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Optimal Uses of Risk Management Techniques

by

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The views expressed are those of the author and do not necessarily reflect the views of UNCTAD



OPTIMAL USES OF RISK MANAGEMENT TECHNIQUES

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Overview



Policy intervention and sovereign risk

Legacy of the crisis

Principles for effective debt management

Constraints on effective debt management

Issues in risk management

Sovereign risk management framework

Stress testing sovereign balance sheet

Challenges and upcoming work

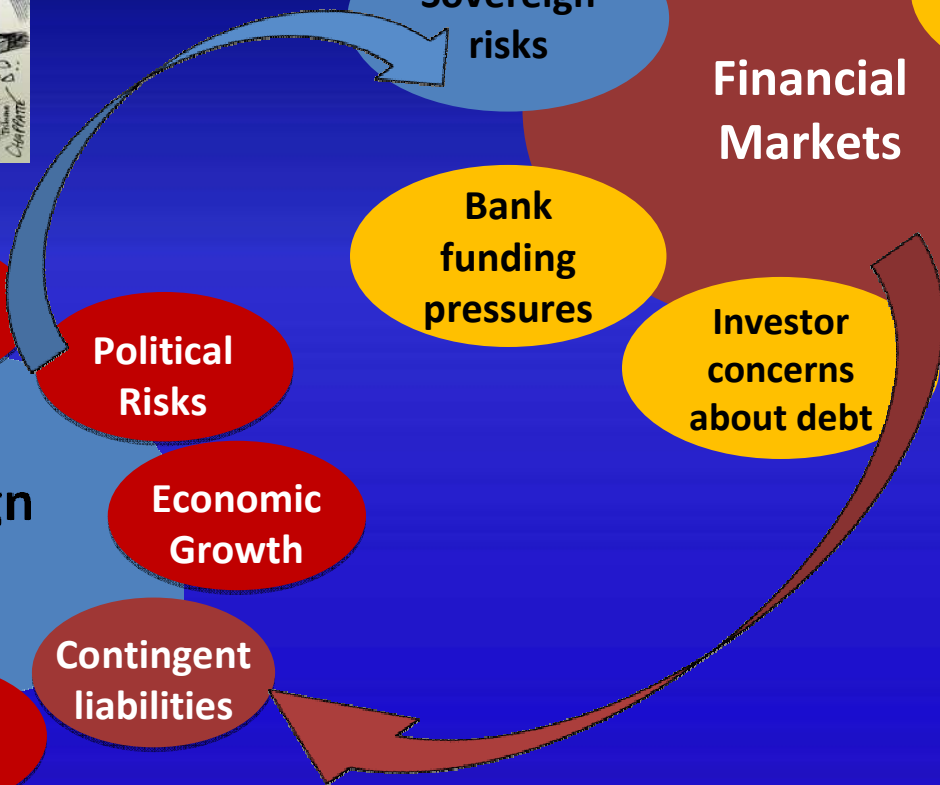
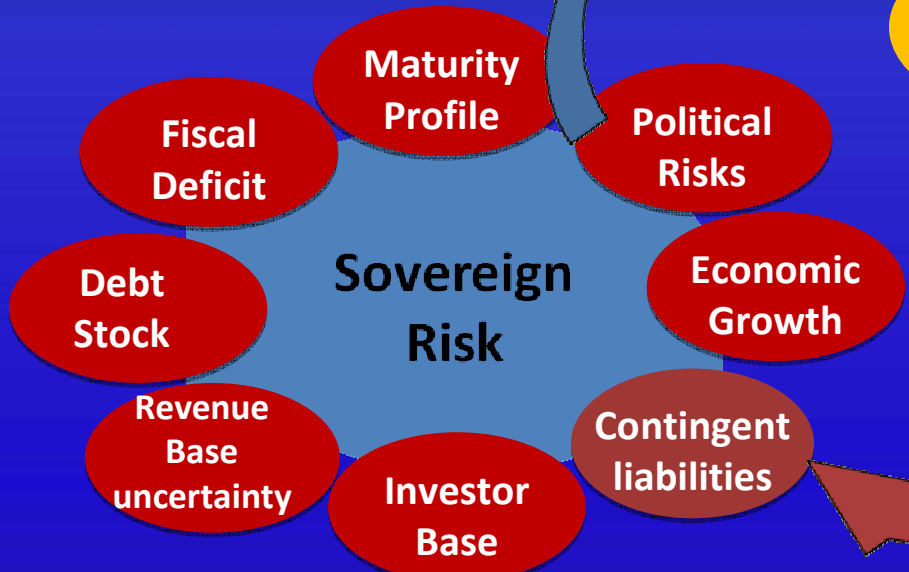
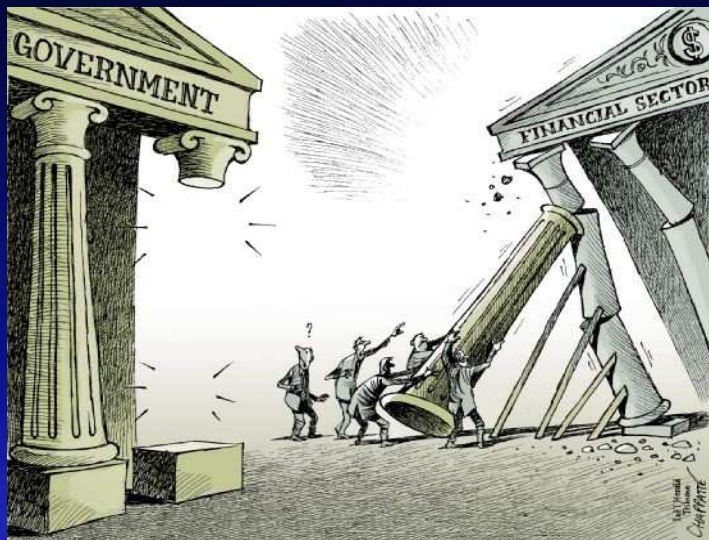


IMPLICATIONS OF FINANCIAL SECTOR INTERVENTIONS FOR SOVEREIGN BALANCE SHEET



- Direct impact on fiscal balance
- Rise in risk exposures
 - ✓ Guarantees
 - ✓ Lending facilities
 - ✓ Loans
 - ✓ Assets
- Unconventional central bank role with balance sheet impact
 - ✓ Liquidity support
 - ✓ Quantitative and credit support
 - ✓ Different central banks had different reactions (FED: QE and ECB: SMP)

MACRO-FINANCIAL LINKAGES AND BALANCE SHEETS INTER-CONNECTIONS



LEGACY OF THE CRISIS

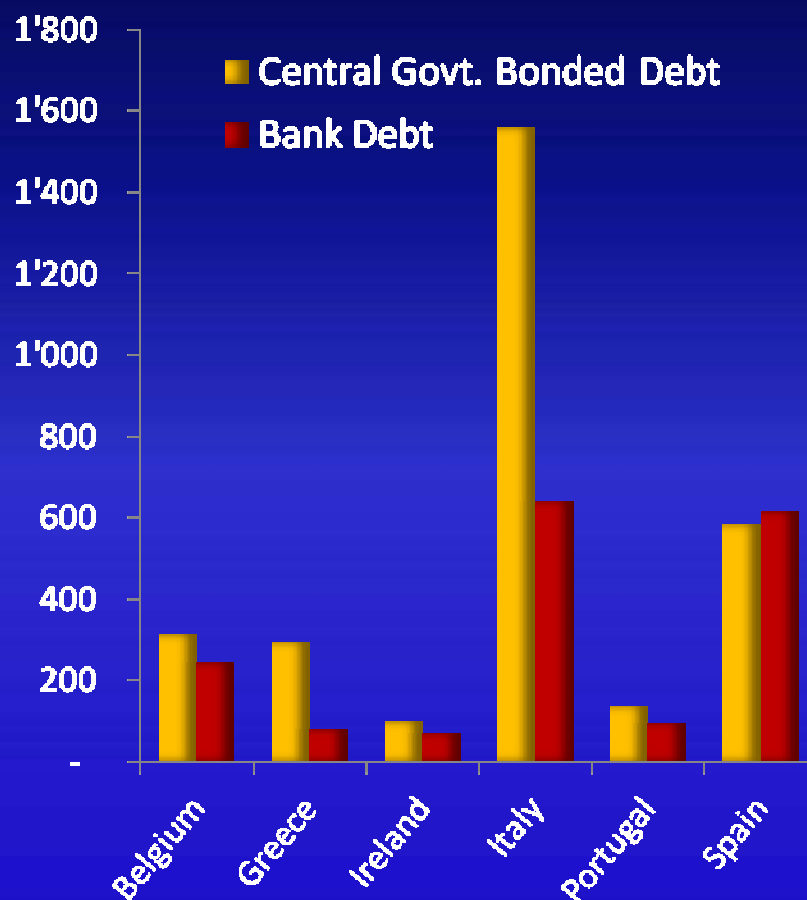


- Impact on sovereign debt level
- Re-pricing sovereign risk for developed economies
- Amplification of contagion channels
- Financial sector at risk
- Erosion of sovereign investor base
- New regulatory framework (macro-prudential)
- New standardized markets (derivatives)

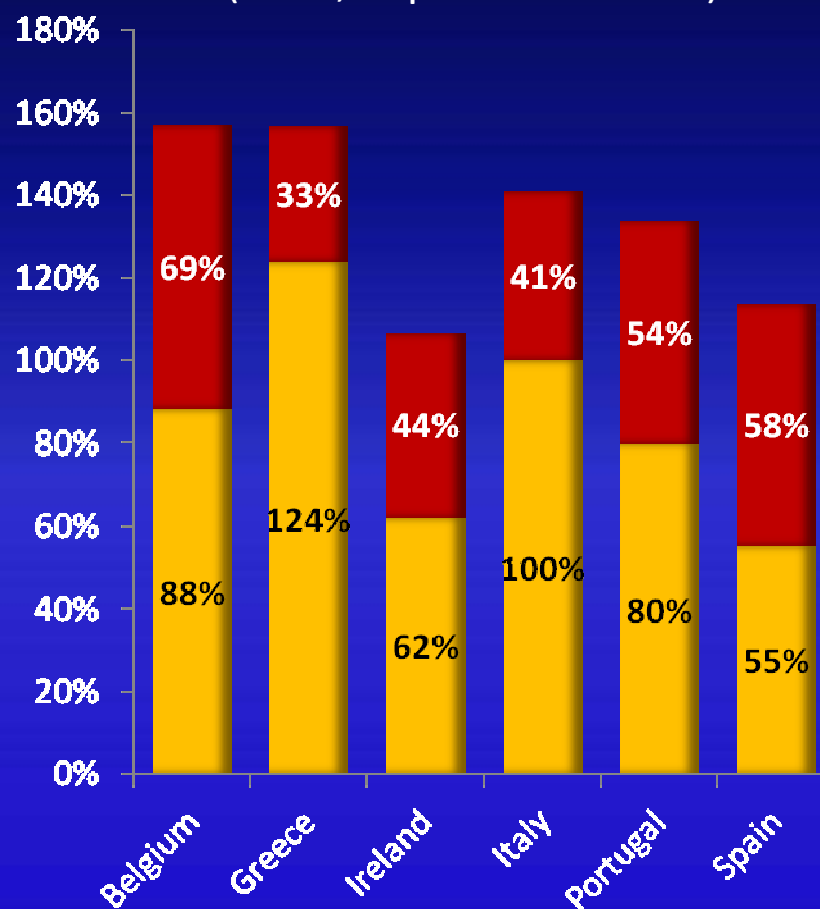
AGGREGATE (SOV.+BANKS) TRADABLE DEBT LEVELS



(2010, in € billion)



(2010, in percent of GDP)



Source: Bloomberg , WEO and staff estimates

BANK FUNDING DIFFICULTIES INCREASES THE SOVEREIGN DEBT BURDEN



Funding pressures
Credit rating downgrades

Sovereign

Materialization of
contingent liabilities/
call on government
guarantees

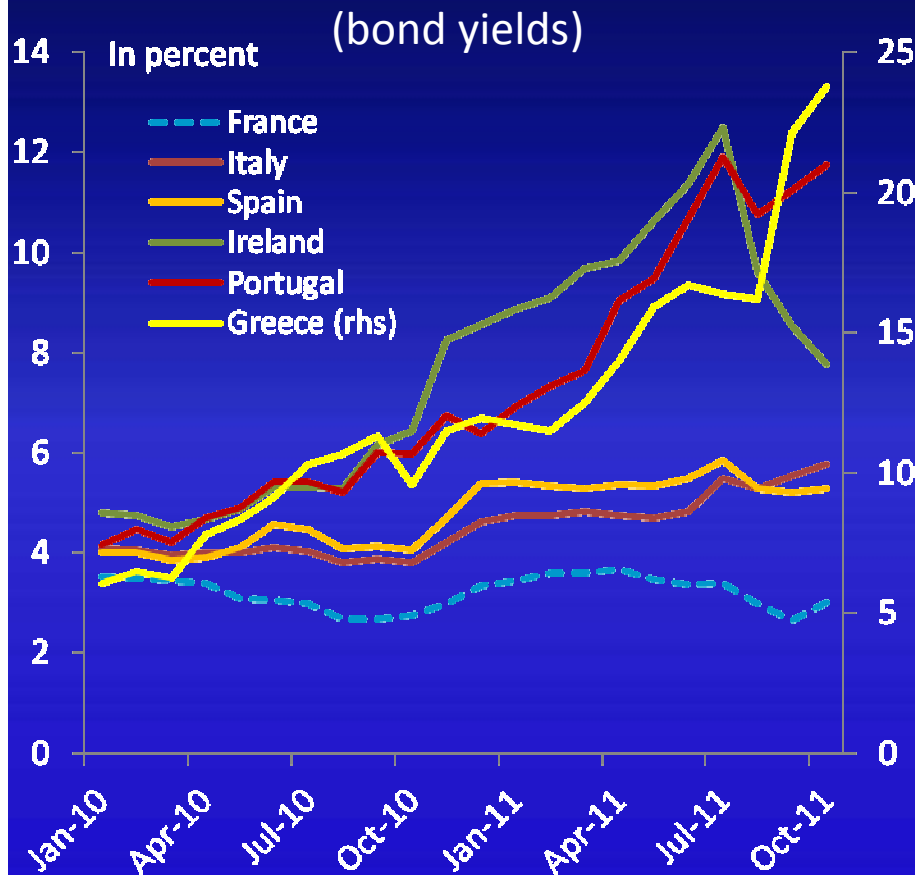
• **Asset side:**
Losses on holdings
of sovereign bonds

Domestic Banks

• **Liability side:**
Higher funding
costs; credit rating
downgrades

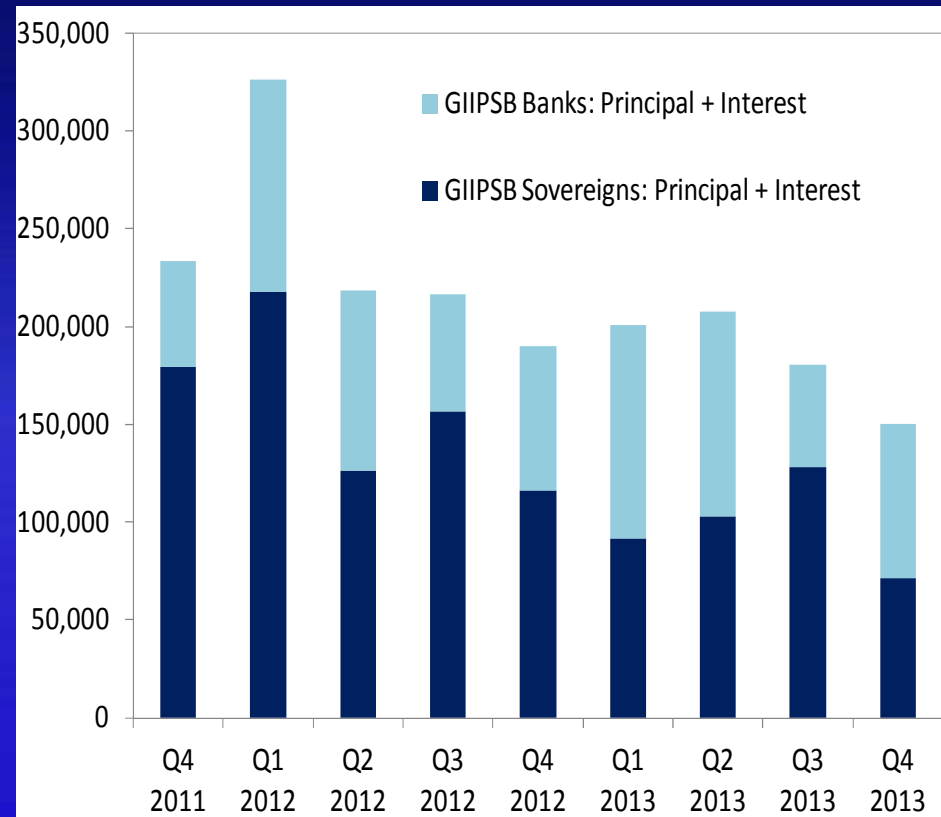


Rollover risk is not longer only related to Sovereign debt profile



Source: Bloomberg

(in € million)



Source: Bloomberg and IMF staff estimates

PRINCIPLES FOR EFFECTIVE DEBT MANAGEMENT



- Debt Management practices can help manage rollover pressures and investor expectations, critical to mitigate the build up of sovereign risk
- The Stockholm Principles, out of the 10th Annual Debt Management Managers' Forum (July 2010), reaffirmed a series of good practices and principles by most countries' debt managers.
- These principles are organized in main three areas:
 - ✓ Framework and operations
 - ✓ Market communication strategies
 - ✓ Risk management

PRINCIPLES FOR EFFECTIVE DEBT MANAGEMENT (CONT.)



- Framework and operations
 - ✓ Preserve sufficient flexibility to smoothen maturity profile and minimize execution risk of issuances and liability management operations
 - ✓ Accounting for financial stability implication
 - ✓ Supporting information sharing at domestic and global levels
- Market Communication
 - ✓ Maintain an open dialogue among debt managers and with other policymakers and market analysts
 - ✓ Share any change that may occur to avoid surprises
 - ✓ Support a predictable operational framework
- Risk Management
 - ✓ Adopt and communicate to investors a strategy that minimizes funding costs over the medium to long term while keeping risks at prudent levels

CONSTRAINTS ON EFFECTIVE DEBT MANAGEMENT



- Level of Public Debt
 - ✓ High levels of public debt limits policy options, reducing the ability to absorb unexpected shocks
 - ✓ Make risk management of debt portfolio even more relevant to reduce vulnerabilities offsetting the “size effect”
- Structure and composition
 - ✓ Should reflect debt strategies that diversify debt instruments and investor base
- Contingent liabilities
- Sudden withdrawal of investor base

IMPACT OF THE CRISIS ON DEBT MANAGEMENT



- The crisis raised significant challenges for DM in advanced economies
 - ✓ The assumption of automatic access to financing in financial markets by advanced countries was tested
 - ✓ Increased financing operations
 - ✓ Raised the execution risk
 - ✓ Strained operational framework
- Most EM experienced a relatively less impact on their financing operations
 - ✓ Result of sustained efforts to enhance the resilience of their debt profiles (e.g.: large liquidity buffers), larger domestic investor base and deeper domestic debt markets
 - ✓ However, there is still need for strengthening debt structures to reduce risk of reversals
- Debt Management challenge of LICs was largely contained
 - ✓ Low integration with international financial markets
 - ✓ Challenge reflected potential shortfall in donor disbursements

DIFFERENT APPROACHES FOR ASSESSING SOVEREIGN RISK

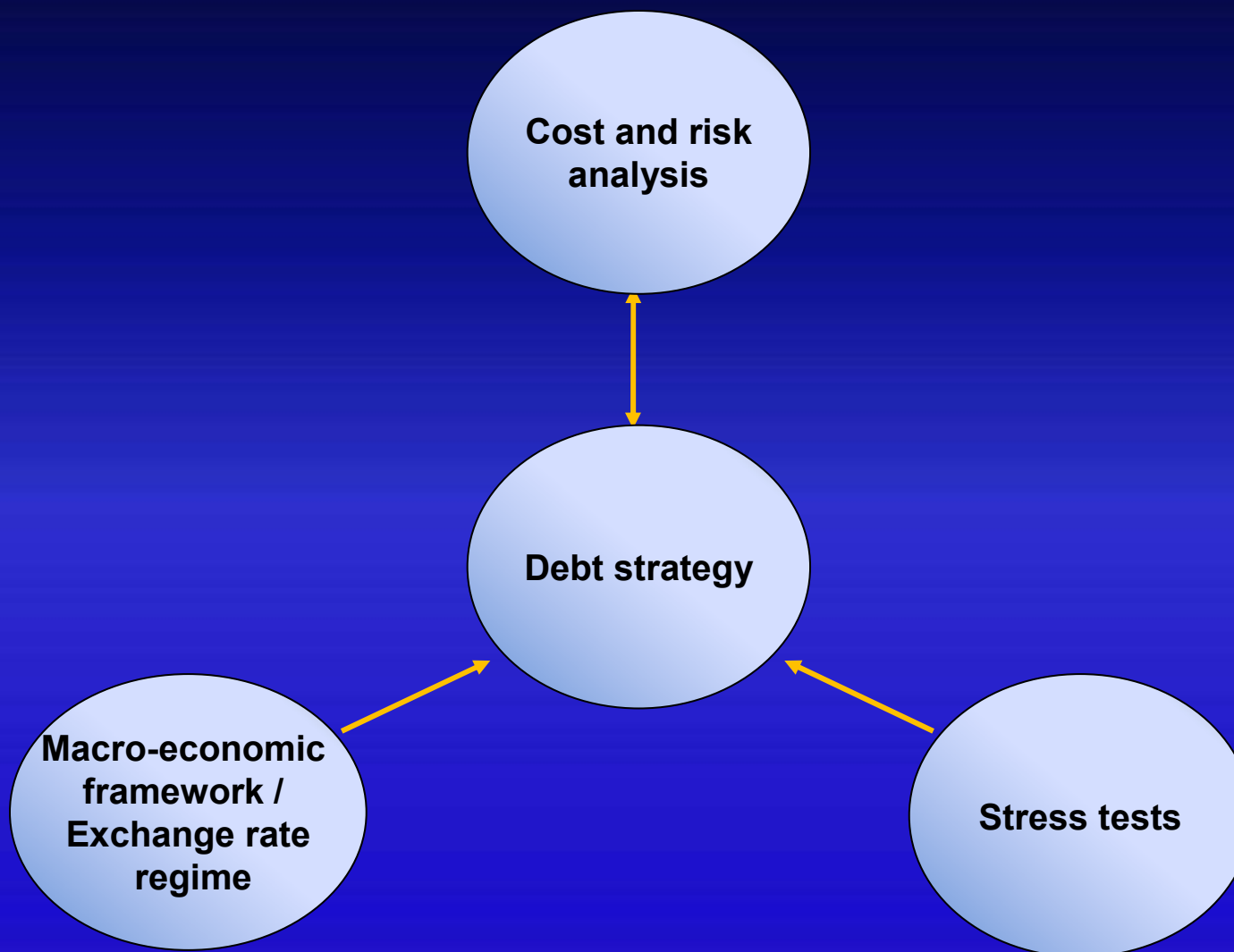


- Number of complementary frameworks – answering different questions:
 - ✓ Cost-at-Risk → impact of changing interest and exchange rates on the debt portfolio
 - ✓ Debt Sustainability Analysis (DSA) → debt-to-GDP
 - ✓ Augmented DSA → linking DSA to more granular portfolio composition
 - ✓ Merton's pricing models → sovereign credit risk (CCA)

CURRENT APPROACH



Only debt side and no feedback loops



ISSUES IN SOVEREIGN RISK MANAGEMENT



- Importance of risk management for:
 - ✓ Reducing the likelihood of crises
 - ✓ Ameliorating the impact of a crisis if occurs
- Identification and measurement of sovereign balance sheet risks
- How to Integrate Risk Management in:
 - ✓ Debt strategy formulation
 - ✓ Debt sustainability analysis
 - ✓ Macro-financial policy decision framework



SOVEREIGN RISK MANAGEMENT FRAMEWORK



- The global crisis highlighted the need for revisiting the risk management approach in debt management
 - Traditional cost-at-risk analysis might not be particularly effective at capturing the full range of risk factors
 - Some cost-at-risk models abstract from analysis of the underlying macroeconomic framework (e.g.: by modeling interest and exchange rate independently).

SOVEREIGN RISK MANAGEMENT FRAMEWORK (CONT.)



➤ Efforts are needed to ensure non-traditional risk exposures are also adequately captured including:

- ✓ Near-term liquidity risks (e.g.: arising from a sudden withdrawal of investors)
 - ✓ Implicit contingent liabilities, especially those arising from the financial sector, and explicit guarantees
 - ✓ Large quasi-sovereign and sub-national debt
 - ✓ Other off-balance sheet risks
- These risks factors may significantly understate the extent of sovereign balance sheet vulnerabilities

IMPROVING SOVEREIGN RISK MANAGEMENT FRAMEWORK



- Testing the robustness for relevant risk factors and scenarios
- ✓ Modeling **feedback loops** underlying macro variables, debt composition, and outstanding stock
- ✓ Putting in place frameworks and tools (**MTDS, Risk Measures**)
- ✓ Integrating **sovereign risk** into the financial stability risk analysis (**FSAP**) stress test

What is the government's real financial exposure?

RISK METRICS: WORK AT THE FUND



- Risk-Measures template: Tools for risk management of *bonded public debt*.
- Conventional measures: Market risk metrics
 - ✓ *Interest rate risk*: Duration, proportion of floating rate debt to total debt
 - ✓ *Roll-over risk*: Average time to maturity, proportion of short-term debt to total debt.
 - ✓ *FX risk*: proportion of foreign debt to total debt.
 - ✓ *Debt maturity* profile and Cost-at-Risk

“Overall, the importance of augmenting traditional cost-risk analysis with appropriately designed stress tests has been brought into sharp relief.”

IMF Board Paper (2011)

*Managing Sovereign Debt and Debt Markets through a Crisis:
Practical Insights and Policy Lessons*



STRESS TESTING ON SOVEREIGN BALANCE SHEET



- Principles of sovereign stress testing
- Quantitative tool for stress testing
 - ✓ Provides a flexible and tractable approach in a forward-looking framework
 - ✓ “Seoul principles”: discussed in the 11th Annual debt managers Forum (June 2011) could serve as a guide to judge stress test framework of sovereign debt portfolios
- The IMF continues working along these lines to develop an operational tool for sovereign stress testing

STRESS TESTING



- Builds a more systematic approach for managing sovereign balance sheet risks.
- Provides a macro financial perspective.
- Clarifies 'what if' dimension to debt structure and sustainability.
- Defining objectives of the exercise:
 - ✓ To make risks more transparent
 - ✓ To assess the impact of abnormal conditions

WHAT TO STRESS?

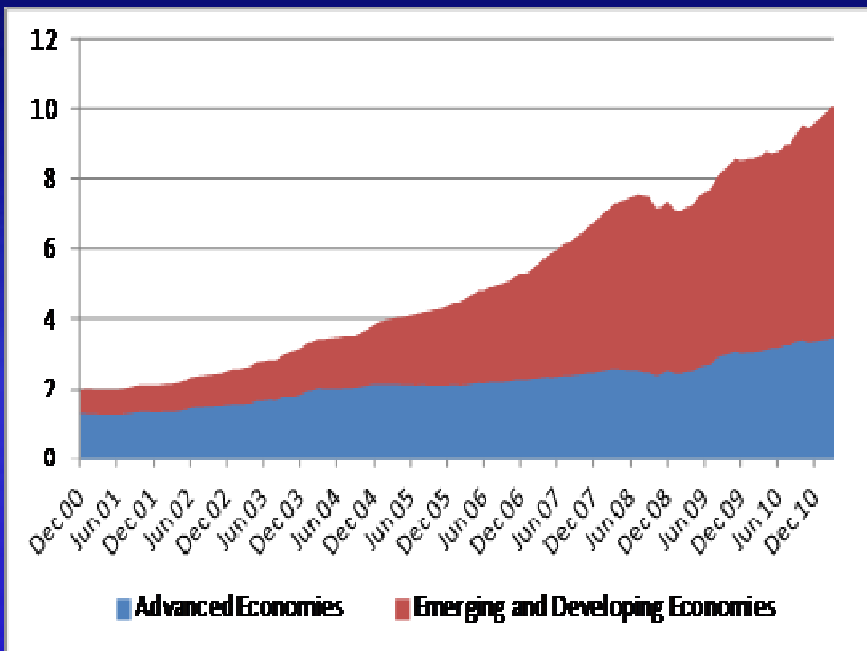


- Defining the scope of the debt portfolio:
 - ✓ Central government, general government, or the entire public sector?
- Defining the perimeter of the exercise:
 - ✓ What is contingent liability?
 - ✓ Liquid vs. illiquid assets
- Assessing both sides of the government balance sheet
 - ✓ ALM outlook

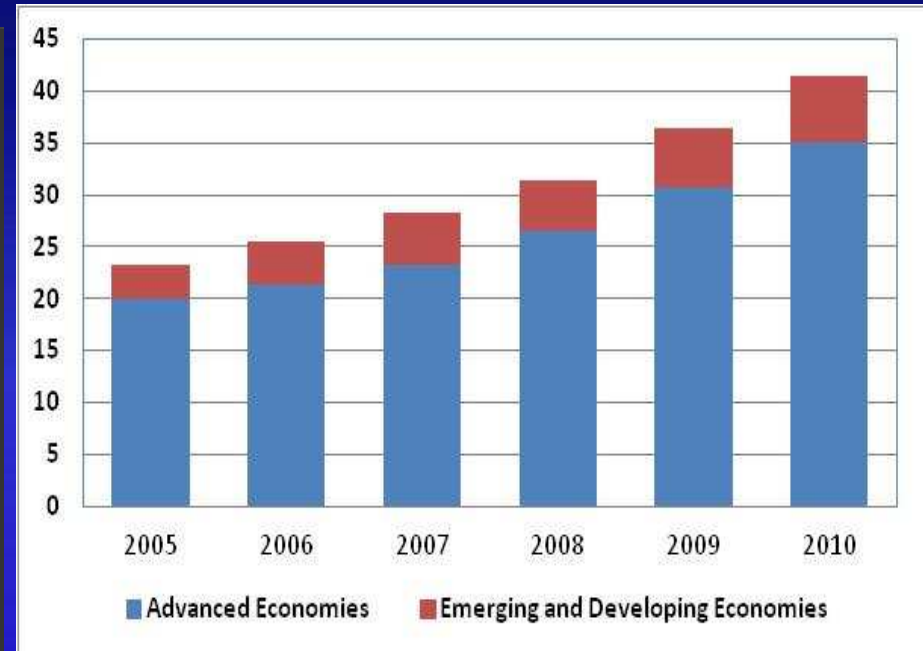
SOVEREIGN PORTFOLIOS ARE VAST ...



Foreign Exchange Reserves Excluding Gold
(in trillions of U.S. dollars)



Total Government Debt Securities Issued
(in trillions of U.S. dollars)



... WITH ASSOCIATED RISKS AND OPPORTUNITIES HIGHLY SIGNIFICANT
FOR MACRO AND FINANCIAL STABILITY ...

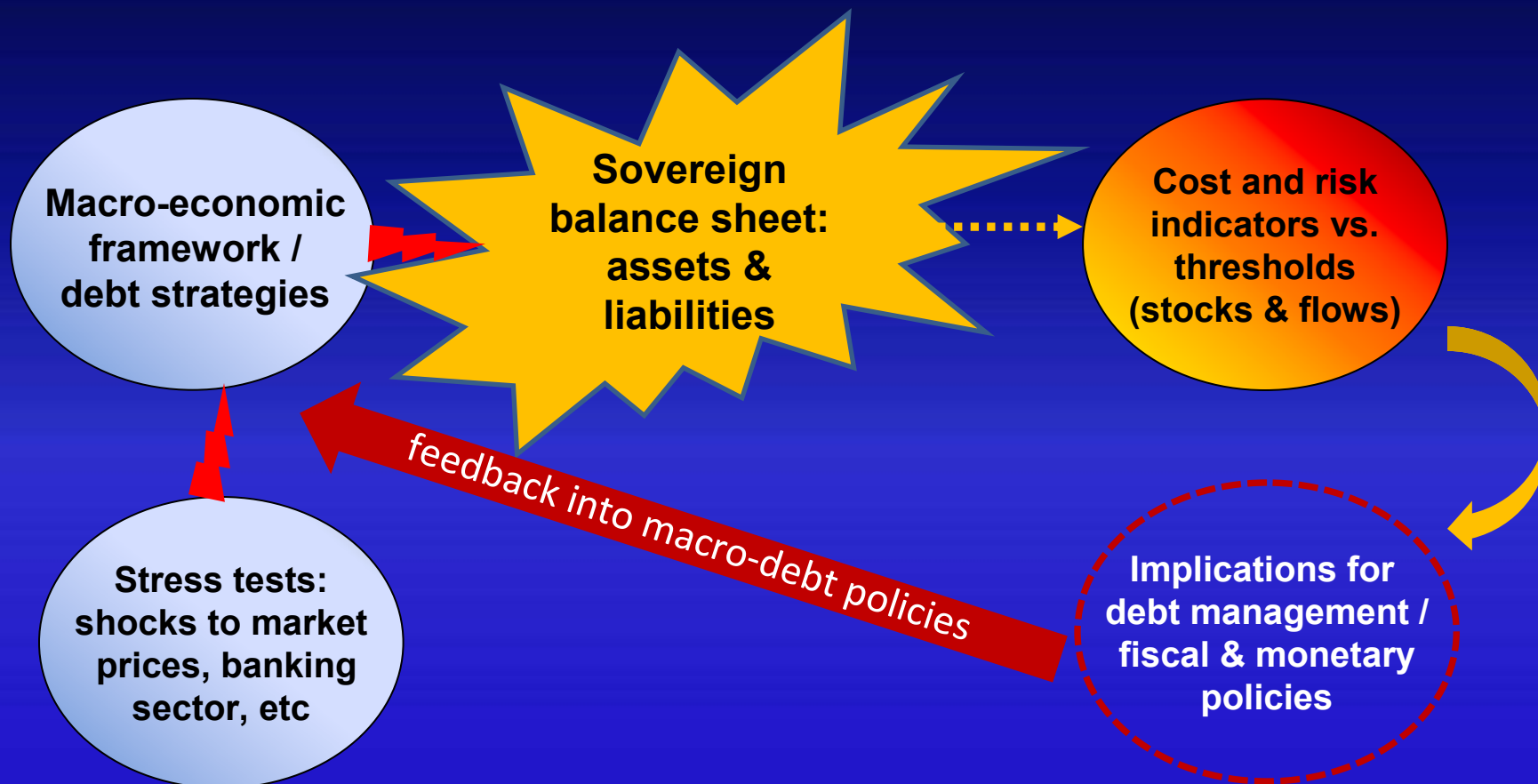


- Defining SALM Objectives
- Defining relevant assets and liabilities
 - ✓ Definition of Government balance sheet
 - ✓ Money base, international reserves, contingent liabilities (e.g.: financial institutions), others
- Integrating assets and liabilities: manage risk in an integrating fashion contribute to mitigate sovereign vulnerabilities
- Institutional constraints: SALM requires coordination but different objectives could pose an challenge

WORK IN PROGRESS: SOVEREIGN ALM APPROACH



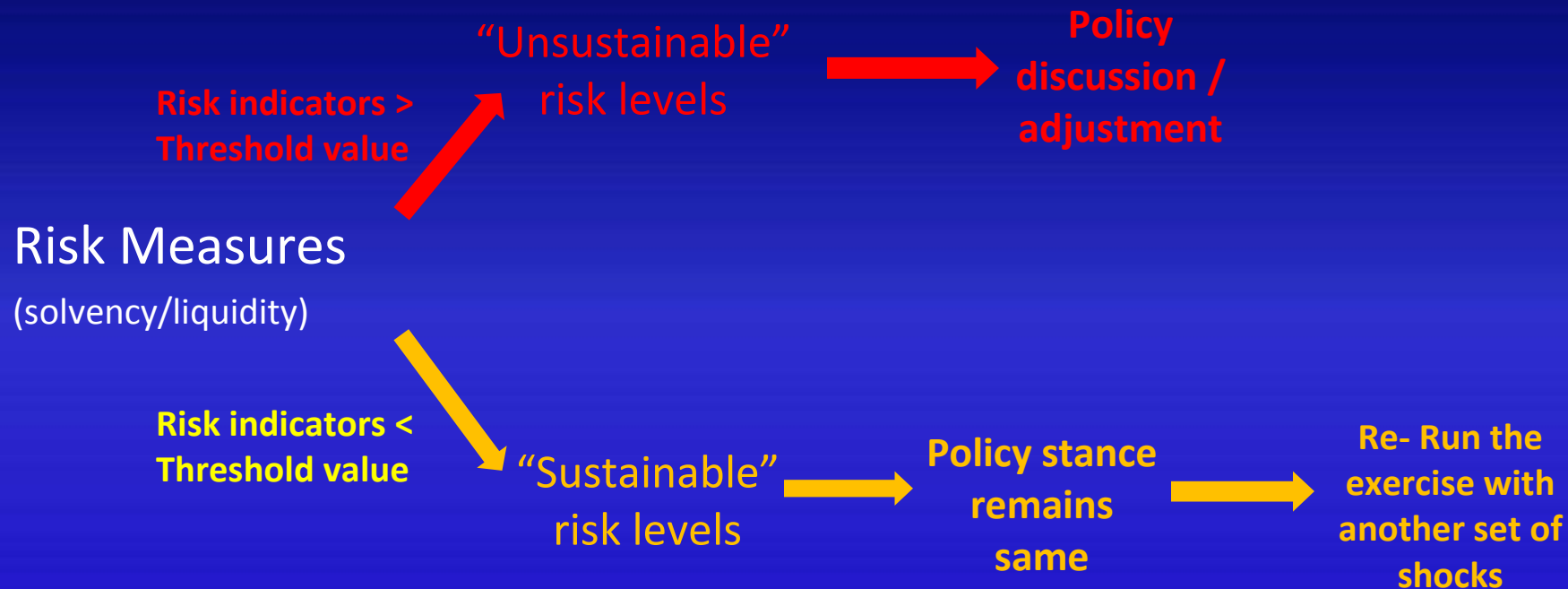
Incorporating Asset side feedback loops



WORK IN PROGRESS: SALM APPROACH (CONT.)



- Decision Tree: in $t=0$ the economy is shocked and risk measures compared against thresholds



Note: a time horizon needs to be chosen (e.g.: 3-5 years). If the economy copes with the shocks well under different scenarios (key indicators below thresholds), it could be considered relatively safe.

WORK IN PROGRESS: SALM APPROACH (CONT.)



➤ Challenges:

- ✓ Definition of sovereign risk and its sources (terms of trade, commodity prices, contingent liabilities, etc)
- ✓ Building the proper channels of real-financial linkages
- ✓ Liquidity risks: different definitions for AMs and EMs?
- ✓ Shocks: standard (e.g.: 2 std dev.) vs. tail risks.
- ✓ Correlations break around crisis time
- ✓ Risk indicators/thresholds: what is the “stress point” for a sovereign? Threshold based on country’s history / vs. peer group?
- ✓ How to model feedback loops?

SUMMARY



- Recent crisis revealed important sources of risks and channels of transmission.
- A new risk management framework is needed
- Both assets and liabilities of the government balance sheet presented and managed in an integrated manner .
- Work–in-progress: Sovereign ALM Balance sheet stress testing as a comprehensive framework that may guide policymakers’ decision process.



THANK YOU!