A Practical Approach to Systemic Risk Monitoring

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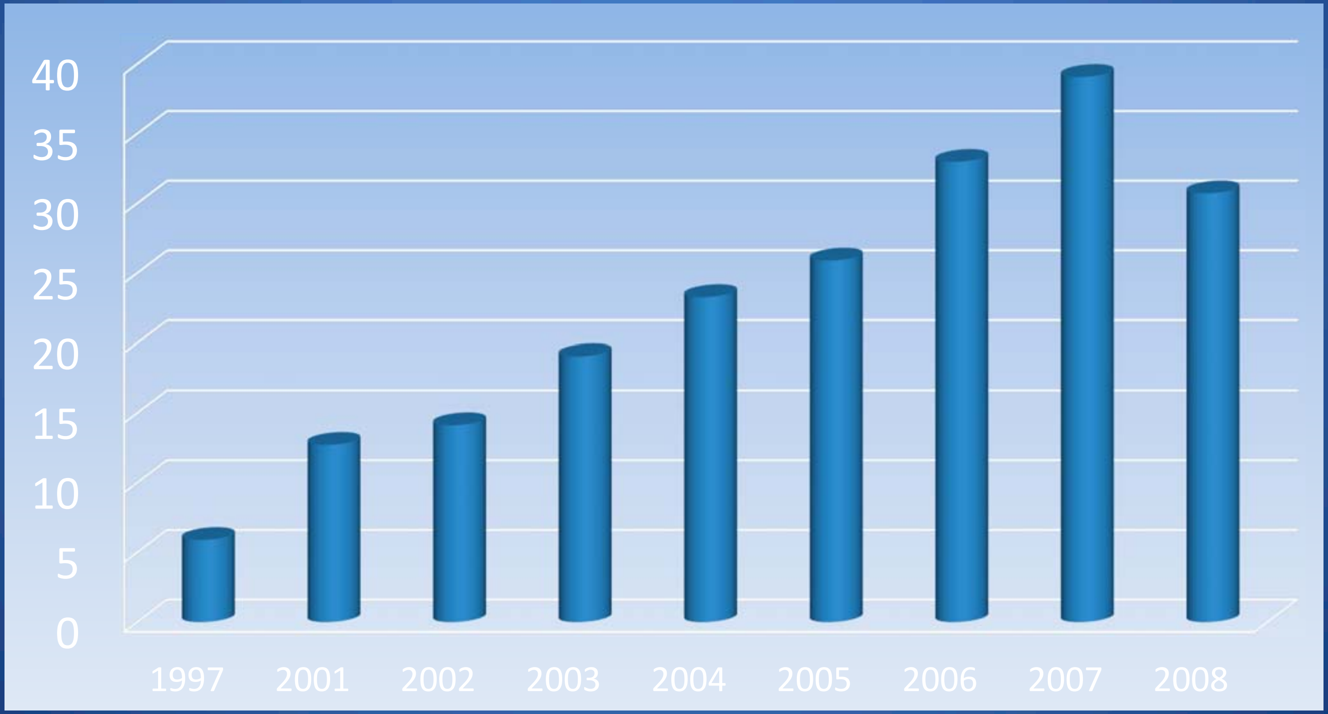
Financial Sector Surveillance

- Bilateral/Country-Specific
  - Financial Sector Assessment Programs (FSAP)
  - Article IV Consultations
- Regional
  - Regional Economic Outlook (REOs)
- Global/Multilateral
  - Economic (WEO)
  - Financial (GFSR)
- **EWE**

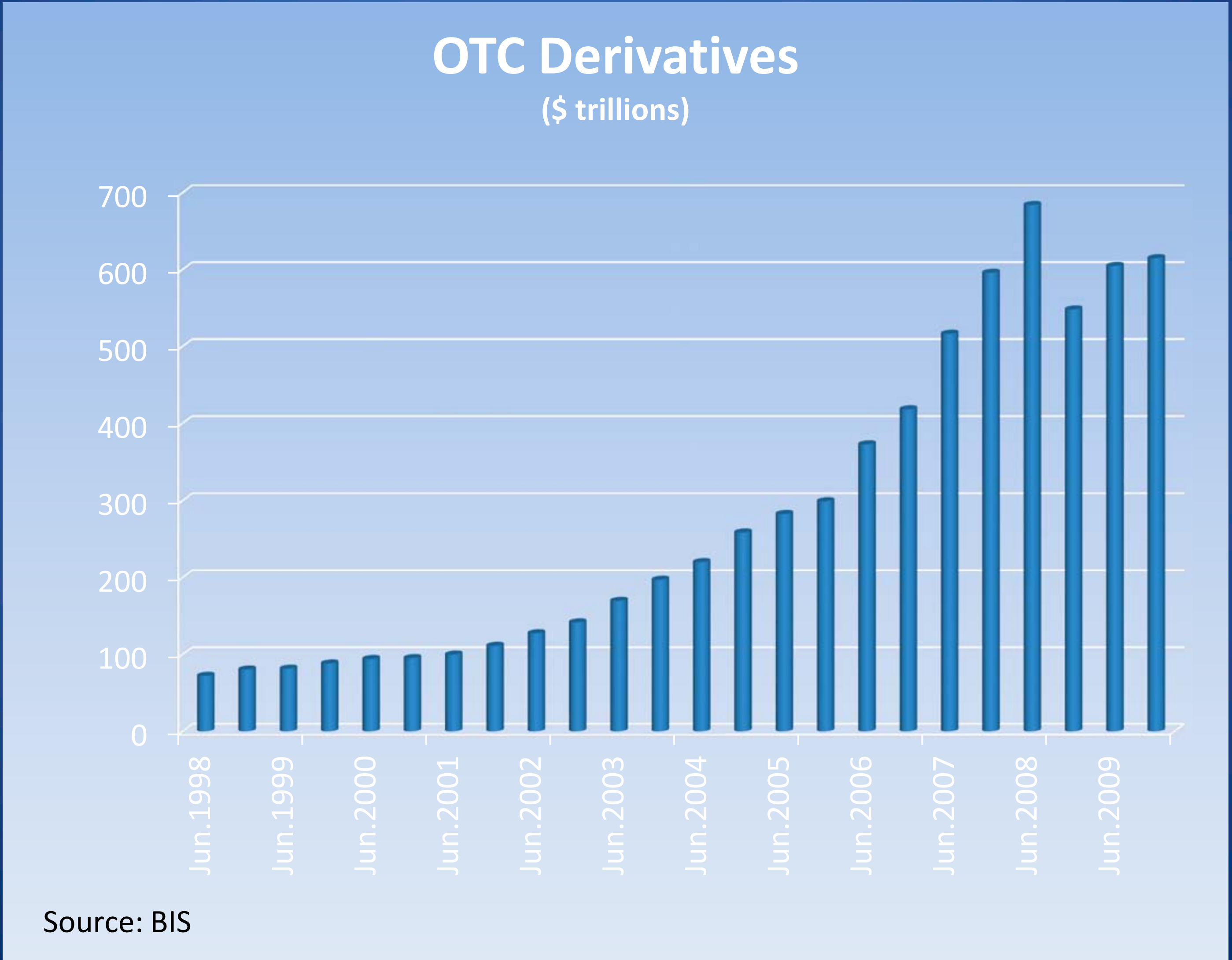
Why Is Financial Sector Surveillance Important at the Global Level?

Global Cross-Border Portfolio Investment
($ trillions)



Source: IMF's Coordinated Portfolio Investment Survey, Table 12

Finance Has Become More Complex and Opaque

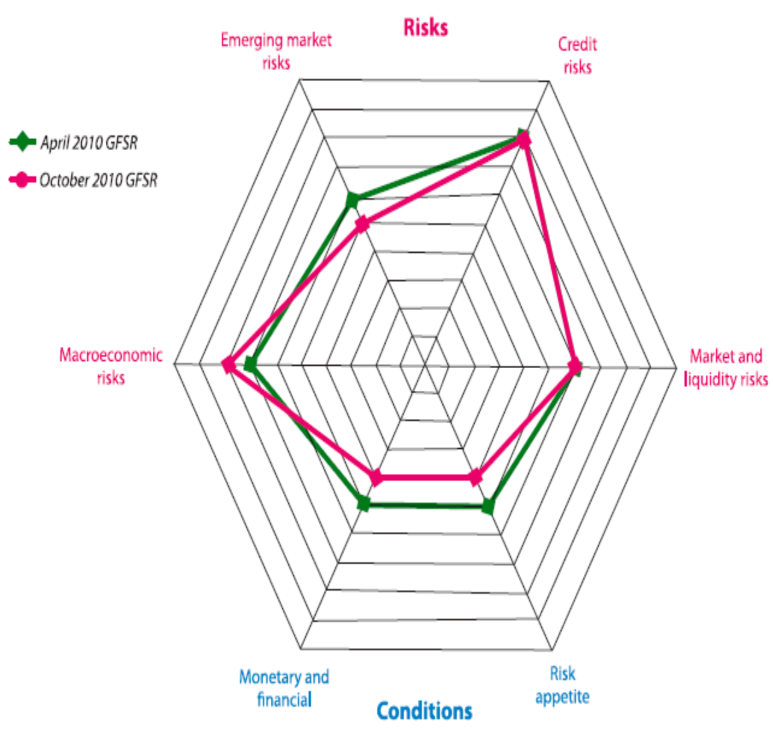


What Does Financial Sector Surveillance Assess?

- Systemic Vulnerabilities
- Possible Spillovers
  - Across Markets (e.g. US Subprime Mortgages to Global Interbank Markets)
  - Across Financial Institutions (e.g. between banks and insurance companies and MMFs)
  - Across Countries (Emerging Market Financing, European Sovereign Crisis Spillovers)
- Policy Advice
  - Financial Reforms
  - Assure Level Playing Fields

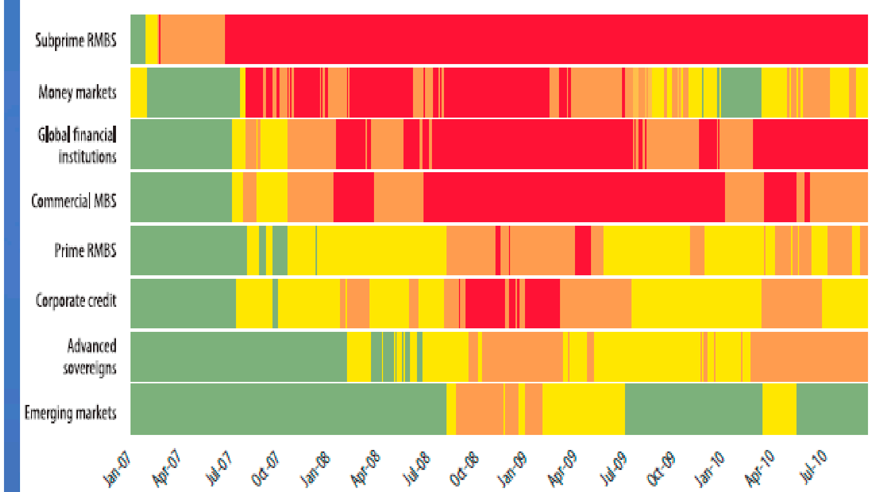
Multilateral Financial Sector Surveillance – The GFSR

Figure 1.1. Global Financial Stability Map



Note: Away from center signifies higher risks, easier monetary and financial conditions, or higher risk appetite.

Figure 1.3. Markets Heat Map



Source: IMF staff estimates.

Note: The heat map measures both the level and one-month volatility of the spreads, prices, and total returns of each asset class relative to the average during 2003–06 (i.e., wider spreads, lower prices and total returns, and higher volatility). The deviation is expressed in terms of standard deviations. Light green signifies a standard deviation under 1, yellow signifies 1 to 4 standard deviations, orange signifies 4 to 9 standard deviations, and red signifies greater than 9. MBS = mortgage-backed security; RMBS = residential mortgage-backed security.

Recent GFSR Focus

- Chapter 1
  - Sovereign and Banking System Spillovers
  - Global Bank Loss/Writedown Estimates
  - Capital Flows and Asset Bubble Risks in Emerging Markets
- Special Features
  - Systemic Liquidity Risk (Oct 2010 & Apr 2011)
  - Housing Finance (Apr 2011)
  - Uses and Abuses of Sovereign Credit Ratings (Oct 2010)
  - Systemic Risk and Redesign of Financial Regulation (Apr 2010)
  - Making OTC Derivatives Safer: Role of Central Counterparties (Apr 2010)
  - **2012--"Safe Assets: Financial System Cornerstone?**" examines the medium-term outlook for the demand and supply of safe assets and their financial stability implications
  - **2012--"The Financial Impact of Longevity Risk,"** analyzes the fiscal and financial stability repercussions from failing to account for longevity risk.

The Early Warning Exercise (EWE)

"the FSB should collaborate with the IMF to provide early warning of macroeconomic and financial risks and the actions needed to address them"

-G20 London Communiqué, April 2, 2009

- Focuses on potential systemic crises—in advanced and emerging markets
- Prioritizes macro-financial vulnerabilities and potential spillovers
- Sets out tail risk scenarios
- Combines IMF's macrofinancial expertise with FSB's in regulation and supervision
- Provides policy advice (e.g., coordinated actions)

Main output: EWE Presentation

By IMF Management/FSB Chairman to IMFC *

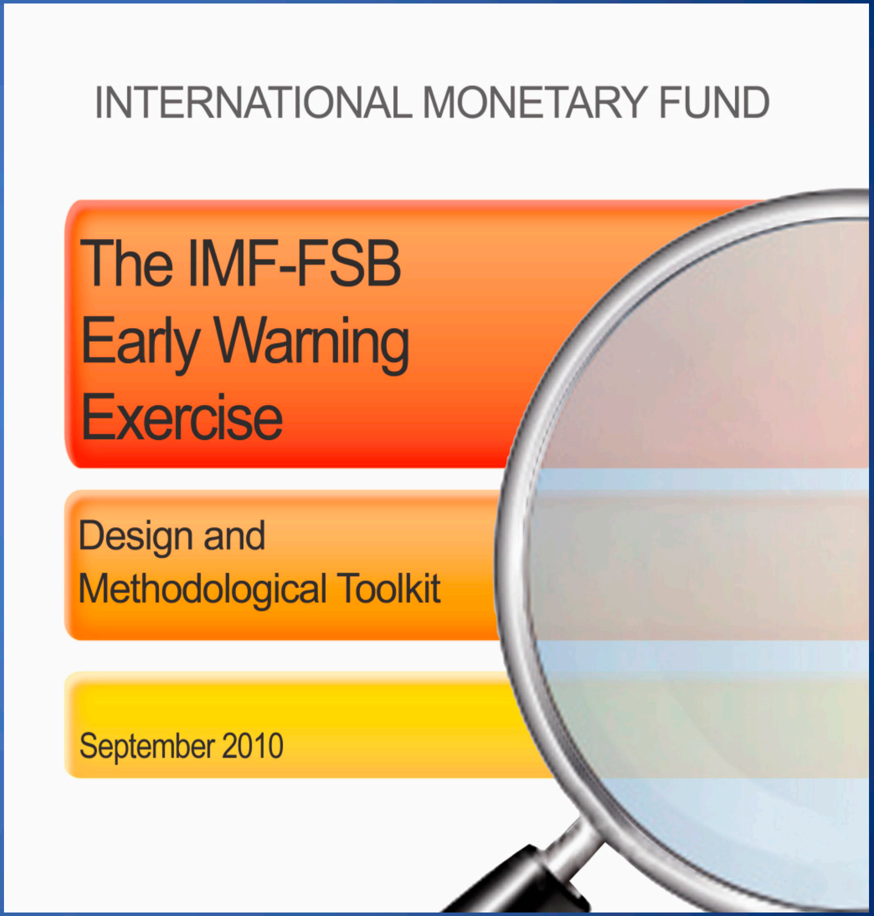
**The IMFC is the IMF's steering committee, responsible for advising, and reporting to, the Board of Governors. Its 24 members are central bank governors, ministers, or others of comparable rank drawn from the Fund's 187 member countries.*

EWE Outputs are confidential – why?

- Decision-makers want unvarnished views
- E.g., need to be specific and name names
  - Hence, potentially market sensitive
- Focus on tail risk scenarios to supplement public baseline messages
- Highlight consequences of inaction or policy mistakes

EWE Methodology

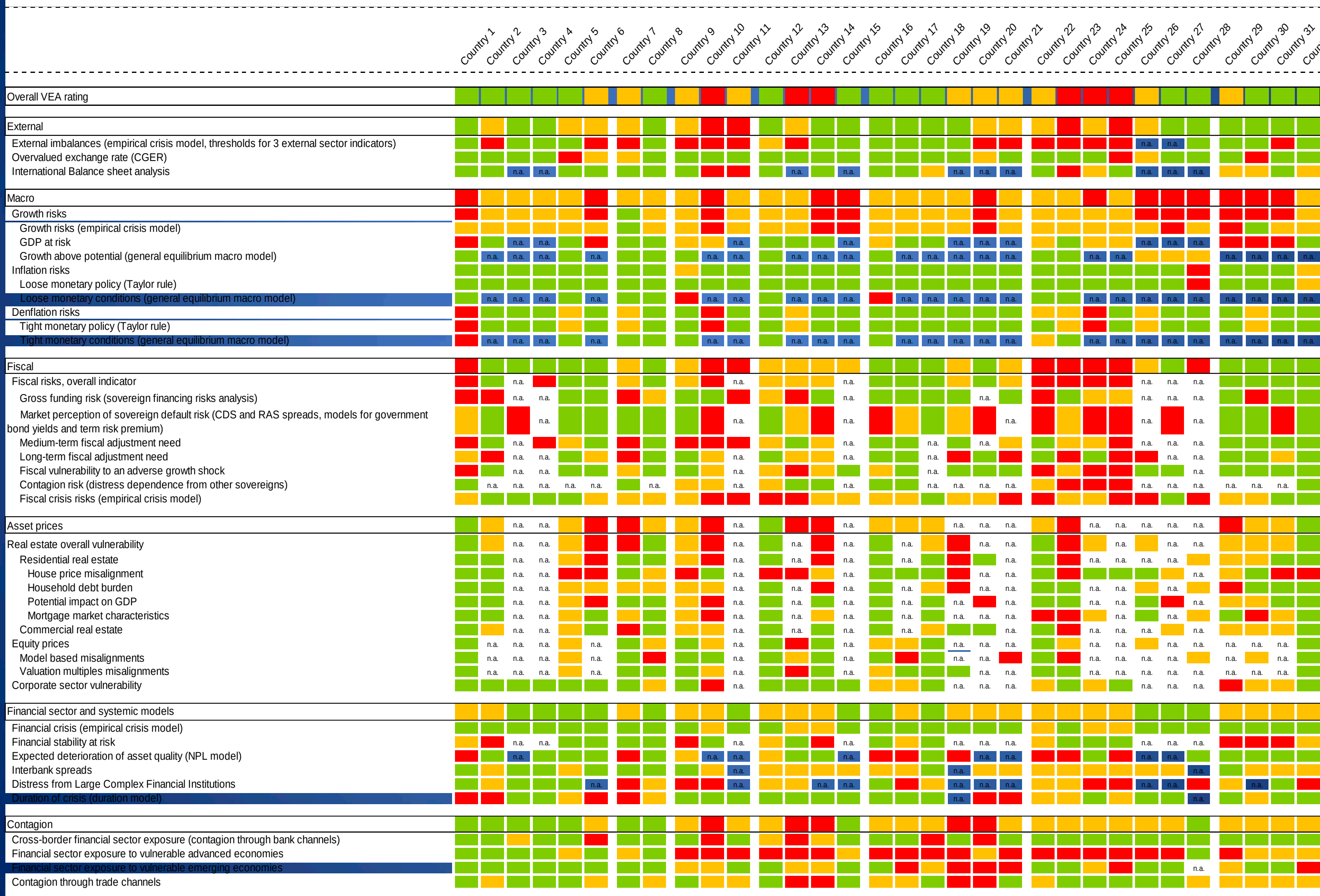
- EWE output confidential, not its methodology
- Methodology paper just released
- John Lipsky on *iMF Direct* blog: “Forewarned is Forearmed: How the EWE Expands the IMF’s Surveillance Toolkit”



http://www.imf.org/external/pp/longres.aspx?id=4479

The Quantitative Part…

Country Flags Raised by the VEA[1]



[1] The table summarizes the main results of the VEA exercise. The colors indicate countries that were flagged as relatively vulnerable in each sector, with red, orange and green for high, medium and low vulnerabilities respectively. When "n.a.", the number of red and orange flags needed to rank a country with H or M drops accordingly.

Looking for Risk in All the Wrong Places: The Limitations of Modeling

- Experience with the Crisis
- Models Deepen, but Don't Widen, Understanding of Risks
  - The "Connecting-the-Dots" Challenge
- Financial Models Can Be Invalidated By Changing Human Behavior:
  - "I can calculate the motion of heavenly bodies but not the madness of people" – Isaac Newton
- Quantifying (e.g. VAR) Can Anchor Expectations in the Wrong Place

Going Beyond Models – The Consultation Process

Take stock of risk perceptions, especially contrarian views

- All levels of economic and financial sector surveillance in the Fund
- FSB's expertise in regulation and supervision
- Specific EWE discussions with:
  - Market participants (key financial centers)
  - Academics & think tanks
  - Officials
- Ultimately, staff judgment

Macroprudential perspective

- Goals
  - Assess strengths and weaknesses of institutional models for macroprudential policy.
  - Provide guidance for countries who review the institutional arrangements supporting macroprudential policies.
- Fund work program
  - Will support Fund surveillance and technical assistance work.
  - Will contribute to the ongoing global debate on the development of macroprudential policy frameworks.
  - Is intended to feed the IMF input to the G-20 process.

3 main work streams

- Systemic Risk Monitoring
  - Can we measure systemic risk?
  - Reliability of current tools to measure systemic risk
  - Operational framework
- Macroprudential Toolkit
  - Instruments of macroprudential policy
  - How should they be used?
  - Ensuring policy effectiveness
- Governance and Coordination
  - Who should be the macroprudential authority?
  - Mandate, powers, and accountability
  - Domestic and international policy coordination

Systemic risk monitoring

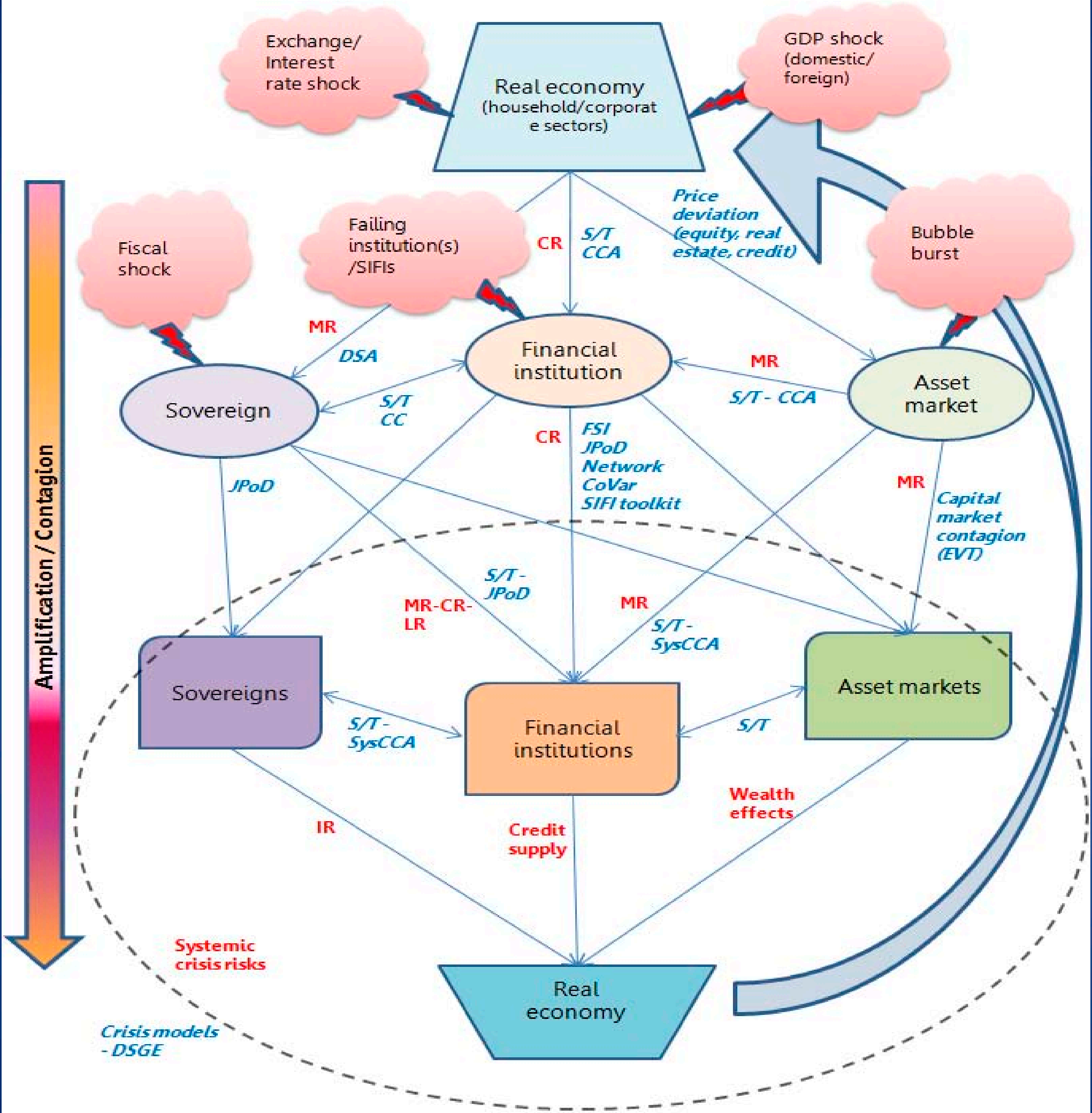
- Definition
  - Aim limit financial risk that originates within the financial sector, with the potential for severe adverse effects on financial intermediation and real output
- Components
  - All crises show different sources and transmissions of shocks
  - May be useful for analytical purposes to decompose
    - Buildup phase
    - Shock materialization
    - Amplification/propagation

Systemic risk monitoring

- Growing complexity.
  - Current crisis
- Risk measurement challenges
  - Potential for more complex and unpredictable scenarios (more difficult to "connect the dots")
  - Greater scope for non-linear impacts (e.g., through illiquid markets or institutions) and unstable correlation structures and behavioral relationships

Toolkit – Levels of focus

- Individual (or groups of) institutions, markets and countries.
  - E.g., market valuation tools
  - E.g., stress testing tools
- Risk transmission channels
  - Network models
  - Distress dependence models
- Whole financial system and economy
  - Crisis models (real and financial sectors)



Exchange/
Interest
rate shock
Real economy
(household/corporat
e sectors)
GDP shock
(domestic/
foreign)
Amplification / Contagion
Fiscal
shock
Failing
institution(s)
/SIFIs
CR
S/T
CCA
Price
deviation
(equity, real
estate, credit)
Bubble
burst
MR
DSA
Financial
institution
MR
S/T - CCA
Asset
market
Sovereign
S/T
CC
CR
FSI
JPoD
Network
CoVar
SIFI toolkit
JPoD
MR
Capital
market
contagion
(EVT)
S/T -
JPoD
MR-CR-
LR
MR
S/T -
SysCCA
Sovereigns
Asset markets
S/T -
SysCCA
Financial
institutions
S/T
Wealth
effects
IR
Credit
supply
Systemic
crisis risks
Real
economy
Crisis models
- DSGE

Toolkit – Types of risks

- Credit risk
- Liquidity risk
  - Market liquidity
  - Financial institutions'
- Market risk
  - Interest rate, exchange rate or asset price shocks
  - Aggregate measures of market volatility
- Spillover risk
  - Interconnectedness among financial institutions
  - Common exposures

Toolkit – Underlying methodology

- Single risk/soundness indicators
  - Indicators based on accounting balance sheet data
- Fundamentals-based models
  - Macroeconomic or accounting data
- Reduced form, market-based models
  - Can be based on high-frequency market data
- Hybrid, structural models
  - integrating accounting/balance sheet data, macroeconomic data, and market prices

Systemic risk dashboards

Aggregate measure	
Low Frequency	*High frequency*
Crisis risk models	Systemic CCA

Likelihood of shocks	
From asset quality/price deviation	
Low Frequency	*High frequency*
Credit/GDP deviation	Regime shifts in financial market volatility (e.g., interest rate, currency, and equity markets)
House prices	
From concentrations/connectedness	
Low Frequency	*High frequency*
Interbank exposures	Distress dependence (JPod, BSI)
Core/non-core liabilities (aggregate)	

Potential impacts	
Through balance sheet exposures	
Low Frequency	*High frequency*
Leverage measure	EDF measures for main SIFIs
Macro stress tests	
Through interconnectedness	
Low Frequency	*High frequency*
Network models	CCA-related measures of joint losses
Cross-border exposures of banking systems	

Managing expectations (1/2)…

- Incomplete toolkit.
  - Only partial coverage across risk, institutions,
- Early warning
  - The forward-looking properties of most systemic risk measures are weak
- Specific analytical challenges
  - Aggregation
  - Risk correlations
  - System's behavior
- Data issues
  - Obstacle to assessing systemic risk components

Managing expectations (2/2)…

- Eclecticism
  - Bring together complementary perspectives
- Role of judgment
  - No "all-in-one" tools for systemic risk assessment
- Building-blocks for a policy roadmap
  - Structure the thinking of policymakers or analysts about how to use the systemic risk monitoring toolkit
  - E.g., various time horizons associated with possible sequences in the build-up and materialization systemic risk