To borrow or not: Empirical evidence from public debt sustainability of Pakistan
Roadmap

Background
  Historical perspective and determinants

Analysis
  Post COVID debt sustainability scenarios
  Fiscal Reaction Function

Key Takeaways and Way Forward
Figure 1: Pakistan Public Debt to GDP
Figure 2: Relation of Real GDP growth and Fiscal deficit

Fiscal deficit to GDP (%) vs Real GDP growth from 2006-10 to 2019.

- Orange line: Fiscal deficit to GDP (%)
- Blue line: Real GDP growth

Note: The graph shows the trend and relationship between Fiscal deficit to GDP (%) and Real GDP growth over the specified period.
Figure 3: Fiscal, Revenue and Primary Balance
Figure 4: Maturity Profile (In Percent of Total Public Debt)
Figure 5: Domestic and External Public Debt % Accumulation per Regime

External debt %
Accumulation per Regime

Domestic debt %
Accumulation per regime
Other tools used to fill deficit gaps

Monetizing the debt

During the COVID situation Pakistan is witnessing two digit inflation

Use of foreign reserves

Very low reserves so Pakistan can not use this option

Increase in taxes

Not possible in a situation when inflation, low growth and unemployment have raised due to COVID-19
Methodology

IMF-World Bank Debt sustainability Analysis

The IMF/World Bank methodology

\[ d_t = \frac{(1 + r_t)}{(1 + g_t)} d_{t-1} - pb_t \]

Fiscal Reaction Function for Public Debt

- The fiscal reaction function adjusted for Pakistan is

\[ pb_t = a_0 + a_1 Pb_{t-1} + a_2 d_{t-1} + a_2 OG_t + dum_{2000} + dum_{reg} + \epsilon_t \quad (1) \]

- The fiscal reaction function for the external debt is

\[ pb_t = a_0 + a_1 Pb_{t-1} + a_2 ED_{t-1} + a_2 OG_t + dum_{2000} + dum_{reg} + \epsilon_t \quad (2) \]

pb indicates primary balance; d shows public debt; OG presents output gap and ED shows external debt.
Table 1: Empirical Results

DSF benchmarks and thresholds for Debt burden

<table>
<thead>
<tr>
<th></th>
<th>Present value of external debt in percentage of</th>
<th>percent of external debt service in</th>
<th>Present value of total public debt in percentage of</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exports</td>
<td>GDP</td>
<td>Revenues</td>
</tr>
<tr>
<td>Weak</td>
<td>140</td>
<td>30</td>
<td>14</td>
</tr>
<tr>
<td>Medium</td>
<td>180</td>
<td>40</td>
<td>18</td>
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<tr>
<td>Strong</td>
<td>240</td>
<td>50</td>
<td>23</td>
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</table>
Public Debt to GDP Estimations till 2030

The results for debt sustainability till 2030 is estimated by assuming various scenario.

In the baseline scenario it is assumed that:
   (i) primary balance close to zero
   (ii) historical real interest rate is 2.7 percent.

Using these assumption, the debt to GDP ratio till 2030 is projected.
The debt to GDP ratio decreased from 86 percent to 64 percent in 2030 if government smoothly maintains the primary balance close to zero.

A sustainable debt level will be achieved if the GDP growth is higher than 4.5 percent annually and the rate of real interest do not cross the historical real interest rate value.
The pessimistic scenario assumes that:

(i) historical primary balance which -3.5% of GDP and
(ii) historical real interest rate is 2.7 percent.

The debt to GDP ratio will worsen in the case of a negative primary balance.

With historical real interest rate 2.7 percent and 10 percent GDP growth is required to maintain the current level of Debt to GDP ratio.
Figure 6: Debt Sustainability
Findings of Fiscal Reaction Function

**Table 3: FRF of Public Debt**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>L.public debt</td>
<td>0.156*</td>
<td>0.116*</td>
<td>0.130*</td>
</tr>
<tr>
<td>L.primary balance</td>
<td>0.615***</td>
<td>0.524***</td>
<td>0.499***</td>
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<tr>
<td>Output Gap</td>
<td>0.0000809</td>
<td>0.0000220</td>
<td>0.0000262</td>
</tr>
<tr>
<td>D2000</td>
<td></td>
<td>1.086*</td>
<td>1.179*</td>
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<tr>
<td>DR</td>
<td></td>
<td></td>
<td>0.209</td>
</tr>
<tr>
<td>Hansen's J chi2(1)</td>
<td>2.20037</td>
<td>0.647897</td>
<td>0.423948</td>
</tr>
<tr>
<td>Observations</td>
<td>44</td>
<td>44</td>
<td>44</td>
</tr>
</tbody>
</table>

*** indicates p<0.01 (1%), ** p<0.05 (5%) and * p<0.1 (10%) levels of significance
### Table 4: FRF for External debt

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>L. external debt</td>
<td>-0.00547</td>
<td>0.235**</td>
<td>0.335**</td>
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<tr>
<td>L. primary balance</td>
<td>0.780***</td>
<td>0.442***</td>
<td>0.373*</td>
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<tr>
<td>Output Gap</td>
<td>0.00003</td>
<td>0.000124*</td>
<td>0.000117</td>
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<tr>
<td>D2000</td>
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<td>4.313**</td>
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<td>Hansen's J chi2(1)</td>
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<tr>
<td>Observations</td>
<td>44</td>
<td>44</td>
<td>44</td>
</tr>
</tbody>
</table>

*** indicates p<0.01 (1%), ** p<0.05 (5%) and * p<0.1 (10%) levels of significance
Key Takeaways

• The results of FRF suggest that public debt is sustainable for Pakistan.

• The IMF-World Bank benchmark shows that 4 out of 5 indicators are distressed for the year 2020.

• In the post COVID scenario, if the fiscal determinants are not managed properly then public debt can explode further.

• If the debt acquiring level remain at the current level then debt will become unsustainable.
Way Forward

• Growth is the first and foremost remedy for a sustainable debt.
• It is the need of time to reform and improve the tax system, to fill the fiscal deficit gaps and the country has not to rely on further debts.
• The minimization of primary budget deficits through rationalized government expenditures.
• Strong coordination is required between monetary and fiscal policies, so that primary budget balance could be lessened.
• Proper debt management with coordination of all stakeholders and strong system of check and balance with proper accountability should be implemented.