Fiscal Sustainability in Uruguay: a balance sheet dynamics approach

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The opinions of the authors represent their individual views and not necessarily the opinion of the institution to which they belong
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

Public debt % GDP

- ER-based stabilization plan
- First local currency securities
- IT framework
- UY financial crisis
- Investment Grade
- Brazil deval., Argentina crisis
- Debt Mg. Unit
- Global financial crisis
- FS committee
- PDC committee
- Investment Grade again

Net Debt
Gross Debt
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.

2005-2018: 13% GDP
Reduce debt with no resident and increment debt maturity

Gross debt by type of agent

Gross Debt by residual term

BCU
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) \( b_t = \left( \frac{1+i_t}{(1+\rho_t) \cdot (1+g_t)} \right) \cdot b_{t-1} - s_t - \frac{\Delta M_t}{Y_t} \)

discount factor \( \beta_t \)

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)

\[
\Delta b_t = \frac{1}{(1 + g_t). (1 + \pi_t)} \cdot \left[ (i_t - \pi_t) b_{t-1} + \bar{i}_t P_{t-1} \bar{b}_{t-1} + (i_t^* + \delta_t - \pi_t) E_{t-1} b_{t-1}^* - (i_t^a + \delta_t - \pi_t) E_{t-1} f_{t-1}^* - g_t \right] - s_t - \Delta m_t
\]

Average real gross debt rate by currency \( (\gamma_b) \)

Average real assets rate \( (\gamma_a) \)

with \( b_t^* = \frac{B^*}{P_y} \Rightarrow E_t b_t^* = \frac{E_t B_t^*}{P_{t,y_t}} \)

- 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

Libor - EMBI

Growth real GDP

Global Public Sector fiscal balance

Monetary Base

BCU
Effective RER, fundamentals RER and real depreciation
Changes in the Net Debt Dynamics: main determinants

2002: financial crisis: $\Delta \text{EMBI}, \Delta \text{FX}, \Delta \text{∏}, \Delta \text{deficit}$

- $\Delta \text{EMBI}$
- $\Delta \text{FX}$
- $\Delta \text{∏}$
- $\Delta \text{deficit}$
Changes in the Net Debt Dynamics: main determinants

Decomposition of debt dynamics by factors

$$\Delta b_t \cong (r - g). b_{t-1} - s_t - \mu_t$$
Solvency indicators: tax gap and primary gap

Effective vs required income

Δb > 0

Δb < 0

primario efectivo (s)

primario necesario (s*)
A balance sheet dynamics approach
A Balance Sheet Approach

- Stocks of assets, liabilities and net worth
- Stocks connected with flows: transactions (T) and “other economic flows” (OEF)

\[ \text{Stock}_0 + T + \text{OEF} = \text{Stock}_1 \]

- 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

- Public Sector
  - Non financial Public Sector
    - CG
    - LG
    - NF Public Corporation
    - other NFPS
  - Financial Public Sector
    - Central Bank

GG
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

**REAL SECTOR**
- SUPPLY SIDE
  - Potential GDP
  - Employment
  - Capital Stock

- DEMAND SIDE
  - Consumption
  - Investment
  - Balance of trade

**REAL EXCHANGE RATE**
- Fundamentals and effective

**PRICES**
- Inflation
- Wages
- Exchange rate

**INTEREST RATES**
- Monetary Policy instrument, Local and FX currencies

**NOMINAL SECTOR**

**Expectations**

**real interest rate**
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.
• 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

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

Global deficit is financed with Δliabilities

Δ FX

Demt holders

BCU
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.
• 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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