Practical experience with BEQM

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Bank of England
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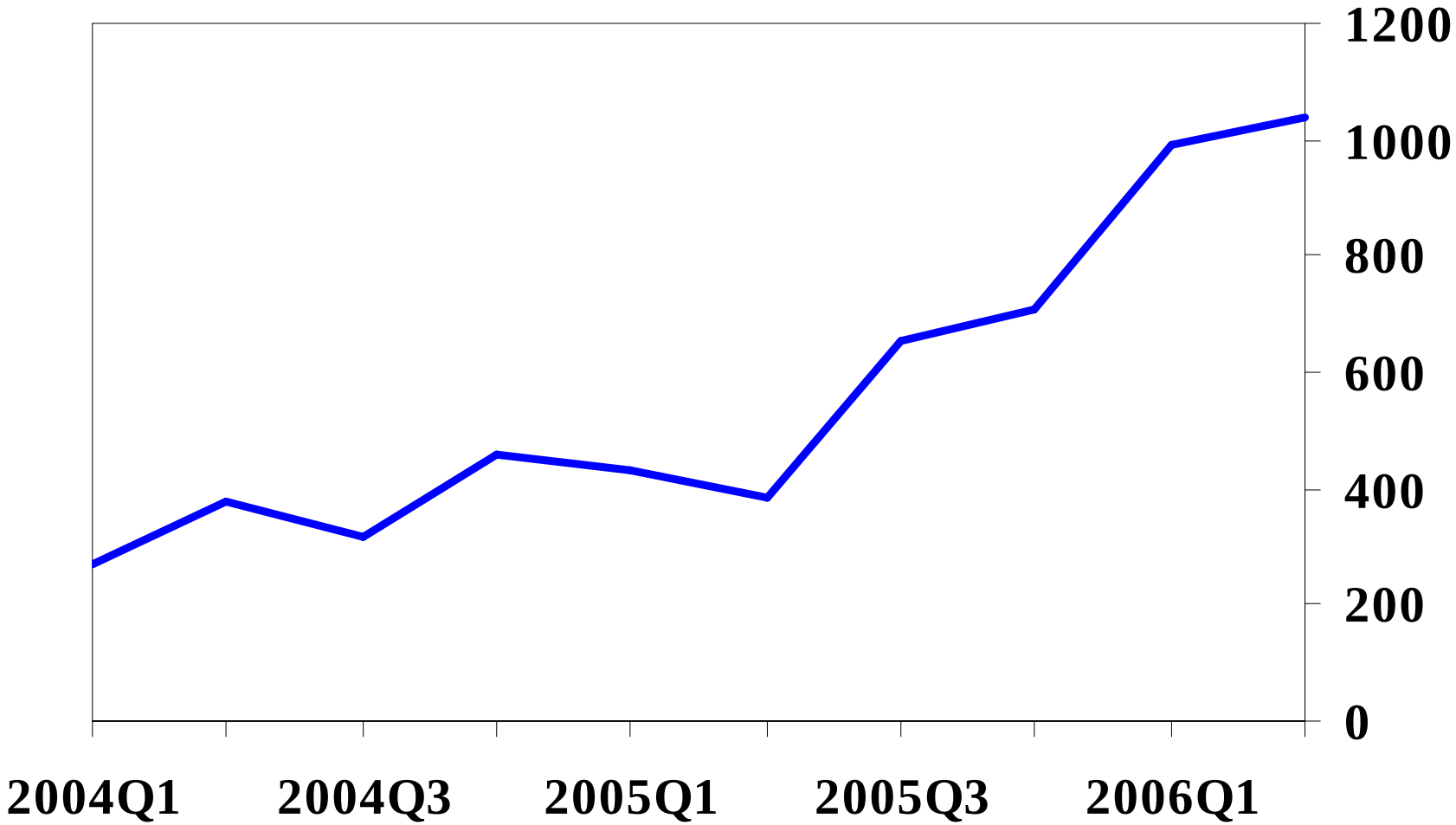
Model runs per forecast round



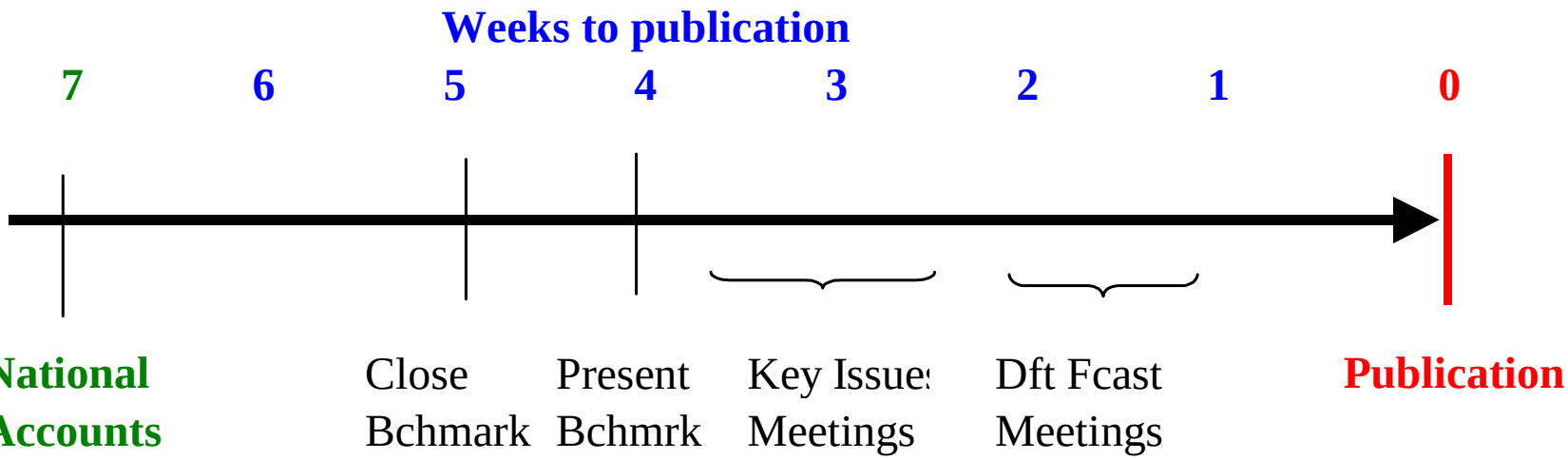
Outline

- Institutional context
- Model description
- Manipulating expectations
- Story telling
- Core / Non-core interaction
- Lessons

Context

- MPC collectively, rather than staff, own the forecast
- But each member individually responsible
- So the model is crucial
  - Matching the data
  - Story telling
  - Repository of judgement

The forecast process : timetable

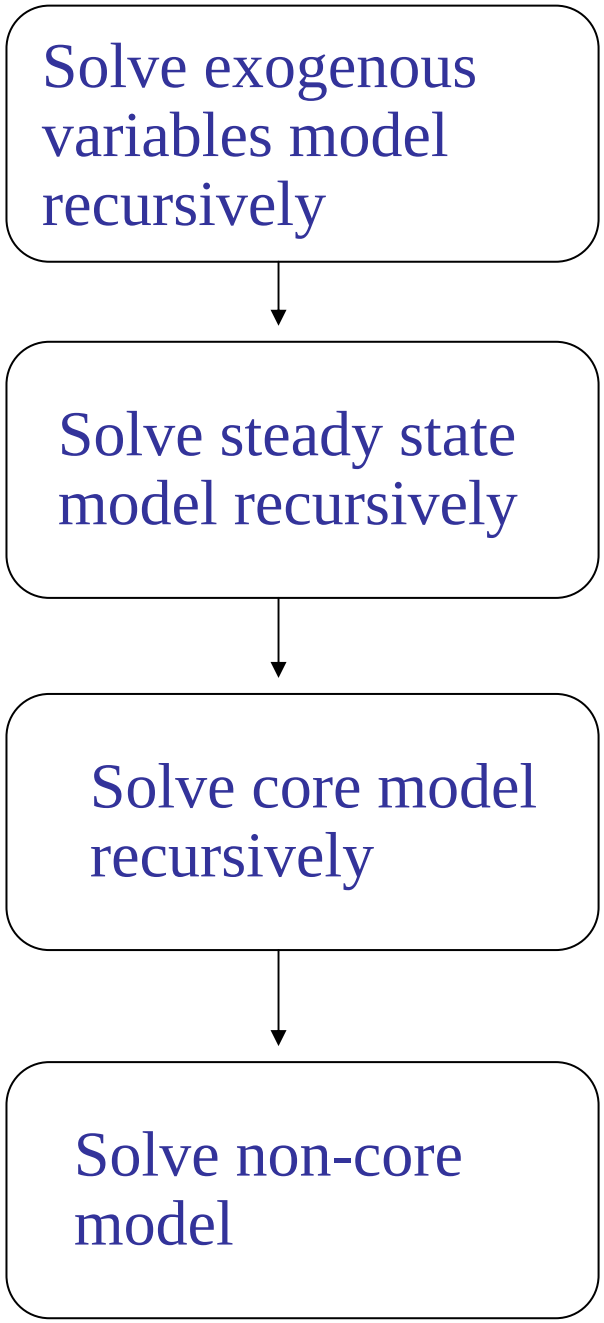


Key Features of BEQM

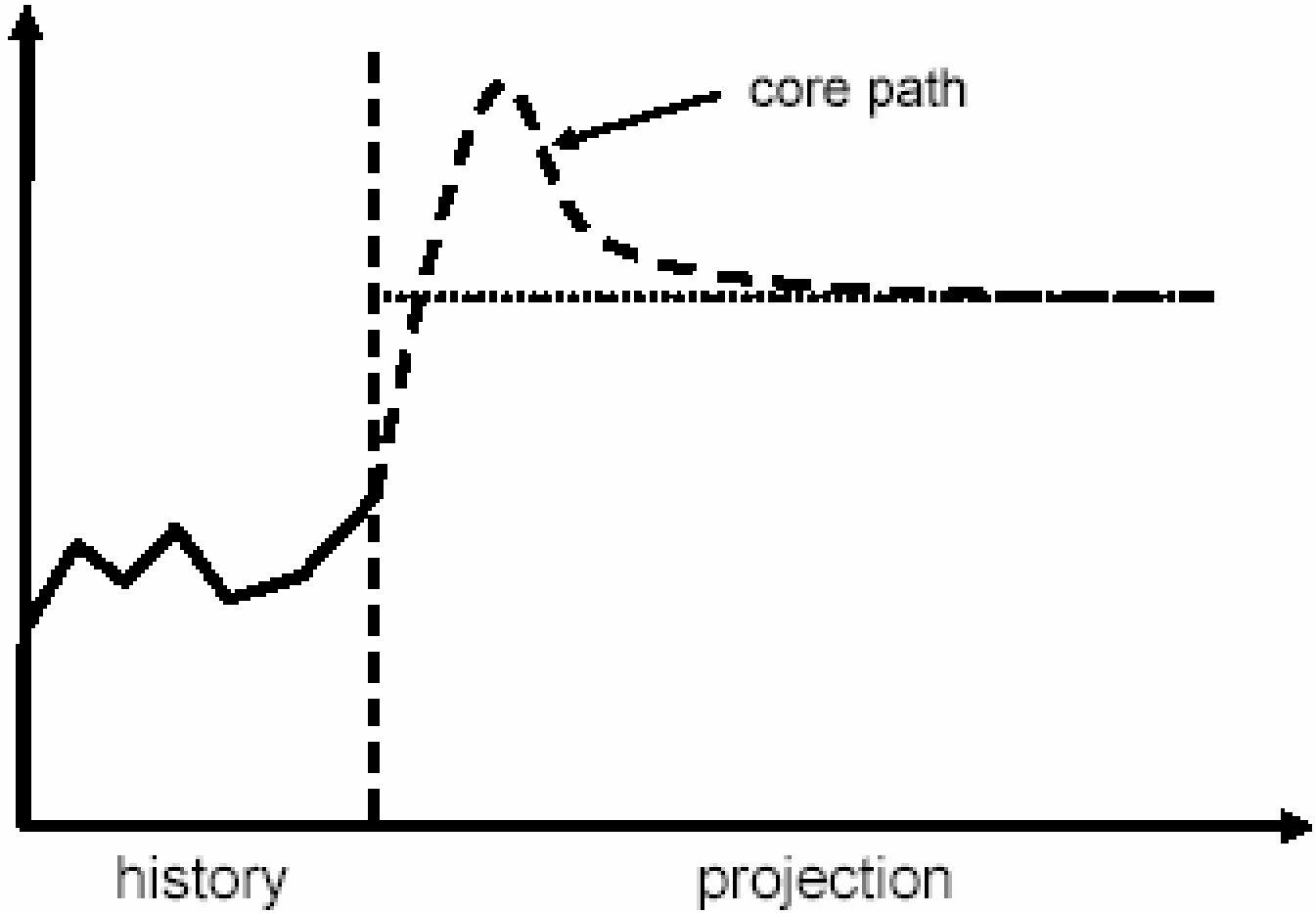
- A partitioned model
- “Core” and “Non-Core” components
- Core is a theory-consistent dynamic general equilibrium model
- Non-core is an ad-hoc ECM model around the core model
  - Additional layer for proxies and judgement
  - Does NOT ‘feed back’ into core model

Key Features of BEQM

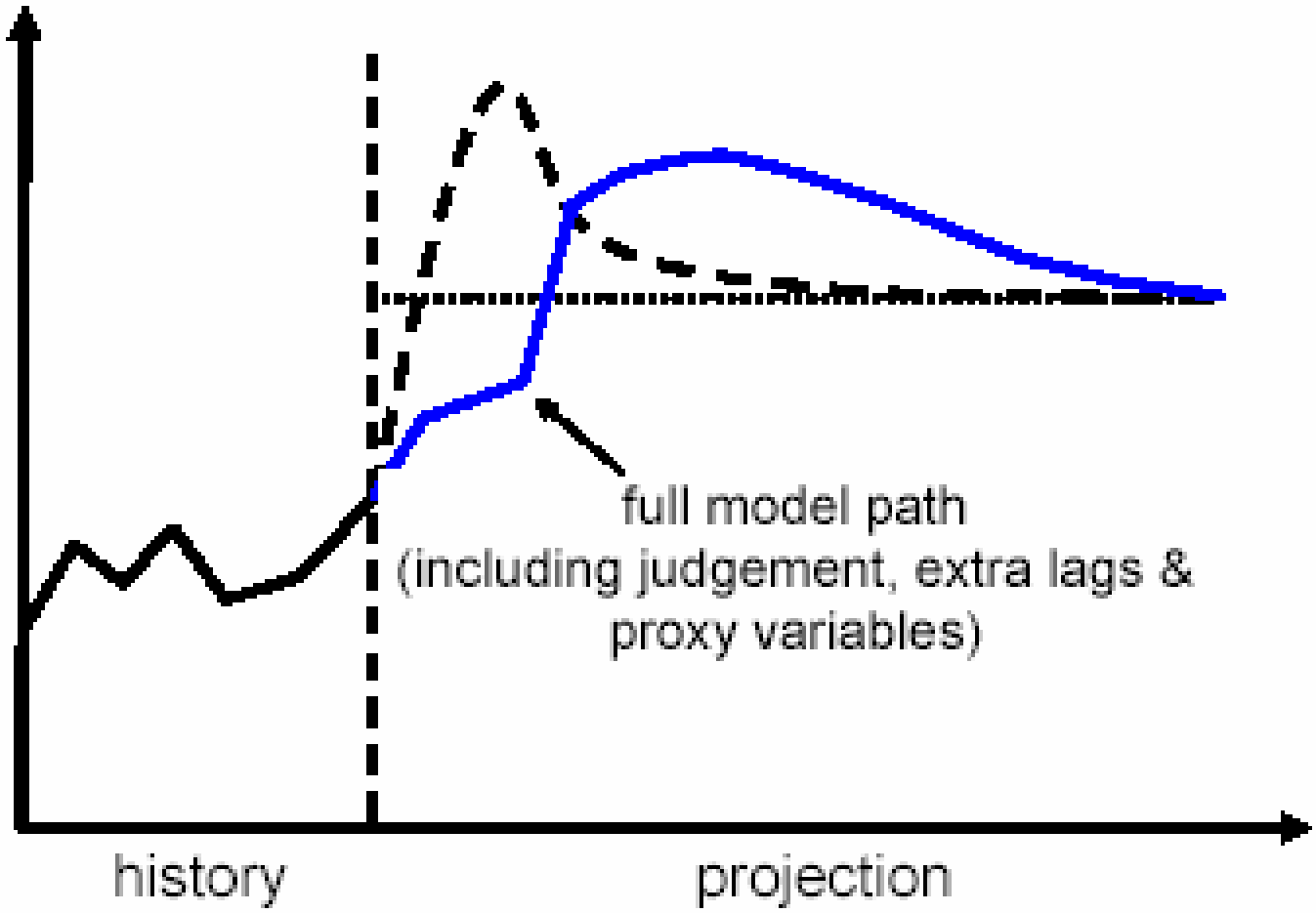
- Core model is forward-looking
  - Assumptions about expectations important
  - Need to have well-defined steady state
- Model is solved “recursively” each period
  - Allow for possibility that information sets evolve
  - Need “exogenous variables” model and “steady state” model
  - Allows for “surprises”, constant interest rate assumption


Solve exogenous variables model recursively
Solve steady state model recursively
Solve core model recursively
Solve non-core model

Building the forecast.



Building the forecast.



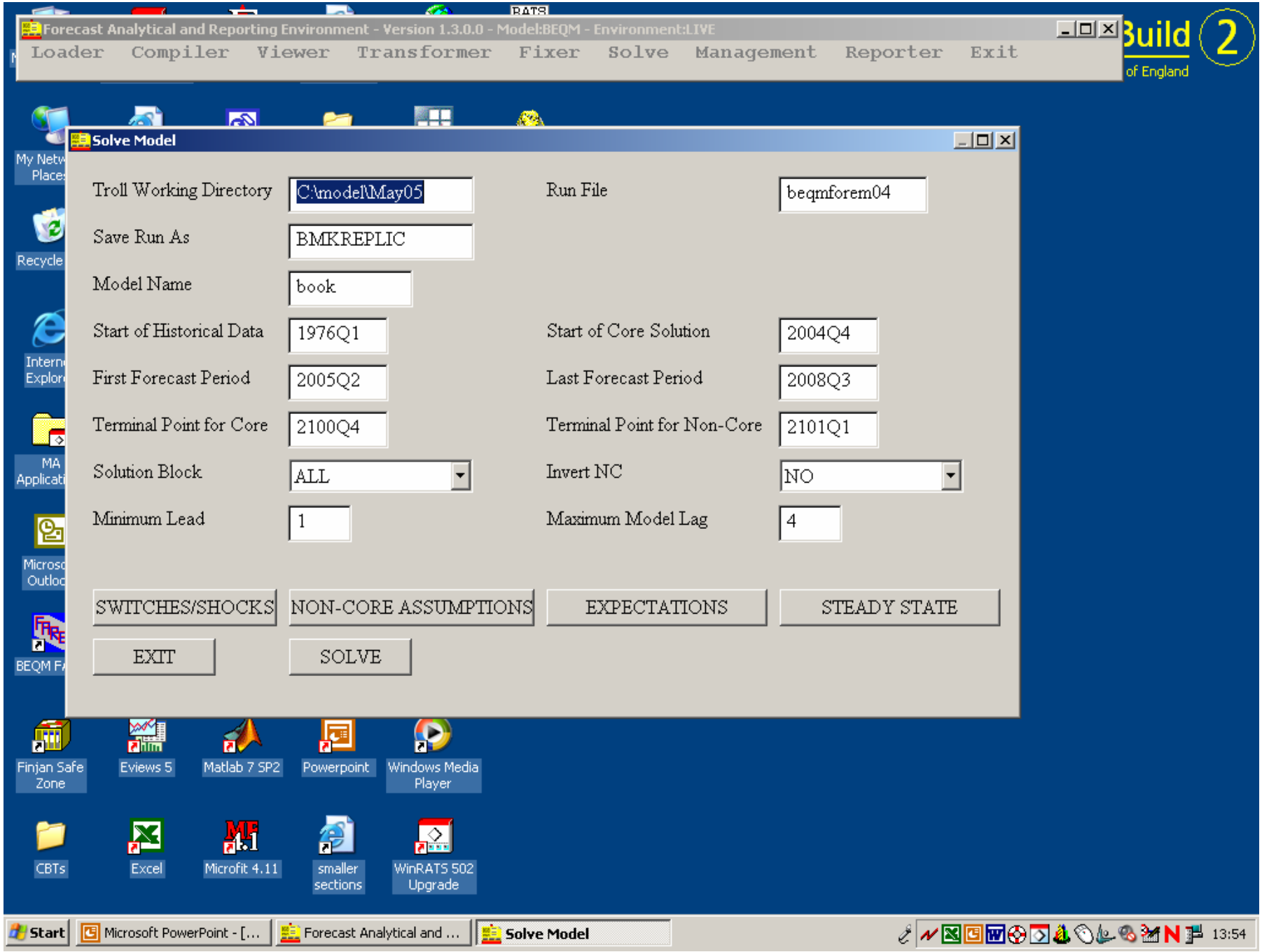
Key Feature of BEQM

Key Feature of BEQM

- It’s big

Forecasting Infrastructure

- Investing in the IT kit and processes that produce a forecast has been just as important as BEQM itself
- TROLL and FARE
  - Transforming variables
  - Inverting parameters
  - Modifying parameters
  - Type 1 and type 2 fixes


Forecast Analytical and Reporting Environment - Version 1.3.0.0 - Model:BEQM - Environment:LIVE
Loader Compiler Viewer Transformer Fixer Solve Management Reporter Exit
Solve Model
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Run File
beqmforem04
Save Run As
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Model Name
book
Start of Historical Data
1976Q1
Start of Core Solution
2004Q4
First Forecast Period
2005Q2
Last Forecast Period
2008Q3
Terminal Point for Core
2100Q4
Terminal Point for Non-Core
2101Q1
Solution Block
ALL
Invert NC
NO
Minimum Lead
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Maximum Model Lag
4
SWITCHES/SHOCKS
NON-CORE ASSUMPTIONS
EXPECTATIONS
STEADY STATE
EXIT
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Matlab 7 SP2
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Forecast Analytical and ...
Solve Model
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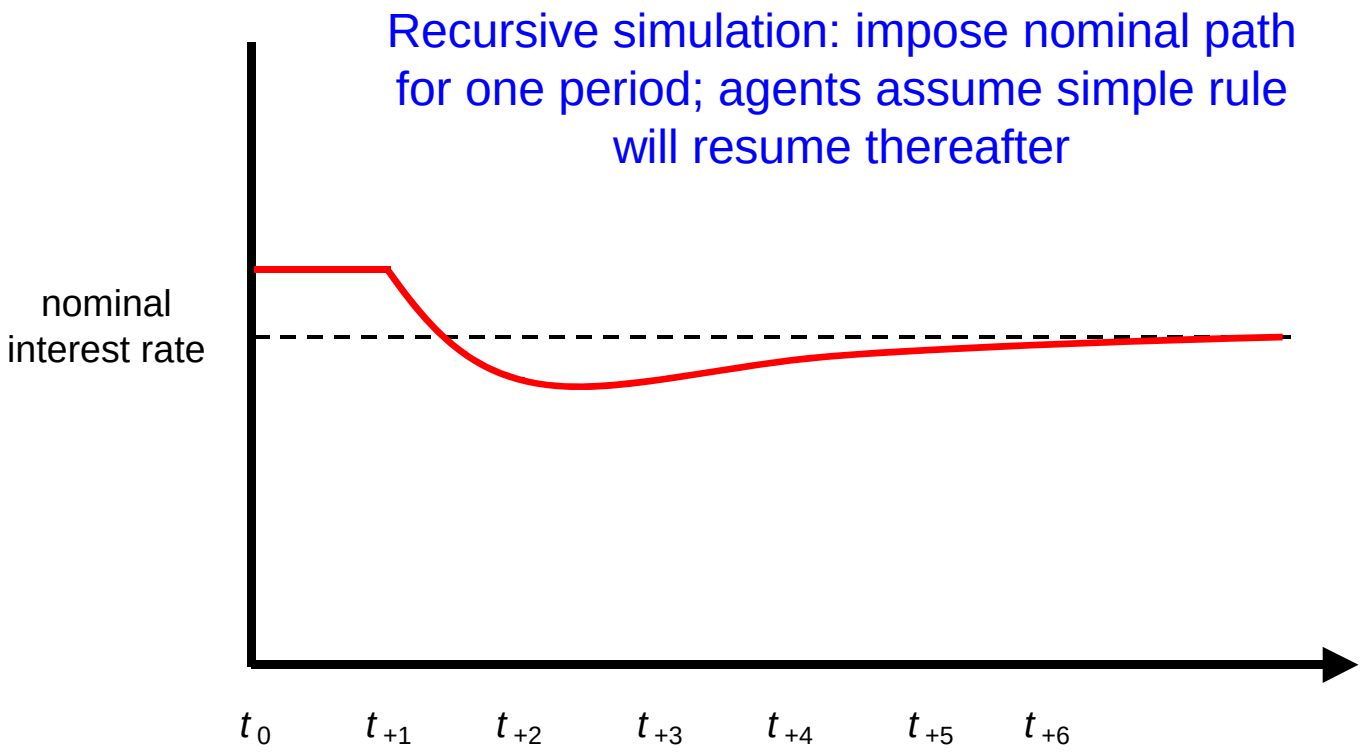
Managing expectations

Imposing a path for an exogenous variable

- Use recursive simulation technique:
  - impose path for one period
  - private agents expect rule to resume next period
  - but path can be imposed again; so exogenous path for rate built up
- Generates “surprises” relative to rule
- Most obvious application is a constant interest rate path…

Imposing a nominal rate path



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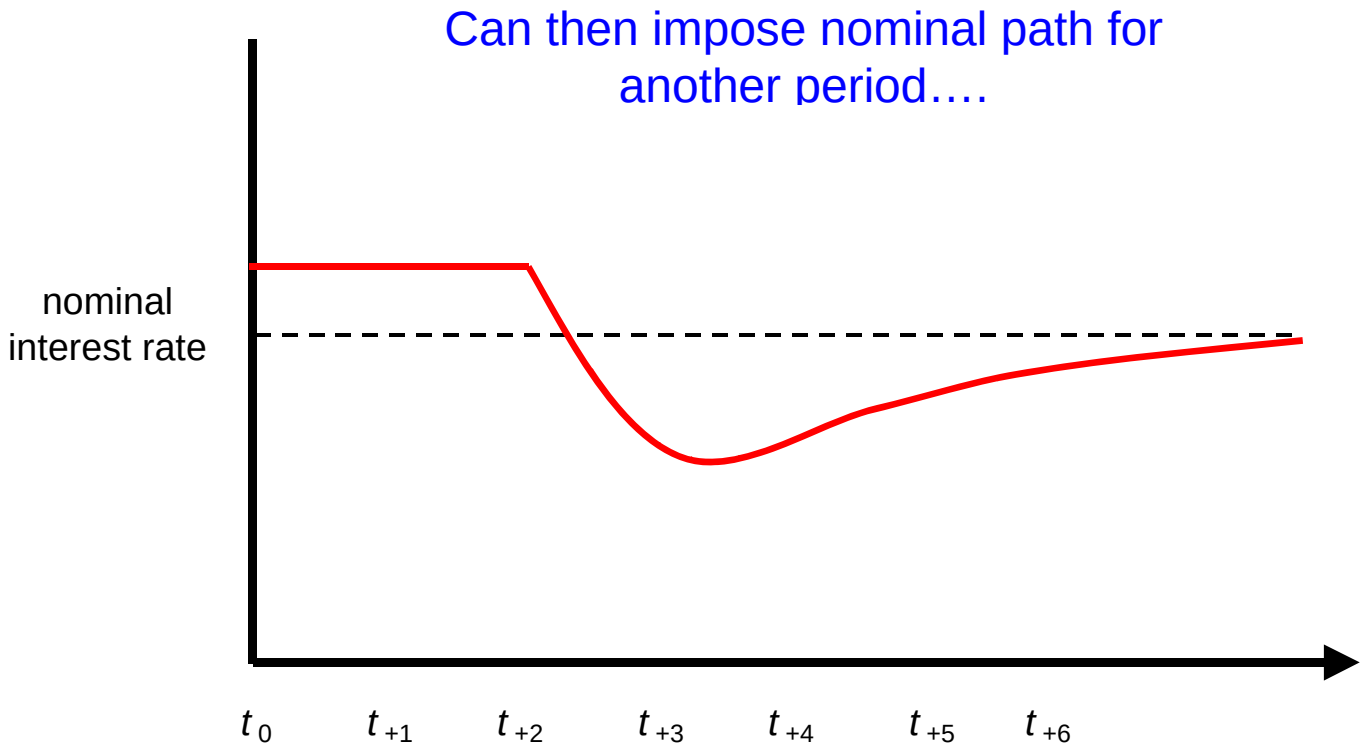

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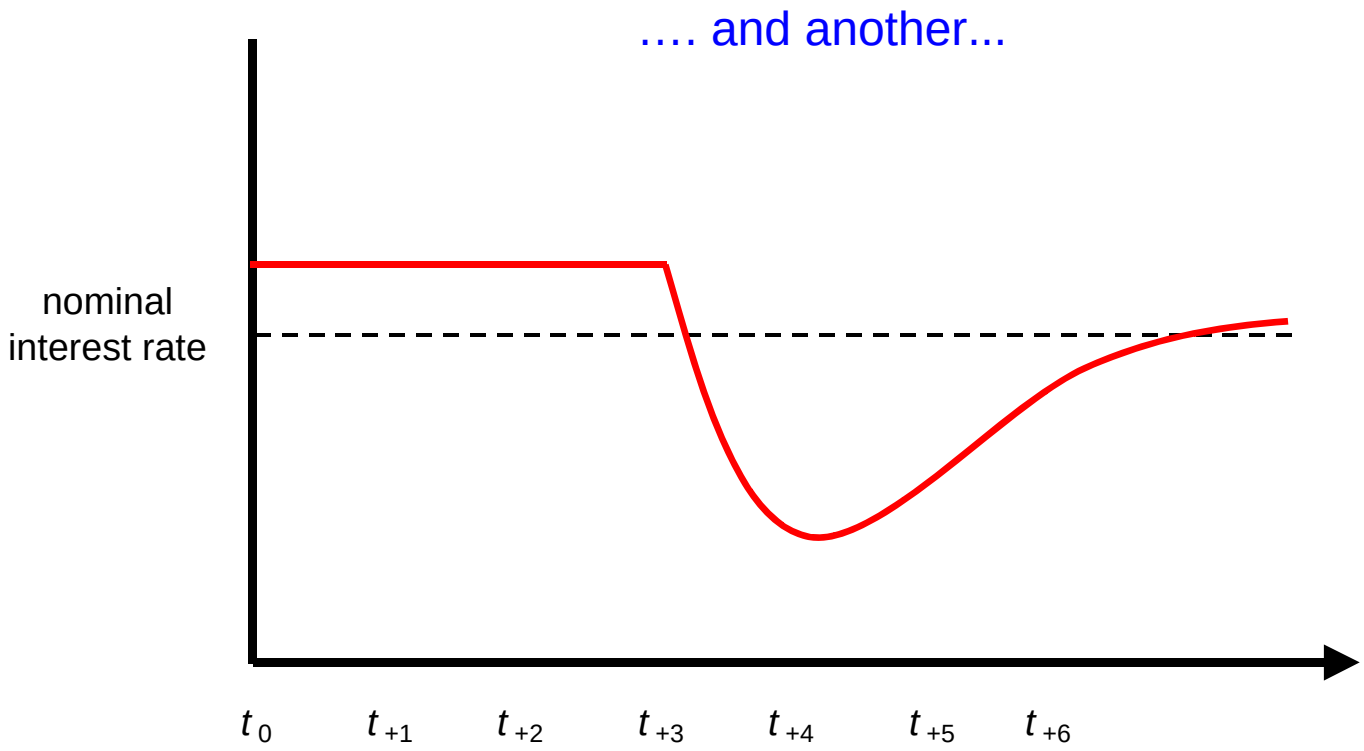

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- Use recursive simulation technique:
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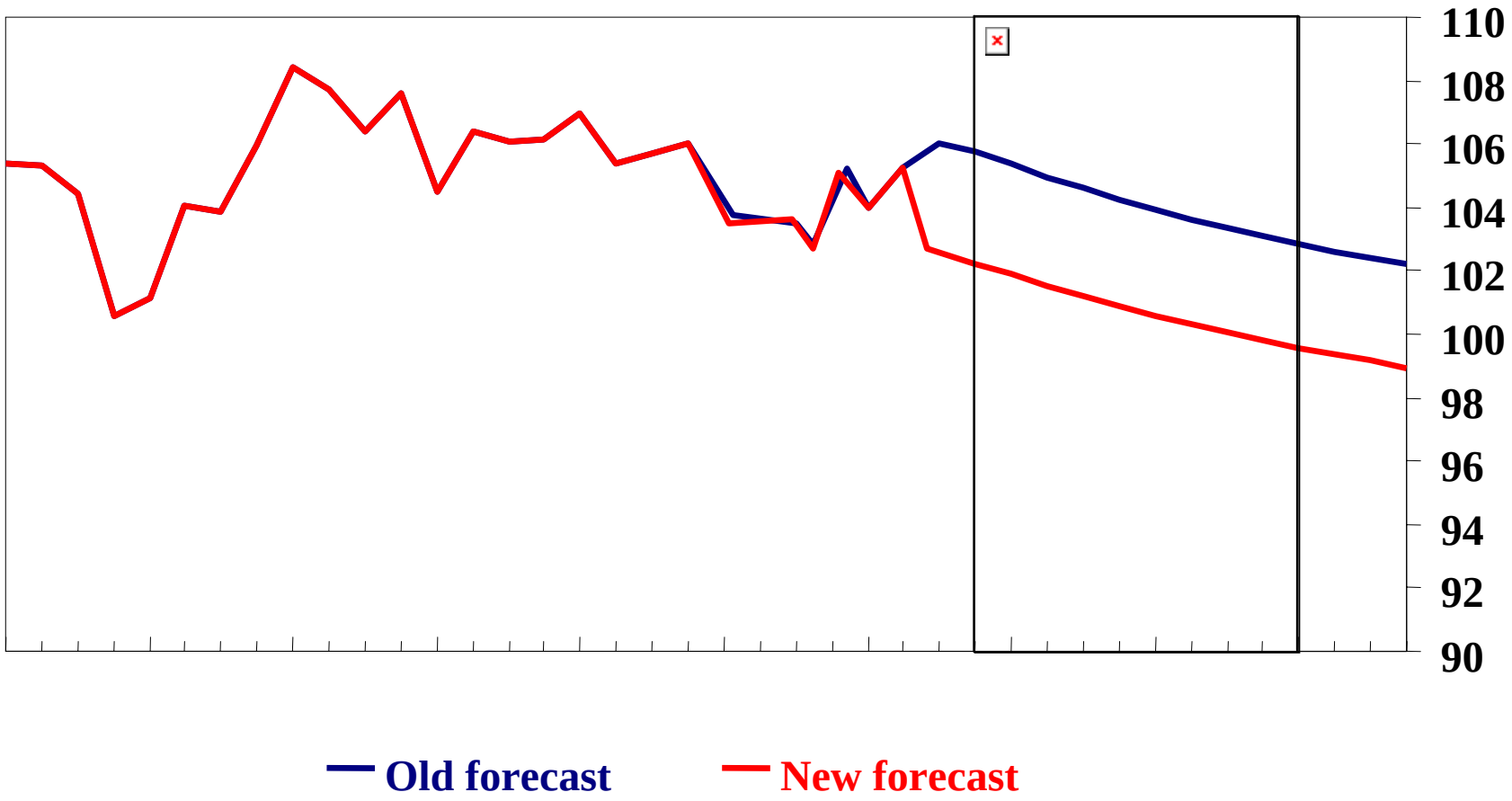
  - but path can be imposed again; so exogenous path for rate built up
- Generates “surprises” relative to rule
- Most obvious application is a constant interest rate path…
- …but manipulating expectations of parameter behaviour just as important
  - Putting the “S” in DSGE

Nominal exchange rate news



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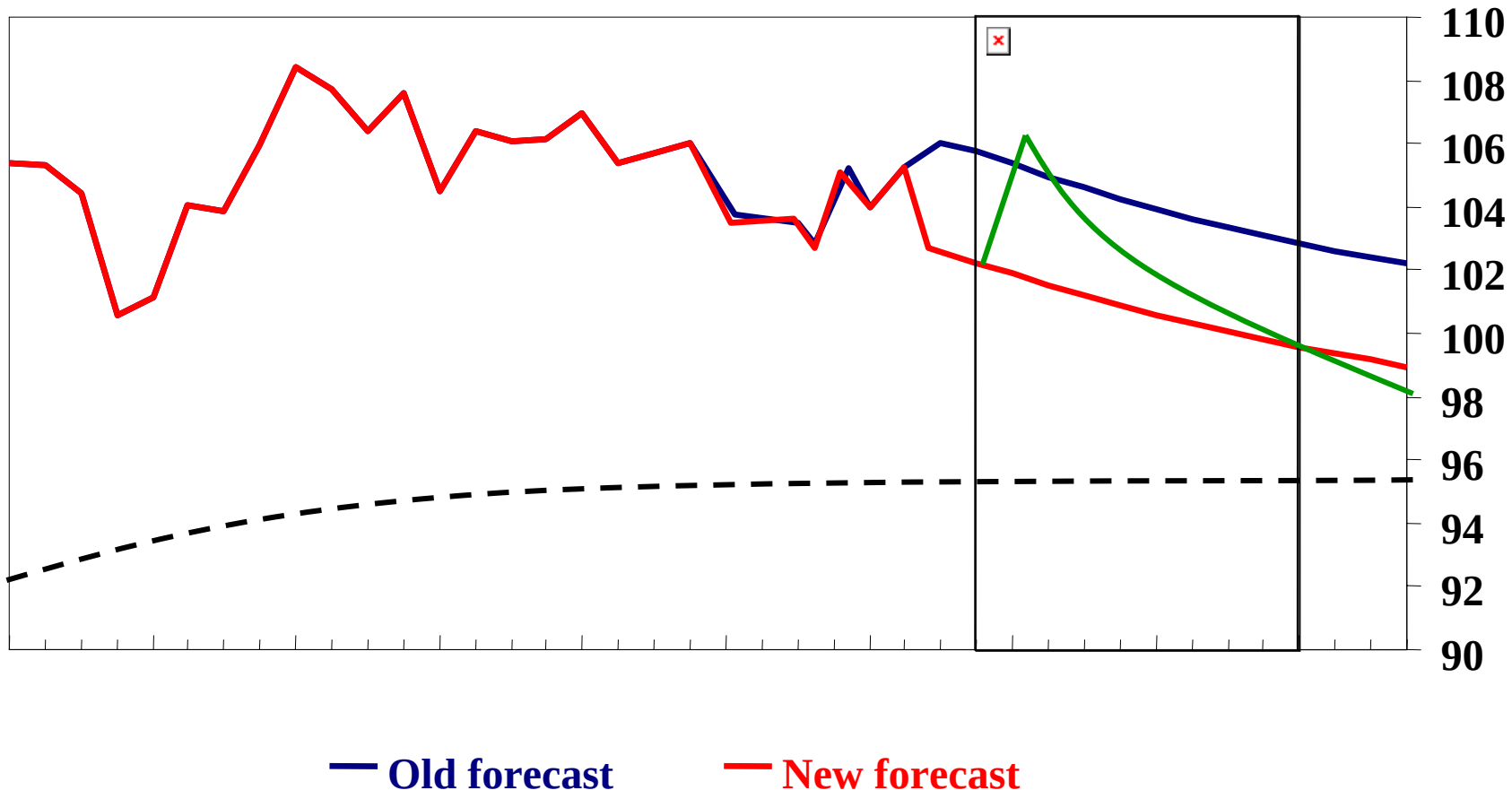
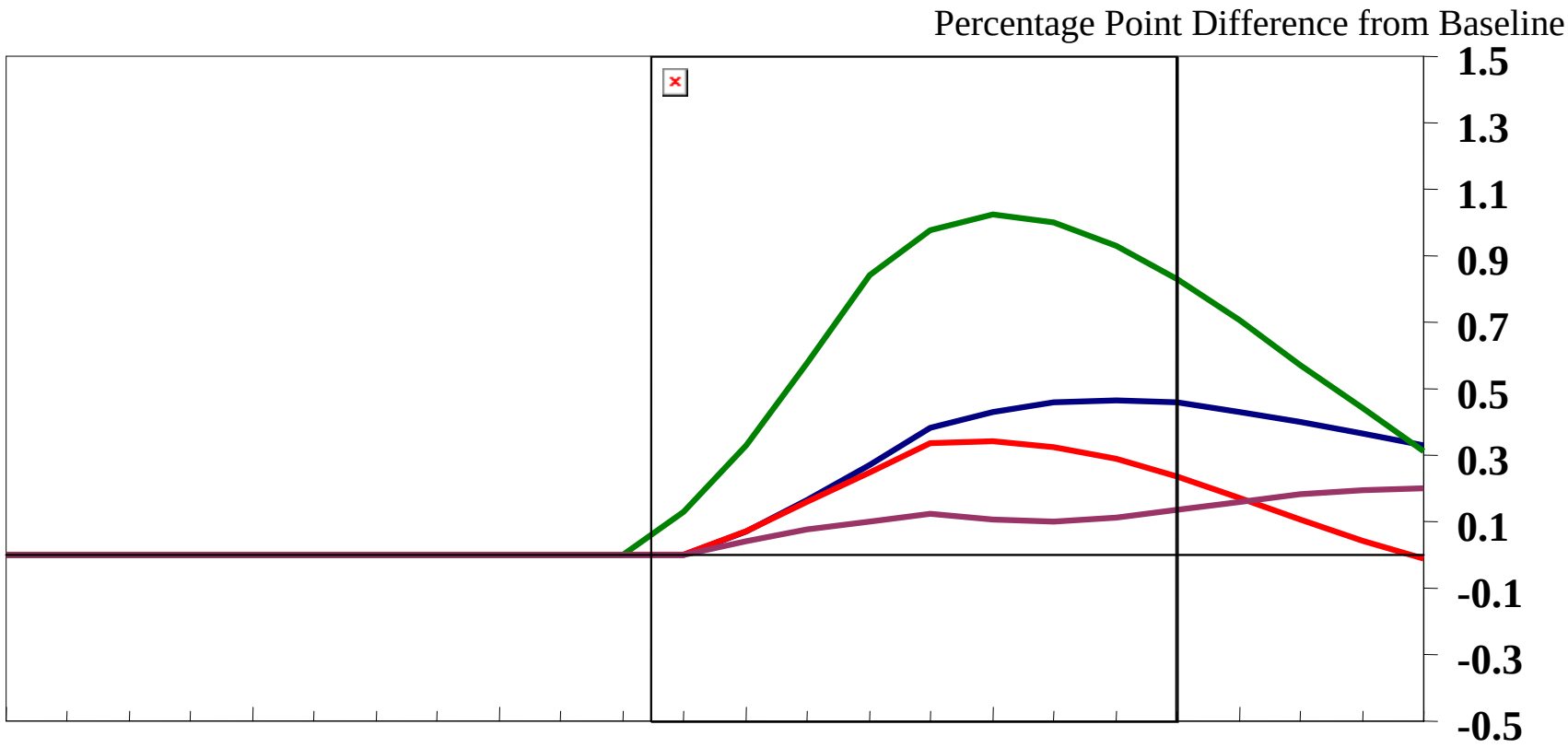
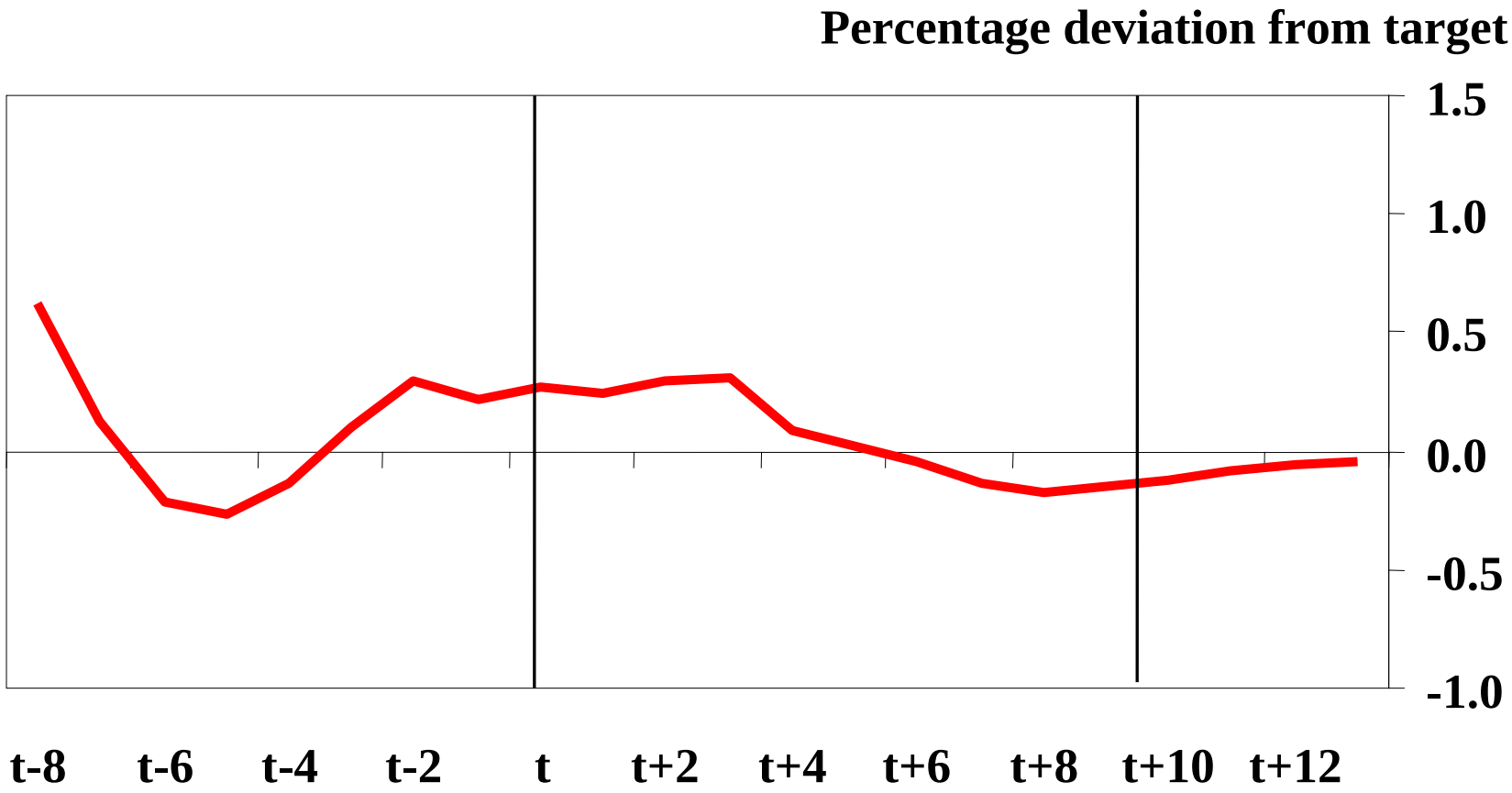


Impact on CPI inflation



Story-telling

Decomposing an inflation forecast



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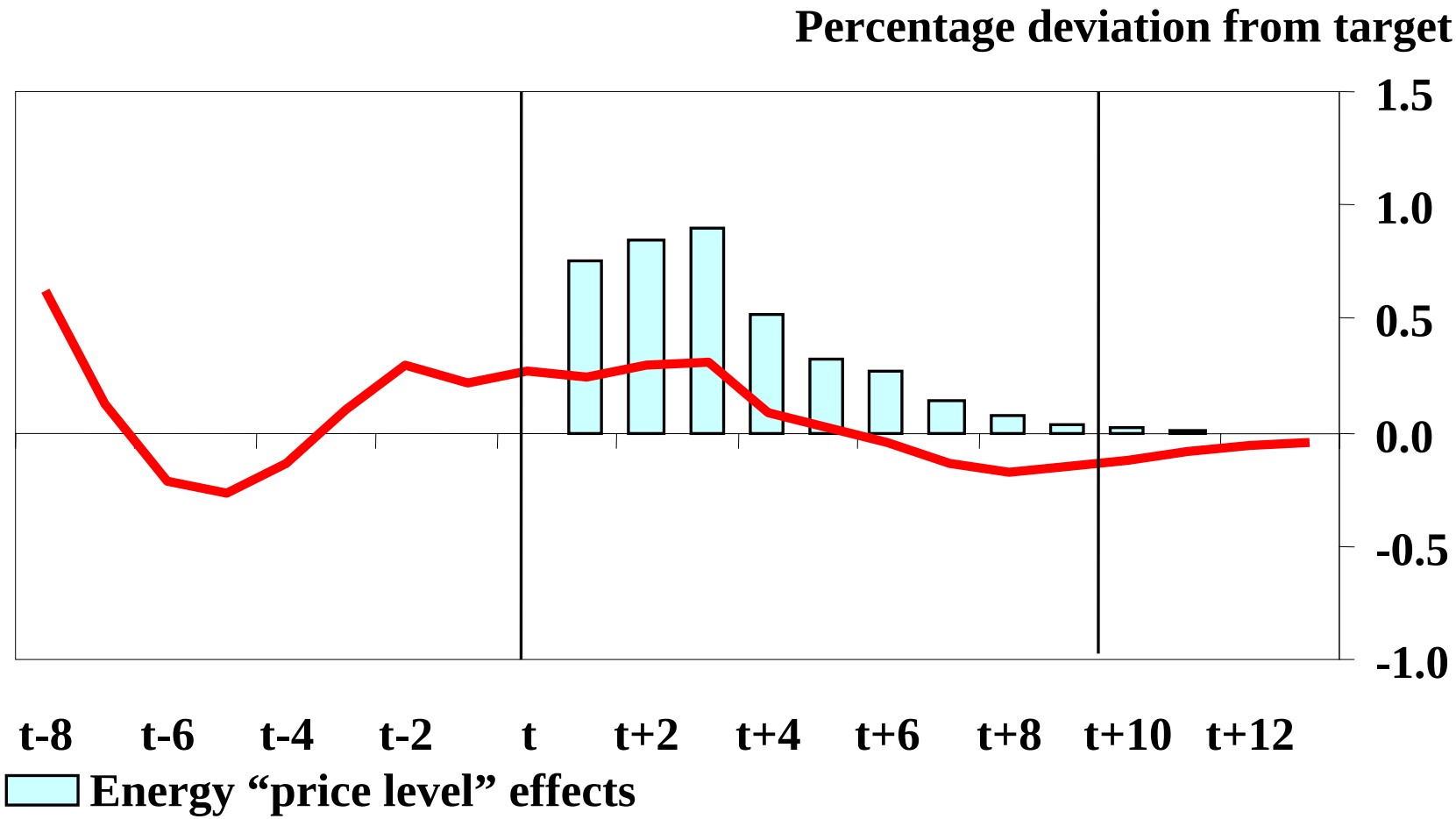

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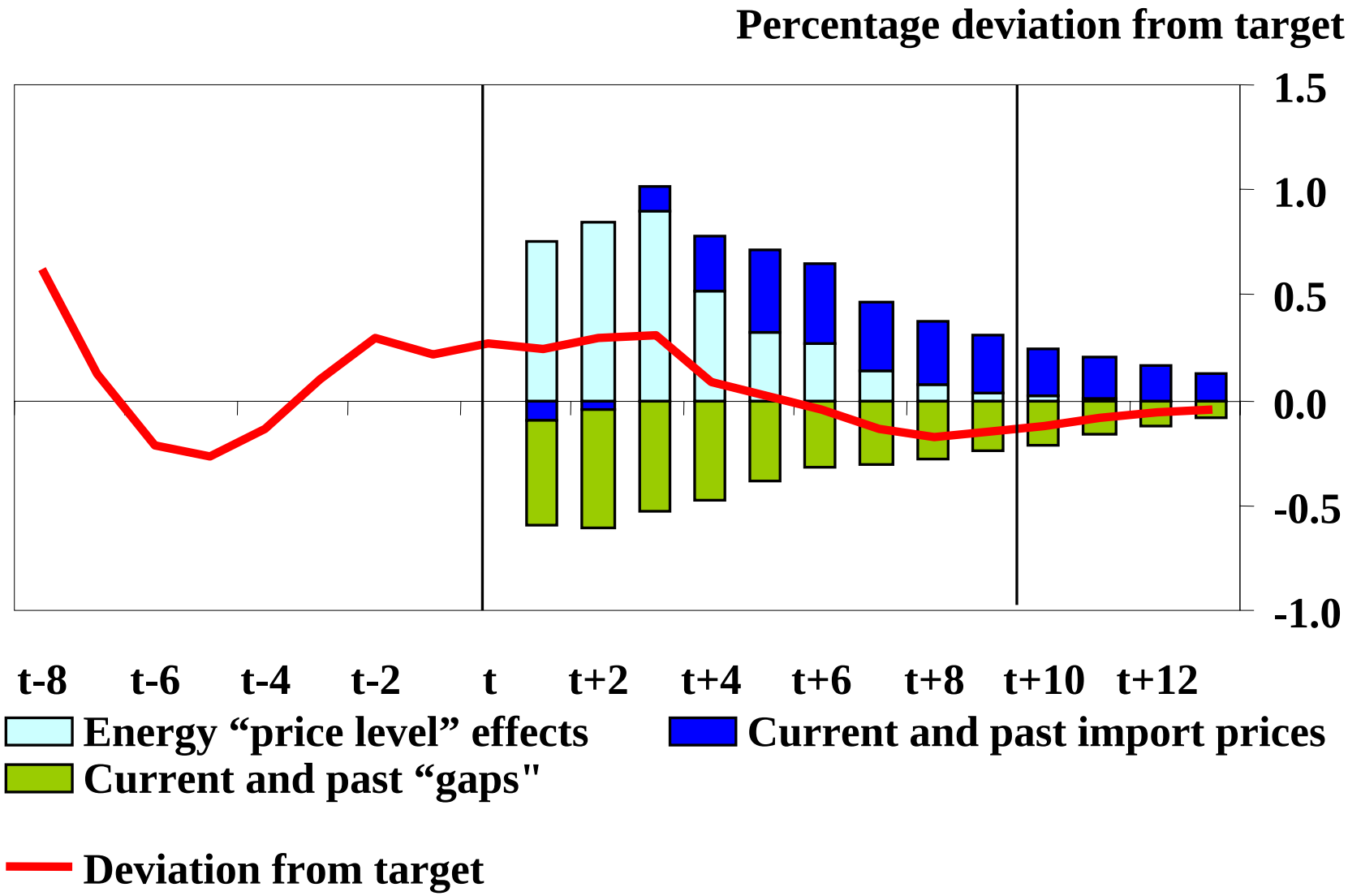

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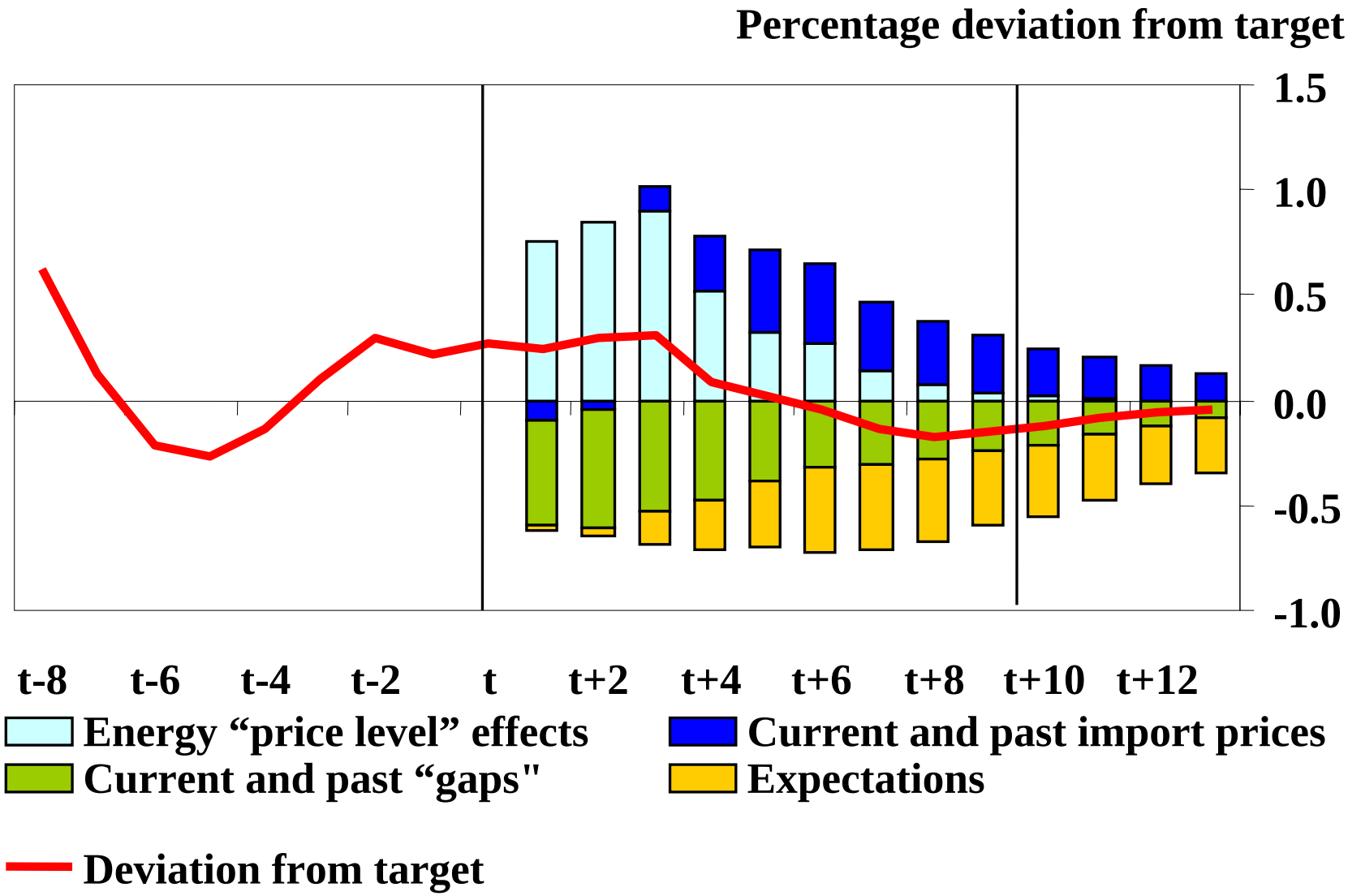

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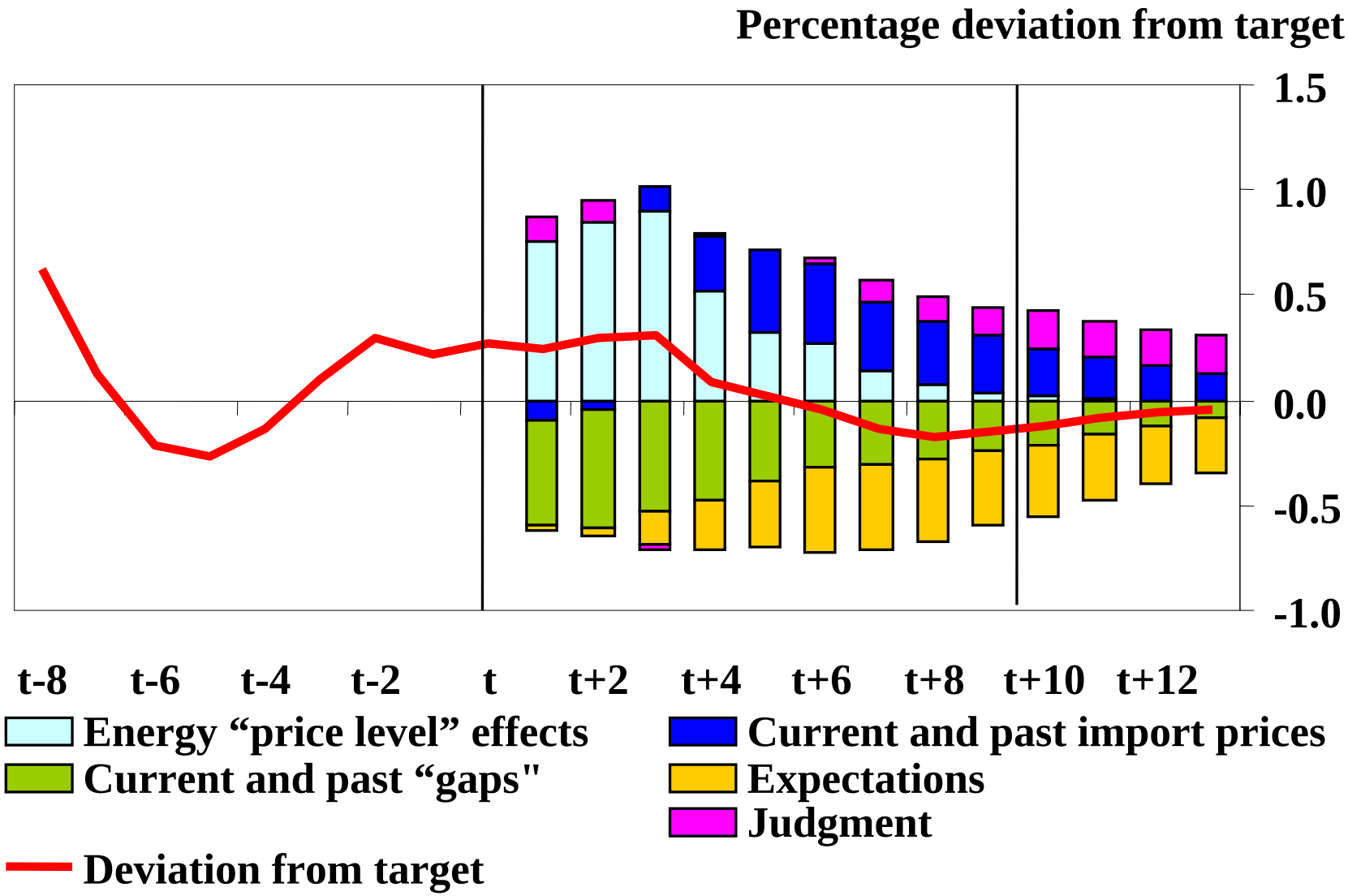

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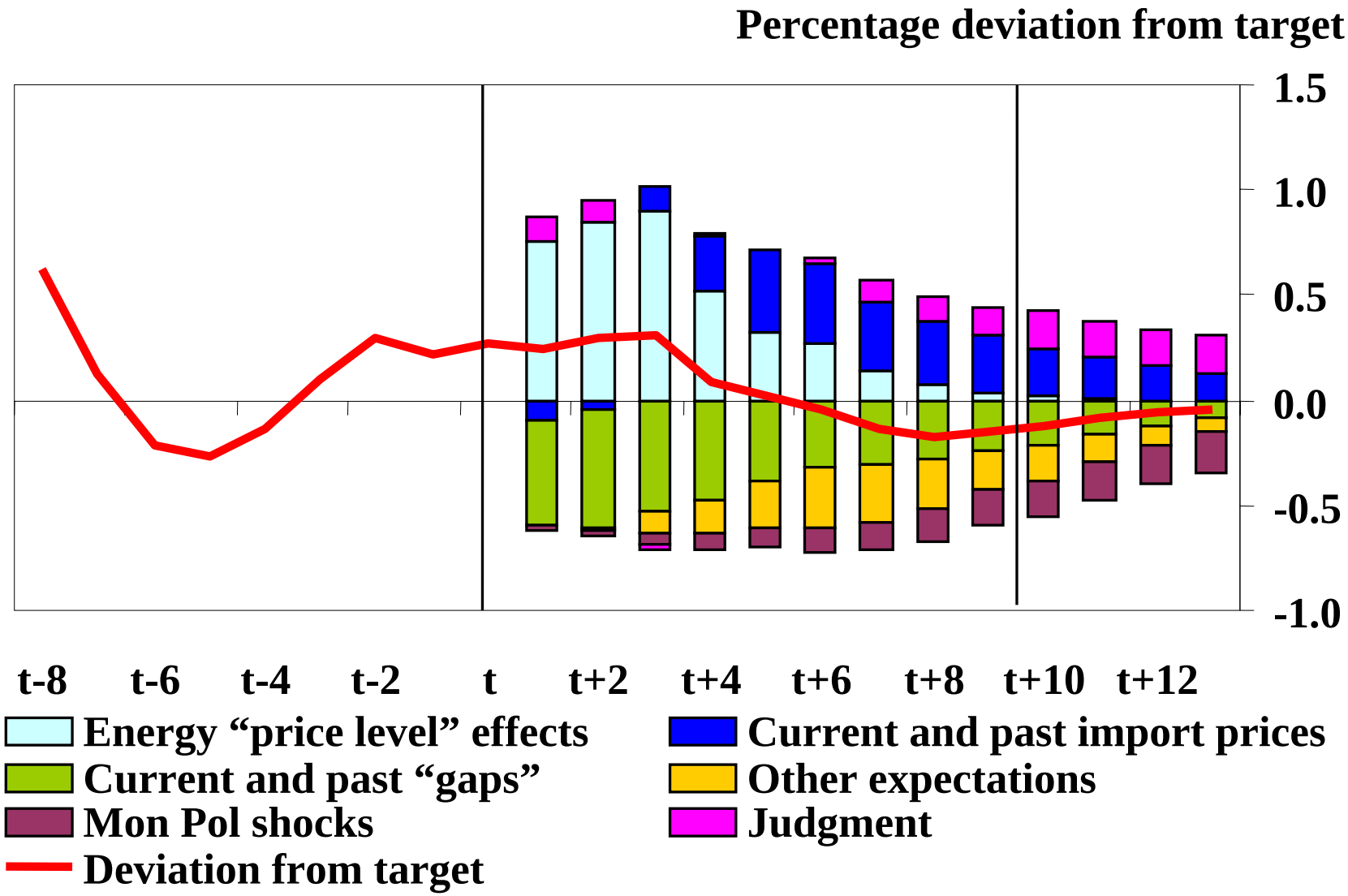
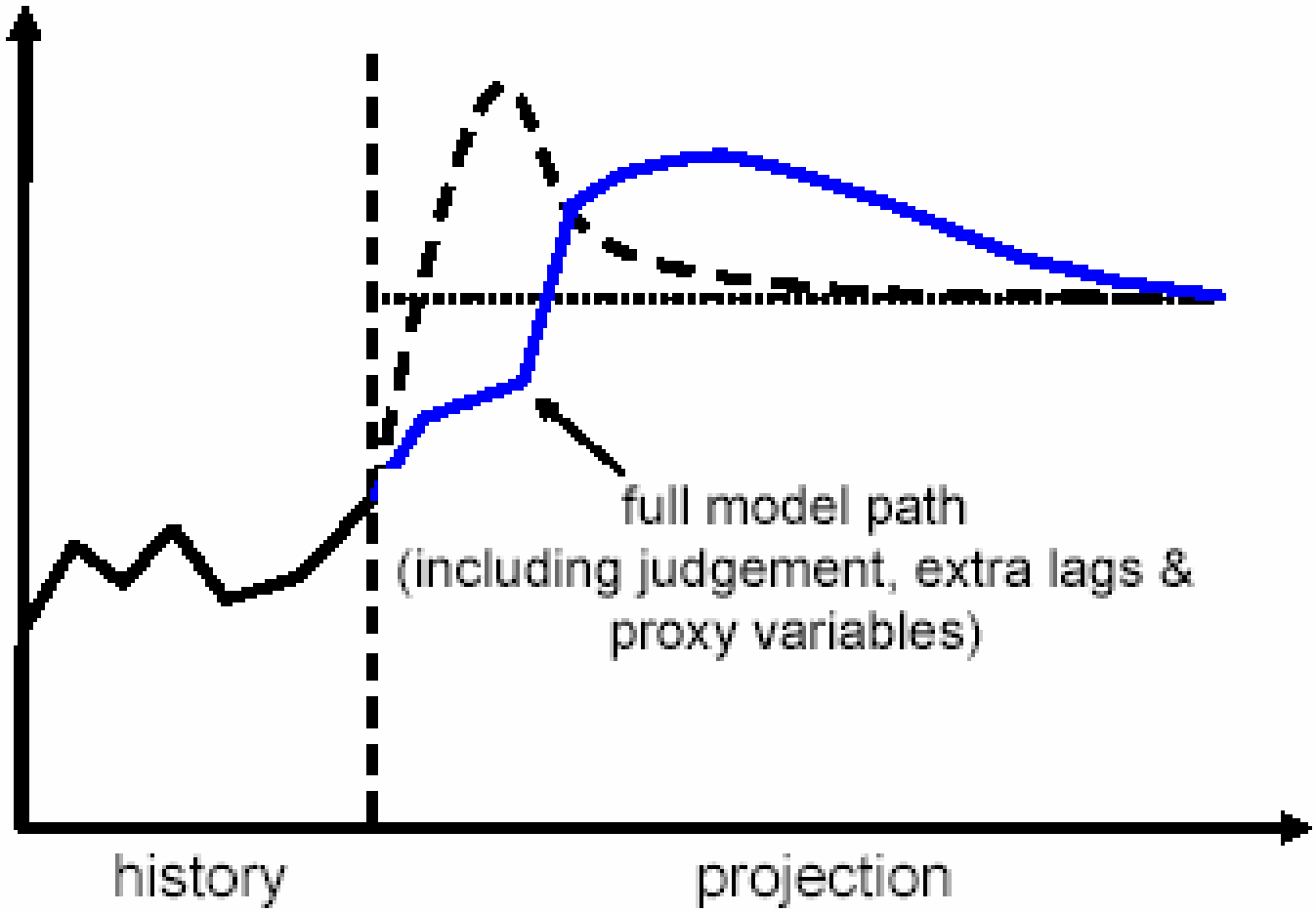


Core / non-core interaction

The “roll-on” problem



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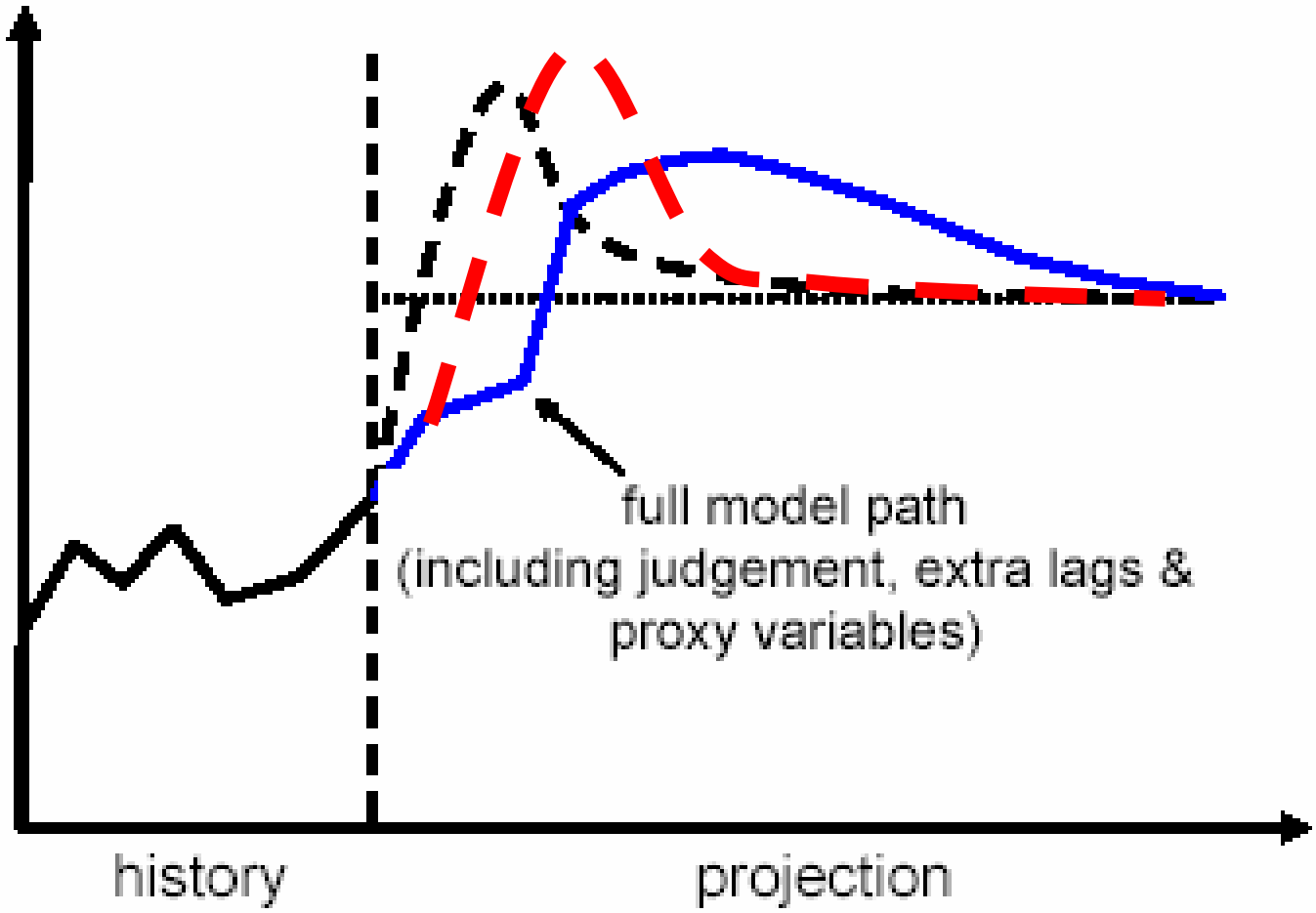
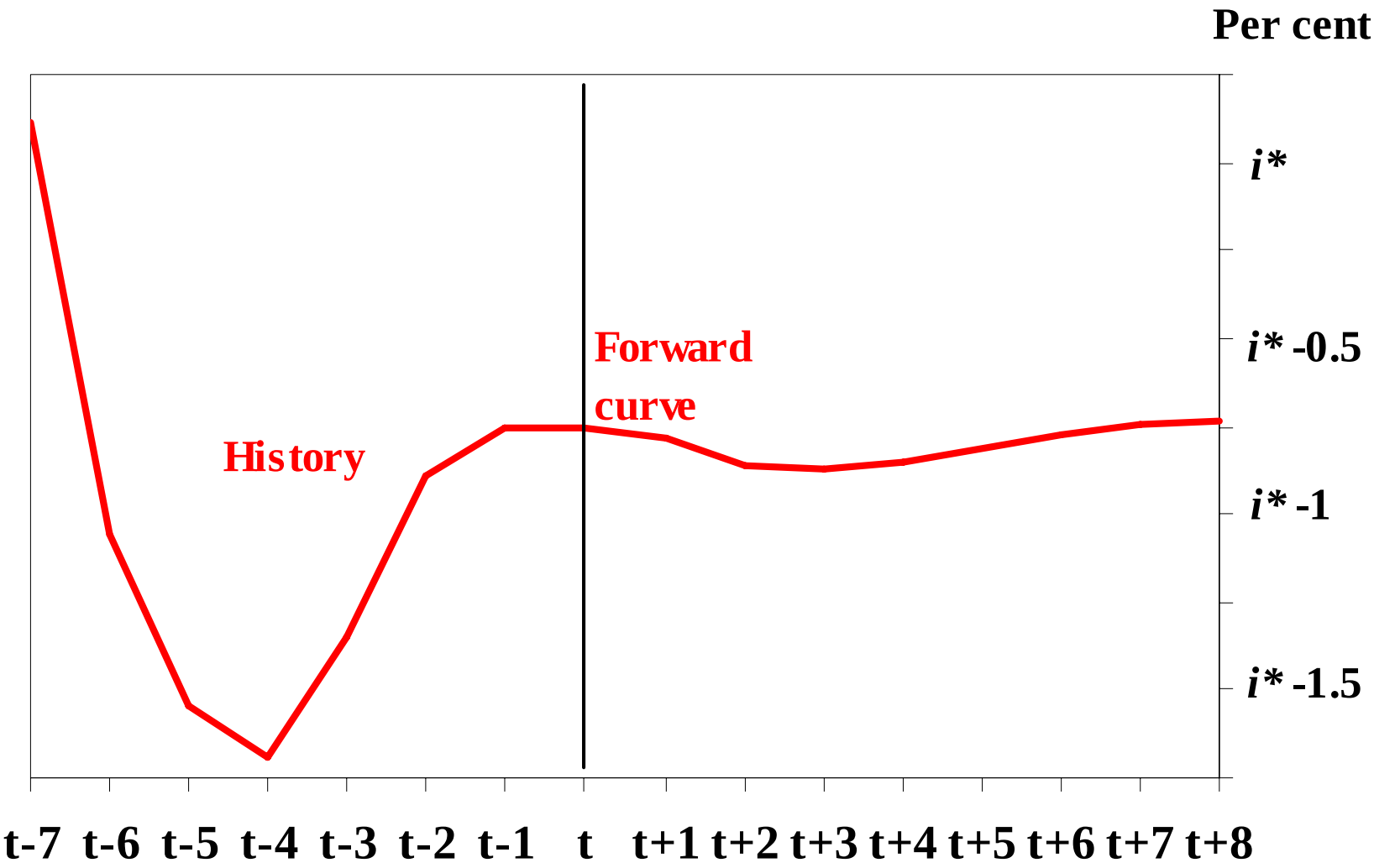


Interest-rate paths



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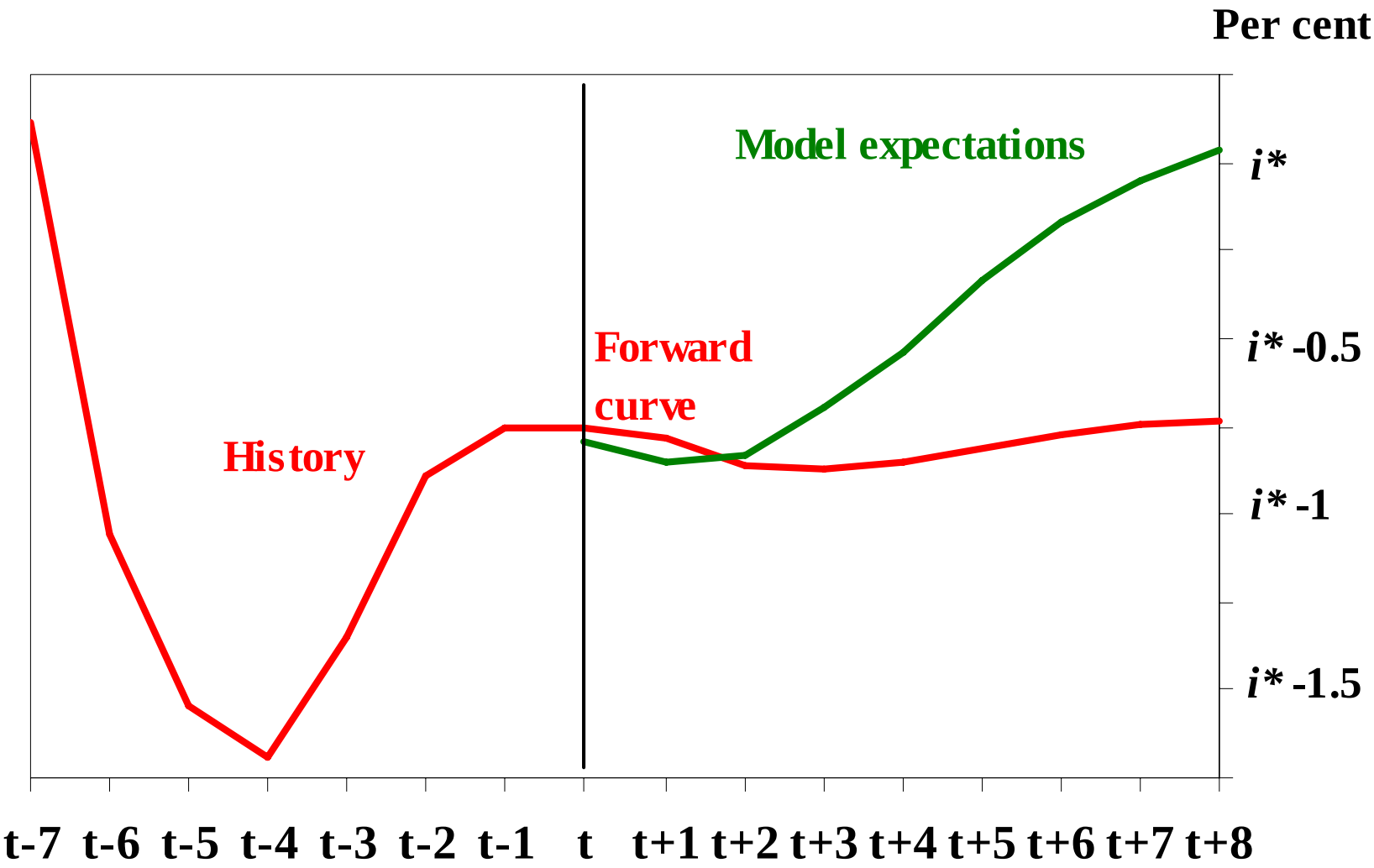

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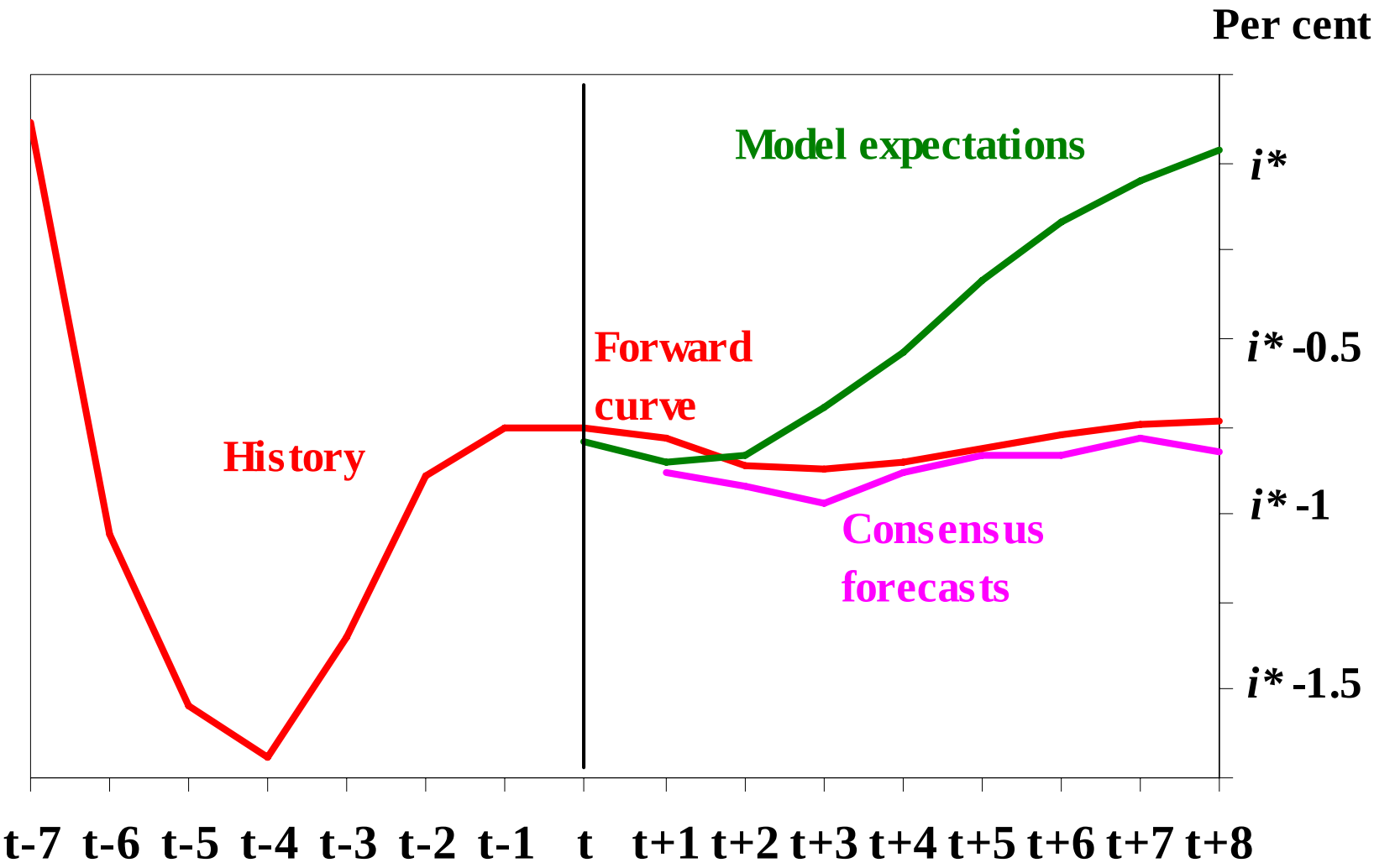

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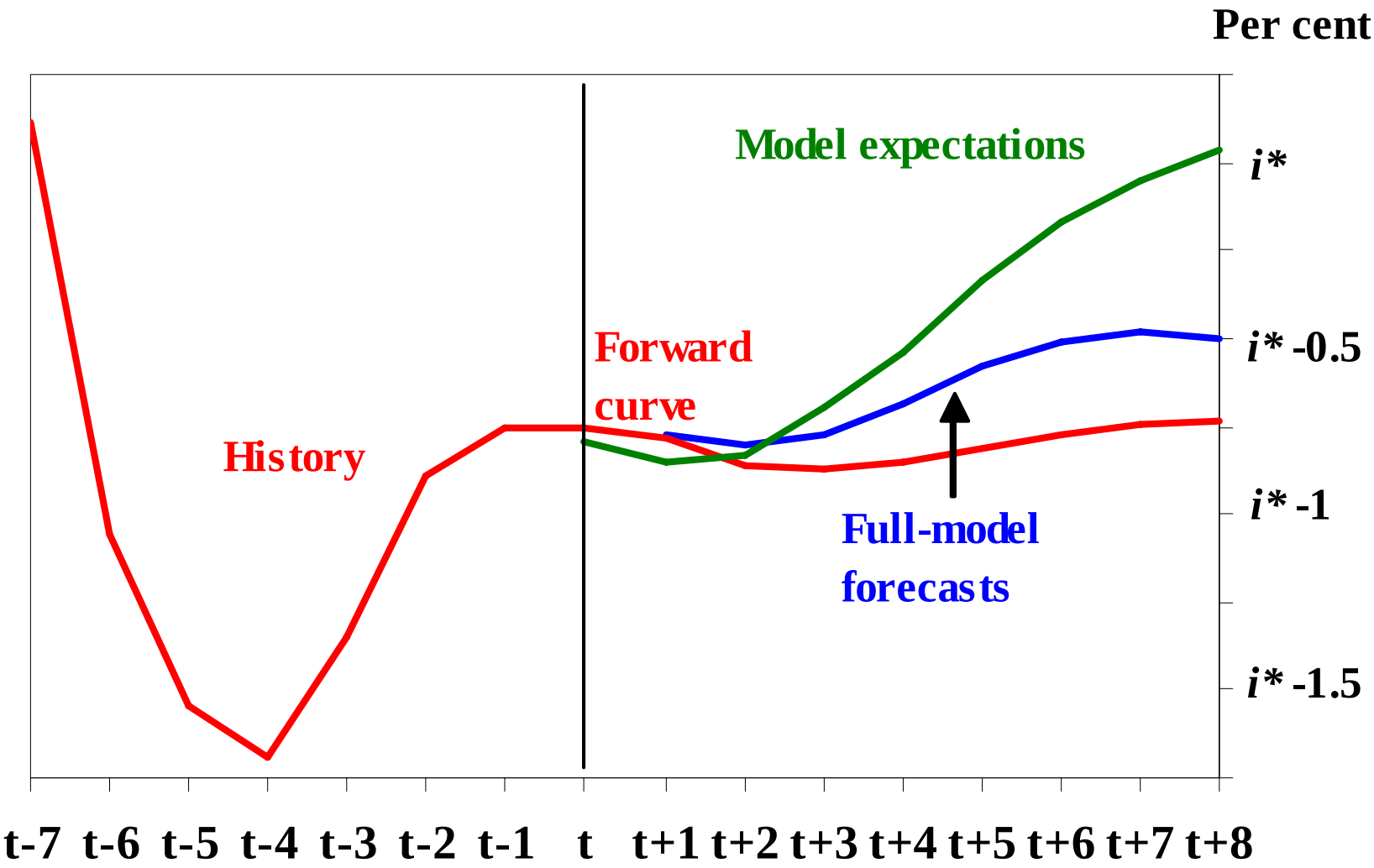

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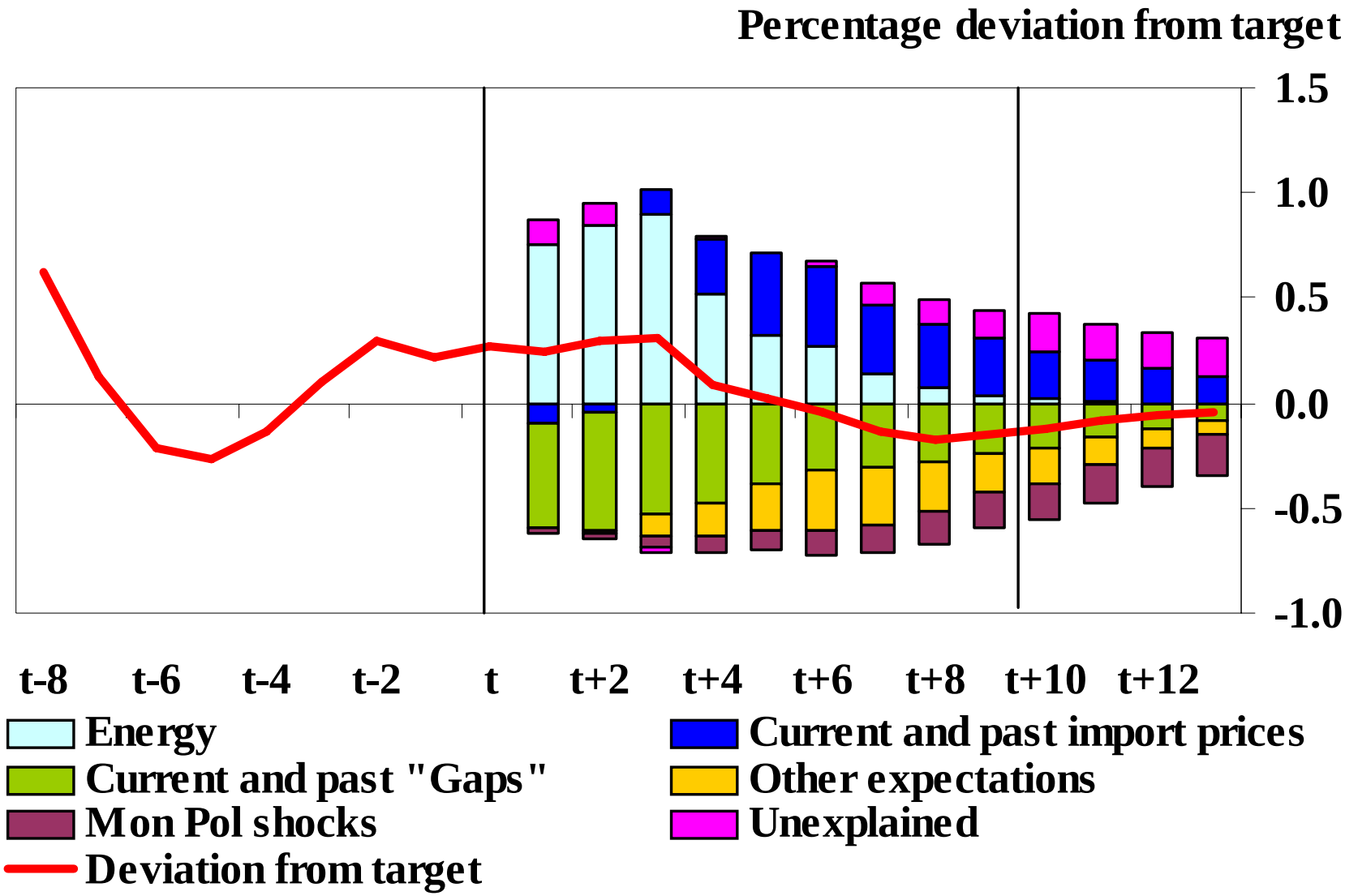

Where next?

- Size of the model vs repository of judgement
  - “Baby-BEQMs”
- Tension between core and non-core
- Product and process innovation

Key practical lessons

- No such thing as a perfect model
  - Real, awkward, trade-offs between tractability and coherence
- Balancing the pressures for product innovation with the need for process innovation

End