Ranking sovereigns by their relative default risks: Why does it have to be so complicated?

Consider how the 100+ sovereigns we rate vary by

- **Form of government**...from democracy to dictatorship
- **Financial sector development**...from Yemen to the UK
- **Size**...from Hong Kong to Russia
- **Gdp per capita**...from under $1,000 (Bangladesh) to over $100,000 (Luxembourg)
- **Population**...from 50 thousand (Cayman) to 1.4 billion (China)
- **Debt to gdp**...from 0% (Macao) to over 230% (Japan)
Agenda

1. Corporate and sovereign credit risk analysis
2. Sovereign indebtedness isn’t the whole story
3. Causes of sovereign defaults
4. Sovereign rating methodology
5. Explanatory power
Comparing corporate and sovereign credit risk analysis
Will a corporation repay its debt? Compare amount to pay to ability to pay

» Measure the stock or flow “cushion”
  – leverage (debt/assets) or
  – interest coverage (profits/debt service)

» And further adjust for
  – uncertainty (in asset valuations and profits), and
  – liquidity (measured by liquid assets and bank lines of credit)

» But book leverage & coverage alone explain a lot
  – explains 41% of the variation in Moody’s US corporate credit ratings
  – explain 35% of the variation in bond yield implied “ratings”
Will a sovereign repay its debt? Compare the amount to pay to the ability & willingness

» Leverage=debt/gdp and coverage=the inverse of (interest expense)/gdp

» Measuring debt & interest is easy, but measuring cushion is hard
  – potential tax base includes all of the nation’s assets, but national taxes on assets are rare, so taxable income (gdp) is the reference point
  – most revenue is dedicated to expenses, budget cuts are hard, and tax increases are limited by political constraints, Laffer Curve, & Keynesian economics

» Uncertainty of gdp varies with a country’s size, wealth, political stability, exchange rate regime, geo-political risk, and industry/trade composition

» Liquidity measured by access to central bank and multi-lateral lending

» Leverage and coverage explain much less for sovereigns than for corporates
  – Explains 0% of the variation in Moody’s credit ratings and yield-implied “ratings”
  – yes, I said 0%! 
Sovereign indebtedness isn’t the whole story
Indebtedness is not predictive of ratings. Why?

Source: Moody’s.
Debt/gdp may not be closely correlated with ratings in part because debt reduction is possible

Episodes of Debt Reduction Among Advanced Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Debt Reduction (% of GDP)</th>
<th>Number of Years</th>
<th>Period Start</th>
<th>End Year</th>
<th>Average Annual Reduction</th>
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<td>2004</td>
<td>2009</td>
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<td>2008</td>
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<tr>
<td>Average</td>
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<td>12</td>
<td></td>
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<td>3.6</td>
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</tbody>
</table>

Source: Moody’s.
Today’s debt load may be weak predictor of future: Debt-to-gdp rose unusually rapidly in EU periphery

*Iceland’s data compares 2007 to 2012 debt outstanding

Source: Moody’s.
High debt-to-gdp ratio has been neither necessary nor sufficient condition for default

» For past defaulters, debt-to-gdp ranged from 30% to 150%.
  – Russia & Argentina had debt-to-gdp ratios ~ 45% year before default
  – Average debt-to-gdp among defaulters ~ 77% year before default

» Many defaulters did have very high debt servicing costs, but variations in debt service costs around more normal levels have not been predictive
  – Average interest payments to revenue of defaulters

» Past defaulters had high share of debt in foreign currency
  – Average foreign currency share of defaulters ~ 77%
  – Many defaults were precipitated by FX devaluations which caused otherwise modest debt levels to mushroom
Share of debt in foreign currency tracks ratings

Share of Foreign Currency Debt of Total Debt, %, 2011

Is Euro-denominated debt truly domestic for the euro area peripheral countries?

Source: Moody's.
Causes of sovereign defaults
Underlying Causes of Sovereign Bond Defaults Vary
Share of the 24 bond defaults observed since 1997

- Banking crisis: 0%
- Chronic economic stagnation: 15%
- High debt burden: 35%
- Institutional and political factors: 30%

Source: Moody’s.
Underlying Fundamental Causes of Sovereign Defaults

» Banking crisis

» Chronic economic stagnation

» High debt burden

» Institutional and political factors

Recessions and banking & currency crises are common even when defaults have different causes

» 58% accompanied by systemic banking and/or currency crises
   – Some of the largest defaults – Russia 1998 and Argentina 2001 – were accompanied by waves of bank runs and large currency devaluations
   – Largest default in history – Greece 2012 – led to depleted bank capital

» 92% accompanied by economic recession

» Some restructurings occur without major economic disruptions
   – Ecuador 2008, Belize 2006, Jamaica 2010 – but even these atypical defaults were accompanied by economic recessions
Sovereign Bond Rating Methodology

The Four Factors

» Factor 1: Economic Strength
  – Wealth, size, diversification, and long-term potential

» Factor 2: Institutional Strength
  – Governance, quality of institutions, and policy predictability

» Factor 3: Government Financial Strength
  – Ability to deploy resources to face current and expected liabilities

» Factor 4: Susceptibility to Event Risk
  – Risk of sudden risk migration

Factor Scorecards

F1: Economic Strength
- Wealth
  - GDP per capita
- Scale of the economy
  - Nominal GDP
- Long-term Economic Strength
  - Qualitative assessment

F2: Institutional Strength
- Governance
  - World Bank Government Effectiveness Index
- Rule of Law
  - World Bank Rule of Law Index
- Transparency
  - Qualitative assessment

F3: Government Financial Strength
- Access to External Liquidity
  - Absence of a liquidity constraint (EVI / Ext. Debt/CAR)
  - Access to External Financing Pool (Mkt or Support)
- Debt Affordability
  - Debt Affordability at present
  - Positive Debt Trend (in Baseline Scenario)
  - Benign Debt Dynamics (in Stressed Scenario)
- Access to Resources
  - Financing Pool (Financial Depth/Reliable Investor Base)
  - Asset Pool (Assets to be mobilized)
  - Fiscal Flexibility (Rev/Exp)

F4: Susceptibility to Event Risk
- Political Risk
  - Qualitative assessment
- Economic Risk
  - Qualitative assessment
- Financial Risk
  - Qualitative assessment

Explanatory Power
Sovereign scorecard explains a fair amount

- predicts 70% of Moody’s ratings within 1 notch
- predicts 70% of bond-implied ratings within 2 notches
- explains 93% of the variation in Moody’s ratings
- explains 67% of the variation in bond-implied ratings

**Scorecard vs. Moody's rating** (in rating notches)

**Scorecard vs. bond-implied rating** (in rating notches)

Source: Moody’s.
Sovereign v. corporate ratings: similar rank ordering power but lower long horizon default rates

Source: Moody’s.
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