# Monetary policy and interrelationships in the Norwegian economy

*Governor Øystein Olsen*

Different horizons – different models
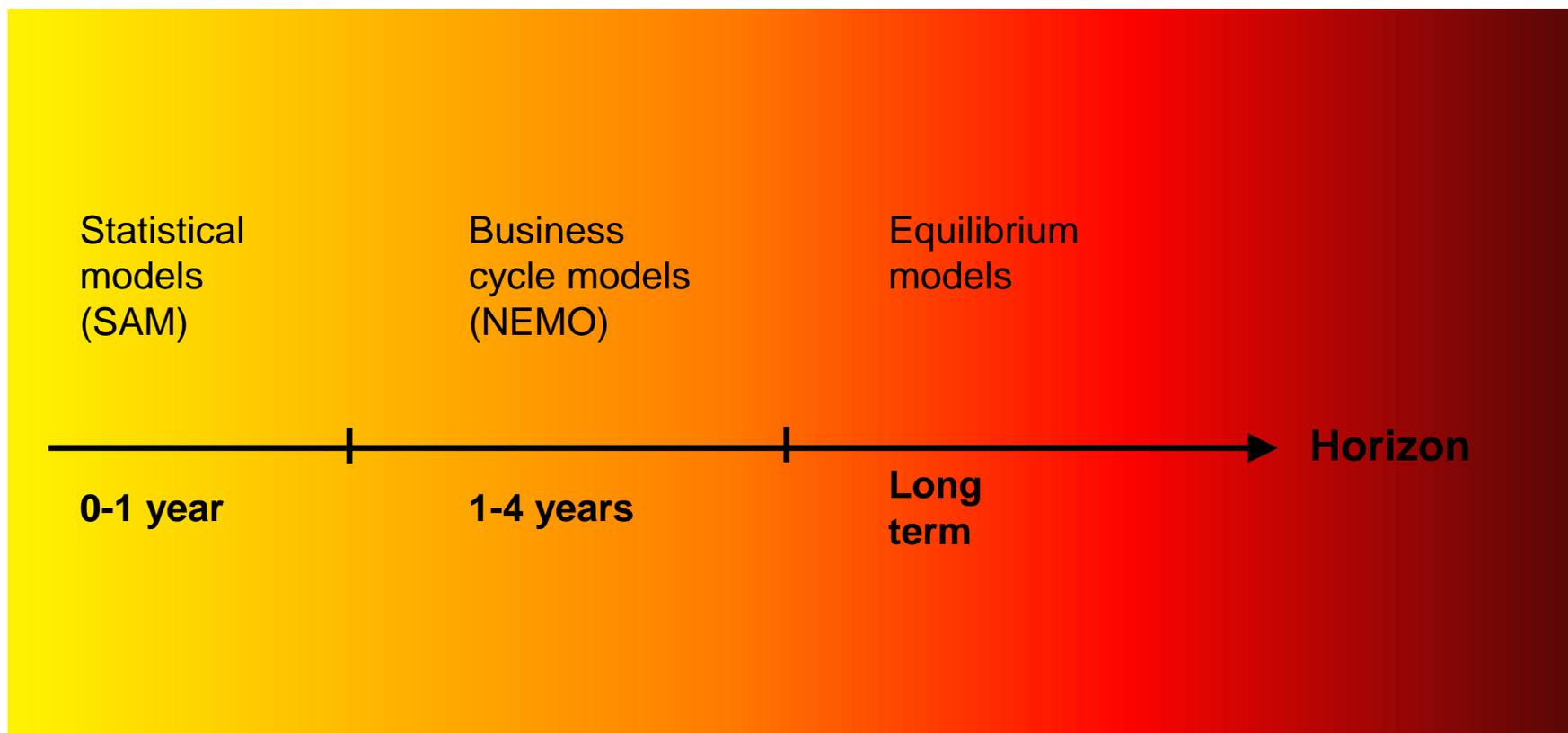
Main requirements for a model for monetary policy

1. Monetary policy controls inflation

2. Expectations must be included

3. Based on theory and empirical data

4. Understandable and easy to communicate

Growth and inflation
Percentage annual growth. Average
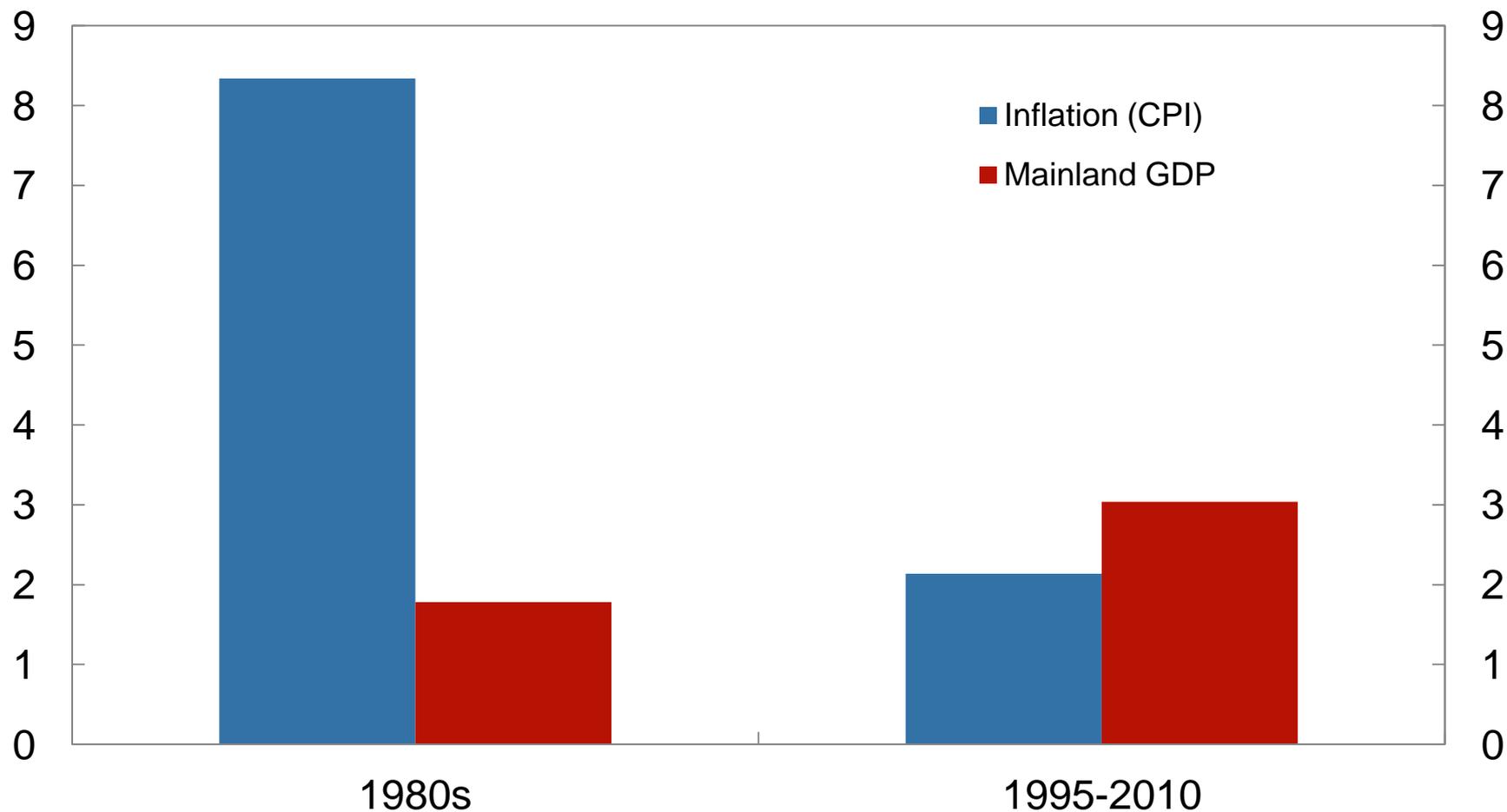
Sources: Statistics Norway and Norges Bank

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4. Understandable and easy to communicate

"Essentially, all models are wrong,

but some are useful."

George Box (1979)

Output and inflation
Percentage deviation from trend
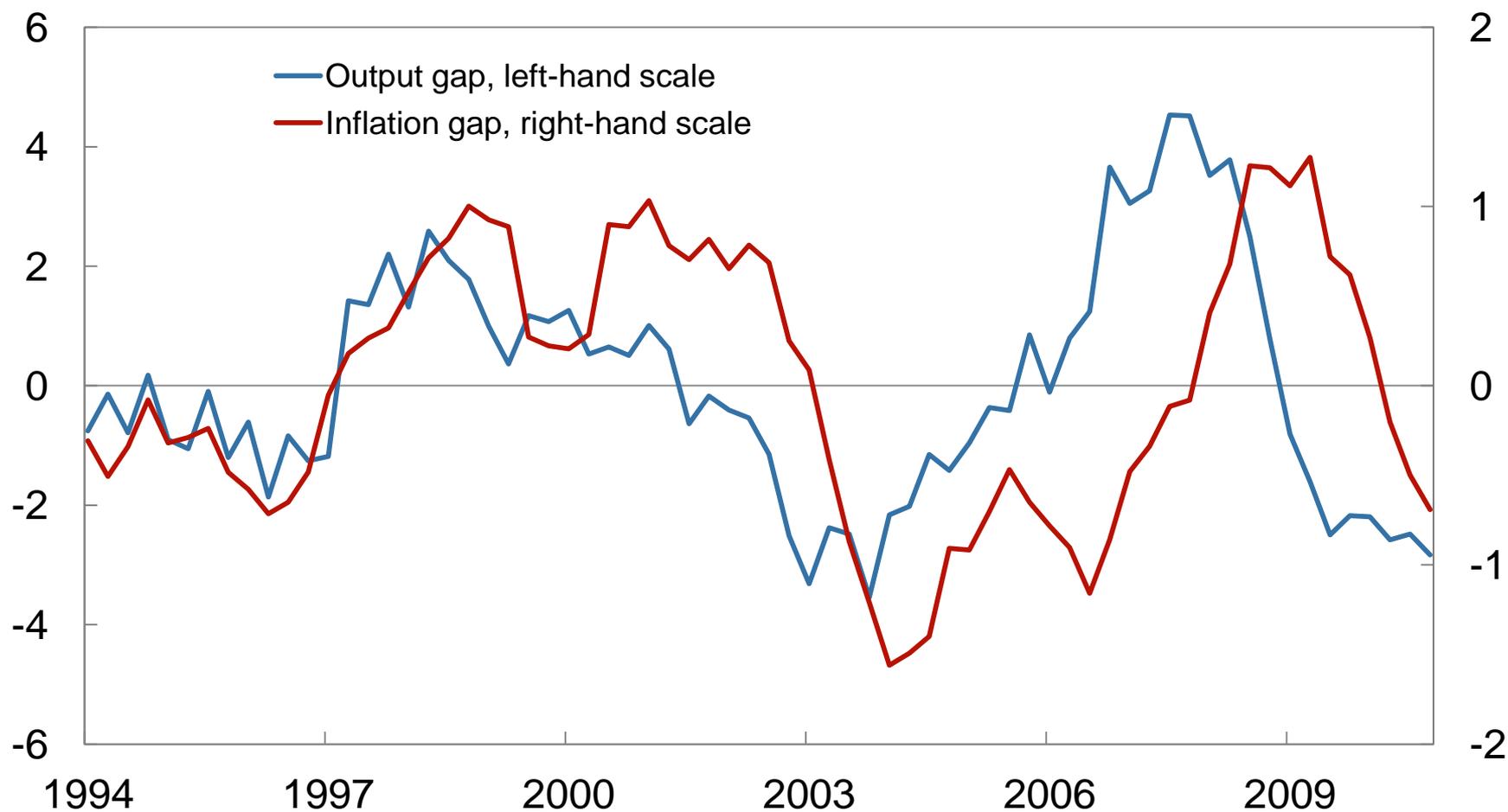
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# Output and unemployment
Percentage deviation from trend

Output gap, left-hand scale

Unemployment gap, right-hand scale
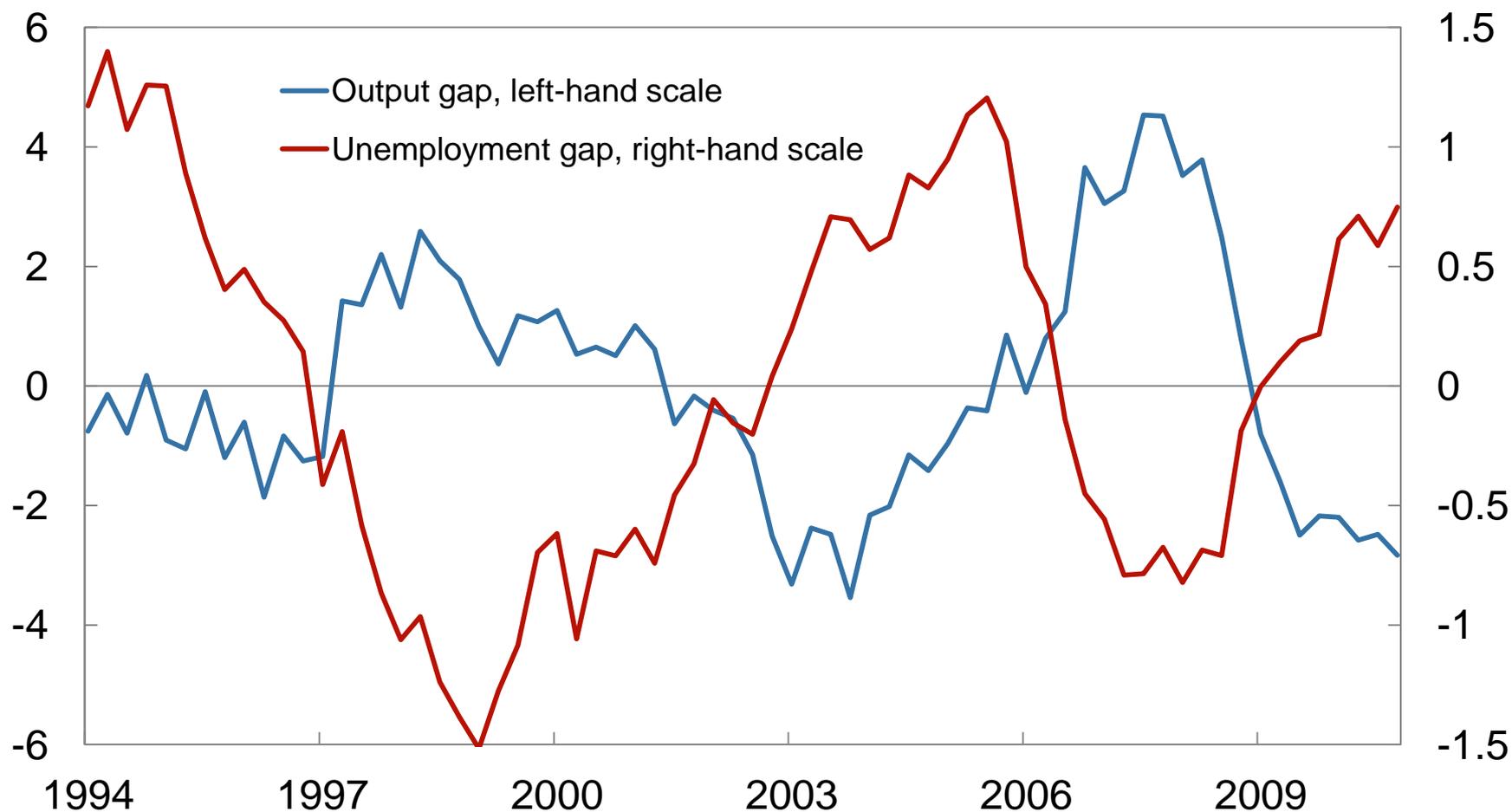
Sources: Statistics Norway and Norges Bank

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Unemployment and wage growth

Percentage deviation from trend
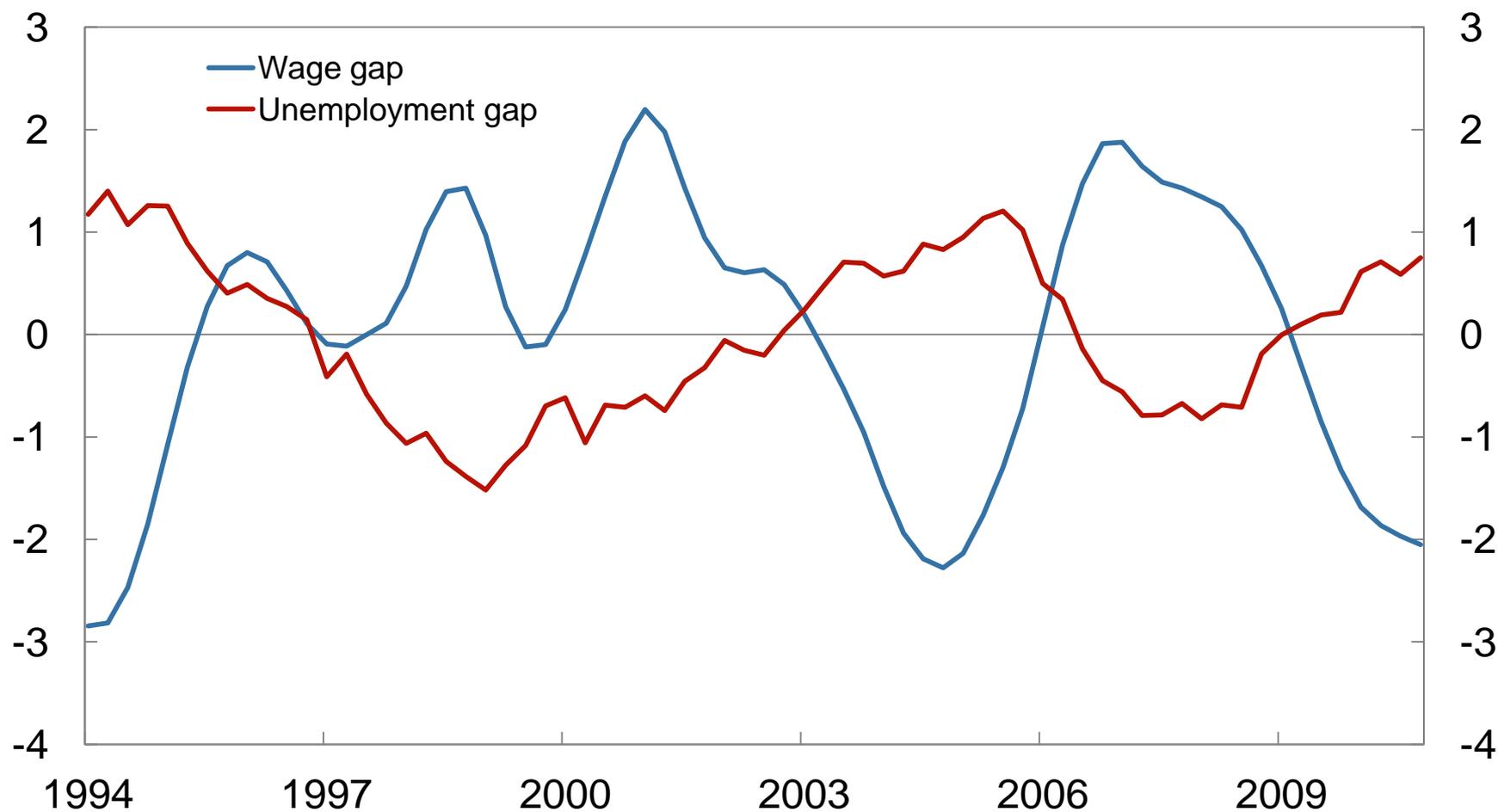
Sources: Statistics Norway and Norges Bank

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Wage growth and inflation
Percentage deviation from trend

Wage gap

Inflation gap, domestically produced goods and services

1994   1997   2000   2003   2006   2009
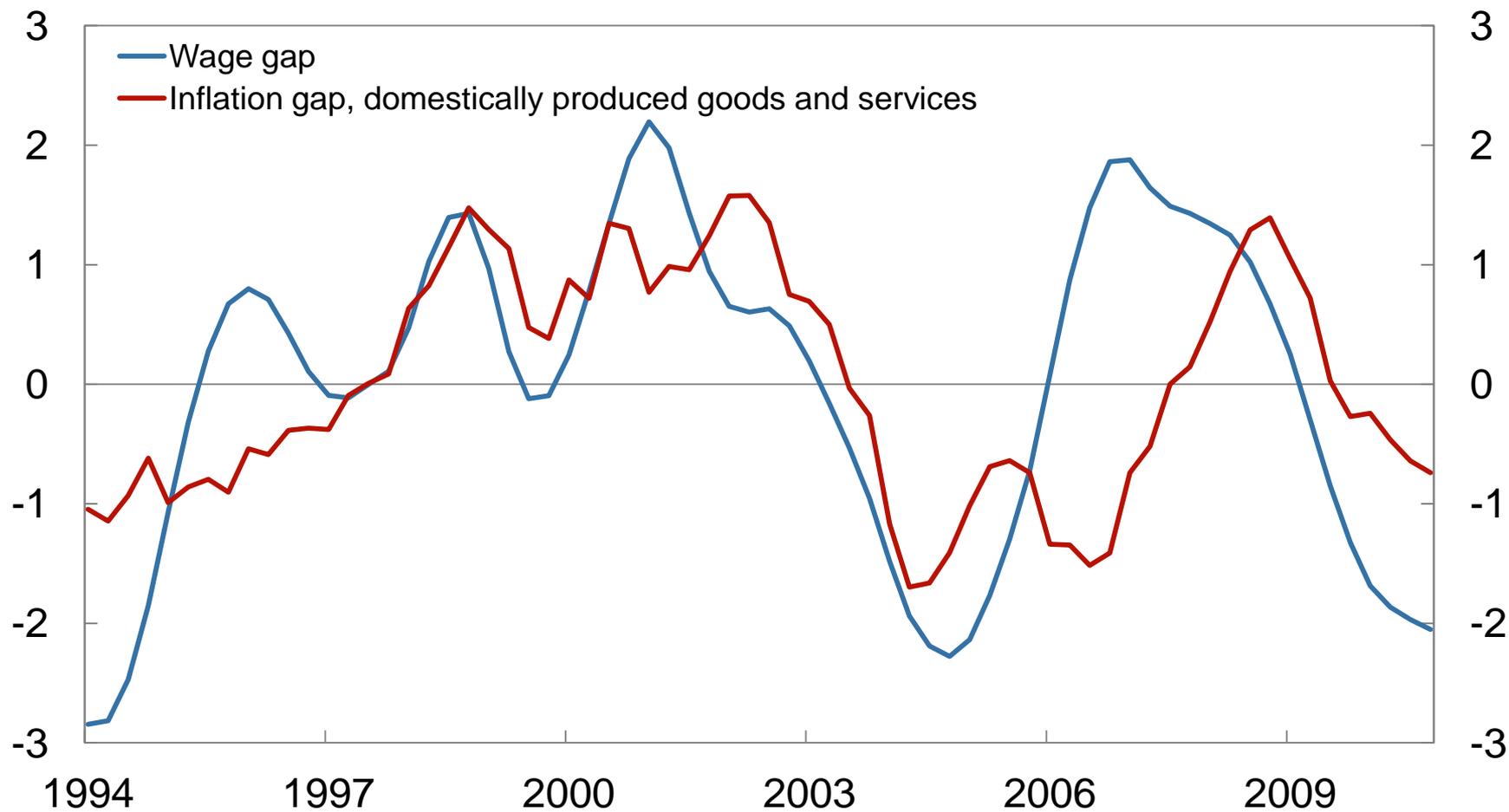
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The interest rate is an endogenous variable

The effect of a change in the interest rate depends on:

- The reason for the change

- Whether the change is a surprise

- Whether the change is temporary or of long duration

VAR model
(vector autoregressive model, structural)

- Mainland GDP

- Inflation (CPI-ATE)

- Exchange rate

- Interest rate

# Isolated effect on GDP of an interest rate increase in two different VAR models

Per cent

Estimation period 1996-2009

Estimation period 1986-2009
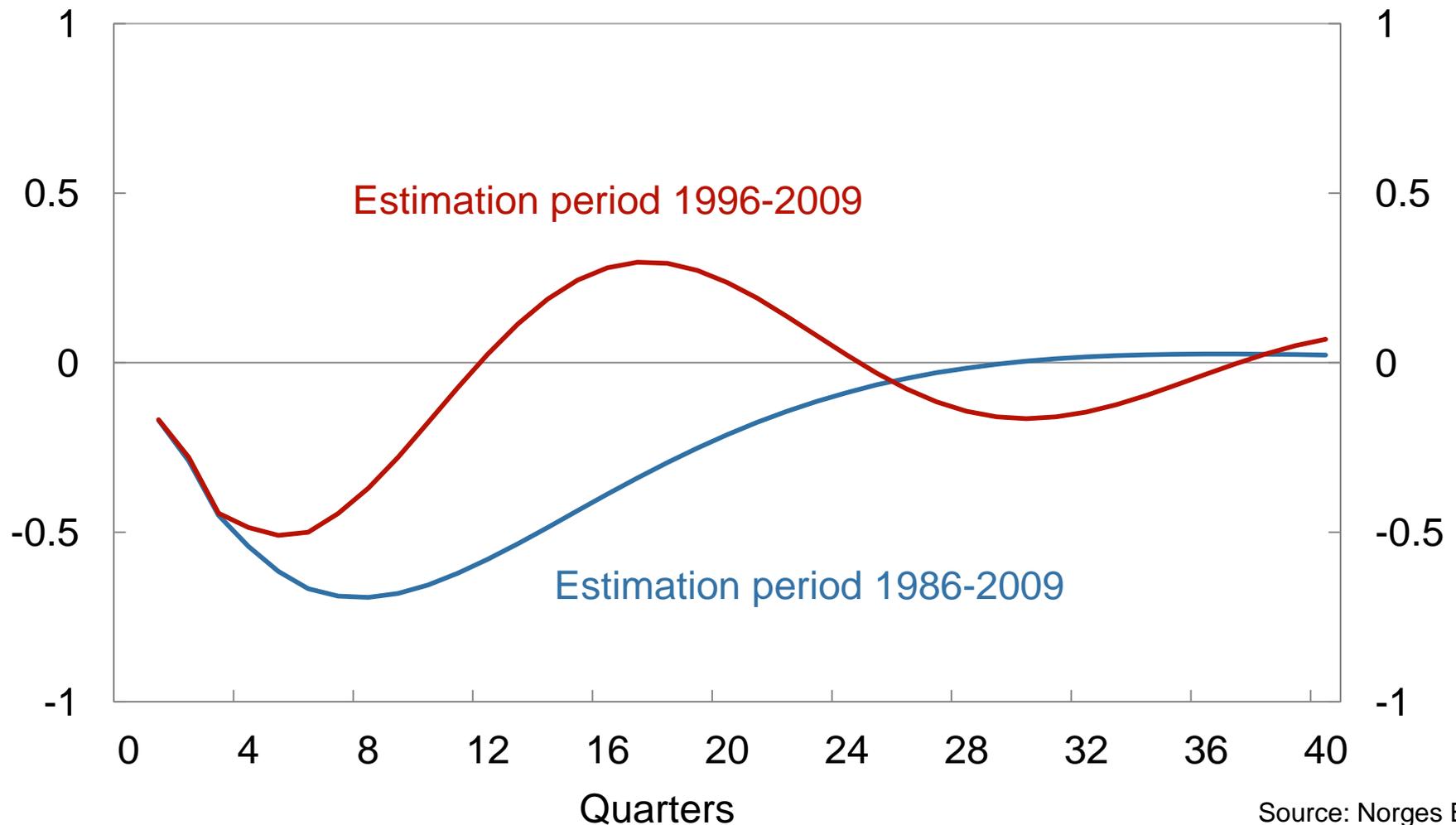
Quarters

Source: Norges Bank

Maximum impact of a 1 percentage point interest rate increase, different estimation periods

GDP
Per cent

Inflation
Percentage points
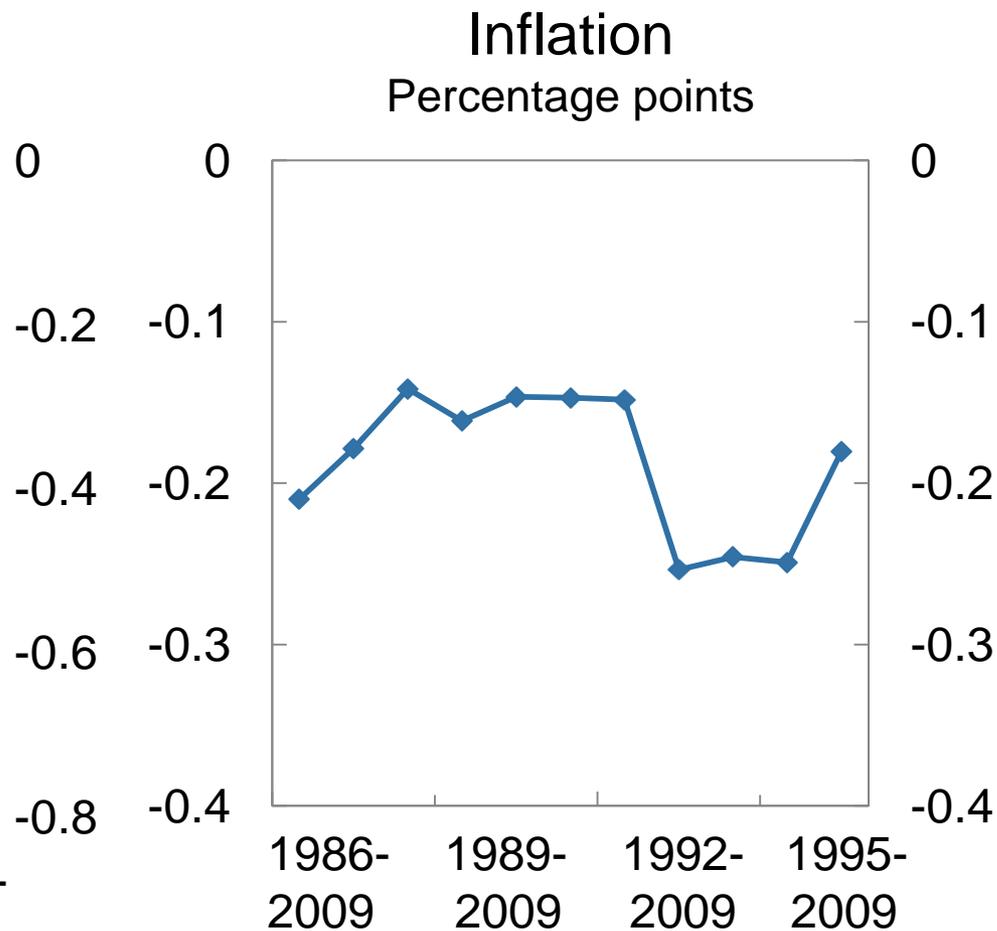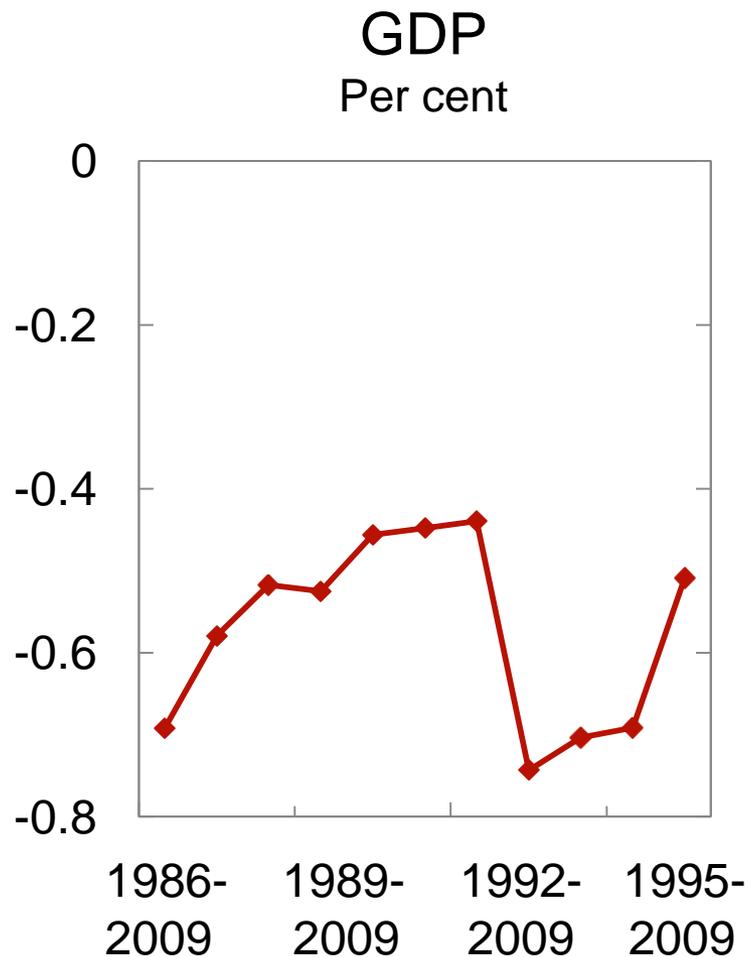
Source: Norges Bank

Number of quarters to maximum effect of interest rate change, different estimation periods

GDP
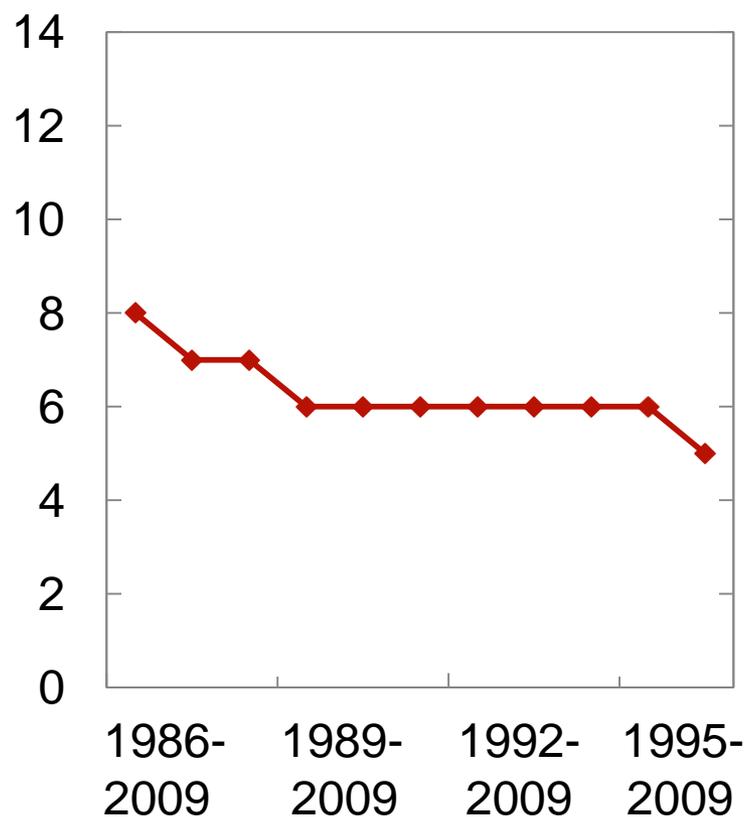
Inflation
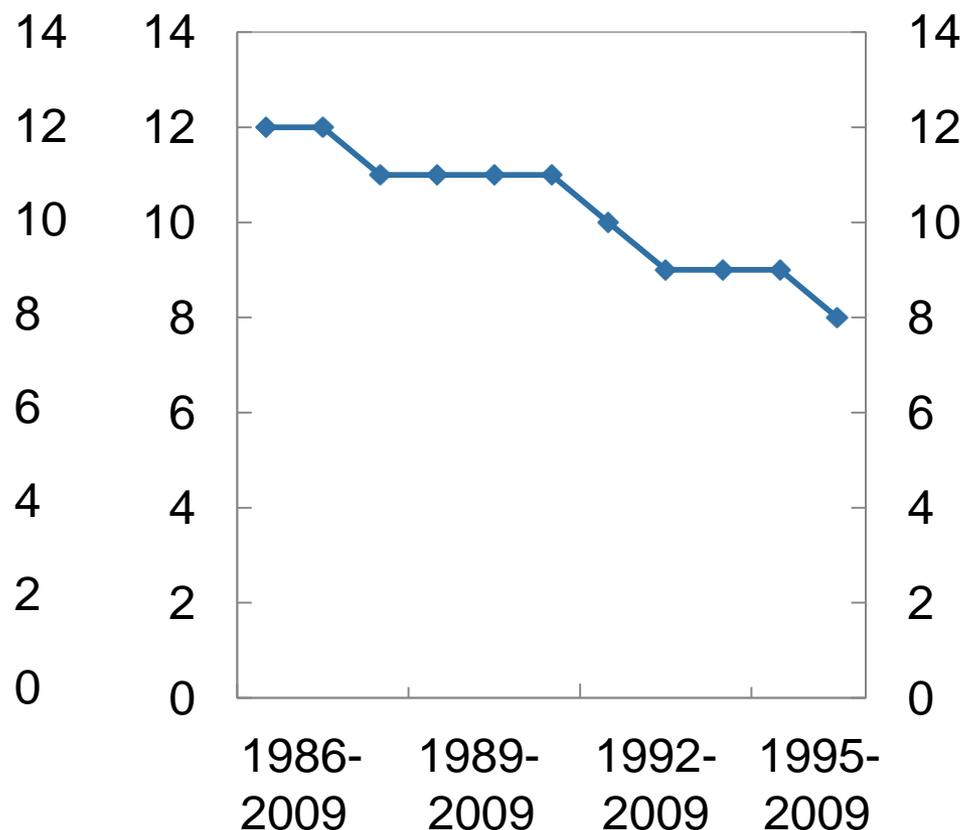
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# Effect of monetary policy shocks, different models/estimation periods

GDP
Per cent

Inflation
Percentage points

Quarters

Quarters
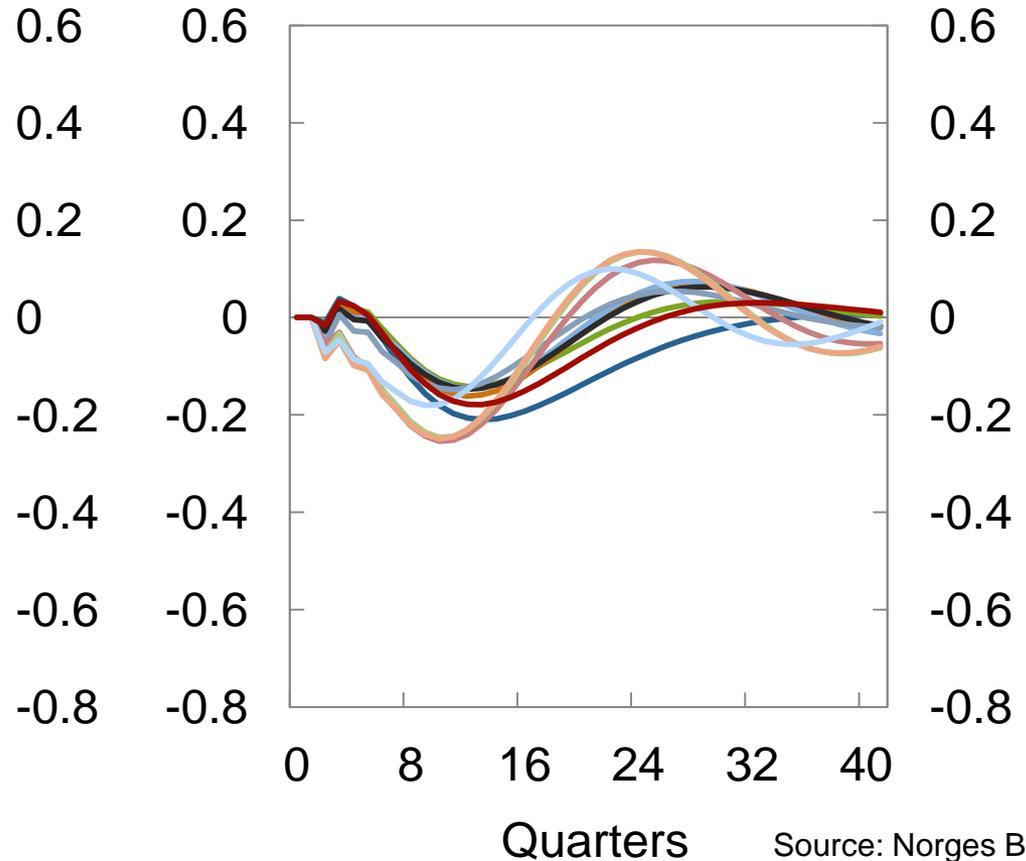
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NEMO (Norwegian Economy Model)

- General equilibrium model (DSGE)

- Forward-looking participants

- Monetary policy controls inflation and gives weight to stabilising output

- No long-term trade-off between inflation and unemployment

- Estimated on Norwegian data

Effect of monetary policy shocks in the VAR models and in NEMO

GDP
Per cent

Inflation
Percentage points

NEMO

NEMO
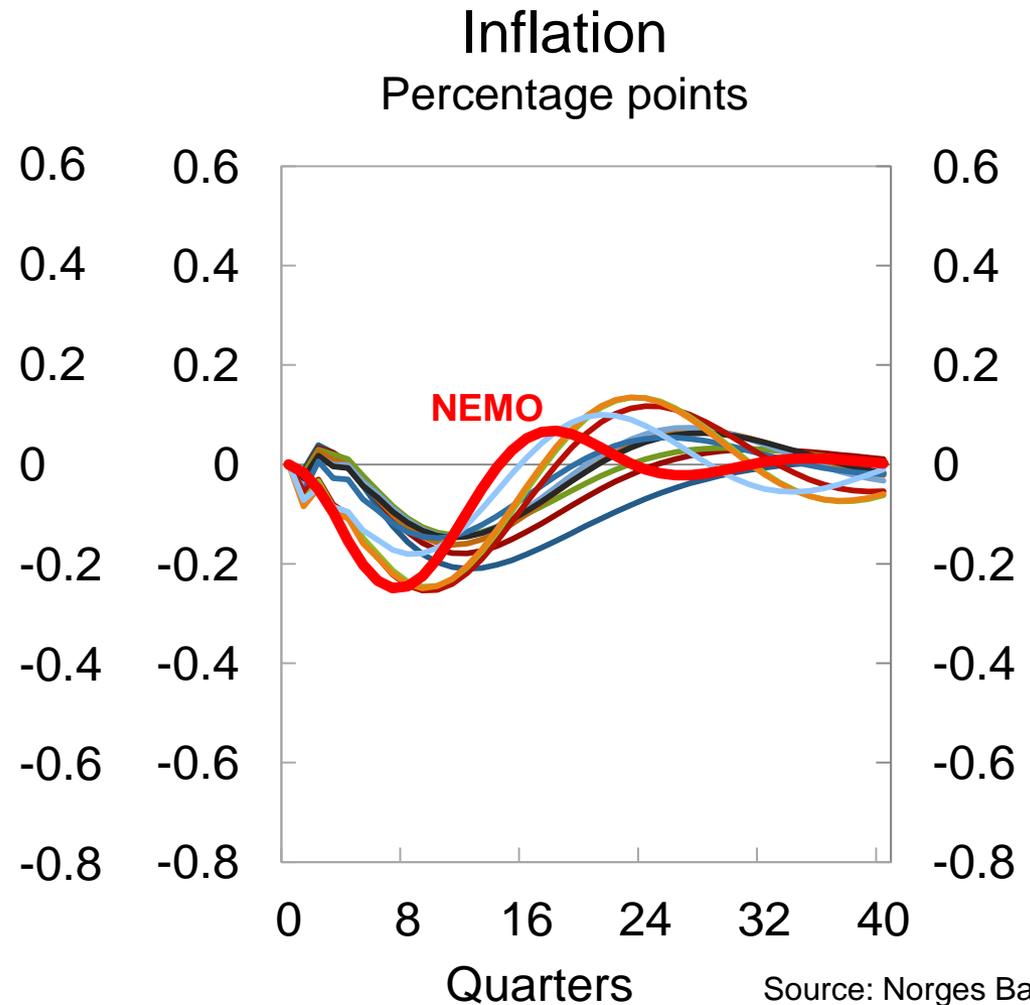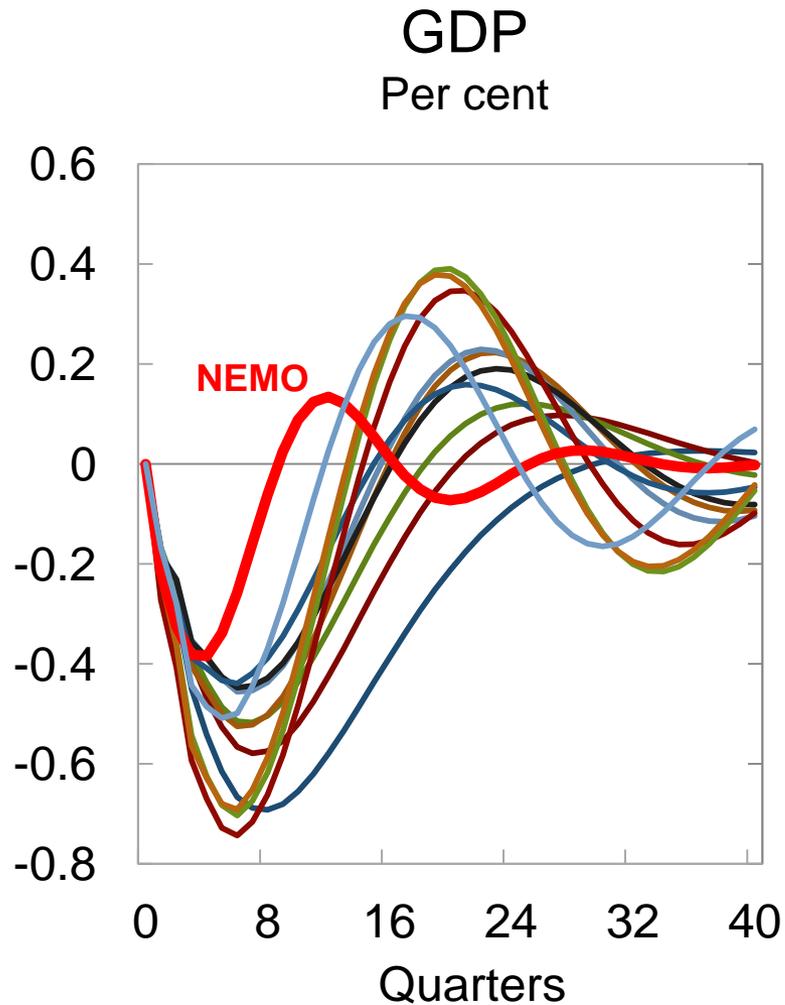
Quarters

Quarters

Source: Norges Bank

Projected inflation and output gap in the baseline scenario from MPR 2/11

Per cent. Quarterly figures. 2008 Q1 – 2014 Q4

Output gap, left-hand scale

CPIXE, right-hand scale
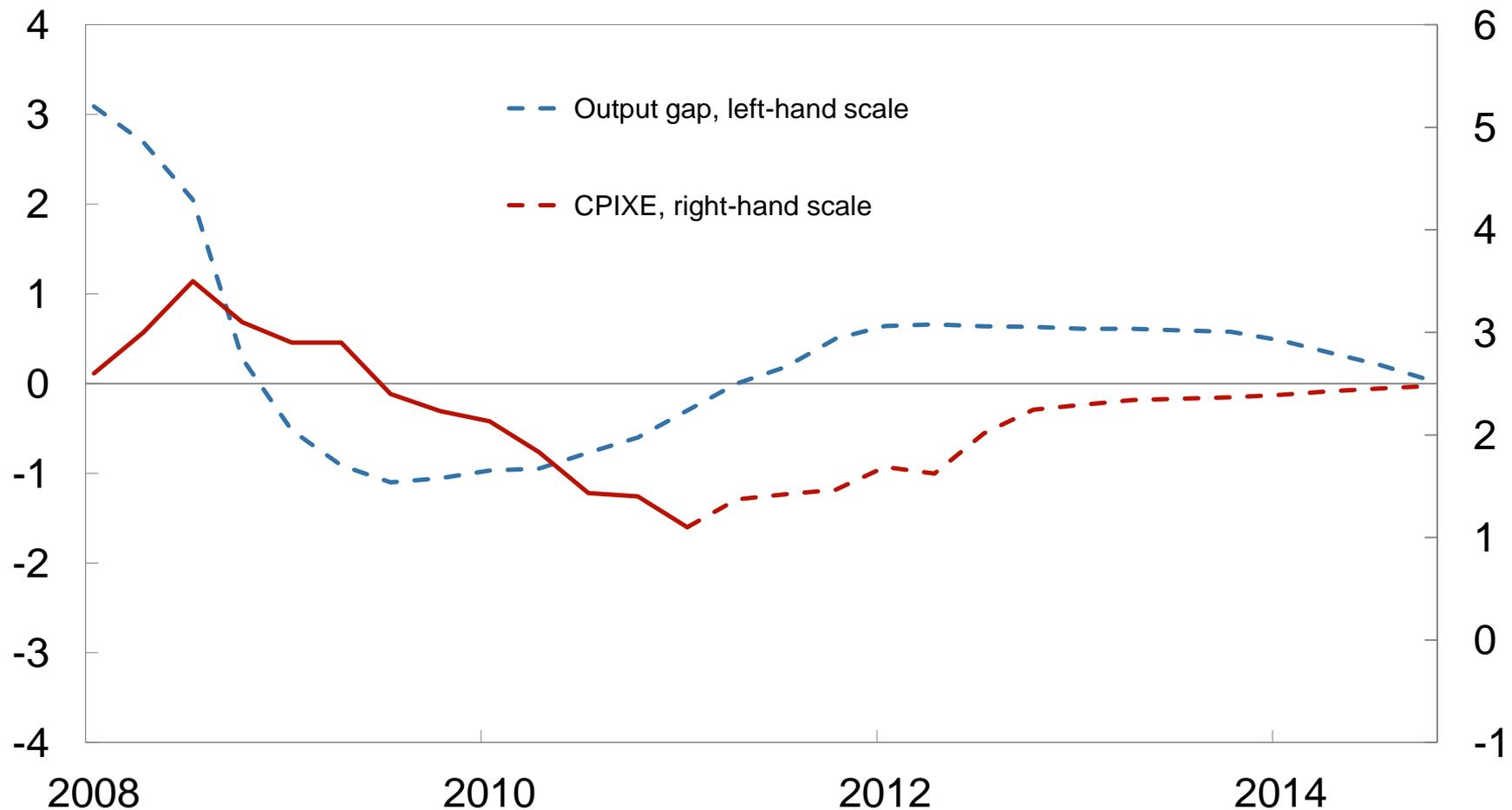
Sources: Statistics Norway and Norges Bank

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Projected key policy rate in the baseline scenario from MPR 2/11 with fan chart

Per cent. Quarterly figures. 2008 Q1 – 2014 Q4
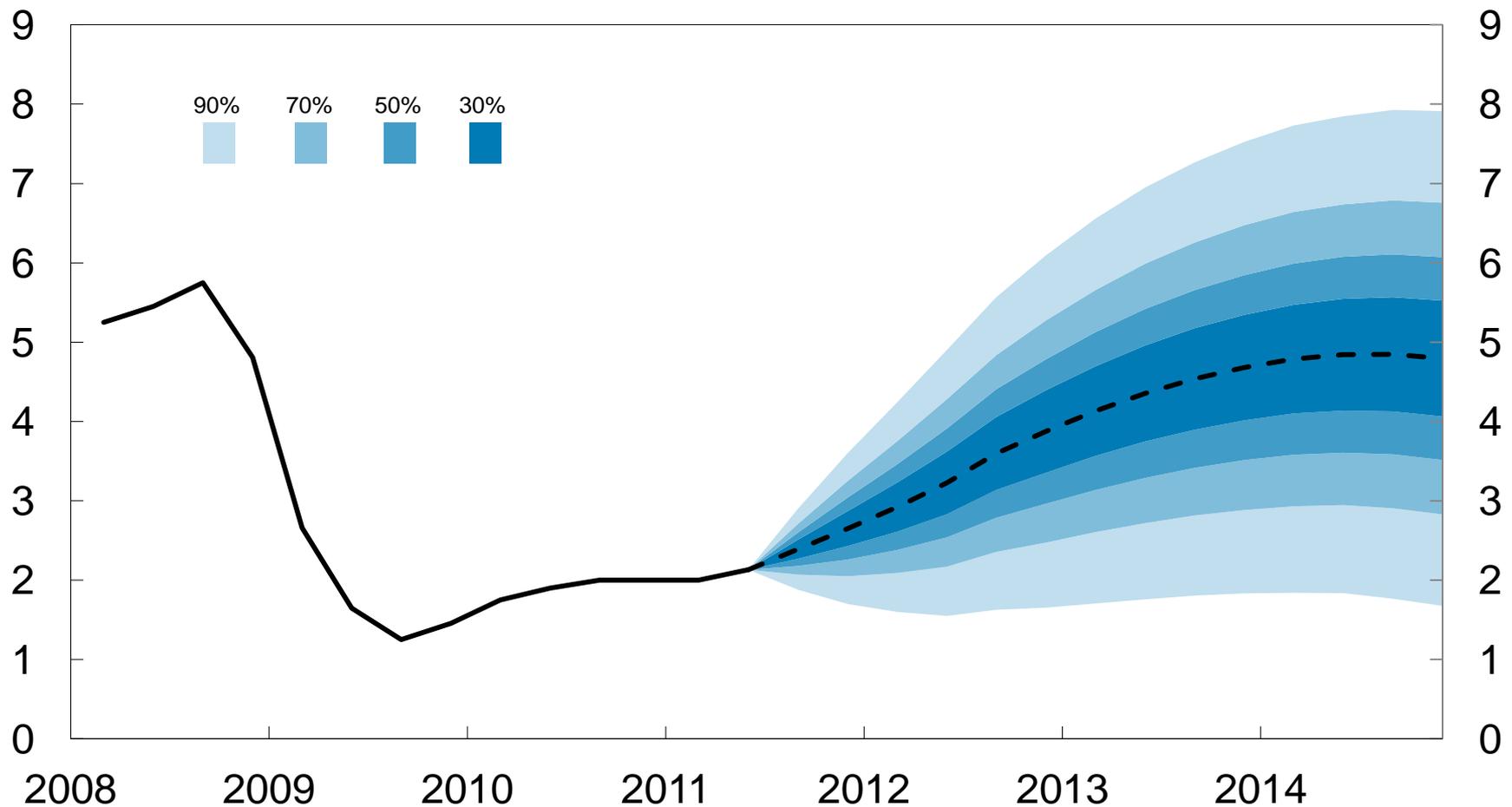
Source: Norges Bank

Key policy rate in the baseline scenario and in the alternative scenarios from MPR 2/11

Per cent. Quarterly figures. 2008 Q1 - 2014 Q4
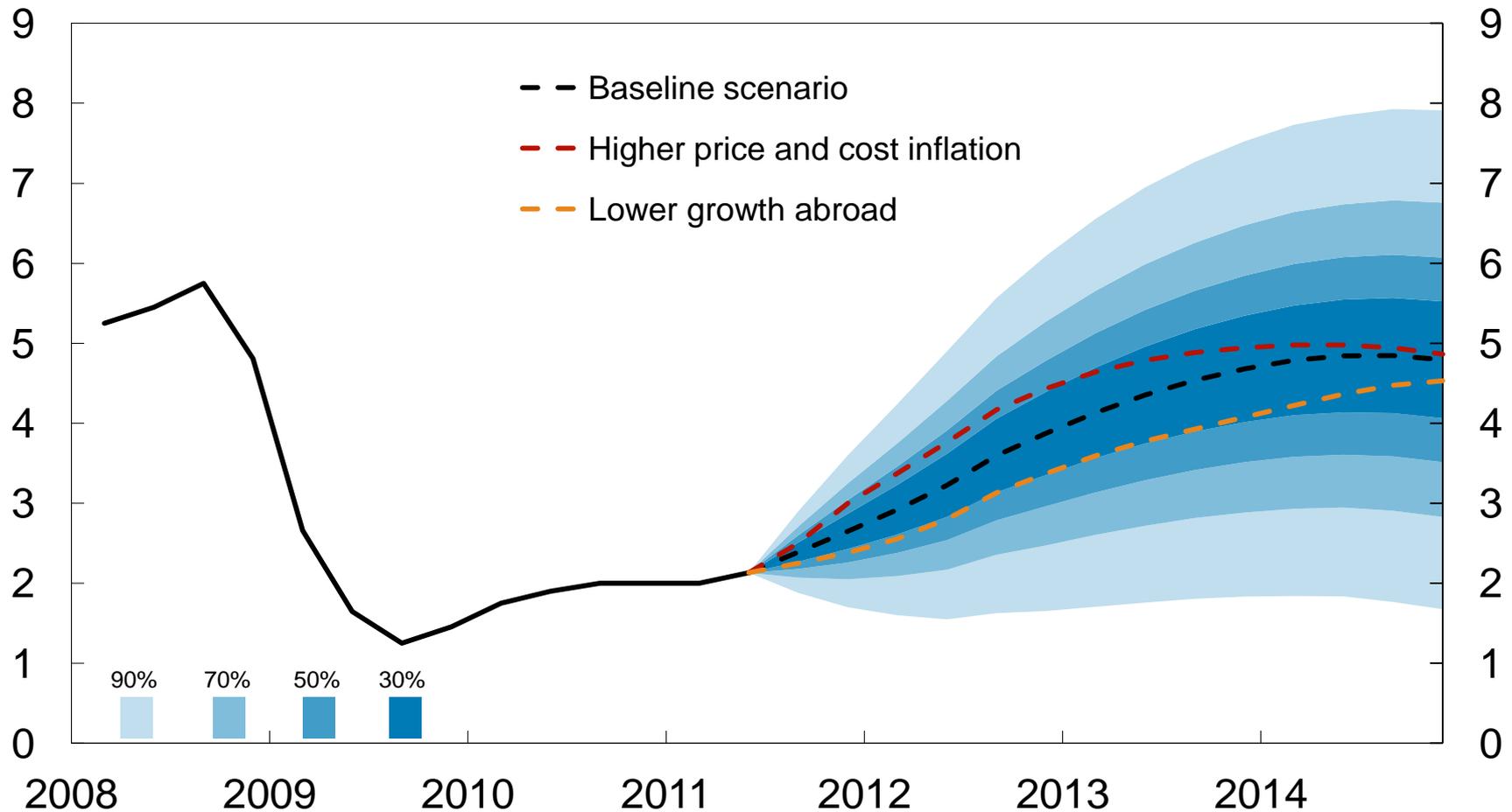
Source: Norges Bank

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Summary:
Response pattern in interest rate setting

- Empirically anchored
- Theory-based
- Professional judgement
- Learning