BANCO DE PORTUGAL
EUROSYSTEM

Macrostability:
Central Banks in Uncharted Territories

Annual Regional Seminar
on Financial Stability Issues

Building up new tools for monitoring systemic risks

The Portuguese Experience

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1) Systemic Risks

2) Tools for monitoring systemic risks and intermediate objectives of macroprudential policy – where do we stand?

3) Tools for monitoring systemic risks – Challenges ahead.

1) Systemic Risks - **Overview**

The financial crisis

- Risks arising from externalities and interconnectedness in the financial system.
- Supervisory model focused on the solvency of individual institutions was ill-suited to detect systemic risks.

Reforms in regulation and supervision

- Development of an institutional and operational framework for macro-prudential policy implementation.
- Basel III and the EU regulatory framework: define conditions for the implementation of a number of instruments for macro-prudential policy.
- ESRB: recommendations and analyses to guide macro-prudential policy implementation.

National context

- In Portugal, Banco de Portugal become the macro -prudential authority (2013).
- Banco de Portugal is responsible for defining a strategy and the appropriate instruments to prevent systemic risks.

1) Systemic Risks - **Definition**

"Risk that financial instability significantly impairs the provision of necessary financial products and services by the financial system to a point where economic growth and welfare may be materially affected"

(ECB, 2009).

1) Systemic Risks – **Sources of systemic risk**

- Macroeconomic shocks that are significant enough to cause distress in the financial system;
- Unwinding of imbalances in the financial system caused by excessive leverage;
- Contagion (intra-financial system, between sectors, between geographies), created by increasing interconnectedness and herd behavior.

2) Tools for monitoring systemic risks and intermediate objectives of macroprudential policy – where do we stand?

- Primary role of macroprudential policy – To identify tools, measure and mitigate systemic risk (time dimension; cross-sectional dimension; structural dimension)

- Intermediate objectives of macroprudential policy (ESRB):
  - Mitigate and prevent credit growth and leverage
  - Mitigate and prevent excessive maturity mismatch and market illiquidity
  - Limit direct and indirect concentration exposures (eg real estate sector; sovereigns; geographies)
  - Limit incentives for excessive risk-taking by systemically important institutions
  - Reduce and prevent fragilities related to asset quality and high level of indebtedness

2) Tools for monitoring systemic risks and intermediate objectives of macroprudential policy – where do we stand?

INDICATORS– 60

- Mitigate and prevent credit growth and leverage

IO#1 – Excessive credit growth and leverage
Total credit-to-GDP gap (percentage points)
Total credit annual growth rate (%)
Total credit-to-GDP ratio (%)
Households and debt service ratio (%)
Financial costs to EBITDA ratio (%)
Residential property price index (y-o-y rate of change, %)
New lending spreads households
New lending spreads non-financial corporations
Changes in credit standards for households: house purchase
Changes in credit standards for households: consumption and other purposes
Changes in credit standards for non-financial corporations

2) Tools for monitoring systemic risks and intermediate objectives of macroprudential policy – where do we stand?

INDICATORS– 60

- Mitigate and prevent excessive maturity mismatch and market illiquidity

IO#2 – Maturity mismatch and liquidity
Loans to deposits ratio (%)
Liquidity gaps
1 month
3 months
12 months
Short-term wholesale funding (as a % of total assets)
Central bank funding (as a % of total assets)
Assets eligible as collateral for lending operations (as a % of Eurosystem funding)
Spread on new deposits (non-financial private sector, basis points)
Financial market liquidity indicator: Composite indicator (euro area)

2) Tools for monitoring systemic risks and intermediate objectives of macroprudential policy – where do we stand?

INDICATORS– 60

- Limit direct and indirect concentration exposures

IO#3 – Exposure concentration
Banking sector
Credit (as a % of total assets)
Loans to households and non-financial corporations (as a % of total assets)
Cross border loans to all sectors (as a % of total assets)
Holding of non-financial corporations' bonds (as a % of total assets)
Equity exposures to non-financial corporations (as a % of total assets)
Exposure to the general government sector (as a % of total assets)
Intra-financial system loans and liabilities (as a %)
Insurance and pension funds sector
Exposure to the general government sector (as a % of total assets)
Exposure to the banking sector (as a % of total assets)
Investment funds sector
Exposure to the general government sector (as a % of total assets)
Exposure to the banking sector (as a % of total assets)

2) Tools for monitoring systemic risks and intermediate objectives of macroprudential policy – where do we stand?

INDICATORS– 60

- Limit incentives for excessive risk-taking by systematically important institutions

IO#4 – Misaligned incentives
Banking sector
Size – Total assets to GDP ratio (%)
Leverage – Total assets to total equity ratio
Concentration/substitutability measured by HHI in assets (normalized index)
Complexity – Gross market values of OTC options as a percentage (%) of total derivatives (notional value)
Exposure to home sovereign – Domestic government bonds held by domestic banks on a consolidated basis (as a % total public debt)
Other financial institutions and shadow banking
Size – Ratio between total assets in shadow banking and total assets in the banking system (%)
Shift from banking to non-banking – Ratio between loans extended by OFIs and loans extended by OMFI

2) Tools for monitoring systemic risks and intermediate objectives of macroprudential policy – where do we stand?

INDICATORS– 60

- Backward-looking
- Data
    - Quantitative – FINREP/COREP; Statistics (Monetary/Financial; National Accounts; Balance of Payments); Micro-data
    - Qualitative – Other micro-supervisory authorities; Industry associations; Market intelligence, International fora
- Insufficient information about the real estate market (prices, LTV, LTI: work in progress)

2) Tools for monitoring systemic risks and intermediate objectives of macroprudential policy – where do we stand?

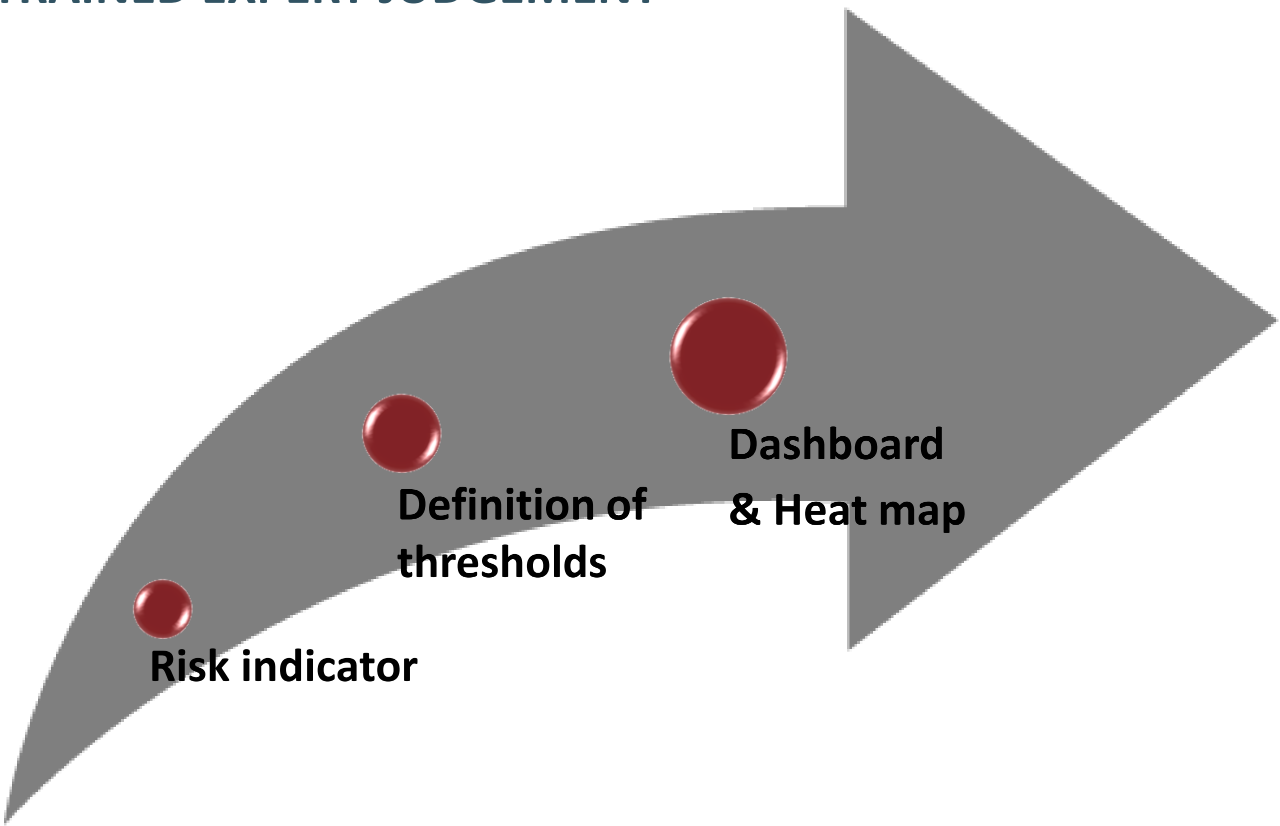
INDICATORS– 60

From risk indicators to

- Composite indexes
- Heat maps

2) Tools for monitoring systemic risks and intermediate objectives of macroprudential policy – where do we stand?

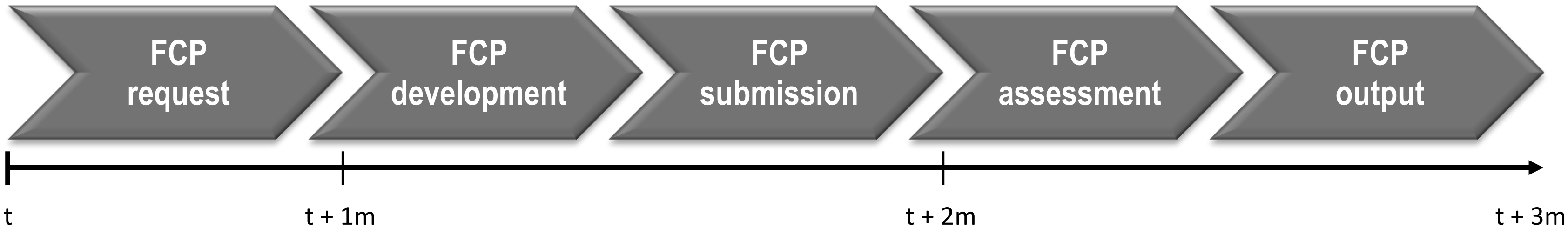
CONSTRAINED EXPERT JUDGEMENT



2) Tools for monitoring systemic risks and intermediate objectives of macroprudential policy – where do we stand?

FUNDING AND CAPITAL PLANS / STRESS TESTS

- The FCPs are submitted by all Portuguese banks to Banco de Portugal
- Contain detailed historical and prospective accounting and prudential information concerning solvency, liquidity and profitability (overall strategies pursued in a 3 year time horizon)
- Built over macro scenarios and guidelines, which allow for full consistency among institutions
- The FCPs are dynamic in the sense that according to the juncture in a given point in time new information or further detail on existing information can be added to the request to banks.
- During the Adjustment Programme, FCPs were submitted by banks on a quarterly basis:



2) Tools for monitoring systemic risks and intermediate objectives of macroprudential policy – where do we stand?

FUNDING AND CAPITAL PLANS / STRESS TESTS

The analysis of the FCPs allow for:

- Deeper understanding of the overall strategies of the institutions and of the overall adjusting path of the banking sector.
- A solid basis for challenging the management of each bank in what regards the strategies on solvency, liquidity and profitability.
- Identifying outliers with deviant behaviours from the sector average, which could have systemic implications.
- Identifying future expected common behaviours which, considered on an aggregated basis, could constitute a looming risk in the sector/economy.
- Checking the consistency of the expected evolution of key aggregates (credit, deposits) with the macro scenario (inconsistency might lead to a change in the estimates of the institutions).

Model for the Assessment of Profitability and Solvency (MAPS)

Economic Research Department
Forecasts (M-model)

Credit and deposits
Domestic activity

Scenario design
Adverse (and Baseline)

Banks' bottom-up submissions
3-year horizon Stress Test (ST)

Balance Sheet

Assets	Liabilities
Interbank assets	Interbank liabilities
Credit	Customer funding
Credit impairments	Eurosystem refinancing
Securities	Securities issued
Other assets	Other liabilities
	Capital

Note: dashed items are not impacted in MAPS.

ECB = Slack variable s.t. collateral availability | **Cumulative earnings** | **Cumulative impairments**

P&L *(these shocks refer to domestic activity only)*

Item	Assumption
Net interest income	Model-based projection for **interest rates**; **Average volumes** projected with M-model
Income from securities; Net commission income; Results on financial ops	Fixed percentage rate of average total assets (set at the minimum annual value since 2010)
Operating costs	Fixed percentage rate of average total assets (last known value)
Credit impairments	Model-based projection
Taxes on income	Implicit tax rate (ST)
Minority interests	Implicit rate (ST)
Net income	*Summation item*

Note: only P&L items impacted by MAPS are exhibited.

100% new non-performing loans (NPL) removed from NII

Own Funds
CRR/CRD IV

Common Equity Tier 1 (CET1) **capital**

Impacts transmitted via:

- **Retained Earnings**

Risk Weighted Assets (RWA)

Impacts transmitted via:

- **Exposures-at-default (EAD)** (volume)
  - Consistent with BS and P&L
- **Risk weights (RW)** (price)
  - *IRB* formula, with credit risk parameters estimated by BdP, adjusted by *scaling factor*[2]
  - *LGDs are* assumed constant
  - RW floor (set at last known value)

[2] described in IMF's Working Paper WP/11/83

CET1 ratio (MAPS)
Transitional provisions and full implementation

For international activity, 30% impact on net interest income and credit impairments, vis-à-vis the FCP

3) Tools for monitoring systemic risks – Challenges ahead.

FrameWork

- Guiding principles of macroprudential policy (V. Constâncio, ECB, 2016)
  - Macroprudential policy should be pre-emptive and strongly counter-cyclical (early identification of risks is essential, supported by early warning indicators and models).
  - Macroprudential policy should rely on the concept of the financial cycle (*vs* business cycle).
  - The real estate component in the financial cycle is of paramount importance (lender-based and borrower-based).
  - Stress tests of the banking and financial system must have a macroprudential dimension.
  - Macroprudential policy is complementary to monetary policy and should share the same status as a policy area.
  - Macroprudential policy should go beyond the banking sector and encompass market-based financial institutions and products.

3) Tools for monitoring systemic risks – Challenges ahead.

Work in Progress

- What to do in a downturn – Preventive versus corrective measures.
- Top-down versus bottom-up monitoring (macro *vs* micro monitoring)
- Institution-based versus activity-based tools.
- Macroprudential stress-tests: (ECB,2016)
    - Dynamic approach that includes banks' reaction to the scenarios
    - Comprehensive two-way interaction between banks and the real economy
    - Assessment of contagion effects stemming from interconnectedness among financial institutions, including non-banks;
    - Analysis of the interaction with other non-financial sectors.
- Banking digitalization and Fintechs.

Questions?

Thank you for your attention