WORKSHOP 3 Portfolio risk modeling: progress, major obstacles

Portfolio risk modelling in Poland

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Forecasting general government debt

- State Treasury – managed by the Minister of Finance
- Other public finance sector units, independent or autonomous in drawing liabilities (local governments, state agencies, funds, social security, health care units etc.)
Minister of Finance – responsible for ensuring that public debt to GDP ratio does not exceed the 60% constitutional limit

Public Debt Department – organizational unit in MoF, with double role:
- participates in fiscal policy (supporting role in decisions on borrowing requirements)
- finances the borrowing requirements (DMO)

Need for multiannual debt forecasts encompassing:
- coherent macroeconomic and budgetary assumptions
- State Treasury debt – as a result of borrowing by the MoF
- other public sector debt (increasing role) and inter-linkages

Current model in use since 2008, constantly developed
### PDP – technical aspects

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- Excel spreadsheet with VBA, developed in-house (1 dedicated employee)
- Functionally integrated with database of existing debt (both State Treasury and other public sector) and transactional model for planning the borrowing needs of State budget – easy automatic user-specified updates
- Inputs: macroeconomic, fiscal (by groups of entities)
- Historical time series
- Explicit decision parameters (assumptions)
- Determinants of debt volume - template for all groups of entities, with customisation to reflect particular patterns (consolidation, deficit/surplus local governments, legal requirements)
- Outputs: system of standard exportable reports
- Back-ups and versions
PDP – use in decision making

- Official forecasts of public debt (Polish and EU methodology)
  - public debt management strategy and justification of draft budget act
  - multi-annual financial plan
  - update of the Convergence Program (to the European Commission)
- Working forecasts
  - overviews of fiscal policies (support for decisions by MoF and Council of Ministries)
  - possibility of triggering debt rules (50%, 55%, 60%, Maastricht 60%)
  - what-if analyses (sensitivity to changes in macroeconomic and budgetary assumptions)
- Analysis of factors influencing changes in debt volume and structure
## PDP – plans for further development

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- New mechanisms in public finance need regular upgrades of model architecture
  - latest: consolidation of liquidity management on the central government level
  - spreadsheet format – allows for flexibility
- Possible upgrades in dealing with historical and planned values
- Addressing operational risk
  - now: 1 person grasping the model in full (upgrades, fixing technical problems) with one additional advanced user (including simple upgrades and fixes), basic documentation
  - planned: 2 people grasping the model in full, extended documentation
Cost and risk profile of State Treasury debt

- Impact on debt volume and structure, debt servicing costs and risk parameters of:
  - various financing instrument structures (strategies)
  - under different budgetary and market assumptions (scenarios)
- Simulations of cost vs. risk efficient frontiers
MDM – historical development

- **Objective of the Strategy:** long term minimisation of debt servicing costs subject to risk constraints
  - Need to translate to operational level - quantitative targets
  - Cost vs. risk efficient frontiers
- **Inspiration for the model:** World Bank seminar on modelling the risk of a sovereign debt portfolio
- First version in 2003
- Since then: two major upgrades with a number of minor changes
Excel spreadsheets with VBA, developed in-house (1 employee, part time)
Scope: domestic currency debt (70-80% of total State Treasury)
Deterministic – market variables derived from economic „stories” designed by a user, not generated by a stochastic process
Main criteria:
- Cost – present value of all future costs on cash basis
- Risk – ATM (refinancing), duration, ATR (interest rate)
Long term (10 years of financing, costs „till the end of the world”)
Automatic generation of:
- feeds from database of existing debt
- feasible financing strategies (subject to user-defined constraints)
- output – summary of results for all strategies under all market scanarios
MDM – use in decision making

**MODEL**

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- **Original ambition**: support in decision-making on instrument structure of debt – a tool for designing an „optimal” benchmark portfolio
- **Actual use** (yearly updates of the Strategy):
  - 80-200 financing structures under 3-5 market scenarios analysed
  - Designing quantitative risk constraints (ATM, duration)
  - Forecasts of risk parameters (ATM, duration)
  - Qualitative indications for instrument structure
  - Better understanding of market constraints
  - What-if simulations: better understanding of what would be „optimal” under different market scenarios („stories”)
- MDM serves as a tool to define risk constraints while cost minimisation is what happens during the year in changing market environment
MDM – plans for further development

- Improving documentation - reducing operational risk
- Stochastic?
- Foreign currencies?
THANK YOU...