

# Fiscal Policy and Macroeconomic Stabilization in Colombia



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# Objective & Outline

Provides evidence on the chief macroeconomic aspects of Fiscal Policy in Colombia:

## 1. The Role in **Short Run Stabilization**:

- **Fiscal Stance** during business cycle: Using directly gov-tools: tax rates and expendit.
- Macroeconomic **Effects from Uncertainty** generated by continuous tax reforms
- **Relationship** between **Fiscal and Monetary policy** through the last FX-Regimes

## 2. **Debt Sustainability and Fiscal Space** in M& L.R: 2 Approaches to assess Fiscal Space

- Taxes: estimating the **Laffer Curves** on consumption, labor and capital taxes
- More debt: Estimation the **Debt Limit** and assessing its sustainability

\*\*\* The final document reconciles seven documents in themselves



## ➤ Fiscal Stance during the business cycle .....→ Tool: Tax Rates

- ✓ **Data:** Three indexes on nominal taxes rates are built to see their time behavior (Income, Consumption and Total): Period 1970-2017
- ✓ **Empirical Strategy:** Cointegration analysis is employed (VEC Model) to assess the S.R & L.R relationship between taxes rates and output (key variables as controls: G, K, L, Debt, etc.).
- ✓ **Robustness:** Carried out different models changing controls and periods
- ✓ **Main Conclusions:** Using tax rates, FP in Colombia has been **procyclical** → Between 1970-2017, on average, have increased rates in phases of low growth
- ✓ The FP procyclicality is larger through the income taxes *vis-à-vis* consumption



## ➤ Fiscal Stance during the business cycle .....→ Tool: Expenditures

✓ **Data:** GDP-decomposition (Cyclical & Permanent): Perron-Wada, 2009. Adjust by possible regime changes (MRM -Multiple Regimen Model). Period 1970-2017

### ✓ **Empirical Strategy:**

(i). Govt's Reaction of Expend. to Transitory and Permanent shocks of GDP with a set of relevant controls;

$$\Delta G_t = \gamma_0 + \gamma_1 \hat{y}_{t-1} + \gamma_2 \Delta \bar{y}_{t-1} + \gamma_3 b_{t-1} + \sum_{s \in S} \zeta_s d_{s,t} + \varepsilon_t$$

(ii) RBC Model for a small and open economy → To support and explain results

✓ **Main Conclusions:** The government expenditures in Colombia has been **acyclical** in the S.R (there is no evidence on positive nor negative responses,  $\gamma_1$ ).

✓ Govt spending responses positively to permanent shocks to GDP, L.R (Elasticity,  $\gamma_2 > 1$ )

# ➤ Macroeconomic **Effects from Uncertainty** by the continuous tax reforms

## ✓ **Empirical Strategy:**

(i) Tax rules are defined and estimated (on capital, labor and consumption,  $\tilde{x}_t$ ). Uncertainty for each tax is derived from these estimates ( $\sigma_{x,t}^2$  with GARCH models)

Rules: 
$$\tilde{x}_t = \rho_x(\tilde{x}_{t-1}) + \phi_{x,y}\tilde{y}_{t-1} + \phi_{x,b}\left(\frac{\tilde{b}_{t-1}}{y_{t-1}}\right) + \varepsilon_{x,t}$$

Uncertainty measure: 
$$\sigma_{x,t}^2 = \alpha_0 + \alpha_1\varepsilon_{x,t-1}^2 + \dots + \alpha_q\varepsilon_{x,t-q}^2 + \beta_1\sigma_{t-1}^2 + \dots + \beta_p\sigma_{t-p}^2$$

(ii) The uncertainty impact on business cycle is estimated using an SVAR Model with sign restrictions. A GE-Nk-Model is used to explain channels of transmission

✓ **Main Conclusions:** Even though continuous tax reforms have attended fiscal sustainability (12-Reforms since 2000), they have also generated uncertainty which could be costly (Its found negatively effects on Business Cycle).

✓ Increases in uncertainty (on capital and labor taxes) lead to falls in aggregate demand (consumption and investment) which impacts prices and interest rates

## ➤ Relationship between Fiscal and Monetary policy → Last FX regimes

### ✓ Empirical Strategy:

(i) Neo-Keynesian DSGM (for Small-Open econ.) with Fiscal and Monetary Policy Rules (Galí et al., 2007). The model is adapted, such that the external-financing-premium depends on debt. Its estimated with Bayesian-Techniques.

(ii) Relationship betw Fiscal and Monetary Policy is analyzed using as link 3-FX-Regimes: Fixed (1980-92); Bands (1993-99); and Flexible (IT) (2000-17). Monetary rule changes across FX-regimes while the fiscal is consistent with debt sustainability.

✓ **Main Conclusions:** Under the current FX-Flexible (I.T.), there seems to be a better relationship between Fiscal and Monetary Policy, reflected in a greater public spending multiplier (compared to FX-regimes of bands & fixed ). The greater spending multiplier could helps to countercyclical fiscal stance.

✓ Two factors help explain the result: (i) A lower premium for external financing in I.O (greater access to the credit market); (ii) A lower adjustment costs in investment

## ➤ Fiscal Space through taxes: **Laffer Curves** .....

### ✓ **Empirical Strategy:**

(i) A Neoclassical Growth model (closed-econ) is used to estimate the Laffer Curves for taxes on labor, capital and consumpt. Results for Colombia is compared against 14-EU and U.S. N.A-Data are used to calibrate parameters: Period 1994-15

(ii)  $Fiscal\ Space = \tau_{n,k,c}^{Max\ Rev} - \tau_{n,k,c}^{Last\ Date}$        $\tau$ : effective tax rate

✓ **Main Conclusions:** Govt has a space of, at least, 5% of GDP to increase the tax burden on factors (K & L), in addition to eventual space by the consumption side.

✓ U.S. has small margin to increase revenues through capital taxes (0.6% of GDP), The 14-EU countries are practically at the peak of the Laffer Curve, in relation to L & K tax rates (have not space, in average)



## ➤ Fiscal Space: **More Debt and its Sustainability** .....

### ✓ **Empirical Strategy:**

(i) Estimate the limit of Govt debt is useful in assessing fiscal space and debt sustainability. Two approaches are addressed: The so-called Natural Limit (Mendoza, et al 2009) and the Limit through "Fiscal Fatigue" (Gosh et.al., 2013)

(ii) Regarding the 2th Approach, Debt Limit is derived from the non-linear fiscal reaction function (panel of countries), which, in turn, is derived from IBC

Reaction Function:  $s_{i,t+1} = c_i + f(b_{i,t}) + \Theta\mu_i + \varepsilon_{i,t+1} = (r_i - g_i)b_{i,t};$  f is cubic

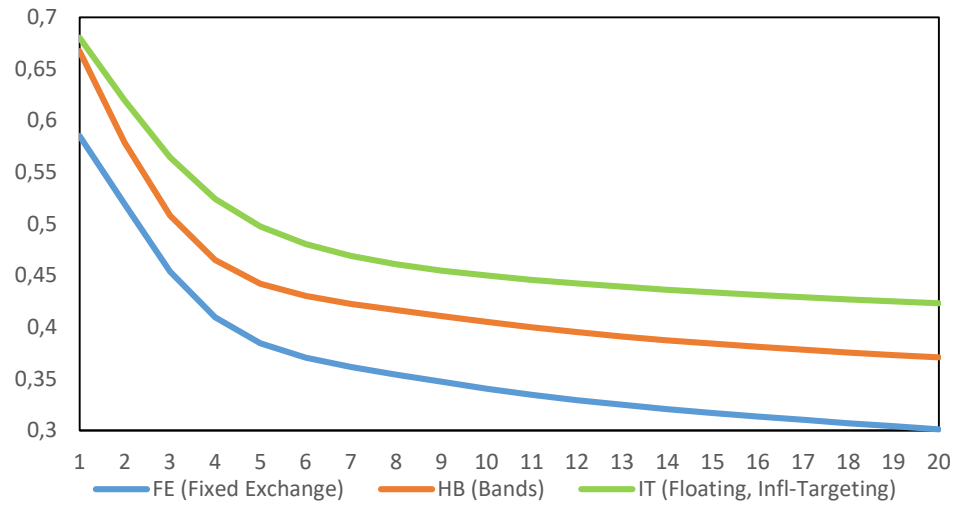
✓ **Main Conclusion:** The Colombian public debt limit is close to 56% of GDP, and Fiscal Space near to 7% GDP. Even though this level appears sustainability, the fiscal space looks narrow, due to the sensitivity of this indicator to external shocks

✓ Regional context: Chile has the greatest fiscal space while Mexico and Ecuador, with a similar level of indebtedness to Colombia's, seem to have less space

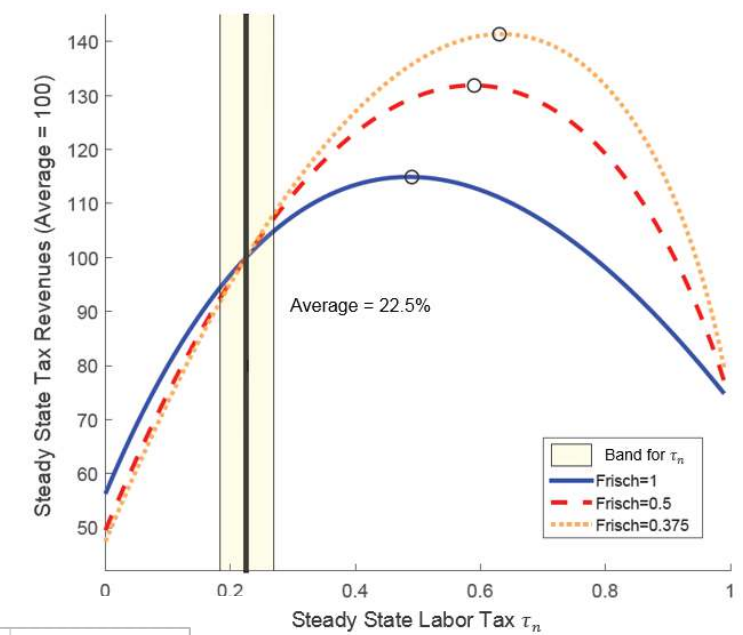


# ➤ Some Evidence in Graphs .....

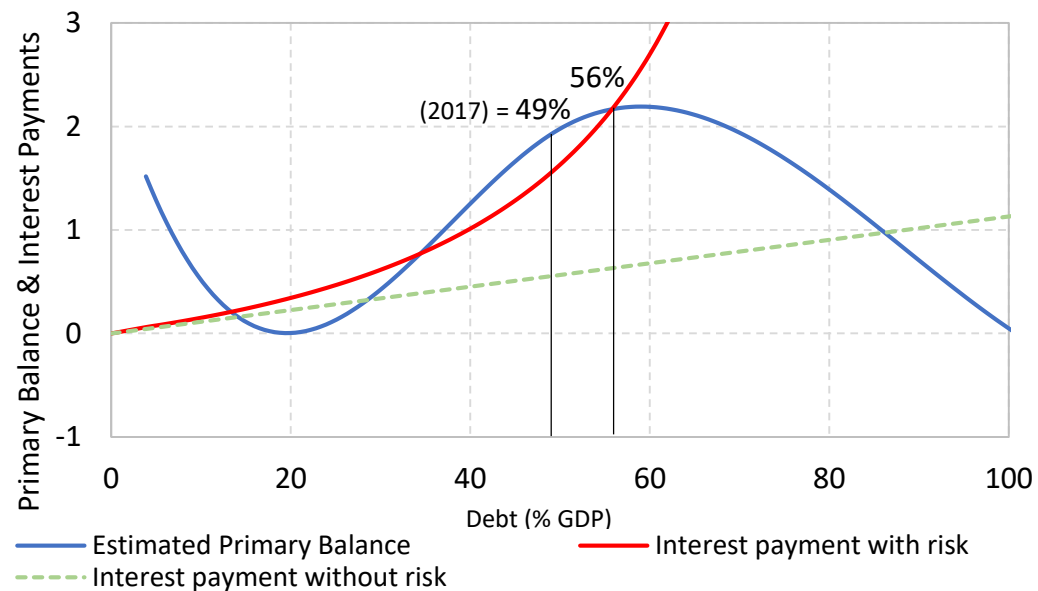
### Fiscal Multiplier Under Different FX Regimes



### Laffer Curve for Labor Income Taxes



### Colombia's Fiscal Space



## ➤ Conclusions .....

- ✓ FP in Colombia continuing to be **procyclical**, especially through taxes. No evidence was found through expenditures
- ✓ In spite of continuous tax reforms for attending fiscal sustainability, they have also generated **uncertainty** which has been **costly for economy** (it had negative Impacts on aggregate demand).
- ✓ Under the current Inflation Targeting Regime (FX-Flexible), there seems to be a **better relationship between Fiscal and Monetary Policies**, reflected in a greater public spending multiplier (compared to FX regimes of bands/fixed ). The greater spending multiplier could helps to countercyclical fiscal stance.
- ✓ Regarding **Fiscal Space** through taxes (**Laffer Curves**), it is found that govt has a space of, at least, 5% of GDP to increase the tax burden on factors, plus the eventual space by consumption side.
- ✓ The Colombian public debt limit is close to 56% of GDP, and Fiscal Space near to 7% GDP. The current debt level looks sustainability; nonetheless, the fiscal space appears narrow, especially due to the sensitivity of this indicator to external shocks