MOODY'S

Recession Watch

Dante DeAntonio, Senior Director-Economic Research
Mark Hopkins, Senior Director-Economic Research
Shandor Whitcher, Economist

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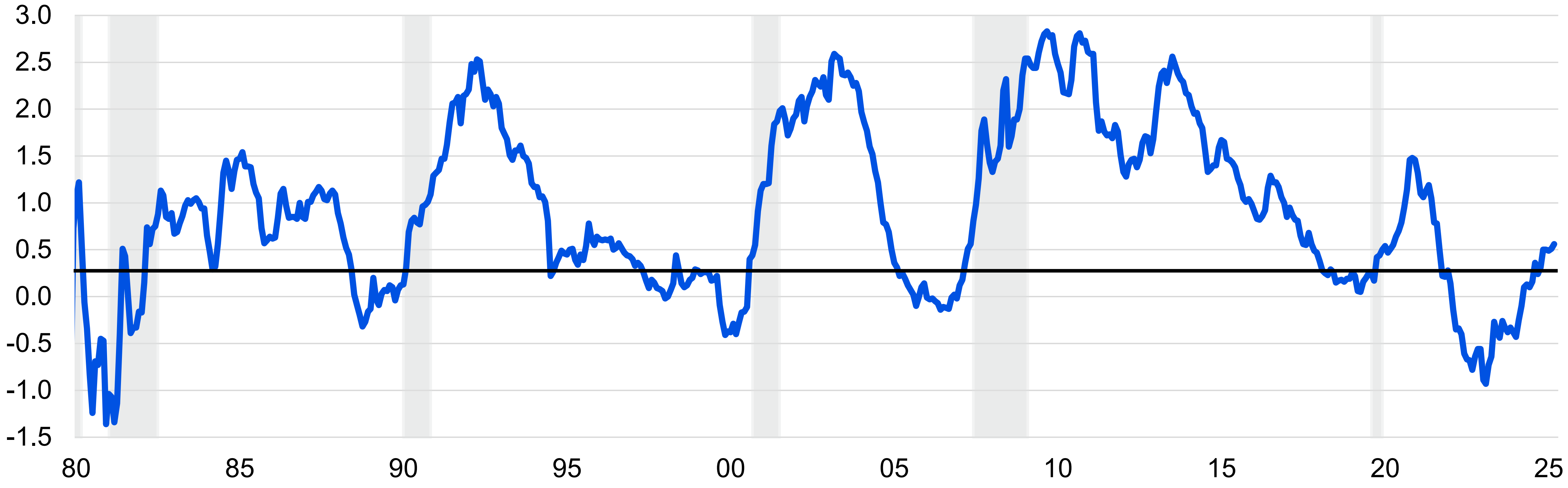
Recession Bellwethers Fail to Deliver

A Warning Sign, Historically

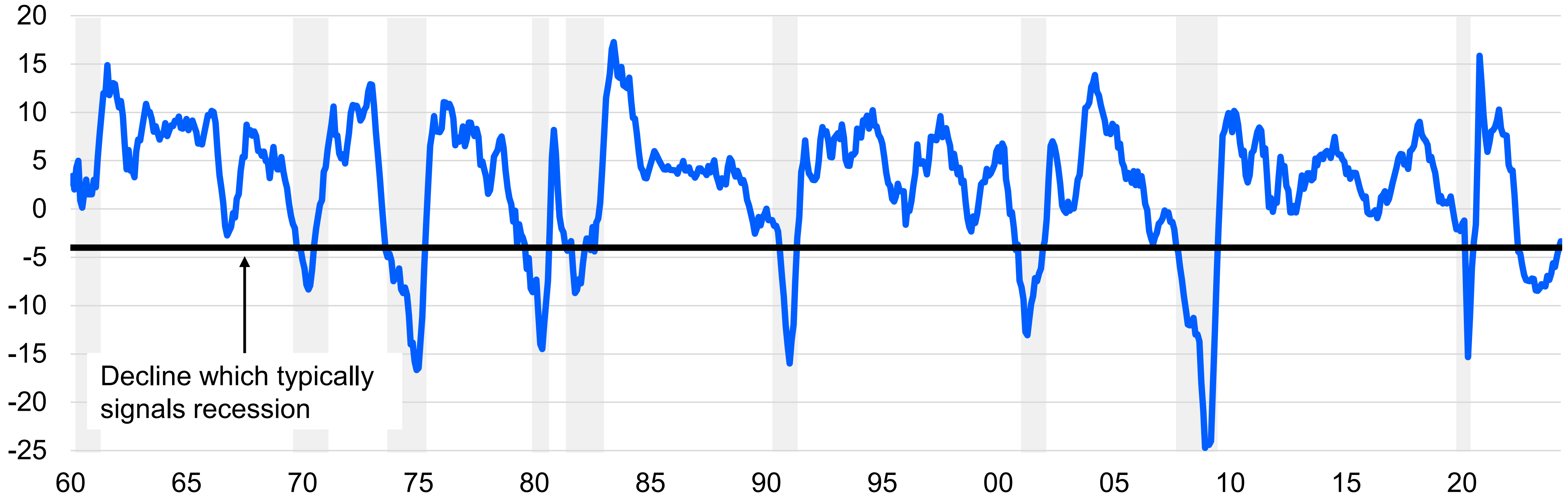
10-yr and 2-yr Treasury yield spread, %



Source: Federal Reserve, Moody’s Analytics

The LEI Has Also Typically Predicted Changes in the Business Cycle

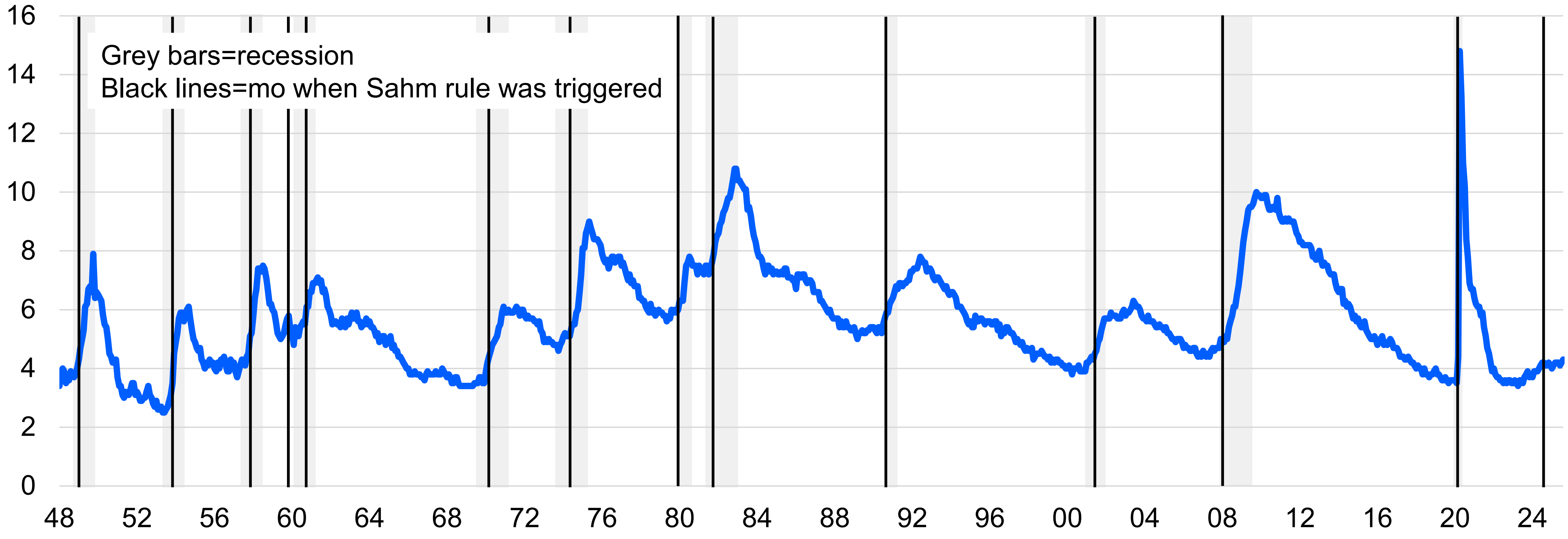
Leading Economic Index, 6-mo annualized change, %



Sources: The Conference Board, Moody's Analytics

Usually Reliable Sahm Rule Also Sends First False Signal

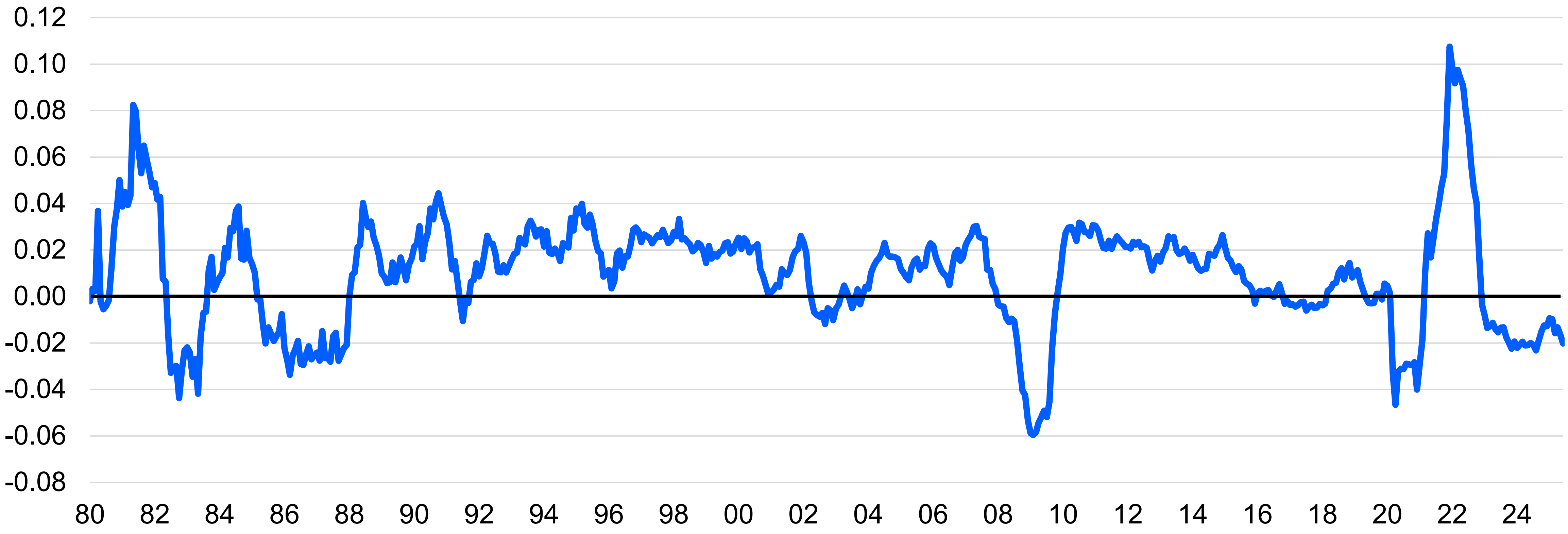
Unemployment rate, %



Sources: BLS, Moody's Analytics

Monthly Revisions to Employment Data Have Turned More Negative…

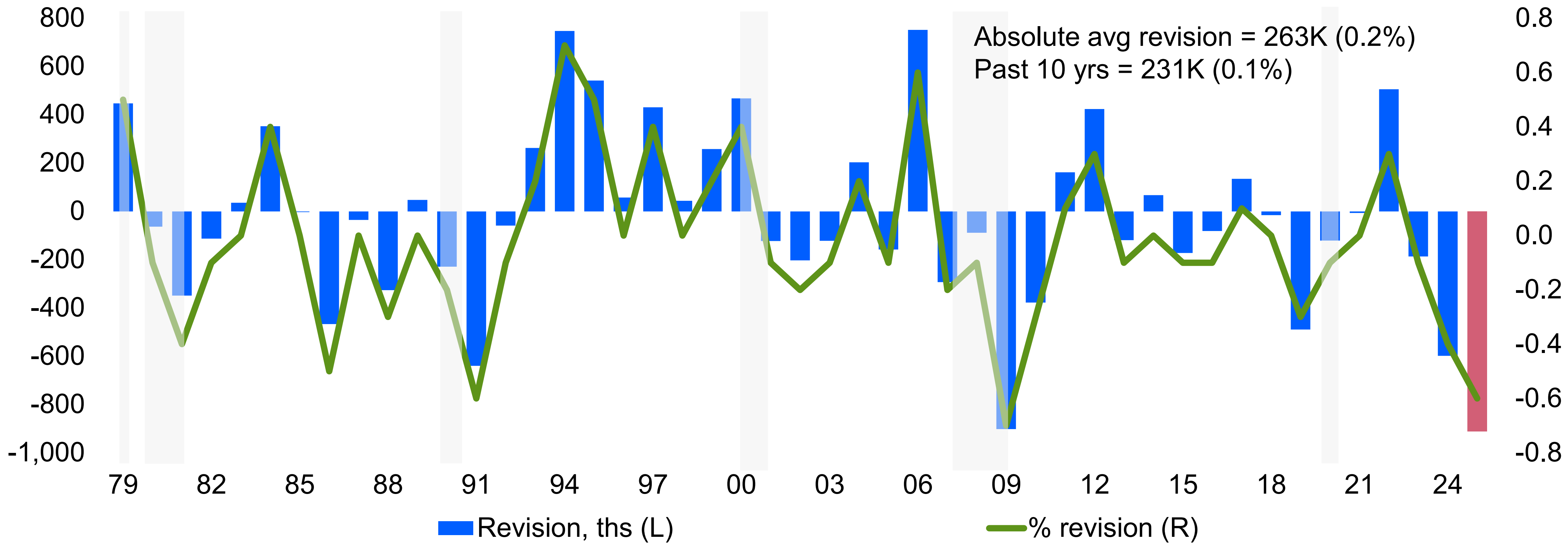
Revisions between 1st and 3rd estimate, % of total employment, 12-mo MA



Sources: BLS, Moody's Analytics

…And Larger Recent Benchmark Revisions Cloud the Real-Time Picture

Annual benchmark revision to payroll employment



Note: 2025 revision is preliminary

Sources: BLS, Moody's Analytics

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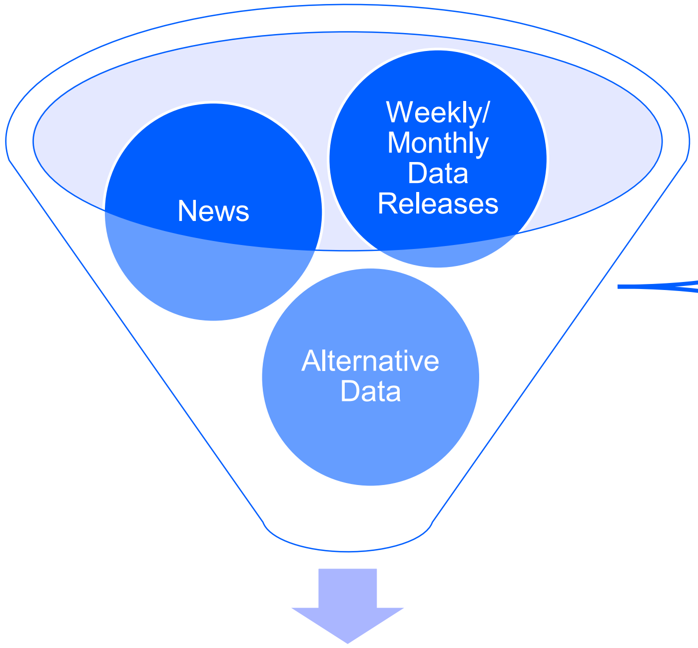
Nowcasting Models

What Is Nowcasting?

Real-time updating from incoming data of beliefs about this qtr, next qtr…and also last qtr



Quarterly GDP Estimate

Bridge Models (Structural)

- Using high-frequency forecasts to “estimate” (not forecast) quarterly values

Dynamic Factor Models (Predictive)

- Linking multiple observable data to a latent unobservable “common factor”

Machine Learning Models (Flexible)

- Can be applied to “alternative” data

Source: Moody’s Analytics

Mixed Frequency Dynamic Factor Model (MF/DFM) Structure

Quarterly GDP growth can be expressed as a weighted avg of 5 monthly (latent) output growth rates

- Letting Q_1 denote GDP in the first quarter and names of months representing the level of activity in that month, we can approximate quarterly GDP as three times the geometric mean of monthly activity:

$$Q_1 = 3 * (Y_{March} * Y_{February} * Y_{January})^{\frac{1}{3}}$$

- Taking logarithms on both sides renders:

$$\log(Q_1) = \log(3) + \frac{1}{3} * (\log(Y_{March}) + \log(Y_{February}) + \log(Y_{January}))$$

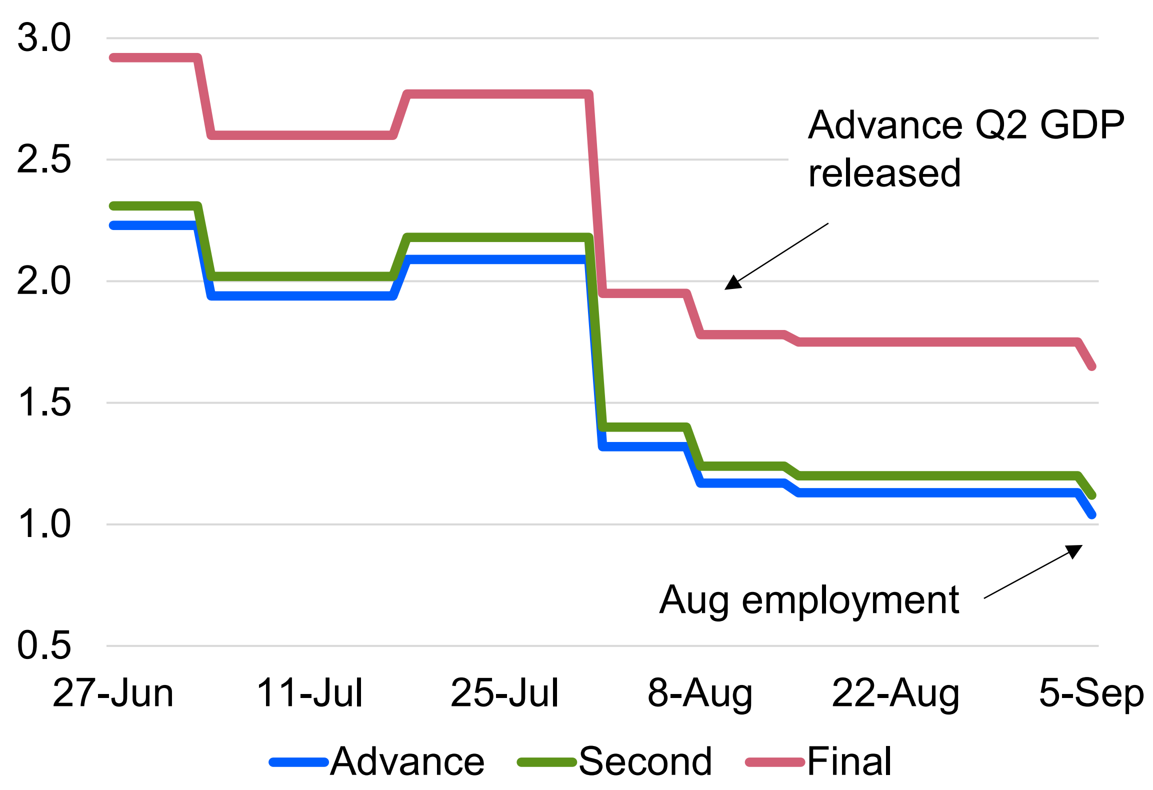
- Applying the same logic to the fourth quarter of the previous year and subtracting, GDP growth from $2024Q_4$ and $2025Q_1$ can be expressed in terms of **a weighted average of monthly growth rates**:

$$\log(Q_1) - \log(Q_4) = \frac{1}{3} * g_{Mar} + \frac{2}{3} * g_{Feb} + g_{Jan} + \frac{2}{3} * g_{Dec} + \frac{1}{3} * g_{Nov}$$

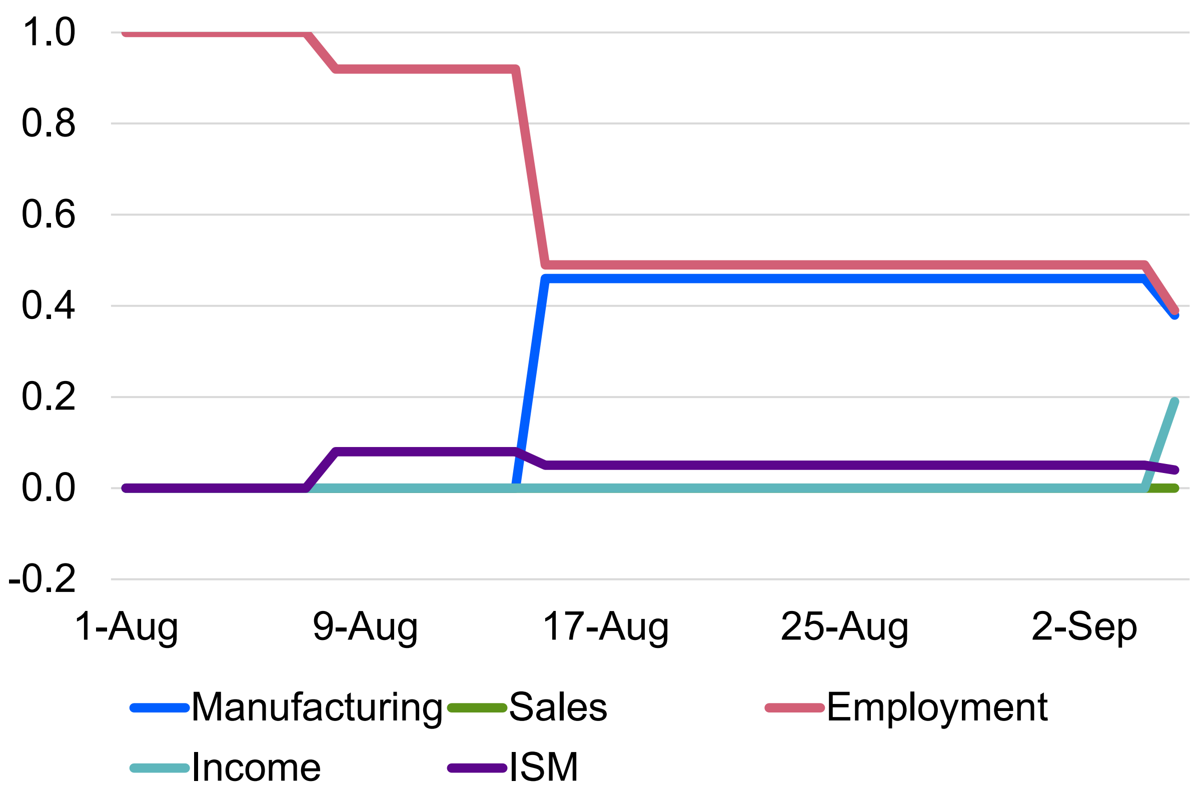
Source: Moody's Analytics

Diminished Expectations

Nowcast, U.S. 25Q3 GDP growth, %, annualized



U.S. nowcast indicator weights, 0 to 1



Source: Moody's Analytics

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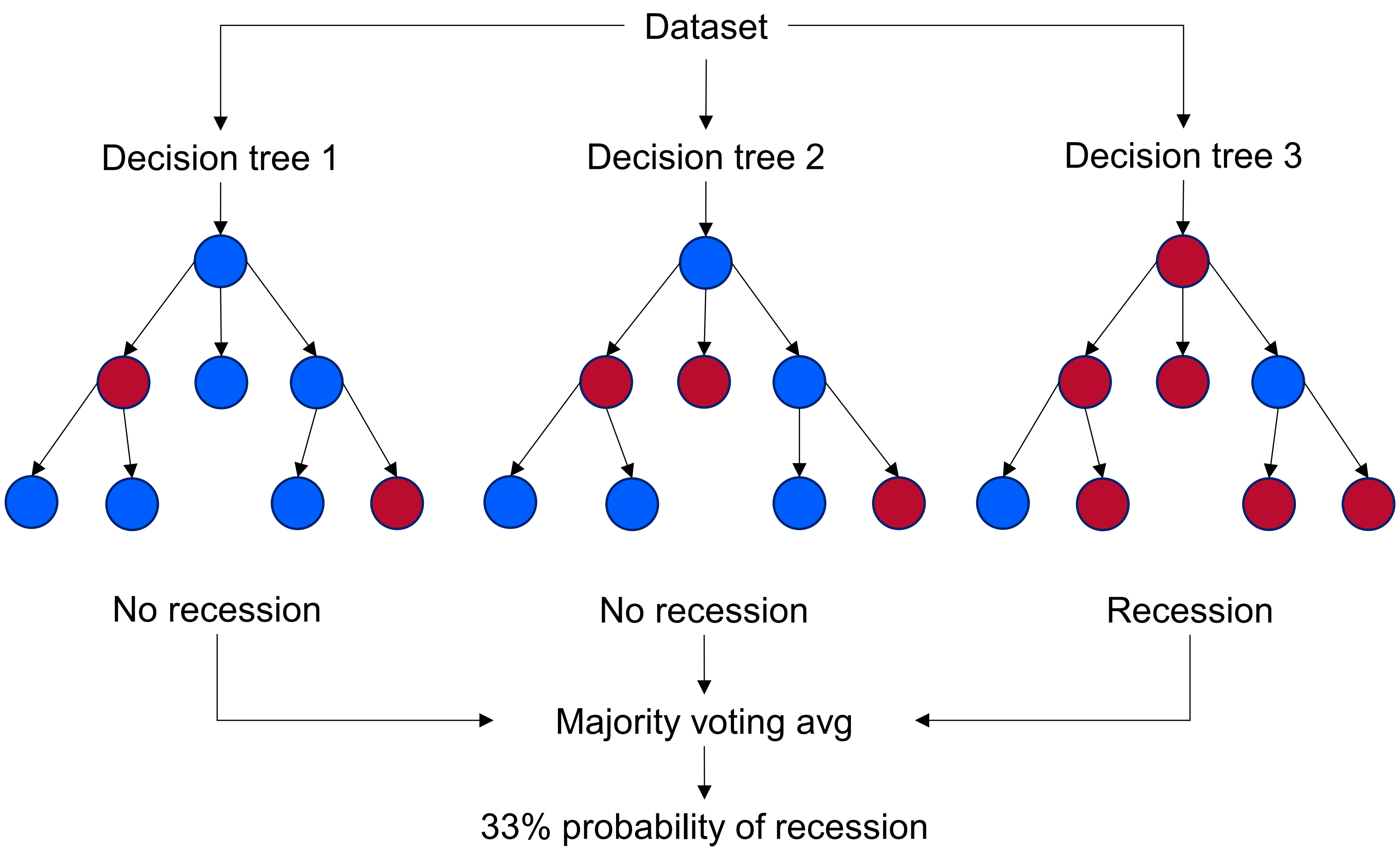
Measuring Recession Risk

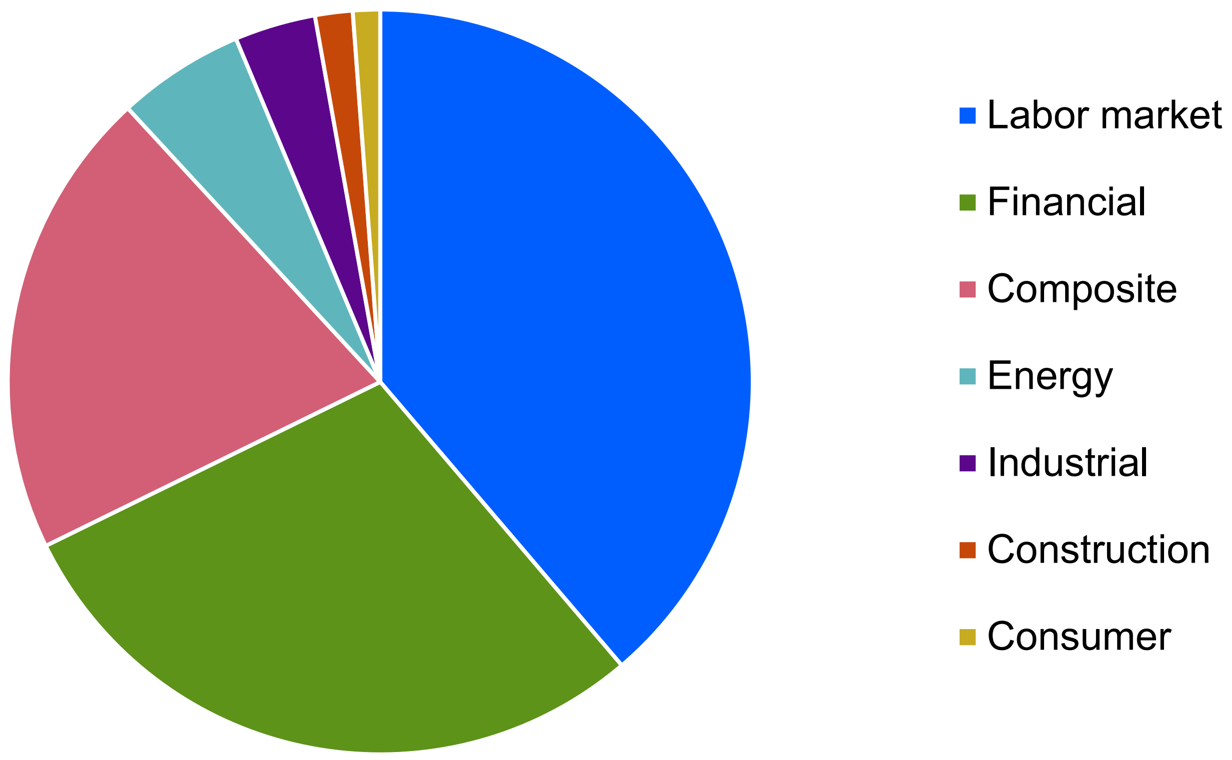
Model Architecture



Source: Moody's Analytics

Labor and Financial Variables Have Outsize Predictive Power

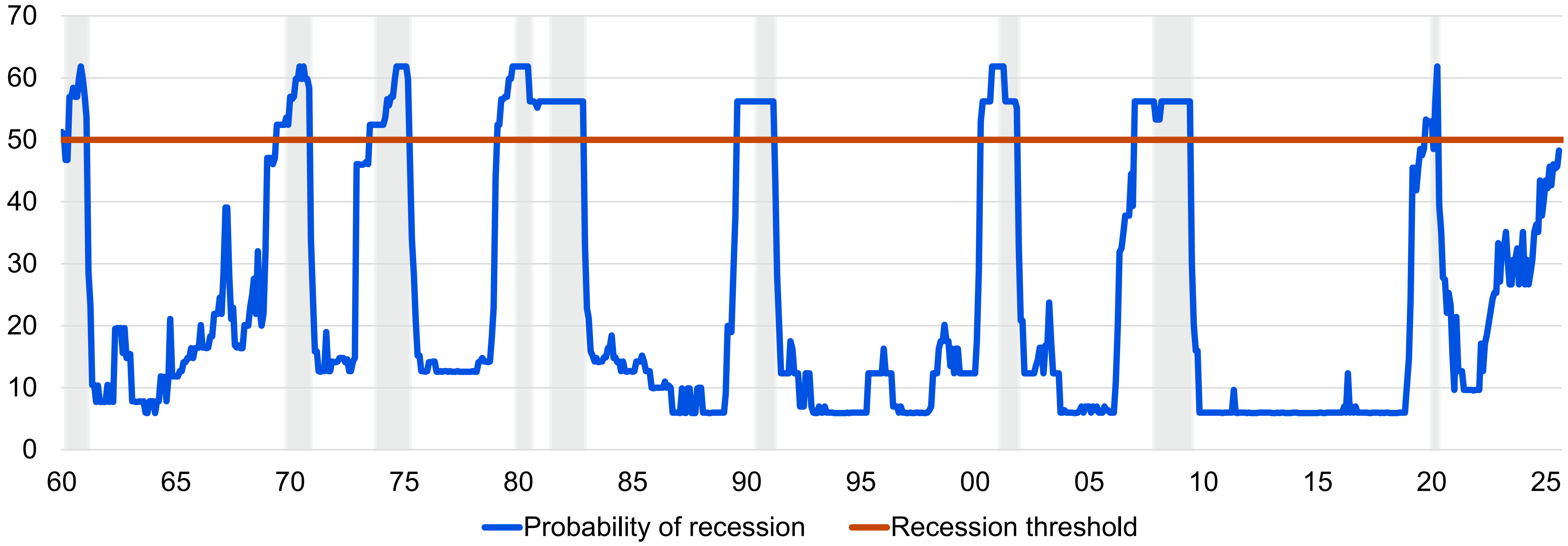
Model importance share by variable category, %



Source: Moody's Analytics

Recession Odds Mounting

Estimated probability of recession in next 12 mo, %



Source: Moody's Analytics

Recession Odds Mounting

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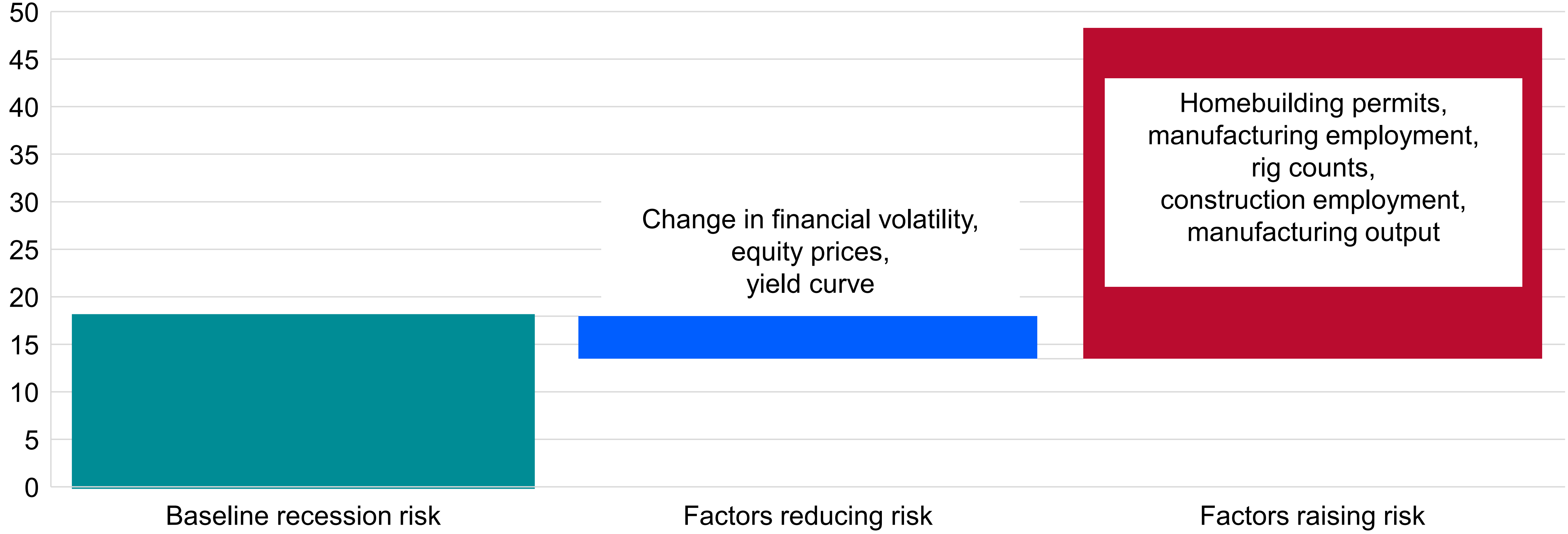

Source: Moody's Analytics

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Thank you!

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Contact Us

Email	helpeconomy@moodys.com
U.S./Canada	+1.866.275.3266
EMEA	+44.20.7772.5454 (London)
	+420.234.747.505 (Prague)
Asia/Pacific	+852.3551.3077
All Others	+1.610.235.5299

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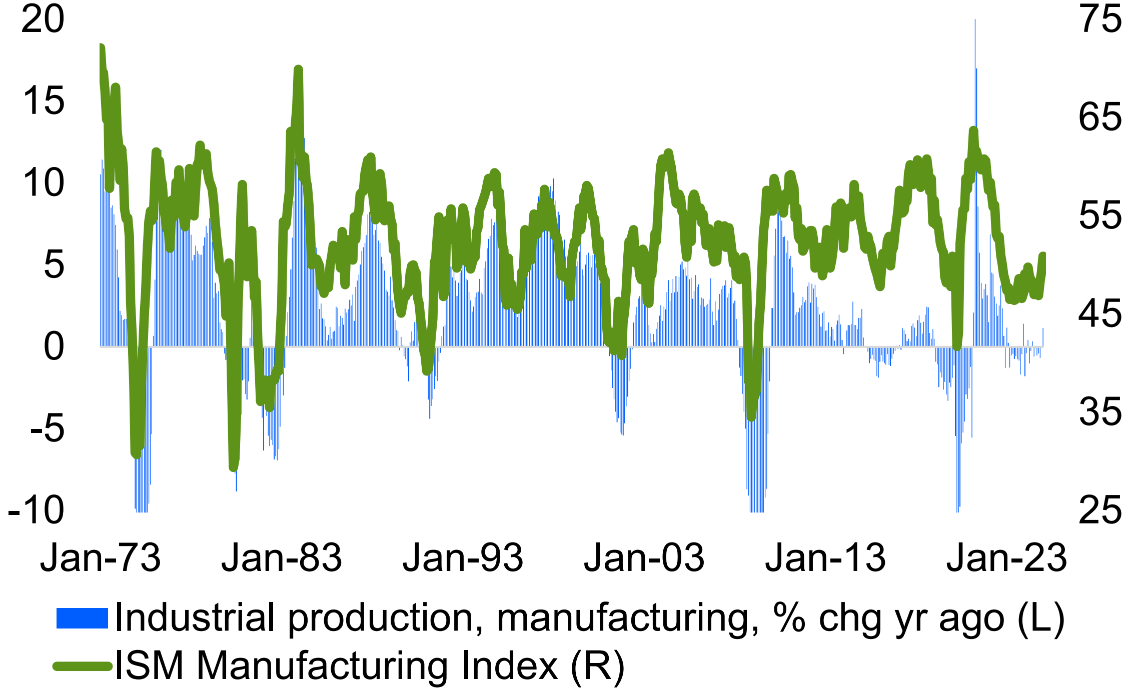
Appendix

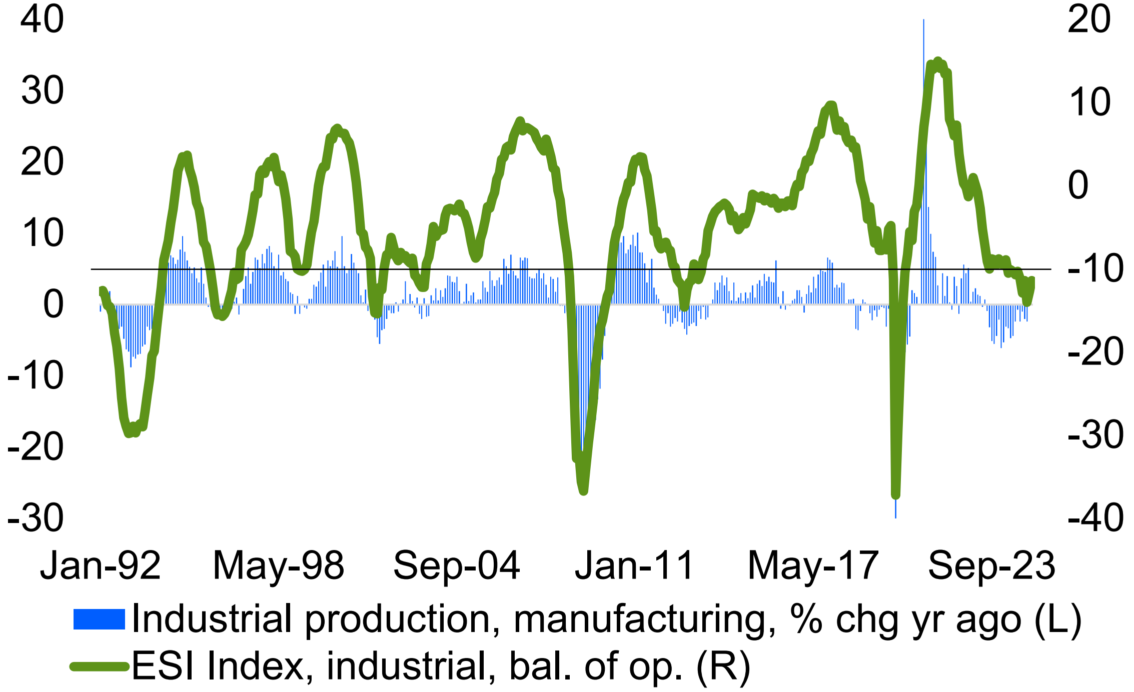
What Monthly Data Should We Incorporate in our MF/DFM?

Hard vs. soft indicators? Many variables or just a few?

U.S. industrial production vs. ISM Manufacturing Index



Euro zone industrial production vs. ESI Index



Sources: ISM, FRB, Eurostat, Moody's Analytics

Bridge Model Structure

Forecast out monthly exogenous drivers

EZ financials
- Monetary policy rate
- Govt. bond yields
- DAX index
- FX rates

Commodities
- Oil
- Gas
- Food
- Raw materials

Expectations
- Coincident economic index

Monthly forecasts for key sectors

Financials
- Govt. bond yields
- Deposit rates
- Lending rate
- Stock prices

Banking & govt.
- M1 & components
- M2 & components
- Government debt

Inflation
- Harmonised CPI & components
- PPI

Trade
- Exports
- Imports
- Net exports

Labor market
- Labour force
- Employment
- Unemployment
- Unemployment rate

Industry
- Industrial production & components
- Retail sales & components

Monthly/quarterly conversion

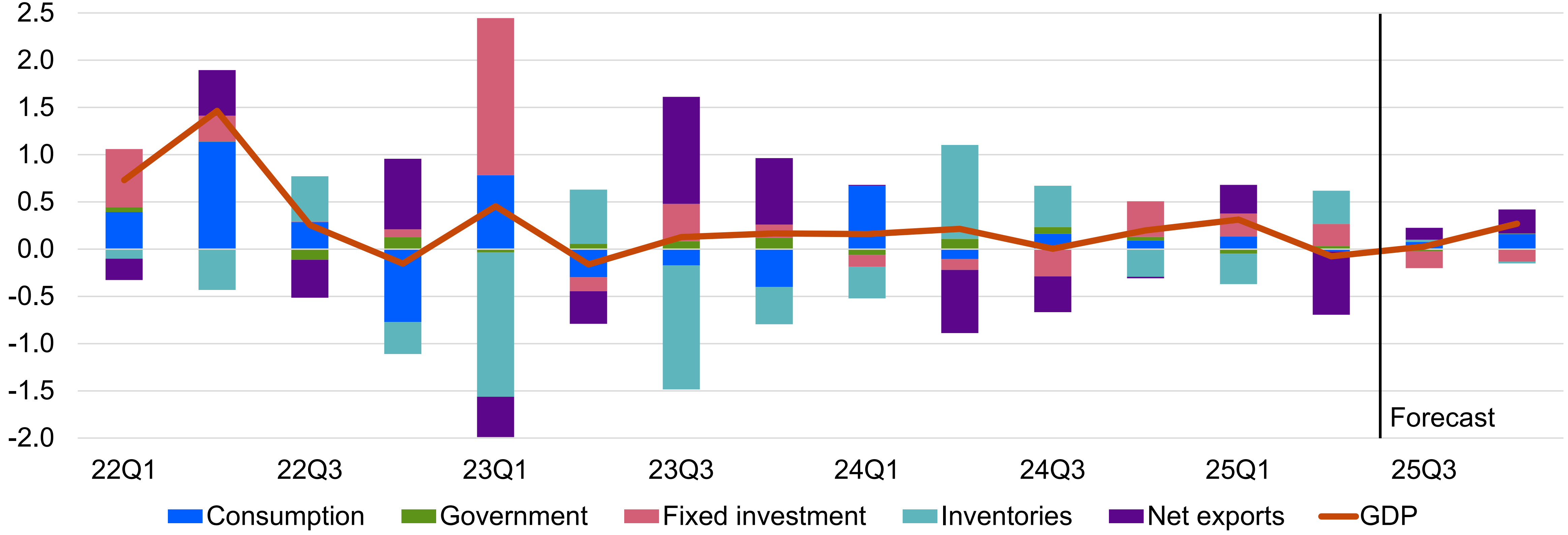
Quarterly GDP & components

Real GDP
- Private consumption
- Fixed investment
- Govt. consumption
- Exports
- Imports

Source: Moody’s Analytics

Bridge Model Nowcasts Are Able to Dig Into GDP by Component

Italy real GDP, % change



Sources: ISTAT, Moody's Analytics