

# CaR Modelling in OECD countries

*Some observations on Trends and  
Developments*

*Myrvin L Anthony*

*Sovereign Debt Management Forum, 23<sup>rd</sup> October,  
2006*



# Overview of Presentation

- Context
- Trends in the use of CaR modelling in OECD countries.
- How are CaR models used in practice.
- What can we learn from the use of CaR modelling in OECD countries.
- Concluding comments



# Context

- The debt management object is (generically) stated as:
  - “the minimisation of long-term debt cost, taking account of risk”;
  - Example, UK debt management objective:
    - “to minimise, over the long term, the costs of meeting the Government’s financing needs, taking into account risk,.....”

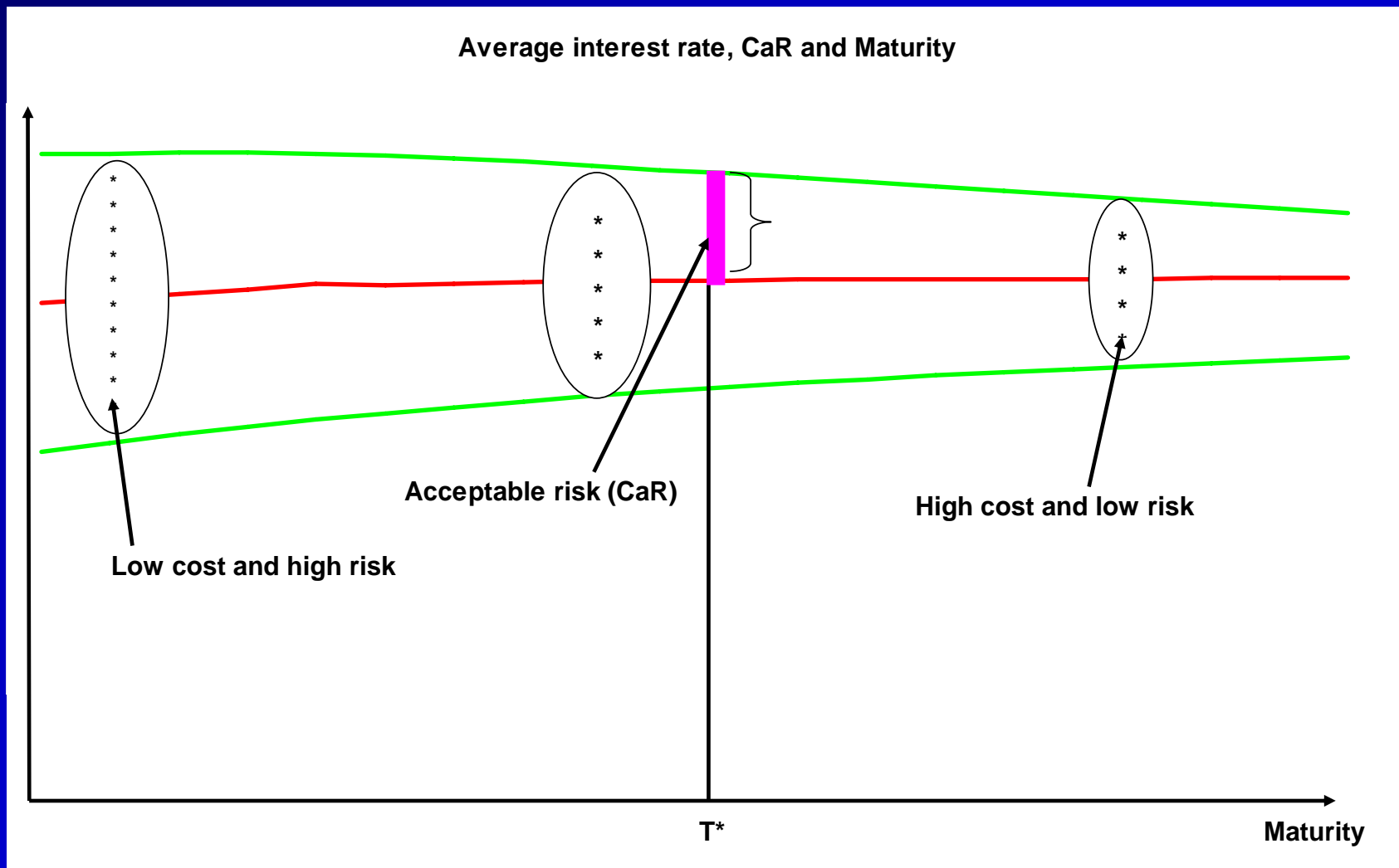


# Context

- The government has a range of debt instruments:
  - Nominal bonds with a range of maturities;
  - Inflation-linked bonds;
  - Foreign currency bonds.
- These instruments have different cost-risk characteristics.
- The combination of instruments should be chosen that satisfies the Government's cost-risk preference.



# Context - illustration



# Context

- Debt managers need to assess cost-risk characteristics/trade-off of instrument combinations.
- Build analytical tools to help do this.

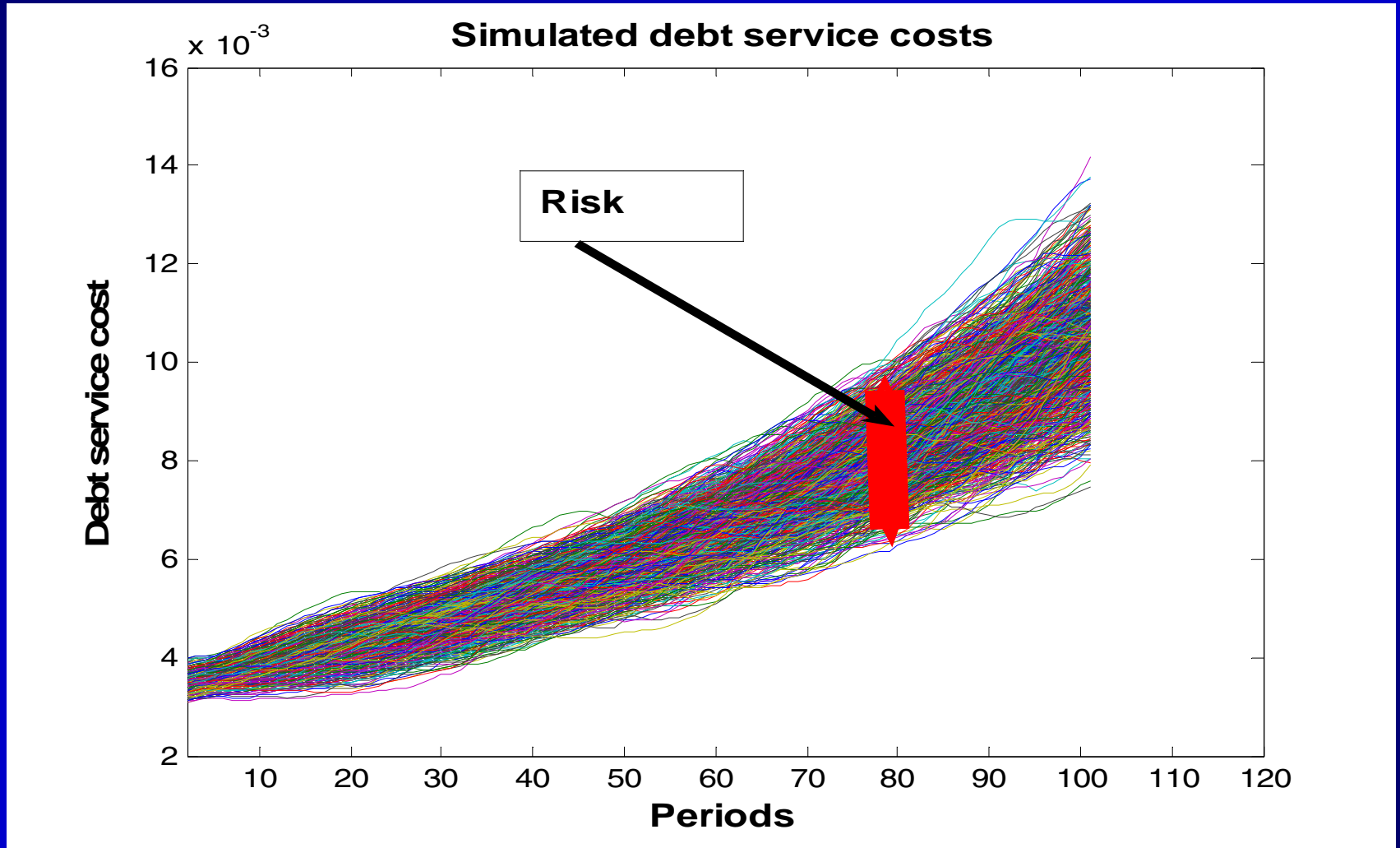


# Trends in the use of CaR Modelling

- The focus is on CaR models that are stochastic debt strategy simulation (SDSS) models:
  - Debt service costs/charges for different debt strategies are stochastically simulated over a given time-horizon;
  - The per-period debt cost distributions are analysed to assess the expected cost and risk characteristics or trade-off of the different debt strategies.



# Trends in the use of CaR Modelling



# Trends in the use of CaR Modelling

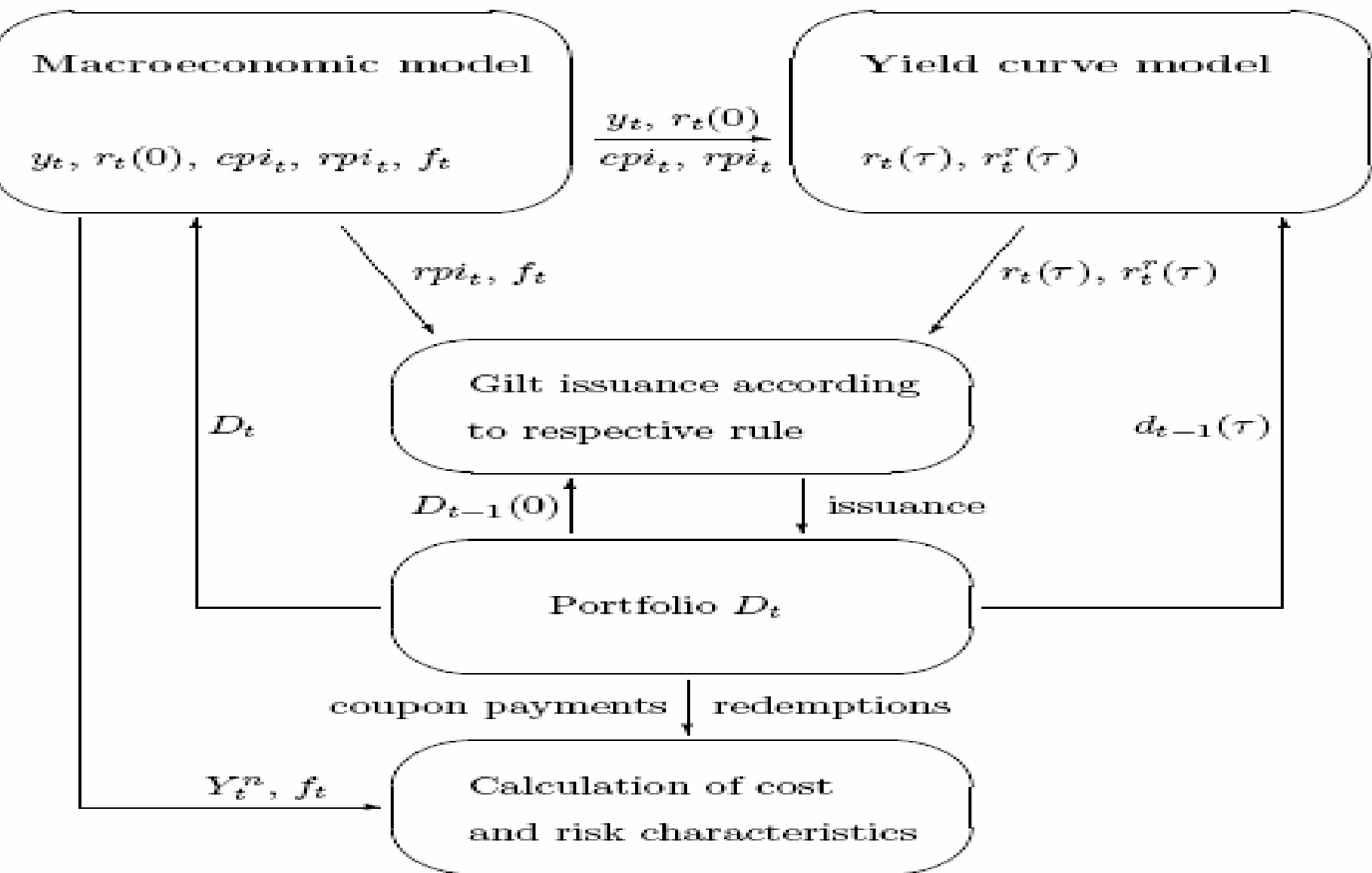
- (1) More OECD members have developed or are developing CaR models as part of their debt management strategy framework.
  - Not always straightforward to detect because:
    - Not all debt managers' models are made public.
- (2) New generation models are incorporating recent developments in the finance literature:
  - First-generation models are being improved;
  - Newcomers are taking advantage of advances in the literature.



# Trends in the use of CaR Modelling

- (3) CaR models are mainly developed in-house;
- (4) CaR models take two broad forms:
  - Deterministic scenarios of primary budget position combined with stochastic simulation of interest rates;
  - Full stochastic environment that also includes a model of the economy.





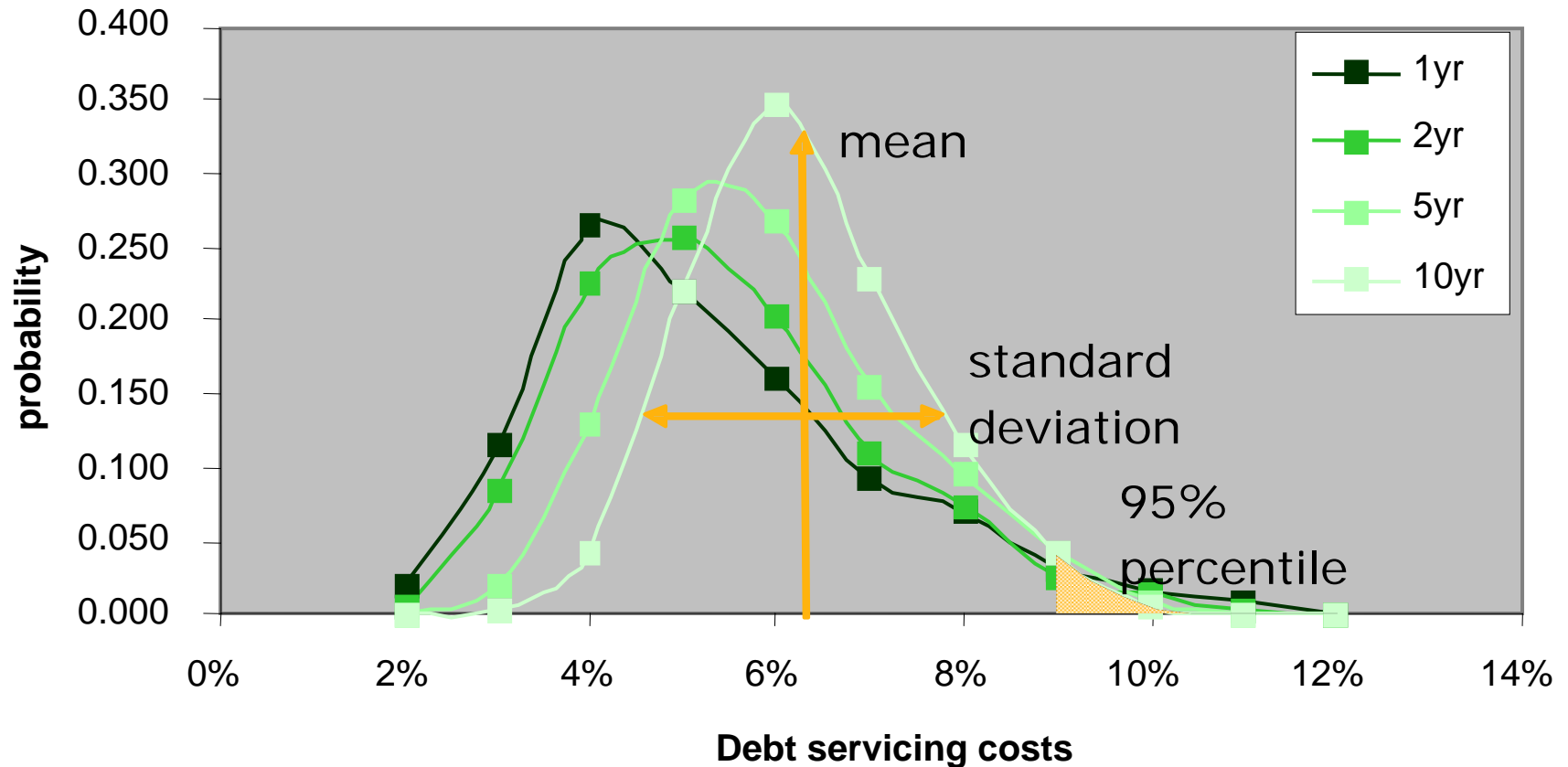
# Trends in the use of CaR Modelling

(5) Models primarily focused on interest rate risk:

- Measure interest rate risk in a variety of ways, but mainly use percentile measures of risk – e.g. absolute CaR, relative CaR, tail CaR, conditional CaR (see Bolder 2003).
- Present simulated risk profiles over a range of time horizons.



# Trends in the use of CaR Modelling

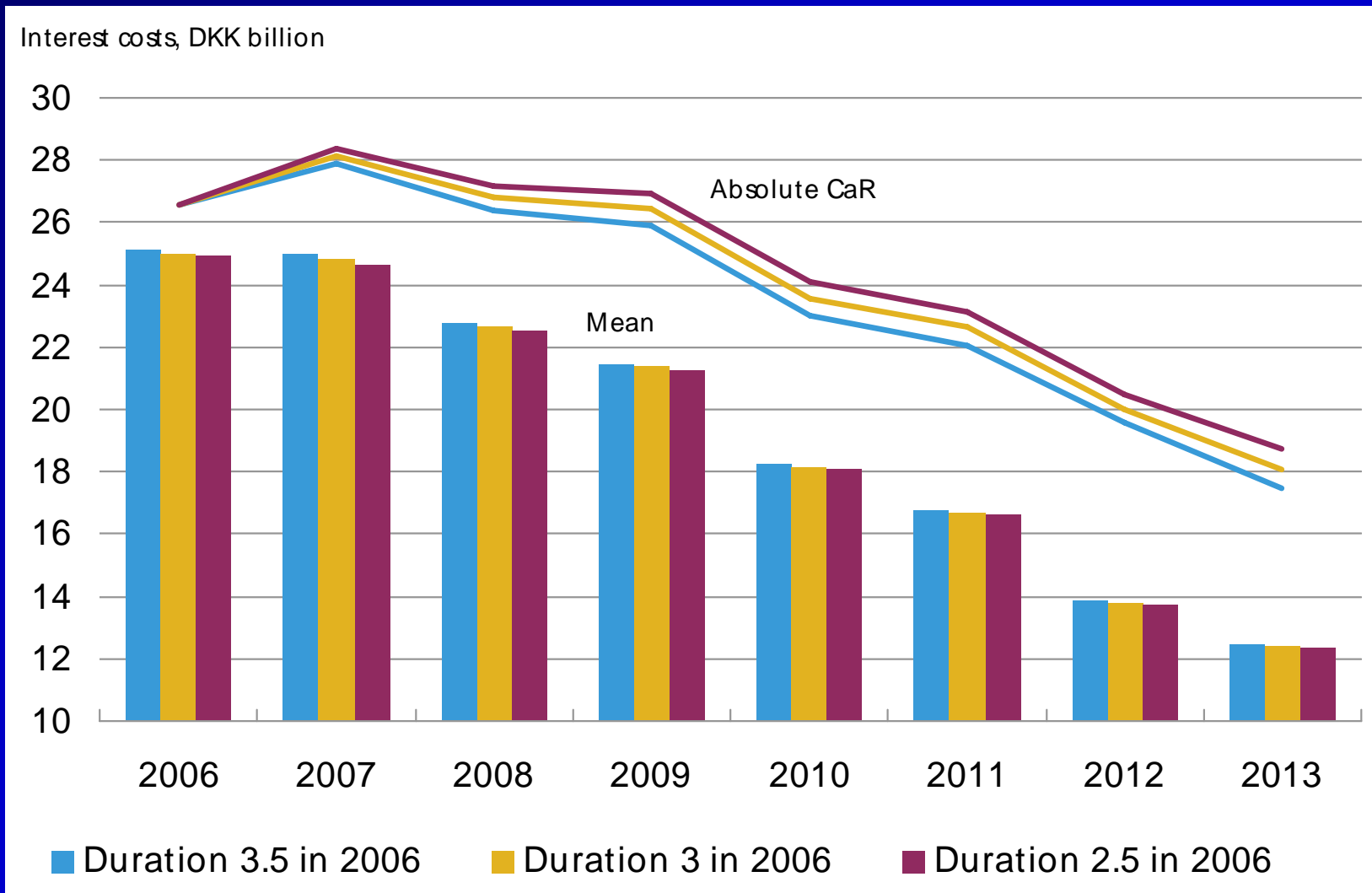


## CaR models in practice

- CaR models are useful tools in the Debt managers' risk management toolkit :
  - They help to complement qualitative judgements in formulating and explaining the debt strategy;
  - Support the choice of benchmarks used to manage the debt;
  - Support performance management /reporting.



# CaR models in practice



# Lessons from use of CaR models

- CaR models are not used as “black boxes” spitting out answers:
  - The results are largely a function of the assumptions made in the model.
  - Therefore assumptions ought to be realistic.
  - Since they help to complement qualitative judgements in formulating and explaining the debt strategy they are not substitutes for that judgement;
  - They help to make the difficult task of explaining debt strategies easier.



# Lessons from use of CaR models

- CaR models should be robust, but not overly ambitious:
  - Should be fit for purpose and consistent with the environment in which the debt is to be managed; and
  - Should only contain as much complexity as is necessary to answer sensibly the questions being investigated.



# Concluding comments

- More OECD countries are using/developing CaR models:
  - Useful tool in debt management strategy formulation;
  - Helps to complement sound judgement and qualitative arguments;
  - No “black-box” approach in its usage;
  - CaR Modelling is taking advantage of advances in finance literature;
  - Models are rigorous but remain tractable.

