EUROPEAN CENTRAL BANK

EUROSYSTEM

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Main advances in macro modelling for monetary policy preparation at the ECB

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** The views expressed in this presentation are those of the presenter and do not necessarily reflect those of the ECB or the Eurosystem.*

A Modelling challenges in post crisis environment

B Addressing the modelling challenges

C ECB modelling portfolio for monetary policy preparation: a multi-pronged strategy

A **Modelling challenges in post crisis environment**

B Addressing the modelling challenges

C ECB modelling portfolio for monetary policy preparation: a multi-pronged strategy

Modelling for monetary policy preparation at the ECB after the crises

- The financial and sovereign debt crises have posed **challenges to the economic and econometric models** that had been predominantly used in the economics profession, with the ECB being no exception.

- All central banks have been affected by the near **absence of financial markets** in aggregate models of the economy and the separation between economic and financial econometric models, i.e. the **neglect of macro-financial linkages**.

- Over recent years, there have been substantial modelling efforts at the ECB to **adapt or develop models** by incorporating:

  - a variety of financial channels and frictions
  - more granularity in terms of sectors and agents
  - interactions among a number of policy tools
  - multi-country dimension

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One or many models?

- No aspiration to build a model that includes everything
- Need for continuity in the assessment while keeping changing and including new channels and frictions
- Resonance or dissonance between academic research and modelling at policy institutions?

Academic research	Policy modelling
Simple and stylised	Realistic and granular
Deep theoretical foundations	Robust to structural uncertainty
Original and strong policy prescriptions	Continuity and consistency with policy paradigm

- **ECB approach**: develop and maintain a portfolio of **MAIN** model(s) interacting with a range of **SATELLITE** models

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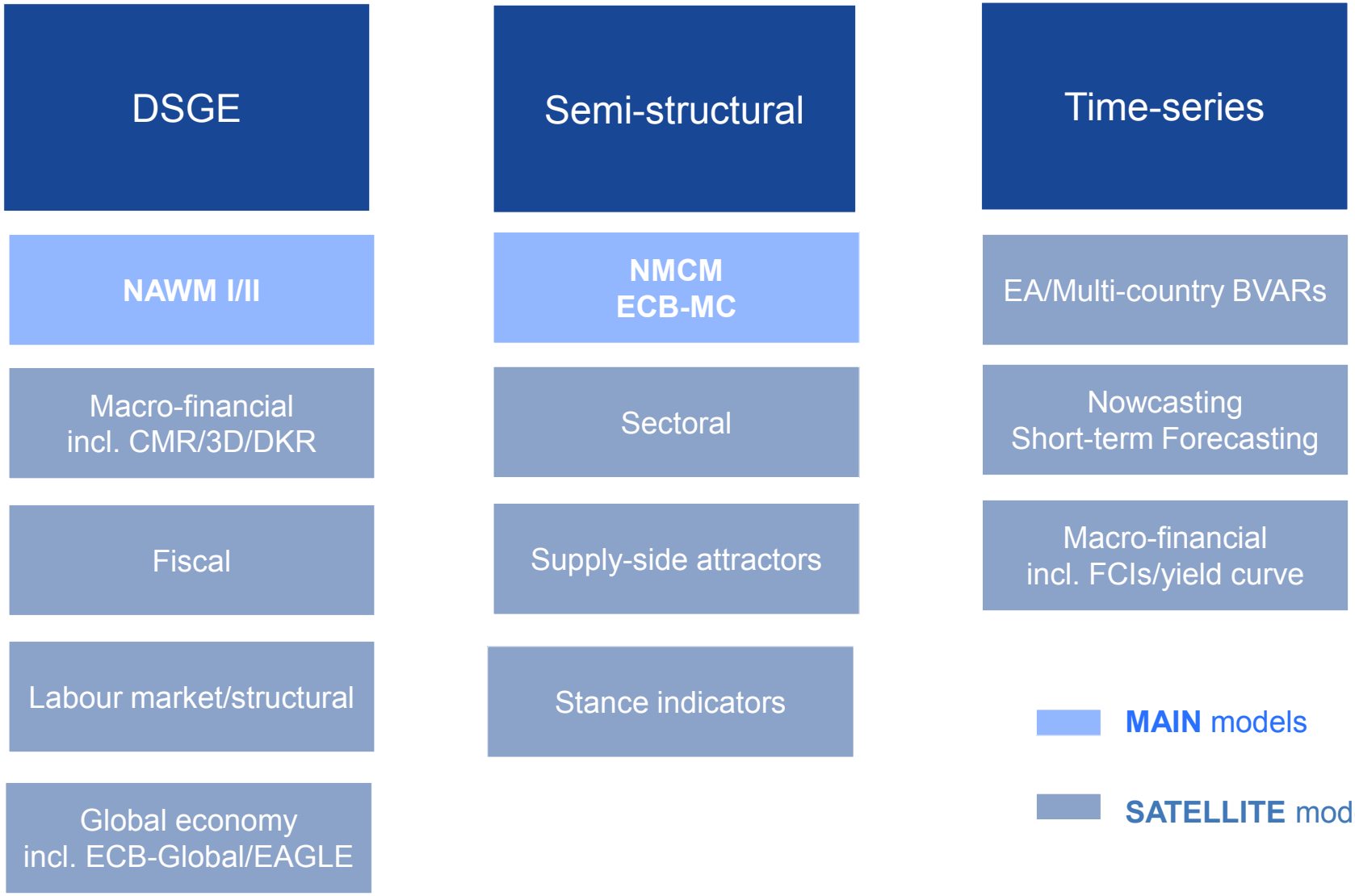
ECB modelling portfolio for monetary policy preparation



ECB modelling portfolio for monetary policy preparation

DSGE	Semi-structural	Time-series
NAWM I/II	**NMCM** **ECB-MC**	EA/Multi-country BVARs
Macro-financial incl. CMR/3D/DKR	Sectoral	Nowcasting Short-term Forecasting
Fiscal	Supply-side attractors	Macro-financial incl. FCIs/yield curve
Labour market/structural	Stance indicators	
Global economy incl. ECB-Global/EAGLE		

MAIN models

SATELLITE models

MAIN models: Adaptation of NAWM I

- Introduction of a long-term rate and a lending rate
  - long-term rate via expectation theory
  - lending rate as combination of short- and long-term rate
- Indirect approach to non-standard monetary (NSM) policy:
  - use of satellite models to evaluate impact of NSM on various interest rates
  - simulation of these rate changes in NAWM I
- Scenario and risk analysis at the effective lower bound on interest rates:
  - various forms of forward guidance
  - deflation and recession probabilities based on model's predictive distributions
  - imperfect credibility and de-anchoring of inflation expectations

MAIN models: Development of the NAWM II

- The NAWM II now features a rich financial intermediary sector:
  - permits to study how shocks originating in the financial sector transmit to the real economy and contribute to business-cycle fluctuations
  - accounts for the prominent role of bank lending rates in the transmission of monetary policy operations
  - allows non-standard monetary policy measures – including large scale asset purchase programmes – to have a meaningful role in affecting the economy
- The NAWM II is at the stage of completion and currently being integrated in the monetary policy preparation process.

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MAIN models

SATELLITE models

MAIN models: The new multi-country model -- NMCM

- The NMCM is a multi-country model, with five country blocks (DE, ES, FR, and NL) linked via trade, common monetary policy and common exchange rate
- The institutional framework of the ECB's forecasting process:
  - bottom-up approach: **individual country forecasts**
  - ECB (Mar. and Sept.) and NCB staff (Jun. and Dec)
  - forecasts conditional on technical assumptions based on satellite models
  - judgmental forecasts
- The financial and sovereign debt crises further revealed the importance of the **country dimension** and the benefits of **flexible semi-structural models**.
- In response to the crises, the existing NMCM was re-estimated and partly adapted, before a decision was taken to more fundamentally revamp the ECB's multi-country modelling.

MAIN models: Development of a new multi-country model -- ECB-MC

- The main goals in developing a new version of the multi-country model:
  - taking into account the **multi-country dimension**, also on the financial side
  - accounting for **multiple channels** of monetary policy transmission and featuring a realistic magnitude and articulation of the transmission of shocks
  - good **forecasting performance**
  - adaptable **user-friendly** model & infrastructure (main forecasting model)
- A semi-structural approach along the lines of FRB-US:
  - **theory-based** but **less stringent** than a DSGE model
  - **good empirical fit**, with empirical regularities matched in a reliable way
  - **flexible framework**: more granularity in the coverage of variables; more straight-forward to include multi-country dimension; easier to link with other in-house tools, new mechanism can be introduced more swiftly

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MAIN models

SATELLITE models

SATELLITE models: Time-series benchmarks for forecasting and policy counterfactuals

- Enhance the suite of time-series models for the euro area and for the large euro area countries:
  - BVARs for cross-checking the official economic projections along selected conditional dimensions
  - providing time-series benchmarks on sectoral and cross-country regularities for the semi-structural models (ECB-MC)
  - nowcasting and short-term forecasting frameworks
- Enrich the suite of models by incorporating transmission channels to assess the impact of non-standard monetary policy measures NSMs:
  - refining and broadening the set of identification strategies for NSMs in (B)VAR analysis
- Account for non-linearity in macroeconomic propagation as well as uncer-tainty in long-term attractors :
  - non-linear/TVP time-series framework for sectoral and risks analysis

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MAIN models

SATELLITE models

SATELLITE models: DSGE models to assess MP and financial policy interactions

- Estimated/calibrated models with both **demand and supply-side credit frictions**, based on "first principles" in macro but major deviations from pre-crisis paradigm:
  - bank capital channel, incentives for excessive credit and regulatory constraints
  - sovereign-banking nexus and funding access of banks
  - credit frictions for both households and firms
  - default as a credible characterization of financial instability, not only for banks but also non-financial corporations and households ("3D")
  - both for euro area and multi-country settings

- Those models can provide a monetary policy perspective on **regulatory, supervisory and macroprudential** interventions
  - transitional costs of higher bank capital ratios through the euro area: Bank deleveraging process which adversely constrained the provision of credit
  - long-term cost and benefits of capital regulation:
    - risk-sensitivity of bank liabilities
    - fiscal consequences of bank fragility
  - strategic complementarities between MP and MaPru (capital versus asset based, untargeted versus targeted)

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