

New Approaches to Fiscal Risk Analysis and Management

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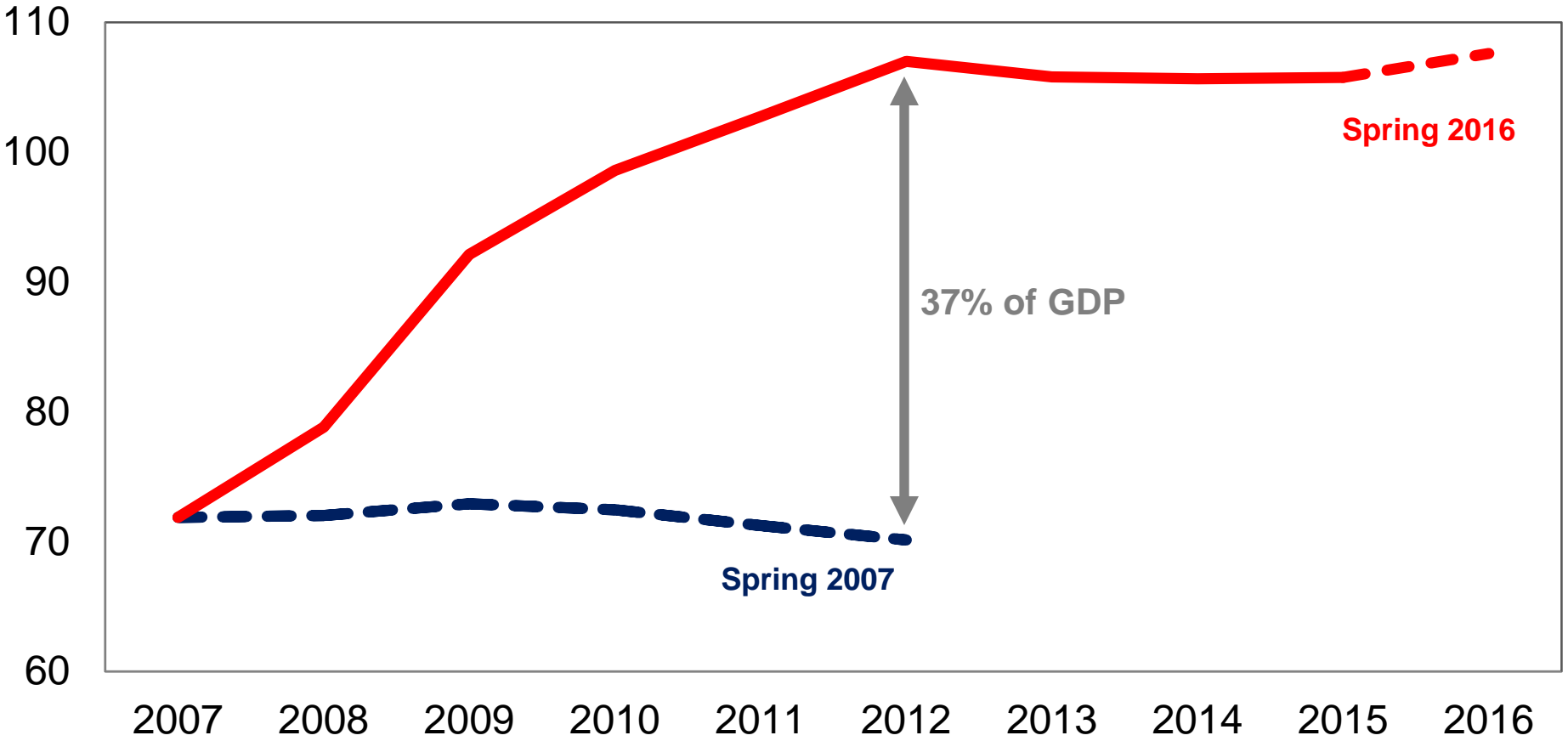
I. Outline of Presentation

- I. Why Fiscal Risks Matter**
- II. Characteristics of Fiscal Risk**
- III. Understanding & Management of Fiscal Risks**
- IV. Strengthening Fiscal Risk Analysis & Mitigation**
- V. Conclusions**
- VI. Discussion Points**

I. Why Fiscal Risks Matter:

Public Debt Forecasts for Advanced Economies

Advanced Economies: Public Debt
(2007-2016, Percent of GDP)

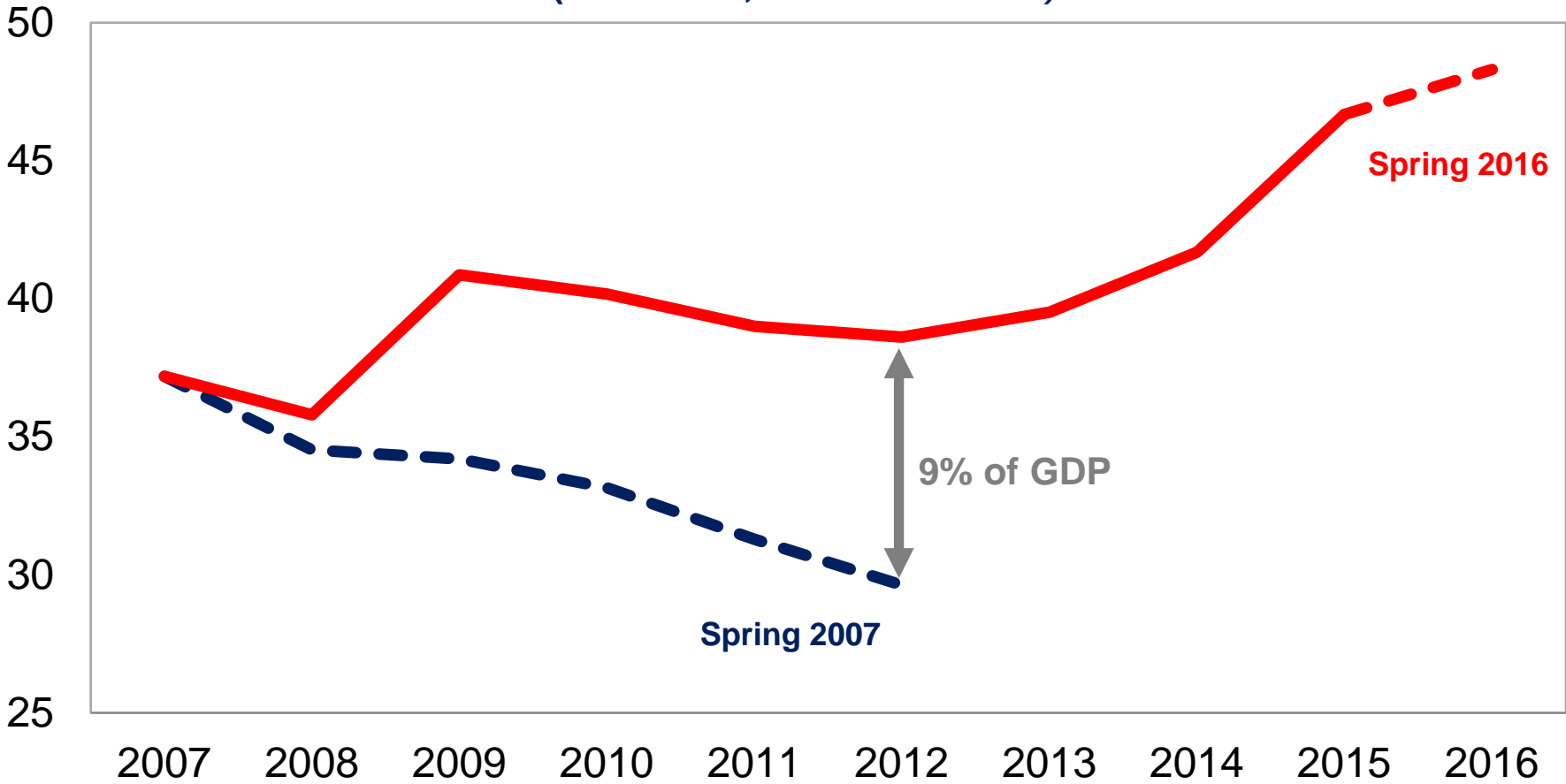


Source: *Fiscal Monitor* Database and staff estimates.

I. Why Fiscal Risks Matter:

Public Debt Forecasts for Emerging Economies

Emerging Economies, Excluding China: Public Debt
(2007-2016, Percent of GDP)



Source: *Fiscal Monitor* Database and staff estimates.

I. Why Fiscal Risks Matter:

How Fiscal Risks Impact on Fiscal Outcomes

**Sources of Unexpected Increase in General Government Debt
(percent of GDP, 2007-2010)**

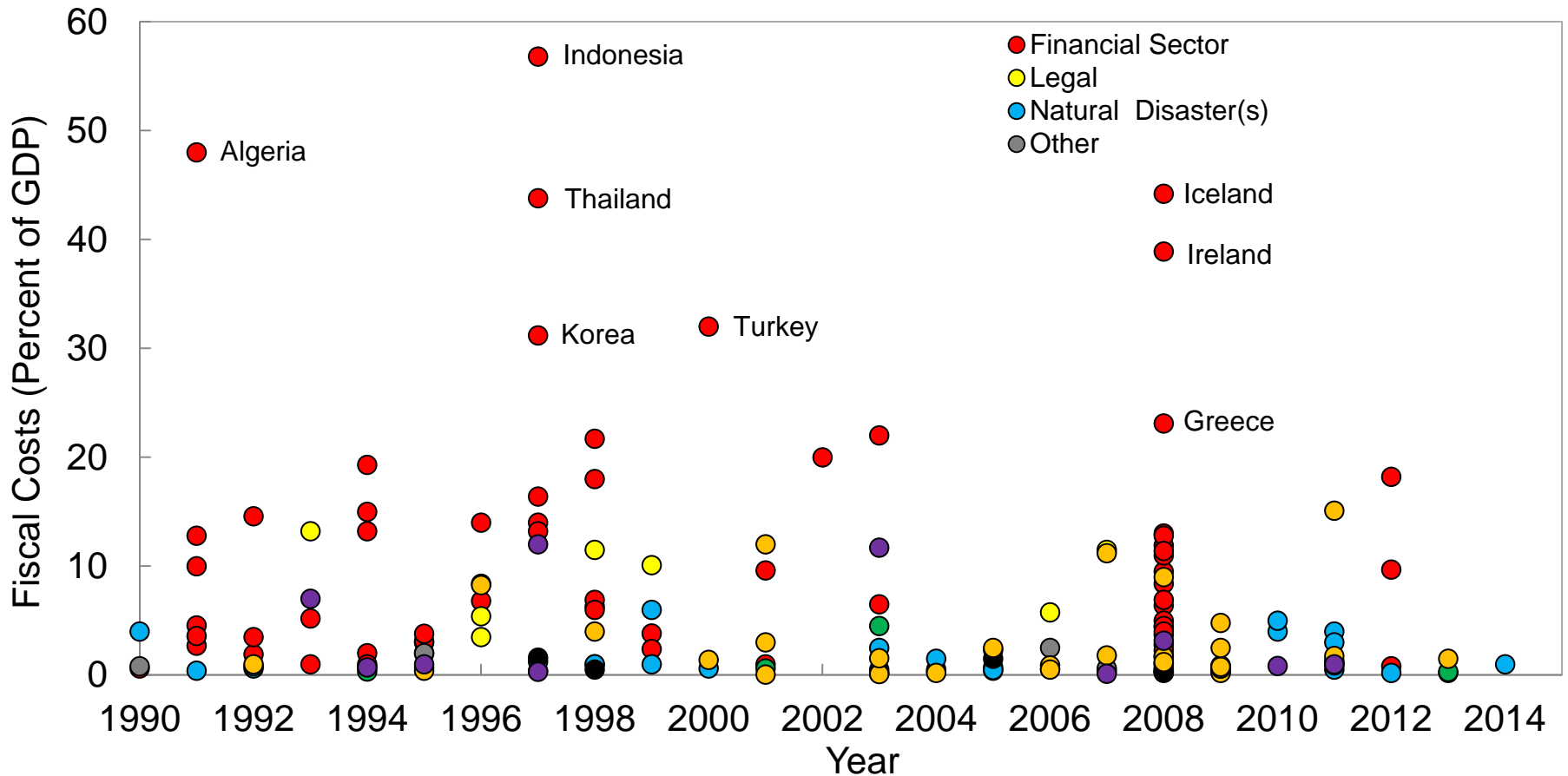
| | FRA | DEU | NLD | ESP | PRT | GBR | USA | GRC | IRL | ISL | AVE* | Issues Revealed by the Crisis |
|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------------------------|
| Underlying fiscal position | 1.7 | 3.2 | -2.4 | 1.8 | 11.3 | 3.7 | 8.1 | 16.3 | 1.3 | 10.9 | 6.0 | Unreported Deficits |
| Revisions to 2007 deficit & debt | 1.7 | 1.8 | -0.9 | -0.1 | 0.1 | 1.5 | 7.1 | 2.5 | 1.6 | 4.0 | 4.7 | |
| Changes to government boundary | -0.7 | 1.4 | -0.2 | 0.6 | 9.4 | 1.9 | 0.9 | 11.2 | -0.1 | 2.5 | 1.1 | SoEs & PPPs |
| Cash-accrual adjustments | 0.7 | 0.0 | -1.3 | 1.3 | 1.7 | 0.3 | 0.0 | 2.6 | -0.2 | 4.5 | 0.2 | Arrears |
| Exogenous shocks | 8.4 | 12.8 | 14.2 | 15.4 | 8.1 | 17.0 | 6.3 | 40.0 | 60.2 | 39.5 | 9.8 | Macroeconomic Risks |
| Macroeconomic shocks | 8.3 | 4.7 | 5.2 | 13.0 | 4.4 | 8.9 | 3.8 | 38.4 | 35.7 | -3.3 | 6.0 | |
| Financial sector interventions | 0.0 | 8.1 | 9.0 | 2.5 | 3.6 | 8.1 | 2.5 | 1.6 | 24.5 | 42.8 | 3.8 | Contingent Liabilities |
| Policy changes | 2.3 | 3.8 | 1.9 | 4.9 | 4.7 | 1.1 | 6.4 | -8.0 | -9.9 | -4.3 | 4.7 | Stimulus / Consolidation |
| Other factors | 2.1 | -0.3 | 6.5 | 1.9 | 3.7 | 6.2 | 8.3 | -6.7 | 7.5 | 21.6 | 5.9 | |
| Total Unforecast Increase in Debt | 14.4 | 19.5 | 20.2 | 24.0 | 27.8 | 28.0 | 29.1 | 41.7 | 59.1 | 67.7 | 26.4 | |

* GDP-weighted average

II. Characteristics of Fiscal Risks

Fiscal risks come from a variety of sources....

Contingent liability realizations

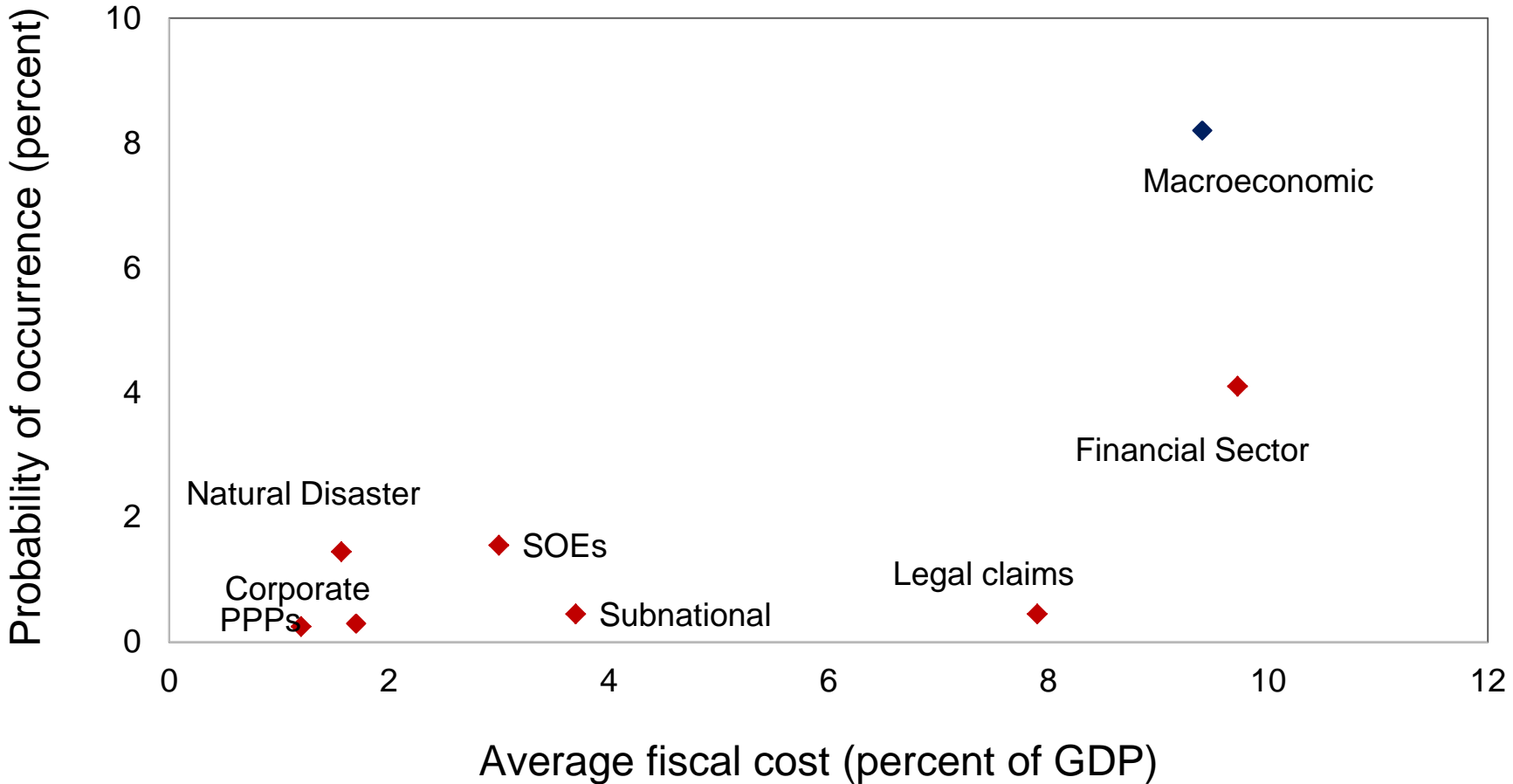


Bova, E., M. Ruiz-Arranz, F. Toscani, and H. E. Ture, 2016, "The Fiscal Costs of Contingent Liabilities: A New Dataset," IMF Working Paper 16/14 (Washington: International Monetary Fund).

II. Characteristics of Fiscal Risks

Have large fiscal costs....

Size and likelihood of fiscal shocks by type

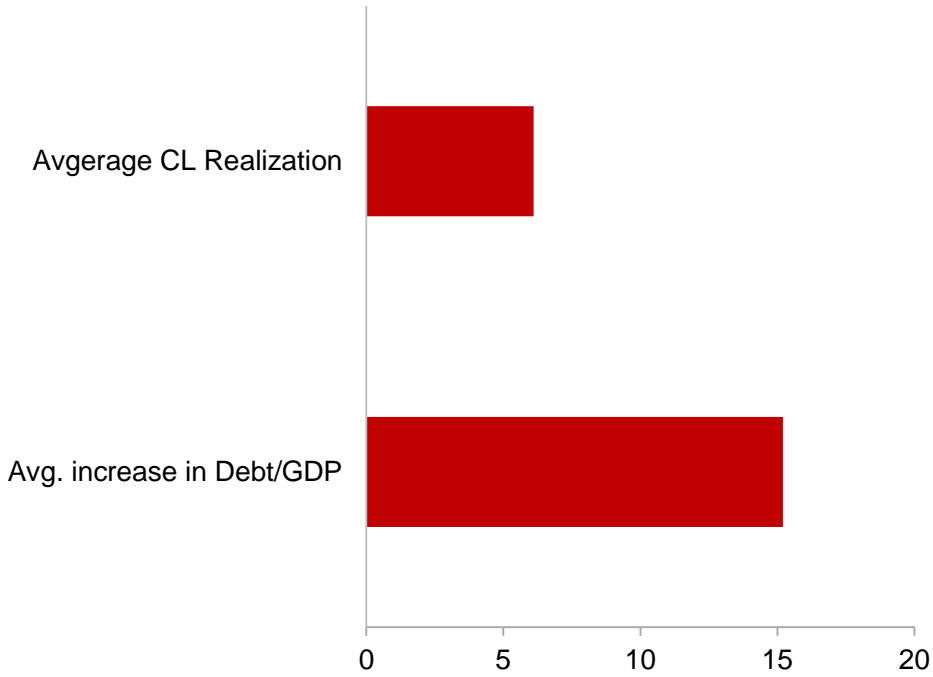


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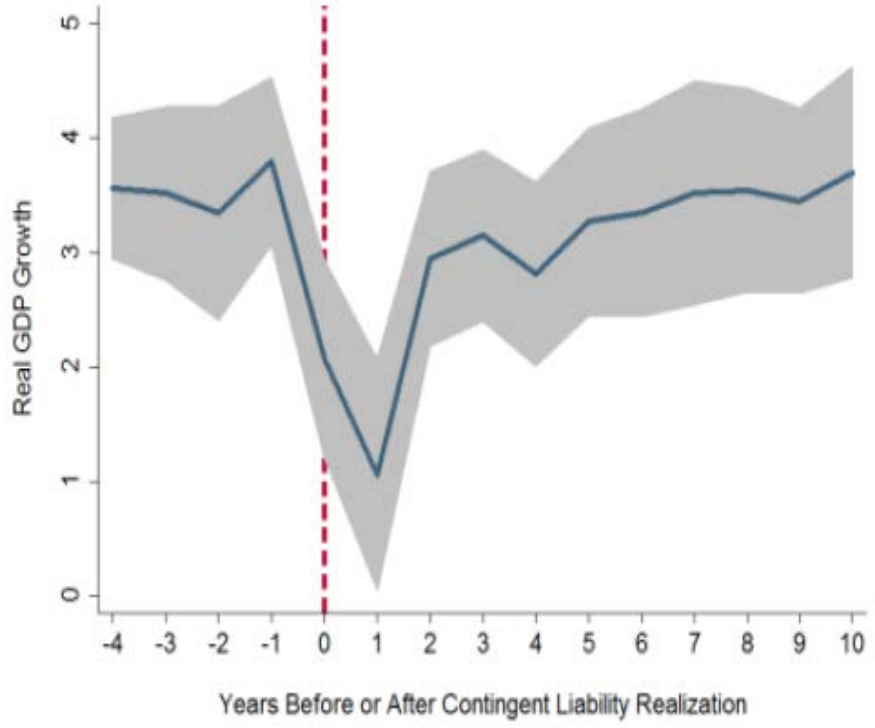
II. Characteristics of Fiscal Risks

Are highly correlated with each other...

Contingent Liability Realizations
 (Average cost compared to Overall Debt Increase)



GDP and Contingent Liability Realizations



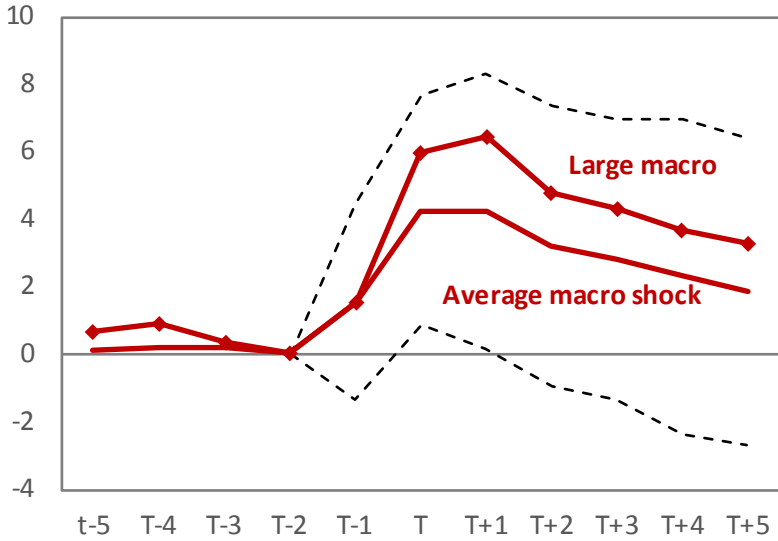
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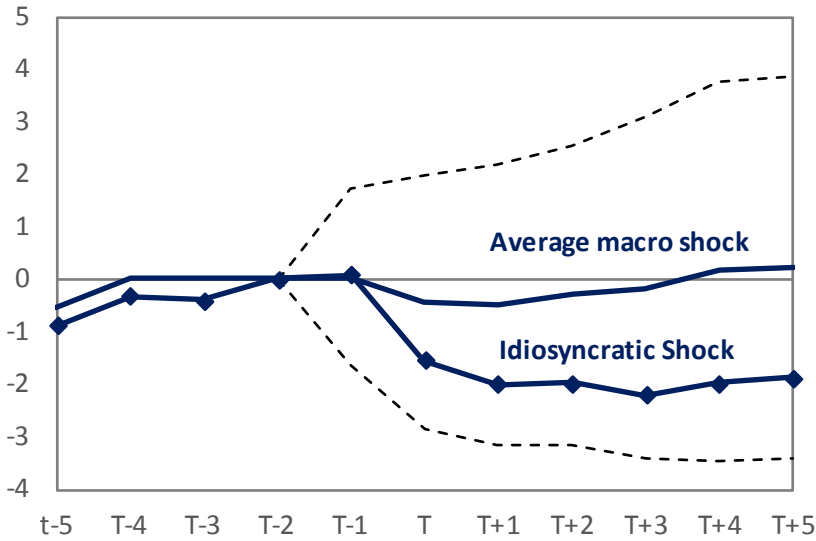
And are non-linear in their impacts.

Typical Fiscal Reaction to Macro shocks

Expenditure Variation
(percent of GDP)



Revenue Variation
(percent of GDP)

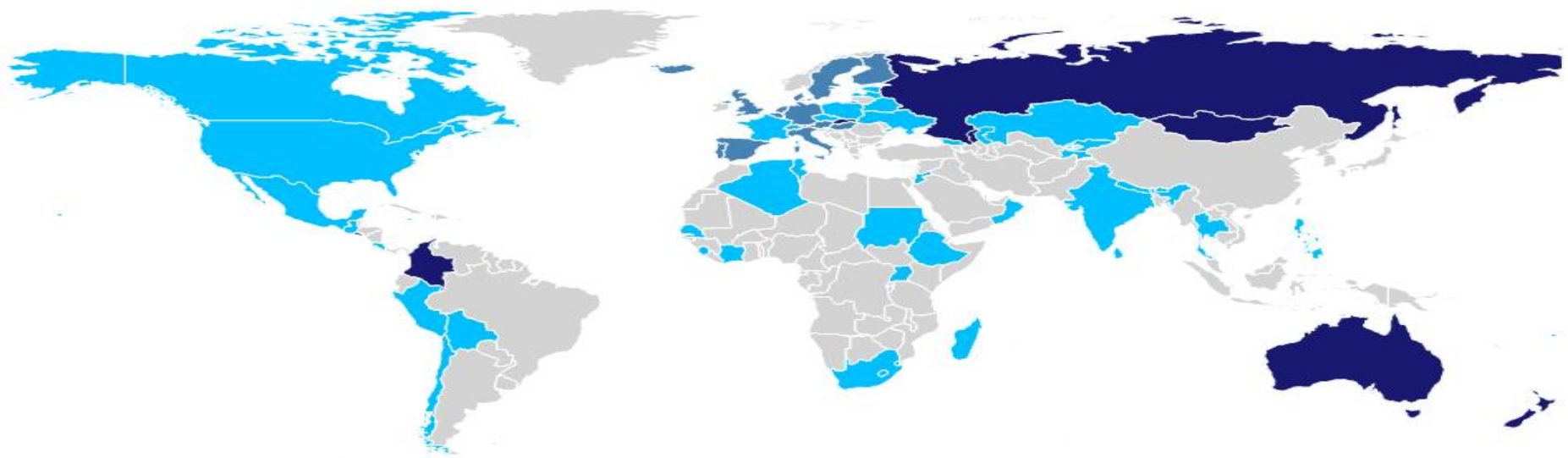


III. Understanding & Management of Fiscal Risks

Balance sheet data has improved, but gaps remain

Coverage of Balance Sheet Data (GFS)

2003



| Accounting Basis | |
|---|-------------------------|
| | No Data |
| | No Balance Sheet |
| | Liabilities Only |
| | Financial Balance Sheet |
| | Full Balance Sheet |

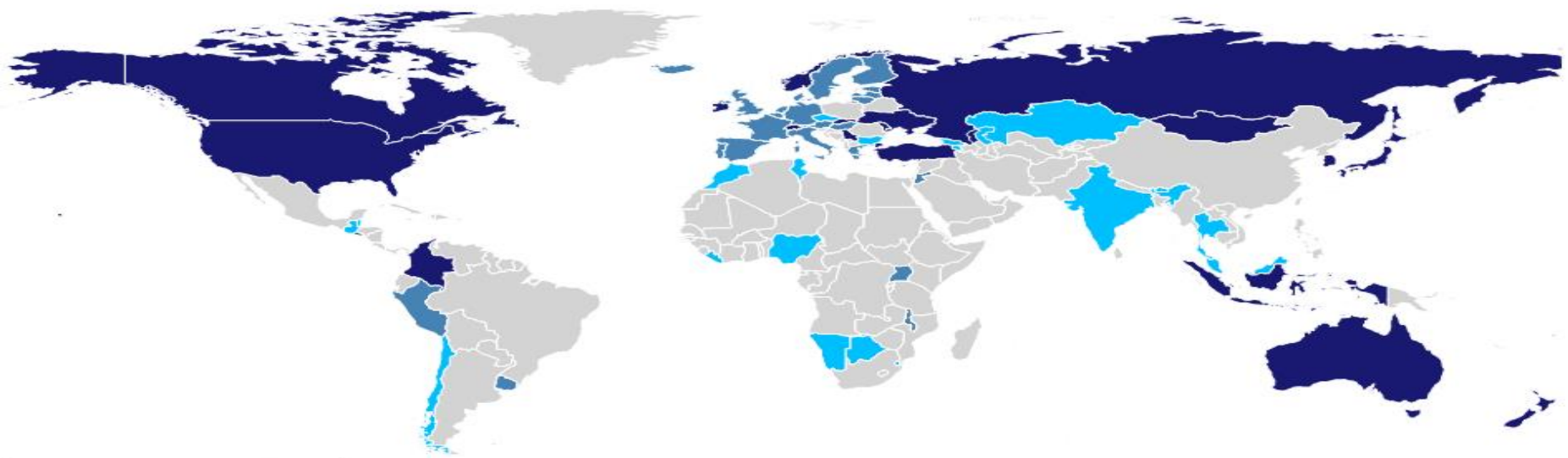
Source: COFA Database

III. Understanding & Management of Fiscal Risks

Balance sheet data has improved, but gaps remain

Coverage of Balance Sheet Data (GFS)

2013



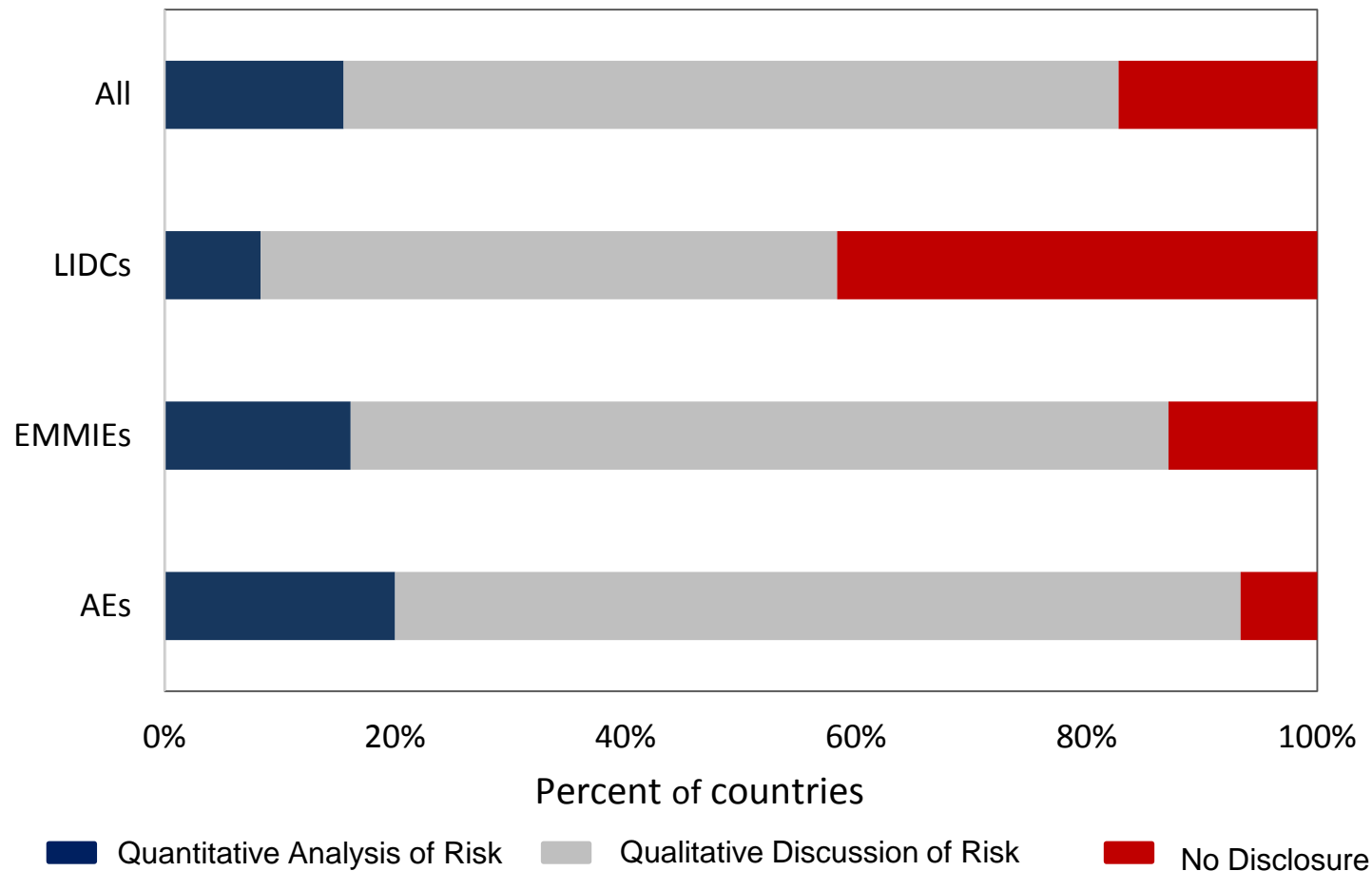
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|---|-------------------------|
| | No Data |
| | No Balance Sheet |
| | Liabilities Only |
| | Financial Balance Sheet |
| | Full Balance Sheet |

Source: COFA Database

III. Understanding & Management of Fiscal Risks

Disclosure of risks remains qualitative

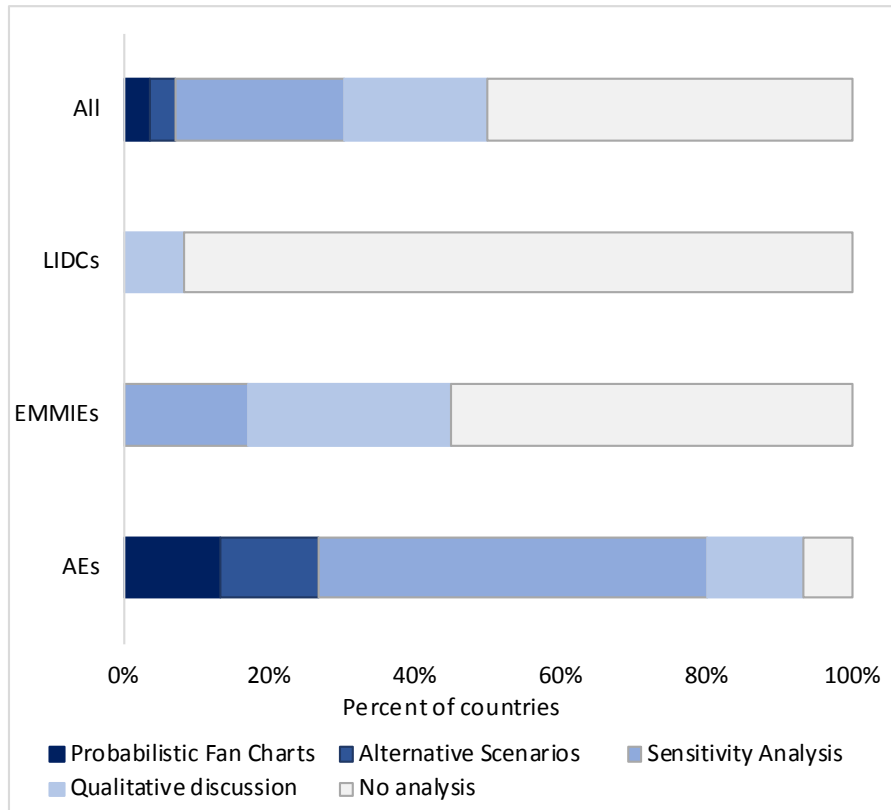
Contingent Liabilities



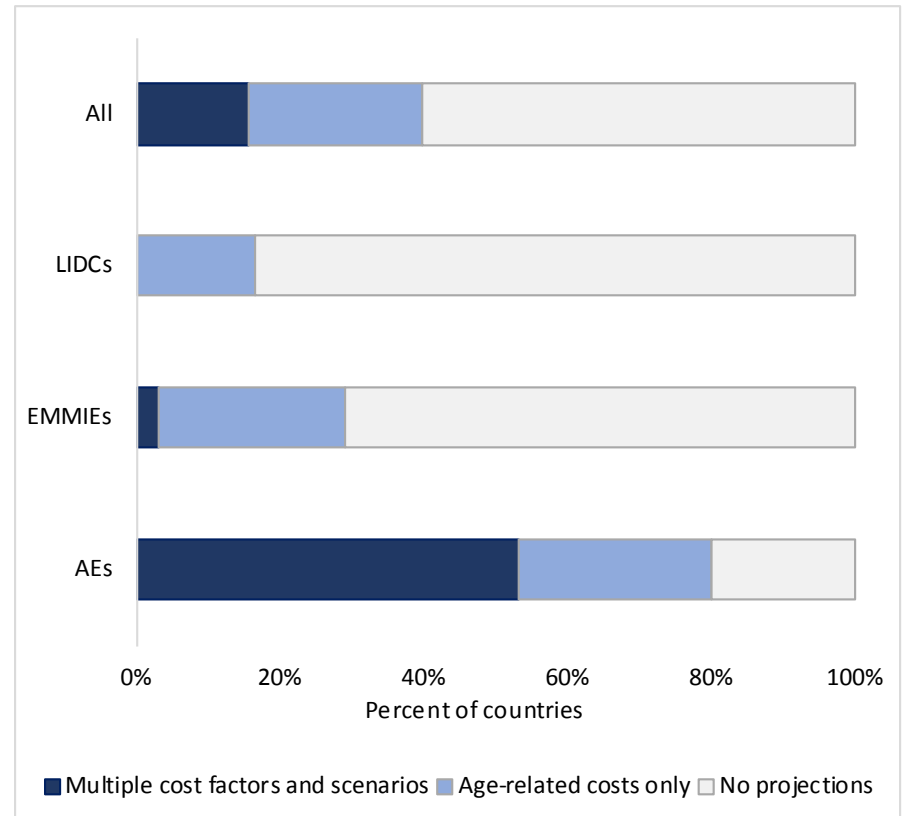
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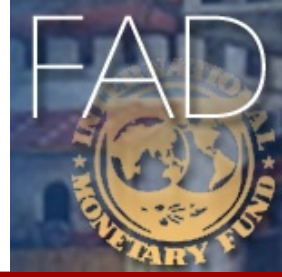
Analysis of fiscal risks is limited

Macro-fiscal Risk Analysis (percent of countries)



Long-term Sustainability Analysis (percent of countries)





IV. Strengthening Fiscal Risk Analysis & Mitigation: More Integrated Approach to Fiscal Risk Analysis

Fiscal Stress Tests provides for more complete picture of scale and impact of fiscal risks

- Focus on more extreme events; rather than year-to-year volatility
- Explore a range of correlated shocks in an integrated way
- Combine macroeconomic shocks with contingent liability realization
- Analyze impact on future flows and balance sheet

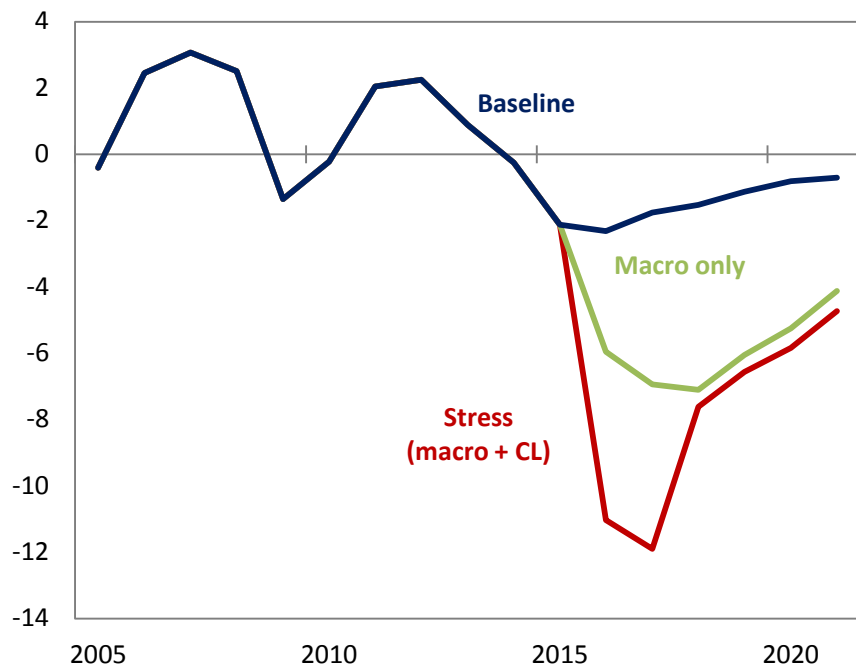
Provide three summary outputs for use in assessing fiscal risks:

- **Liquidity risk:** gross financing needs
- **Fiscal burden:** interest expenses as share of government revenue
- **Solvency:** change in the governments comprehensive net worth

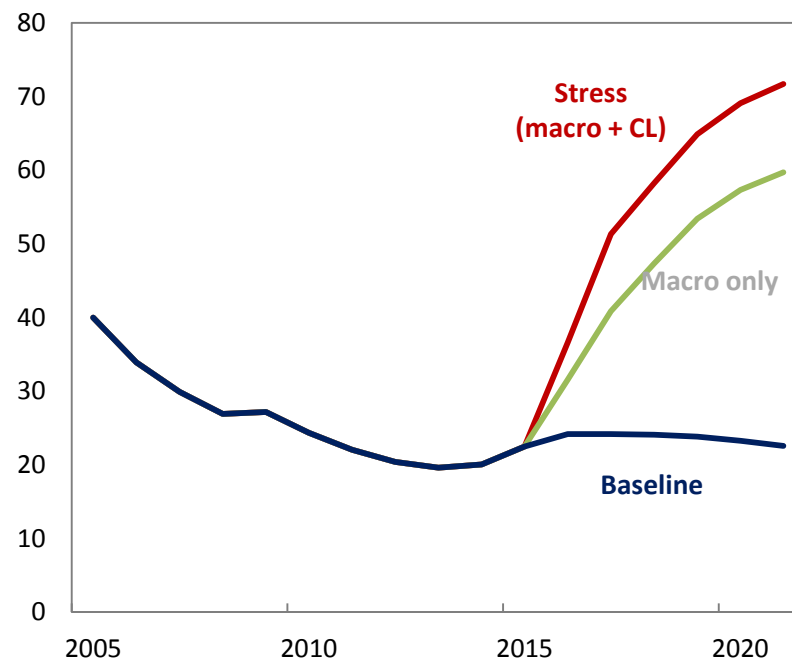
IV. Strengthening Fiscal Risk Analysis & Mitigation: More Integrated Approach to Fiscal Risk Analysis

Peru Illustrative Stress Test

Fiscal Balance
(Percent of GDP)



Public Debt
(Percent of GDP)

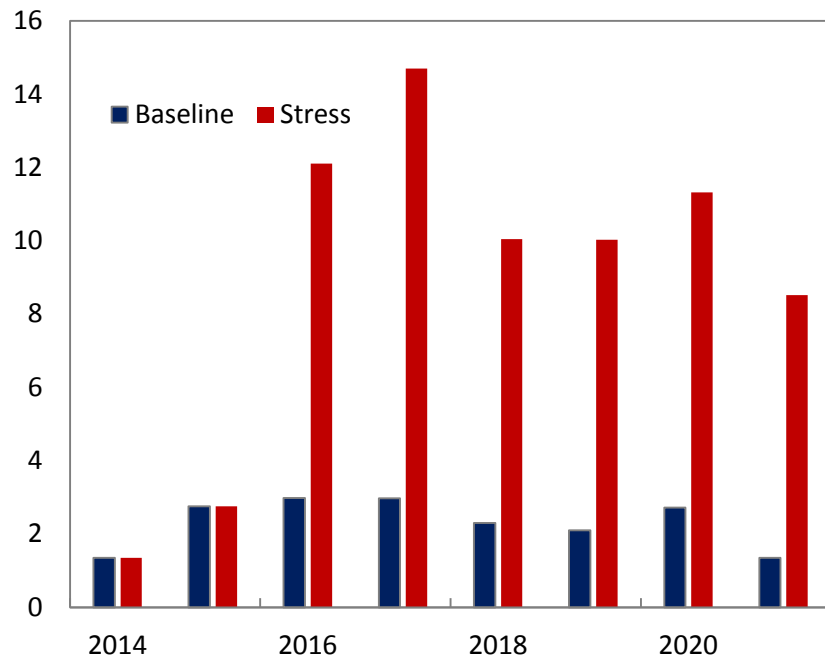


Source: IMF (2016) "Analyzing and Managing Fiscal Risks – Best Practices," IMF Policy Paper, June (Washington: International Monetary Fund).

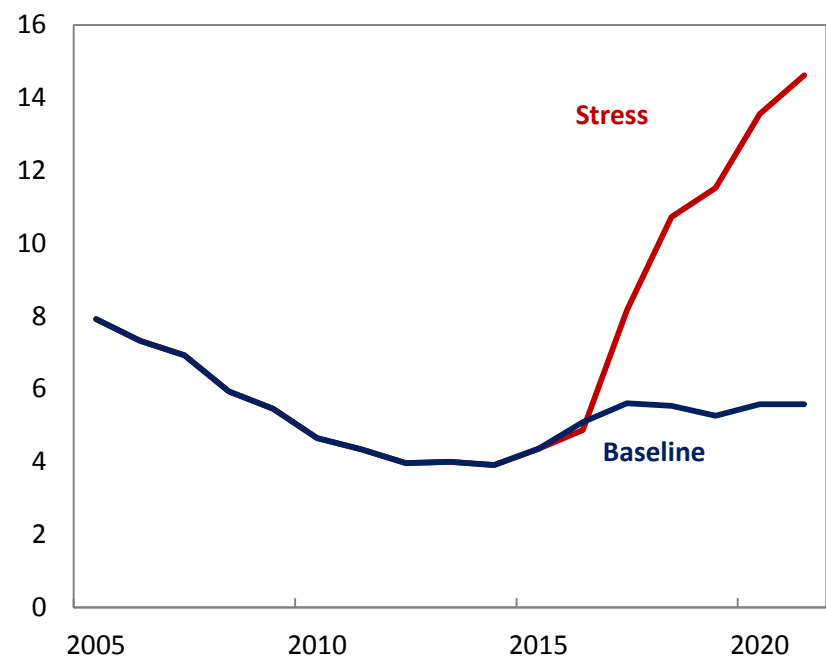
IV. Strengthening Fiscal Risk Analysis & Mitigation: More Integrated Approach to Fiscal Risk Analysis

Peru Illustrative Stress Test

Gross Financing
(Percent of GDP)



Fiscal Burden: Interest
(Percent of Revenue)



Source: IMF (2016) "Analyzing and Managing Fiscal Risks – Best Practices," IMF Policy Paper, June (Washington: International Monetary Fund).

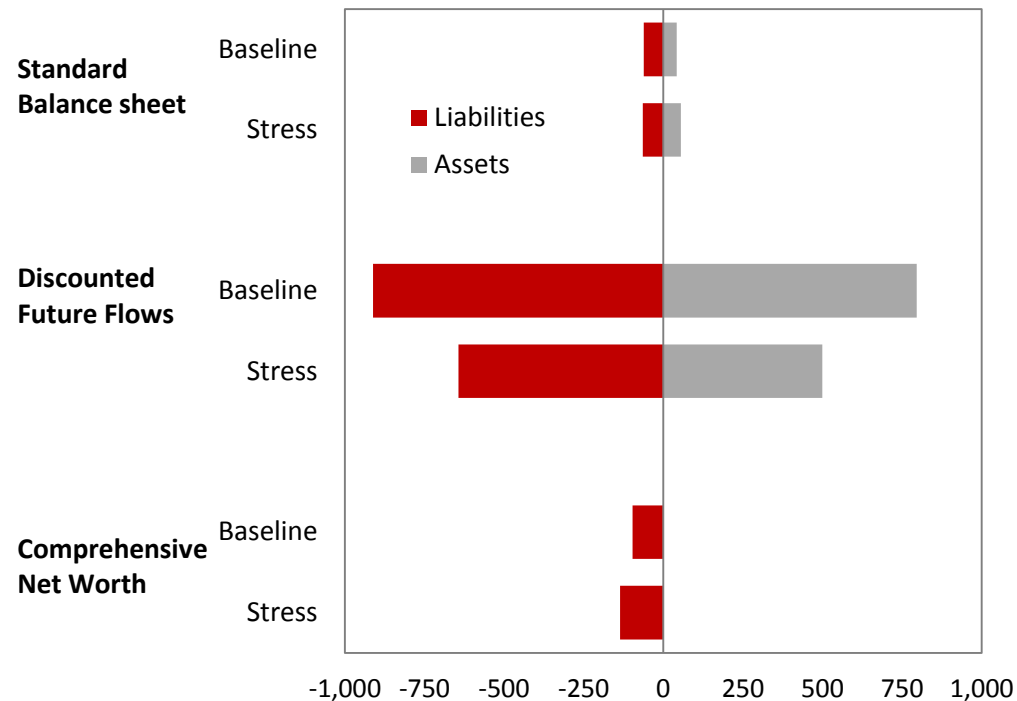
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Peru Illustrative Stress Test

Comprehensive Balance Sheet (Percent of GDP)

| Non-financial Public Sector Balance Sheet (2017) (Percent of 2017 Baseline GDP) | | |
|--|--------------|---------------|
| | Baseline | Shock |
| Total Assets | 856.8 | 564.2 |
| Non-Financial Assets | 41.5 | 41.5 |
| Financial Assets | 19.4 | 22.8 |
| Currency and Deposits | 14.6 | 14.6 |
| Debt securities | 2.6 | 2.6 |
| Loans | 1.2 | 1.2 |
| Equity | 1.0 | 4.5 |
| <i>NPV Revenues</i> | <i>795.9</i> | <i>499.8</i> |
| Liabilities | 953.2 | 699.3 |
| Debt securities | 15.2 | 23.8 |
| Loans | 9.0 | 14.1 |
| Insurance, pensions | 18.0 | 18.0 |
| <i>NPV Expenditure</i> | <i>911.1</i> | <i>643.4</i> |
| Comprehensive net worth | -96.5 | -135.2 |
| Existing net worth | 18.7 | 8.4 |
| Future discounted deficits | -115.1 | -143.6 |

Solvency: Net Financial Worth (Percent of 2017 GDP)





IV. Strengthening Fiscal Risk Analysis & Mitigation: Netherlands Stress Test

Netherlands conducted two stress tests in 2011 and 2013 for a range of stress scenarios

Netherlands: Stress scenarios

| Exogenous variable (GDP is endogenous) | Financial crisis | European crisis | Global crisis |
|--|------------------|-----------------|---------------|
| Relevant world trade | -15% | -7,5% | -15% (y5) |
| Share prices | -40% | -40% | -50% |
| House prices | -10% | -20% | 0% |
| Energy price in euro | -20% | 0% | -35% |
| Import price in euro | -5% | 0% | -15% |
| Nominal interest rate (10y) | -0,8%* | 0%* | -1%* |
| Euro/Dollar | 0% | 20% depr. | 30% appr. |

*percentage point

IV. Strengthening Fiscal Risk Analysis & Mitigation: Netherlands Stress Test

Combined macroeconomic impacts of shock with CL realizations

Netherlands: Combined effects of the financial crisis scenario (debt as %GDP)





IV. Strengthening Fiscal Risk Analysis & Mitigation: New Zealand Comprehensive Balance Sheet

Comprehensive Net Worth

| NZ\$ billion | | Assets | Liabilities | Net Worth |
|--------------------------------|-------------------------------|-------------|-------------|-------------|
| Based on accounting principles | Social | 130 | 86 | 44 |
| | Financial | 122 | 96 | 25 |
| | Commercial | 23 | 11 | 13 |
| Accounting Net Worth | | 275 | 193 | 82 |
| Add | Contingent Liabilities | 0 | 18 | (18) |
| Add | NPV future expenses & revenue | 785 | 886 | (101) |
| Comprehensive Net Worth | | 1078 | 1098 | (20) |

All of the assets and liabilities have the potential to create fiscal risk. These impact on comprehensive net worth *immediately* and GAAP net worth *eventually*.

Accounting Net Worth – Cumulative impact of past decisions

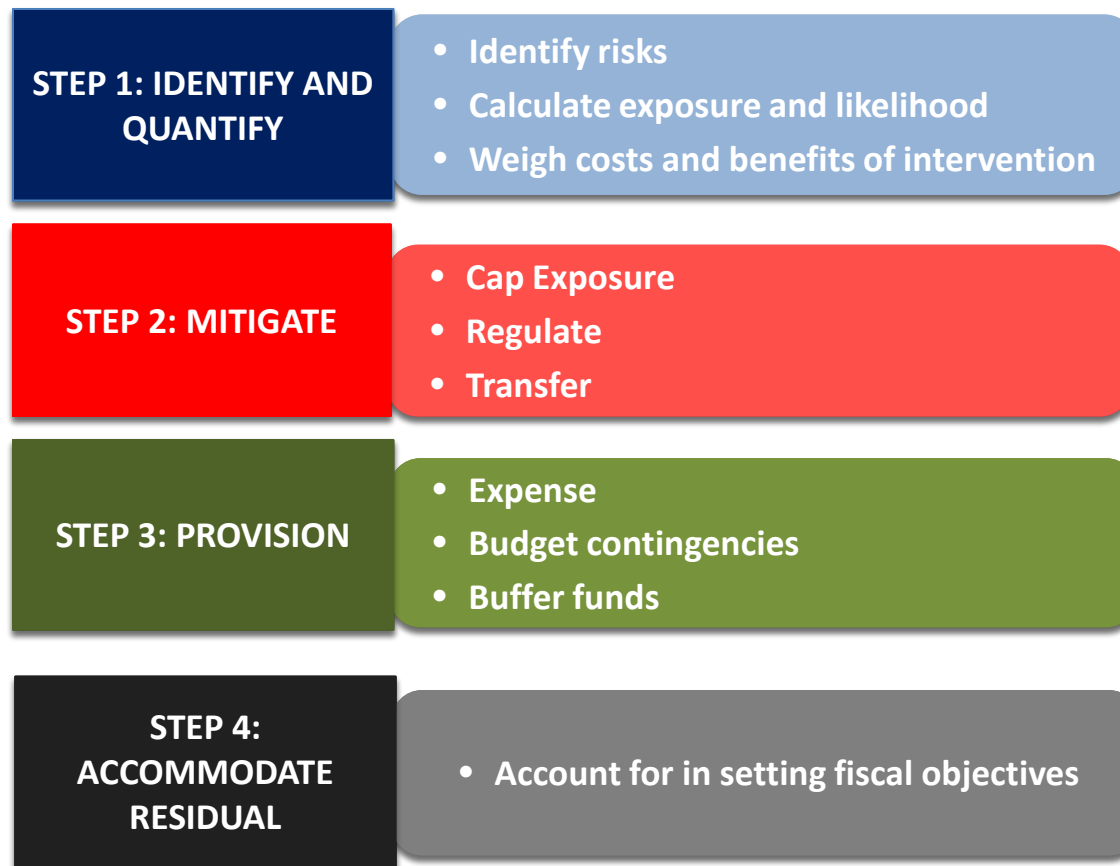
Contingent Liabilities – Estimate of the value of contingent and implicit liabilities.

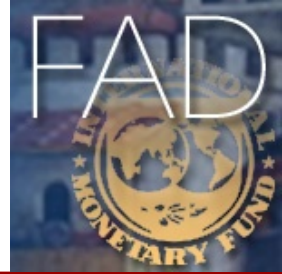
Fiscal – Estimates of the present value of future Government spending and income

Comprehensive Net Worth – Combines balance sheet, expected losses from CL realizations, and NPV of future policies

Note: Figures are illustrative only.

IV. Strengthening Fiscal Risk Analysis & Mitigation: Fiscal Risk Management Toolkit





IV. Strengthening Fiscal Risk Analysis & Mitigation: Fiscal Risk Management Toolkit

| Risk | 1. Identify & Quantify | 2. Mitigate | | | 3. Provision | | | 4. Accommodate Residual |
|--|---|--|--|---|---|---|------------------------------------|-------------------------|
| | | Direct Controls | Indirect tools (regulation and charges) | Risk Transfer Instruments | Expense | Contingencies | Buffer funds | |
| Financial sector | Quantify contingent exposures Monitor financial soundness and risk indicators Incorporate financial sector stress tests into debt sustainability analysis | Reduce state participation in banks | Increase bank loss absorbing capacity (capital adequacy standards) Macprudential tools to reduce procyclicality Reduce debt bias in tax system | Require banks to fund deposit insurance schemes Resolution mechanisms (e.g. Living wills) | Appropriate expected payments | Maintain cash buffers | Pre-fund deposit guarantee schemes | Safe debt level |
| Natural disasters and environmental risks | Early warning systems | Planning to reduce footprint in risky areas | Tax premia in high risk areas Environmental standards Building codes Disaster preparedness strategies | Reinsurance Catastrophe bonds Cap payouts and require deductibles for govt. schemes Mandate insurance in high risk areas | Appropriate expended payments | Disaster contingency | Natural disaster funds | |
| Macro shock: e.g. Commodity Prices | Sensitivity analysis, alternative scenarios, probabilistic fan charts | Privatization of commodity producers | Commodity market regulation Tax base diversification | Hedging instruments (options, commodity futures) | Resource-based fiscal rules | Prudent price assumptions | Stabilization funds | |
| Guarantees | Maintain a central registry of guarantees and assess risks of at time of issue and over their life | Central authorizing entity Ceilings on liabilities Standard criteria for issuing Conditions on access | Charge risk-related fees | Partial guarantees Require collateral Reinsure if feasible | Appropriate expected cash flows | Provision for expected calls | Guarantee funds | |
| Public Private Partnership | Maintain central registry of PPP commitments Subject projects to sensitivity analysis | Central authorizing entity Ministry of Finance gatekeeper role Ceilings on PPP commitments | CBA and value for money checks Charge guarantee fees | Risk sharing allocation framework Cap payments linked to demand Insure retained contract risks where feasible | Appropriate expected cash flows | Provision for expected calls on guarantees | Guarantee funds | |
| State Owned Enterprises | Quantify explicit exposures Monitor financial performance Scenario analysis or stress testing | Reduce size of the SOE sector | Hold boards accountable for performance Reporting requirements | Explicit no-bail-out clauses | Appropriate expected subsidies and QFAs | Provision for cost in case of restructuring | - | |
| Subnational government | Monitor financial performance against benchmarks | Fiscal rules and limits on borrowing | Link degree of financial autonomy to performance Reporting requirements | Establish credible no-bail out clauses Retain authority to liquidate assets / appoint administrator | Appropriate expected support | | | |

V. Conclusions

Fiscal Risk Analysis and Management

More comprehensive balance sheets can help policymakers better understand their underlying fiscal position

While enhanced fiscal risk disclosure and more integrated fiscal risk analysis can help them better understand fiscal exposures

But development of analytical tools will need to be tailored to country circumstances and capacities

- **Lower capacity countries** could focus on: macro-fiscal sensitivity or scenario analysis; preparing complete financial balance sheets and disclosing contingent liabilities
- **Higher capacity countries** could focus on: undertaking periodic fiscal stress testing; preparing full balance sheets, disclosure and estimation of contingent liability realization

V. Conclusions

Fiscal Risk Management

- All countries should strengthen their institutional frameworks for monitoring and managing risks
- Countries with relatively low capacity should look to strengthen direct controls and centralize approval of explicit contingent liabilities
- Countries with higher capacity should prioritize more effective use of risk mitigation and transfer tools and build risk exposure into fiscal plans

IV. Discussion

- What are the main sources of fiscal exposures in your country?
- What have been the most useful types of fiscal risk analysis and disclosure practices?
- How can governments take a more integrated approach to fiscal risk analysis?
- How can fiscal risk analysis better inform policy making?