THE FISCAL POLICY STANCE IN COLOMBIA BASED ON THE ADJUSTMENTS TO TAX RATES

Jorge Toro

Coauthors: Clark Granger

Yurany Hernández

Jorge Ramos

Héctor Zárate

7th Annual Conference of the Bilateral Assistance of Capacity Building For Central Banks (BCC) program
Interaction of fiscal and monetary policies
Geneva, 26-27 September, 2019

1. Motivation

- Casual observations show that in recessions, when governments are concerned with growing deficits, they tend to raise taxes. In booming times however, tax reforms are more focused on improving the tax system and providing relieve to taxpayers.

- Colombian recent experience is a good example. Following the fall of international oil prices in 2014 (Colombia´s main export), three tax reforms were approved in a row : 2014; 2016; 2018. Their aim was to cushion the fall in oil revenue to avoid a deficit expansion.

- By these reforms, VAT was raised from 16% to 19%; a temporary tax on financial transactions (TFT) was made permanent; a wealth tax and a dividend tax were approved; new taxes on liquors and real state transactions were introduced, etc.

- In contrast, during periods of economic expansion (i.e. 2006; 2012) tax reforms focused either on fixing distortions of the tax system or providing stimulus to the corporate sector (ex: the reduction of payroll taxes approved by the 2012 tax reform).

2. Background

- The traditional approach proposed by the IMF to assess the fiscal stance of a country is based on the calculation of the fiscal balance adjusted by the cycle.
- Based on the IMF's approach, in the case of Colombia it has been found that its fiscal policy stance was pro-cyclical in the period between 1980 and 2002 1/. With the same methodology, and also by calculating elasticities, a pro-cyclical fiscal policy was found for the period 1995 -2006 2/.
- Using an alternative approach based on variations of statutory tax rates 3/ and taxable basis, Vegh and Vuletin (2015) assess the fiscal stance for a panel of developed and developing countries. In general they found that developed countries adopt an acyclical (and sometimes countercyclical) fiscal stance, while developing countries a procyclical one.
- Similarly, from variations of statutory tax rates , Strawczynski (2004) assess the fiscal stance of Israel using cointegration methods for the period 1980-2009. He found that while direct tax rates are a-cyclical, indirect taxes (and in particular VAT) are changed procyclycally.

1/ Rincón, Berthel and Gómez (2013); 2/ Lozano and Toro (2007); 3/ official tax rates ignoring deductions or exemptions

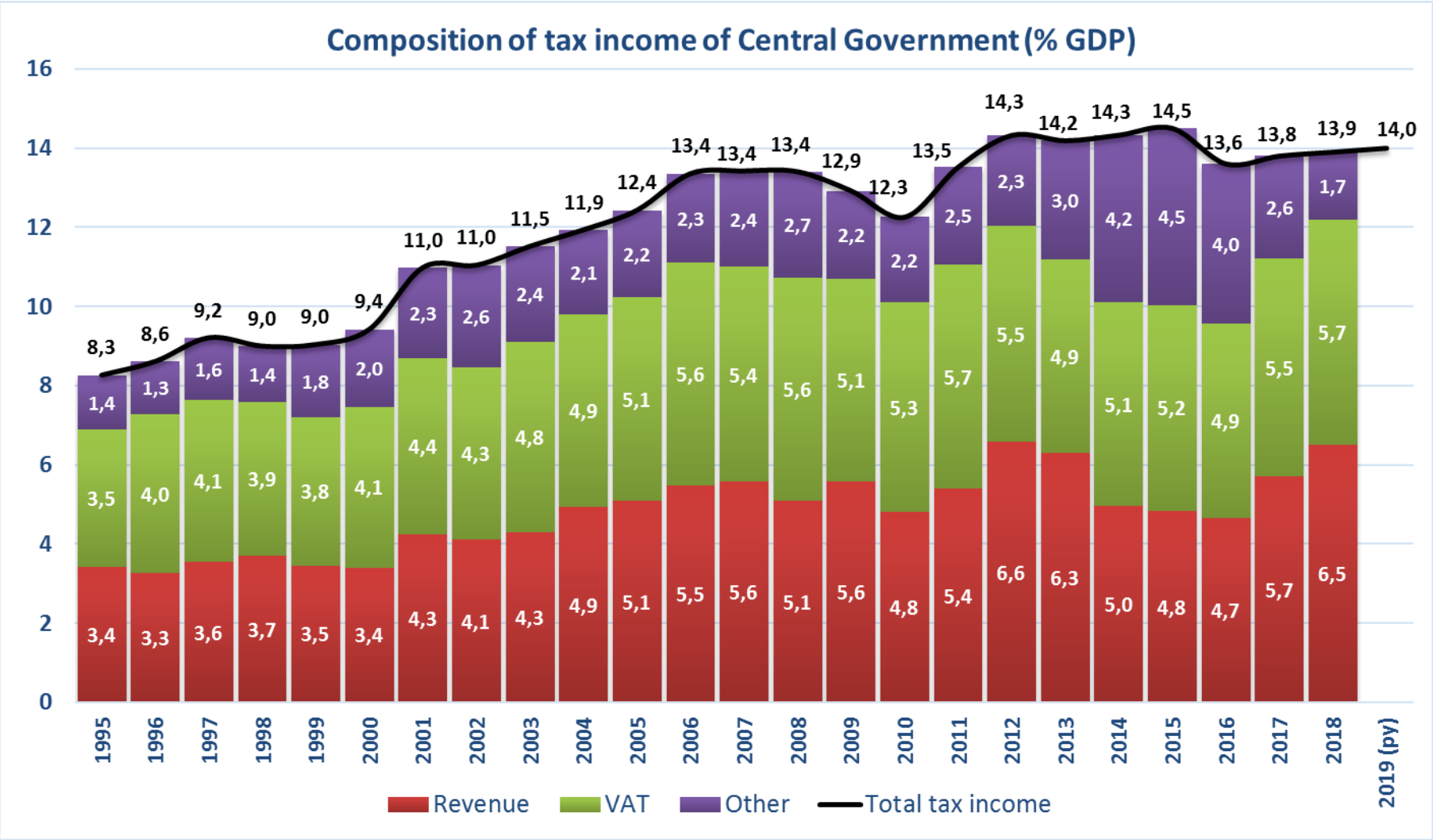
3. Objective

- To go beyond standard approaches that rely on non-observable variables (such as potential GDP; structural primary balances; revenue elasticities) for assessing the fiscal stance through the cycle.

- To use the alternative approach based on adjustments of *statutory tax rates* -which are observable and truly reflect policymakers decisions-, to assess the Colombian fiscal policy stance through the cycle based on historical data for the period 1970-2017.

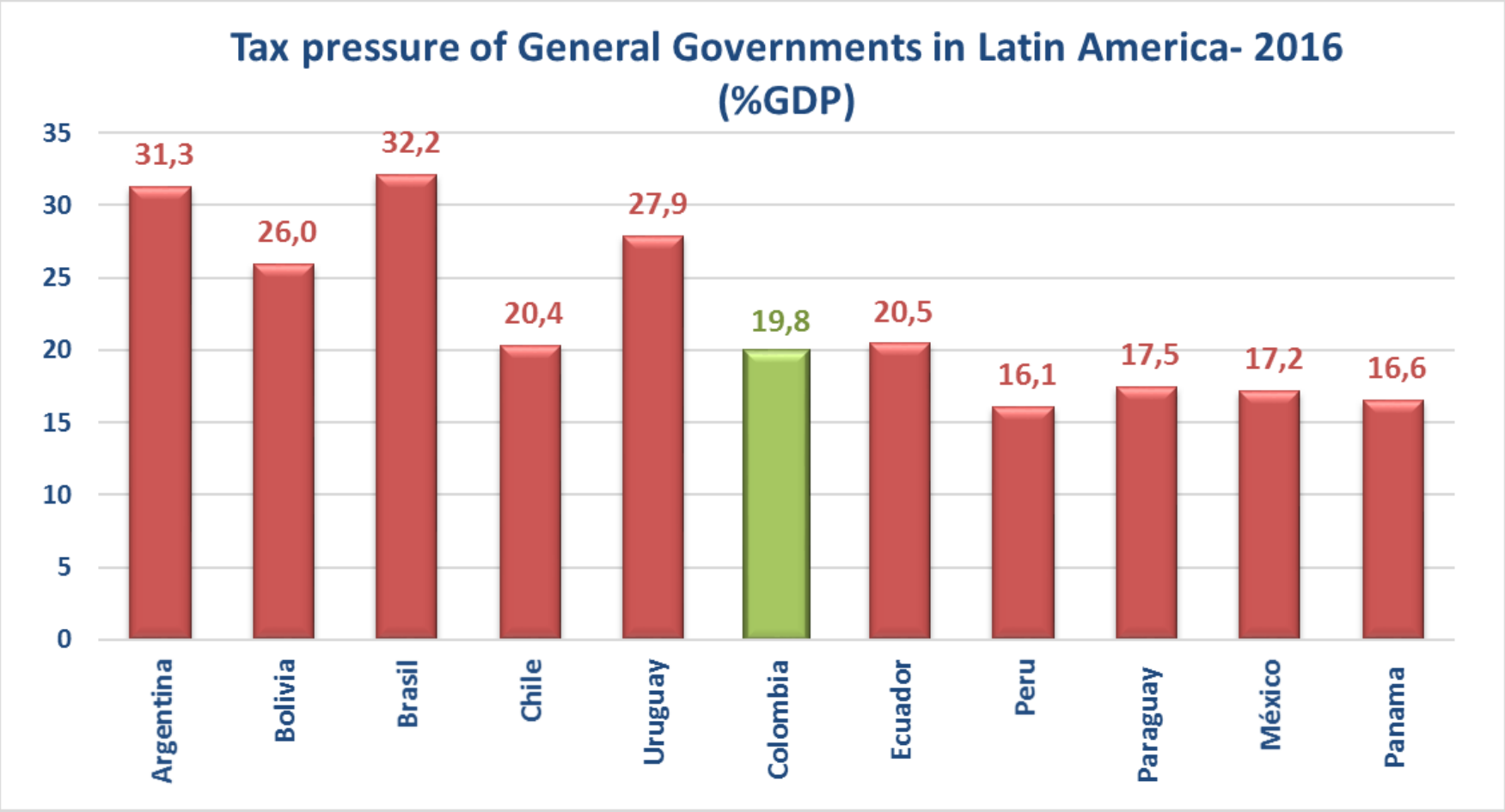
4. Colombian Fiscal Context

Tax Income of the Colombian central government has increased smoothly, based on larger revenue taxes and VAT. Other tax income has fluctuated according to normative changes.



Source: MHCP

However, at the level of general government 1/, Colombia situates among the group of countries of lower tax pressure in Latin America.

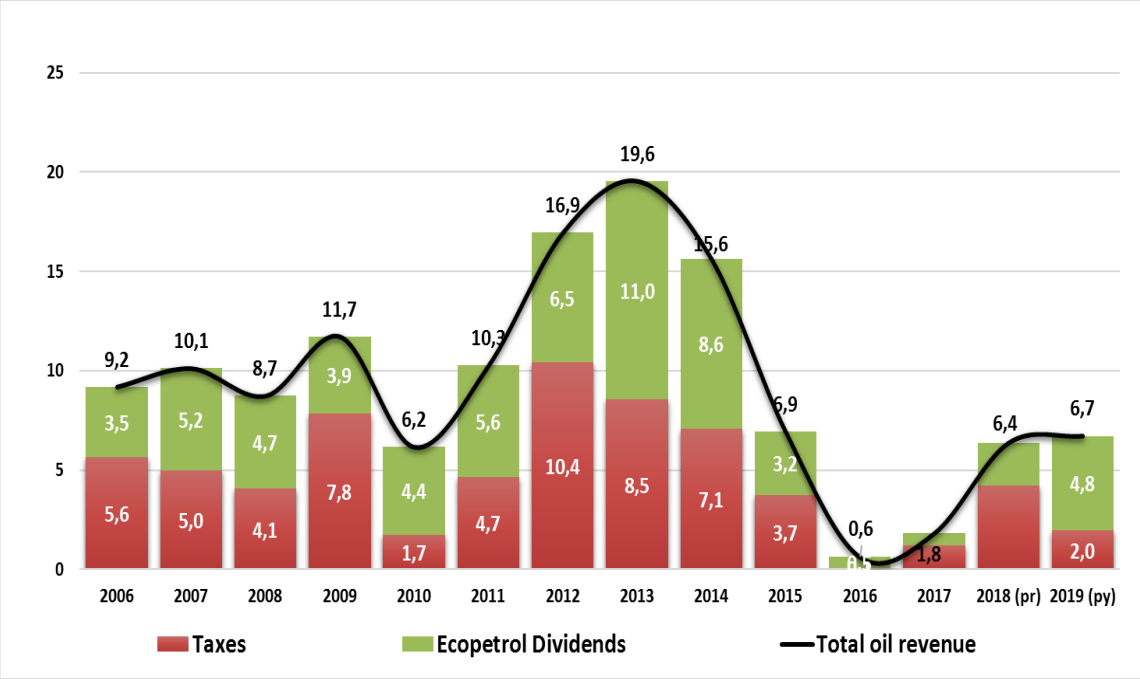


Source: OECD, Revenue Statistics in Latin America and the Caribbean 2018

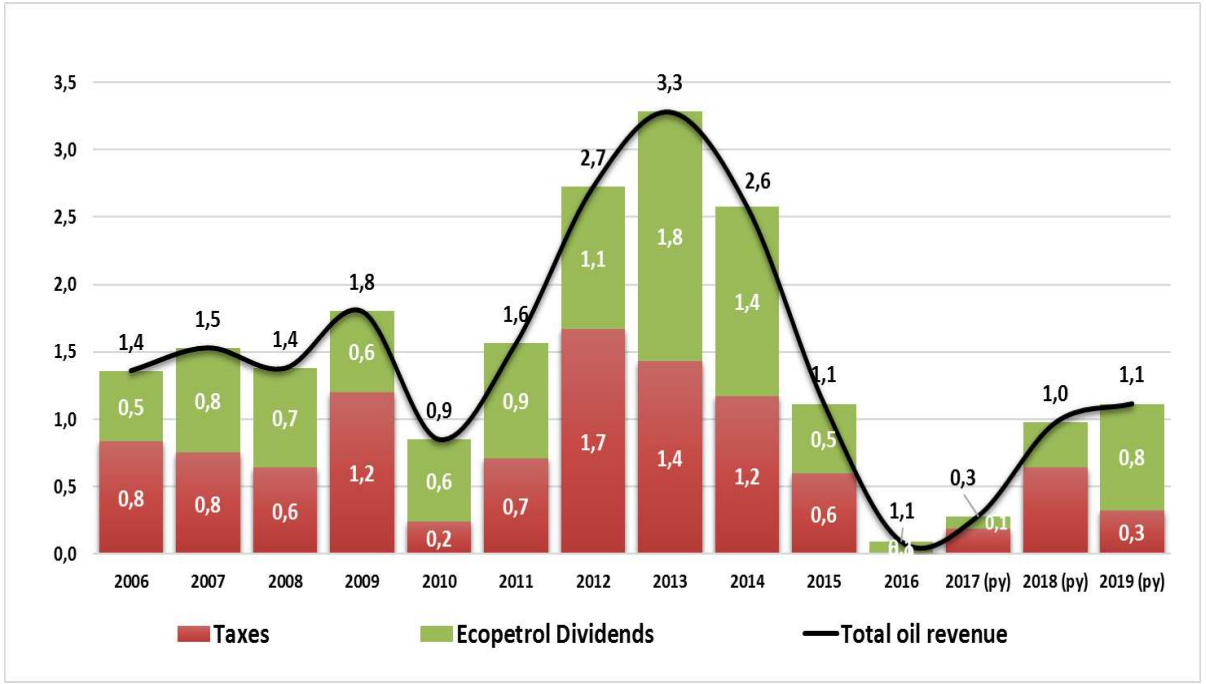
1/ includes central government; regional governments and social security

Government income in Colombia is highly dependent of the oil sector. Following the fall of oil prices in 2014, oil revenues plunged.

Oil Revenue as a proportion of total Government income



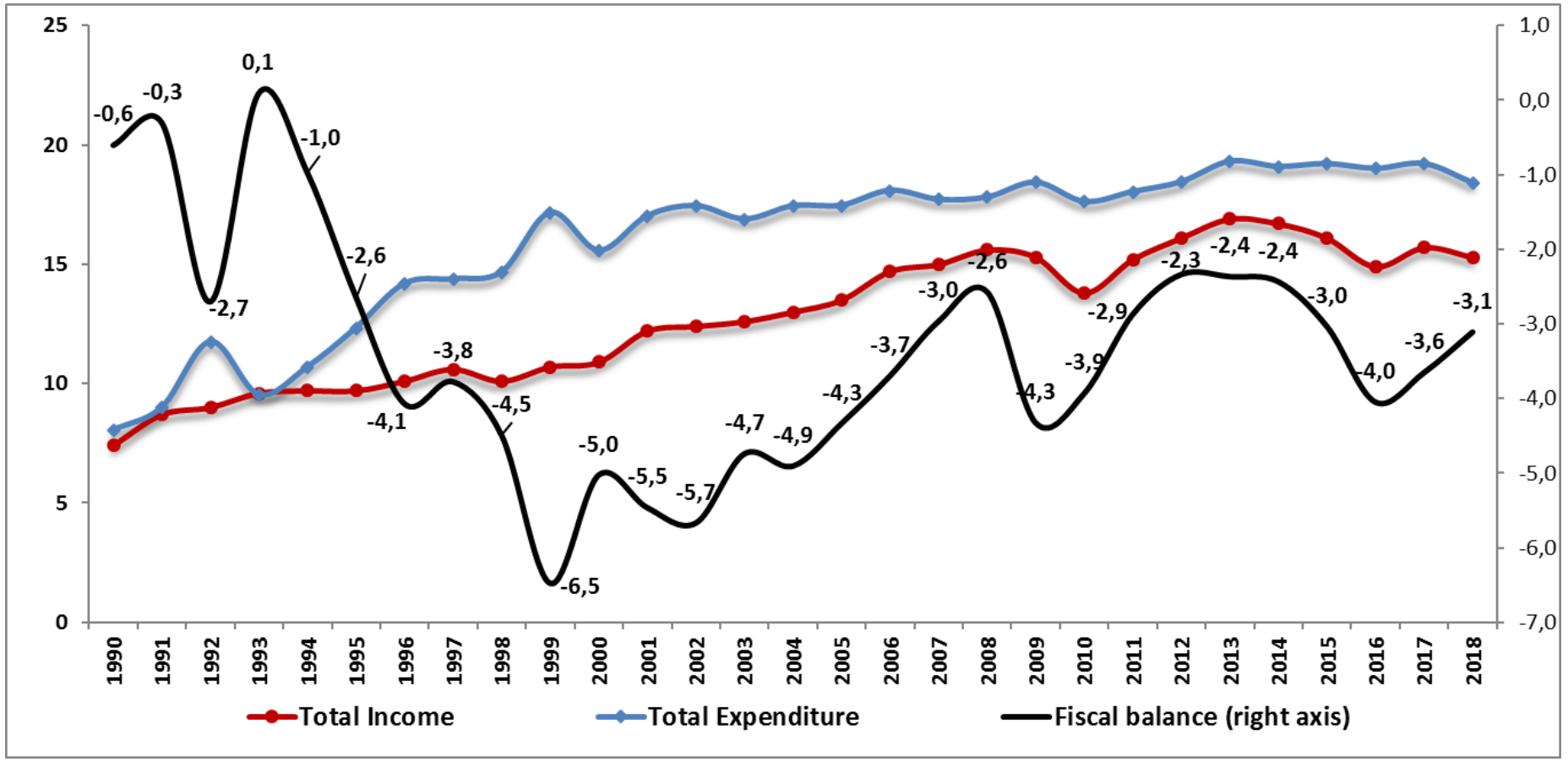
As percentage of GDP



Source: MHCP

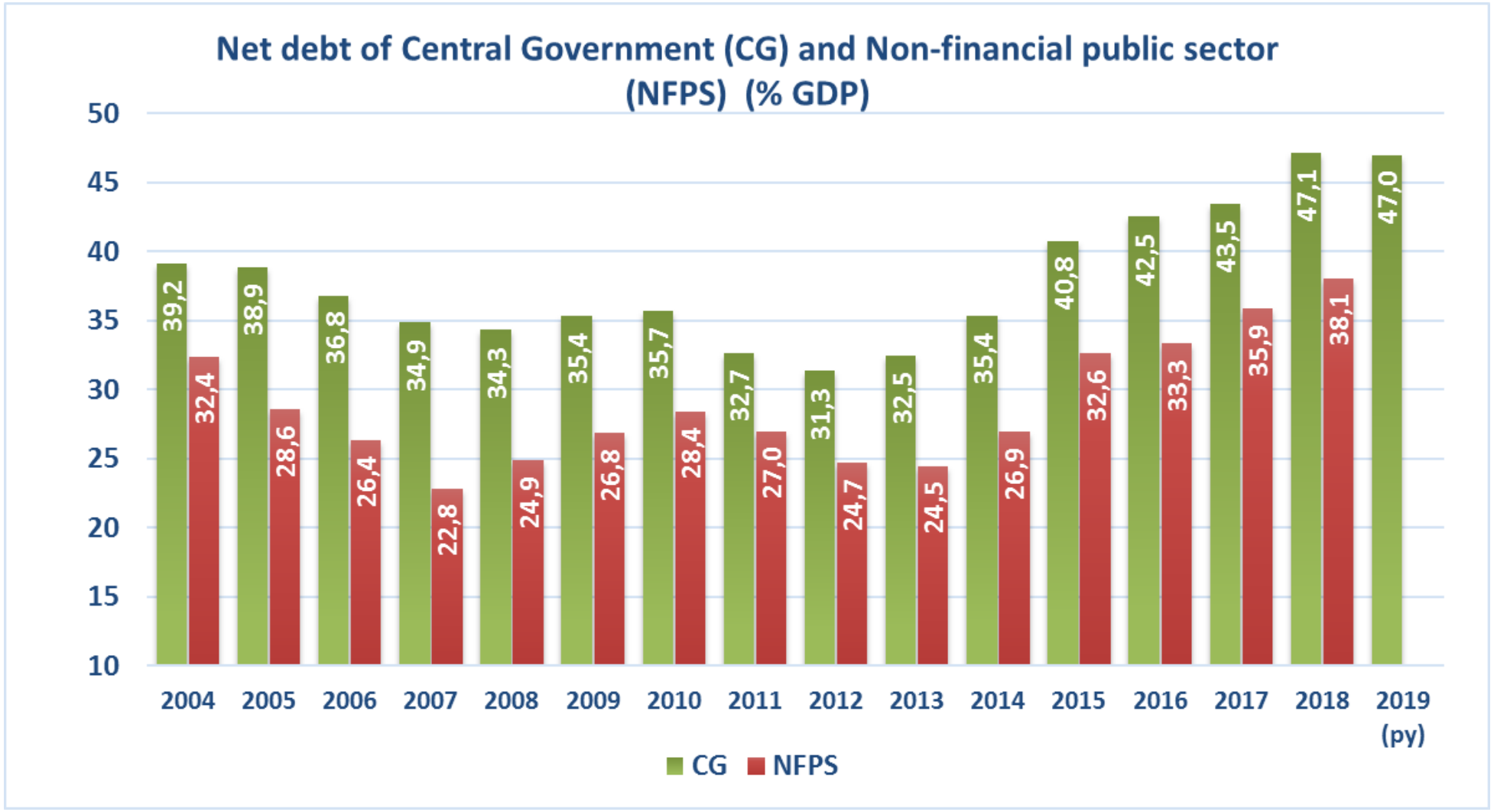
As a result, the fiscal deficit almost doubled between 2013-2016. Most recently the deficit is correcting following three tax reforms and fiscal austerity. Yet, this adjustment is limited by the inflexibility of the government expenditure.

Income, expenditure and fiscal deficit of Central Government (%GDP)



Source: MHCP

Consequently, after declining for a decade, the public debt increased raising concerns of sustainability.



Source: MHCP

5. Framework of the analysis

Let assume that taxes (T) finance government expenditure (G):

$$T(Y) = t(Y)Y = tY^{\theta}Y = G \qquad (1)$$

Where t is a statutory tax rate; Y is the GDP; and θ a parameter related to the elasticity of the average statutory tax rate to GDP.

Production Function is a Cobb-Douglas:

$$Y = AK^{\alpha}L^{1-\alpha} \qquad (2)$$

Substituting (2) in (1) and taking logarithms:

$$\ln(t) = \ln(G) - \theta \ln(Y) - \ln A - \alpha \ln(K) - (1-\alpha)\ln(L) \quad (3)$$

Equation (3) determines the long-term relationship between the fiscal variables, the output, and the tax rates.

Cointegration equations and the associated error correction mechanisms are used to check the relationship between statutory tax rates and the cycle, as measured by changes in the GDP.

6. The data

Statutory taxes (as opposed to effective taxes) include only the official rates, ignoring deductions or exemptions.

To capture variation of tariffs three indexes were built with the information on taxes for the period 1970-2017:

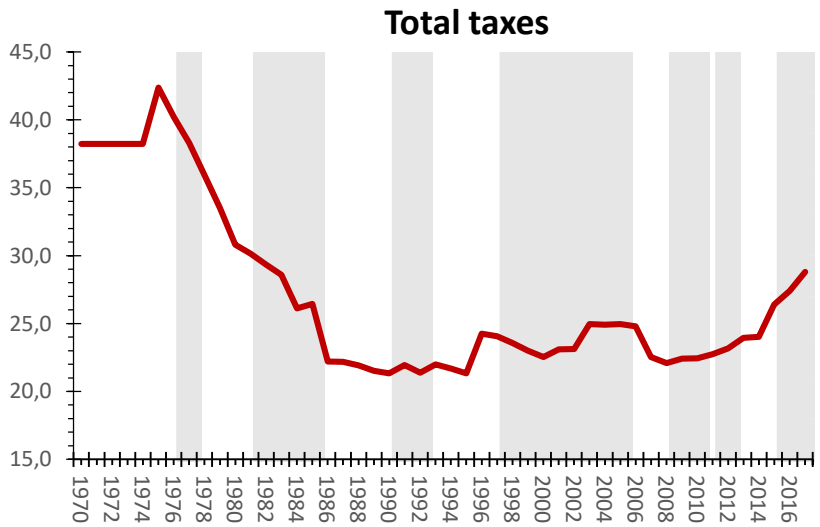
- Total Taxes: $$T_t = \gamma_{RN,t}\, RN_t + \gamma_{RJ,t}\, RJ_t + \gamma_{R,t}\, W_t + \gamma_{VAT,t}\, VAT + \gamma_{TFT,t}\, TFT_t \qquad (4)$$

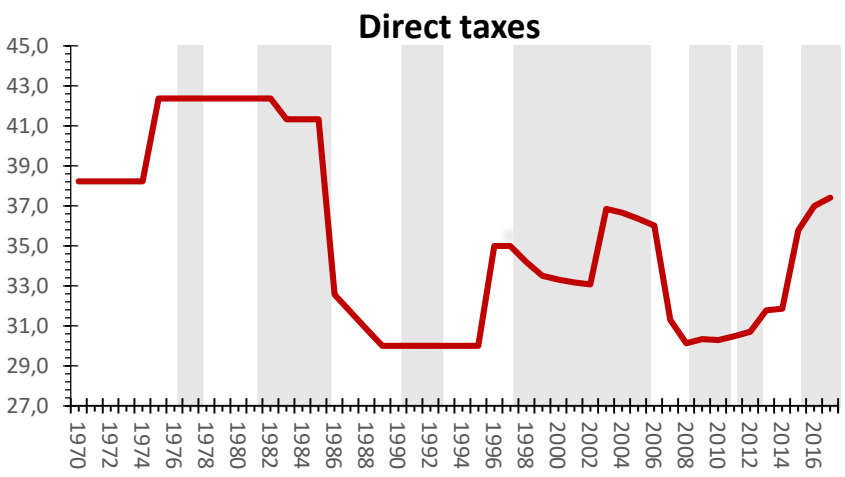
- Direct Taxes : $$D_t = \gamma_{RN,t}\, RN_t + \gamma_{RJ,t}\, RJ_t + \gamma_{R,t}\, W_t \qquad (5)$$

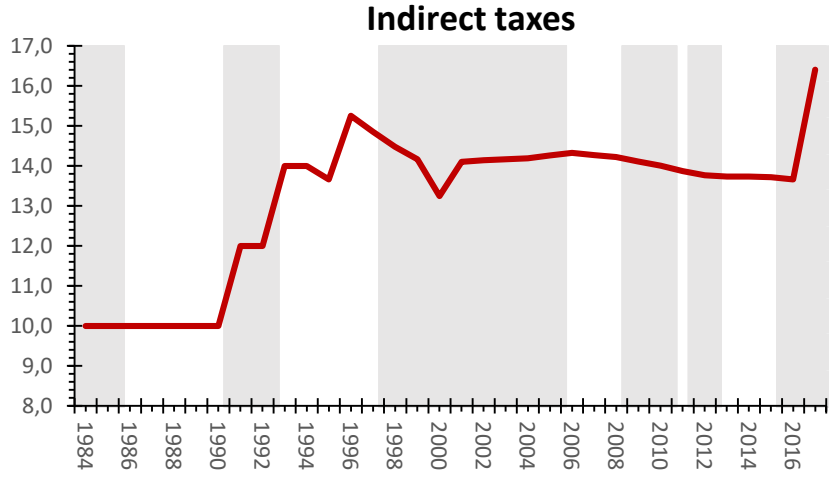
- Indirect Taxes : $$I_t = \gamma_{IVA,t}\, VAT + \gamma_{TFT,t}\, TFT_t \qquad (9)$$

The indices were calculated as an average of statutory rates, weighted for the participation of each type of tax in the total collection ($\gamma_{i,t}$), according to the tax regulations during the period.

Indices of statutory taxes







***Shadow areas are periods of negative output gap.**

7. Fiscal policy stance

From equation (3), an error correction mechanism (ECM) can be obtained. This latter allows to estimate the short-term relationship between statutory rates and output variations, which identifies the fiscal authority's stance vis-à-vis the economic cycle.

the ECM[1/] can be represented as :

$$\Delta I_t = \mu + \Pi y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta\, y_{t-1} + \varepsilon_t \quad (10)$$

ΔI_t stand for each type of tax. The term $\sum_{i=1}^{p-1} \Gamma_i \Delta\, y_{t-1}$ allows to determine the fiscal policy stance from the sum of the coefficients Γ_i associated with GDP variations.

This sum indicates the response of tax rates to output changes. If the sum is positive and statistically significant, there is evidence of a counter-cyclical policy stance. On the contrary, if the result is negative, the fiscal policy can be interpreted as pro-cyclical, which means that taxes are lowered during expansions and raised during recessions.

1/ Johansen (1995)

8. Results

Cyclical Nature of the Total Tax Index

	Model	Dlog (GDP)
1	$Log(IT_t)\ Log(L_t)\ Log(K_t)\ Log(E_t)\ Log(GDP_t)$	-2.6811 ***
		(0.2154)
		-12.4473
2	$Log(IT_t)\ Log(L_t)\ Log(K_t)\ Log(D_t)\ Log(GDP_t)$	-1.1606 **
		(0.1881)
		-6.1701
3	$Log(IT_t)\ Log(K_t)\ Log(E_t)\ Log(GDP_t) = Log(L_t)\ Gini_t$	-2.9631 ***
		(0.2154)
		-13.7565

Cyclicity of the Index of Direct Taxes

	Model	Dlog (GDP)
4	$Log(ID_t)\ Log(L_t)\ Log(K_t)\ Log(E_t)\ Log(GDP_t)$	-4.0557 ***
		(0.2063)
		-19.6667
5	$Log(ID_t)\ Log(L_t)\ Log(K_t)\ Log(D_t)\ Log(GDP_t)$	-3.6463 ***
		(0.1705)
		-21.3897
6	$Log(ID_t)\ Log(K_t)\ Log(E_t)\ Log(GDP_t) = Log(L_t)\ \ Gini_t$	-13.4599 ***
		(0.1705)
		-75.9584

8. Results

Cyclicity of the Index of Indirect Taxes

	Model	Dlog (GDP)
7	$Log(II_t)\ Log(L_t)\ Log(K_t)\ Log(E_t)\ Log(GDP_t)$	-3.0237 ***
		(0.2110)
		-14.3285
8	$Log(II_t)\ Log(L_t)\ Log(K_t)\ Log(D_t)\ Log(GDP_t)$	-4.2057 ***
		(0.1635)
		-25.7228
9	$Log(ID_t)\ Log(L_t)\ Log(K_t)\ Log(D_t)\ Log(GDP_t) = \ Gini_t$	-14.898 ***
		(0.2422)
		-61.5039

The coefficients indicate the effect of GDP on the tax index. In parentheses are the standard errors and following, the trial statistics.

*** Statistical Significance at 1.0%. Source: Own elaboration.

9. Conclusions

- In general terms, tax policy in Colombia has responded to the cycles of the economy and other factors such as the size of the fiscal deficit or the financing needs of expenditure.

- Although some of the tax reforms imply a stabilization purpose or try to correct problems of equity, progressiveness, and neutrality of the tax system, the bulk of them focused on the generation of revenues to meet increasing government expenses.

- The results of the exercise indicate that, on average, the fiscal management in Colombia was pro-cyclical between 1970 and 2016, as previous studies had suggested for shorter periods of time.

- A structural fiscal rule on the national government's deficit in effect from 2014, generates a favorable context for the adoption of countercyclical policies to moderate fluctuations in the economy and ensure the sustainability of public debt.

THANKS