TURKISH CASE
Contingent liabilities risk management: Measuring and managing risk related to sovereign guarantees and on-lending

HARUN AKKAŞ
Head of Credit Risk Management Department
General Directorate of Public Finance

February 24, 2016
AGENDA

- Background
  - Organizational Structure and Mandate
  - Guaranteed and on-lent portfolio (size, entities)
- Risk analysis and quantification
  - Credit Rating Model (flow of working process, PD)
  - Model outcomes (internal credit rating, expected losses)
- Application in Risk Management
  - Policy tools for risk mitigation
    - Tools based on model outcomes
    - Other tools
  - Monitoring & Reporting
- Lessons learned
Organizational Chart

Credit Risk Management Department Staff
- 1 Head Of Department, 3 experts, 2 assistant experts
Monitor, evaluate and adopt measures for credit risk arising from

1. Guarantees
   • Credit guarantees (to loan repayments)
   • Investment guarantees (to PPP projects)

2. Treasury Receivables
   • Receivables from on-lent loans
   • Receivables from undertakings of guarantees

3. Debt assumption commitments (to PPP projects)
Treasury Credit Guarantees & On-Lent Debt Stock

Credit Guarantee Debt Stock (2014)

- Total: 13,674 (Million USD)
- Credit Guarantees: 11,156
- On-Lent: 2,518

- 83% of Total
- 1% on Guaraní
- 9% Municipalities
- 7% Municipal Admin.
- 2% SOEs

On-Lent Debt Stock (2014)*

- Total: 2,518 (Million USD)
- Banks: 29%
- Municipalities: 11%
- Municipal Admin.: 15%
- SOEs: 15%
- Other: 30%

*Stock of projected receivables from external debt
Risk Analysis (Credit Rating Model)
Risk Quantification

Model outcomes – internal credit ratings

<table>
<thead>
<tr>
<th>Rating</th>
<th>Status</th>
<th>P(D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Non defaulted</td>
<td>P(D/ND) ≤ 5%</td>
</tr>
<tr>
<td>B</td>
<td>Non defaulted</td>
<td>5% &lt; P(D/ND) ≤ 15%</td>
</tr>
<tr>
<td>C</td>
<td>Non defaulted</td>
<td>15% &lt; P(D/ND) ≤ 30%</td>
</tr>
<tr>
<td>D</td>
<td>Non defaulted</td>
<td>P(D/ND) &gt; 30%</td>
</tr>
</tbody>
</table>

P(D/ND) is calculated from the scoring model

<table>
<thead>
<tr>
<th>Rating (*)</th>
<th>Status</th>
<th>P(D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Defaulted</td>
<td>P(D) &lt; 100%</td>
</tr>
<tr>
<td>F</td>
<td>Defaulted</td>
<td>P(D) = 100%</td>
</tr>
</tbody>
</table>

P(D/D) is calculated from the historical data

(*) If the institution has defaulted at least once in the last 2 years.
Risk Management Applications (Based on Expected Loss)

**Aim:** Compensate the losses stem from these credits at least partially
- Between 0.1% and 1% of total amount
- Directly proportional to the expected losses

**Aim:** Share the risk with the creditor
- Between 80% and 95% of the total debt
- Inversely proportional to the expected losses
Risk Management Applications (Based on Expected Loss)

**Guarantee & On-Lending Limit**
- Limit on the amount of Treasury guarantees and on-lending
- Annual Budget Law

**Risk Account**
- Composed of guarantee fees, budget allocations, collections from receivables (guarantee assumptions)
- Used when beneficiary defaults
- Precautionary account for unexpected cash needs
Risk Management Applications (Other Tools)

Pre-Conditions

- No overdue liability to Treasury
- Stay within the guarantee and on-lending limit
- Sound financial capacity

Foreign Debt Payment Account

- Escrow account for Municipalities and their affiliates
- Canalizes incomes of Municipalities to the escrow account
- Guarantees timely payment of external debt
Monitoring & Reporting

- Public Debt Management Report (monthly/annual)
  - Guaranteed Stock/Receivables Stock
  - Undertaken Amounts
  - Debt Service Projections of guaranteed debt stock
  - Guarantees / On-lent Loans Provided
  - Risk Account Realizations

- Fiscal Risk Bulletin (Quarterly) - internal

- Performance of Risk Account (Quarterly) - internal
Treasury Guaranteed Debt Stock & Undertakings from these guarantees

- Guaranteed External Debt (Million USD)
- Undertakings arising from Treasury Guarantees (Million USD)

- Guaranteed External Debt
- Undertaken Debt

- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014

- 800
- 700
- 600
- 500
- 400
- 300
- 200
- 100
- 0

- 12,000
- 11,000
- 10,000
- 9,000
- 8,000
- 7,000
- 6,000
- 5,000
- 4,000
- 3,000
- 2,000
- 1,000
- 0
The Distribution of Treasury Guaranteed Credit and On-Lent Stock by Credit Rating(%)
Lessons Learned

- Management of credit risks that arise from contingent liabilities gets even greater importance for maintaining fiscal discipline and efficient cash and debt management.
- Building up legal framework is imperative.
- Choose a risk analysis method and measure your credit risk.
- Benefit from risk mitigation policy tools effectively.
- Evaluate your model’s performance periodically.
- Share the results with appropriate report formats.
- Do not forget; it is a long-term process.
Thank you...
Risk Analysis (Calculation of PD)

Credit Rating Model – PDs

\[ P(D/ND) \text{ probability of default given non-default in year (t-1)} \]

Altman-Z

Standard scoring model: Score \[ Z_i = \beta_0 + \beta_1 X_1 + \ldots + \beta_n X_n \]

\( X \) denotes the explanatory variables
\( \beta \) denotes the weights
\( \beta_0 \) is the intercept

\[ P(D/ND)_i \text{ then derived using an exponential function: } 1/(1+e^{-z_i}) \]

\[ P(D/D) \text{ probability of default given default in year (t-1)} \]

from historic data

\[ P(D/D)_i \text{ derived by dividing two consecutive defaults to total defaults} \]

\[ P(D/ND) = P_1 \]

from scoring model

\[ P(D/D) = P_0 \]

from historical data

\[ TM = \begin{bmatrix} P_1 & P_0 \\ 1 - P_1 & 1 - P_0 \end{bmatrix} \]

We drive all future PDs of the beneficiaries from a transition matrix
Risk Quantification (Calculation of Expected Loss)

Recovery Rate = X% + Y% * Z%

X% : Collection rate of initial (non-restructured) cash flows
Y% : Restructured cash flows
Z% : Collection rate from restructured cash flows

When calculating the PV of Expected loss:
- Probability of defaults
- Recovery rate
- Treasury funding curve
- Cash flow projections