use of information technology. These combined efforts should result in a more efficient system and increased revenue from the personal income tax.

On corporate income tax, our analysis focuses on the relationship between taxation and growth and more specifically, the relationship between corporate income tax and investment in Colombia. We analyse critically the empirical evidence on the subject including the special case of Chile and also provide our estimates on what the effective corporate income tax rate in Colombia is, as well as the size of exemptions. Unfortunately, the available data from the tax authority on corporate income tax is not on single corporations, but on sectors and therefore the room for further analysis is limited. Our main policy proposal is that the tax base for the corporate income tax should be increased by drastically reducing exemptions and deductions, while compensating with a reduction in the rate to 30 percent, more in line with other Latin American countries. This tax would include a temporary surcharge to bring it to a 32 percent tax rate. Such a reform would greatly increase the efficiency of the corporate income tax, by sharing the burden across more tax payers, and eliminating distortions created by the numerous exemptions and loopholes.

On VAT, we reviewed the reforms that were put in place and the current system, concluding that this tax holds most potential as a means to increase overall tax revenues. Further analysis was again constrained by data availability as the tax authority only provides data on VAT revenues by sector of activity and not by product, which is how rates are applied. In this sense, revenue simulations of different number of rates and groups of products taxed combined with progressivity estimations could not be realized.

Following the recommendations by the Mission for Public Income, we would recommend instituting a single general tax rate applied to almost all goods, possibly with a second rate for basic goods consumed by poor families to maintain progressivity. However, limitations in the data limit the significance of these estimates. Thus, improving the availability of data by collecting revenue by product would be key to implement a good technical analysis in order to determine the impact of reforms on revenue and progressivity of the tax.

Implementation Strategy

We analyse past tax reforms in Colombia to take into consideration some of the success factors of these experiences. Our proposed strategy takes into consideration these ingredients and the structure of the political process of reform, concluding that two main concerns have to be addressed. First, the overall progressivity of the project has to be secured for Constitutional approval. This

should be done through balancing the need for broadening the VAT base with measures in personal and corporate income tax that give positive signals on equity of the system. We also propose targeting part of extra revenues to social spending to compensate for regressivity in VAT. Second, we suggest the creation of a concrete report with measures building on the different research papers and the results of the Mission for Public Income and culminating in a conference which would include members of parliament, private sector and unions representatives, opinion leaders and other civil society persons in order to gather support for reform. The advantage of such a procedure is that even in the event of President Uribe not being allowed to try re-election, there is always that, as in the past, the proposals may be used by a new administration. The fact is that given the growing fiscal concerns, by 2006-07 the latest a fiscal reform will have to be undertaken.

1. Introduction

Colombia stood for a long time in the post-war period as one of the most fiscally responsible countries in Latin America. The country's fiscal situation started to deteriorate sharply in the second half of the 1990s, resulting in a substantial public debt which reached 56.2% of GDP in 2003. Several factors contributed to this deterioration of the fiscal accounts, most importantly the decentralization of public expenditures and the financial crisis that hit Latin America in 1997-98. In addition, recent efforts by President Uribe to fight drug trafficking, crime and guerrilla warfare, have added pressure to the budget by increasing military expenditure to 4.5 % of GDP.

It is the country's security situation that is most commonly quoted as the major obstacle to Colombia's economic development, not only because of the burden on public expenditures, but also because it discourages both national and international investment and severely limits free movement of people within the country. Moreover, the security-related problems of drug production and trafficking also contribute to the informal economy (estimated at around 65% of employment). As Cardenas¹ points out in his sources-of-growth decomposition for Colombia, the major productivity decline since the 1980s "is related to the increase in criminality which has diverted capital and labor to unproductive activities. In turn, the rise in crime has been the result of rapid expansion in drug-trafficking activities, which erupted around 1980". A similar result was also obtained in our application of growth diagnostics to Colombia²

The rapid increase in public debt and the need for increased revenue to fight crime and drug trafficking are commonly used to argue for the urgent need for a fiscal reform in the country. A comprehensive fiscal reform would include measures aimed at both containing expenditure and increasing government revenues. Such a reform is out of the scope of this paper. Instead we focus our attention on the revenue side and more specifically the reform of the Colombian tax system, since taxes account for about 65% of Colombia's central government revenues. Moreover, any preliminary analysis of the tax system in Colombia highlights its inefficiencies: low tax bases and high tax rates in the three main taxes, personal income tax, corporate income tax and VAT, result in a concentrated burden on very few taxpayers, therefore severely limiting the ability of the central government to raise revenue. Given the revenue needs of the government to avoid a fiscal crisis, the difficulty in reducing expenditure because of the rigidity of the budget and these inefficiencies of the tax system, a tax reform in Colombia is needed independently of expenditure side reforms. The IMF head Rodrigo Rato, while visiting Colombia in February 2005 also stressed the need for a tax reform in the country, suggesting two objectives, simplifying VAT and increasing the base of products taxable and also to promote policies aimed at enlarging the income tax base. As he stated at the time, "these are elements that can be very useful for the country".

Colombia's tax system can be described as consisting of unpredictable, high and complex taxes. The unpredictability comes from a series of successive small reforms aimed at raising revenue in particular years to be able to curb higher fiscal imbalances. As Junguito and Rincon³ state "despite the multiplicity of tax reforms adopted in recent years, the general criticism discussed by the literature is that they have been fragmented and that the resulting tax structure is inefficient". Colombia also has one of the highest tax rate levels in Latin America for corporate and personal

income taxes and one of the lowest tax bases. The complexity of the system has also partly come from successive reforms that have added new taxes, further discriminated rates among products and incomes and created exemptions.

As a consequence of all this, tax system reform in Colombia is not a new topic. Historically, tax reforms have been a continuous process of small adjustments and not carefully thought reforms. As pointed out in the historical analysis of fiscal policy in Colombia by Junguito and Rincón (2004), tax system reforms have coincided with downturns in tax revenue due to lower economic activity and have increased in intensity in the nineties. The country has in fact conducted twelve tax reforms since 1990, and three during President Alvaro Uribe's administration since 2002. Just recently, in December 2004, the Colombian government decided to withdraw its project of a new tax law since it did not receive enough support from Congress. This project aimed at raising 0.7% of GDP in tax revenue since 2005. In addition, the political strategies that have been used to pass these reforms have been often that of invoking emergency situations, in order to avoid consultation to Congress.

The "Mission on Public Income" started in 2001 by the Ministry of Finance and including international and national policy experts and political figures and supported by Fedesarrollo⁴, presented new proposals for tax reform to the Uribe administration in 2002. These proposals "emphasized broad principles of tax design that should be followed in searching for higher revenues" and also made some specific recommendations. We build on this research in our paper and aim to fill in the gaps, especially on the personal income tax. Finally, we provide an analysis of institutional and political constraints, and we suggest an implementation strategy to increase the chances of success of the reform.

The report is organized as follows. We begin by justifying in more detail the need for a reform of the tax system, including a brief analysis of the sustainability of the public debt and rigidities of public expenditures. We then examine the three main taxes: personal income tax, corporate income tax and the value-added tax. We conclude with the main recommendations for reform of each tax, and an implementation strategy.

¹ Cardenas, M. "Economic Growth in Colombia: A Reversal of 'Fortune' (2001) CID Working Paper nr. 83.

² See Cerdan-Infantes, P., Hernandez, T. and Santos, N. "Growth Diagnostics: An application to Colombia" (2005) carta financiera ANIF.

³ Junguito, R. and Rincón, H. "La Política Fiscal en el siglo XX en Colombia" (2004), Banco de la Republica.

⁴ Fedesarrollo is a leading Colombian Research Institute (www.fedesarrollo.org).

2. Why is a Tax System Reform needed in Colombia?

Colombia's Non-Financial public sector deficit increased after 1994, reaching 5.5 percent of GDP during the economic crisis of 1999, and lowering in subsequent years, to 2.7 percent of GDP in 2004. These large deficits were financed through the accumulation of public debt, which reached 60 percent of GDP in 2004. A key question arises, which has strong implications for credit ratings and the ability of the Colombian economy to borrow internationally: will the Colombian government be able to pay back its debt?

In order to evaluate the solvency of the Colombian economy, we examine four indicators: on the one hand public debt over GDP as an overall look at the indebtedness of the country; and on the other debt service over GDP, tax revenues and current revenues as more appropriate measures of ability to service the debt⁵. As we see in Figure 2.1, all measures move similarly, with a clear change in trend since 1997. Since 1997, the debt has risen from about 25 percent of GDP to 50 percent, and most importantly, debt service payments have risen from 15 percent of total tax revenue to 25 percent in 2003. Colombia spends a quarter of its tax revenue and about 15 of total current revenue on servicing its debt, a very important burden on the budget.

Figure 2.1– Public Debt and Debt Service



Source: IMF Country reports for Colombia, 1999, 2001 and 2004

⁵ See Appendix B for an analysis of the sustainability of the debt under different scenarios.

Why focus on Taxation?

Colombia's Non-Financial Public Sector (NFPS) revenues are mostly tax dependent with tax income accounting for 63% of total revenues in 2003 (see appendix A for details). The main non-tax item is the operating surplus of the public oil company ECOPETROL that accounted for 9.3% of total NFPS revenues. Despite a current and expected temporary boom due to high oil prices, the key to a sounder fiscal stance in the country lies in a more efficient tax system.

Tax revenue has increased in recent years from 9.7 percent of GDP in 1995 to 14 percent in 2004. However, this revenue has been insufficient to match the increase in expenditures, resulting in an increase in the cost of debt service over the ability to generate revenue, a sign of reduced solvency for Colombia. We argue however, that the key to solvency is in increased tax revenue, given the constraints on expenditure faced by the government due to the decentralization process and military conflict, as well as the importance of tax revenue and the links to growth.

Colombian total Non-Financial Public Sector (NFPS)⁶ expenditure and net lending has increased significantly since 1993 from 22.8 to 34.1 percent of GDP in 2003. The rigid budget process, the decentralization of public expenditures (but not revenue collection) and the recent increase in military expenditure in an effort to thwart guerrilla activity and drug-trafficking by the Uribe administration have all contributed to this surge in expenditures.

- Rigidity of Public Expenditure and Decentralization

Echeverry et al (2004) examine the budget process in Colombia, and argue that the wide array of laws and constitutional decrees have compromised the ability of the central government to effectively control expenditures and therefore carry out responsible fiscal policy. In 2003, the Ministry of Finance estimated that 94 percent of the Central Government's budget was allocated ex-ante by a mandate to specific sectors and regions. Thus, with the current system, balancing the budget by reducing expenditures is an arduous task. This inflexibility is partly designed to compensate for the decentralization of public expenditures. Since raising revenue is done by the central government, but expenditure is carried out by local governments, the central government needs to provide guidelines on public expenditure.

In fact, Alesina et al. (2003) point to the decentralization process of Colombia's public expenditure after the Constitution of 1990 as a possible cause of the increase in public expenditures. Colombia's central government transfers about 40 percent of its revenue to local governments, one of the largest shares in Latin America only behind two federal states Argentina and Brazil. With these transfers, local governments then have flexibility on expenditures and most importantly, are not forced to balance their budgets and are allowed to borrow in financial markets to finance deficits. Furthermore, local governments are responsible only for a small share of its revenues through local taxes (mainly excise taxes on gasoline, alcohol and other sales taxes), and therefore do not bear the burden of repayment of their debt. There is a clear mismatch of incentives, in which local governments have incentives to overspend and borrow, in the expectation that the burden of their irresponsibility will be shared with the central government.

The solution to these rigidities is not simple; in fact, Echeverry et al (2004) provide 8 complex proposals to deal with this rigidity. We argue, therefore, that these rigidities are impossible to overcome in the short run, which points to tax reform to balance the budget.

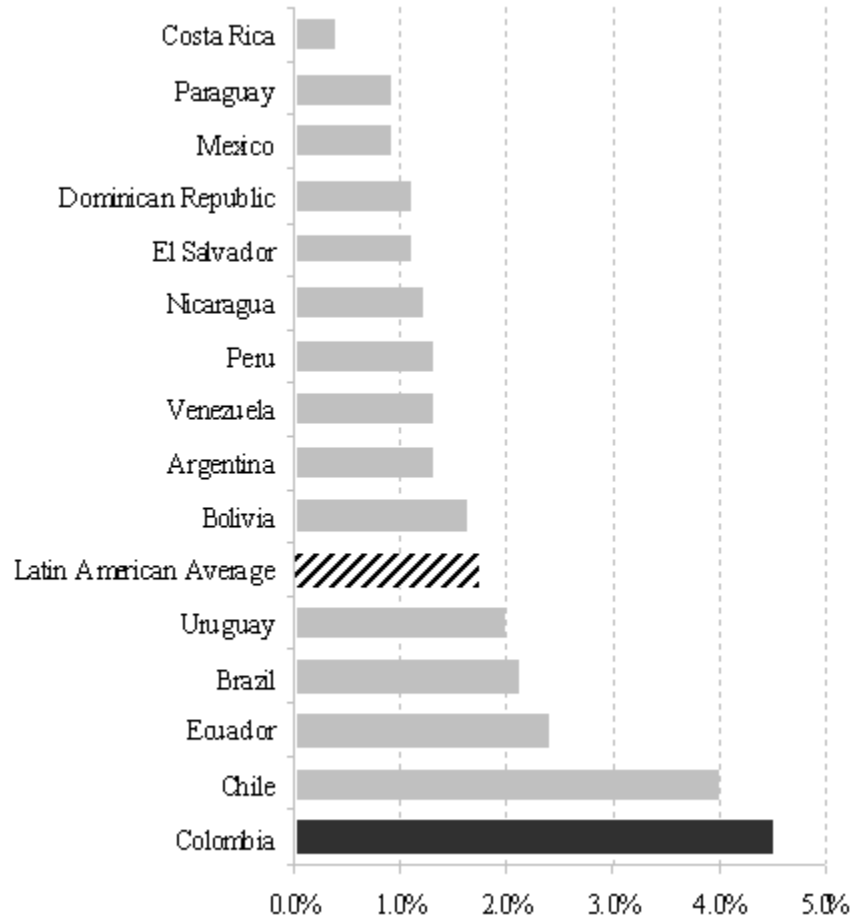
- The Military Conflict: Need for Resources

Colombia spends a larger percentage of its GDP in the military than any other country in Latin America (see figure 2.2). Currently at 4.5 percent of GDP, almost three times the Latin American average, it is expected to double by the end of the decade. But it is not only the military cost of the conflict that burdens the Colombian economy. There exist numerous studies of the cost of the internal conflict on the Colombian economy and the estimates on the yearly costs range from 0.5 percent to over 7 percent of GDP per year, increasing in recent years⁷. The costs include direct costs such as military operations, repairs to damages to infrastructure, payment of ransoms and cost of lives, as well as indirect costs such as loss of human lives.

⁶ Non-Financial Public Sector includes local governments and departamentos.

⁷ Pinto-Borrego et al (2005), "Costos generados por el conflicto armado interno en Colombia: 1999-2003" includes a detailed account of these costs in recent years, and presents an overview of the literature on the subject. Sulinamo, ed. "Colombia: Essays on Conflict, Peace and Development" (2000) examines the implications of the conflict on the economy.

Figure 2.2: Military Expenditure as % of GDP in Latin America



Source: CIA World Factbook, 2003

Additionally, some studies have examined the implications of the conflict for economic growth. For example, Cardenas (2001) attributes most of the fall in productivity of the Colombian economy since 1980 to the diversion of resources (productive capital and labor) due to the armed conflict. Similarly, Etxeverry et al. (2001) find that the conflict is reducing the long-term growth of the Colombian economy by 0.5 percent, and Rubio (1995) finds an even larger effect of 2 percent. Whichever estimate we believe, it seems that the resolution of the internal conflict should be a priority of the Colombian government, which should devote the necessary resources to fight the war against crime, something the current president, Alvaro Uribe has pushed for during his presidency.

3. Personal Income Tax

The personal income tax in Colombia represented only one percent of GDP in 2003, or about 10 percent of tax revenue raised by the Central Government, very low even when compared with other developing countries. In fact, as we can see in Table 3.1 which shows the share of GDP generated by major taxes for countries at different income levels, Colombia's personal income tax raises less than half the revenue of countries with similar GDP per capita.

Table 3.1: Share of Revenue from major taxes by country's GDP per capita, 1996-2001

| | Total Revenue (% of GDP) | Income Tax (% of GDP) | | VAT (% of GDP) |
|--------------------|-----------------------------|-----------------------|-----------|----------------|
| | | Personal | Corporate | |
| Colombia (\$2,347) | 13.1 | 1.0 | 4.3 | 5.3 |
| <\$745 | 14.1 | 2.3 | 2.7 | 6.1 |
| \$746-2,975 | 16.7 | 2.7 | 2.6 | 8.7 |
| \$2,976-9,205 | 20.2 | 4.1 | 1.8 | 10.7 |
| All Developing | 17.6 | 3.2 | 2.3 | 9.0 |
| Developed | 25.0 | 11.2 | 2.4 | 8.2 |

Source: Gordon and Li (2004) and DIAN

Why is revenue from the Personal Income Tax (PIT) so low in Colombia? The answer is a very low tax base, which makes subsequent efforts to raise revenue through increases in marginal rates ineffective. In fact, the World Bank estimates that of the current 8 million workers in Colombia only 1 million pay personal income tax. As a result of this low base and the need for revenue, reforms have focused on increasing tax rates to very high levels (see table 3.2), thereby concentrating the tax burden on few individuals, and making it difficult to raise additional income by imposing too high a cost on these taxpayers. In fact, using taxpayer data provided by the DIAN, the tax authority in Colombia, we calculate that 50 percent of the total revenue from personal income tax comes from the top 10 percent of income earners, and almost 90 percent from the top 30 percent. In numbers, in a country of 42 million people, only 1,000,000 of them pay personal income tax, and of those, only 300,000 bear 90 percent of the tax burden.

Table 3.2: Income Tax Rates in Latin America

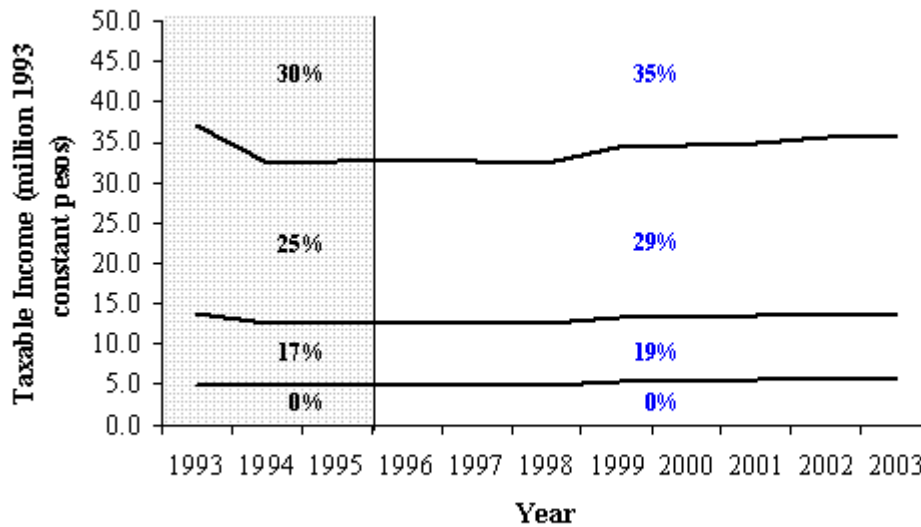
| Country | Income Personal | | Income Corporate |
|-----------------|-----------------|--------------|------------------|
| | Lowest rate | Highest rate | |
| Argentina | 6 | 35 | 35 |
| Bolivia | 13 | 13 | 25 |
| Brasil | 15 | 27.5 | 34 |
| Chile | 5 | 45 | 16.5 |
| Colombia | 22 | 38.5 | 38.5 |
| Costa Rica | 10 | 25 | 36 |
| Ecuador | 5 | 25 | 36.25 |
| México | 3 | 32 | 34 |
| Perú | 15 | 30 | 27 |
| Uruguay | 30 | 30 | 35 |

Source: World Bank "Colombia Public Expenditure Review", 2002

Early Reforms of the Personal Income Tax

Colombia has implemented only one major Personal Income Tax reform since the signing of the Constitution. The reform, during the presidency of Ernesto Samper, increased marginal rates but did not attempt to increase tax base or modify the tax brackets. In fact, brackets have remained moderately constant since 1993 in real terms (see Figure 3.1).

Figure 3.1: Evolution of personal income tax brackets (constant 1993 million pesos) and correspondent marginal tax rates



Source: Author's calculations based on DIAN data.

In addition, current President Uribe, instituted a one-year 10 percent surcharge on the 2002 tax bill to finance the war against the guerrillas (law 788), which was then extended to three years and accompanied by additional increases in the VAT and wealth tax in 2003 (law 863). This reform, contrary to the one carried out in 1996, tried to broaden the tax base on low income brackets by reducing the minimum wealth required to file income taxes.

The focus on increasing marginal rates in response to revenue needs has resulted in an inefficient personal income tax and very low tax revenue. Thus, any change in the tax rates should be accompanied by measures to increase the tax base. Colombia is currently implementing a program that aims at doubling the number of tax payers by the year 2006 through improved tax enforcement using new technologies (plan "Muisca"). Such efforts are important to complement any reforms in the technical aspects of the tax law, and should be emphasized in the policy recommendations.

Reforming the Personal Income Tax

What should the Colombian government do with the PIT? We examine three important characteristics for the success and appropriateness of any proposed reform: increased revenue, increased efficiency and maintaining or increasing progressivity. In order to evaluate the characteristics of the PIT, we use a panel of data for a representative sample of over 100,000 taxpayers for the 1994-2003 period, with information on total reported income, exemptions, taxable income and tax liabilities for each year⁸. Due to the richness of the panel dataset, we are able to perform a detailed analysis (and innovative in the case of developing countries) on the effects of tax reforms on individual behavior and estimate effects of proposed reforms.

The main analysis will result in the estimation of the sensitivity of taxable income to changes in the tax rates for different groups, that is, how changes in the marginal tax rates affect the reported taxable income, which is our policy variable of interest. In particular, we are interested in calculating

this relationship for taxpayers in different income brackets. Whether taxpayers reduce taxable income through evasion, heavier use of exemptions or through changes in labor supply decisions, this estimate allows us to establish the relationship between an increase in marginal tax rates and income, and therefore estimate the effects on revenue. While the vast literature on the subject finds a wide array of elasticities depending on the methodology used⁹, we follow the methodology of Gruber and Saez (2002), which attempts to isolate the behavioral response of taxpayers to these changes by controlling for the income distribution and using two instrumental variables (IV)¹⁰ to avoid biased estimates for two main reasons. First, because an individual facing any income shock could see its tax rate increase automatically just due to the progressivity of the system and not because of a behavioral response. Second, because real net of tax income is correlated with changes in the distribution of income in the country. In our preferred specification, the model aims at isolating the behavioral change in taxable income for changes in marginal tax rates by using such econometric techniques.

We perform this analysis for two reasons. First, it permits us to estimate the effects of changing rates on tax revenue. Second, it allows us to target increases in the tax rates in the most efficient way by raising rates for those individuals who will respond to the changes the least, so as to guarantee a larger increase in tax revenue for the same tax increase and reduce the distortion of new taxes¹¹. Therefore, this analysis will allow us to assess the efficiency and effects on revenue derived from a proposed reform. We will then estimate the effects of passed reforms on the progressivity of the system, and consider all aspects of the analysis to propose a reform of the personal income tax.

Table 3.3 presents the results from our estimations using the entire sample of 100,000 taxpayers for 10 years. Column 1 presents the correlation between changes in marginal rates and taxable income, without controlling for unobservable characteristics of taxpayers. However, to the extent that there is a correlation between individual characteristics and their behavioral response, this specification will yield biased results.

Table 3.3: Elasticity of Taxable Income with respect to Marginal Tax Rates

| | % Change in Taxable Income | | |
|-------------------------------|----------------------------|-------------------|-------------------|
| | -1 | -2 | -3 |
| % Change in Marginal Tax Rate | 0.557 | 0.469 | 0.424 |
| | (59.48) | (49.89) | (44.25) |
| Log(Lagged income) | | -0.013 (79.57) | |
| Spline 1st decile control | | | -0.062 (22.62) |
| Spline 2nd decile control | | | -0.054 (12.62) |
| Spline 3rd decile control | | | -0.015 (3.19) |
| Spline 4th decile control | | | 0.011 (1.89) |
| Spline 5th decile control | | | -0.122 (19.12) |

| | | | |
|----------------------------|-----------------|------------------|-------------------|
| Spline 6th decile control | | | -0.005 (0.66) |
| Spline 7th decile control | | | -0.044 (6.79) |
| Spline 8th decile control | | | -0.004 (1.26) |
| Spline 9th decile control | | | 0.001 (0.98) |
| Spline 10th decile control | | | -0.005 (12.66) |
| Constant | 0.001 (1.88) | 0.226 (78.91) | 1,028 (23.49) |
| Observations | 1,006,284 | 1,006,284 | 1,006,284 |
| R-squared | 0.02 | 0.02 | 0.03 |

Absolute value of t statistics in parentheses

Regression results from a Two-Stage-Least-Squares, controlling for year fixed effects. All regressions weighted by income.

⁸ We tested for representativeness by examining the distribution of income. For example, we estimate the GINI coefficient in 2003 based on broad income (before taxes) at 0.4 while World Bank estimates for Colombia point to 0.56, the difference attributed to our sample not including people that do not pay taxes, a large majority of which is just because they have very low incomes.

⁹See Feldstein (1995) for a survey of the literature analyzing the 1986 Tax Reform act in the US.

¹⁰IVs are used for the change in tax rates and in real net of tax income respectively. The econometric details of the estimation, see Appendix C.

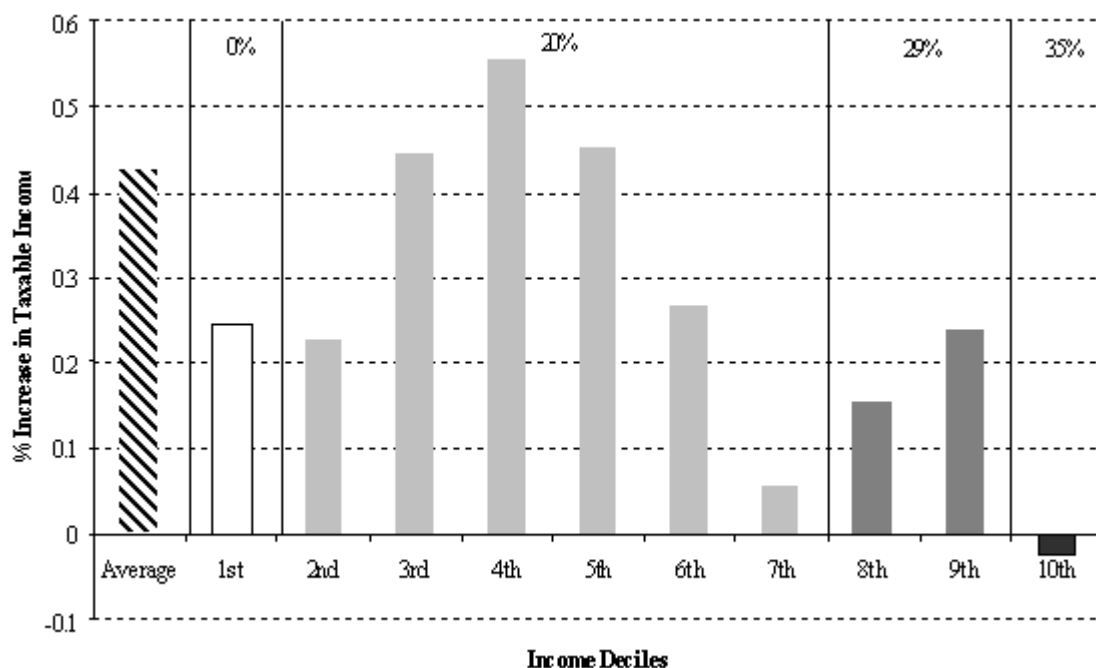
¹¹It is a standard textbook economics result that the deadweight loss of taxes is reduced when the tax is applied to goods with very low elasticity.

For example, if individuals with lower income in the previous year tend to systematically increase their income in the next, because of mean reversal, they will tend to have a positive increase in the marginal tax rate and higher taxable income, which would be reflected in a larger estimated relationship between the two. Column 2 attempts to correct for this possibility by including income from the previous year to account for these differences. Finally, column 3, our preferred specification, allows for different effects of income for different income groups and thus provides a more accurate estimate of the elasticity.

We estimate that if we increased marginal rates by 10 percent, taxable income would fall by 4 percent on average, therefore resulting in slightly more than a 5 percent increase in revenue¹². The size of the relationship is similar to that found for the US by Gruber and Saez (2002), and smaller than other estimates found in the literature¹³.

In practice, however, we are interested in the effect of such changes for individuals in different income groups, in order to better target changes in brackets and rates. Figure 3.2 breaks up the sample into 10 income groups by dividing our sample into income deciles.

Figure 3.2: Elasticity of Taxable Income to Changes in Marginal Tax Rates



Source: Authors estimates based on DIAN data.

¹² Note that the elasticities, while negative (increasing rates results in a smaller taxable income), are introduced in the graph with a positive sign for easier presentation.

¹³ See Gruber and Saez (2002) p. 5 for a review of empirical estimates of taxable income elasticities. We could not find, however, empirical work of this type for developing countries.

The analysis for different income groups provides some interesting results. The bars represent the estimated elasticities for each income bracket, and the different shadings show the income bracket each income category falls into (the respective marginal tax rate is the percentage figure above the bars).

Only the top 10 percent of tax payers fall into the top income tax bracket in our sample. This 10 percent of tax payers, however, represent a much smaller percentage of the population, since we do not include individuals who do not pay taxes because their income is too low. The largest share of taxpayers is taxed at a 20 percent marginal tax rate.

Even more interesting is the pattern of the elasticity across income levels: the elasticity is low for low and high income groups, rising for individuals in the middle of the income distribution. An increase of 10 percent in the corresponding marginal rate decreases taxable income by 2.5 percent for individuals both in the lowest and highest ends of the income distribution, whereas the same increase would result in a decrease of 5.5 percent for those in the middle of the distribution¹⁴. Even though the elasticities are similar for very low and very high income earners, the reasons for the low response of their taxable income to changes in the marginal tax rates are different. First, it is important to note that our sample includes individuals who reported income for all the years in our sample. Thus, an important effect is missing from our analysis: by increasing the marginal rates we may be incentivizing informality, and therefore a change in the marginal rates may reduce the number of taxpayers. However, because of the presumptive tax system existing in Colombia, in which an individual is assigned a taxable income derived from her wealth in the previous year and pays taxes on that income if her reported income for the year is lower than the presumptive, high income tax payers with high wealth will have a harder time evading taxes by moving to the informal

sector. Moreover, they are also often more visible which makes it costlier to get caught. Thus, these individuals may be less likely to evade taxes and report less taxable income because of the presumptive tax, whereas low income payers may be more likely to leave the system. In this sense, our exercise would underestimate the effects of increases in the marginal tax rates on total taxable income.

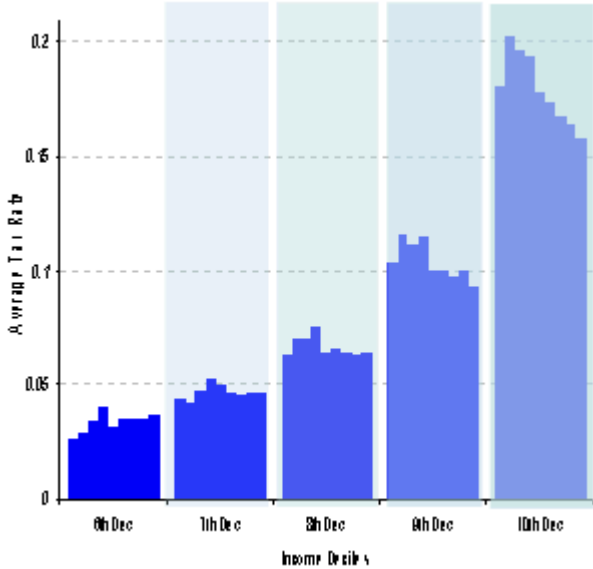
These vast differences in elasticities, however, have strong implications for the targeting of any reform of the personal income tax: to minimize distortions and maximize revenue, increases in the marginal tax should target those groups with low taxable income elasticity. The analysis of elasticities would point to individuals in the low income bracket and high income brackets as the potential groups for targeted increases in the marginal rates. However, progressivity and revenue considerations need also be taken into account for any proposed reform.

¹⁴Note the coefficient for the top income group is not significant, possibly because of lack of variation in marginal rates for these high income earners. The rest of the coefficients are highly significant.

Progressivity

Figure 3.3 examines the evolution of the progressivity of the personal income tax by plotting the average tax rate, calculated as the tax liability divided by taxable income, for each decile for each year in the 1994-2003 period. The panel on the left includes the first 5 deciles and the panel on the right includes the 5 top deciles. The pattern is clear, while for lower deciles the average tax rate has been increasing progressively over the 10 year period, this is not the case for the top 5 deciles. The average rate has remained fairly constant for the 6th, 7th and 8th deciles and the average rates for the top deciles have been reduced gradually in recent years. Thus, the overall progressivity of the personal income tax has been reduced over the preceding years after the 1996 and 2000 reforms.

Figure 3.3: Average Tax Rates by income deciles (each bar represents a year from 1994 to 2003)



Source: Authors estimates based on DIAN data

Increasing the marginal rate for low income earners, or broadening the tax base by including currently exempt low-income individuals would increase this observed trend. On the other hand, by

targeting high income individuals, the Colombian government could reverse this trend of diminishing progressivity. This is a key policy decision, and it has strong implications for the probability of success of a structural reform, given the Constitutional mandate for progressivity of the tax system.

Effects on Revenue

The importance of high income earners for tax revenue is clear from the progressive structure of the income tax. An increase in the marginal tax rate for high income earners, therefore, has a very large effect on tax revenue, especially given the low sensitivity of taxable income for these individuals. In fact, assuming a conservative elasticity of .25 for the top 20 percent of tax payers¹⁵, a 10 percent raise in the marginal tax rate (from 35 to 38 percent) would increase revenue coming from these brackets by 8 percent. Given the contribution of these brackets to total revenue, such a reform would greatly increase the capacity to raise revenue. On the other hand, raising the same revenue by broadening the tax base or increasing the marginal tax rate for lower income taxpayers would require a much more significant reform.

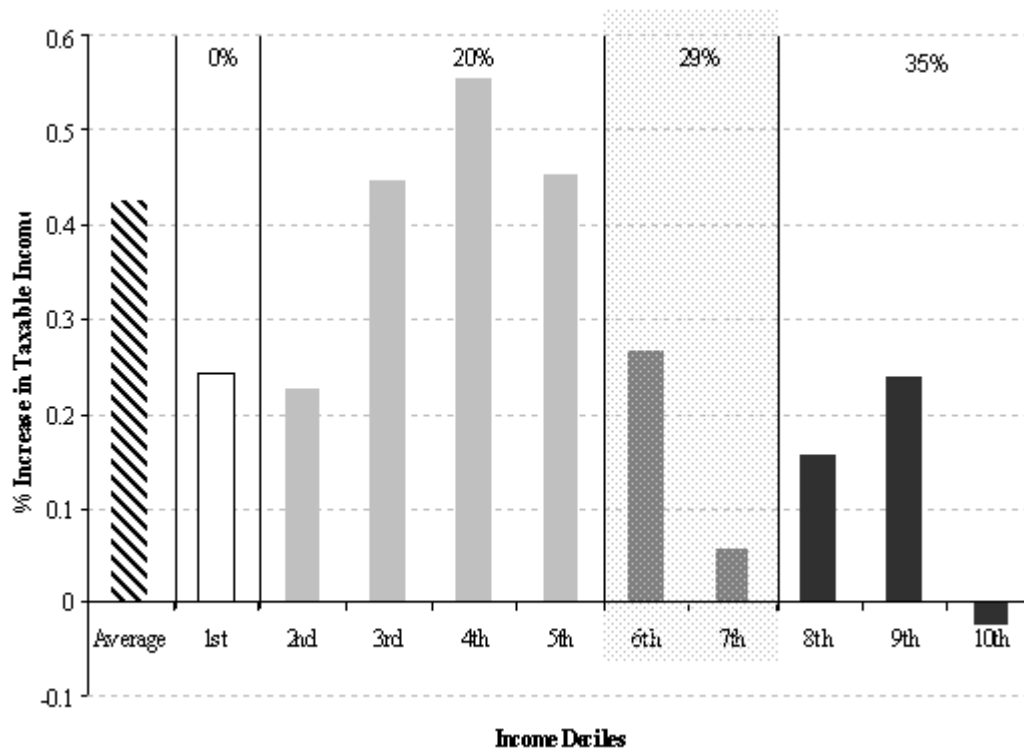
¹⁵ Recall we find an elasticity not statistically different from 0 for the top decile

A Proposal for Reform

In order to increase revenue from the personal income tax with the lowest efficiency cost, maintaining or increasing the progressivity of the tax, the proposed reform should target the top 30 percent of income earners by shifting the brackets into which these individuals fall. There are a number of reforms that can accomplish this goal, by reducing the minimum income for top brackets or creating a new bracket between the levels taxed at 29 and 35 percent marginal rates. For illustration purposes, we perform an exercise with a proposed change in the brackets and evaluate the effects on tax revenues, leaving the tax base unchanged.

Table 3.4 proposes the simplest change in the tax brackets using the analysis of deciles, in which we move the tax bracket for top income payers to the 7th income decile, and that of 29 percent to the 5th (see figure 3.4 for a graphical representation of the reform).

Figure 3.4: Proposed Reform of the Personal Income Tax Brackets



Source: Authors estimates based on DIAN data

While moving 30 percent of taxpayers to the top bracket may not be politically feasible, this exercise provides an indication of the ability to raise extra revenue by shifting income brackets while maintaining the tax base intact.

Table 3.4: Proposed Changes in the Tax Brackets

| Current | | | | New | | | |
|-----------------|---------|------------|---------------|-----------------|---------|------------|---------------|
| Income Brackets | | | Marginal Rate | Income Brackets | | | Marginal Rate |
| 1 | to | 19,700,000 | 0.0 | 1 | to | 19,700,000 | 0.0 |
| 19,700,000 | to | 29,500,000 | 20.0 | 19,700,000 | to | 22,500,000 | 20.0 |
| 29,500,000 | to | 79,100,000 | 29.0 | 22,500,000 | to | 29,500,000 | 29.0 |
| 79,100,000 | or more | | 35.0 | 29,500,000 | or more | | 35.0 |

Source: Author's Calculations using 2003 Income Distribution from DIAN

Using the elasticities of taxable income and the proposed changes in tax rates, and a share of the revenue coming from each decile, we estimate that the shift in income brackets would increase revenue by slightly more than 10 percent, from 1 percent to 1.11 percent of GDP. While 0.11 percent of GDP is not a very large number, the importance of this reform lies in the synergies with the current efforts by the Colombian tax administration on tax enforcement. Investments in Information Technology and other measures to fight evasion, like the plan "Muisca", are aimed at increasing the number of taxpayers by identifying potential evaders. Potential reforms should aim at imitating Chile's tax filing and enforcement system, in which taxpayers file taxes on-line, therefore making tax evasion more difficult. Under the assumption that individuals in the same income group

behave similarly on average, bringing extra taxpayers into a more efficient system will increase revenue in a more efficient way, and result in a productivity of the personal income tax more in line with that of other countries at similar GDP levels as Colombia.

In conclusion, the Colombian personal income tax raises less revenue than countries at similar income levels. This is due to a very low tax base, which has caused tax rates to increase, burdening a small share of the population for most of the revenue. Our analysis indicates that increases in rates should target those taxpayers in high income brackets, whose taxable income present low sensitivity to tax rates. We also emphasize the need for measures to increase the tax base through improvements in enforcement through better use of information technology. These combined efforts should result in a more efficient system and increased revenue from the personal income tax.

4. Corporate Income Tax

The last major reform of the corporate income tax in Colombia dates from 2003 when the current Uribe Administration created a temporary 10% surcharge on the existing corporate income tax rate, valid until 2006. The corporate income tax rate had previously been increased from 30% to 35% through the tax reform of 1995 (ley 223), and the increase in 2003 was mostly an effort to improve the government's fiscal stance at a time when public debt was still increasing. The corporate income tax continues to be a major contributor to Colombian tax revenues (almost 5 percent of GDP in 2003) but, as in the case of personal income tax, it concentrates its burden on very few taxpayers who pay very high rates (at 38.5%, the highest in Latin America). The high rate lowers after tax return on investments, distorts investment decisions, and it may lead to lower investment and economic growth. Thus, the interesting policy question is whether the benefits from lowering the corporate income tax would outweigh the loss in revenue, and therefore Colombia should lower the corporate tax and compensate the loss in revenue through other taxes. We start by discussing the effects of corporate income tax on growth, reviewing the evidence from the literature, and then explore their applicability to the case of Colombia, in order to propose what, if anything, the Colombian government should change in the corporate income tax.

Corporate Income Tax and Growth

An important economics literature has focused on the effects of corporate income taxation on growth, both through the theoretical relationship between taxation and growth and empirical evidence on the importance of taxation on growth rates. Neo-classical growth models predict that lowering the corporate tax rates should increase investment in the short-run, as the return on investment increases, but should have no effect on growth in the long-run, as this is determined exclusively by technological change. In fact, Hall and Jorgenson (1967) and much subsequent literature on taxes and rates of capital investment, show low current effective tax rates on new investment should be associated with faster short-run growth, due to an investment boom in response to the temporarily lower tax rates. Gordon and Lee (2004) quantify the effect using standard growth theory and a cross-sectional dataset of 70 countries in an effort to relate taxation and GDP growth. Depending on the specifications, control variables included and estimation methodology, the authors concluded that a 10% point decrease in corporate income tax rates is associated with an increase in annual GDP per capita in the range of 0.57% and 1.09% points and reaching 1.82% in a fixed effects estimation using a constructed panel¹⁶. for 77 countries.

These sizeable estimates of the relationship between taxation and growth, however, should be interpreted with caution for several reasons. First, there could potentially be problems with the regression specifications used. For example, the corporate tax rate used does not include specific characteristics of the corporate income tax in each country, such as tax incentives for entrepreneurs, tax loopholes, exemptions and evasion, which are pervasive in developing countries in general, and Colombia in particular. Moreover, the authors don't take into account interactions of the corporate income tax rate with other taxes that could also affect growth through reductions in

distortions, as is the case with VAT.

Second, even if one would take the results literally, these estimates are based on the average relation between growth and tax rates and are not necessarily applicable to particular countries. In fact, in their most complete specification the authors use country fixed effects to capture the particular characteristics of the country that may affect the relationship between growth and taxation, therefore limiting their applicability to particular countries.

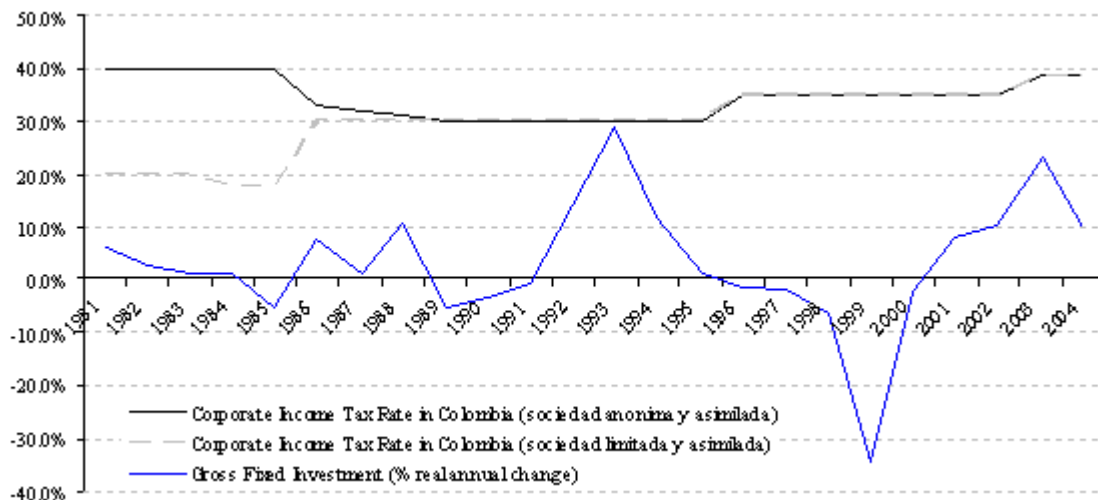
¹⁶ For details see Gordon and Lee (2004).

Chile's corporate income tax reform: an example to follow?

Among Latin American countries, Chile has the lowest corporate income tax rate. Some authors have argued that the Chilean tax reform of the 1980-90s was responsible for the impressive increase in private investment in the country. In particular, Vergara (2004) provides evidence that the tax reform was responsible for an increase of two percentage points in private investment, using macro data for the period 1975-2003. The author also uses microeconomic evidence from a panel of 88 publicly held companies for the period 1980-2003 suggesting that private investment growth was induced by the tax reform¹⁷.

There are two important caveats for the application of these results to the case of Colombia, however¹⁸. First, the policy relevant variable used by Vergara is the tax rate, ignoring changes in depreciation rules and other tax characteristics that can impact investor's appropriability of investment which may have accompanied the decrease in rates, and which may also be changing over time. Second and most importantly, Vergara's results are based on a period in which Chile's government reduced the corporate tax rate dramatically, from 50 percent in the early 1980s to zero in 1989, then to 15 percent in 1990 until 2001, in which a small gradual increase brought the tax to the current 17 percent. The effect of such a dramatic reduction in the corporate income tax on private investment may not be well explained by a simple linear relationship. One could envisage that private investment sensitivity to such a large, credible reduction, be much higher than the responsiveness to just small reductions at high corporate tax levels. Models of investment behavior include several other factors that could be more binding than corporate tax rates unless there is a significant credible shift in the rates. Moreover, a number of other variables besides tax competitiveness are important for the global competitiveness index, for example security, which is particularly interesting in the case of Colombia.

Figure 4.1: Corporate Income Tax Rate vs. Gross Fixed Investment in Colombia



Source: DIAN and EIU

Therefore, the examples of other countries such as Chile¹⁹, where lower corporate tax rates are believed to have fostered growth therefore do not seem to be fully applicable for Colombia's case. Cardenas and Olivera (1995) confirm this view in their analysis of investment in Colombia since the fifties. Using a simple linear regression methodology for estimating investment in Colombia with data from 1950 to 1994 they estimate an insignificant effect of taxes on Colombia's investment²⁰. Their tax variable is actually a mix of effects of corporate income tax, VAT and import tariffs and their approach has the clear advantage of being focused on Colombia. A simple observation of the graph above (figure 4.1) also seems to suggest that there is no strong relationship between investment (in this case both public and private, although for only private investment the result is similar) and corporate income tax rates.

¹⁷For more details see Vergara, R. "Taxation and Private Investment: Evidence for Chile" (2004),

¹⁸It could also be argued that the author's strong results are based on an average over a long time period where despite controls the regression specification could still suffer from omitted variable bias and endogeneity.

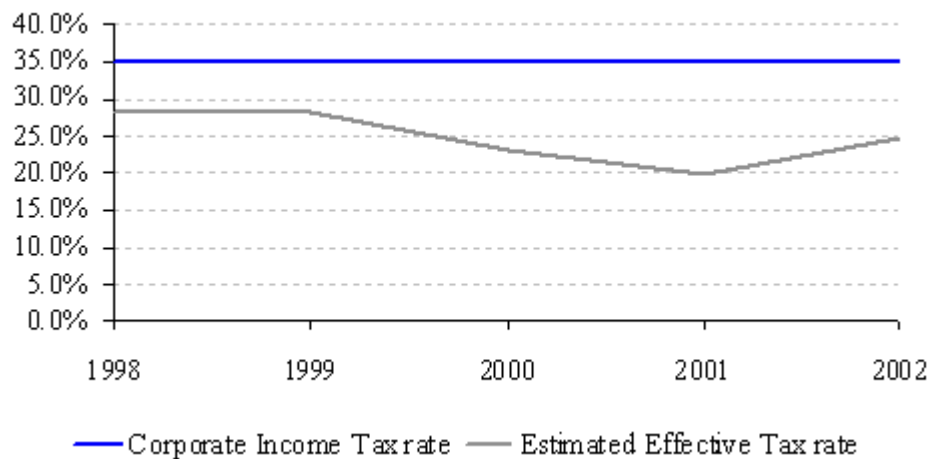
¹⁹One could also mention similar examples such as Slovakia or Ireland where significant corporate tax reductions took place as a way to attract local and foreign investment.

²⁰See Cardenas and Olivera (1995) for more details on the methodology followed. The coefficient on the tax factor included in the regression is not statistically significant after adjusting for error autocorrelation.

So are Colombian firms paying too much in income taxes? As we mentioned above, at 38.5 percent, the nominal rate in Colombia is the largest in Latin America. However, as has been often mentioned in the taxation literature, the "de facto" rate paid by companies may be far from this nominal rate. Two main factors may explain such a difference. First, the amount of deductions (depreciation rules for example) and exceptions, as well as incomplete legislation that allow companies to reduce their tax burden by leveraging on all the options provided by the law voluntarily or not. Second, tax compliance by companies may simply be very low, a phenomenon which can be explained in part by lack of proper fiscalization by tax authorities, because of inefficient administration or lack of resources, or by non-functioning courts, overall level of institutional development of the country and government corruption, among others.

It is therefore important for policy purposes, before analyzing the effect of a lower corporate income tax rate, to understand what the real tax burden is for Colombian companies. To conduct this analysis we used aggregate data on corporate income tax revenue from the DIAN, by economic sector and administration, and computed the effective tax rate paid, i.e. the amount of tax paid divided by the company's taxable income²¹. The results presented in the figure below indicate that the effective tax rate for Colombian companies lies consistently below the official tax rate.

Figure 4.2: Corporate Income Tax Rate vs. Effective Tax Rate



Source: Authors calculations based on DIAN data.

²¹This effective tax rate should be not taken literally, since the lack of firm level data makes this computation difficult. However, it does provide an interesting estimate of the effective tax rate.

In conclusion, the corporate income tax suffers from similar problems as the personal income tax: very low tax base and high tax rates (the highest in Latin America), resulting in excessive burden on few taxpayers. In addition, and despite some cross-country evidence from the literature, we argue that lowering the corporate income tax may not result in a large increase in investment and economic growth in Colombia.

Reforming the Corporate the Income Tax

What should the Colombian government do about the corporate income tax? Similarly to the personal income tax, the goal of any reform should be to increase the efficiency of the tax, by broadening the tax base to share the burden of tax revenue. In addition, however, corporate income tax deserves special attention, as it may have implications for investment and growth, and therefore exemptions and deductions may be costly beyond the loss in revenue. In order to get a measure of the importance of exemptions, we used data from the DIAN on corporate income tax, to calculate the average share of total income that is exempted from the tax base. Table 4.1 shows that that in 2001, almost 35 percent of corporate income was exempt from taxation, mostly due to the large number of deductions and loopholes.

Table 4.1: Share of Exempt Income on Total Income

| | 1998 | 1999 | 2000 | 2001 |
|----------------------------|--------|--------|--------|--------|
| Exempt income/Total income | 32.40% | 25.30% | 26.20% | 34.90% |

Source: Author's calculations using data from DIAN

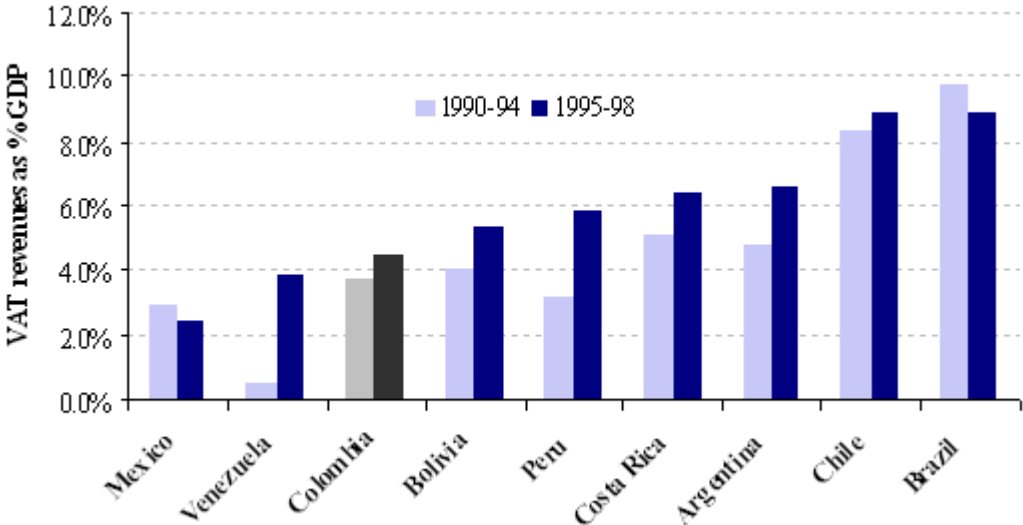
These exemptions force the government to increase the tax rate in order to meet the need for increased revenue, resulting in the current 38.5 percent tax. Having identified this problem, the last reform proposed in 2004, which failed to pass congress, aimed at increasing the tax base by drastically reducing exemptions in the corporate income tax, while compensating with a reduction in the corporate income tax to 30 percent, more in line with other Latin American countries. This tax would include a temporary surcharge to bring it to a 32 percent tax rate.

Such a reform would greatly increase the efficiency of the corporate income tax, by sharing the burden across more tax payers, and eliminating distortions created by the numerous exemptions and loopholes. Furthermore, if the reductions in deductions were substantial, this reform may not result in loss of revenue. It would also place Colombia's rate on a leveled playing field with other Latin American countries for attracting foreign direct investment, an important feature in light of the likely signing of the Free Trade Agreement with the United States.

5. Value-Added Tax (VAT)

VAT is currently the single most important contributor for Colombia's Central Government revenues. Revenue from VAT reached 5.9% of GDP or 13.5 trillion pesos in 2003, a significant increase when compared to the levels of 2.6% of GDP in 1993. Despite its size and important contribution, VAT revenues in Colombia are still below levels found in other Latin American countries and in the world overall. In the figure below, we compare revenue as a percentage of GDP for Latin America in the nineties indicating that Colombia is still lagging behind countries like Brazil, Chile and Argentina.

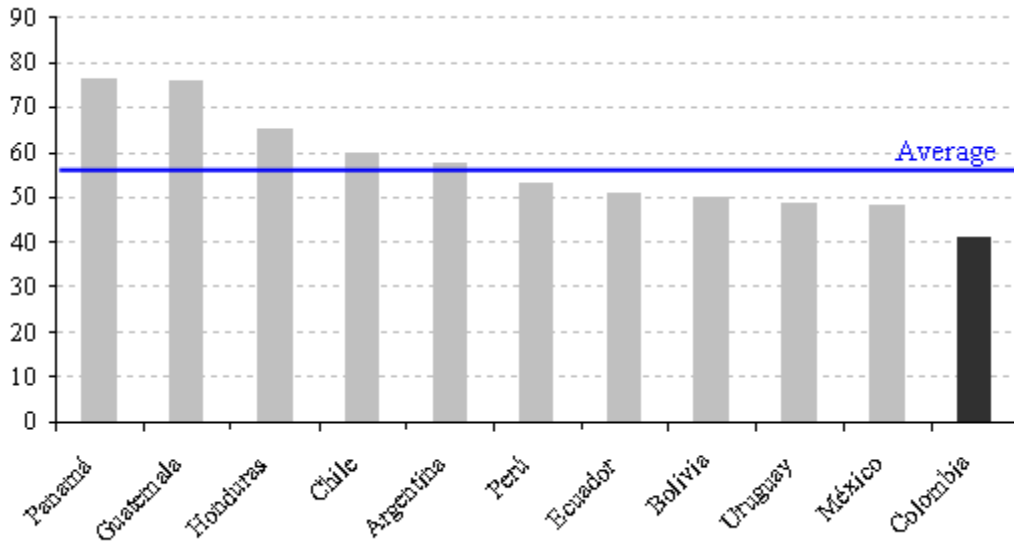
Figure 5.1: VAT/GDP for a selection of Latin American countries



Source: IMF

With a general tax rate of 16 percent, which is similar to other Latin American countries, the low revenue raised by the VAT in Colombia is due mostly to a low tax base, 40 percent of GDP (see figure 5.2). The low tax base is mostly a consequence of the large amount of exempted goods or products taxed substantially below the general rate.

Figure 5.2: VAT tax base as % of GDP in Latin America (2002)

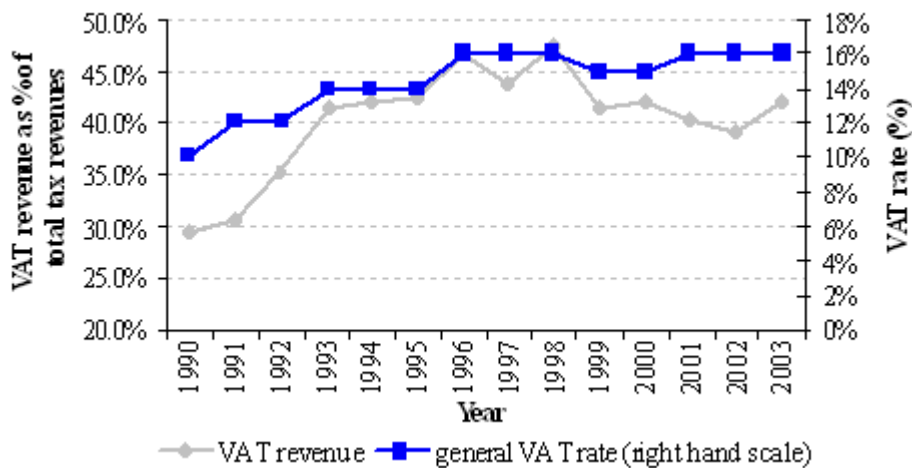


Source: IMF

Previous Reforms of the VAT

Colombia has enacted a number of reforms of VAT since its introduction in 1975. However, the most significant reforms took place in the 1990s, with the general rate raising steadily, though not uniformly from 10% in 1990 to the current 16%. (see figure 5.3).

Figure 5.3: Evolution of Colombia's VAT revenues as % of total tax revenues and VAT general tax rate



Source: OEE-DIAN data

Most importantly, two other major types of changes to the VAT rules may be identified. First, the taxable activities and products (the tax base) have changed significantly over the years, sometimes in radical ways. As an example, as part of the last reform (Ley 863 of 2003 under president Uribe), several agricultural inputs were excluded from taxation, while coffee grains, cotton fiber, some agricultural machinery among others started being taxed. Second, multiple tax rates have been

created in addition to the general rate to be able to discriminate among products. Through such reforms, the system has aimed at one or more of the following: increasing progressivity, generating more revenue or simply accommodating concerns about certain products (some in an ethical perspective, such as alcohol). The result of this process has been that Colombia currently has the largest number of VAT rates (a total of nine) in Latin America, with a large list of products included in each rate category (see table 5.1 below).

Table 5.1: VAT rates in Latin America in 2002

| Country | VAT | |
|-----------------|-----------|-----------------|
| | Main rate | Number of rates |
| Argentina | 21 | 3 |
| Bolivia | 13 | 1 |
| Brasil | 11 | 3 |
| Chile | 18 | 1 |
| Colombia | 16 | 9 |
| Costa Rica | 13 | 1 |
| Ecuador | 10 | 1 |
| México | 15 | 2 |
| Perú | 18 | 1 |
| Uruguay | 23 | 2 |

Source: World Bank, DIAN

Proposed VAT Reforms

When suggesting strategies for tax system reform in Colombia, most analysts have focused on restructuring VAT as the best alternative to conduct such reform in an efficient way. There are several reasons for this. First, the other taxes, such as corporate or personal income have already high rates as seen before and therefore it is difficult to push rates up further.

Second, despite VAT's low base in Colombia relative to other Latin American countries it is argued that VAT productivity²² is on average similar to that of other Latin American countries and is higher than corporate or personal income taxes. In fact, in 2001 for example the productivity of VAT was of 33% versus 3% for personal income and 12% for corporate income tax²³. Productivity tries to capture how much tax revenue is generated by each percentage point in the tax rate, therefore aiming at identifying which taxes are more effective at increasing revenues. However, productivity comparisons both among taxes and across countries have to be interpreted with caution. In fact, productivity is very sensitive to the tax rates used (average, maximum or effective rates), does not necessarily provide a correct sense of the distortions implied by raising the tax rate (distortions depend also on other taxes and other country characteristics) and ignores behavioral and dynamic effects of raising rates. As an example, using the average rate for personal income tax weighted by income based on our sample from the DIAN, we obtain a productivity of 9 percent, much larger than the 3 percent calculated using the maximum rate in 2001 (35%).

Third, research conducted by the Mission for Public Income²⁴ based on the construction of a general equilibrium model using data from 1997 with 57 different sectors and product categories suggested that value-added taxes are one of the most efficient ways of raising revenue. In particular, the authors suggest broadening the VAT base by including sectors such as food and health care in order to raise more revenue.

Finally, VAT has several theoretical advantages compared to other ways of raising revenue, which

have received increased attention. The tax literature has focused on the neutrality of having a unique VAT rate leading to a low level of distortions since agents can retrieve the value of the taxes paid for inputs. Moreover VAT is seen as being more easily collectable and facilitating compliance since it creates a conflict of interest between seller and buyer by requiring collecting VAT to deduct VAT expenditures, which can be exploited by authorities to improve compliance.

$$\frac{\text{Tax Revenue / GDP}}{\text{Tax Rate}}$$

²²The commonly used definition of Productivity of a Tax is

²³These estimations for 2001 used as tax rates: a) 16% (general rate) for VAT; b) 35% for personal income (maximum tax rate) and c) 35% for corporate income tax.

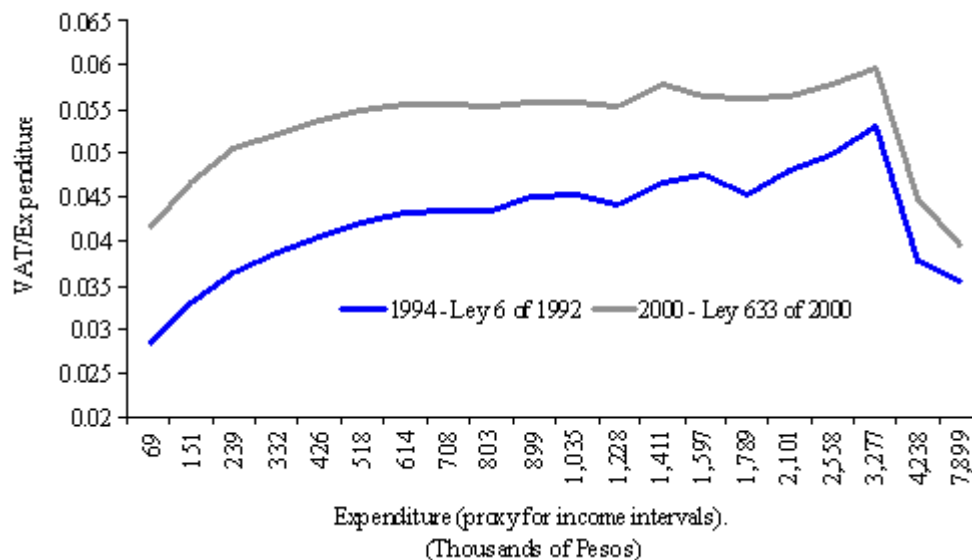
²⁴See Rutherford et al. (2002).

The main reform proposals that have been suggested by the Mission for Public Income, the multi-partisan committee in Congress that discussed tax reform during 2004²⁵, as well as other independent researchers²⁶ includes essentially two broad lines of measures: (i) to reduce the number of rates and (ii) to include more products in the tax base. The arguments used are mostly a mix of those mentioned above. They stress the fact that despite the advantage of multiple VAT rates to counter the natural regressivity of VAT²⁷, they entail several negative effects such as complicating administration and compliance²⁸ and reducing or canceling the neutrality of the tax²⁹. It is our view that most of the already suggested topics for VAT reform seem to be justified on theoretical grounds. However, there is still the need for greater detail in constructing careful estimates of the impact of possible scenarios of reform on revenues and progressivity.

Regarding revenue, the only major work produced was a study by the DIAN that indicated that the application of a unique VAT rate in 2005 would require a level of at least 13% to be revenue neutral. A 14 percent unique rate would rise around 0.5% of GDP in extra revenue.

Overall the main problem faced by these proposals is the impact on progressivity of the VAT system, which as we discuss in the following section of this document is key in the political supportability of a tax reform project. In fact, despite the possibilities for improving tax revenues through such reforms, VAT is perceived in Colombia to a great extent as a tax on the poor, while income taxes are perceived as able to reach the rich. However, existing research on the subject does not fully sustain this view. In fact, according to estimates of the DIAN based on the DANE's 1994 national survey of income and expenditure³⁰, VAT actually acts in a progressive way up until the 18th income level of the distribution³¹ (see figure 5.4 below). Moreover, the DIAN also shows that the GINI coefficient before and after introduction of taxation doesn't decrease significantly (goes from 0.448 to 0.446). The average tax rate in 1994 (based on the VAT law of 1992) is 4.2% reflecting the fact that several basic food products are exempt as well as savings (important for higher income households). When conducting the same analysis for the 1994 household survey data but applying the changes in the law introduced in 2000 (general rate increased from 14% in 1994 to 16% in 2000 and inclusion of several services in the tax base), the average tax rate increases to 5.3% but the general progressivity doesn't change substantially as can be seen in the figure below.

Figure 5.4: Progressivity of VAT in 1994 and 2000



Source: OEE-DIAN calculations based on DANE's "Encuesta de Ingresos y Gastos" of 1994

²⁵ More information and analysis of this process will be provided in the last section of the present paper dedicated to implementation and political support for the reform.

²⁶ See for example comments on *Economía y Política* (Jan. 2005), Fedesarrollo.

²⁷ When measured with respect to income groups, a unique VAT tax will always be regressive because lower income households will pay proportionally more of the tax relative to their income than richer households.

²⁸ This is possible through several channels: i) the VAT rate structure with multiple rates risks being not well defined and therefore implies that products can fit more than one category, ii) categories may be based on criteria for which information is not readily available, iii) small firms face higher costs for appropriately filling taxes because of higher complexity and iv) taxpayers may use rate differences to evade taxes.

²⁹ Neutrality is reduced since businesses may face differential rates on their outputs and inputs and therefore some sector's may see value-added being taxed more heavily than others.

³⁰ The survey, "Encuesta de Ingresos y Gastos" of 1994, from the DANE is a national cross-section survey of households that provides detailed data on their expenditures, namely through 850 product categories.

³¹ Because of the unreliability of the income data from the survey (around 55% of the observations in the survey report total expenditure above total income), the DIAN actually based the stratification of the population on expenditure levels.

These estimations seem to contradict the expected regressivity, due to multiple rates and exempted goods. However, these analyses, present a number concerns which require further analysis and data insights to be able to understand the effects of proposed reforms on the progressivity of the tax.

First, the DIAN only collects data on VAT revenue by economic activity. However, due to the large number of special rates and product categories, there is a need to gather data of VAT by product categories and not by professional activities. In fact, for the moment only attempts at progressivity are possible without making too many assumptions.

Second, product categories in the household surveys should be sufficiently detailed and organized in order to be able to better distinguish between product VAT rates (for example approximately discriminating for different type of vehicles as it is done in VAT legislation).

Third, elasticities should be used in the estimations of progressivity and revenues in order to account for behavioral responses as agents change their consumption and investment decisions based on relative price changes. These behavioral changes vary considerably for different products, and are very large for some products and households³². This could be done ideally through constructing panel data but also could be approximated through elasticity estimates by products for several categories from other countries or constructing scenarios. In conclusion, while revenues from VAT constitute the single most important source of revenue for the central government, the revenue raised is still low as compared with other countries. This is due mostly to a low tax base, resulting from the exclusion of numerous goods and the use of multiple special rates for different goods, which create distortions and reduce the efficiency of the tax. Following the recommendations by the Mision of Public Income, we would recommend instituting a single general tax rate applied to almost all goods, possibly with a second rate for basic goods consumed by poor families to maintain progressivity. However, estimates of the effects of such a reform on revenue and progressivity are severely limited by the availability of data, which should be improved in order to better be able to assess impacts of current and future reforms of VAT.

6. Implementation Strategy and Political Support

Our reform proposal can therefore be summarized as consisting of three main points:

1. The tax base for the CIT should be increased by drastically reducing exemptions and deductions, while compensating with a reduction in the rate to 30 percent, more in line with other Latin American countries. This tax would include a temporary surcharge to bring it to a 32 percent tax rate. Such a reform would greatly increase the efficiency of the corporate income tax, by sharing the burden across more tax payers, and eliminating distortions created by the numerous exemptions and loopholes. Furthermore, if the reductions in deductions were substantial, this reform may not result in loss of revenue.
2. Increases in the Colombian personal income tax should target those taxpayers in high income brackets, whose taxable income present low sensitivity to tax rates. We also emphasize the need for measures to increase the tax base through improvements in enforcement through better use of information technology. These combined efforts should result in a more efficient system and increased revenue from the personal income tax.
3. Following the recommendations by the Mision of Public Income, we would recommend instituting a single general tax rate applied to almost all goods, possibly with a second rate for basic goods consumed by poor families to maintain progressivity. However, limitations in the data limit the significance of these estimates. Thus, improving the availability of data by collecting revenue by product would be key to implement a good technical analysis in order to determine the impact of reforms on revenue and progressivity of the tax.

Key Issues in Gathering Support for Reform – Lessons from the Past

There are several lessons that can be taken from analyzing earlier reforms and situations conducting to reform. First, as pointed out by Junguito and Rincón (2004), most Colombian Administrations have resorted to declaring some type of emergency state in order to conduct reform without the need to pass Congress. However, when they could not declare an emergency state usually Congress approved suggested reforms. A second and related item is that Colombia has been keen on maintaining a tradition for fiscal responsibility and therefore there is room among politicians for approval of measures aimed at improving the fiscal situation of the country. Finally, government has often started technical missions with foreign and local experts to help build a technical consensus towards reform. This has resulted in concrete reform proposals being defined

in documents later on adopted by following administrations. For example the results in terms of tax system reform of the Musgrave Mission³³ included in a detailed document presented in 1969 at the end of the Lleras Restrepo government (1966-70) were then partially followed by the Pastrana administration (1970-74).

More recently, the attempt by the Uribe administration to pass a tax reform in 2004 also provide interesting insights. First, it highlights the importance of creating multi-partisan committee's in Congress for this type of reforms based on broad based political agreements. In fact, in 2004 the committee on economic affairs concluded its work with ambitious proposals (for example on eliminating exemptions in corporate income tax and also simplifying VAT rates). Second, the need for assuring that the reform is consistent with constitutional demands, namely in making sure that the reform will not impact substantially progressivity of the system and foster privileges of certain social groups³⁴. The Colombian constitution does not require that reforms simply exclude regressive aspects, but overall they must preserve the principle of progressivity and equity. Third, the need for the Government to be more actively involved in the discussions of the committee so that overall the final proposals of the committee become the essential of the Government's proposed reform to Congress, which was not the case in 2004. In fact, following the report by the committee, the Government did not follow some of the essential conclusions that undermined not only the Constitutional approval of the project but also had a negative impact on the political atmosphere in Congress. Finally, an important element in achieving not only tax reform in Colombia lately has been the issue of the attempt to allow the re-election of President Alvaro Uribe. This controversial change to the constitution has taken most of the political space in the country and should continue to do so in the short term since the Constitutional Court will make a final decision on the issue until June 2005.

Proposed Strategy

Our proposed strategy takes into consideration these elements, as well as the main ingredients of the the political process of reform (see figure 6.1 for a summary). We consider two main components to the strategy:

1. Overall progressivity of the project for Constitutional approval. This should be done through balancing the need for broadening the VAT base with measures in personal and corporate income tax that give positive signals on equity of the system. Regarding the latter, we propose lowering the level of personal income at which people are excluded from taxation and excluding exemptions in the case of corporate income. Moreover, through the data analysis proposed for VAT, one could estimate the amount of extra burden for poorer families (most of them excluded from personal income taxation), which could be compensated through targeted social expenditure. In fact, the Constitutional Court when repealing past reforms has mentioned the issue of decreasing social spending as an indicator of an unbalanced equity promoting strategy by the Administration.
2. Creation of a concrete report with measures building on the different research papers and the results from the Mission for Public Income and culminating in a conference which would include members of parliament, private sector and unions representatives, opinion leaders and other civil society persons in order to gather support for reform. The advantage of such a procedure is that even in the event of President Uribe not being allowed to try re-election, there is always that, as in the past, the proposals may be used by a new administration. The fact is that given the growing fiscal concerns, by 2006-07 the latest a fiscal reform will have to be undertaken.

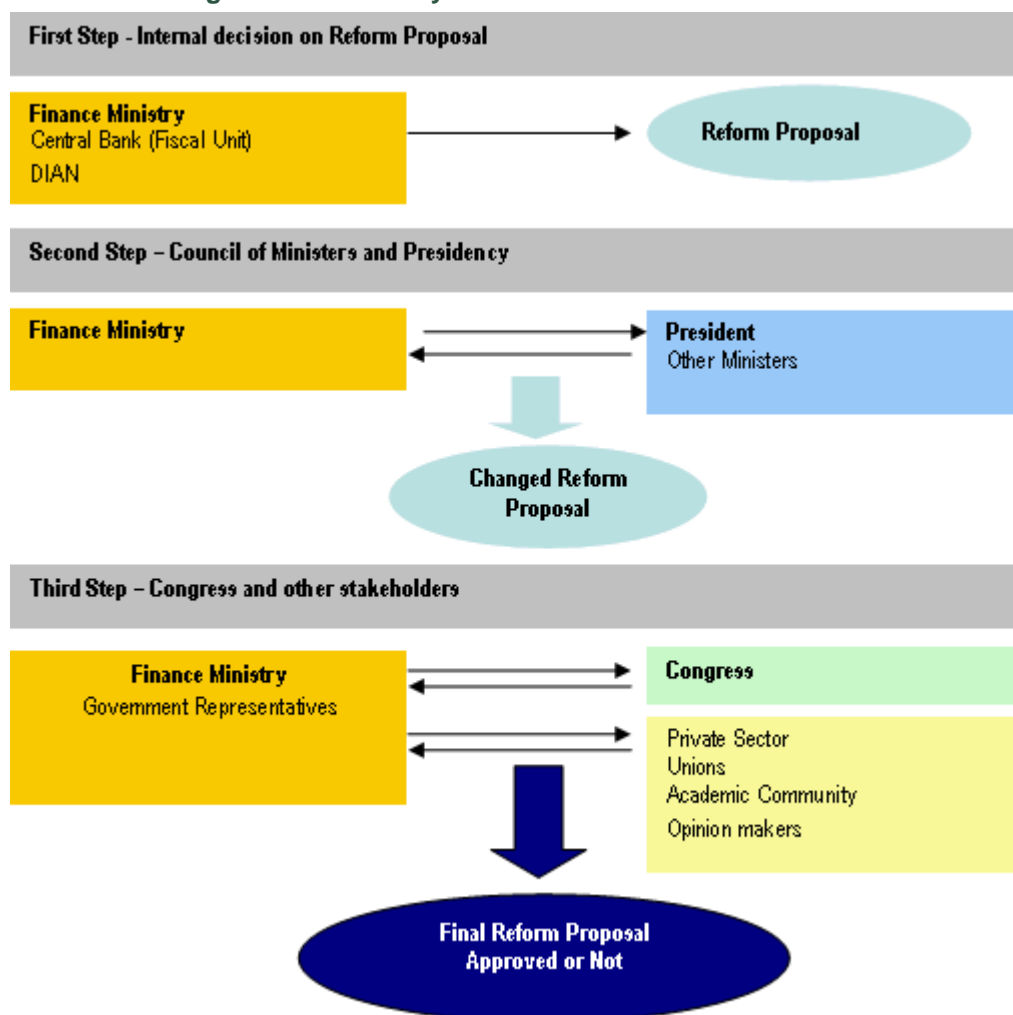
³²See Nicita (2004) for estimations of elasticities for food products in Mexico.

³³Set up in 1968 and headed by Harvard Professor Richard Musgrave with the objective of

proposing concrete fiscal reforms for Colombia.

³⁴According to the analysis by Fedesarrollo (see “Economía y Política” (Jan. 2005)) the fact that the Colombian Government did not incorporate the end of exemptions in corporate income tax (as proposed by the committee) was key in the political failure of the project since it did not provide a balance against the attempt to tax basic products through VAT.

Figure 6.1: Summary of the Political Process of Reform



Source: Authors' interpretation

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Appendix A - Analysis of Debt Sustainability in Colombia

To measure the sustainability of Colombia’s public debt we use the standard methodology of calculating the primary surplus as % of GDP that would allow the debt over GDP to remain constant to the current surplus. This deficit is derived from a simple law of motion of debt, and yields the following equation:

$$S = \frac{(r - g)}{(1 + g)} b$$

Where S is the required primary surplus over GDP, b is public debt over GDP, r is the real interest rate paid on public debt, and g is the real GDP growth. When calculating this target surplus we made the following assumptions:

- Real interest rate is of 6% in our base case scenario. The calculation of the level of real interest rate is based on the interest payments by the NFPS and the average stock of NFPS debt for the same year. The reason for our 6% figure, which may seem too conservative, is that we expect real interest rates to be rising from the current low levels of 3% due to two main reasons. First, international rates are at very low levels currently and should start rising with an expected improvement in world GDP growth. Second, Colombia has experienced deterioration in its credit ratings since 1994 as the NFPS accumulated more debt as a percentage of GDP. This has already translated into higher interest rates for external debt, but the increase has not been substantial. For example, Colombia was paying an average nominal interest rate on domestic debt of 16.7% in 1998 when it had A- Fitch rating and the nominal interest rate had gone down to 10% in 2003 when the Fitch rating was of BBB-.
- GDP real growth rate of 2.5%, reflecting the average growth rate in the period 1993-2003. We have chosen to use the historical average, as it may give a better idea of long term growth than just the expected growth rate for 2004, which stands at 4% (consensus and IMF forecast). The latter is used in our more optimistic scenario.
- Public sector debt over GDP ratio of 56%, reflecting the 2003 figure.

The results are shown in table A.1 below. Basically in our base case scenario, Colombia would need a primary surplus of 1.9% of GDP vs. the current 1.7% in 2003 to maintain its Debt to GDP ratio. Hence, the main conclusion derived from the fiscal sustainability analysis is that despite Colombia not being extremely close to a fiscal crisis, its position has deteriorated significantly since the 1998-99 recession making its debt look unsustainable based on moderate assumptions. In fact, the accumulation of debt and the expected rise in international interest rates are factors that warrant some attention by the country’s fiscal authorities. In order to curb this trend, it is necessary to impose fiscal discipline, which (as mentioned above) should come mainly from the reform in the pension system and measures aimed at broadening the tax base.

Table A.1 - Required Primary Surplus as % of GDP

| b=56 | | | | |
|-------|-------|---|-----|---|
| s (%) | g (%) | 2 | 2.5 | 4 |

| r (%) | | | | |
|-------|-----|-----|-----|--|
| 4 | 1.1 | 0.8 | 0 | |
| 6 | 2.2 | 1.9 | 1.1 | |
| 8 | 3.3 | 3.0 | 2.2 | |

Source: Own calculations

Table A.2: Breakdown of items of NFPS revenues (as % of GDP)

| | avg 93-98 | avg 99-02 | 2003 |
|--|-----------|-----------|------|
| Tax income | 16.4 | 18.2 | 19.7 |
| o.w. Tax income from Central Government | 10.1 | 12.0 | 14.0 |
| o.w. Other Tax income | 6.3 | 6.2 | 5.7 |
| Property income | 0.6 | 1.1 | 1.1 |
| Operating surplus ECOPETROL | 1.7 | 2.6 | 2.9 |
| Operating surplus Other Public companies | 2.4 | 1.6 | 1.7 |
| Other Non-tax income | 4.5 | 5.3 | 5.7 |

Source: IMF and DANE

Appendix B – Breakdown of Central Government Revenues

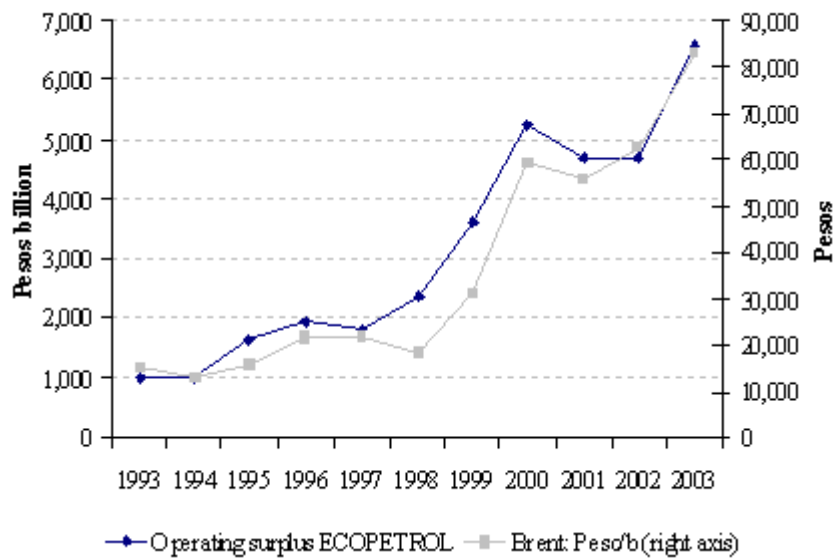
Tax income accounted for an average of 64% of total Central government revenue since 1993. As mentioned above, we believe one of the key issues in Colombia's future fiscal situation is the way it can improve total tax revenue, as policies in other components of the NFPS look to be more limited in contributing significantly to fiscal consolidation and some of them should actually face some decline.

Colombia is approximately on the Latin American average of tax income as percentage of GDP. At around 14 percent, the country ranks far below Chile or Brazil (18 percent and 21 percent respectively), though it has seen a gradual increase in tax income as a percentage of GDP from only 8 percent in 1990.

The main source of tax revenues are income taxes and internally collected VAT (see figure B.1), which during 2003 accounted for 42% and 30% of the central government's total revenues, respectively. Relative to 1995, the breakdown has not changed significantly, except for the introduction of the financial transactions tax.

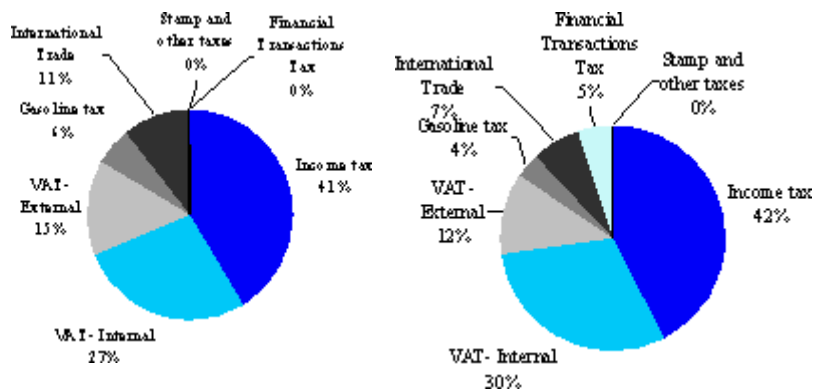
The other sources of NFPS revenues have recently been driven by higher oil prices that impacted positively the contribution of the public oil company ECOPETROL that in 2003 accounted for 2.9% of GDP. As can be seen in the figure below, the contributions of ECOPETROL to the NFPS closely tracks oil prices and should be expected to continue. As in 2004, oil prices in dollars and pesos have gone up; one should expect a further positive increase in ECOPETROL's contributions. However, given that oil prices are at extremely high levels, there could be some decrease in the medium term.

Figure B.1: Oil prices and ECOPETROL's contribution to NFPS revenues



Source: IMF, DIAN, EIU

Figure B.2: Breakdown of central government tax revenues 1995-2003



Source: IMF, DIAN Appendix C – Econometric Estimation of Elasticity of Taxable Income

Our econometric model uses Gruber and Saez's (2002) methodology to estimate the elasticity of taxable and broad income to tax rates, and extends the results to different income groups as in Gierz (2004). This appendix briefly presents the econometric model and a description of the methodology and results of the main specifications we ran. For a more detailed description of the theoretical micro-economic model behind the estimation, see Feldstein (1985) or Grueber and Saez (2002).

The basic econometric model is as follows:

$$\log(y_2 / y_1) = \xi \cdot \log \left[\frac{(1 - T_2')}{(1 - T_1')} \right] + \beta \cdot \log \left[\frac{(y_2 - T_2(y_2))}{(y_1 - T_1(y_1))} \right] + \varepsilon \quad (1)$$

where y is income (taxable income or total income, depending on the specification), T is the marginal tax rate in each year, and $T(y)$ is the tax liability in each year. The coefficients ξ and β , stand for the elasticity of income to tax rates, and to tax liability, therefore separating the direct

effect of the tax rate and the income effect derived from it.

However, this specification suffers from endogeneity problems that would lead to biased coefficients. In particular, our measure of tax rates depends on taxable income due to the progressivity of the tax system – a positive income shock raises the income bracket and results in a higher marginal tax rate. Therefore, our estimate of elasticity would be biased. In order to control for this correlation we use Instrumental Variables (IV) estimation, in which we instrument our measure of change in marginal tax rates

$\left[\frac{(1 - T_2)}{(1 - T_1)} \right]$ with $\left[\frac{(1 - T_p)}{(1 - T_1)} \right]$, where T_p is the predicted marginal tax rate using the previous year's income. A good instrument needs to be strongly correlated with the instrumented variable, and not with the dependent variable except through the instrumented variable. Our instrument meets these conditions: as long as income is correlated across years for the same individual, the predicted tax rate using current and lagged income should be highly correlated, while the change in taxable income should not affect the income in the previous year. In fact, to correct for possible correlation between the income in the previous year and change in income (such as mean reversion, which would bias our IV estimation), we include lagged income as a control variable in the final specification.

Our measure of the income effect also suffers from endogeneity, since changes in income will change the marginal tax rate, and consequently the disposable income. Therefore our estimate of the income effect would be biased. Similarly to the instrument for the change in the tax rate, we

instrument $\left[\frac{(y_2 - T_2(y_2))}{(y_1 - T_1(y_1))} \right]$ with $\left[\frac{(y_1 - T_2(y_1))}{(y_1 - T_1(y_1))} \right]$, where $T_2(y_1)$ is the tax liability the tax-payer would face if his/her income did not change from the previous year.

In the final specification we also include year fixed effects and income controls in the form of a *spline*, therefore accounting for different behavior in different income groups (we use deciles of the taxable income distribution) and obtaining a more flexible estimation. Our final specification is therefore.

$$\log(y_2 / y_1) = \alpha_0 + \xi \cdot \log \left[\frac{(1 - T_2)}{(1 - T_1)} \right] + \beta \cdot \log \left[\frac{(y_2 - T_2(y_2))}{(y_1 - T_1(y_1))} \right] + \alpha_1 \cdot \log(y_1) + \sum_7 \text{YEAR}_j + \sum_{-1}^{10} \text{SPLINE}_j(y_1) + \varepsilon$$

using the instruments described above. We present the results in the main text.

Finally, we run the specification for 10 income deciles. The results from these estimations are presented in Appendix Table C.1.

Appendix Table C.1

| | Income Deciles | | | | | | | | | |
|-------------------------------|----------------|----------------|----------------|----------------|----------------|---------------|---------------|---------------|---------------|---------------|
| | 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th |
| | -4 | -5 | -6 | -7 | -8 | -9 | -10 | -11 | -12 | -13 |
| % Change in Marginal Tax Rate | 0.242 | 0.224 | 0.444 | 0.555 | 0.45 | 0.265 | 0.055 | 0.154 | 0.239 | -0.026 |
| | (10.03) | (12.68) | (17.57) | (17.03) | (13.75) | (8.01) | (1.89) | (4.76) | (6.02) | (0.68) |
| Ln (Lagged income) | -0.047 | -0.049 | -0.047 | -0.039 | -0.034 | -0.051 | -0.044 | -0.035 | -0.03 | -0.016 |
| Spline 1 | (38.02) | (35.95) | (41.62) | (34.53) | (29.71) | (39.86) | (36.96) | (29.14) | (25.99) | (19.47) |
| Constant | 0.699 | 0.825 | 0.799 | 0.657 | 0.545 | 0.822 | 0.759 | 0.577 | 0.49 | 0.263 |

| | | | | | | | | | | |
|--------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | (35.97) | (35.88) | (41.51) | (34.56) | (29.76) | (40.52) | (36.86) | (29.78) | (25.67) | (17.98) |
| Observations | 70.33 | 71.896 | 95.768 | 83.866 | 82.353 | 81.636 | 79.864 | 77.292 | 73.225 | 68.825 |
| R-squared | 0.08 | 0.09 | 0.11 | 0.08 | 0.05 | 0.04 | 0.03 | 0.02 | 0.02 | 0.01 |

Absolute value of t statistics in parentheses

Regression results from a Two-Stage-Least-Squares, controlling for year fixed effects

Note that we limit our sample to those individuals with a change in taxable income of less than a 25 percent, in order to eliminate the possibility that our results would be biased due to unobservable characteristics of these individuals, in the absence of demographic controls. For example, these would include students, people who changed their marital status, or simply people who moved into the labor market and were working part-time or party in the informal sector. The coefficient on the elasticity between taxable income and marginal rates would be capturing these shocks, and therefore we would get a biased result. Furthermore, following Grueber and Saez (2002), we cap our weights at the equivalent of \$1,000,000 in PPP, 78,000,000, so as to not place extra weight on outliers.