Sustainability of Public Finances in Mexico

Oscar Budar
Fernando Espino
Jorge Maya
Juan Sherwell

Fiscal Policy: Fiscal Sustainability and Proposals for Institutional Change
CEMLA Joint Research of Central Banks 2019

Madrid, Spain
October 31, 2019
This working paper disseminates preliminary results of economic research conducted at Banco de México in order to promote the exchange and debate of ideas. The views and conclusions presented in this work are exclusively the responsibility of the authors and do not necessarily reflect those of Banco de México.
Índice

1. Context and Objectives
2. Fiscal Sustainability Indicator
3. Results
4. Conclusions
1 Context and Objectives

- Motivation to analyze fiscal sustainability: LATAM countries operate in highly volatile environment (Talvi and Vegh, 1998).
- In the case of Mexico, in 2016, three rating agencies modified Mexico’s sovereign credit rating outlook from stable to negative. Among the reasons were the increased public debt to GDP ratio and the challenges the country faced to stabilize this ratio.
- That same year, the IMF indicated that, while Mexico’s public debt was sustainable over the medium term, it noted that the country had limited fiscal space to respond to external shocks, considering also potential spending pressures.
- In this context, the IMF said that a more ambitious fiscal target would help bring public debt down faster, which would provide a buffer to address long term demographic pressures.
- While the debt-to-GDP has decreased since 2016, the topic of debt sustainability remains relevant, particularly in a context of limited revenues and potential spending pressures in the medium term.
Context and Objectives

Public Sector Borrowing Requirements (PSBR) % of GDP

Debt-to-GDP (Historical Balance of the PSBR) % of GDP

Source: Ministry of Finance.
Context and Objectives

The objective in this work is to estimate in a quantitative fashion, fiscal sustainability in Mexico with a medium term horizon, under different macroeconomic scenarios (one of them considers the absence of a fiscal target).

In this manner, we can have different estimates of fiscal sustainability, considering for instance past and present fiscal frameworks, the outlook of relevant macroeconomic variables, and risks scenarios.

We use the indicator proposed by Blanchard et al. (1990), further developed by Talvi and Végh (2000).
Several studies seek to empirically estimate the sustainability of fiscal policy, using mainly two approaches: i) an accounting approach; and ii) present value constraint.

While both approaches address the budget constraint of the public sector, the former defines sustainability as the long-term primary surplus needed to stabilize debt to its initial level, while the second relies on an intertemporal budget constraint.

Overall, the intertemporal budget constraint approach (present value constraint) states that fiscal policy is sustainable if, at any time, the public debt level equals the present value of the future primary balances.

Blanchard (1990) and Talvi and Végh (2000) propose a set of fiscal sustainability indicators that reduces considerably the amount of information needed in its estimation such as the number of time periods to estimate.
2 Fiscal Sustainability Indicator

- From the public sector budget constraint:
  \[ B_t - B_{t-1} = GP_t - T_t + rB_{t-1} \]
- We can express in terms of GDP, and solve for public debt at \( t \):
  \[ b_t = \left[ \frac{1 + r}{1 + g} \right] b_{t-1} - s_t \]
- Define \( s_t = gp_t - t_t \) as the primary surplus at \( t \).
- Solving for \( b_{t-1} \), iterating forward \( n \) times and imposing a No Ponzi restriction\(^1\), an intertemporal budget constraint is obtained, which indicates that the present value of the primary surplus trajectory must equal the initial public debt stock.

\[ b_{t-1} = \sum_{j=0}^{\infty} \left[ \frac{1 + g}{1 + r} \right]^{j+1} s_{t+j} \]

\( 1/ \) No Ponzi condition: \( \lim_{n \to \infty} \left[ \frac{1 + g}{1 + r} \right]^n b_{t+n} = 0 \).
The intertemporal budget constraint implies to know all primary surpluses expected to have in an infinite time horizon.

A permanent primary surplus is defined, $s_t^*$, as the primary surplus that is constant overtime, and which its present value at $t$ equals the present value of all primary surpluses observed overtime.

Substituting in in the intertemporal budget constraint and solving for $s_t^*$, we obtain:

$$s_t^* = \left( \frac{r - g}{1 + g} \right) b_{t-1}$$

This equation says that, if fiscal policy is sustainable, the permanent primary surplus must equal the effective interest payment on the initial public debt stock.
Fiscal Sustainability Indicator

Taking on the permanent primary surplus equation, an indicator of sustainability can be defined in the following identity:

\[ I_t^* \equiv \left( \frac{r - g}{1 + g} \right) b_{t-1} - s_t^* \]

Cases:

- If \( I_t^* = 0 \), the planned fiscal policy starting at \( t \) is sustainable.
- If \( I_t^* > 0 \), the planned fiscal policy is not sustainable, given that it violates the intertemporal budget constraint.
- If \( I_t^* < 0 \), the planned fiscal complies with the intertemporal budget constraint.
Fiscal Sustainability Indicator

- To estimate the indicator empirically, Blanchard (1990) suggests to compute the permanent primary surplus through an approximation for $n$ periods.
- We approximate the permanent budget constraint, $s_t^B$, through a simple average for a $n$ periods\(^1\):

$$s_t^B \approx \frac{\sum_{j=0}^{n} s_{t+j}}{n + 1}$$

- We get a sustainability indicator for a finite period:

$$I_t^B \equiv \left(\frac{r - g}{1 + g}\right) b_{t-1} - s_t^B$$

\(^1\) With respect to “n”, Blanchard (1990) suggest to use a time horizon for which there is availability of projections. In the case of Mexico, macro forecast by the Ministry of Finance usually covers a 5-year span.
2 Fiscal Sustainability Indicator

- As context, in Mexico at the end of 2018, 36.1% of public debt was issued in foreign currency.

- The previous suggests the importance to incorporate the effect that fluctuations in the exchange rate have on the debt stock, and therefore on the degree of fiscal sustainability. Starting from the sustainability indicator for a finite period, we introduce an additional term that captures changes in the valuation of the foreign currency denominated debt from fluctuations in the exchange rate:

\[ I_t^B \equiv b_{t-1} \left( \frac{r + \theta(\Delta \varepsilon) - g}{1 + g} \right) - s_t^B \]
Results

- We evaluate four scenarios using different assumptions mainly on the macro variables that determine the evolution of fiscal balances and debt. All four scenarios consider a 5-year horizon given the availability of data (we are currently building a longer time frame for the analysis):

1. **Scenario 1.** It considers past information to determine the parameters used in the sustainability analysis (as done by Santaella, 2001). In particular, we take on observed fiscal deficits in recent years, assume they persist going forward, and evaluate sustainability.

2. **Scenario 2.** It assumes that the fiscal rule is attained and the macroeconomic framework is conducive to such objective.

3. **Scenario 3.** Revenues and Expenditures follow inertial trajectories, and in particular, expenditures face non-avoidable pressures. The fiscal rule is absent.

4. **Scenario 4.** Fiscal targets are attained (like in scenario 2) but it considers some shocks to the macroeconomic framework.
### Results: Scenario 1 (past deficits persist)

- **Recall**: this scenario assumes that observed fiscal deficits from recent years, continue going forward.

- The permanent primary balance, the real interest rate, variations in the exchange rate and the rate of growth of the economy are proxied by their observed values from 2011 to 2018 (this period was arbitrarily chosen and can be modified).

#### Table 1. Macroeconomic Framework

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public Debt (HBPSBR, % of GDP)</strong></td>
<td>37.2</td>
<td>37.2</td>
<td>40.0</td>
<td>42.6</td>
<td>46.5</td>
<td>48.7</td>
<td>45.8</td>
<td>44.9</td>
<td>-</td>
</tr>
<tr>
<td><strong>Real Growth (%)</strong></td>
<td>3.7</td>
<td>3.6</td>
<td>1.4</td>
<td>2.8</td>
<td>3.3</td>
<td>2.9</td>
<td>2.1</td>
<td>2.0</td>
<td><strong>2.7</strong></td>
</tr>
<tr>
<td><strong>Inflation (%)</strong></td>
<td>3.8</td>
<td>3.6</td>
<td>4.0</td>
<td>4.1</td>
<td>2.1</td>
<td>3.4</td>
<td>6.8</td>
<td>4.8</td>
<td><strong>4.1</strong></td>
</tr>
<tr>
<td><strong>Nominal Interest Rate(^1)/ (%)</strong></td>
<td>7.5</td>
<td>7.6</td>
<td>7.2</td>
<td>7.0</td>
<td>6.4</td>
<td>6.6</td>
<td>7.4</td>
<td>8.0</td>
<td><strong>7.2</strong></td>
</tr>
<tr>
<td><strong>Primary Balance (PSBR, % of GDP)</strong></td>
<td>-0.5</td>
<td>-0.7</td>
<td>-0.7</td>
<td>-1.5</td>
<td>-1.1</td>
<td>-0.7</td>
<td>1.3</td>
<td>1.7</td>
<td><strong>-0.3</strong></td>
</tr>
</tbody>
</table>

*Note: A positive value of PSRB indicates a surplus and a negative value of PSBR indicates a deficit.*  
1/ Corresponds to the interest payment divided by the public debt stock (see Végh et al., 2018).  
Source: Banco de México, Ministry of Finance and INEGI.
Results: Scenario 1 (past deficits persist)

- The indicator yields values above zero at all times (solid orange line). Fiscal policy would not be sustainable from the first year onwards.

- If the exchange rate variation effect was omitted, while fiscal policy remains unsustainable, the indicator is closer to zero.

Figure 1. Fiscal Sustainability Indicator (Historical Data Scenario)

Source: Own calculations.
Results: Scenario 1 (past deficits persist)

- The sustainability indicator is equivalent to the adjustment needed to get back to the sustainability path.
- Thus, in this scenario, the primary surplus needed to guarantee sustainability would be around 1.0% of GDP.
- This would represent an adjustment of about 1.1 percentage points of GDP per year with respect to the permanent primary deficit.

Figure 2. Primary Balance Adjustment (Historical Data Scenario)

% of GDP

Source: Own calculations.
3 Results: Scenario 2 (Fiscal Rule is attained)

- It assumes the attainment of a fiscal target, which is a PSBR of -2.5% of GDP.
- The primary PSBR considers estimated trajectories of both public revenues and expenditures. Nevertheless, expenditures adjust in order to meet the fiscal target. As a result, the average primary surplus estimated for 2019-2024 would be 0.9%.

- If the fiscal rule is fulfilled, fiscal policy would be on a sustainable path.
- While in this scenario the *ex ante* policy is sustainable, this accomplishment is also subject to a macroeconomic framework that is conducive to the fiscal targets.

Figure 3. Fiscal Sustainability Indicator (Fiscal Rule Scenario)

Source: Own calculations.
Results: Scenario 2 (Fiscal Rule is attained)

The primary surplus that guarantees sustainability is estimated at 0.4% of GDP.

This exercises underscores the importance of meeting the fiscal target in order to maintain public debt sustainability, while easing some pressures from the limited fiscal space.

Recall that when $I_t^B = 0$, public debt as a percentage of GDP remains constant.
Results: Scenario 3 (revenues and expenditures follow inertial trajectories in absence of a fiscal rule)

- The fiscal deficit does not have a “floor” (no rule)

- We consider some fiscal pressures that could materialize in the coming years and could represent a burden to public finances:
  - Expenditures related to pensions and health are likely to increase, reflecting demographic dynamics.
  - Furthermore, public investment recovers from current levels (for instance, to be able to maintain the capital stock level)
Results: Scenario 3 (revenues and expenditures follow inertial trajectories in absence of a fiscal rule)

- The fiscal deficit reflects expenditure pressures, fairly constant revenues, and the absence of a fiscal rule.
- As a result, this exercise shows that fiscal policy would not be sustainable.
- For the case of Mexico, this shows the importance of meeting the fiscal rule. With relatively constant revenues (as a percentage of GDP) and increasing non-avoidable expenditures, it may be the case to further discuss how to boost revenues.

Figure 5. Fiscal Sustainability Indicator (No Rule Scenario)

Source: Own calculations.
Results: Scenario 3 (revenues and expenditures follow inertial trajectories in absence of a fiscal rule)

Considering the expected trajectories of both revenues and expenditures, and the absence of a fiscal rule, the primary surplus that guarantees sustainability would be around 0.5% of GDP.

This would imply an adjustment of about 1.9% of GDP per year in the permanent primary balance.

Figure 6. Primary Balance Adjustment (No Fiscal Rule Scenario)

Source: Own calculations.
3 Results: Scenario 4 (Fiscal targets are attained, although with macroeconomic shocks)

- We assume that the fiscal rule is attained.
- Nevertheless, we also assume that going forward there is a macro shocks:
  - Growth of the economy diminishes by 1.0 percentage points.
  - The permanent primary balance and the initial public debt stock remain at the same levels.
- With this, we can see how responsive the sustainability results are to a macroeconomic shock.
Results: Scenario 4 (Fiscal targets are attained, although with macroeconomic shocks)

- If GDP growth deteriorates, the fiscal policy would be close to become non-sustainable.
Results: Scenario 4 (Fiscal targets are attained, although with macroeconomic shocks)

- In the case of a growth shock, the sustainability indicator is close to zero, so no need for adjustment (but close to become unsustainable, therefore close to a possible adjustment).
Índice

1. Context and Objectives
2. Fiscal Sustainability Indicator
3. Results
4. Conclusions
4 Conclusions

- In a context where:
  - Mexico experienced growth in its public debt (although debt-to-GDP ratio has decreased since 2016), and
  - There are non-avoidable expenditure pressures that could add a burden to public finances,
- Then it is necessary to have estimations of fiscal sustainability.
- The ex ante trajectories of the planned primary surpluses by the fiscal authorities point to fiscal sustainability.
- Nonetheless, the other scenarios stress the importance of meeting the fiscal targets. Achieving sustainability chiefly depends on attaining the fiscal objectives, and having a macroeconomic framework that is conducive to such targets.
Conclusions

- It is important to incorporate realistic assumptions (e.g. in the macroeconomic Outlook) in order to have better evaluations of the fiscal sustainability.
- There is currently work in progress as of increasing the time frame of the exercise to a longer period.