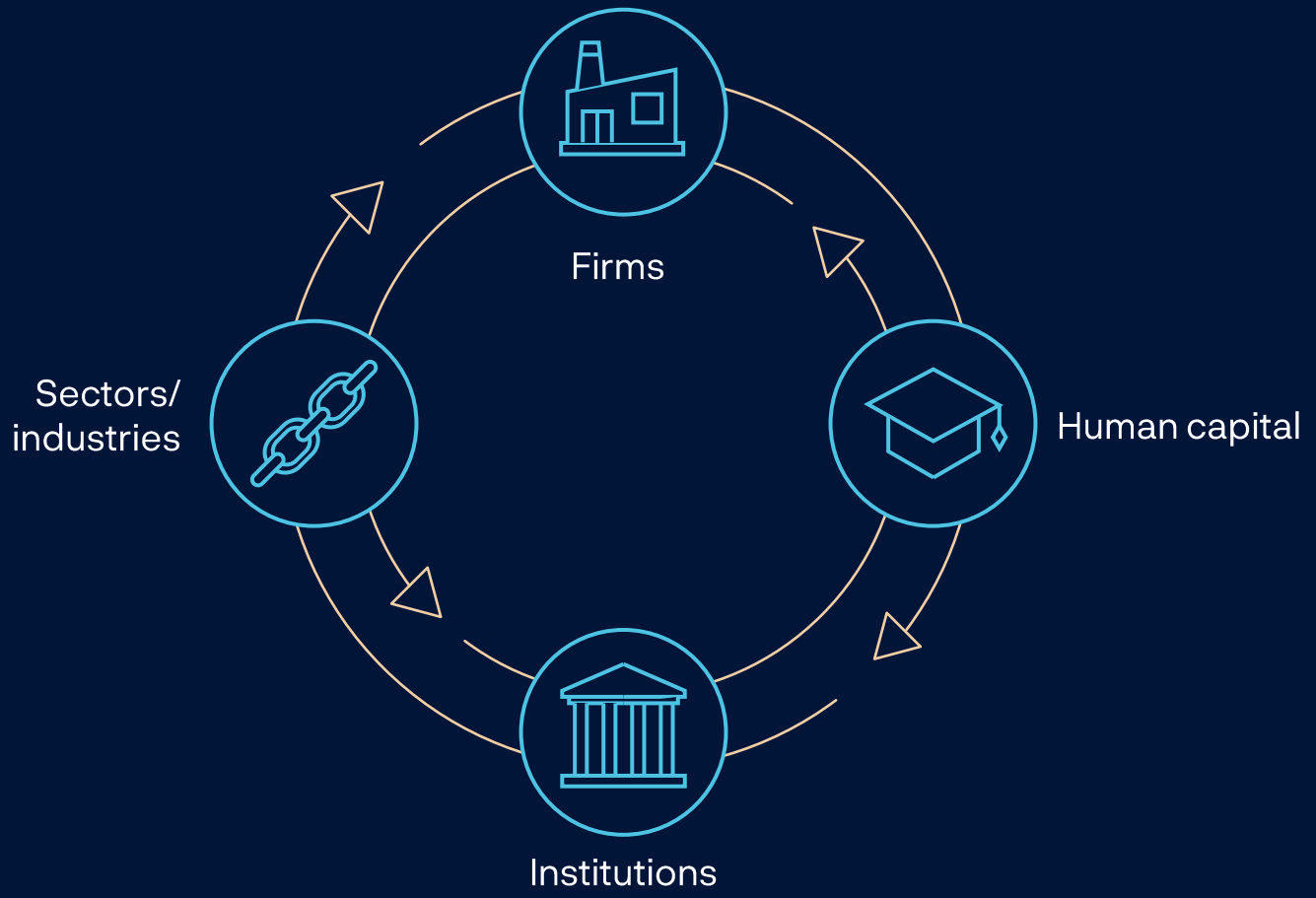
How can AI affect monetary policy?

What drives productivity growth?

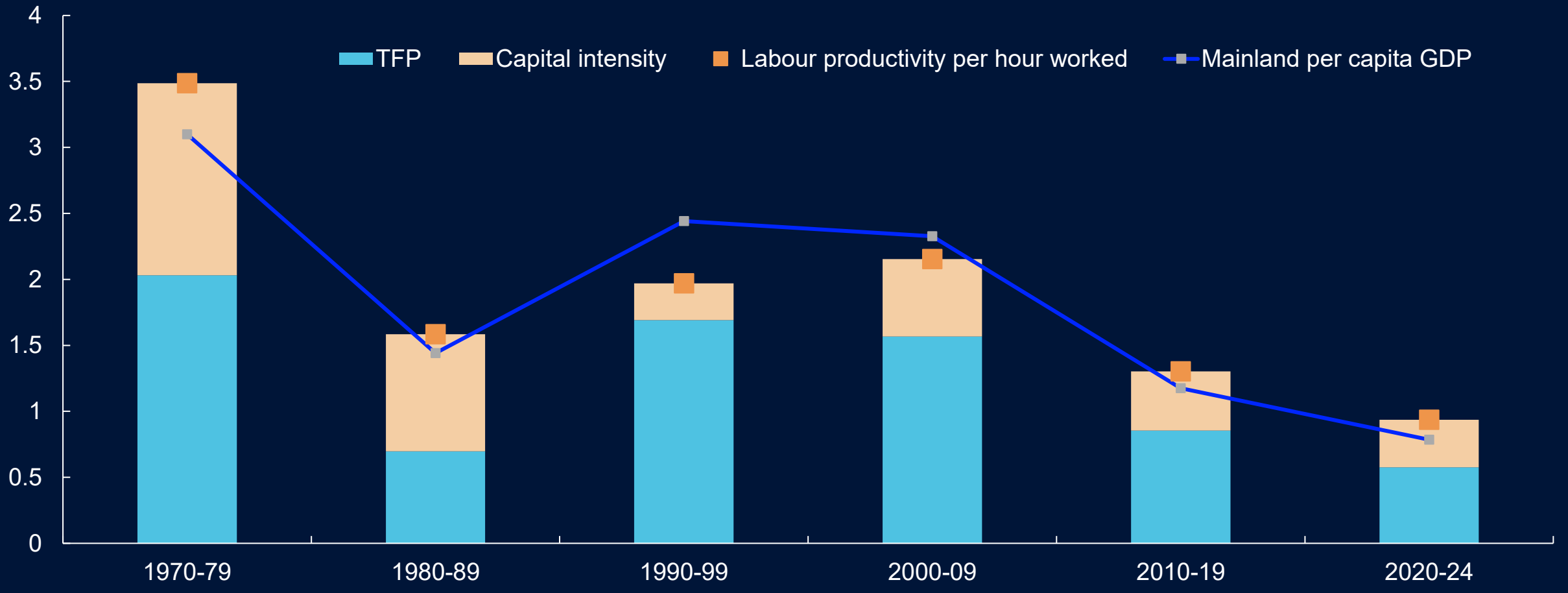
MACRO PRODUCTIVITY



Two common productivity measures – and a rough proxy

Average annual growth. Percent

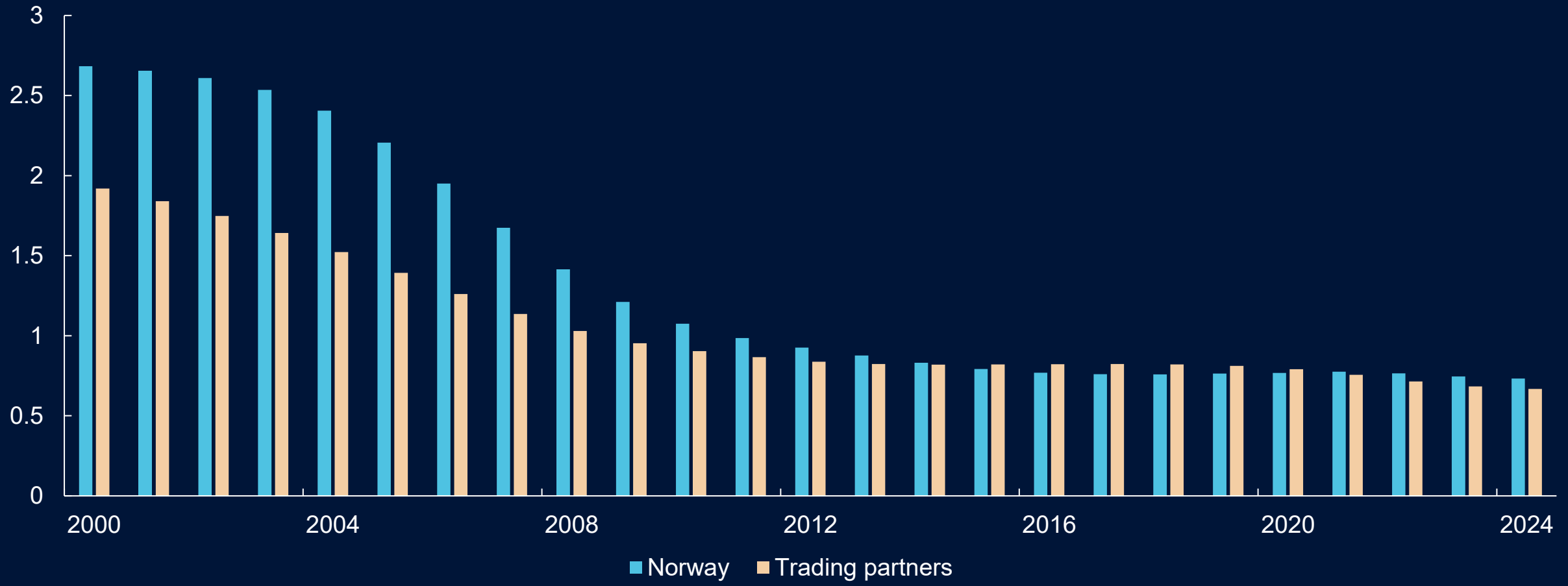
Source: Norges Bank, Statistics Norway



Productivity growth has slowed both in Norway and abroad

HP trend, annual growth. Percent

Sources: OECD, U.S. Bureau of Economic Analysis and Statistics Norway



Relatively weak productivity growth in manufacturing in Norway

Sources: OECD, U.S. Bureau of Economic Analysis

More than compensated for by strong services sector growth

Offset by terms of trade gains,

providing, in isolation, sound manufacturing profitability

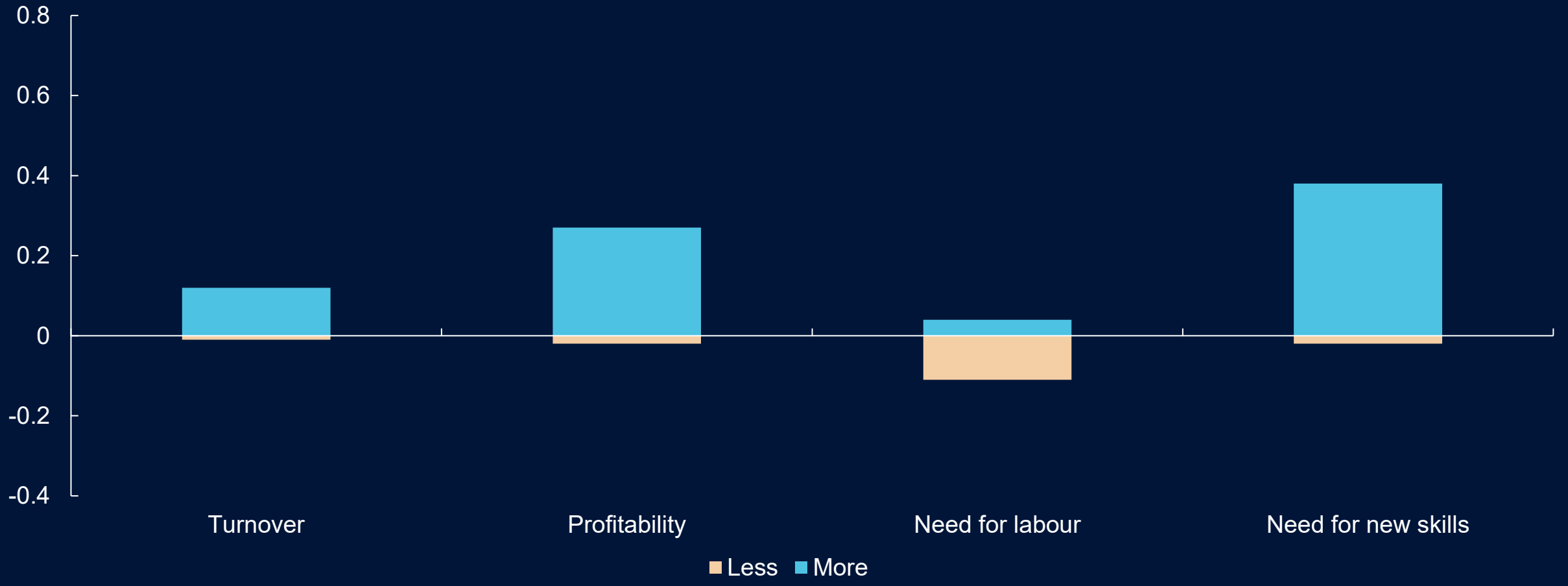
Sources: OECD, U.S. Bureau of Economic Analysis

Artificial intelligence and productivity

How is AI affecting Regional Network survey contacts?

Share of enterprises

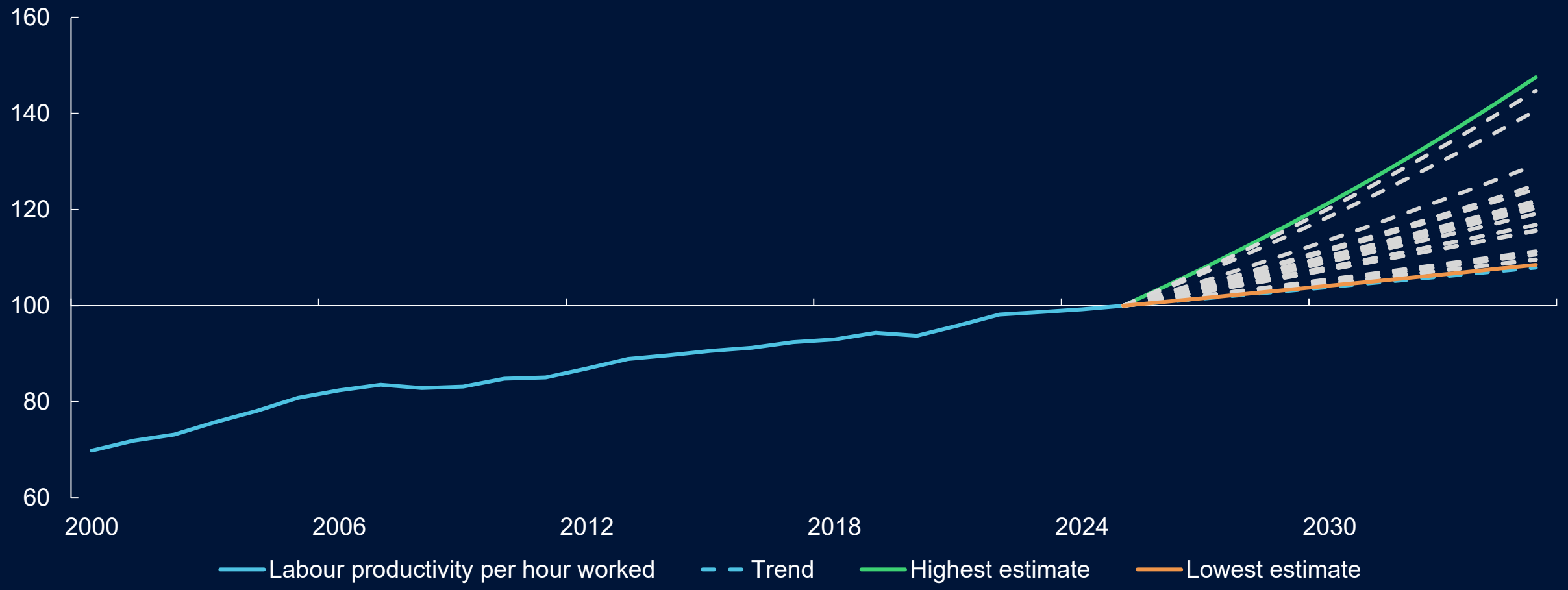
Source: Norges Bank's Regional Network survey



Divergent estimates of AI-driven productivity growth

Expected labour productivity per hour worked over the next ten years.

Index: 2025 = 100

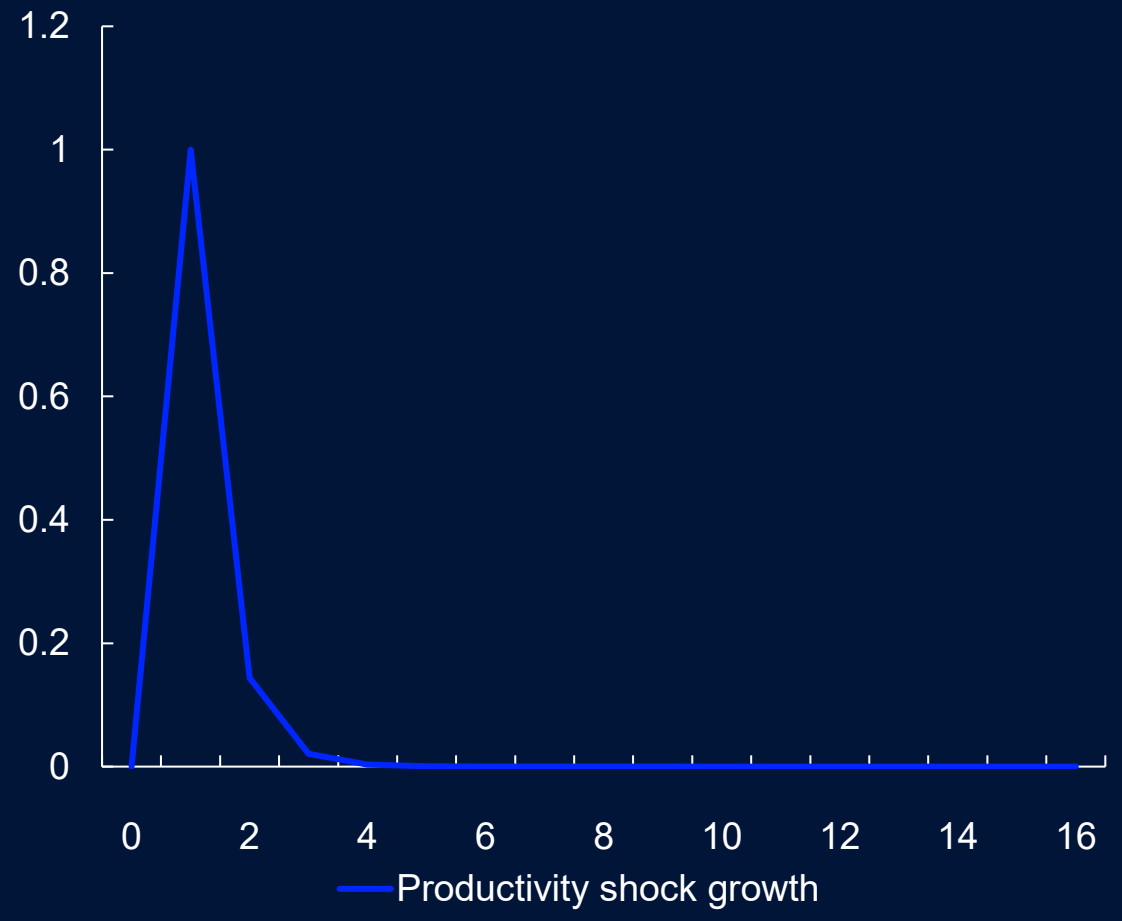


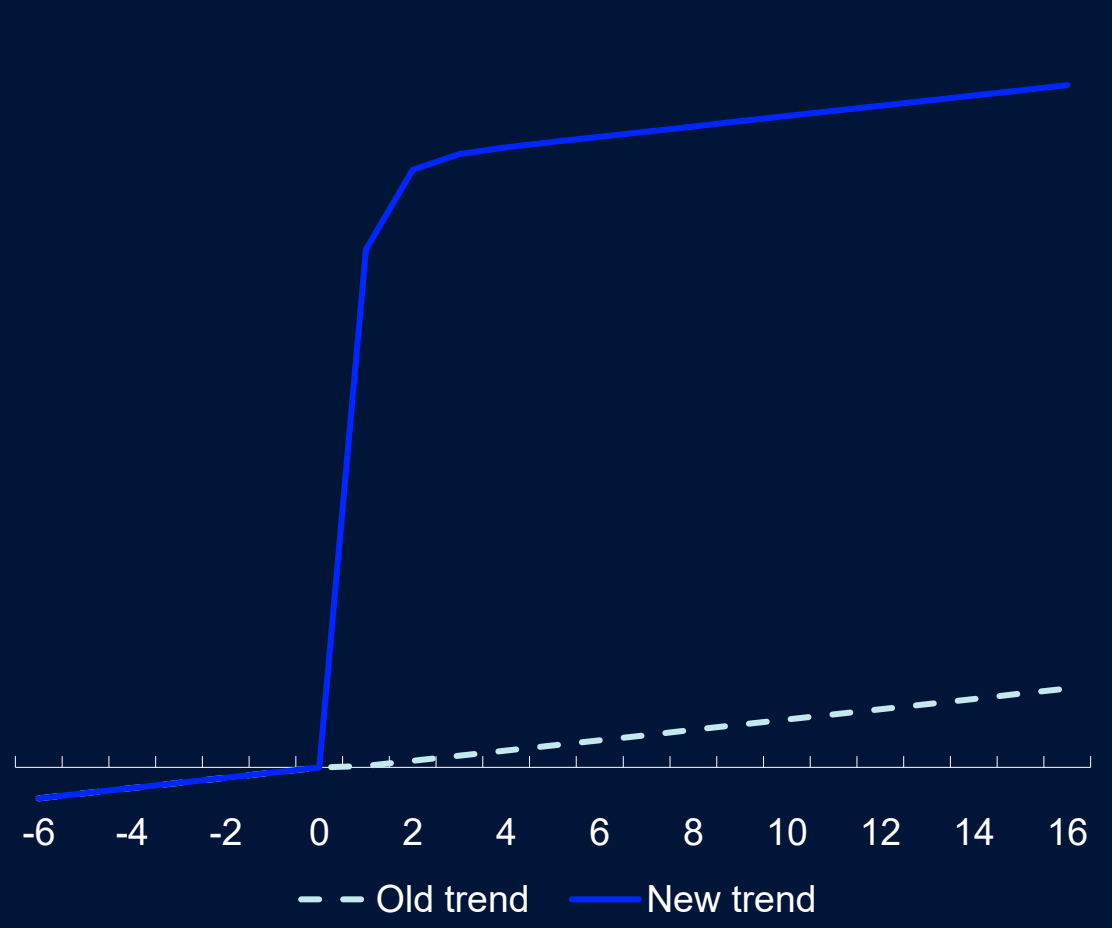
Productivity and Monetary Policy

A permanent productivity shock

Percent

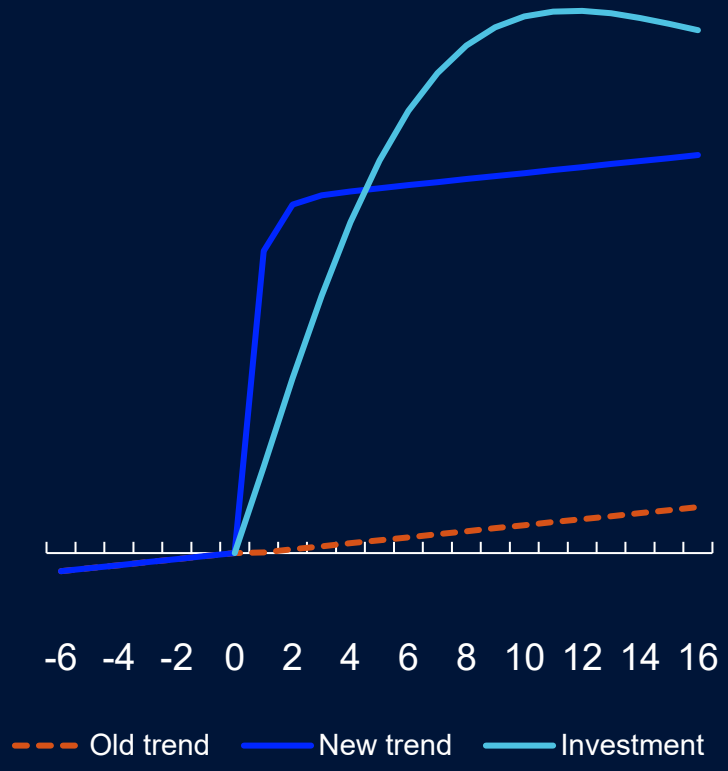
Source: Norges Bank

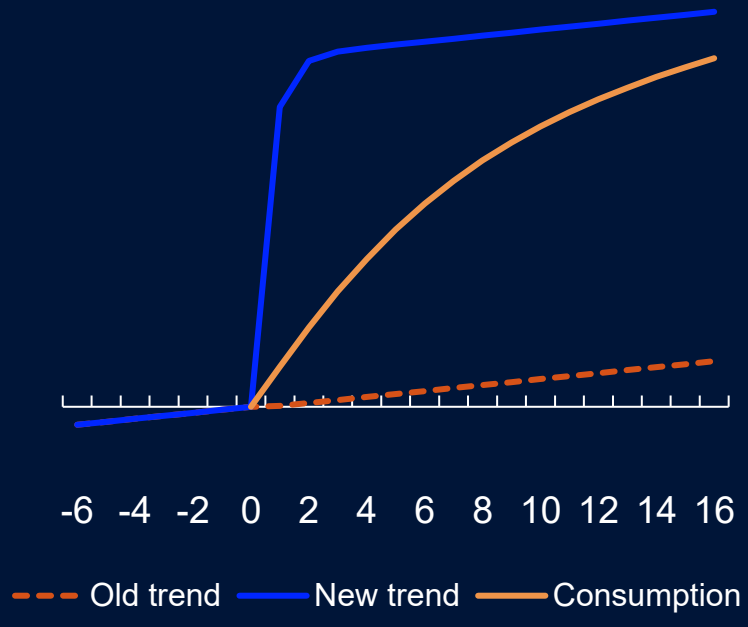


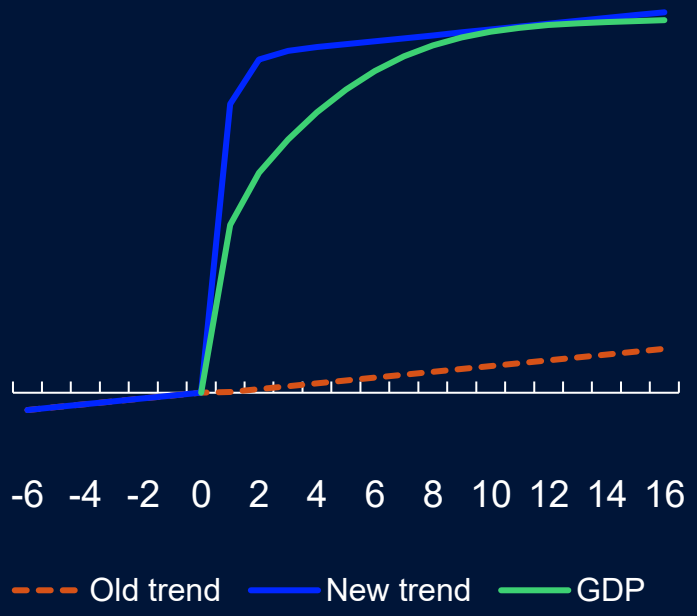


Effects of a permanent productivity shock in NEMO

Source: Norges Bank



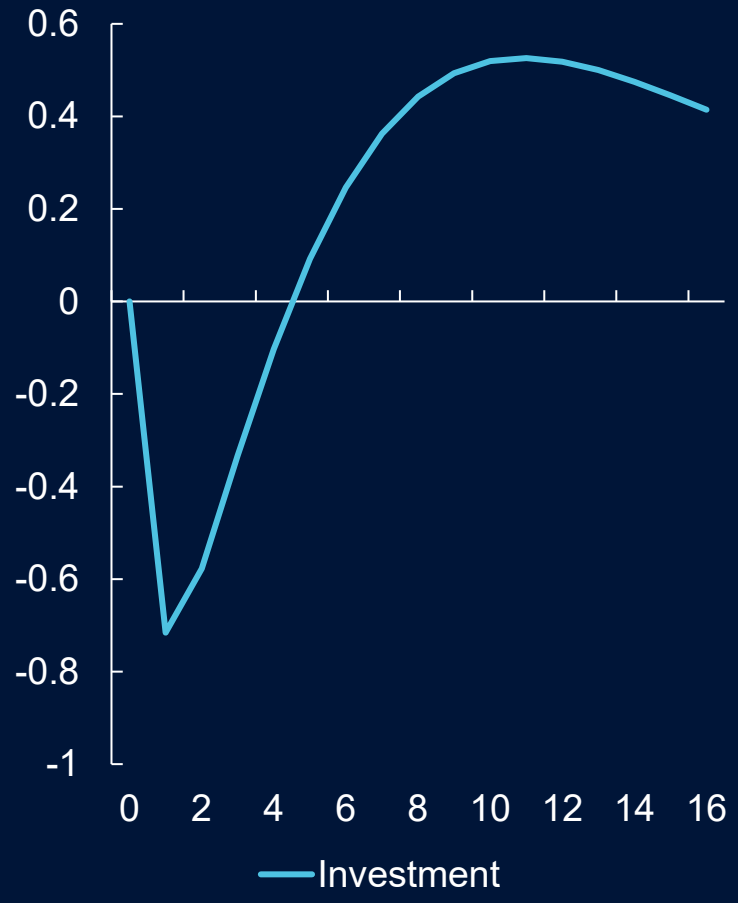


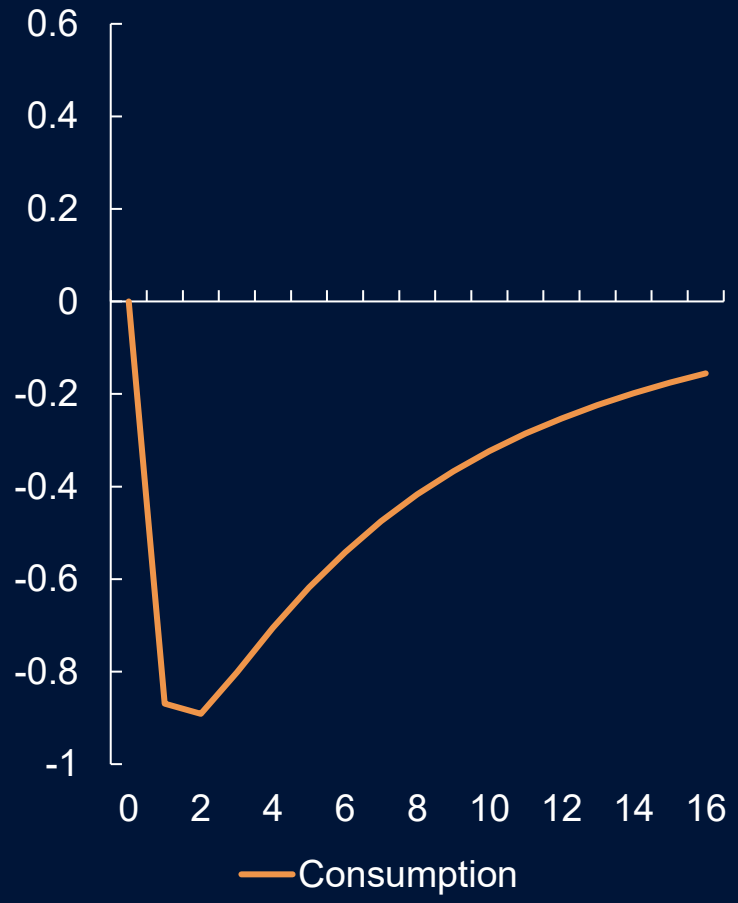


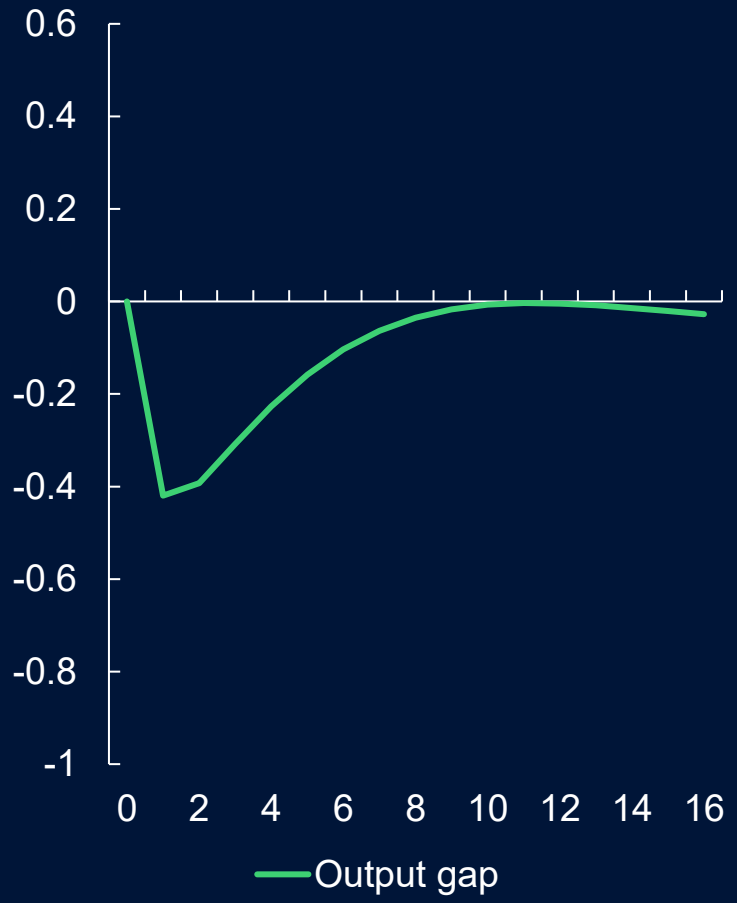
... measured as deviation from trend

Source: Norges Bank

Percent

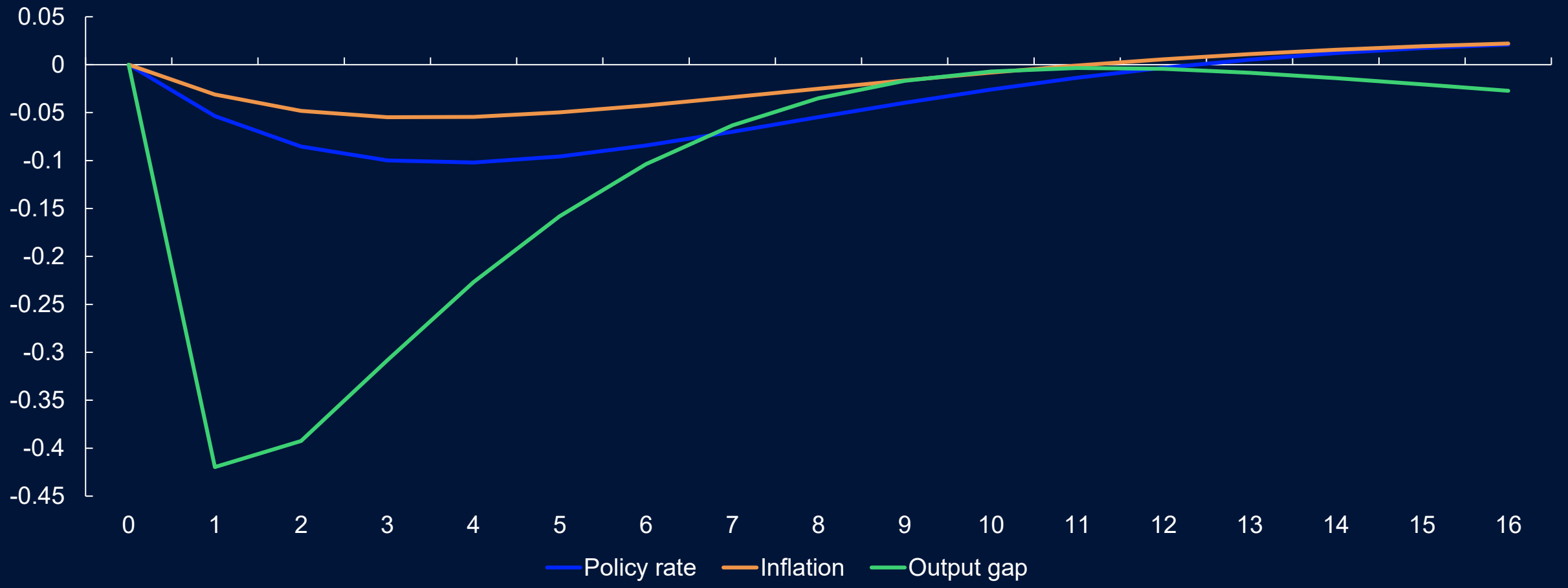






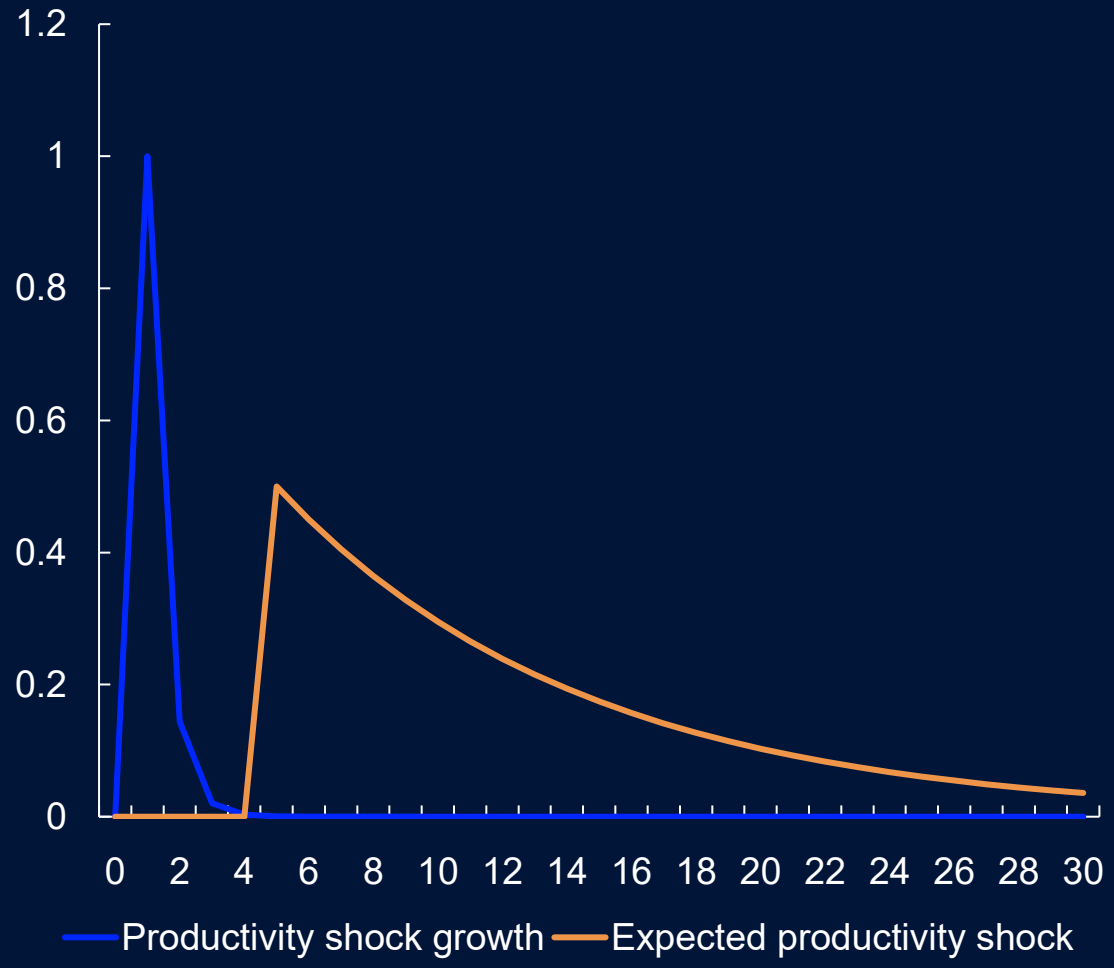
Monetary policy responds by lowering the policy rate

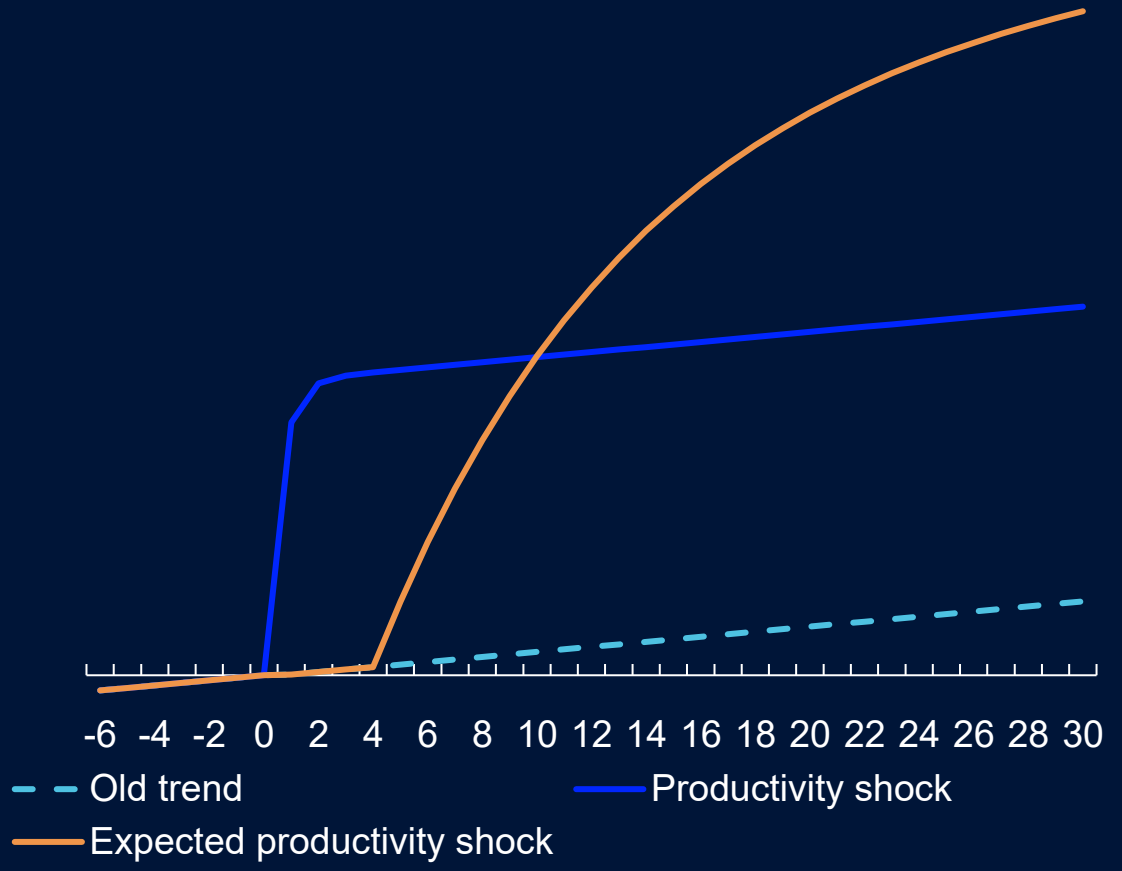
Source: Norges Bank



An expected future productivity shock

Source: Norges Bank

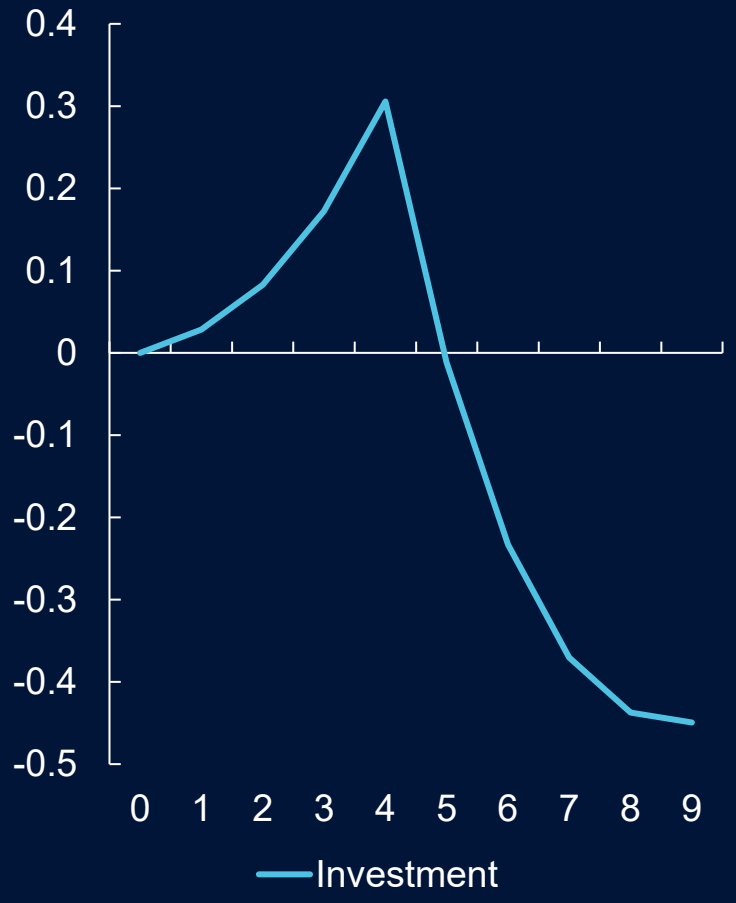


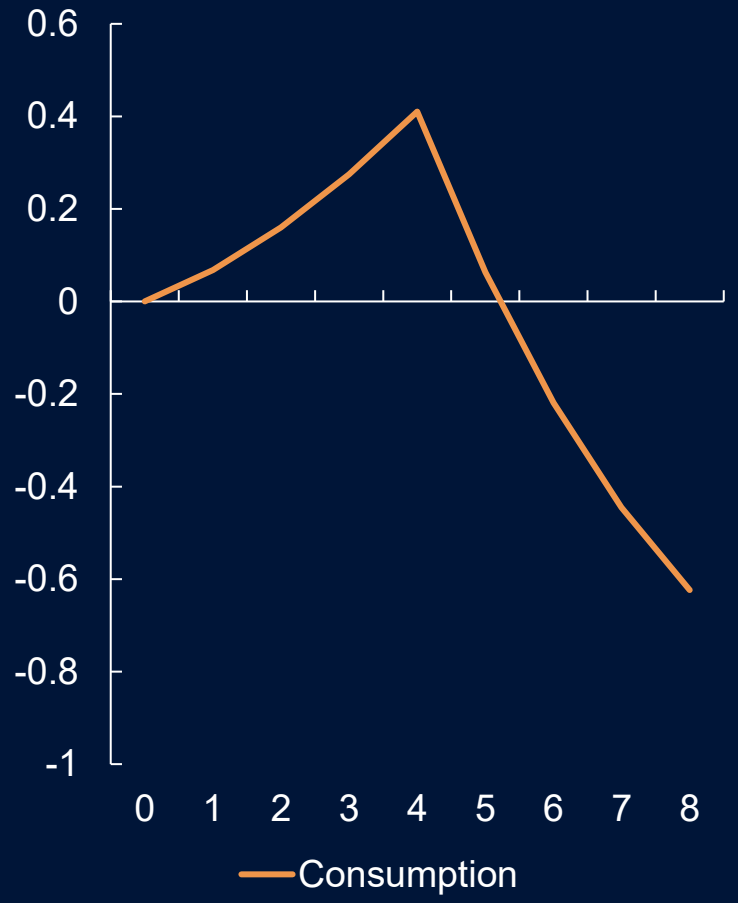


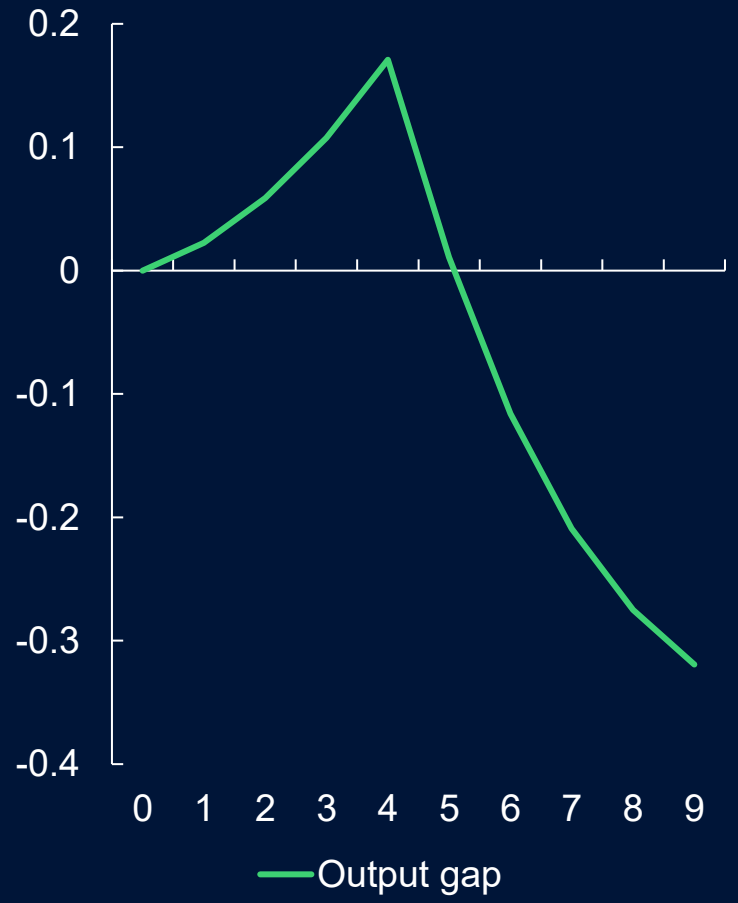
Expectations of higher productivity growth affect the economy as early as at the start of the simulation period
Expectations of higher productivity growth affect the economy as early as at the start of the simulation period

Source: Norges Bank

Deviation from trend. Percent



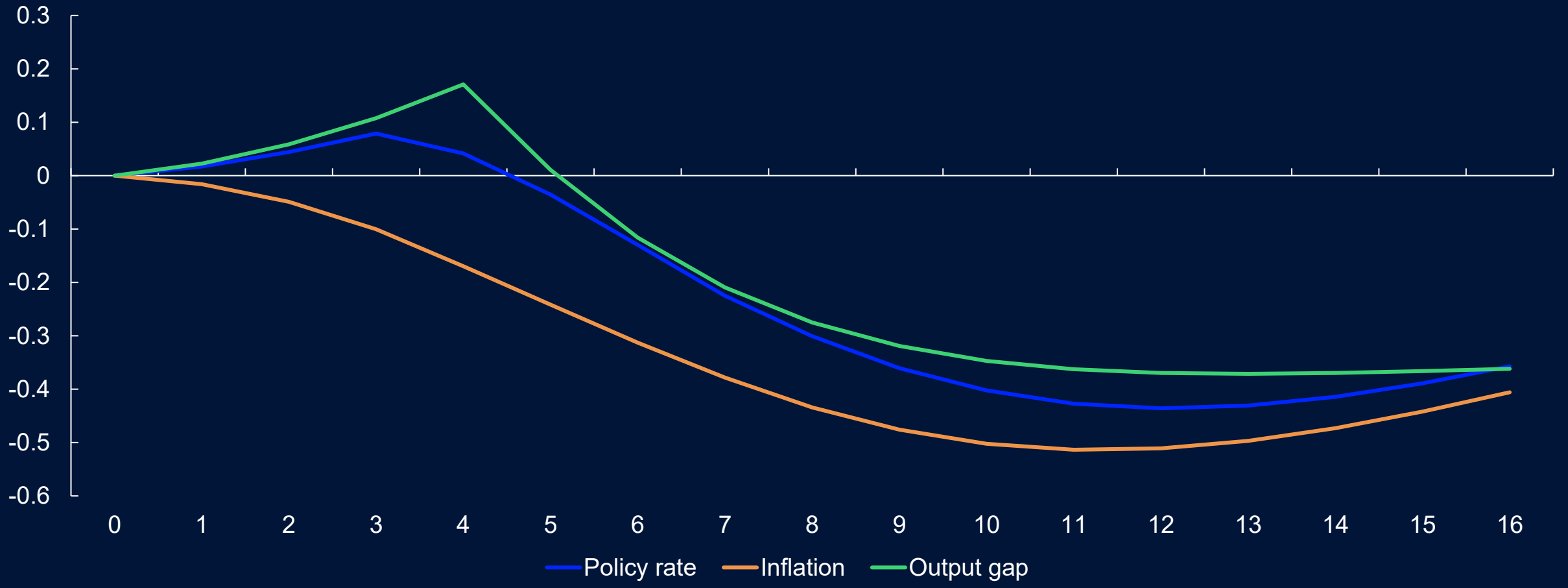




Monetary policy responds with a higher policy rate in the near term

Source: Norges Bank

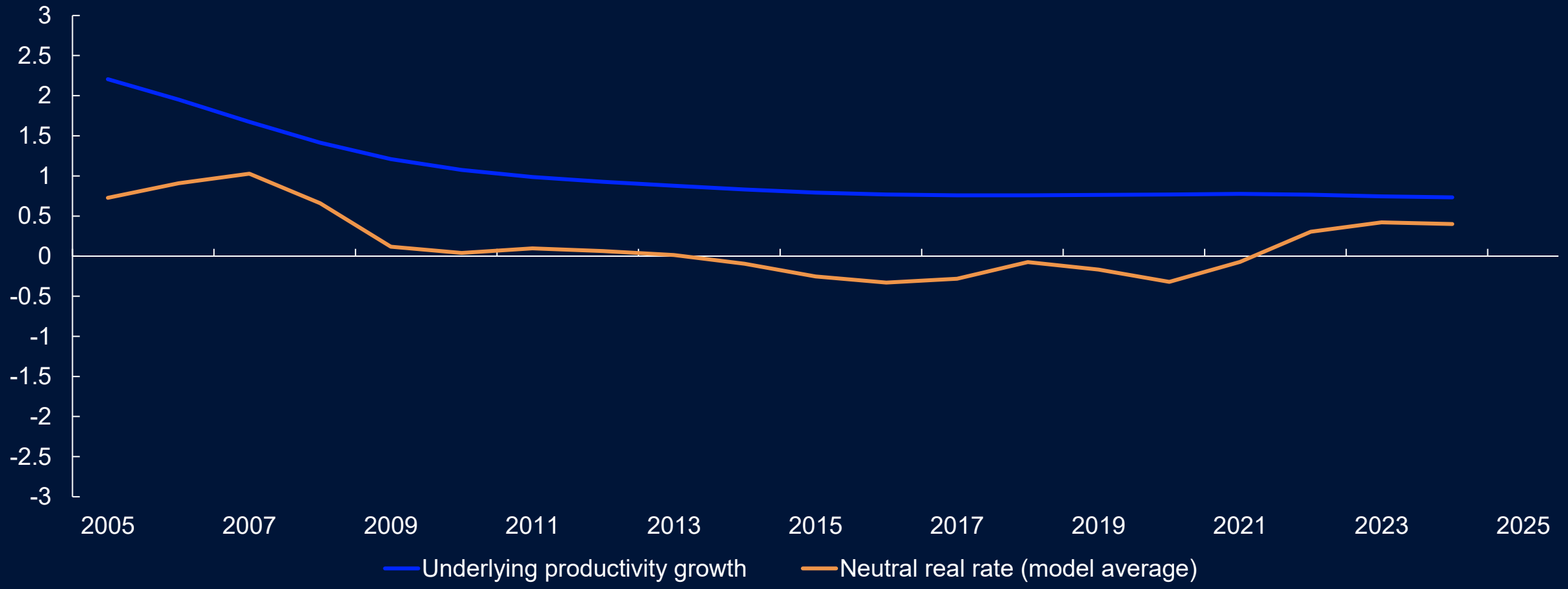
Deviation from trend.



Covariation between the neutral rate and productivity growth over time

Percent

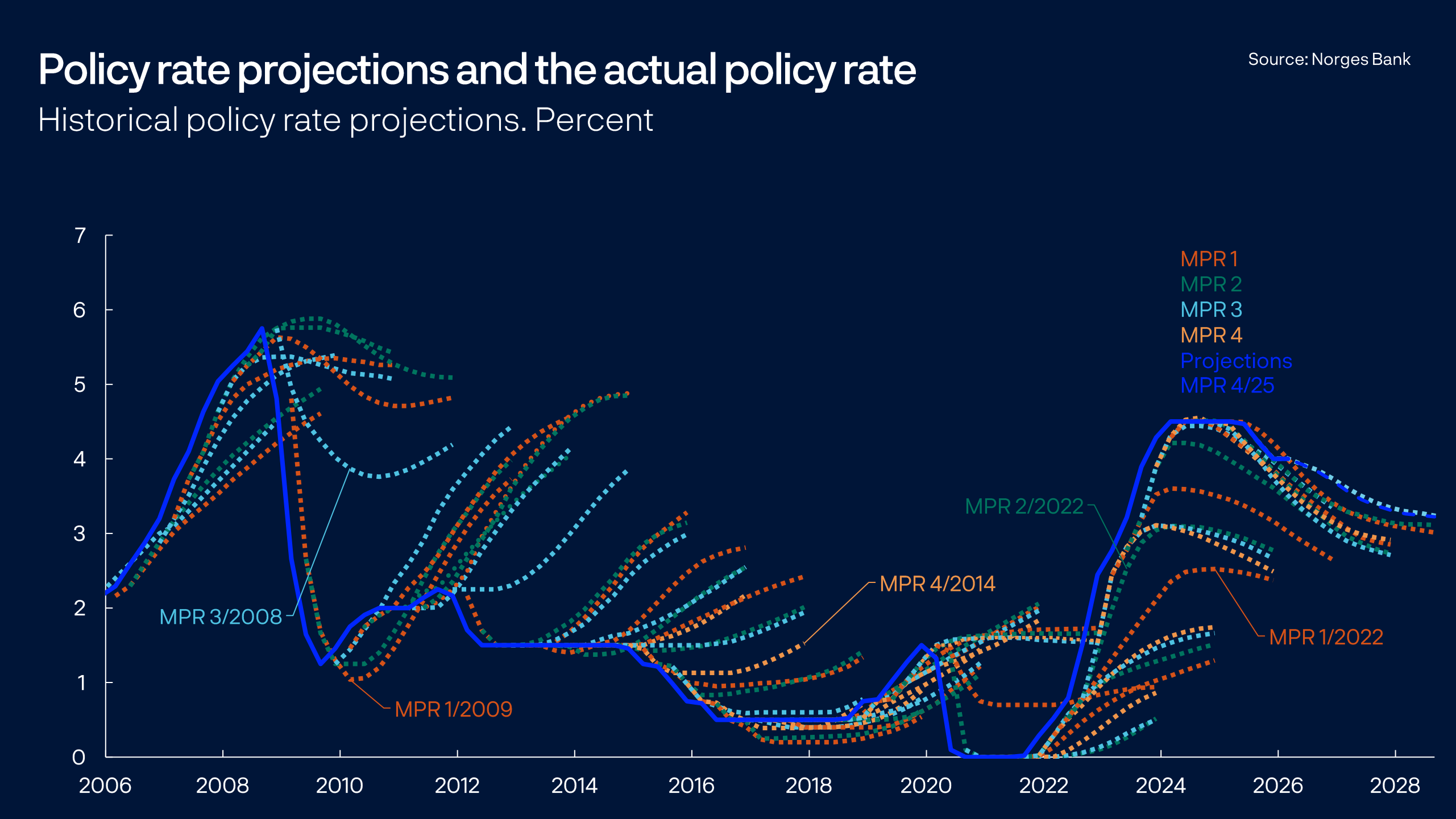
Source: Norges Bank



Policy rate projections and the actual policy rate

Historical policy rate projections. Percent

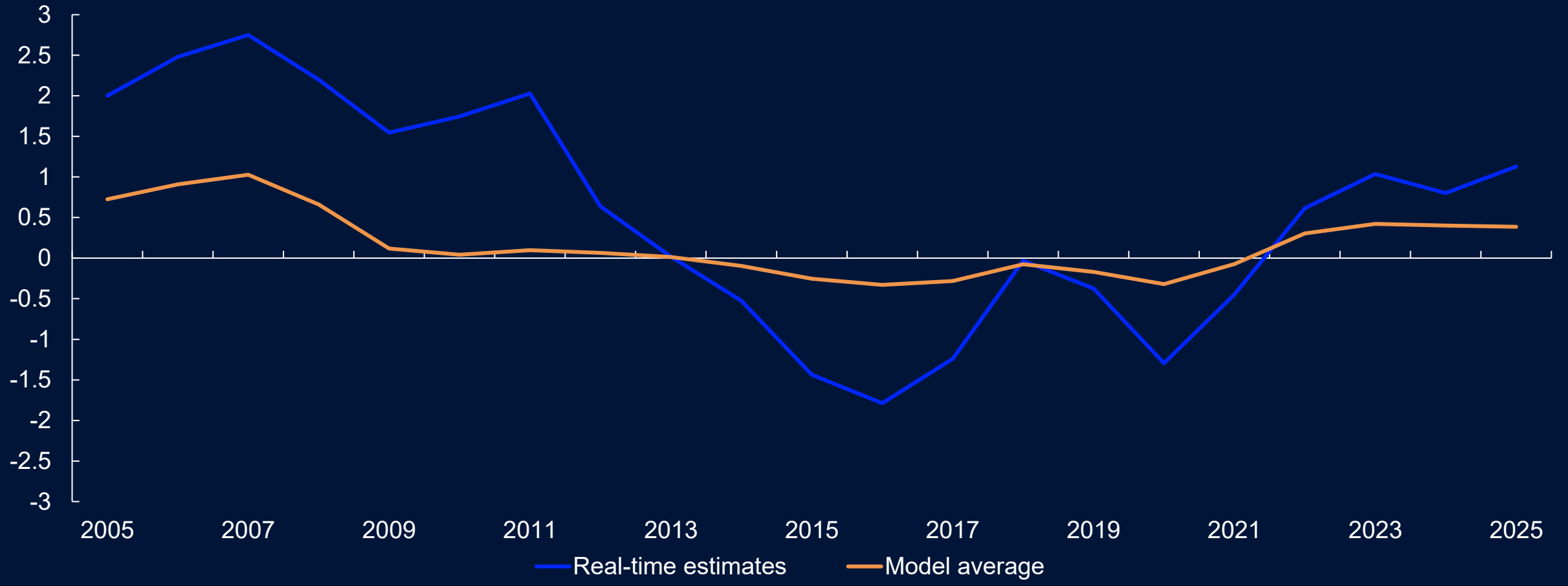
Source: Norges Bank



"Real-time" estimates and model estimates of the neutral real rate

Sources: Norges Bank

Percent



Artificial intelligence and monetary policy

AI may change how the policy rate affects the economy

The transmission mechanism

$$\hat{y}_t = \cdots - \sigma(\hat{r}_t - \hat{\pi}_t) + \varepsilon_t \qquad \text{(IS curve)}$$

$$\hat{\pi}_t = \cdots + \gamma\hat{y}_t + \epsilon_t \qquad \text{(Phillips curve)}$$

... and therefore how monetary policy should respond

$$\hat{y}_t = \cdots - \sigma(\hat{r}_t - \hat{\pi}_t) + \varepsilon_t \qquad \text{(IS curve)}$$

$$\hat{\pi}_t = \cdots + \gamma \hat{y}_t + \epsilon_t \qquad \text{(Phillips curve)}$$

$$\hat{r}_t = \cdots \varphi_\pi \hat{\pi}_t + \varphi_y \hat{y}_t + \vartheta_t \qquad \text{(Interest rate rule)}$$

AI and new technology help improve monetary policy

Improve models and analyses

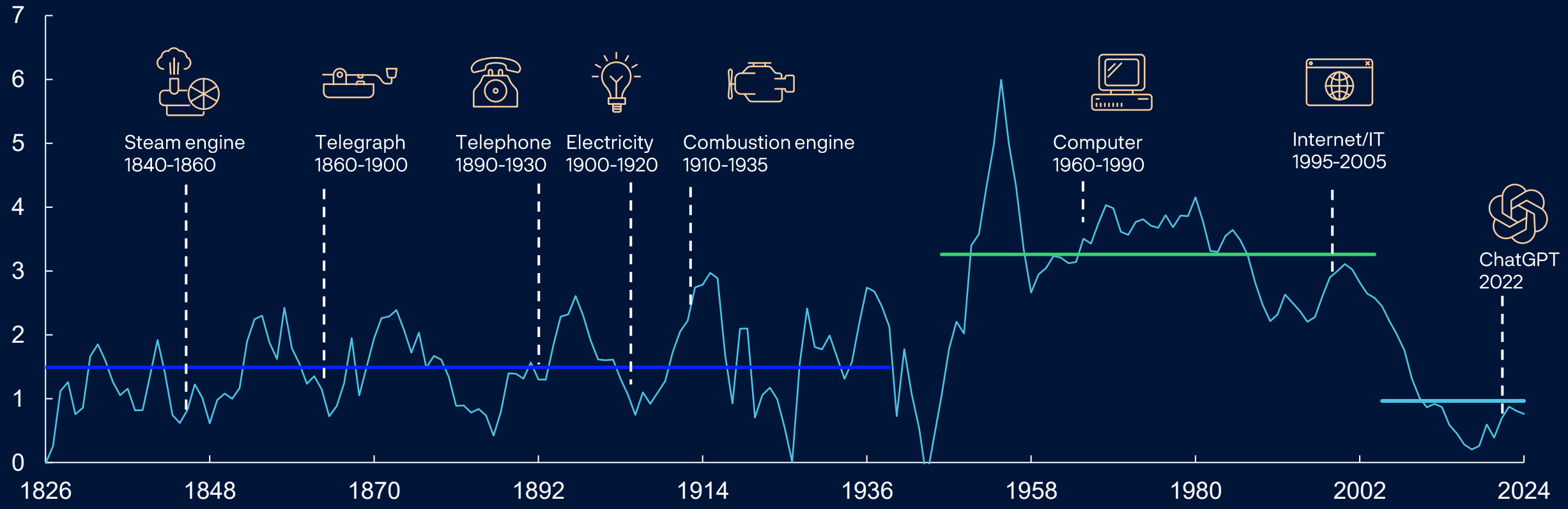
Develop tailored models
Analyse large datasets

Improve how we communicate monetary policy

Adapt communication to different groups
Increase precision

What is "normal" productivity growth?

GDP per capita. Percentage change. 10-year moving average



Sources: Statistics Norway, Norges Bank.