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Moody's Sovereign Rating Methodology

Presented at the Moody's-NYU Credit Conference

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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

1

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%!

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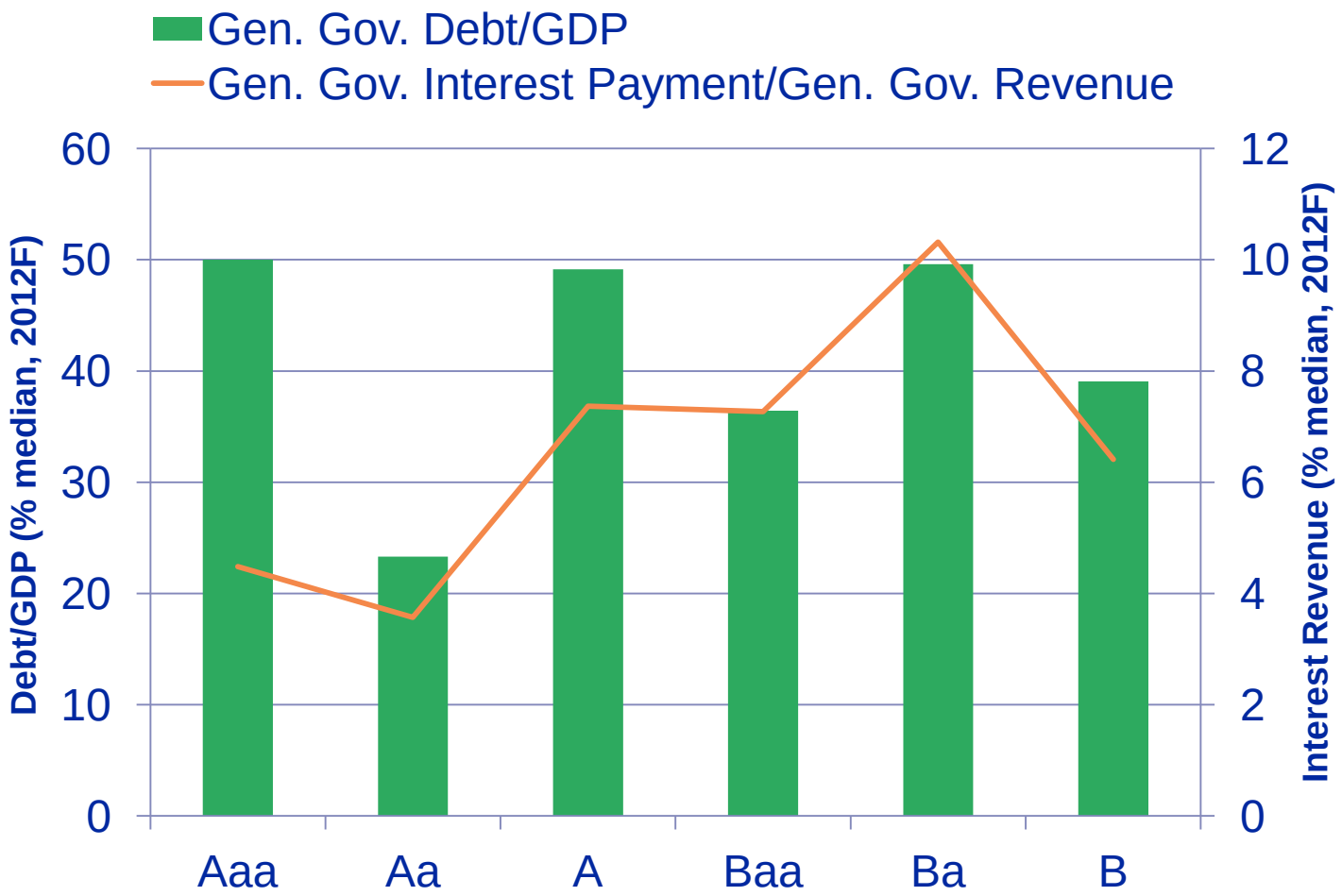
Sovereign indebtedness isn’t the whole story

Indebtedness is not predictive of ratings. Why?



Source: Moody's.

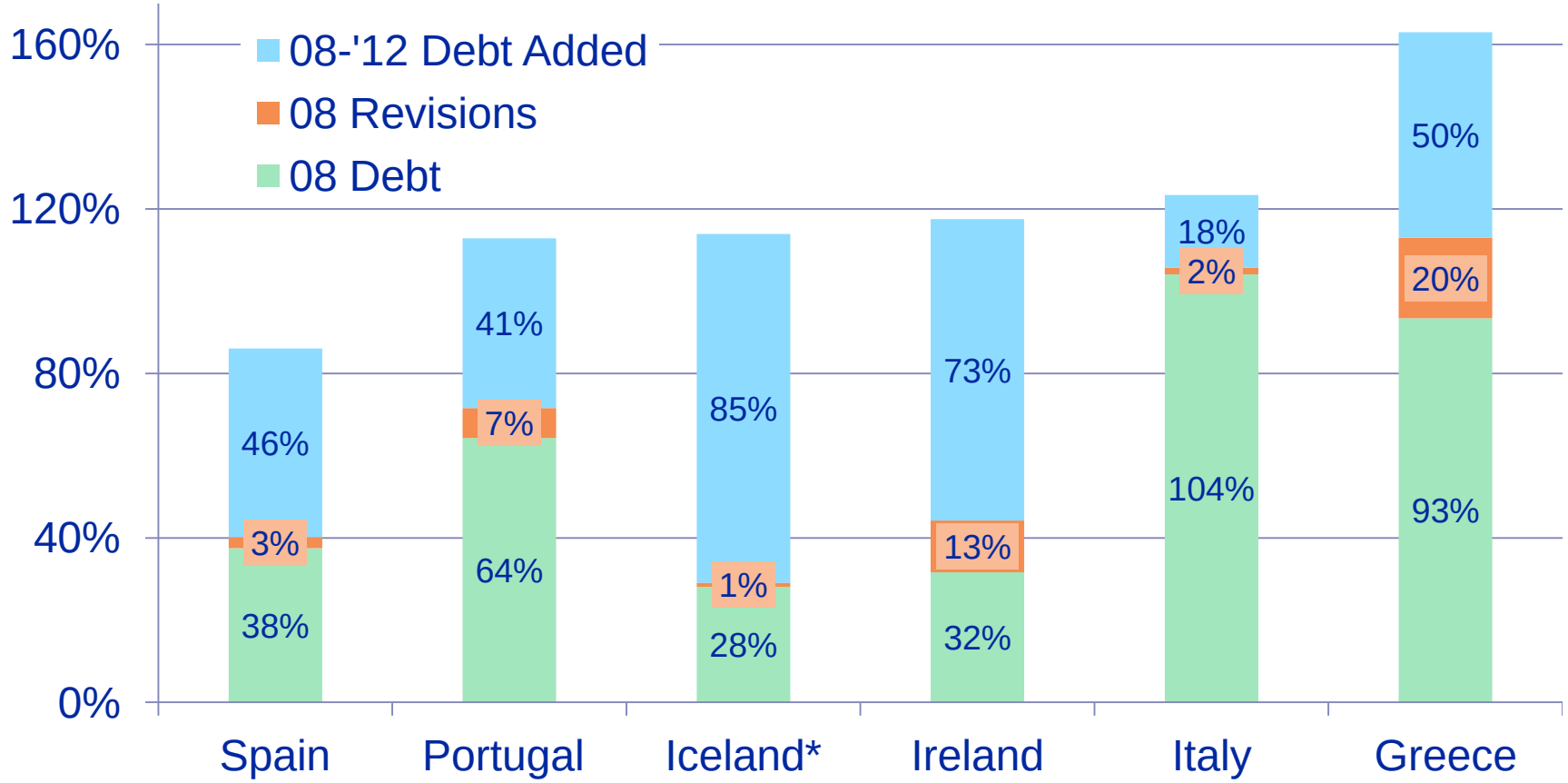
Debt/gdp may not be closely correlated with ratings in part because debt reduction is possible

Episodes of Debt Reduction Among Advanced Countries

	Total Debt Reduction (% of GDP)	Number of Years	Period Start	End Year	Average Annual Reduction
Australia	28	14	1995	2008	2.1
Belgium	57	15	1993	2007	4.0
Canada	39	13	1996	2008	3.2
Cyprus	23	6	2004	2009	4.5
Denmark	59	15	1993	2007	4.2
Finland	33	13	1996	2008	2.7
Ireland	71	17	1991	2007	4.4
Italy	25	9	1996	2004	3.1
Netherlands	46	10	1993	2002	5.1
New Zealand	32	14	1994	2007	2.5
Slovakia	23	9	2000	2008	2.8
Spain	40	12	1996	2007	3.6
Sweden	46	13	1996	2008	3.9
Average	**40**	**12**			**3.6**

Source: Moody's.

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



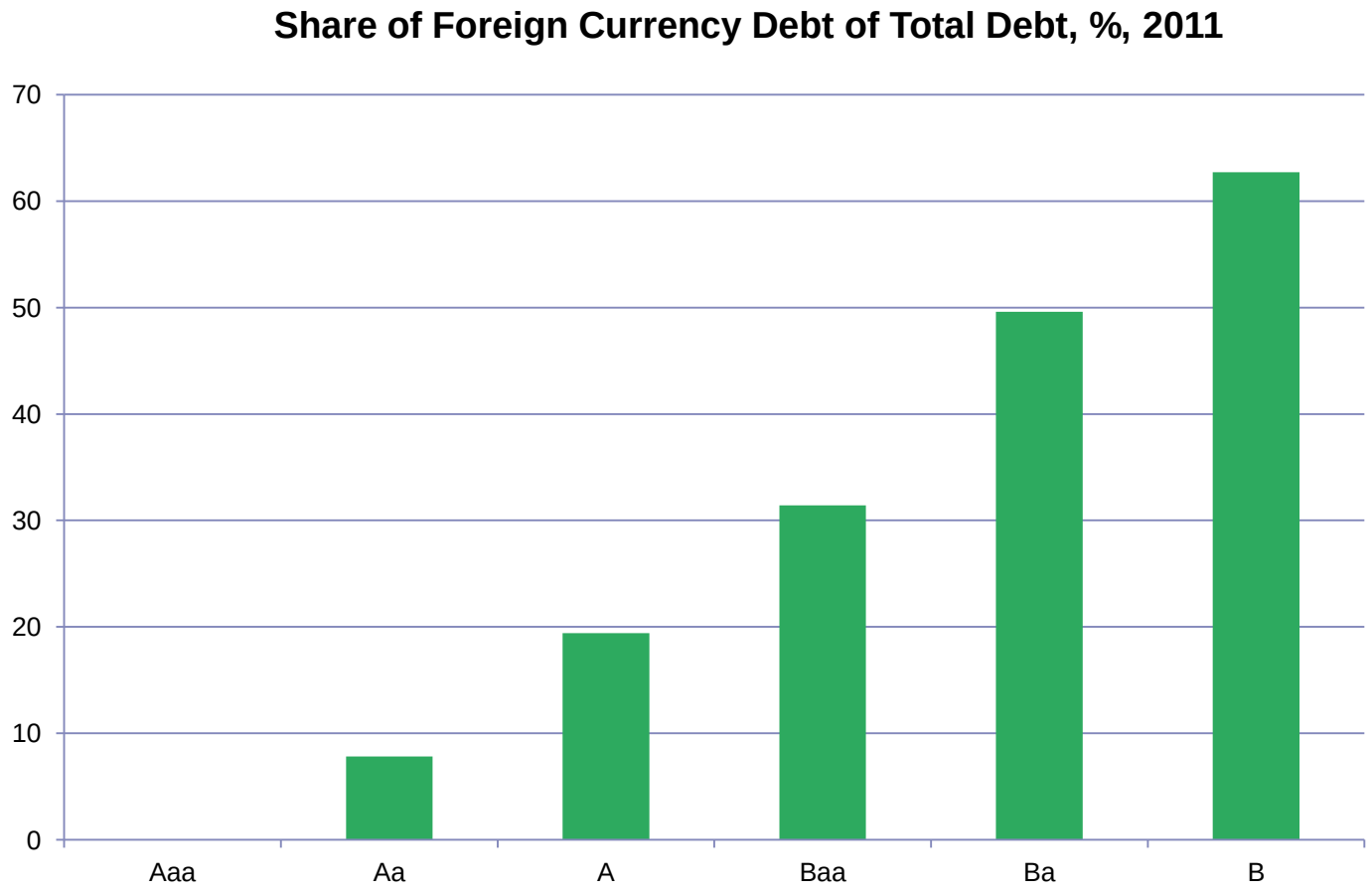
* Iceland's data compares 2007 to 2012 debt outstanding

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



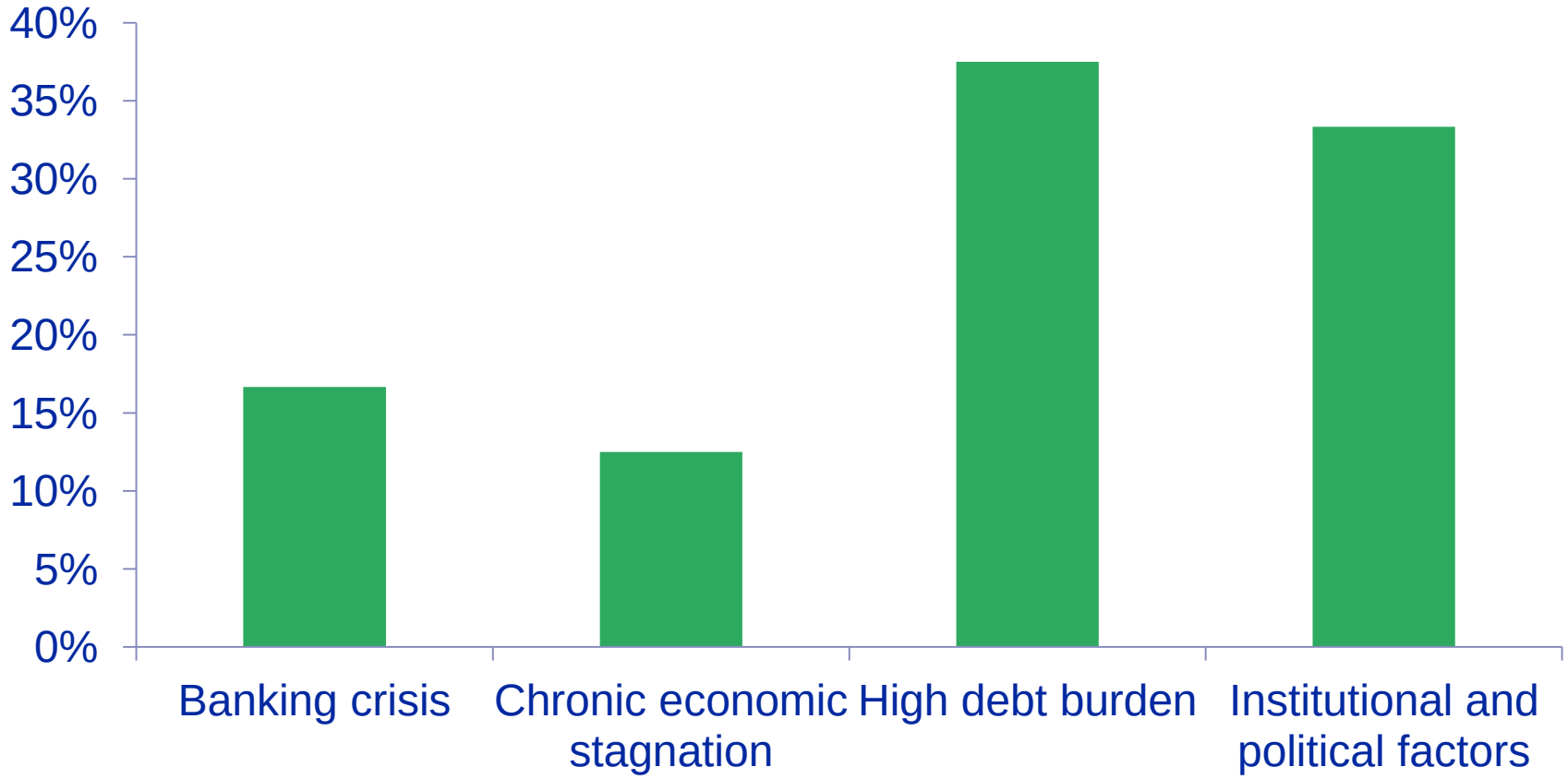
Is Euro-denominated debt truly domestic for the euro area peripheral countries?

Source: Moody's.

3

Causes of sovereign defaults

Underlying Causes of Sovereign Bond Defaults Vary
Share of the 24 bond defaults observed since 1997



Source: Moody's.

Underlying Fundamental Causes of Sovereign Defaults

- Banking crisis
  - Ecuador 1999, Uruguay 2003, Nicaragua 2003, Dominican Republic 2005
- Chronic economic stagnation
  - Russia 1998, Ukraine 1998-00, Argentina 2001
- High debt burden
  - Pakistan 1999, Moldova 2002, Dominica 2003, Grenada 2004, Belize 2006, Seychelles 2008, Jamaica 2010, St. Kitts and Nevis 2011, Greece 2012
- Institutional and political factors
  - Mongolia 1997, Venezuela 1998, Turkey 1999, Ivory Coast 2000, Paraguay 2002-03, Cameroon 2004, Ecuador 2008, Ivory Coast 2011

Source: Moody's, "The Causes of Sovereign Defaults: Ability to Manage Crises Not Merely Determined by Debt Levels," Nov 2010.

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

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Sovereign bond rating methodology

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

Source: Moody's, "Sovereign Bond Ratings," Sep 2008.

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

Source: Moody's, "Sovereign Bond Ratings," Sep 2008.

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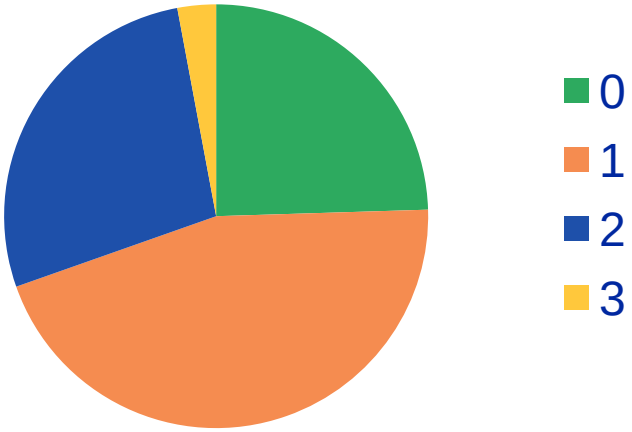
Explanatory Power

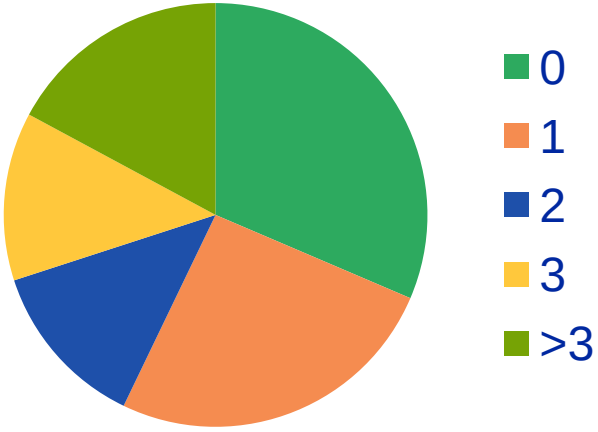
Sovereign scorecard explains a fair amount

- 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)

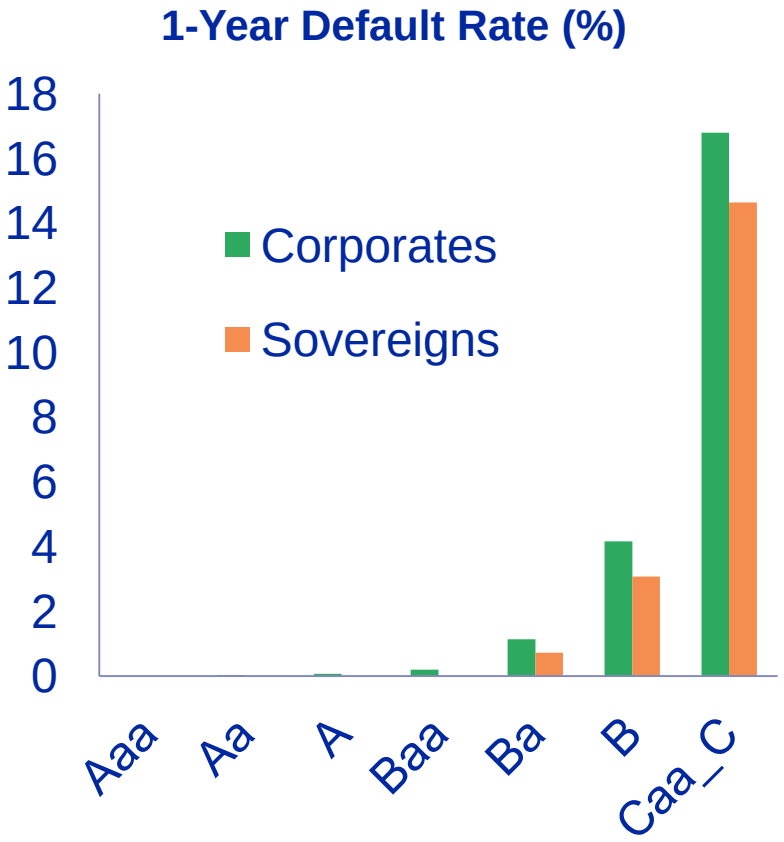


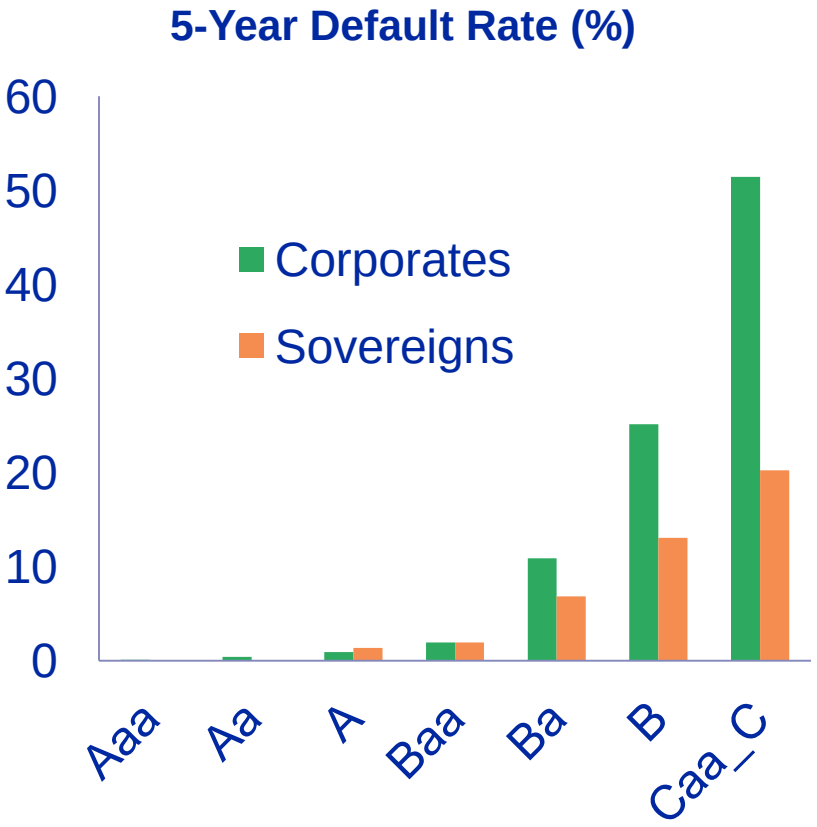
Scorecard vs. bond-implied rating (in rating notches)



Source: Moody's.

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





Source: Moody's.

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