

# **Fiscal Sustainability in Uruguay: a balance sheet dynamics approach**

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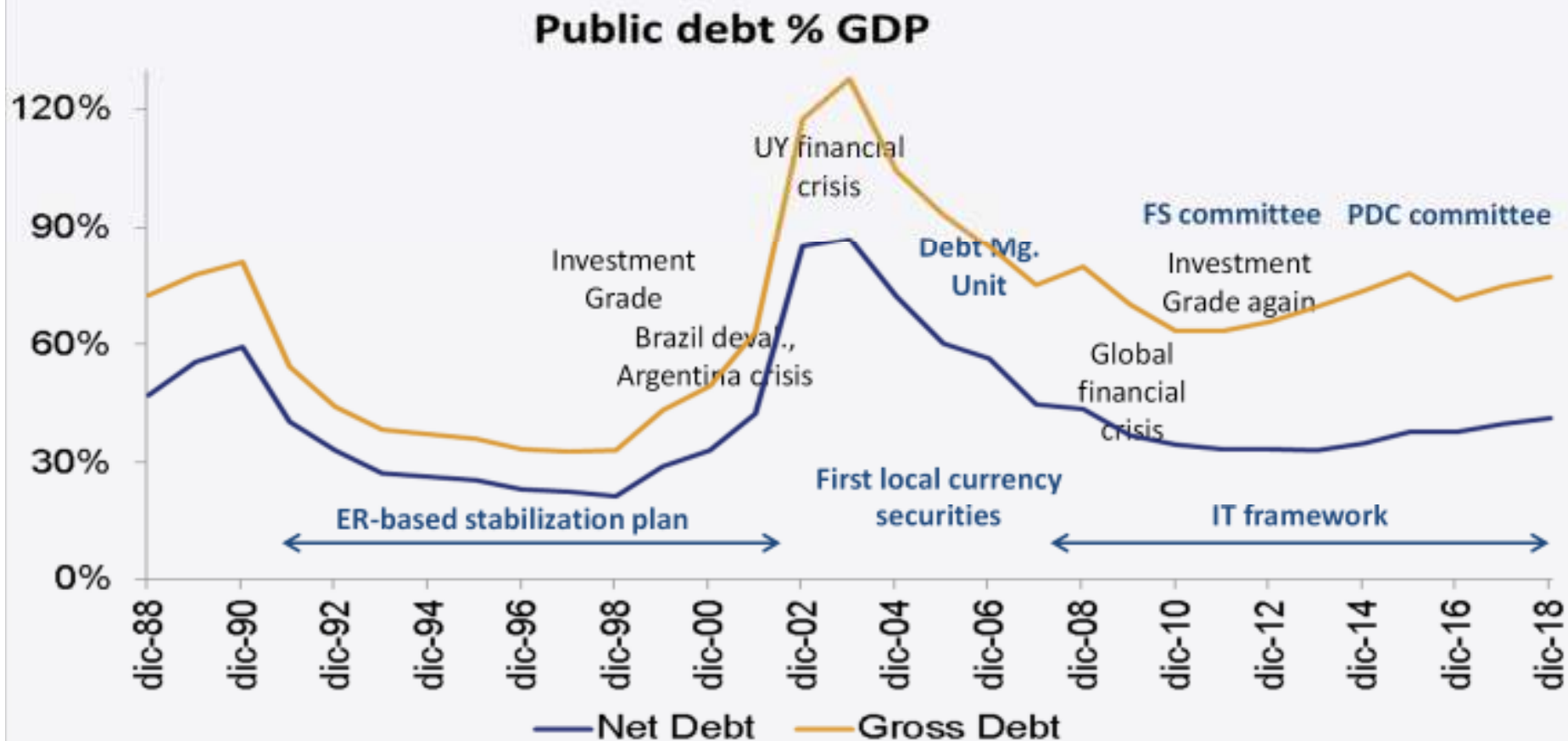
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# Outline

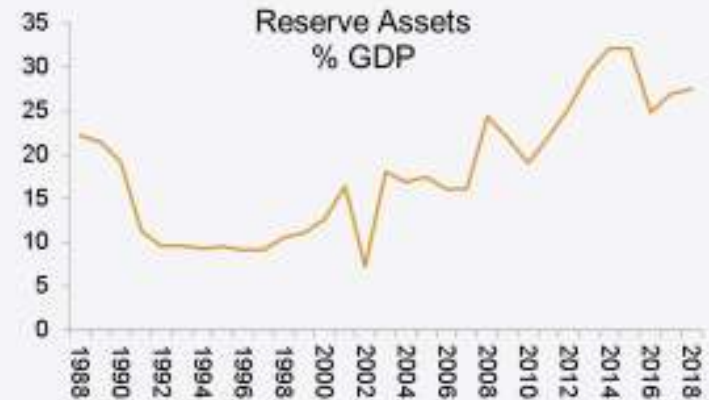
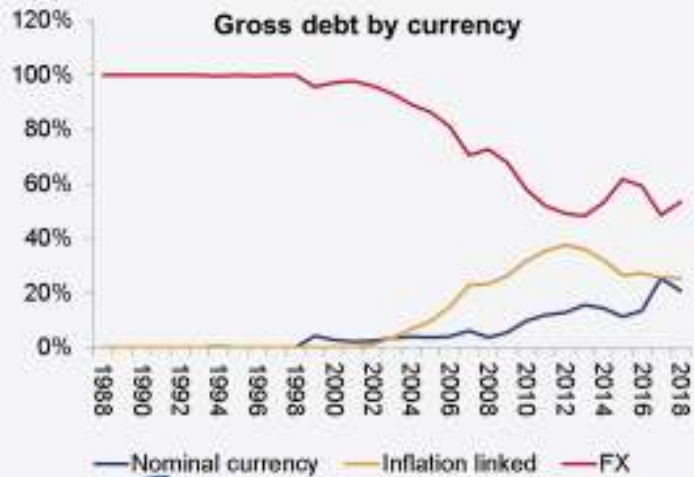
- ❑ *Recap*: public debt dynamics over the last 30 years using a traditional DSA framework, main trends and drivers
  
- ❑ A balance sheet dynamics approach
  - stocks and flows, assets and liabilities, debt structure, institutional breakdown
  
- ❑ Debt dynamics and fiscal sustainability over the next 10 years

# Public debt dynamics in the last 30 years

# Debt dynamics, international framework and institutional policies

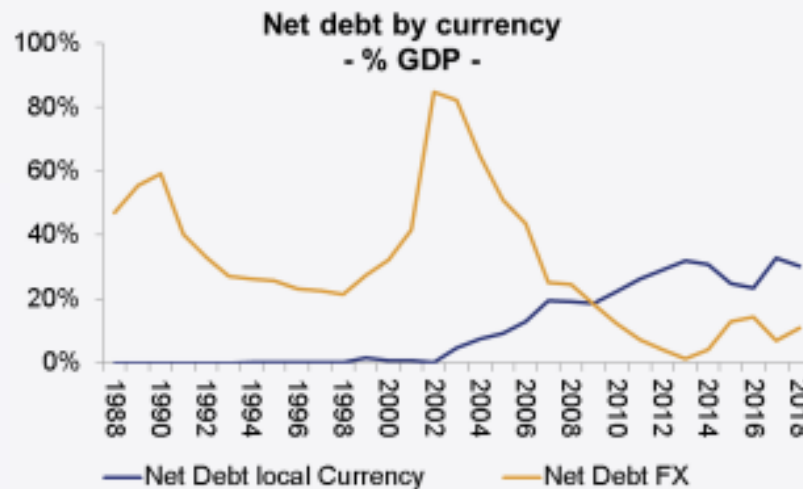


# Macro-financial risks mitigation: currency composition and assets accumulation

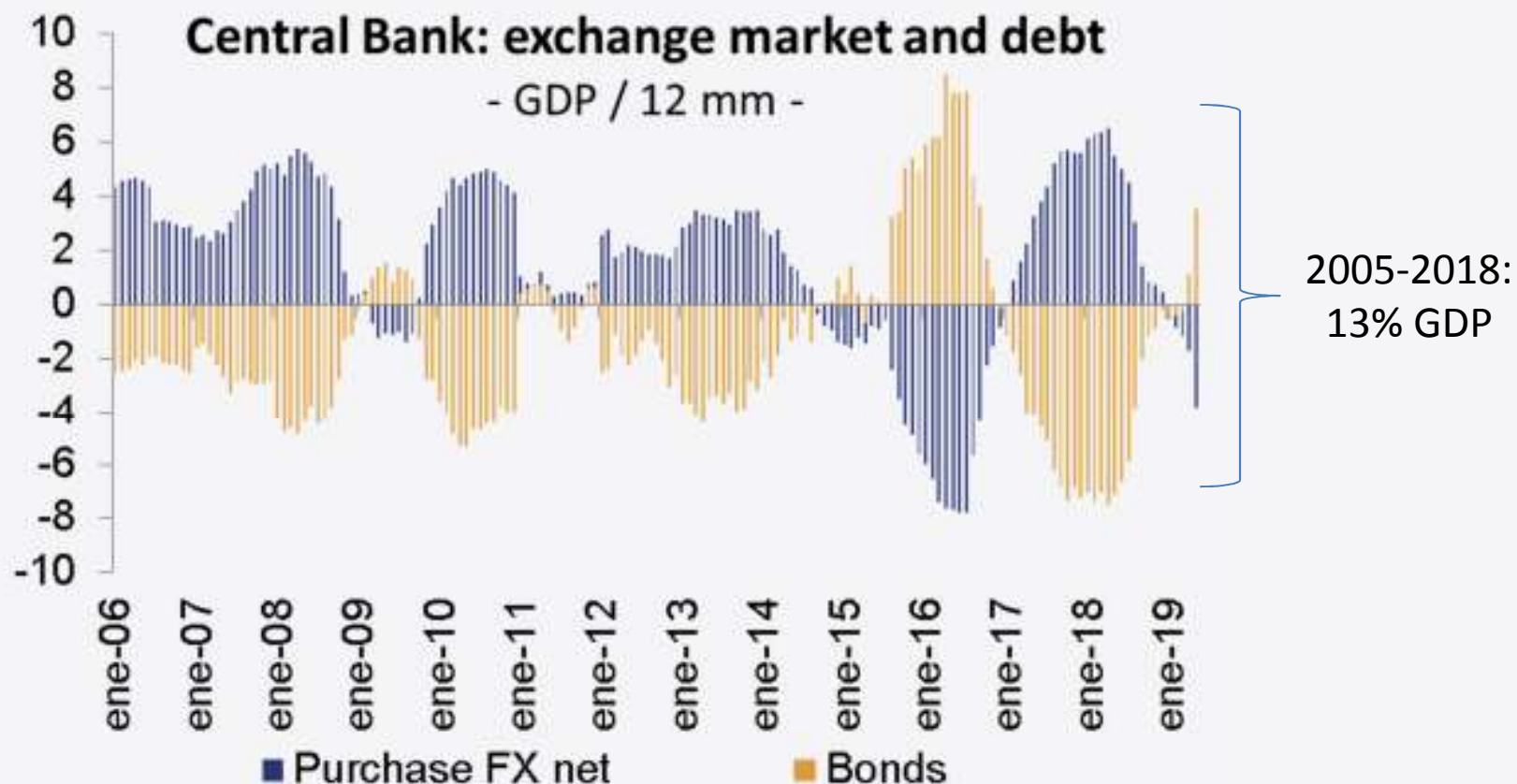


- First half: fixed ER and whole debt in FX
- Second half: flexible ER and local currency debt

- Increase in FX assets and gross debt... leaving net debt quite stable.

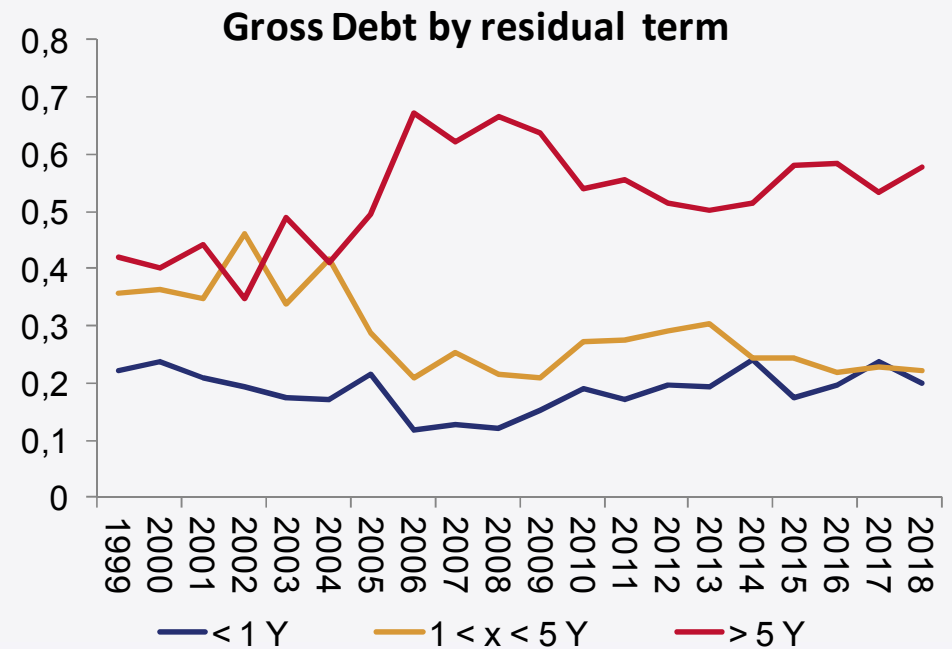
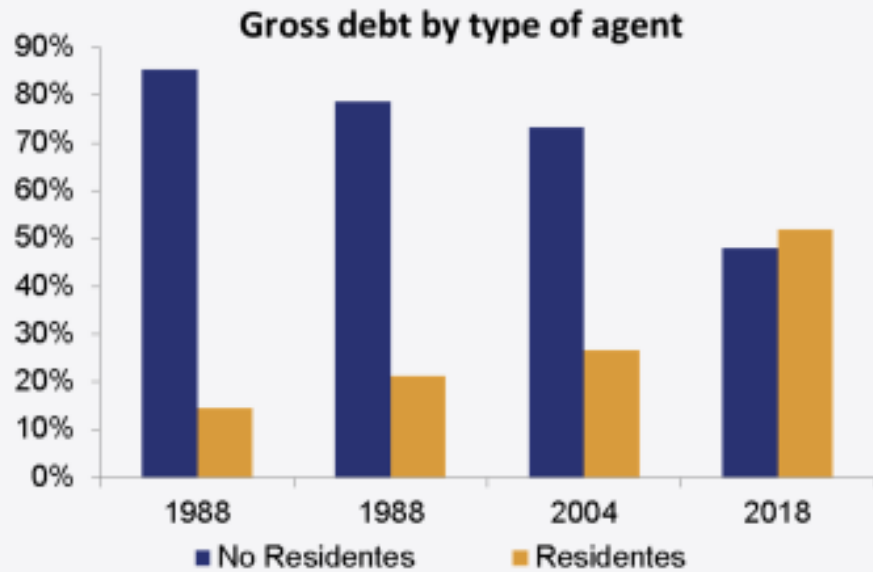


## Balance sheet management in a SOE with open capital account



- Capital flows (inflows and outflows) can lead to macro prudential problems...
- FX market is very important in a still highly-dollarized economy.
- Then, an important task for the CB: to smooth the change in FX market, allowing for a trend determined by its fundamentals.
- A key feature to take into account in public debt dynamics.

# Reduce debt with no resident and increment debt maturity



## The arithmetic of deficit and debt

$$(1) NFSP_t = -S_t + i_t \cdot B_{t-1} = \Delta B_t + \Delta M_t$$

It is based on the nominal NFSP, where **B** is a weighted average debt by currency: foreign and local currency (both indexed and nominal).

This deficit can be financed with new non-monetary net debt ( $\Delta B_t$ ) or Monetary Base ( $\Delta M_t$ ).

$$(5) b_t = \underbrace{\left( \frac{1+i_t}{(1+\rho_t) \cdot (1+g_t)} \right)}_{\text{discount factor } \beta_t} \cdot b_{t-1} - s_t - \underbrace{\frac{\Delta M_t}{Y_t}}_{\text{monetary base } \mu_t}$$

$$b = (r - g) \cdot b_{t-1} - s_t - \mu_t$$



## Incorporating some Uruguayan features

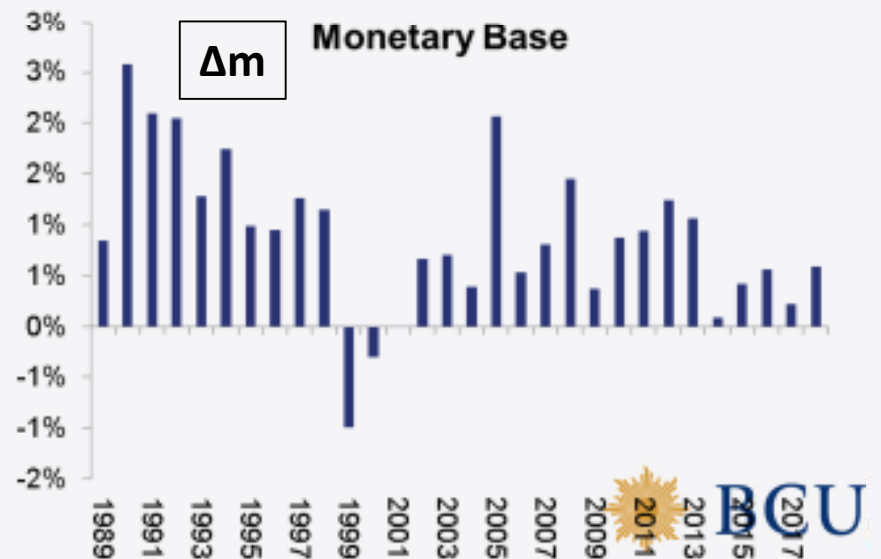
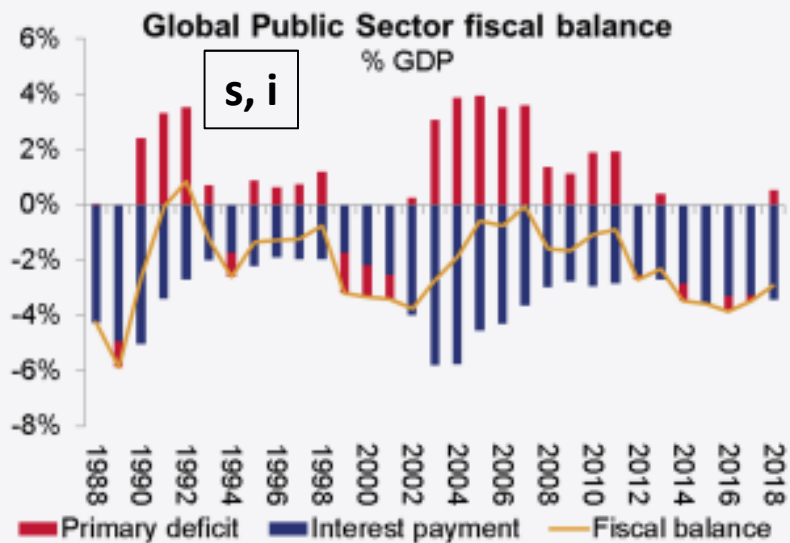
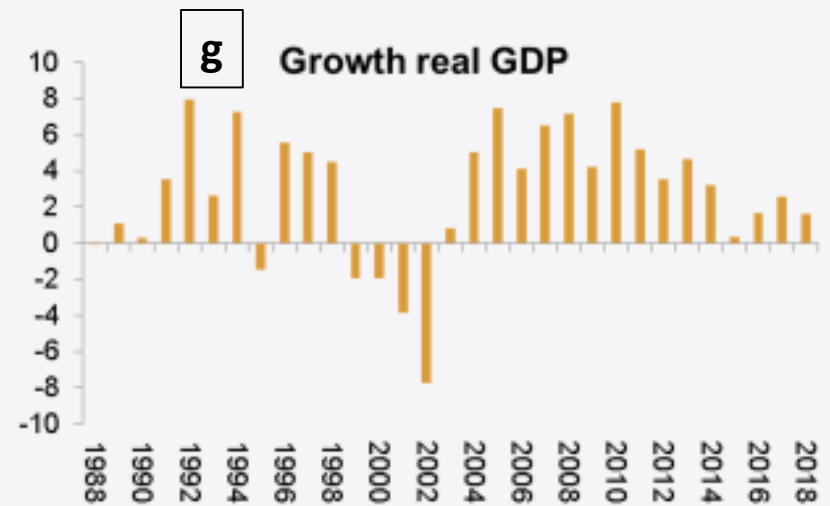
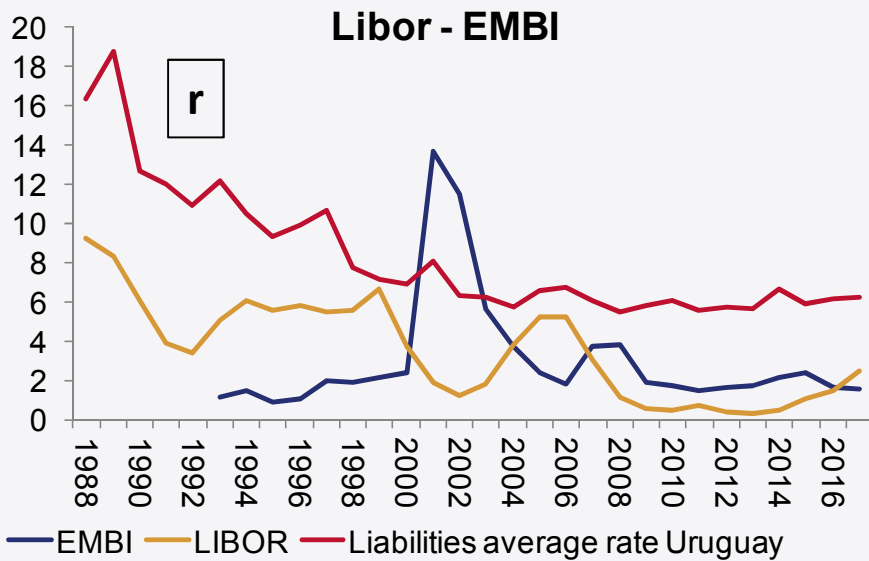
- High dolarization (“original sin”)
- Part of the debt is indexed to inflation
- Integrated management of assets and liabilities framework (ALM)

$$\Delta b_t = \frac{1}{(1 + g_t) \cdot (1 + \pi_t)} \cdot \left[ \underbrace{(i_t - \pi_t) \cdot b_{t-1} + \bar{i}_t \cdot P_{t-1} \bar{b}_{t-1} + (i_t^* + \delta_t - \pi_t) \cdot E_{t-1} b_{t-1}^*}_{\text{Average real gross debt rate by currency } (r_b)} - \underbrace{(i_t^{a*} + \delta_t - \pi_t) \cdot E_{t-1} f_{t-1}^* - g_t}_{\text{Average real assets rate } (r_a)} \right] - s_t - \Delta m_t$$

with  $b_t^* = \frac{B^*}{P \cdot y} \Rightarrow E_t b_t^* = \frac{E_t \cdot B_t^*}{P_{t,y_t}}$

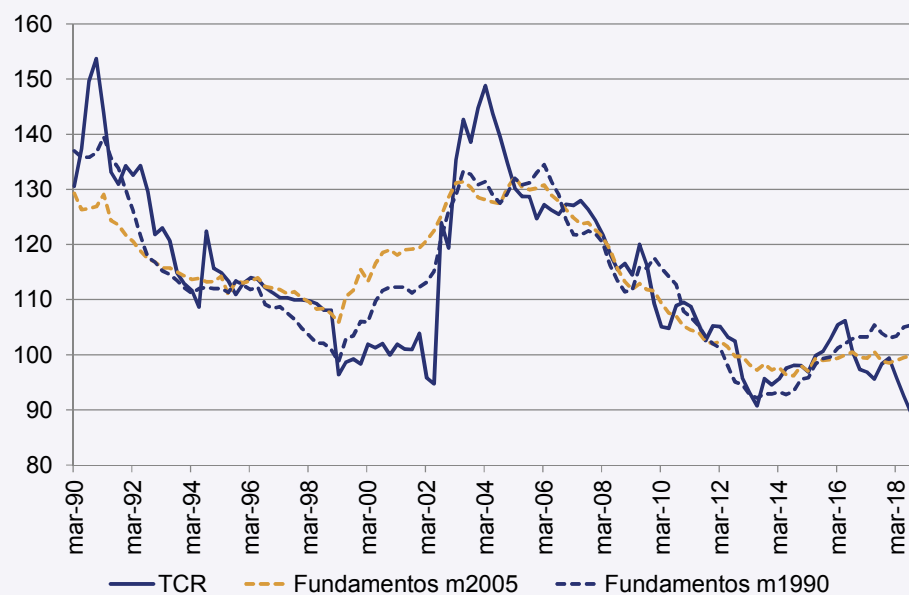
- It shows some important features of Uruguayan economy :
  - Real depreciation ( $e - \pi$ ), international conditions ( $i^{usd}$ ), gross debt structure, liabilities and assets structure.

# Debt dynamics: macro-fiscal determinants

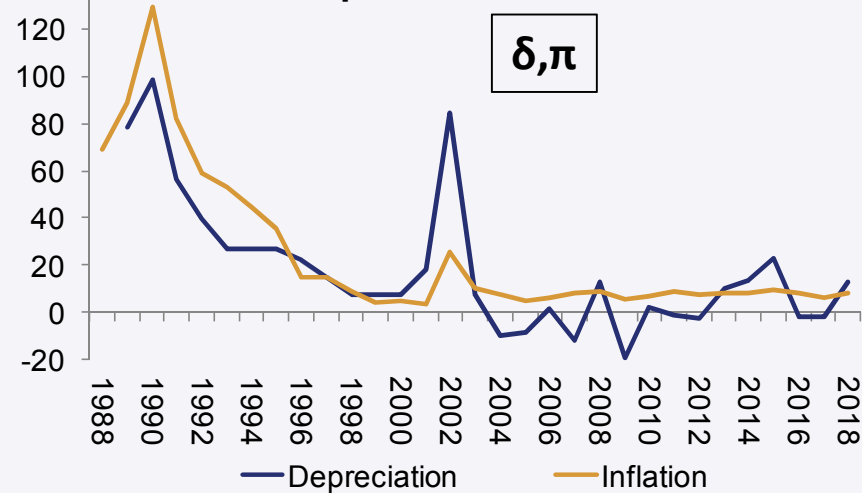


# Effective RER, fundamentals RER and real depreciation

**TCR y fundamentos**  
2 estimaciones alternativas

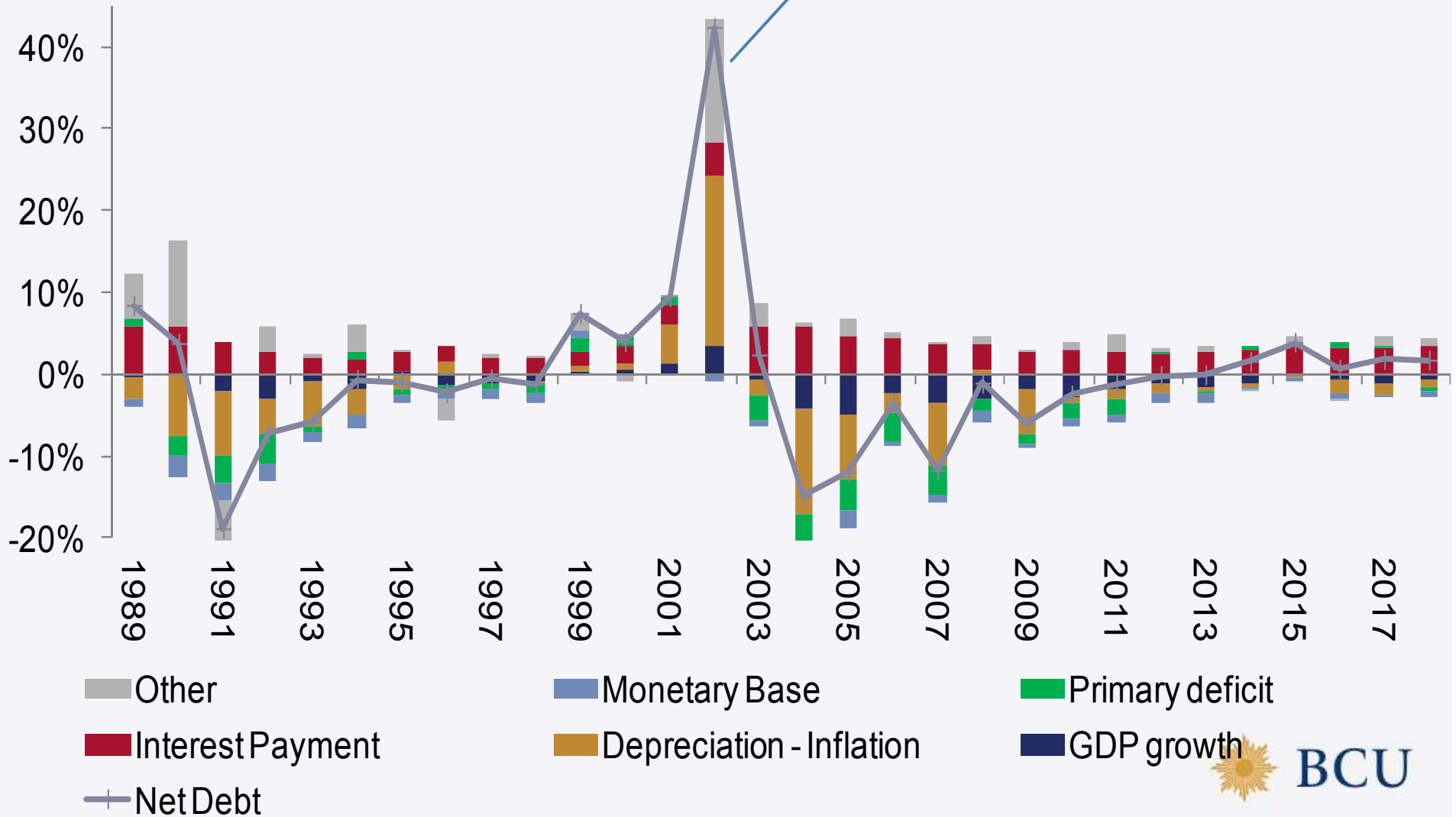


**Nominal depreciation and inflation**



# Changes in the Net Debt Dynamics: main determinants

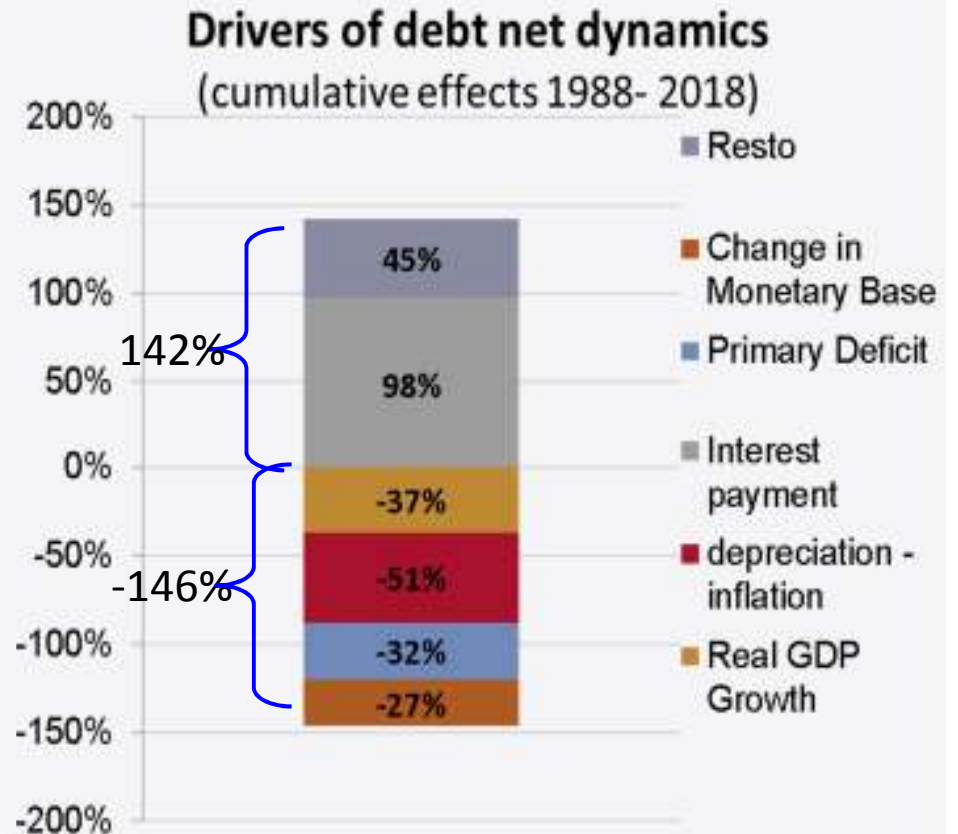
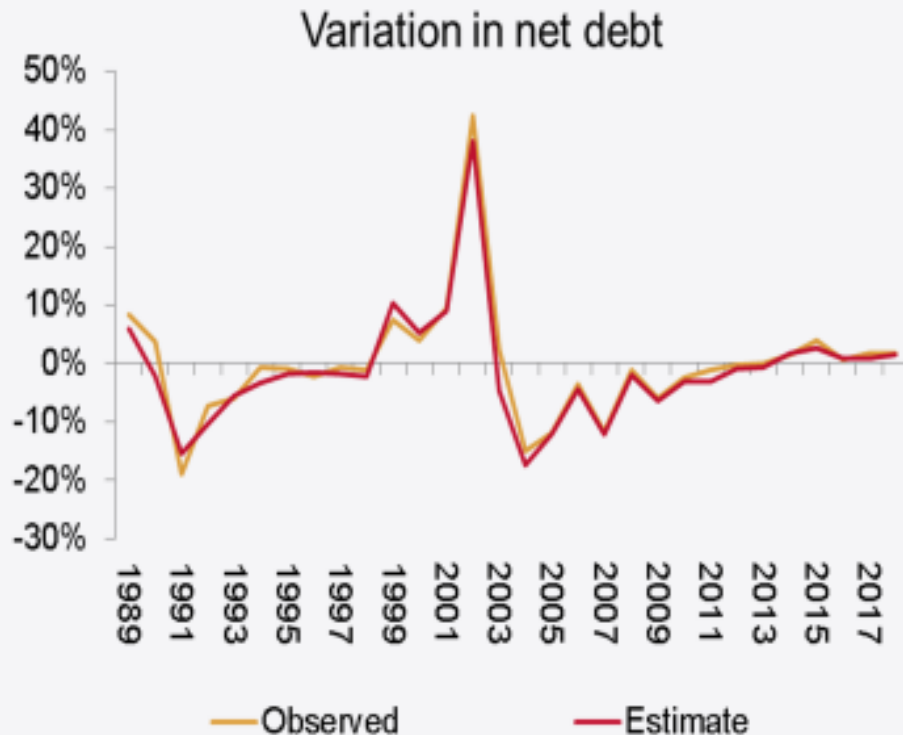
2002: financial crisis:  $\Delta$  EMBI,  $\Delta$  FX,  $\Delta$  T,  $\Delta$  deficit



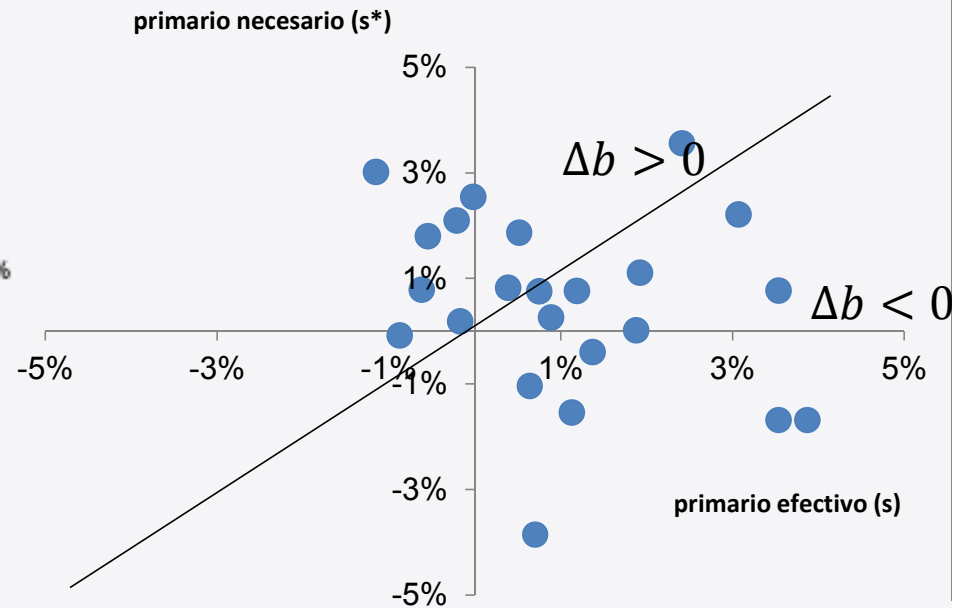
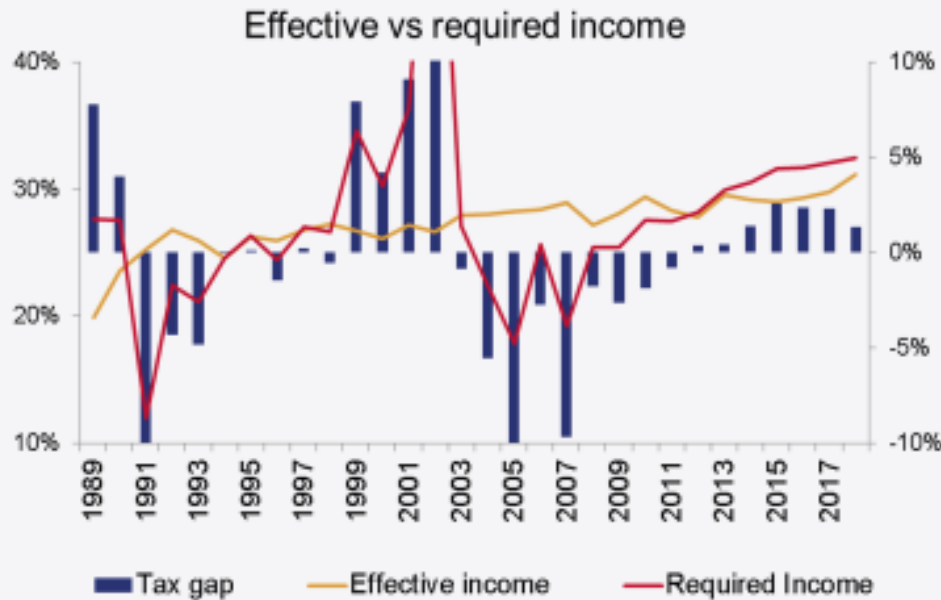
# Changes in the Net Debt Dynamics: main determinants

## Decomposition of debt dynamics by factors

$$\Delta b_t \cong (r - g) \cdot b_{t-1} - s_t - \mu_t$$



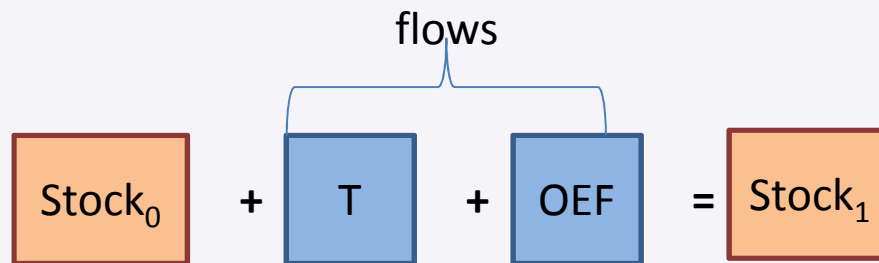
# Solvency indicators: tax gap and primary gap



# A balance sheet dynamics approach

# A Balance Sheet Approach

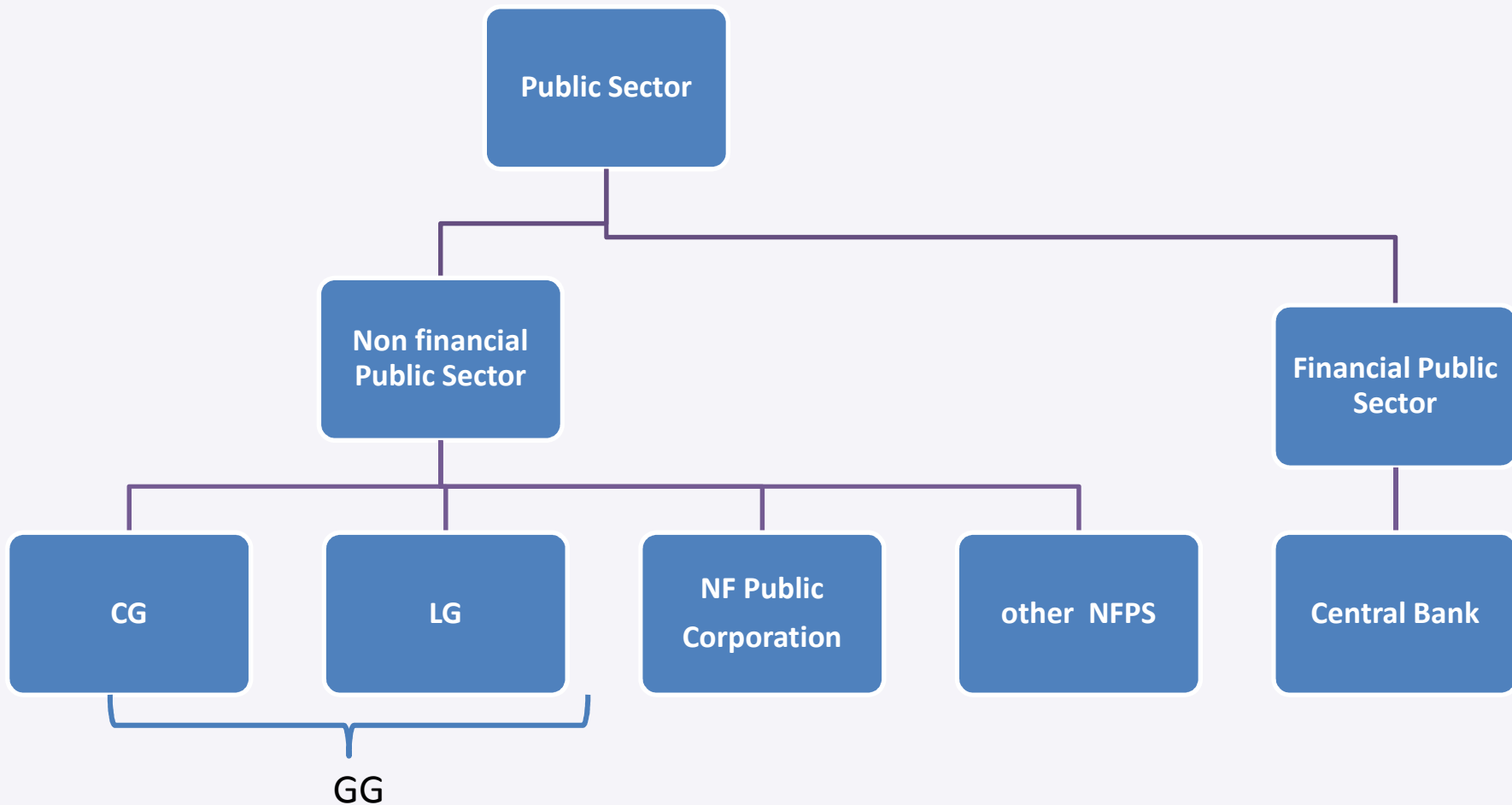
- Framework: IMF GFS Manual (2001-2014)
- Stocks of assets, liabilities and net worth
- Stocks connected with flows: transactions (T) and “other economic flows” (OEF)



- Transactions : interaction by mutual agreement
- OEF: Changes in the value of assets or liabilities that do not result from transactions; e.g.: gains and losses for RER movements or inflation.

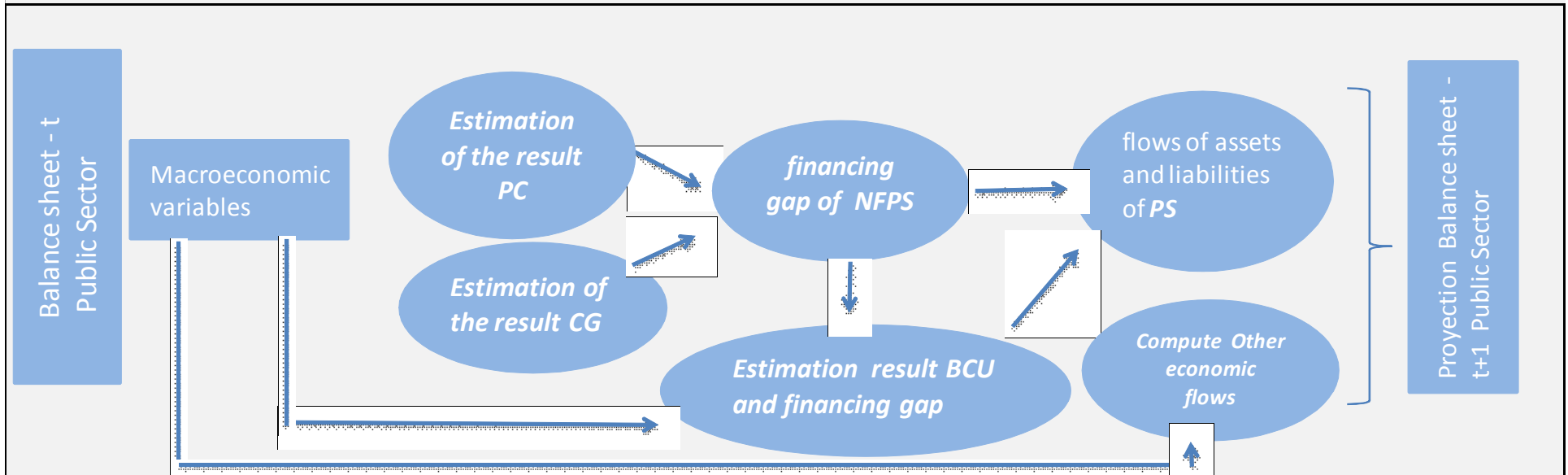


# A large institutional coverage of the public sector



# How does it work?

## Financing gap and construction of assets and liabilities flows - stocks



### Advantages over traditional approach:

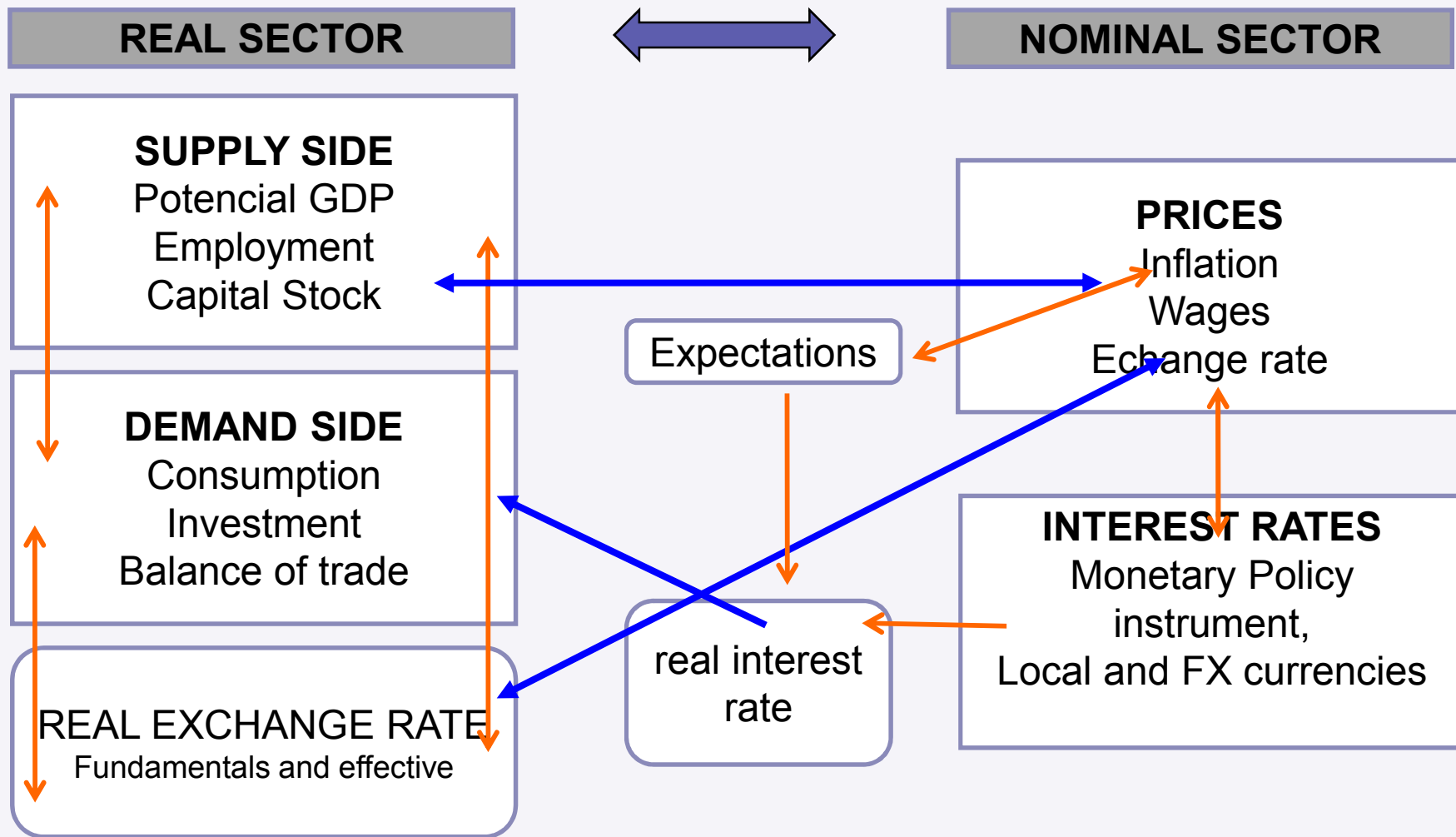
- Rigorous statistical conceptual framework
- Interaction between units of public sector
- Level of assets and liabilities – how big is the balance sheet
- Counterpart – resident vs non residents

# Debt dynamics and fiscal sustainability over the next 10 years

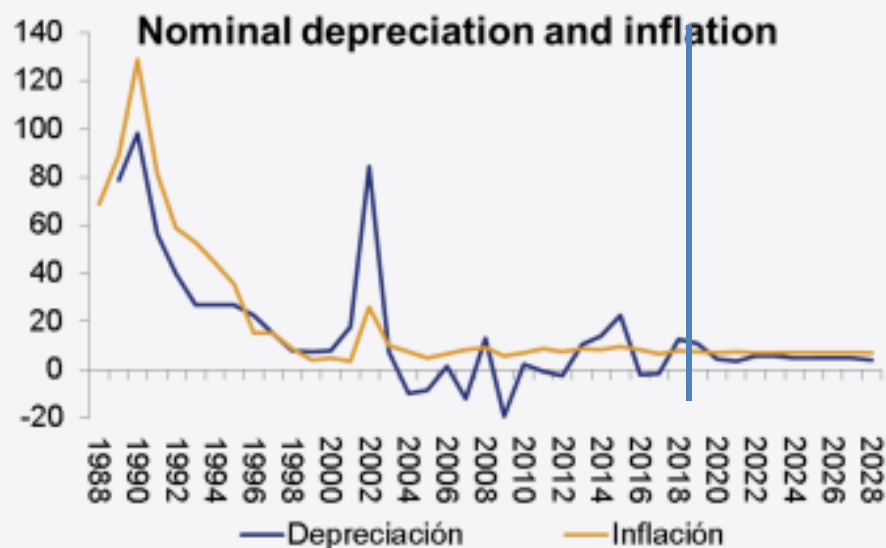
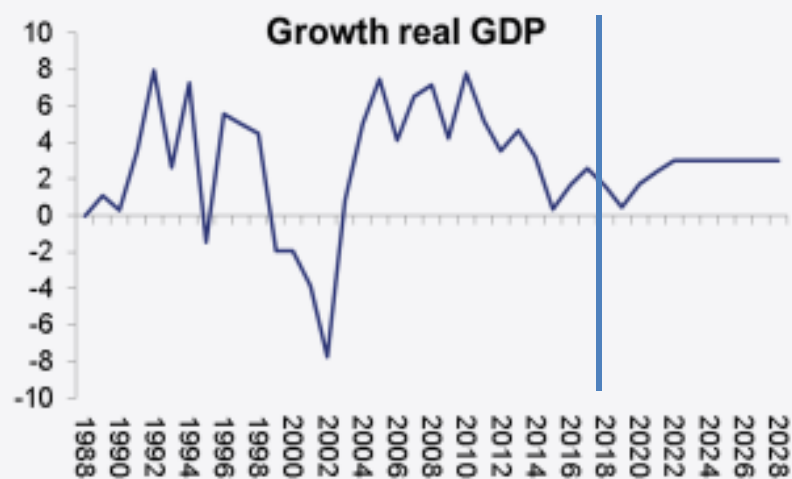
## Macro-fiscal variables are determined within a macro model

- All the variables that interact in this exercise are endogenously and jointly determined within a general equilibrium macro econometric model (MMET)...
- ... which interacts with other two GE models (MPM, DSGE) to give sensible forecasts.
- Main advantage: fiscal policy (consolidation) is no “free lunch”... while fiscal variables (can) affect macro equilibrium.
- Forecast horizons:
  - Next 2 years: forecasts come from the quarterly MPC analysis.
  - 2 to 5 years: guides by medium term trends
  - 5 to 10 years: guided by steady state values.

## The structure and links of the model: a simple view

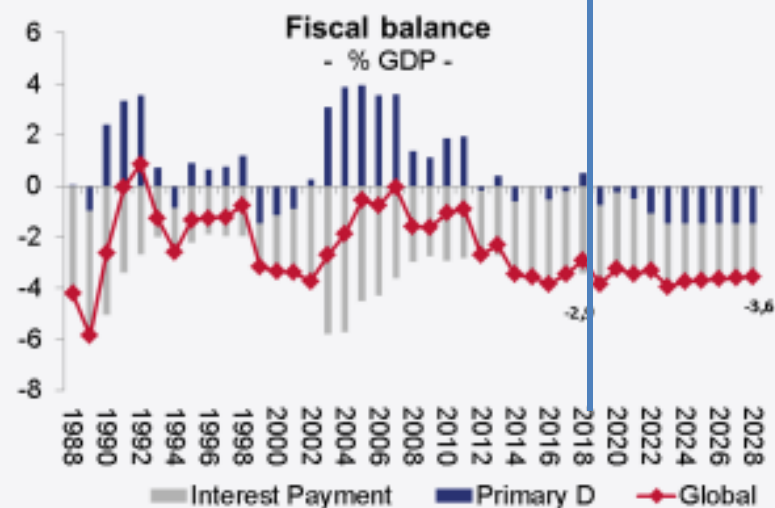
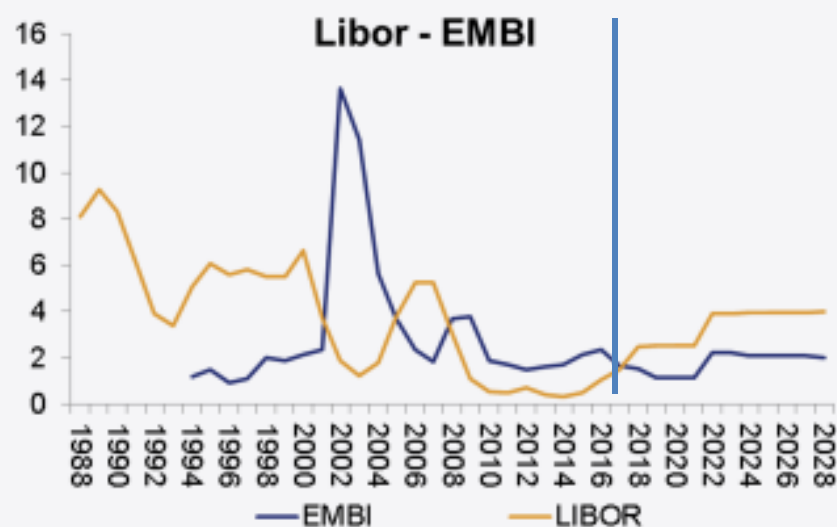


## Macroeconomic forecasts: GDP and relative prices



- GDP, inflation and RER gaps are closed in the next years
- Real GDP growth reach its potential (S-S) trend of 3%
- Inflation stays in the target, RER reach a S-S level compatible with its fundamentals.
- Both variables together with foreign inflation determine the trend for the nominal ER.

## Macroeconomic forecasts: interest rates and primary balance



- Foreign interest rate and risk premium trends, together with inflation, MP rule and UIP determine local interest rates (both in local and foreign currency)...
- ... which in turn help to forecast the interest bill.
- Finally, in this “**constant policy**” **exercise**, primary balance reach a figure compatible with the macroeconomic framework, with no further analysis nor consolidation measures.

# A balance sheet approach

## Central Bank financial equity - % GDP

	2018	T	OEF	GDP	2019
<b>Assets</b>	<b>39</b>	<b>0,1</b>	<b>3,7</b>	<b>-3</b>	<b>40</b>
Reserve assets	28	0,1	2,8	-2	28
Others	2	0,0	0,2	0	2
Bonds - CG	10	0,0	0,7	-1	9
<b>Liabilities</b>	<b>35</b>	<b>0,9</b>	<b>1,3</b>	<b>-3</b>	<b>35</b>
Bonds local currency	12	0,4	0,0	-1	12
Bonds inflation linked	1	-0,8	0,1	0	0
Deposits LC	3	-1,4	0,0	0	1
Deposits FX	13	2,0	1,4	-1	16
Monetary Base	5	0,4	0,0	0	5
Loans	1	0,2	-0,2	0	1
<b>Financial net worth</b>	<b>4</b>	<b>-0,8</b>	<b>2,3</b>	<b>0</b>	<b>5</b>

$\Delta \Pi$

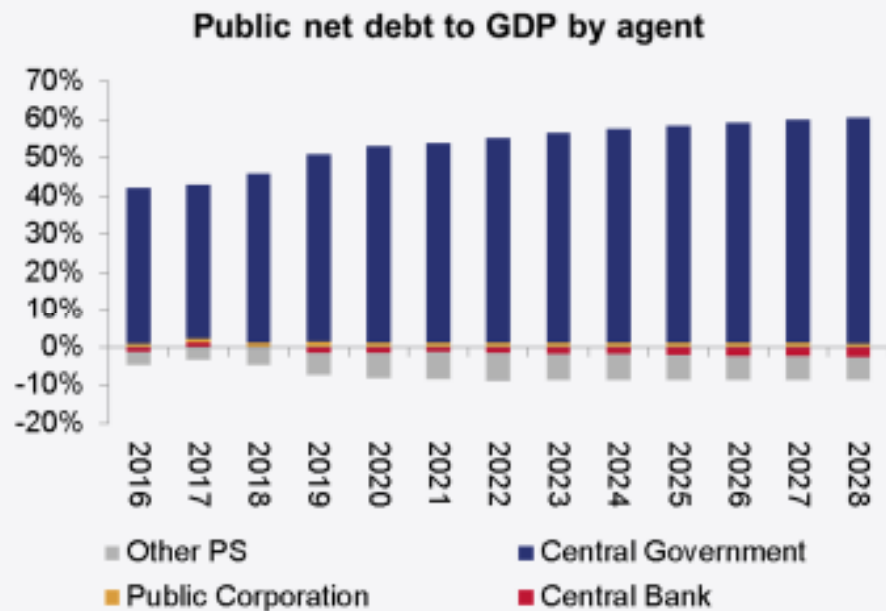
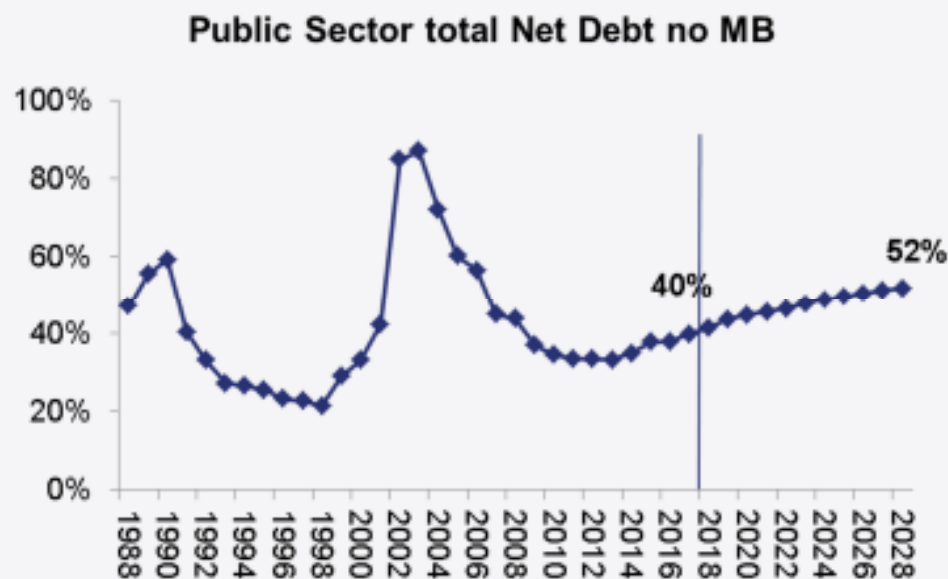
Debt holders

Global deficit is financed with  $\Delta$ liabilities

$\Delta$  FX

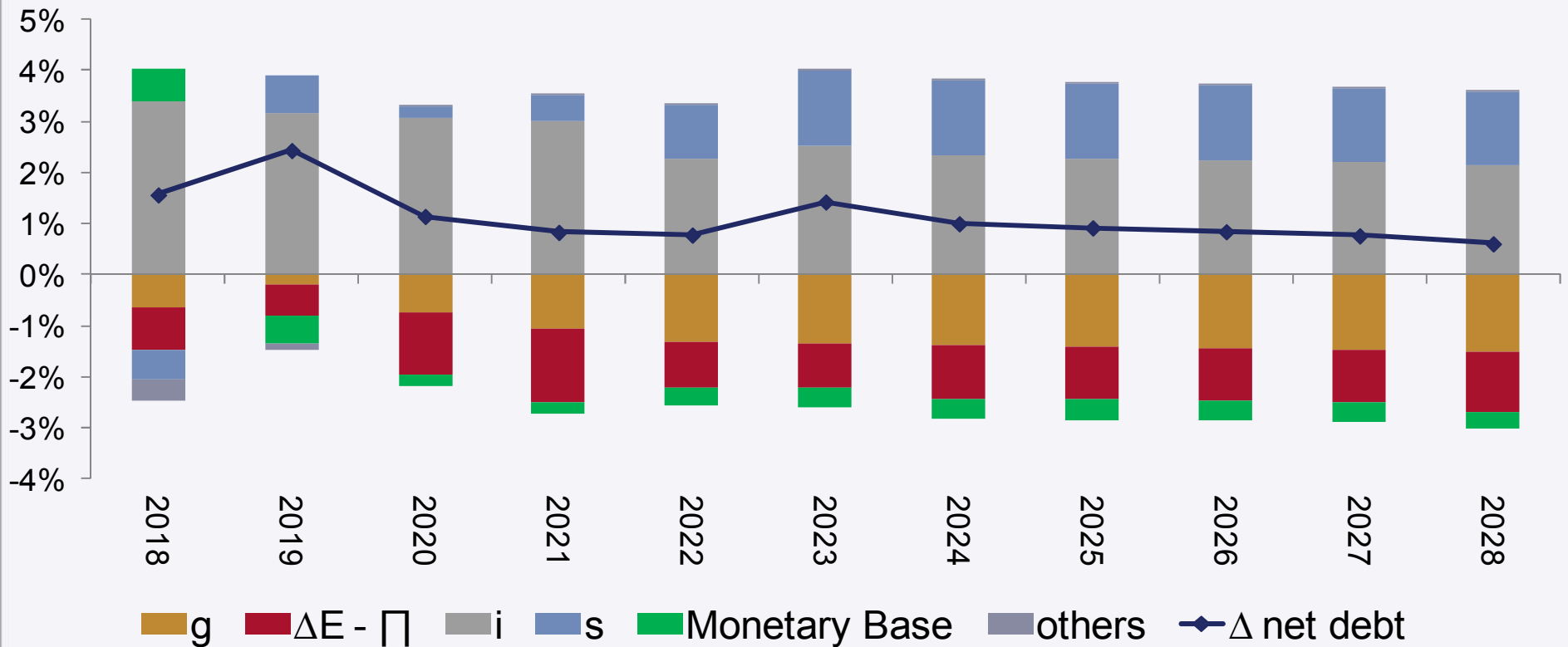


## Net public debt dynamics: global and institutional contributions, “constant policy” exercise



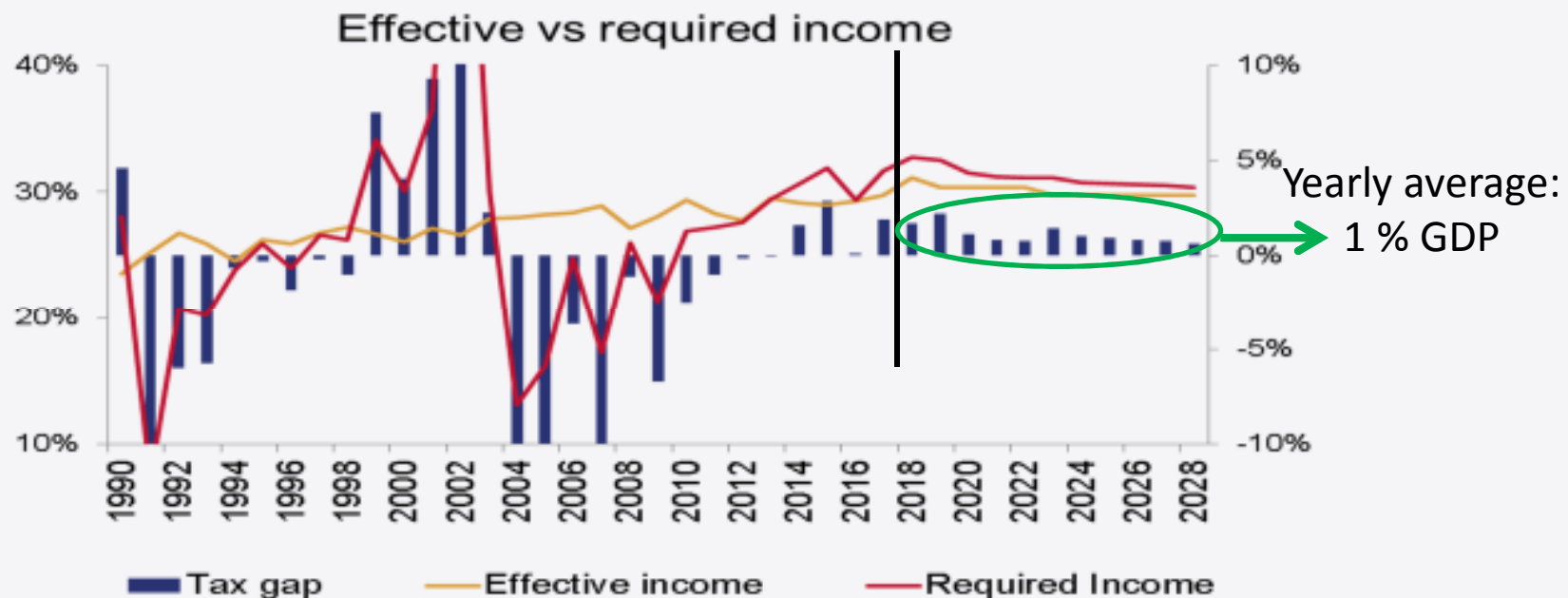
- In this framework, net public debt would reach 52 of GDP, driven by the dynamics of the Central Government.

## Net debt variation by drivers - % GDP



- Net debt dynamics is explained by the global deficit, which is partially offset by real growth, RER dynamics and monetary base financing.

## Which is the tax increase required to stabilize net debt?



### How wide is this gap?

- New FDI project in the cellulose pulp sector was announced last week, which will be the biggest investment of this kind in Uruguay. As a result, GDP level would increase permanently, resulting in a permanent increase in the tax base.
- Main Political parties in competition in this year election agreed that the future government from march 2020 will take actions for a fiscal consolidation.

## Agenda

- Estimate an empirical fiscal reaction function *à la* Bohn (2007).
- Estimate an empirical equation for the EMBI using fiscal arguments.
- Medium term perspective: incorporate risk scenarios.
- Medium/long term perspective: include demographic and actuarial data and its impact on the social security system.

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