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Deutsche Bank
Research

Monthly charts: Warsh-ing their hands of accommodation

Matthew Luzzetti, Brett Ryan, Amy Yang, Justin Weidner
Sourav Dasgupta, Suvir Ranjan
Deutsche Bank Center, 1 Columbus Circle
New York, New York 10019
Tel: 212 250 6161

November 2026

IMPORTANT RESEARCH DISCLOSURES AND ANALYST CERTIFICATIONS LOCATED IN APPENDIX 1.

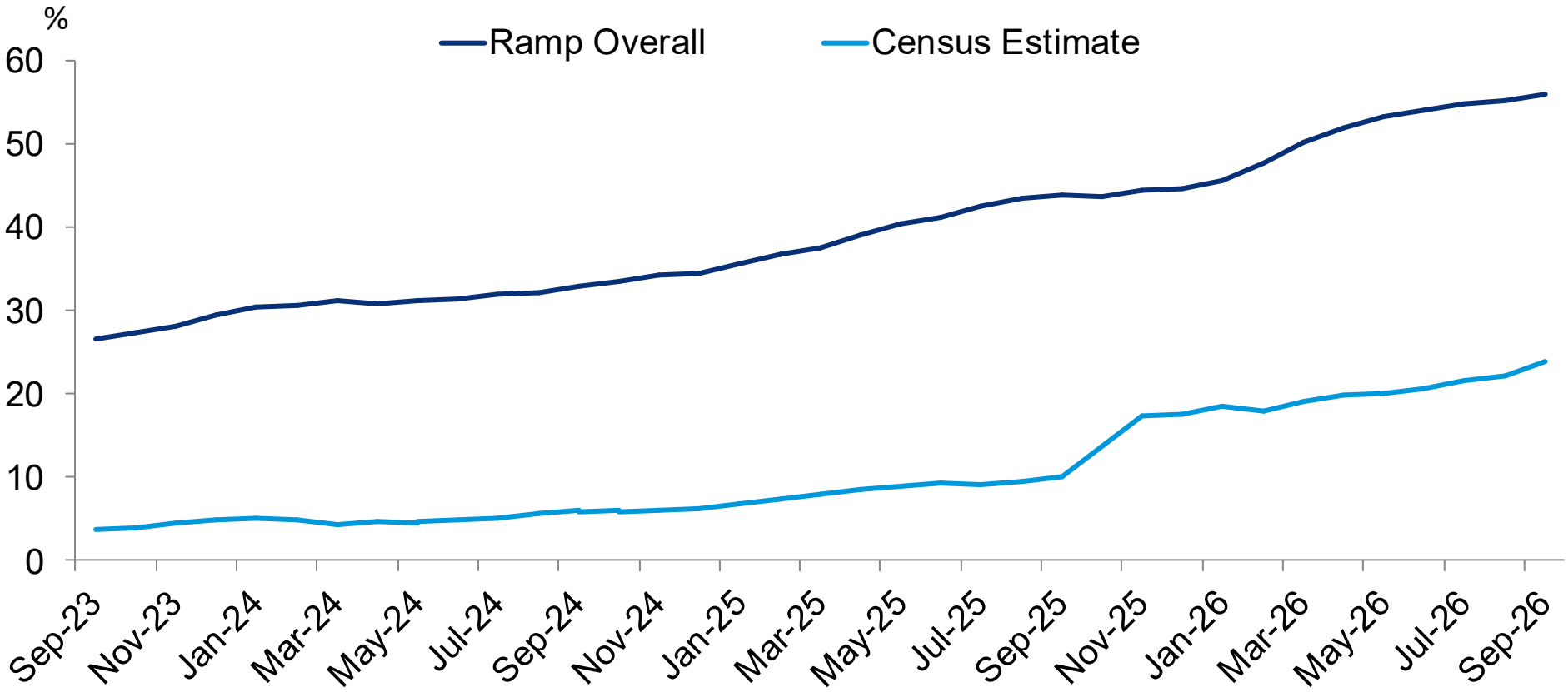
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1. Tracking AI demand

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AI adoption rates have continued to rise, though alternative datasets disagree on the levels

AI adoption

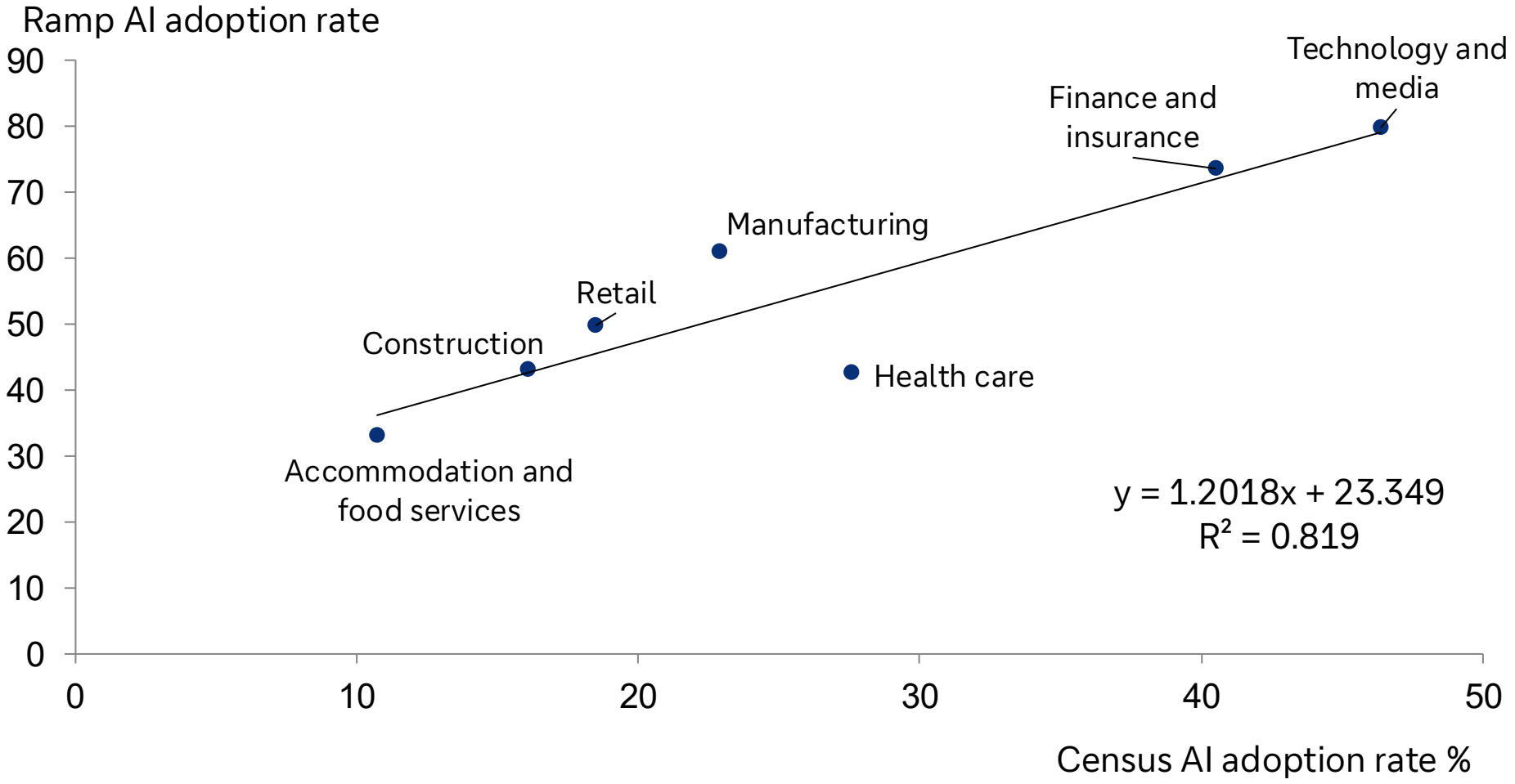


Source: Ramp, Census Bureau, Deutsche Bank

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Agreement across AI adoption rate measures at the sector level

AI adoption rate across sectors

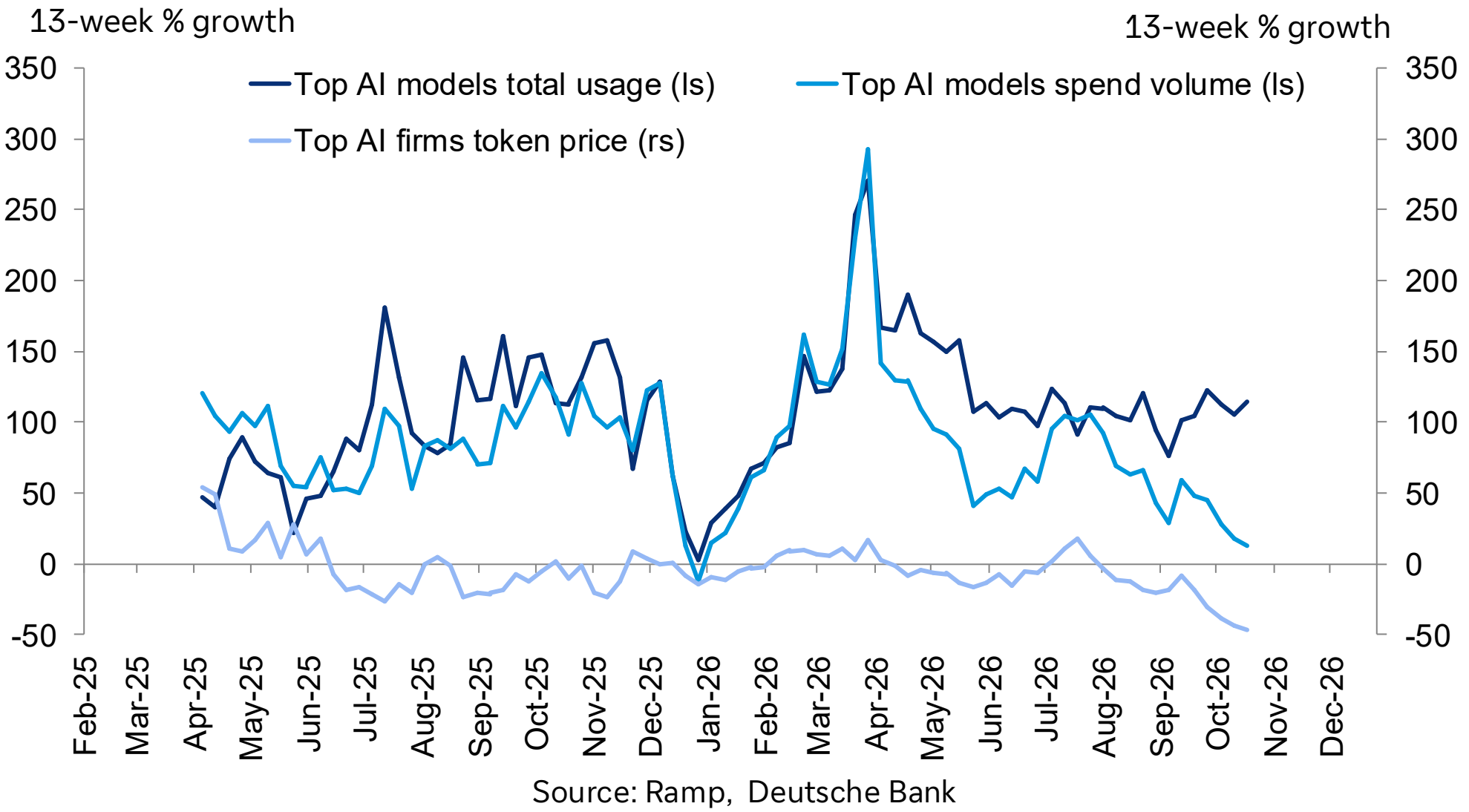


Source: Ramp, Census BTOS, Deutsche Bank

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Ramp data show growth rate of AI spend has slowed as robust usage growth is offset by falling token prices

Top AI models total usage

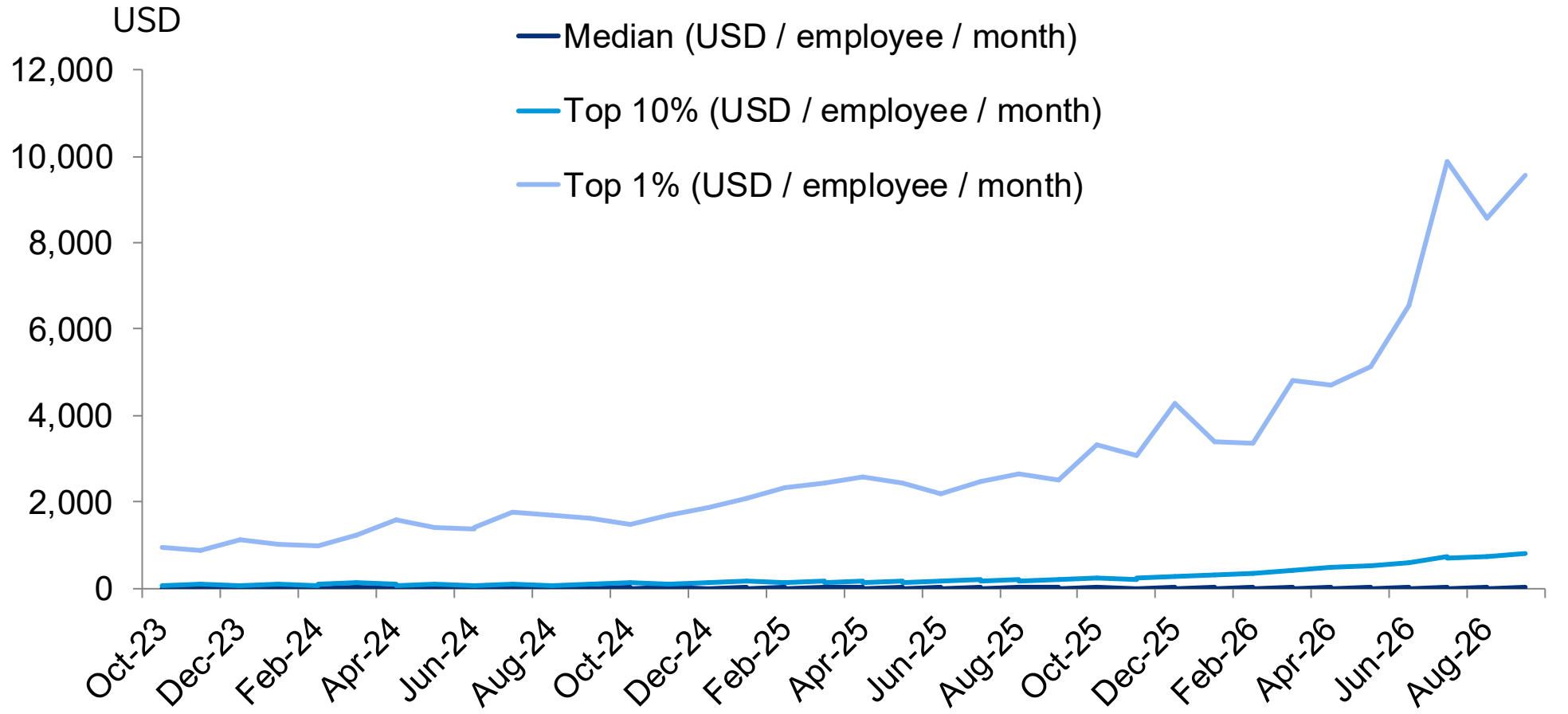


Source: Ramp, Deutsche Bank

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AI spending is heavily skewed towards high users – top 1% spends nearly $10k per employee per month, median is $16

Monthly AI spend per employee



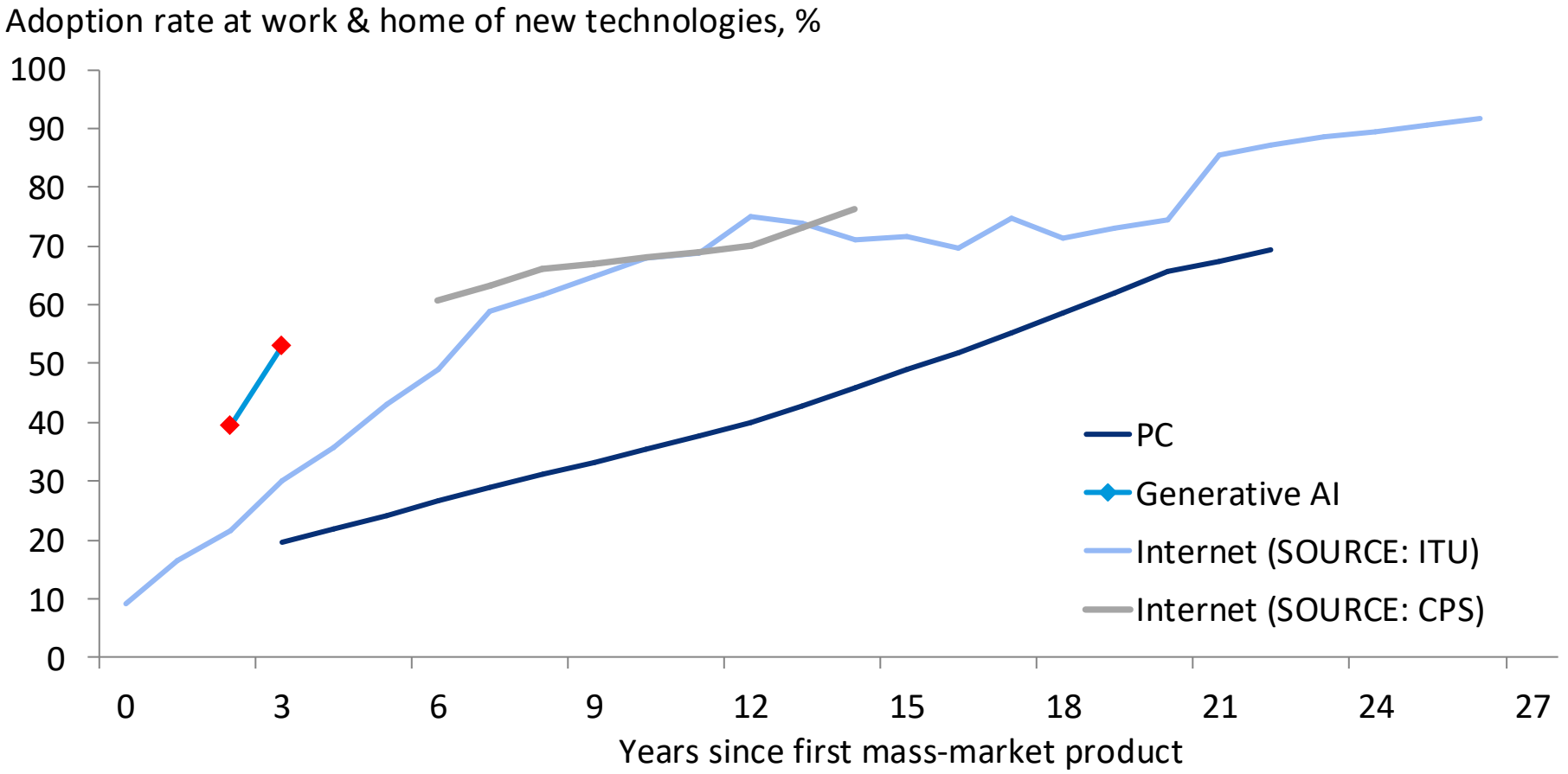
Note: Business spend data from Ramp includes corporate card and invoice / ACH payments. AI spend includes LLM subscriptions, coding agent subscriptions, API tokens, and GPU cloud and infrastructure spend

Source: Ramp, Deutsche Bank

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AI adoption outpacing historical technological revolutions

Adoption rates of historical technologies

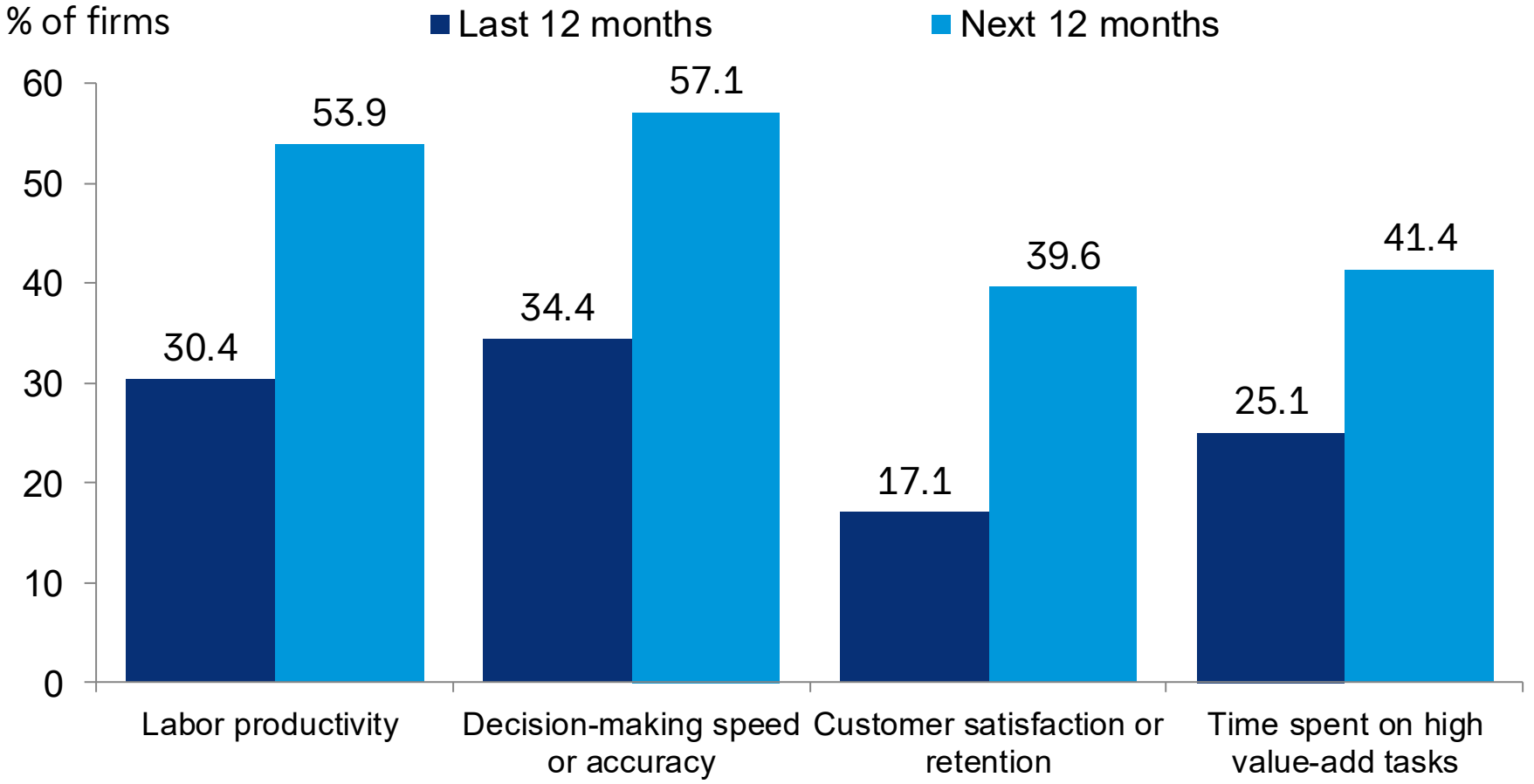


Source: Bick, Blandin & Deming, Real-Time Population Survey, CPS, ITU, Stanford AI Report 2026, Deutsche Bank

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Firms are optimistic that AI will begin to improve labor productivity over the next twelve months

Efficency and outcomes for firms due to use of AI: Net balance



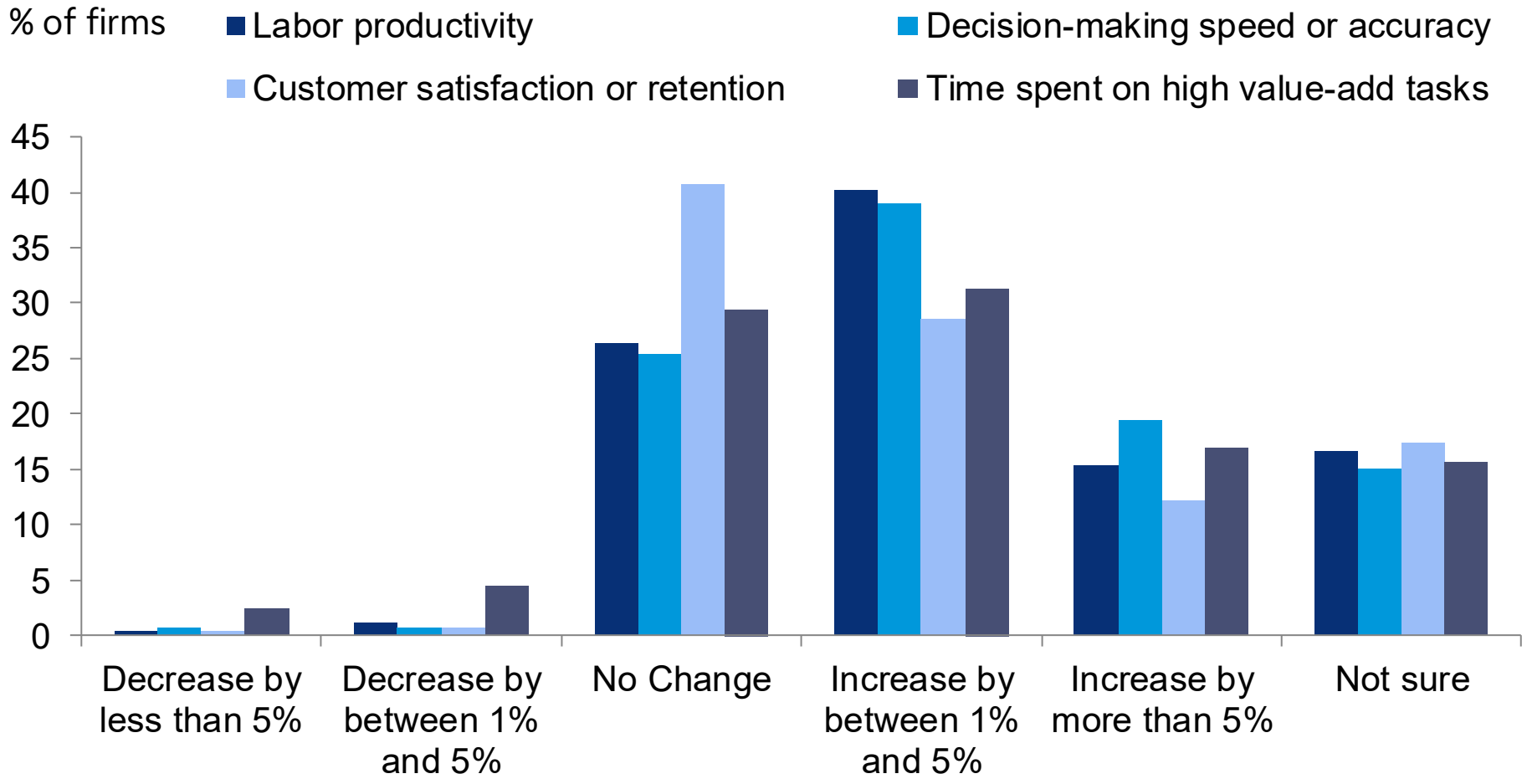
Note: Sample sizes differ slightly between the last 12 months and the next 12 months

Source: Duke University, Richmond Fed, Atlanta Fed, The CFO survey (Q4 2025), Deutsche Bank

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AI expected to improve efficiency and outcomes over the next 12 months

Efficency and outcomes for firms over next 12 months due to use of AI

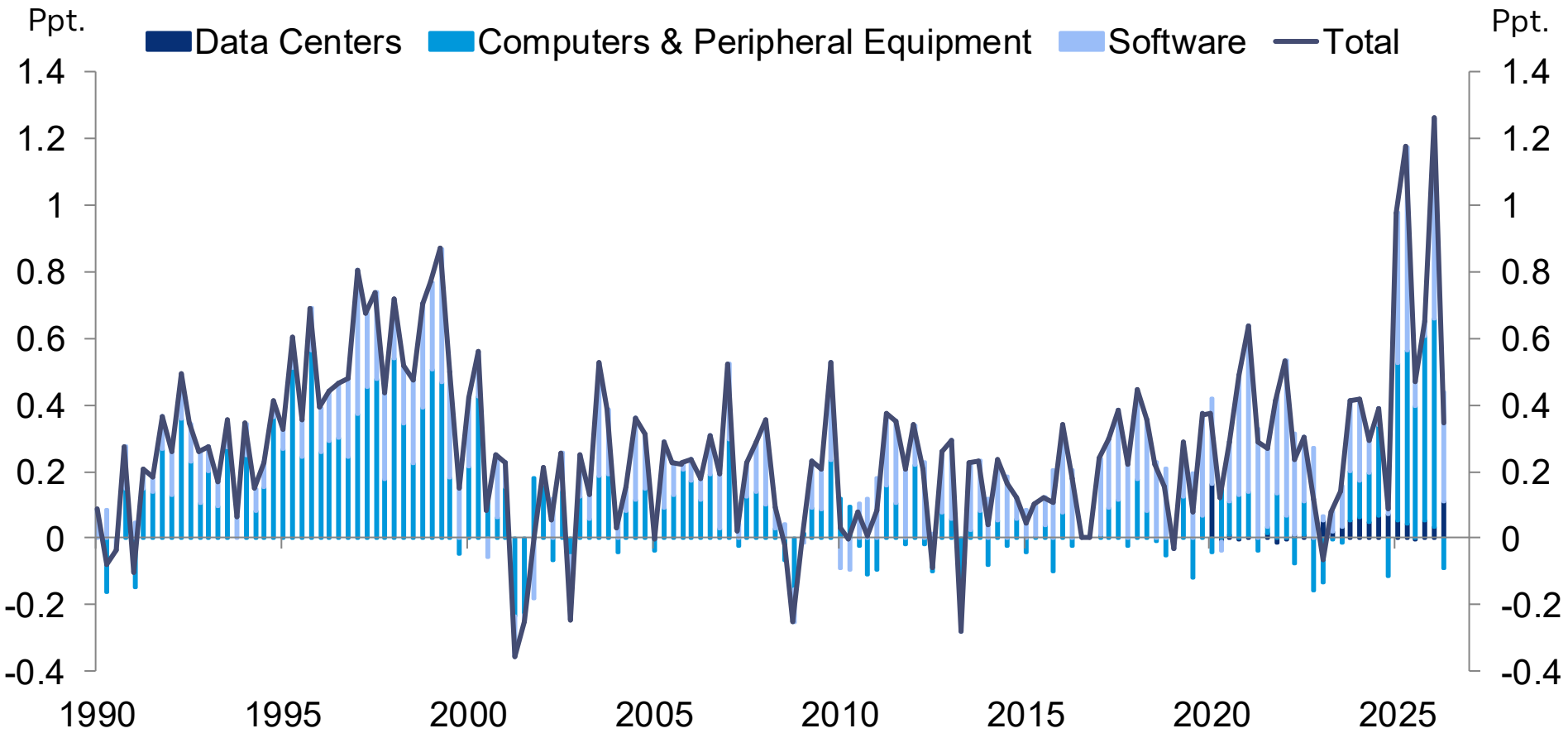


Source: Duke University, Richmond Fed, Atlanta Fed, The CFO survey (Q4 2025), Deutsche Bank

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AI has been an important driver of capex in recent quarters

GDP contribution from AI

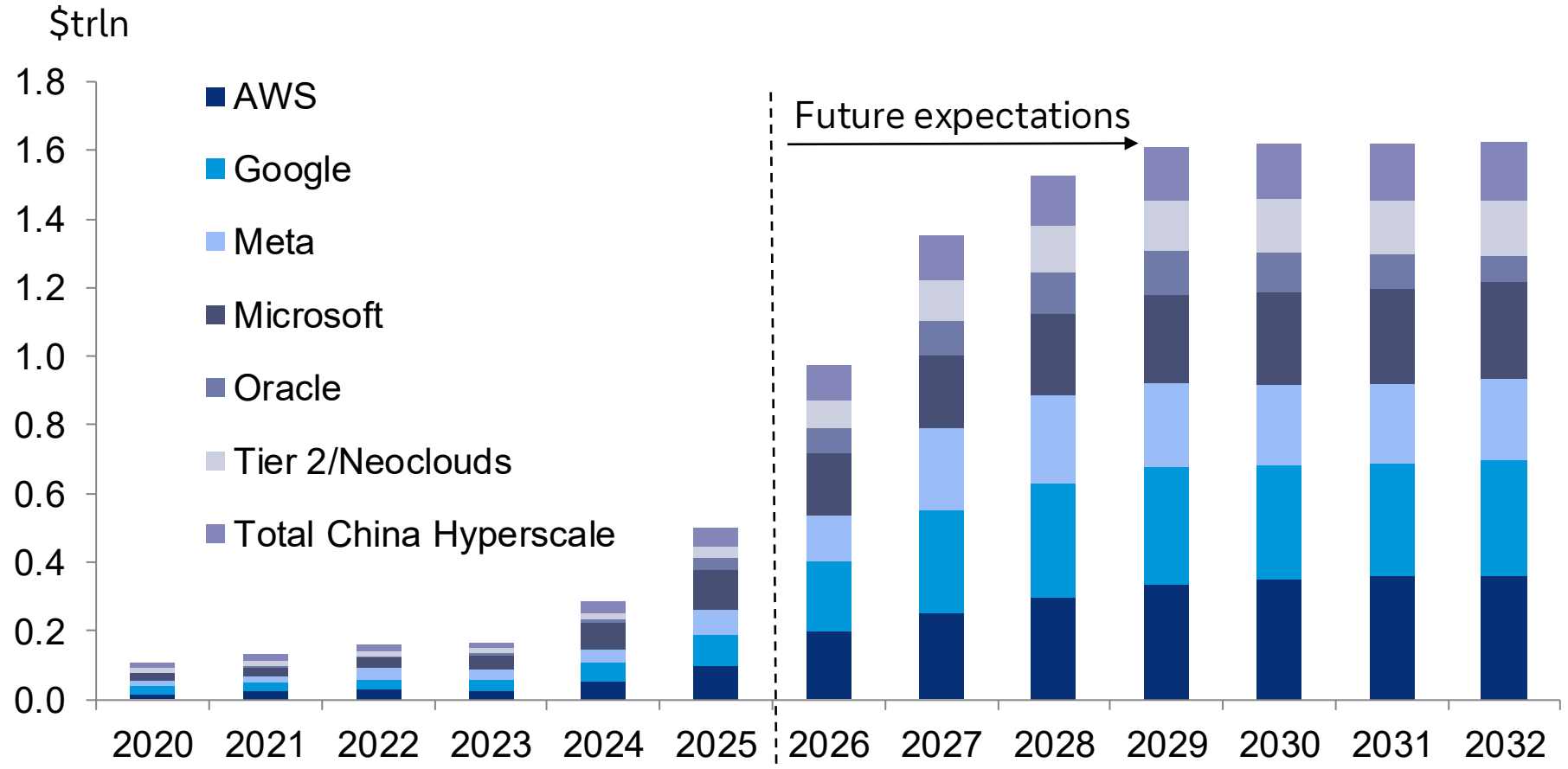


Source: BEA, Haver Analytics, Deutsche Bank

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Hyperscaler capex levels increase through 2029

Hyperscaler capital expenditure 2020 to 2032 (USD trn)

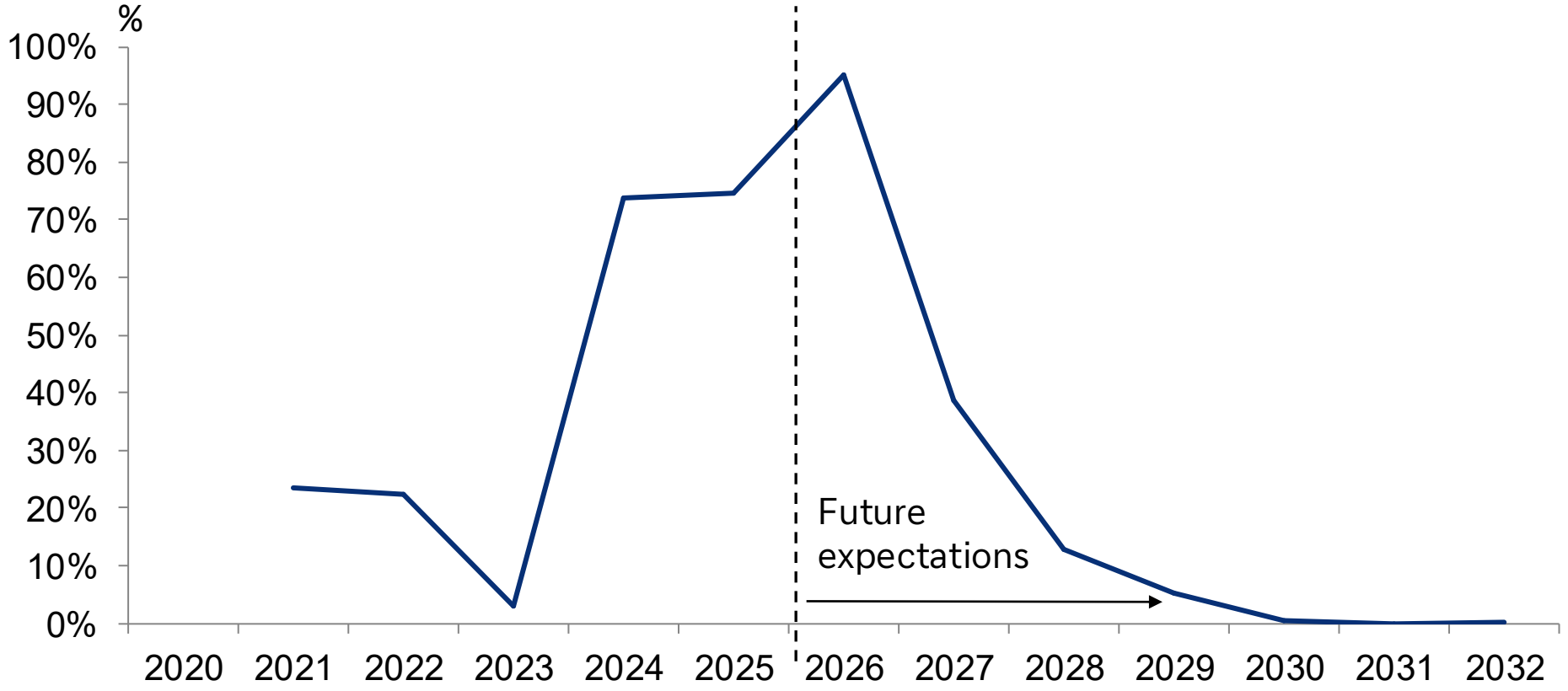


Source: Bloomberg Finance LP, Deutsche Bank

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Hyperscaler capex growth rates slow beginning in 2027

Growth rate in hyperscaler capital expenditure 2020 to 2032

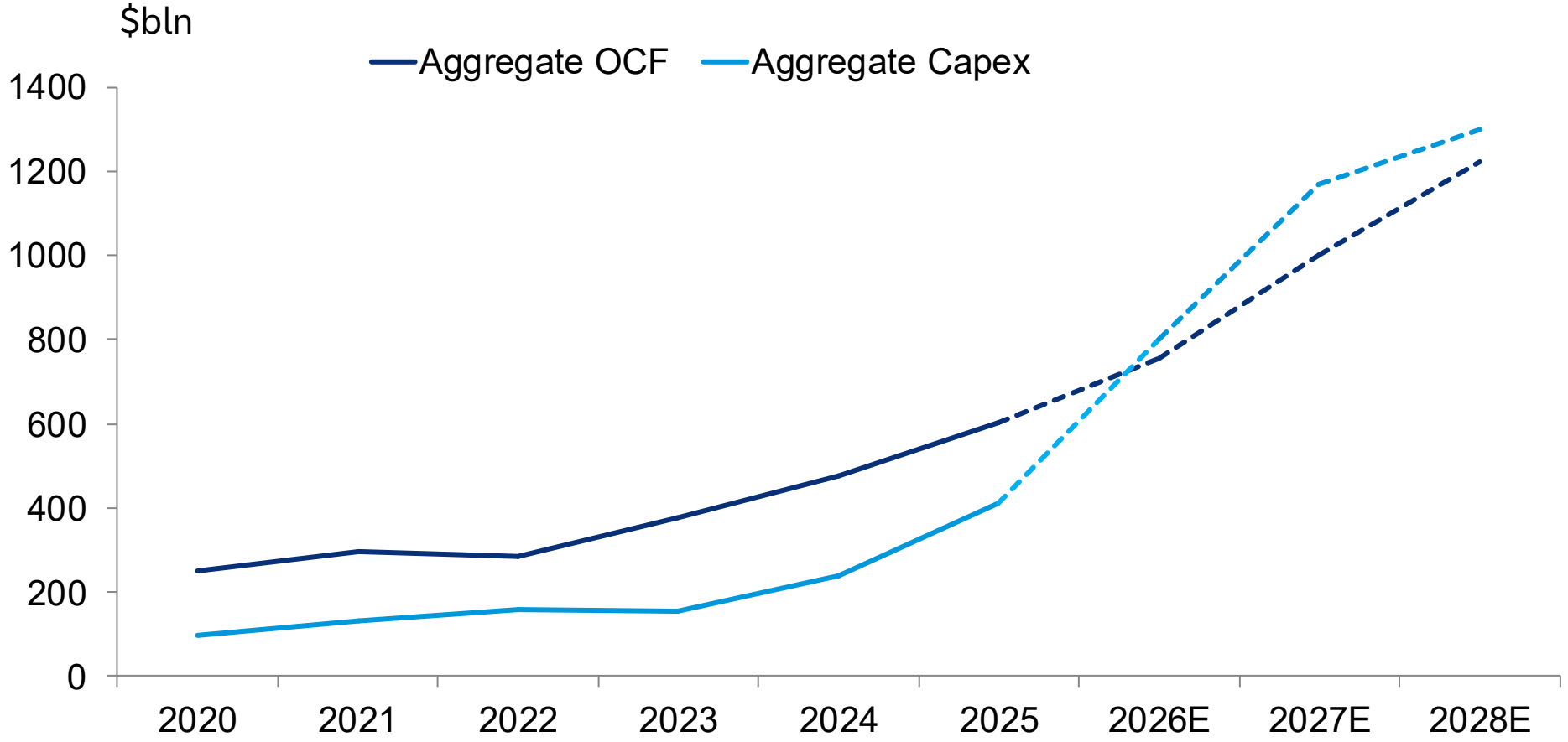


Source: Bloomberg Finance LP, Deutsche Bank

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Free cash flow turns negative as capex ramps up for hyperscalers

Hyperscaler aggregate operating cash flow vs capex (2020-2028E) (USDbn)



Source: Bloomberg Finance LP, Deutsche Bank

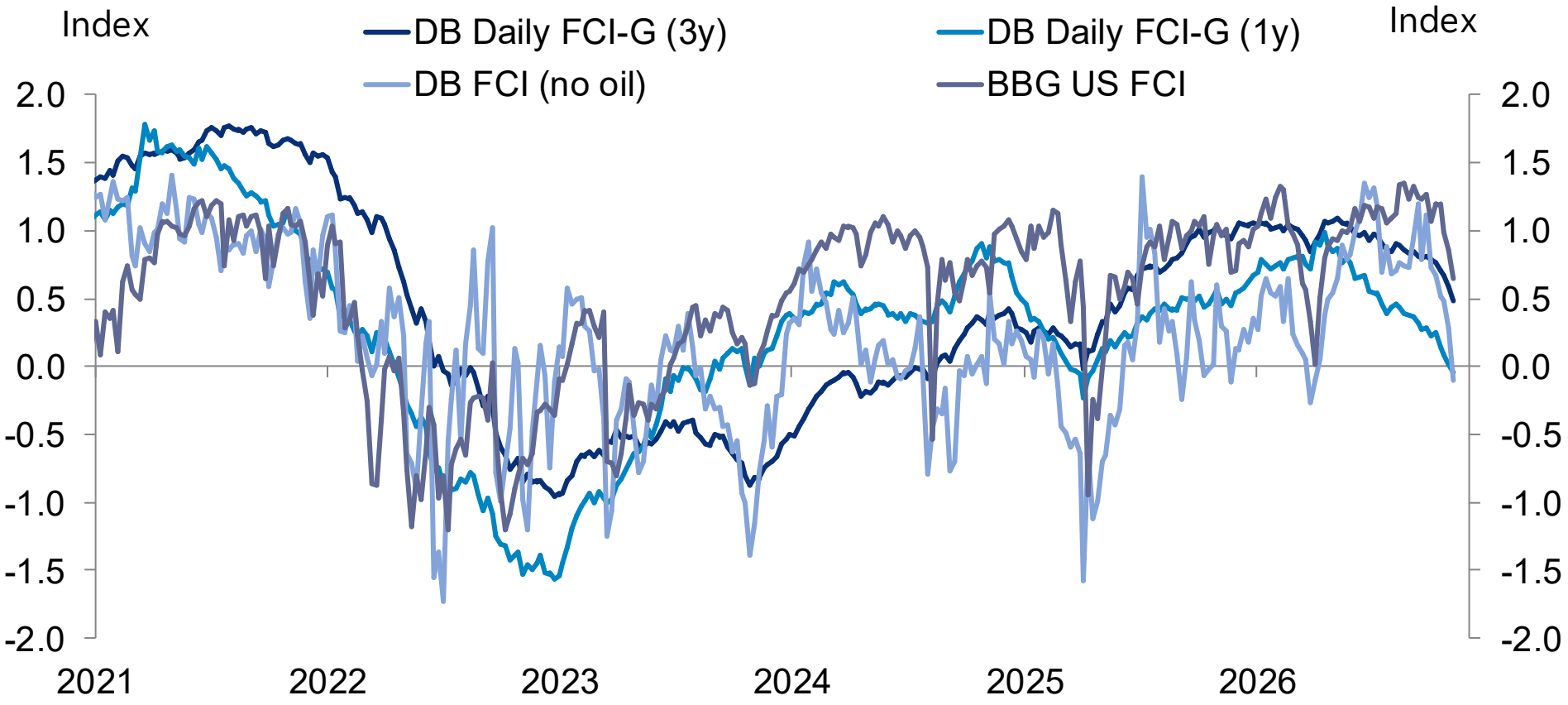
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2. Growth momentum solid

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FCIs range from neutral to still meaningfully accommodative

FCIs

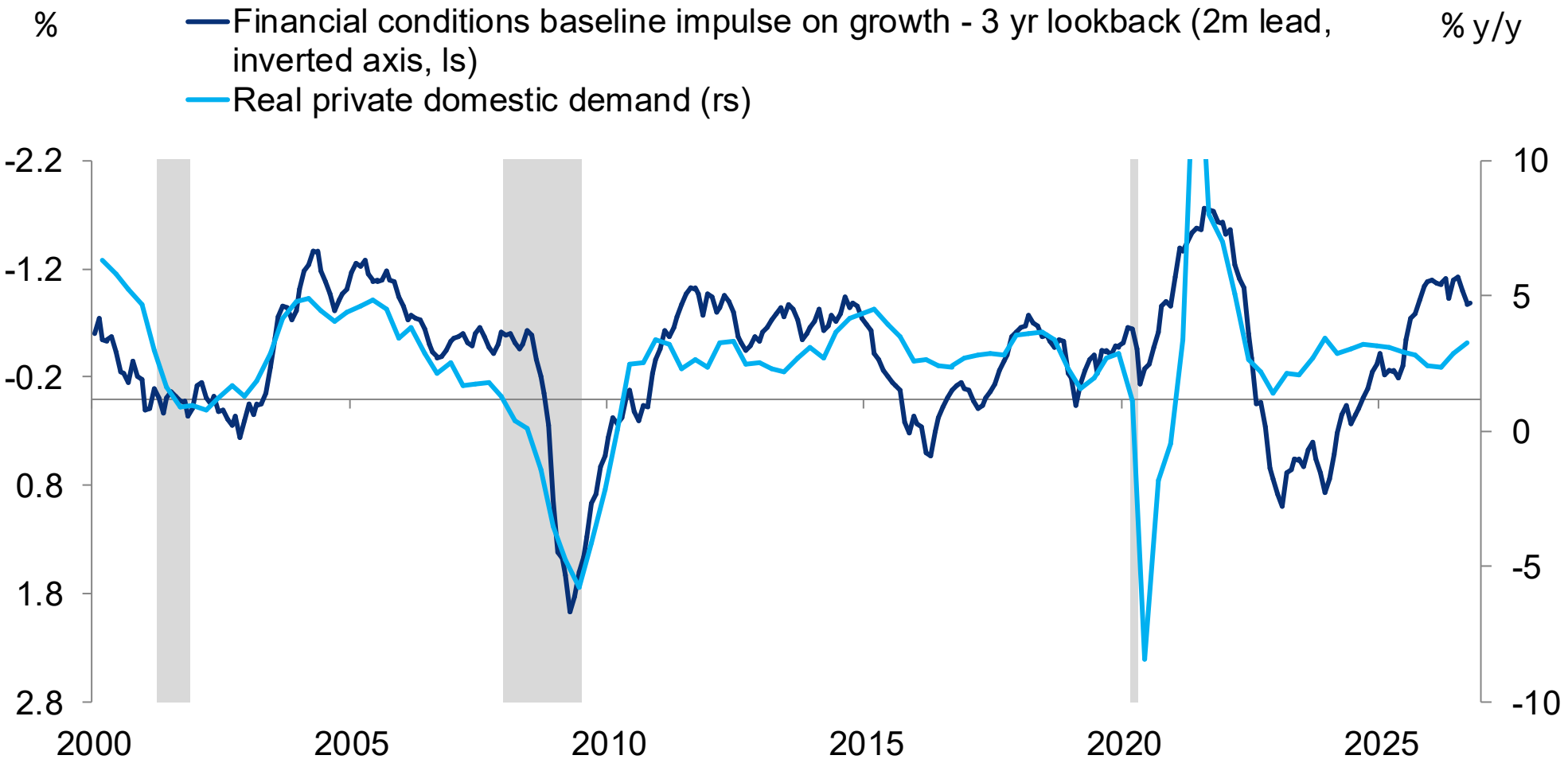


Source: FRB, Bloomberg Finance LP, Haver Analytics, Deutsche Bank

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Loose financial conditions providing a tailwind to underlying growth in the US

Financial conditions and real private domestic demand

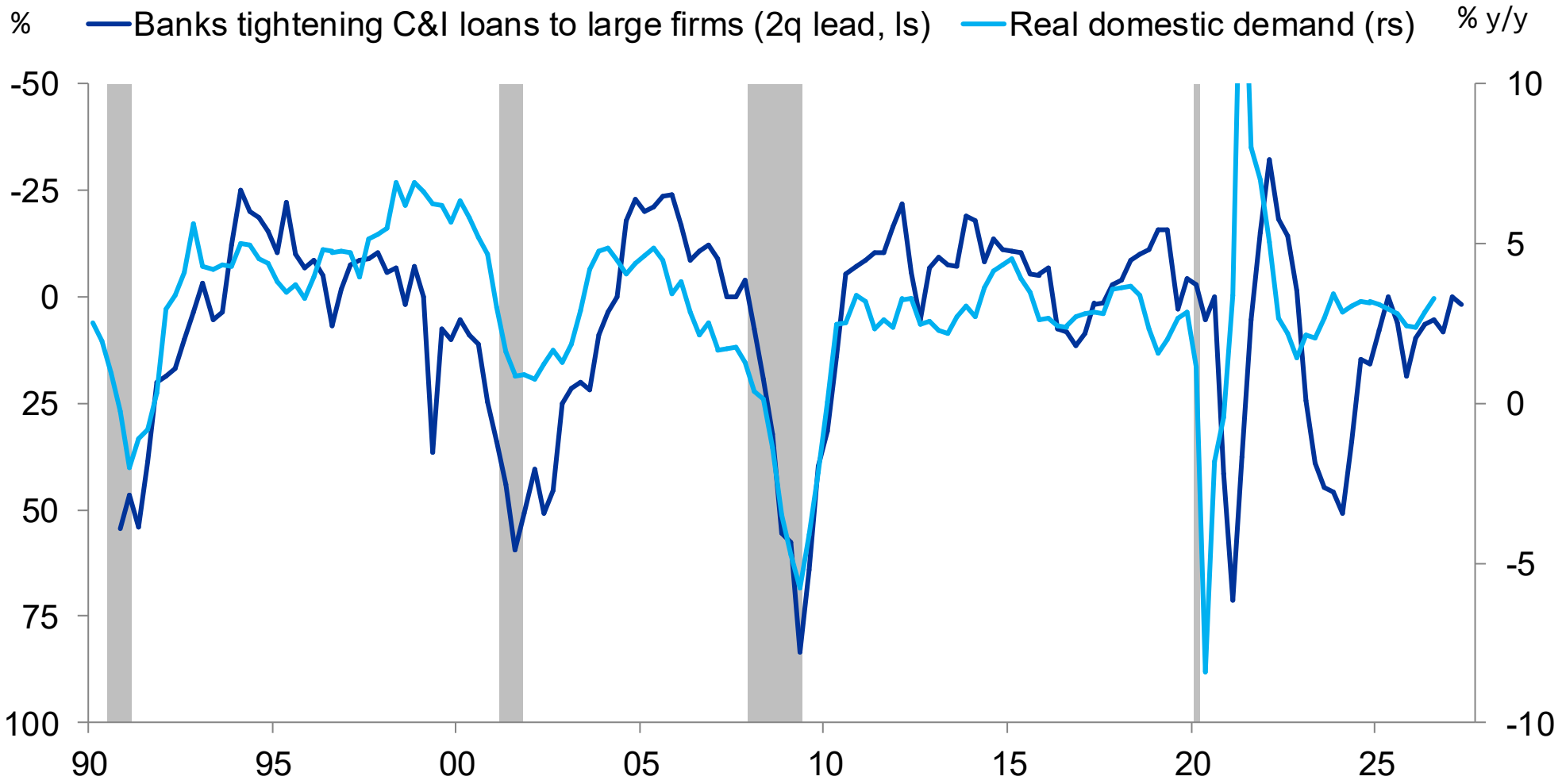


Source: FRB, BEA, Haver Analytics, Deutsche Bank

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Bank lending conditions consistent with solid growth in real final sales to private domestic purchasers

Bank lending conditions vs. PDFP

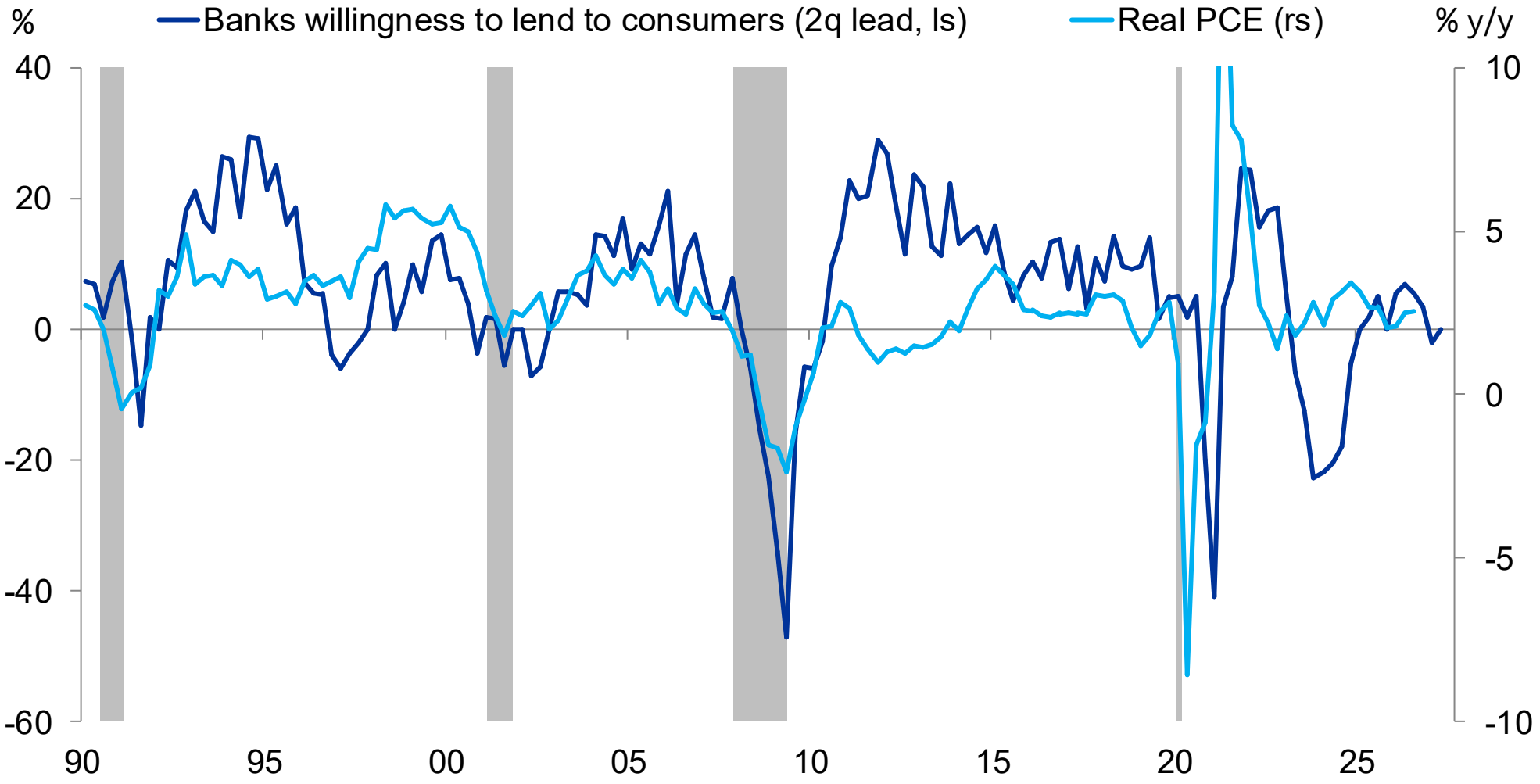


Source: BEA, FRB, Haver Analytics, Deutsche Bank

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Recent move in banks willingness to lend to consumers points to stable or slightly weaker consumer spending

Bank lending and real PCE

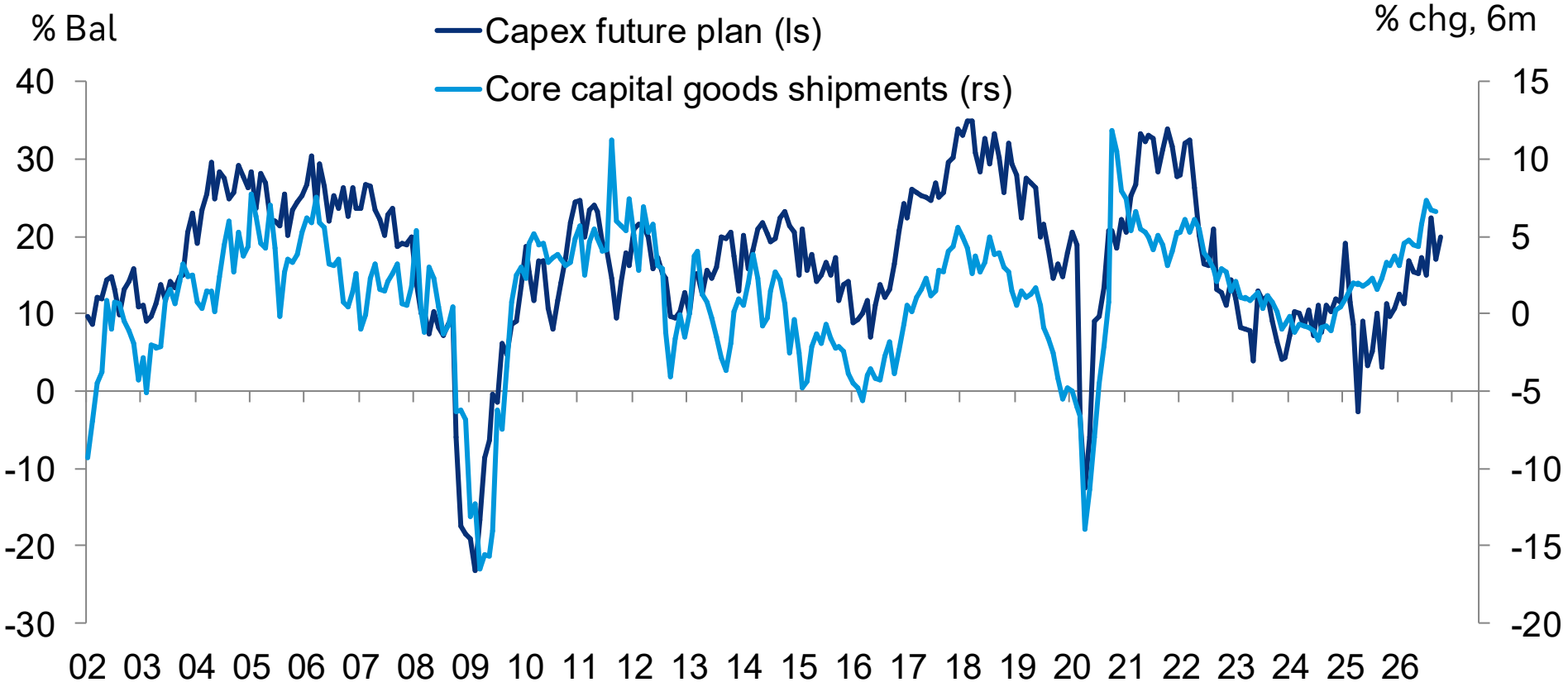


Source: BEA, FRB, Haver Analytics, Deutsche Bank

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Capex expectations have firmed alongside capital goods shipments

Capex expectations vs. durable goods shipments

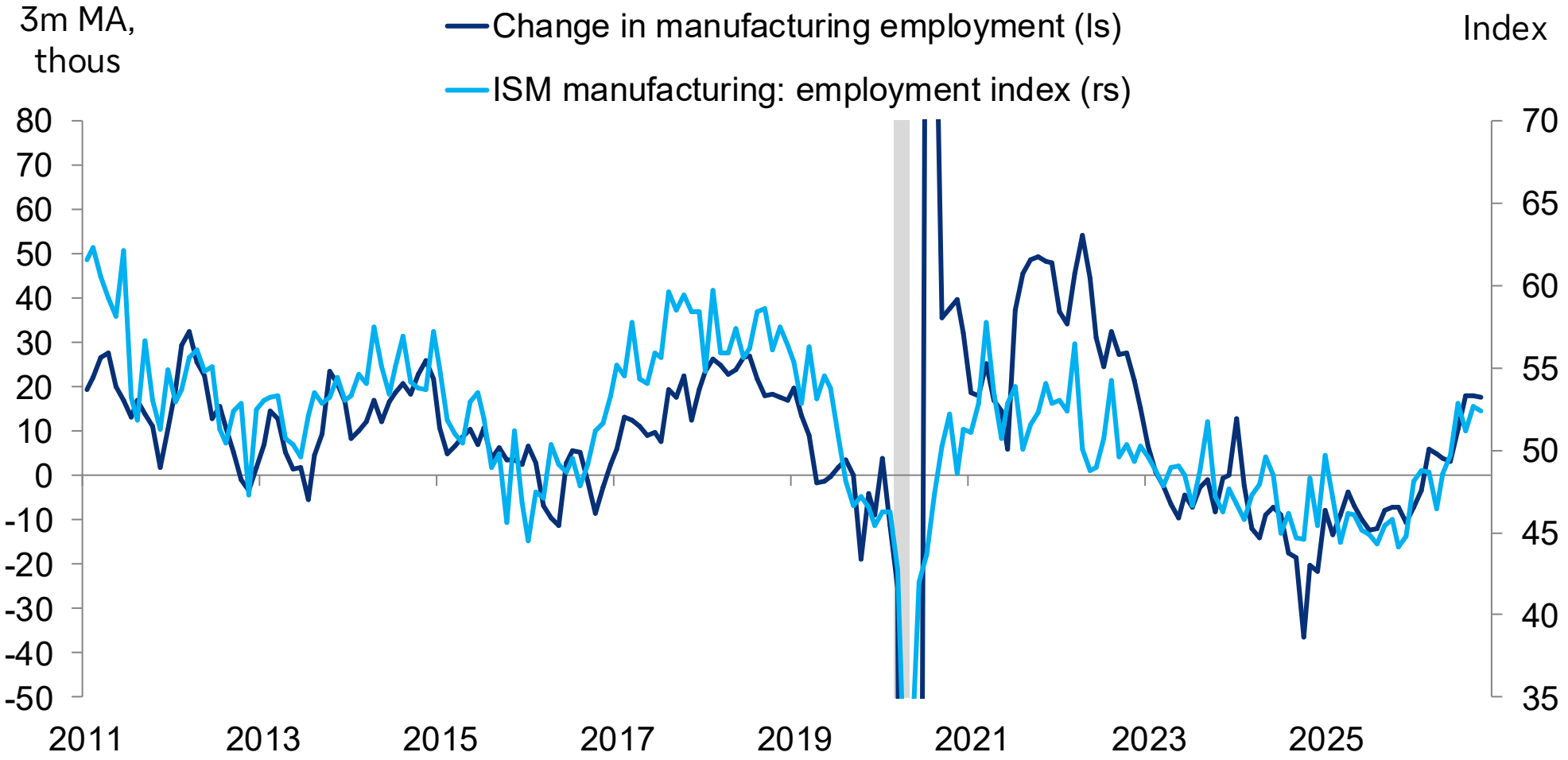


Source: Census, NY Fed, Dallas Fed, Richmond Fed, Philadelphia Fed, Kanas City Fed, Haver Analytics, Deutsche Bank

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Manufacturing momentum improving

Manufacturing employment change and ISM manufacturing employment

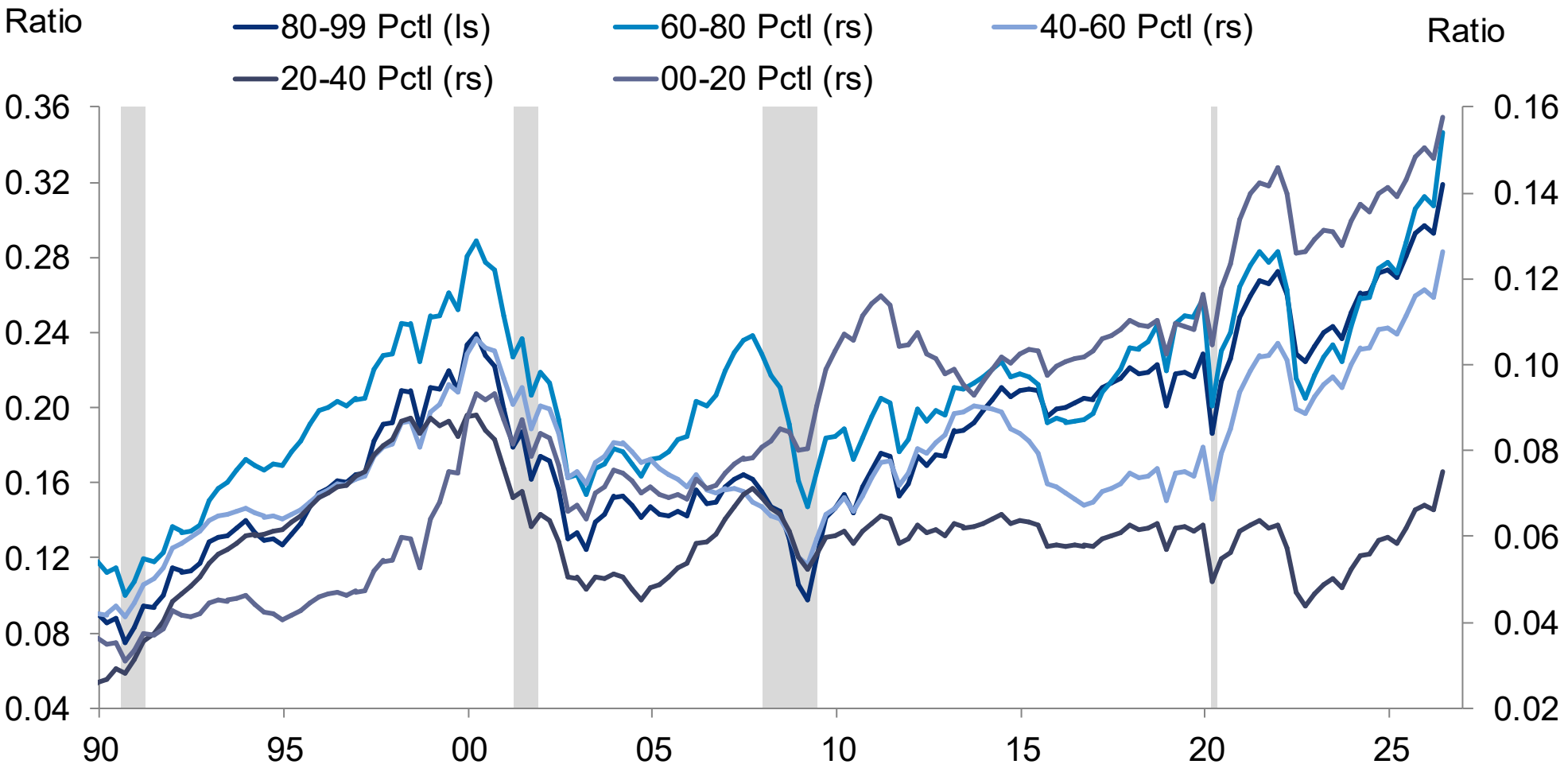


Source: BLS, ISM, Haver Analytics, Deutsche Bank

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Equities have grown in importance across the income distribution

Level of corporate equities and mutual funds as share of total assets



Source: FRB, NBER, Haver Analytics, Bloomberg Finance LP, Deutsche Bank

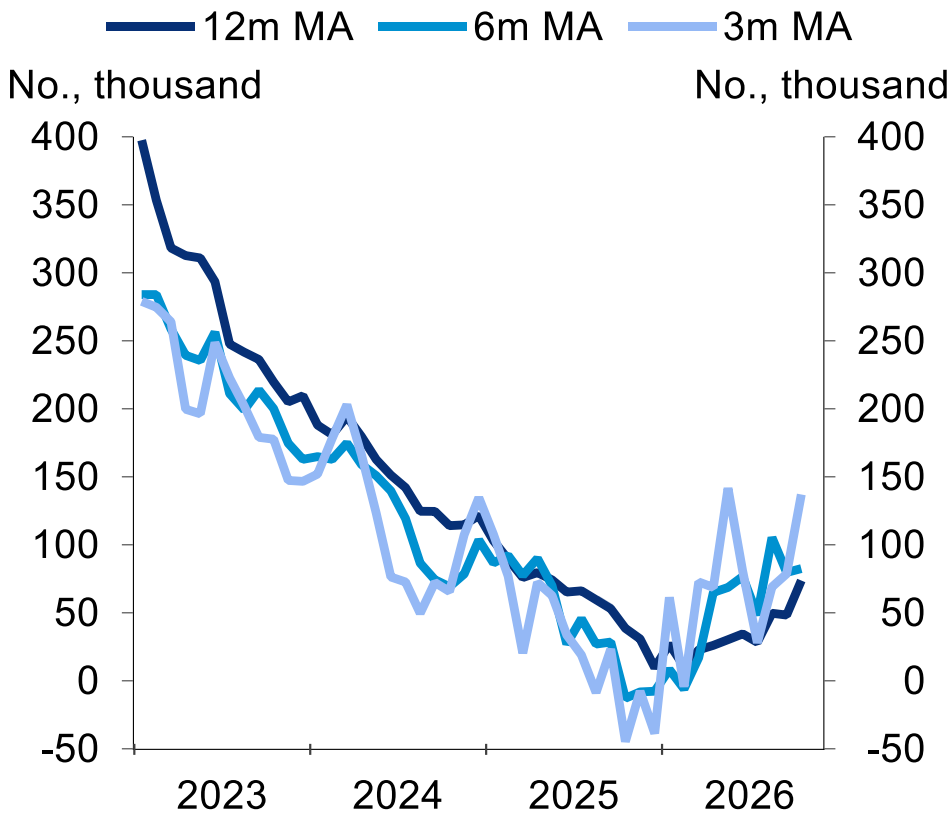
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3. Labor market: Re-tightening a rising risk

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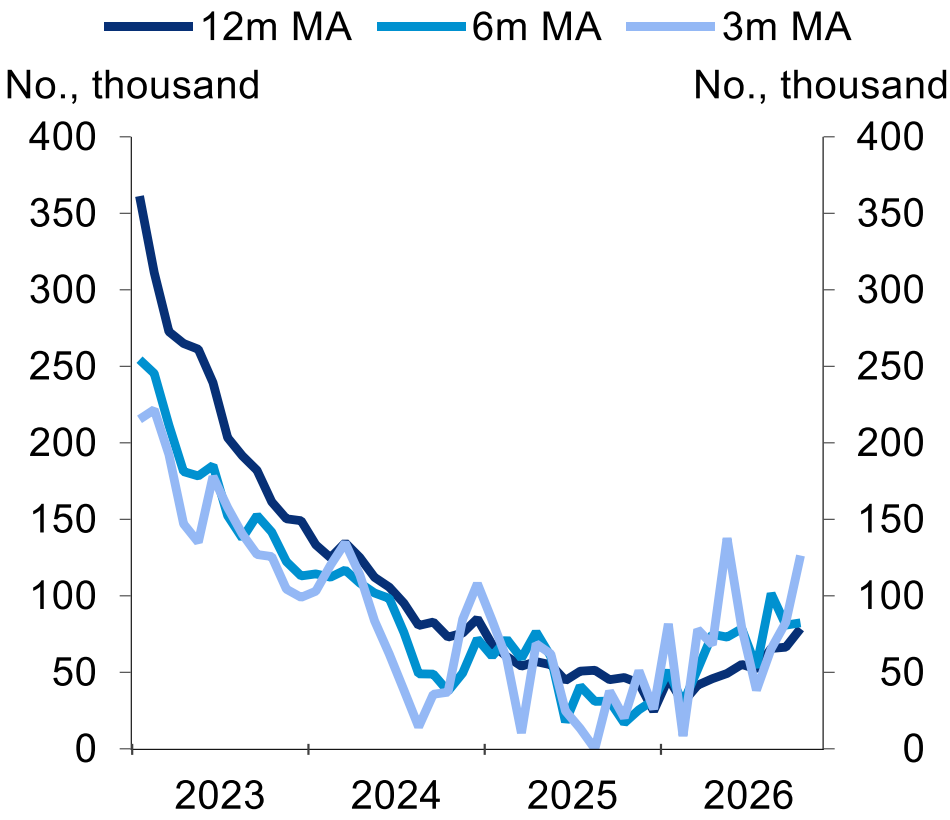
Payroll gains have picked up

Smoothed monthly gains in headline nonfarm payrolls



Source: BLS, Macrobond, Deutsche Bank

Smoothed monthly gains in private nonfarm payrolls

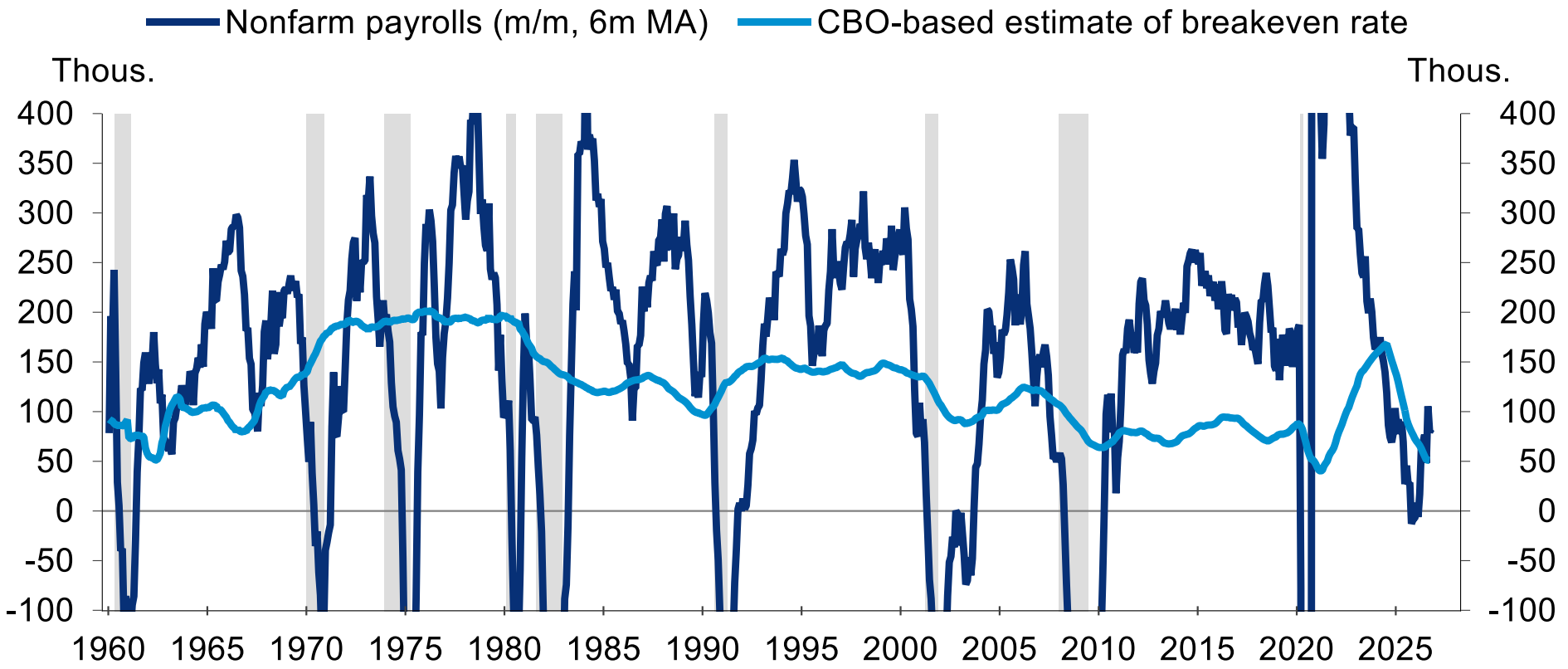


Source: BLS, Macrobond, Deutsche Bank

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DB estimate for the monthly breakeven payrolls number around 40-50k; some Fed estimates lower around 0

Monthly breakeven rate of employment growth

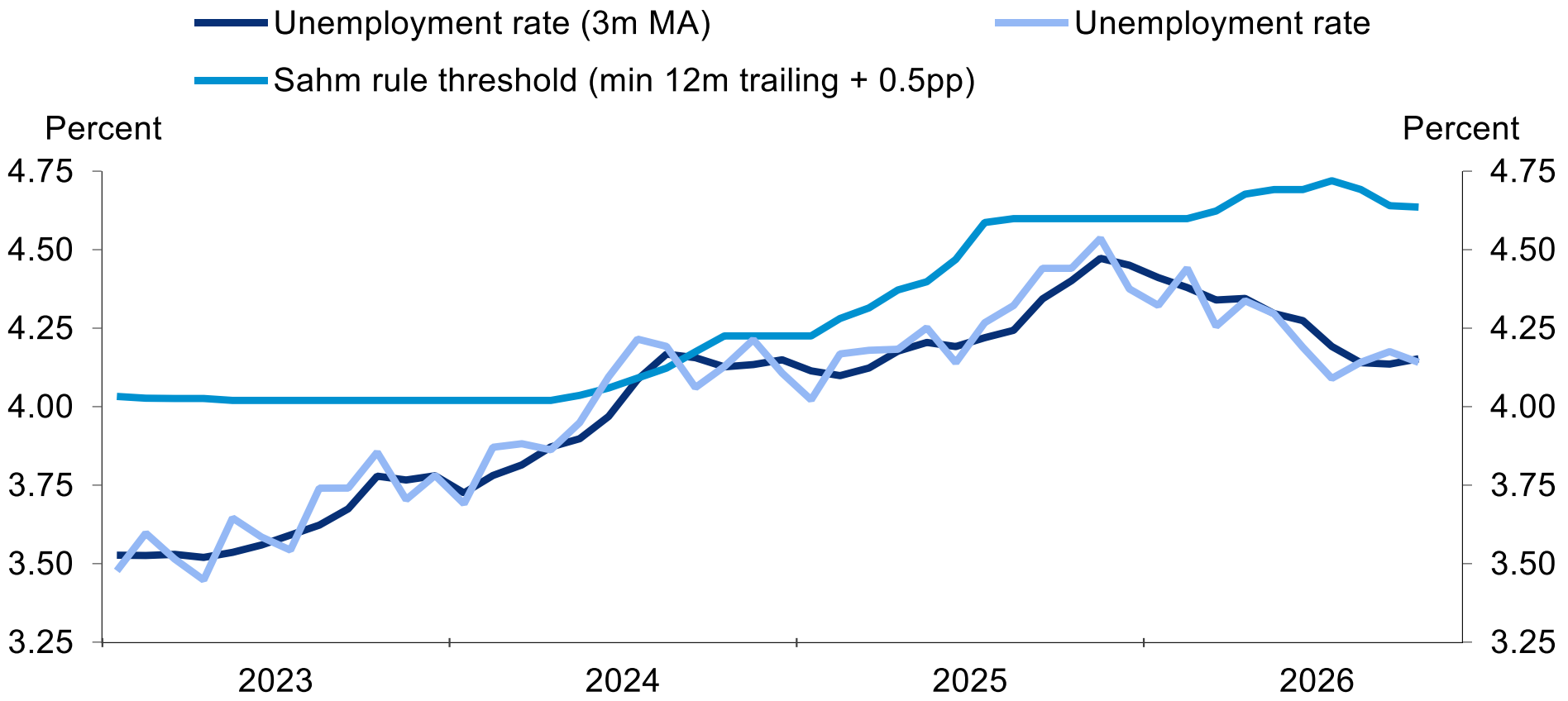


Source: CBO, BLS, Coglianese, Murray, and Nekarda (2025), Macrobond, Deutsche Bank. Note: Constructed as the change in a CBO-based estimate of the potential labor force * (1 - CBO natural rate of unemployment).

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Unemployment rate was 4.1% in October

Sahm rule

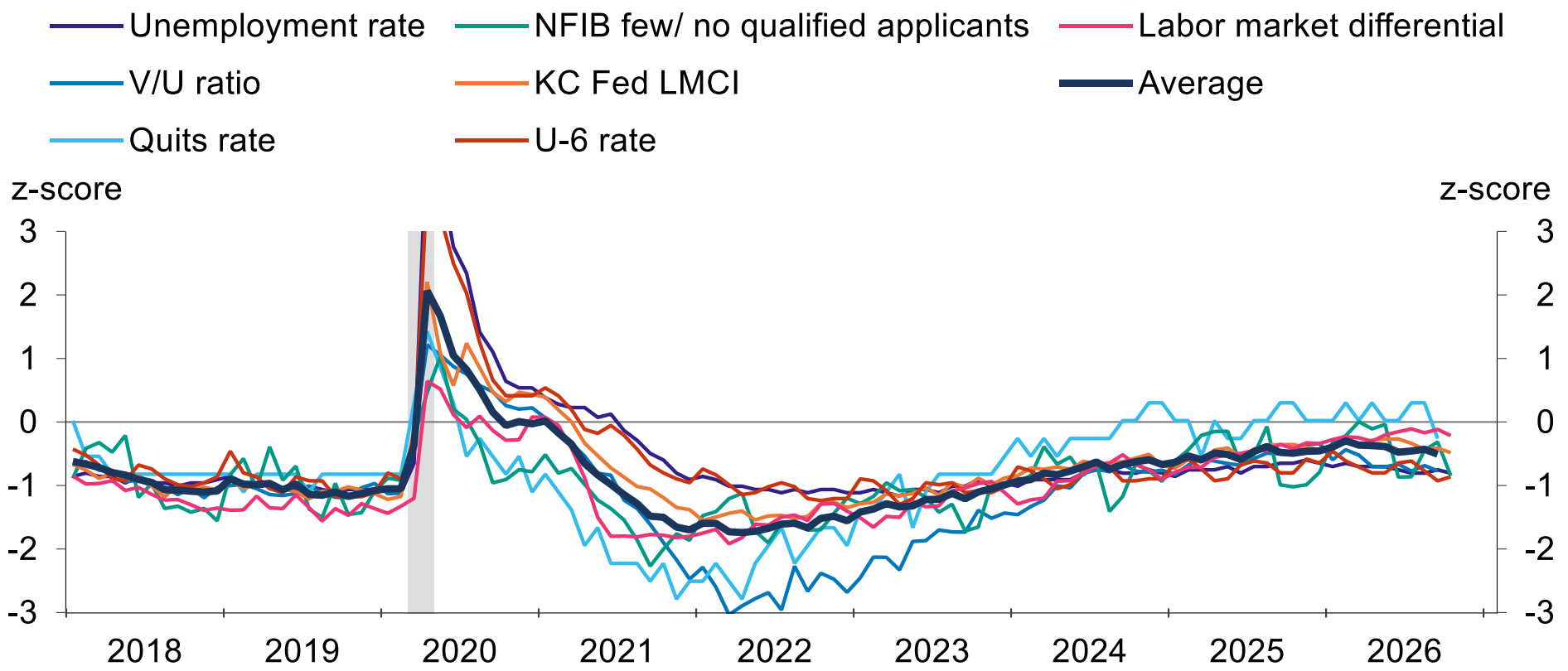


Source: BLS, Macrobond, Deutsche Bank

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Measures of labor market slack have on balance fallen modestly in recent months

Z-scores of labor market indicators

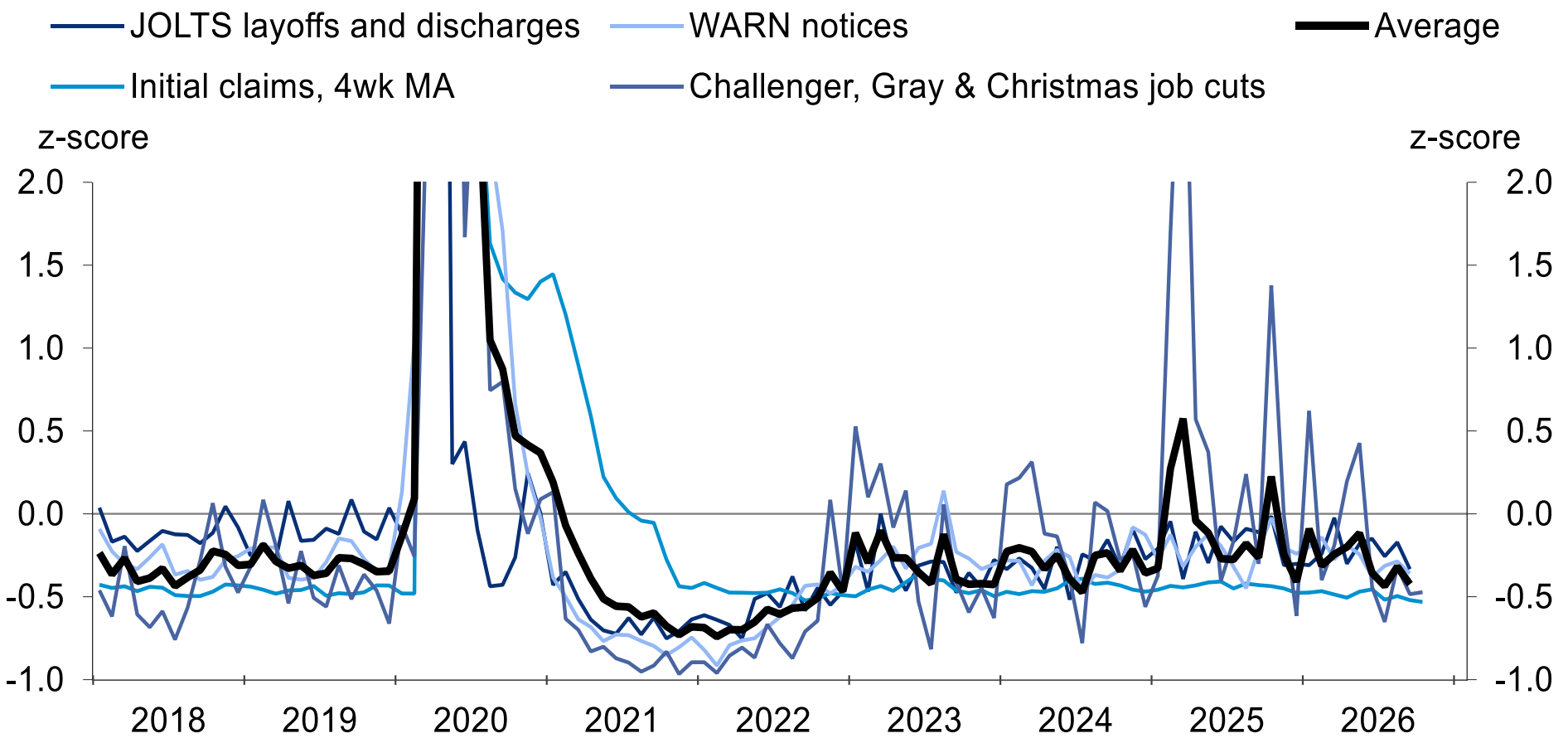


Source: BLS, Kansas City Fed, TCB, NFIB, Macrobond, Deutsche Bank. Note: z-scores computed over data from 2001 on.

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Layoffs are falling

Layoff indicators

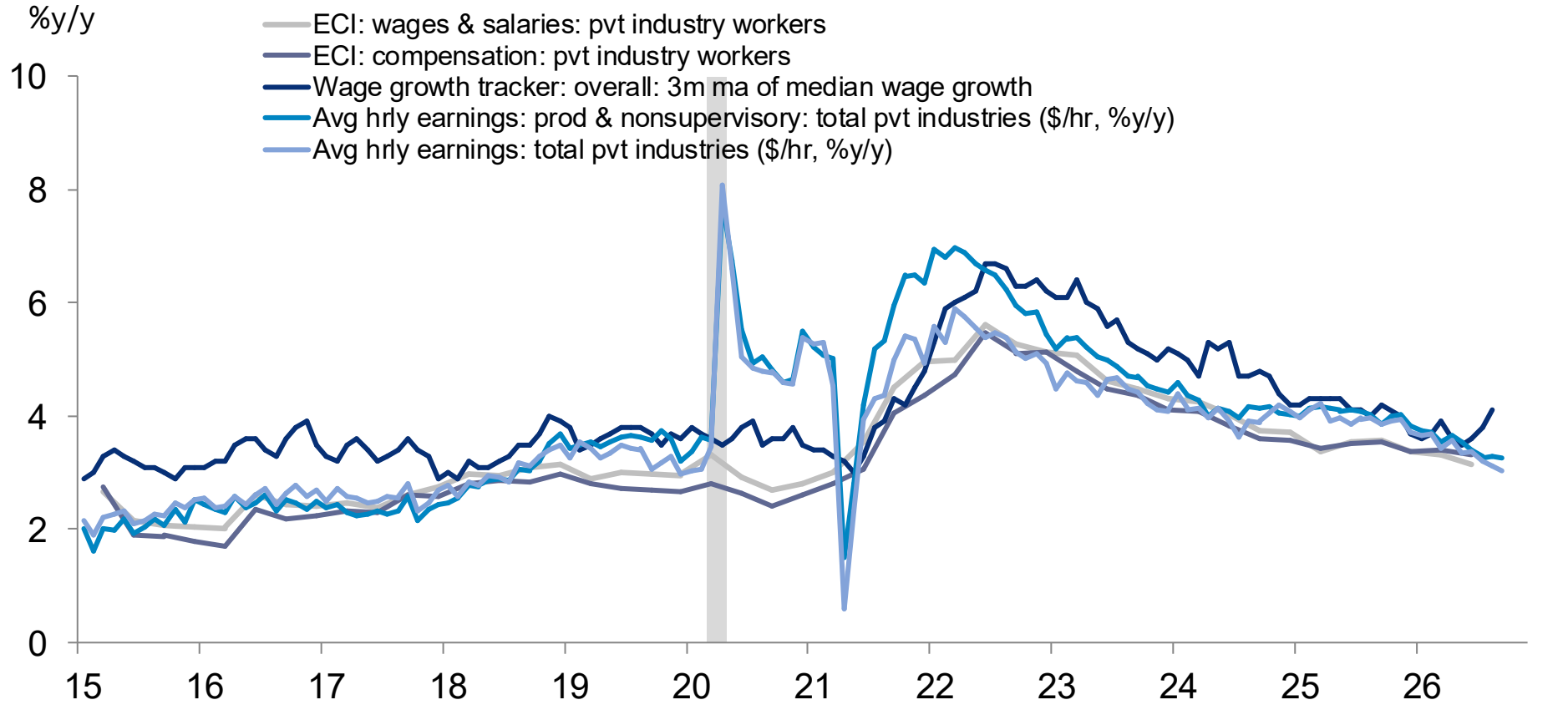


Source: DOL, BLS, ICPSR, Challenger, Gray & Christmas, Inc., Macrobond, Deutsche Bank

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Measures of wage growth generally moderating, though some divergence

Wage growth

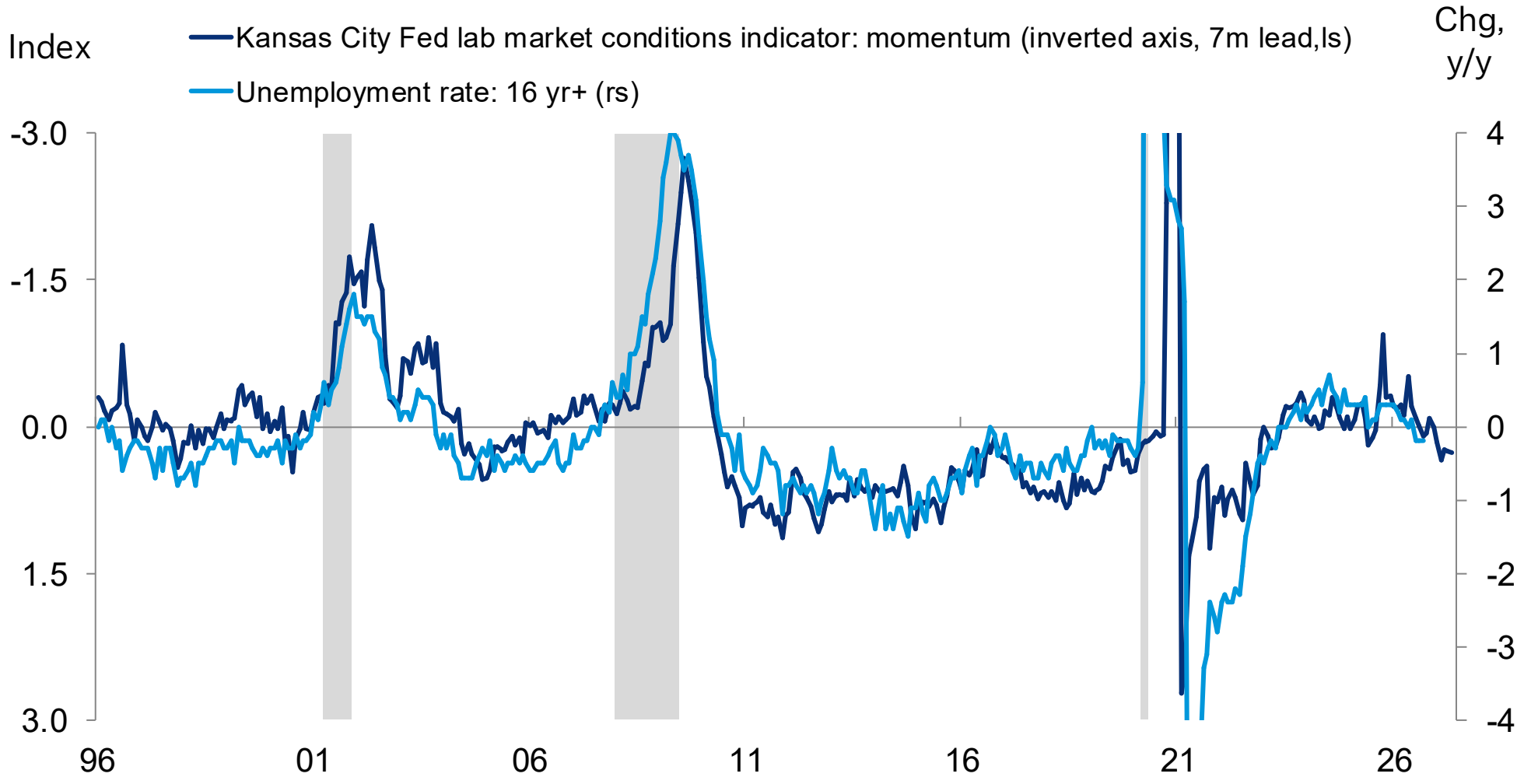


Source: BEA, BLS, FRB Atlanta, Haver Analytics, Deutsche Bank

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But wage growth could accelerate if the labor market continues to tighten

Unemployment rate and labor market momentum



Source: Kansas City Fed, BLS, Haver Analytics, Deutsche Bank

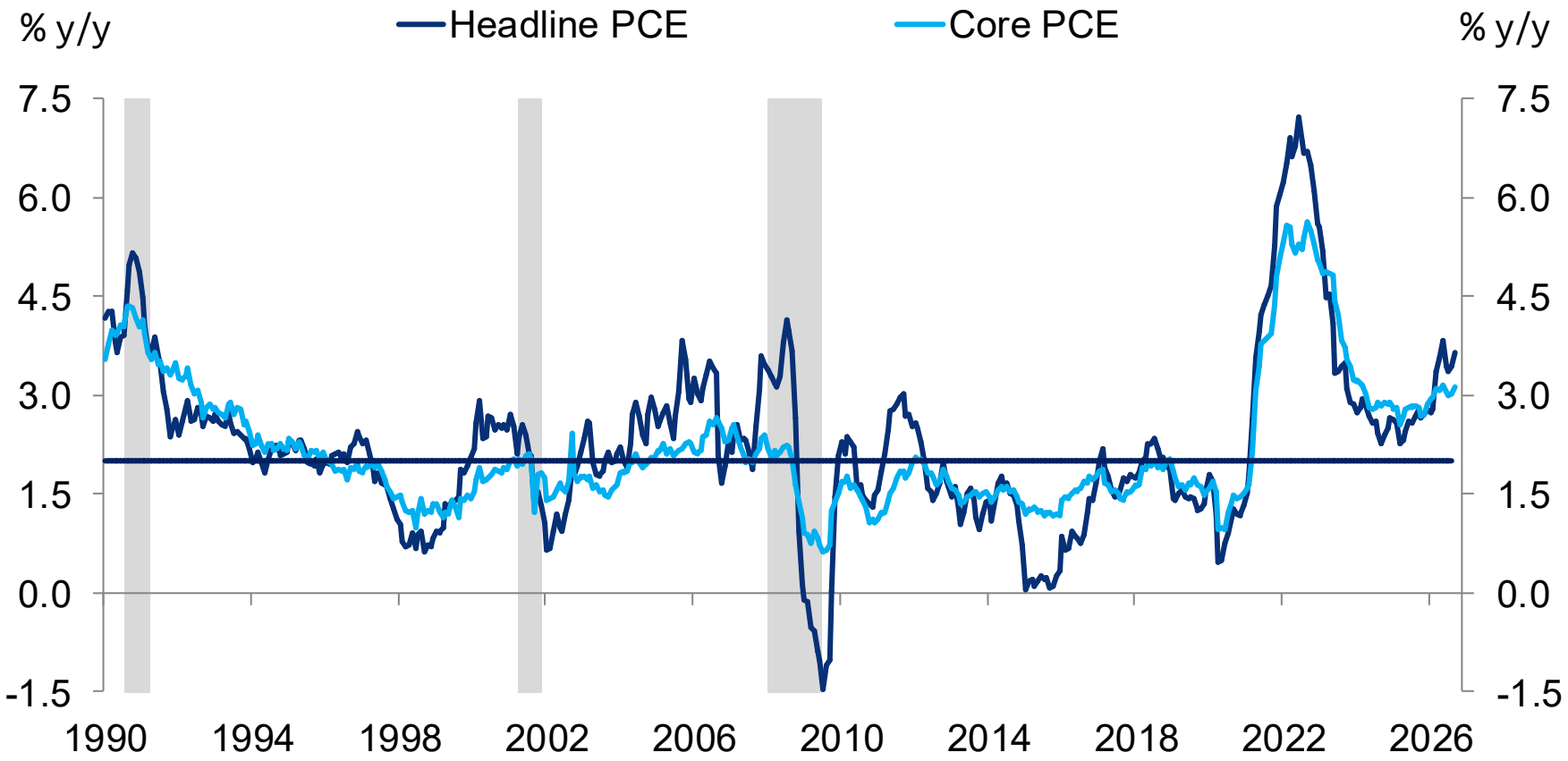
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4. Continued doubts on disinflation

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PCE inflation remains well above the Fed's 2% target; excluding the Covid period, core PCE highest since 1992

PCE inflation

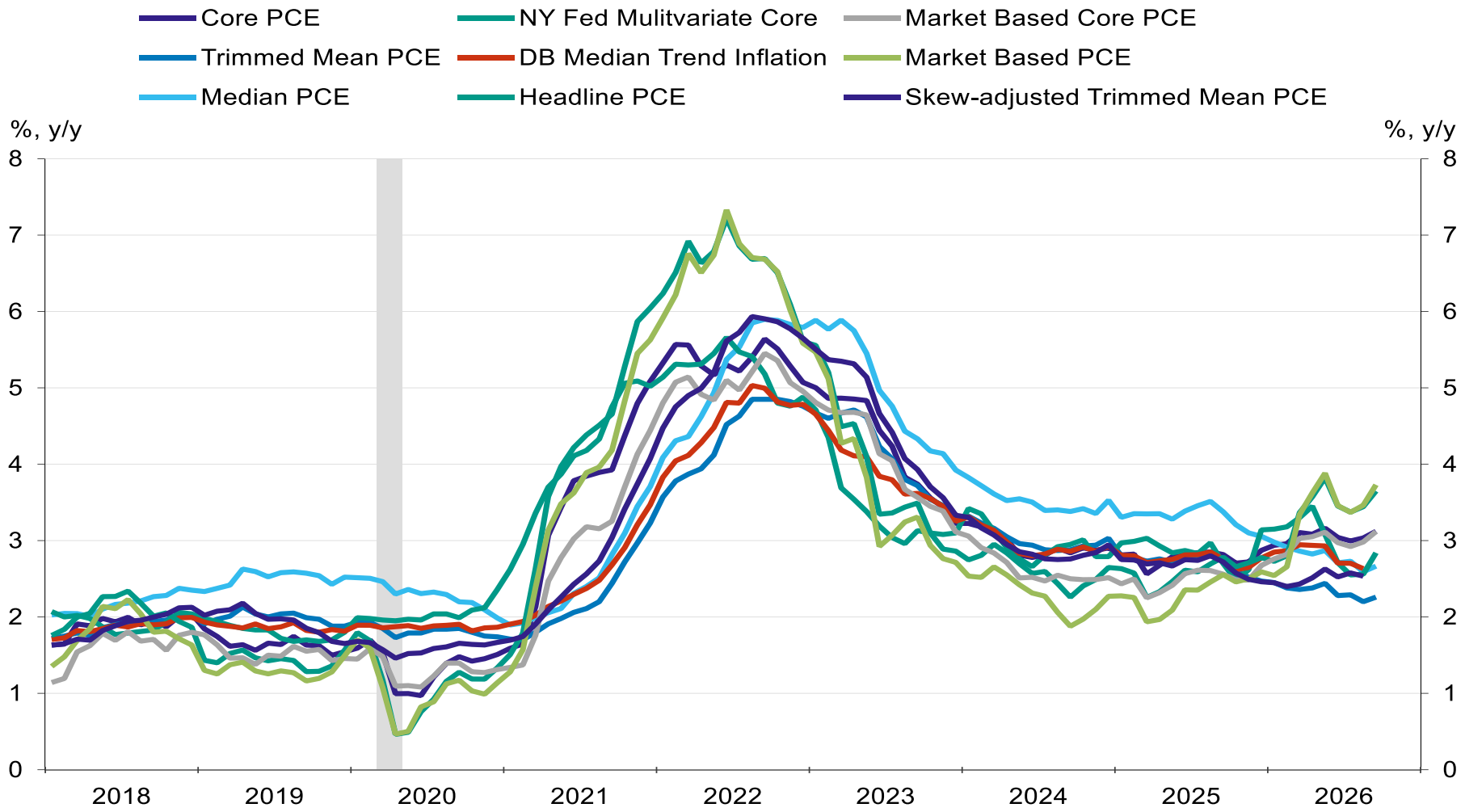


Source: BEA, Haver Analytics, Deutsche Bank

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Measures of trend inflation now more disperse

Alternative measures of trend PCE inflation

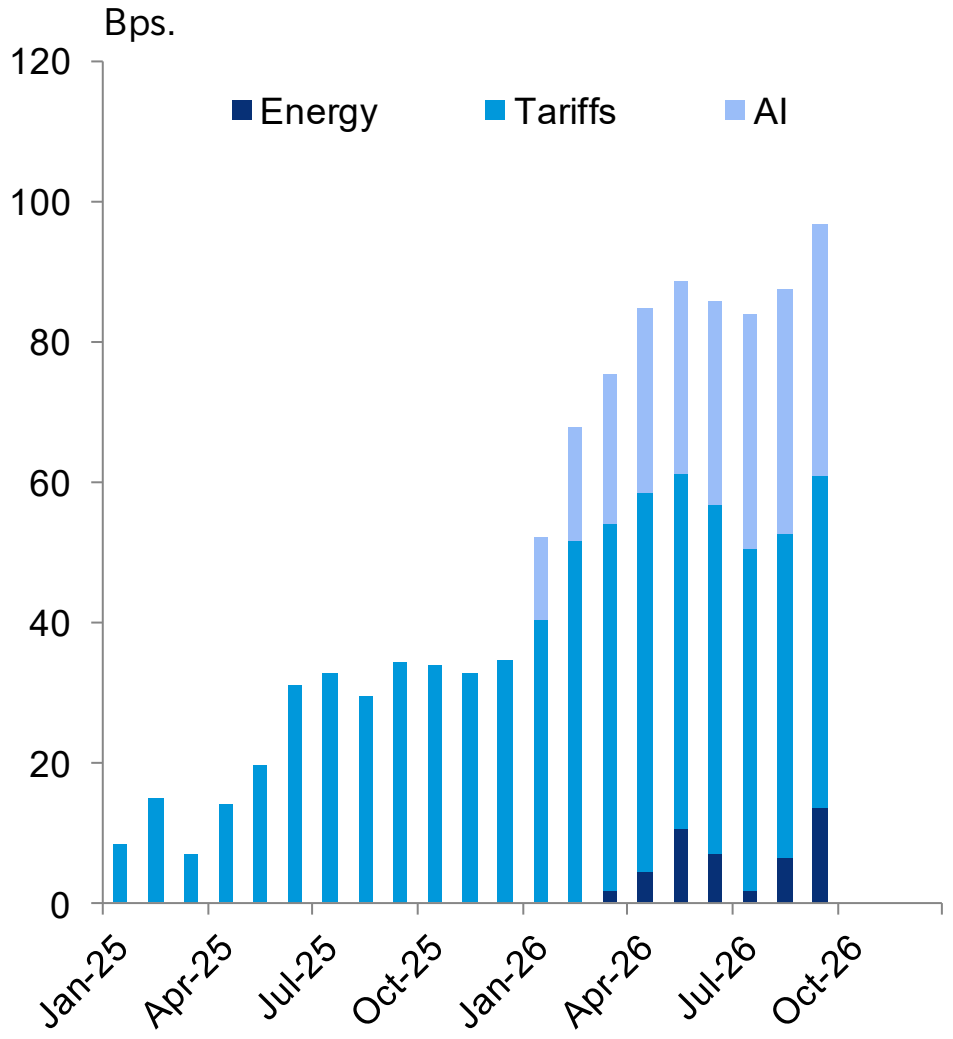


Source: BEA, Dallas Fed, Cleveland Fed, New York Fed, Macrobond, Deutsche Bank

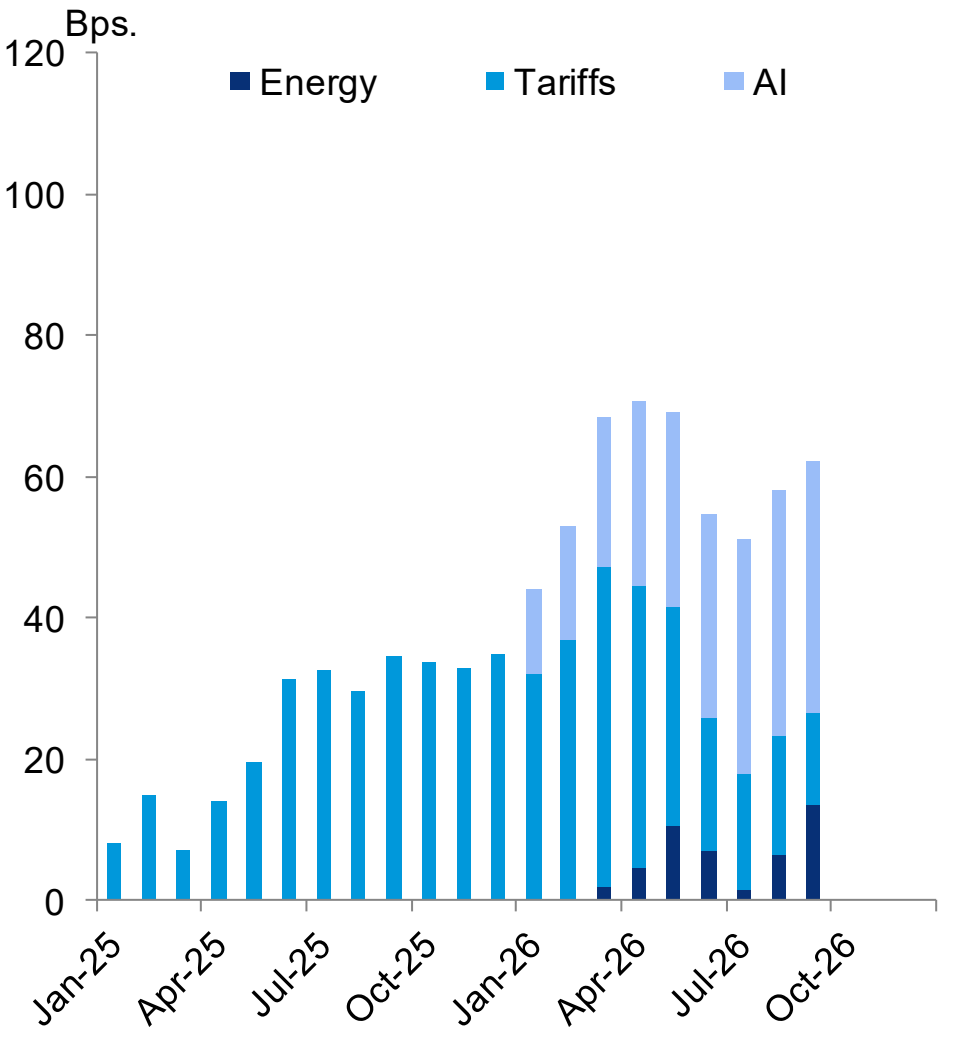
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Contribution to core PCE price level and year-over-year inflation rate from energy, tariffs and AI

Effect on the core PCE price level



Effect on the core PCE inflation rate (%yoy)

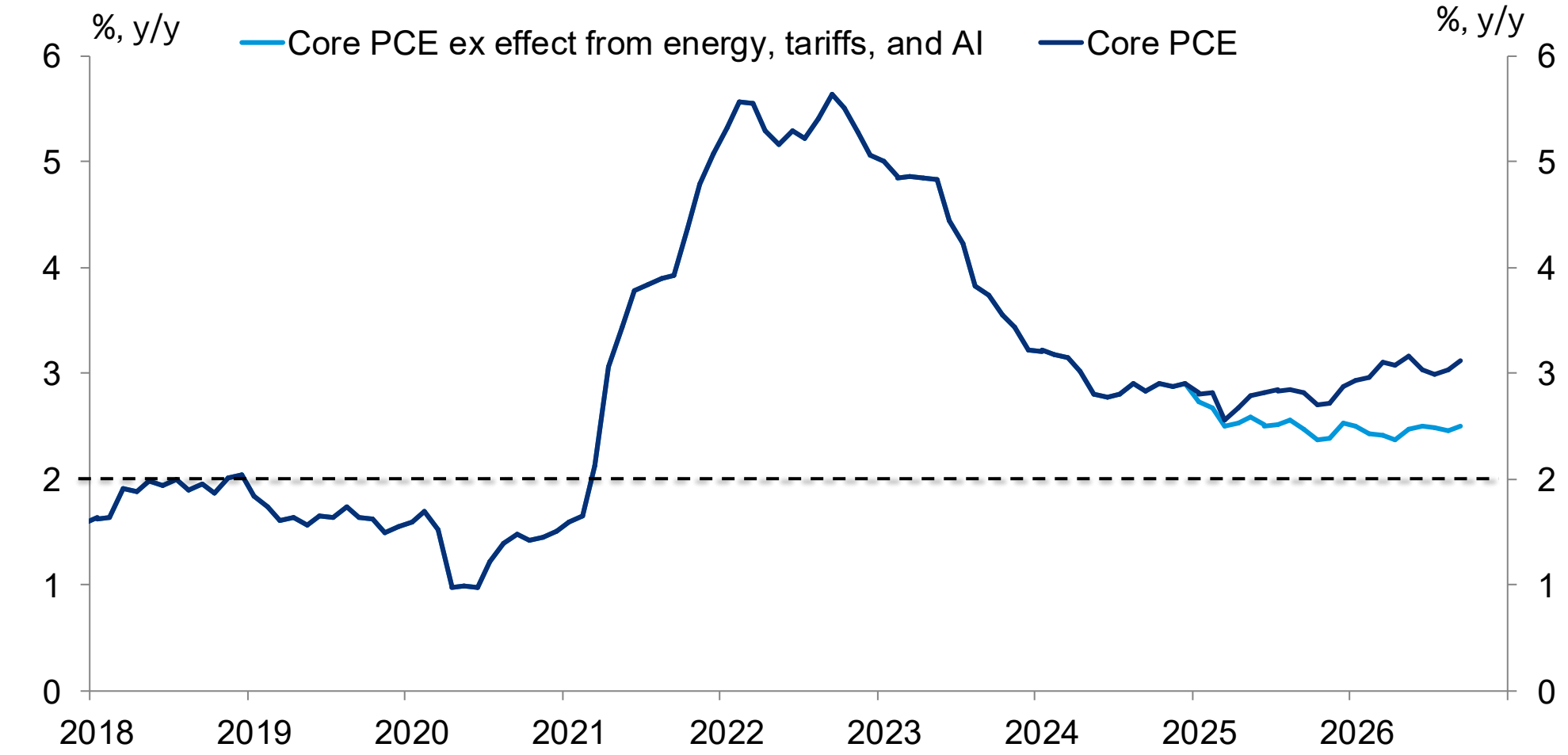


Source: BEA, Macrobond, Deutsche Bank

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Core PCE inflation has stalled out near 2.5% excluding those factors

Core PCE inflation

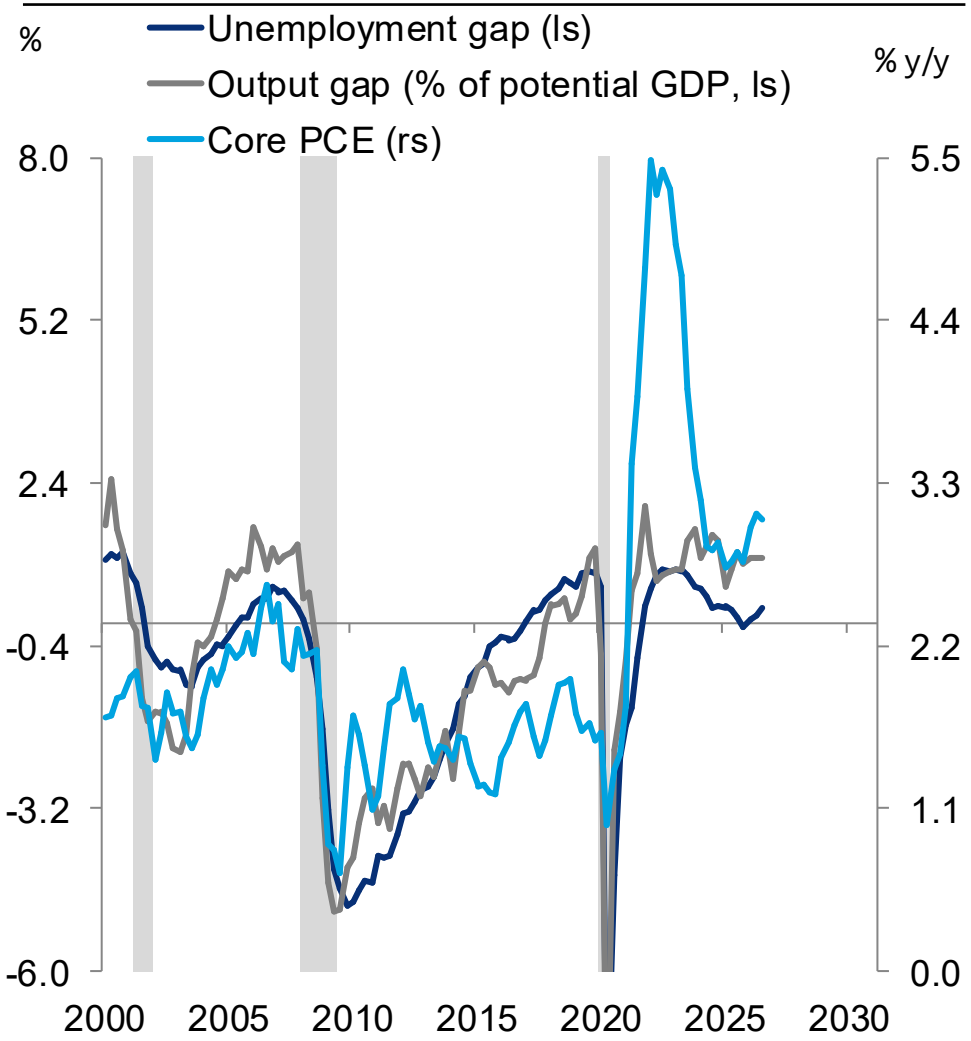


Source: BEA, Macrobond, Deutsche Bank

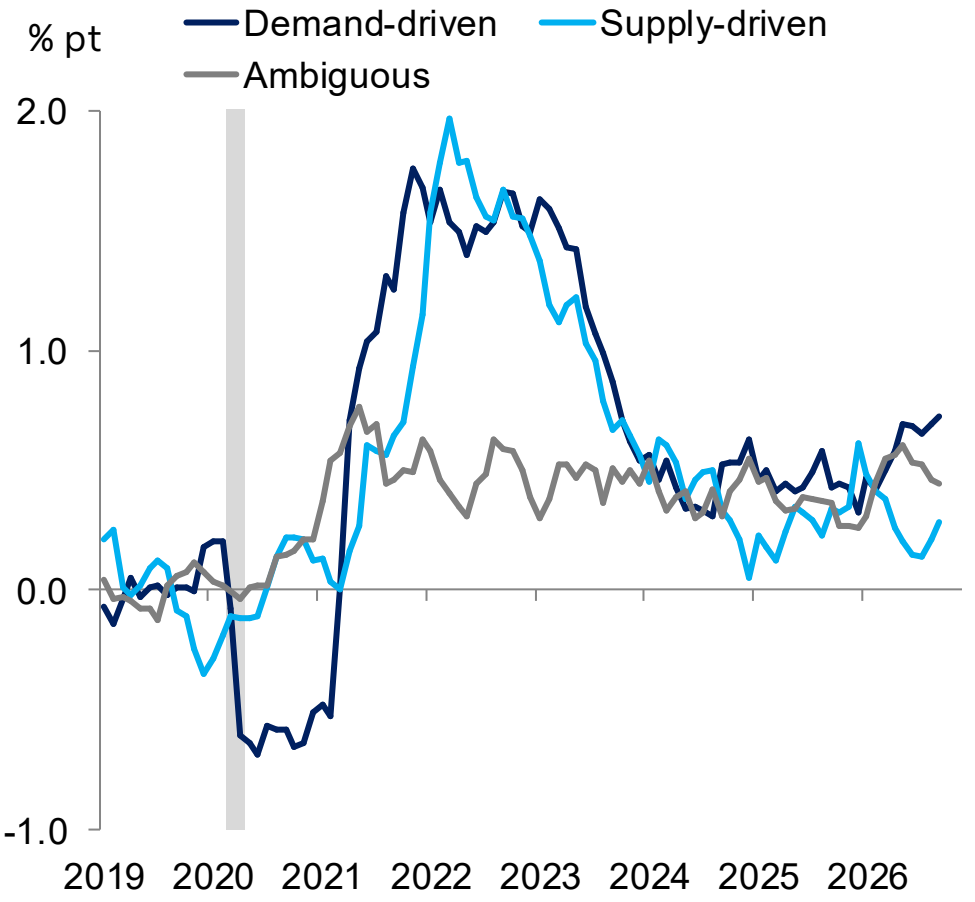
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Demand remains an important driver of inflation

Output gap implies elevated inflation



Demand remains most important inflation driver



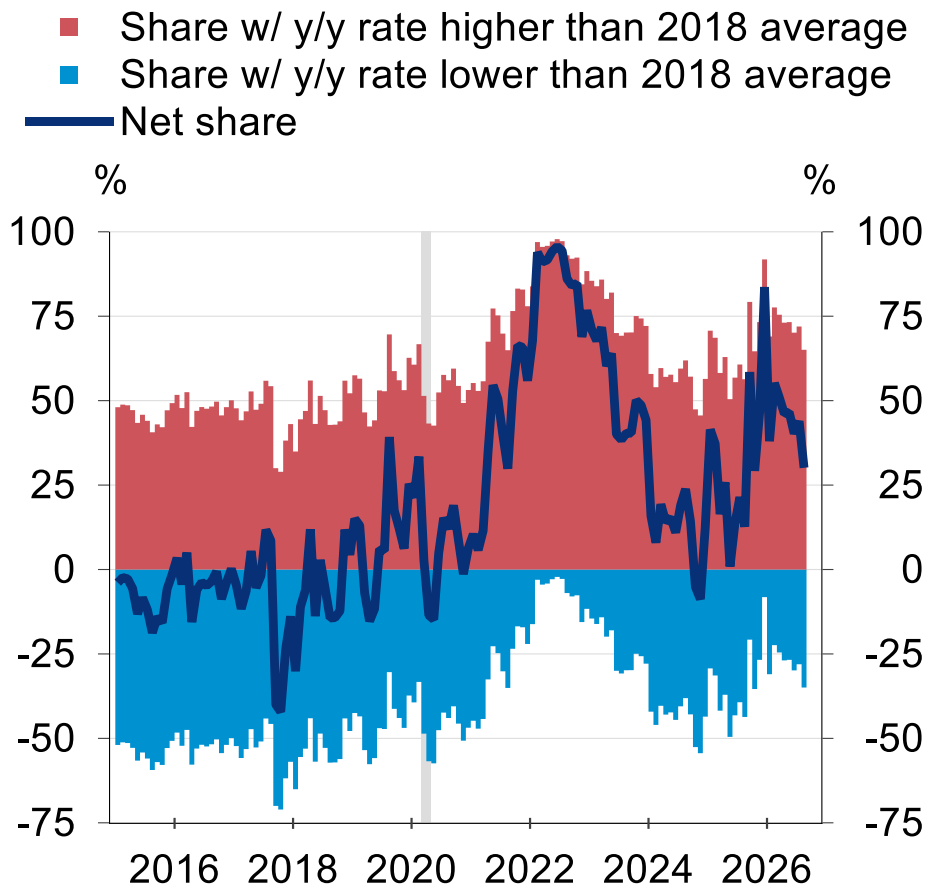
Note: Chart shows contributions of each factor to %yoy core PCE inflation relative to the average contribution in 2019.

Source: BEA, BLS, CBO, FRB SF, Haver Analytics, Deutsche Bank

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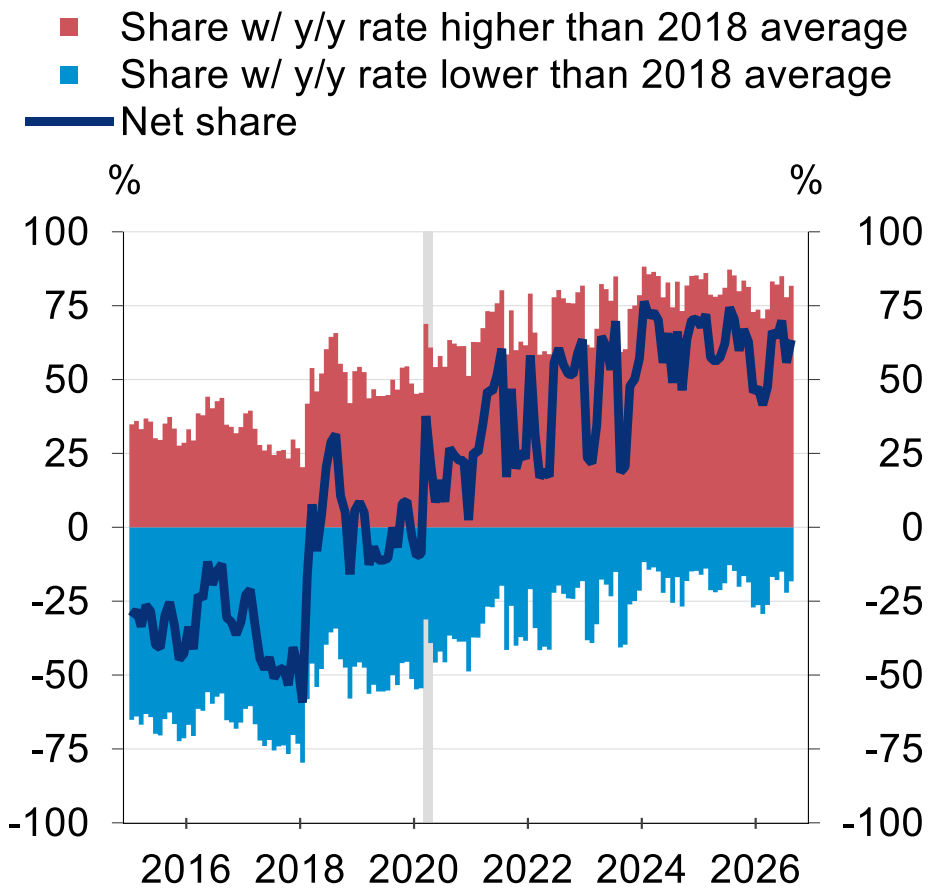
Inflation has been broad-based in goods and supercore

Core goods inflation diffusion index



Source: BEA, Macrobond, Deutsche Bank

Supercore inflation diffusion index

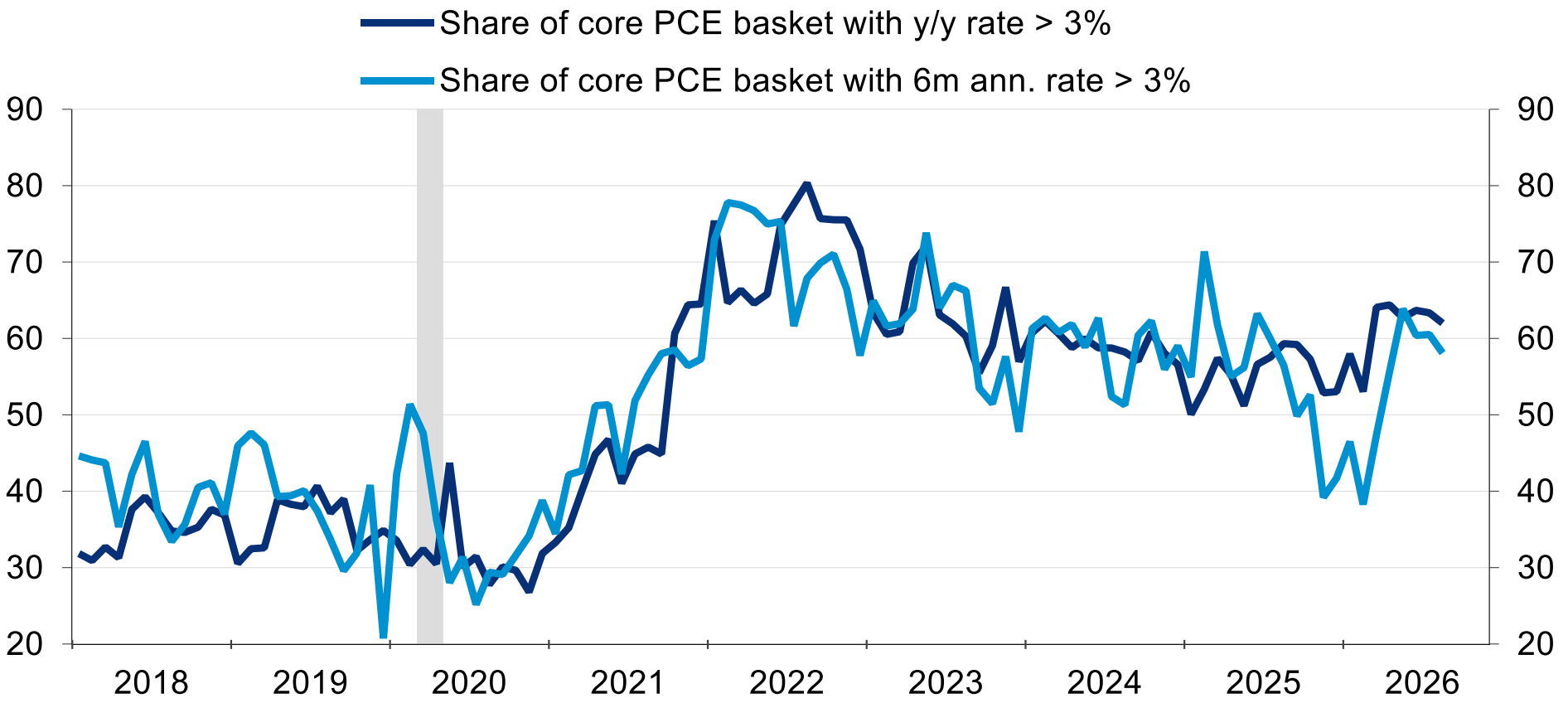


Source: BEA, Macrobond, Deutsche Bank

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Share of core PCE basket that has high inflation rates still elevated

Core PCE inflation

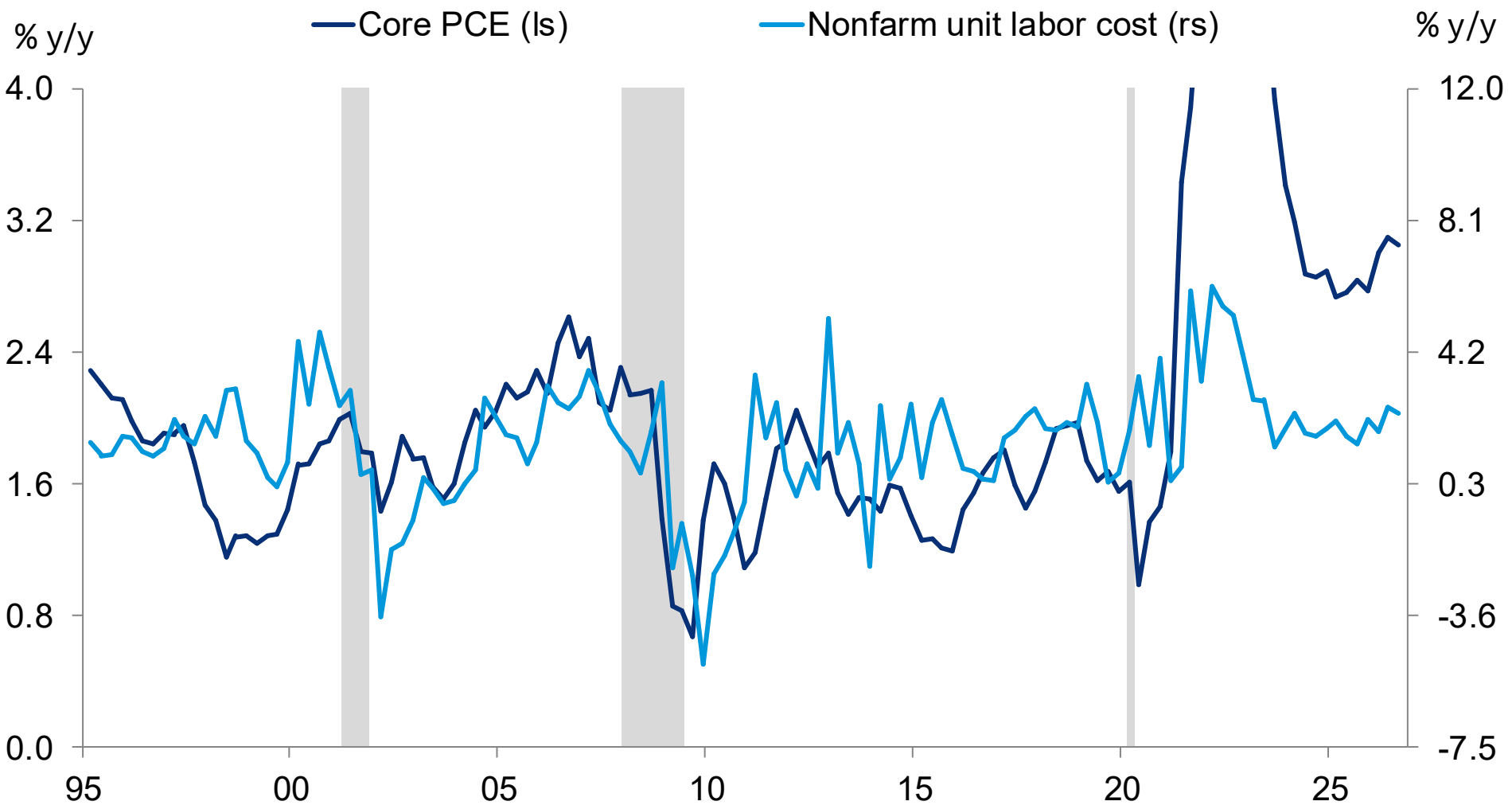


Source: BEA, Macrobond, Deutsche Bank

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Labor market not a source of inflationary pressures, but ULCs revised up recently

Core PCE vs. ULCs

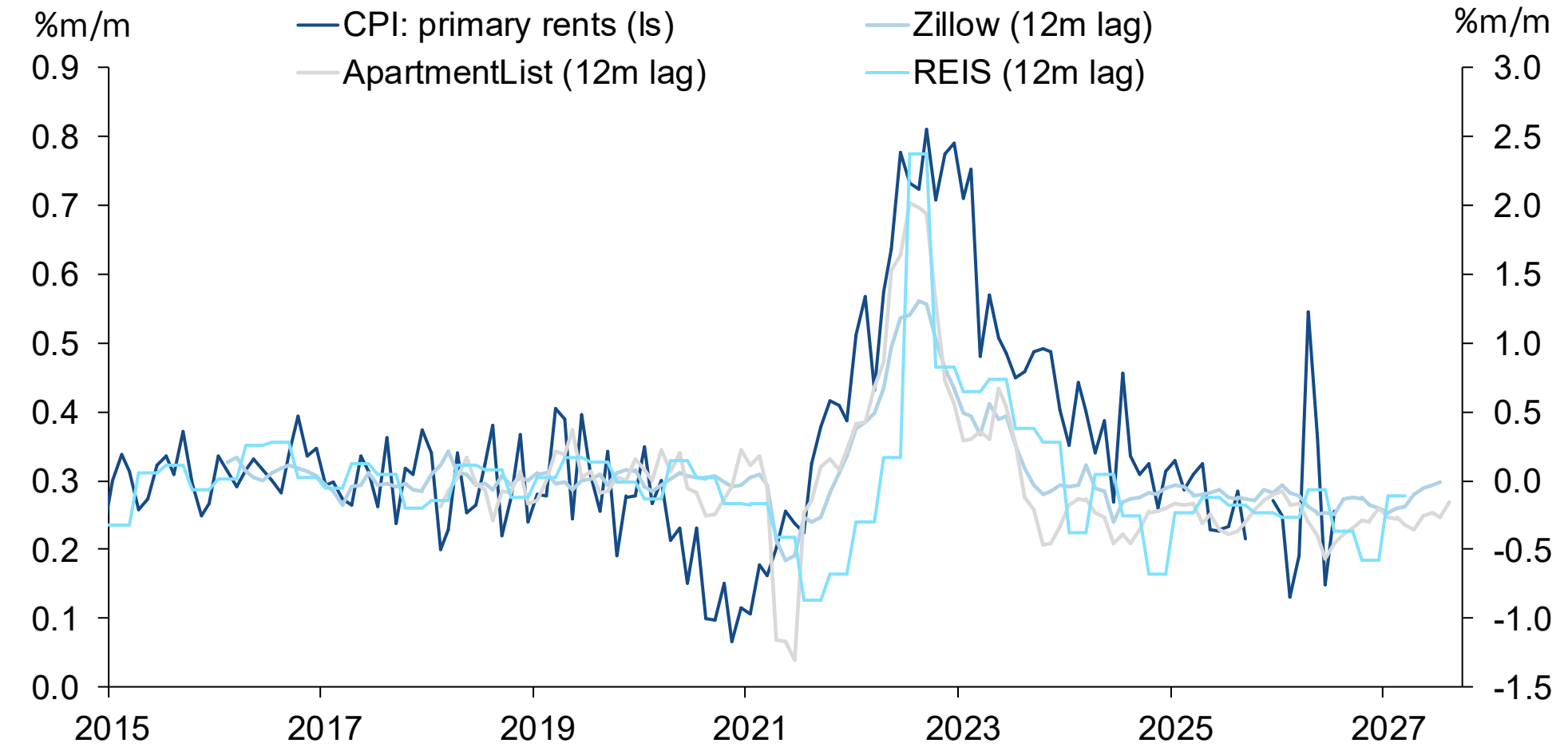


Source: BEA, BLS, Haver Analytics, Deutsche Bank

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Rental price disinflation may begin to reverse over the next year

Rent inflation

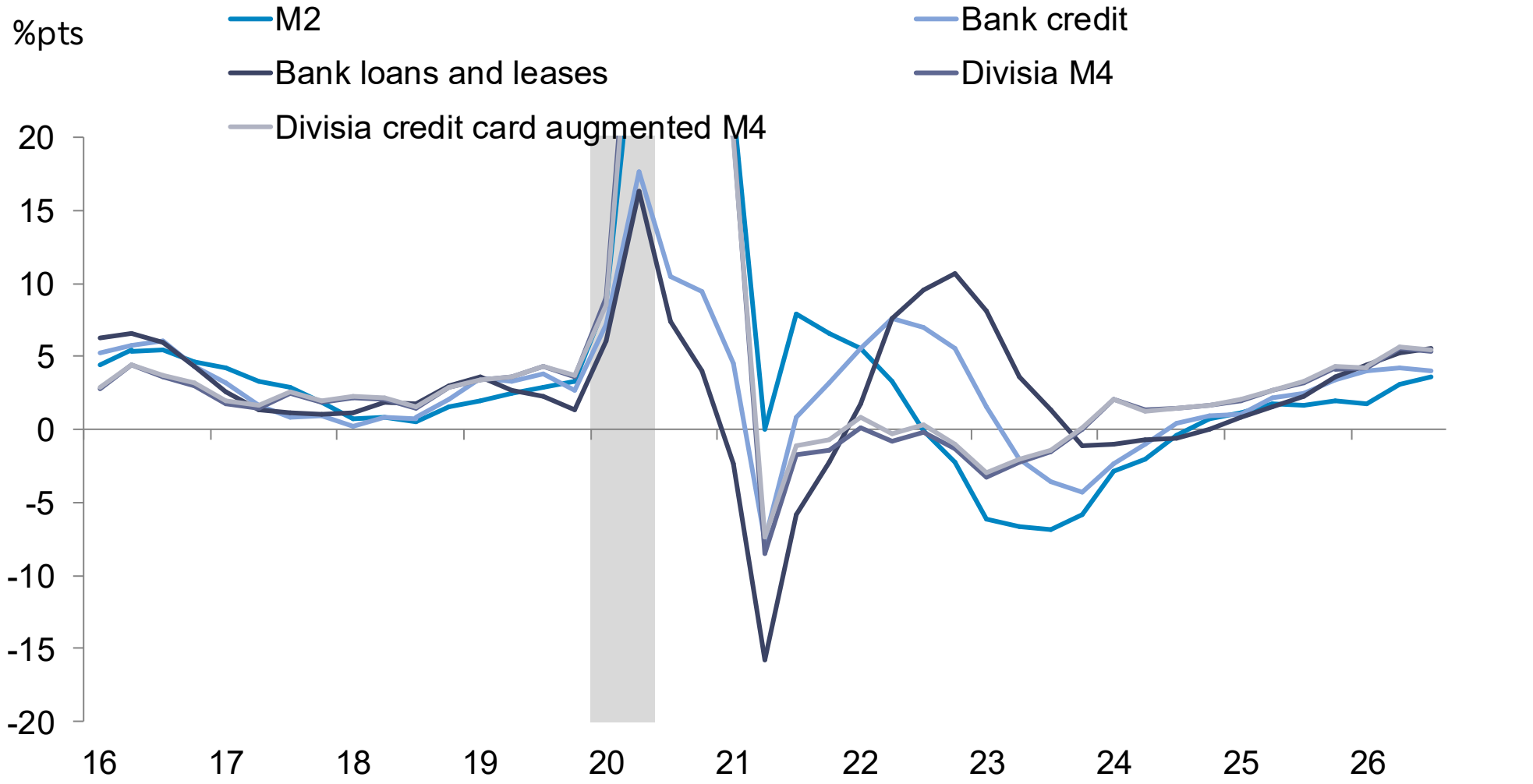


Source: BLS, Zillow, Apartment List, REIS, Haver Analytics, Deutsche Bank

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Measures of money supply growth are picking up

Excess money supply growth measures

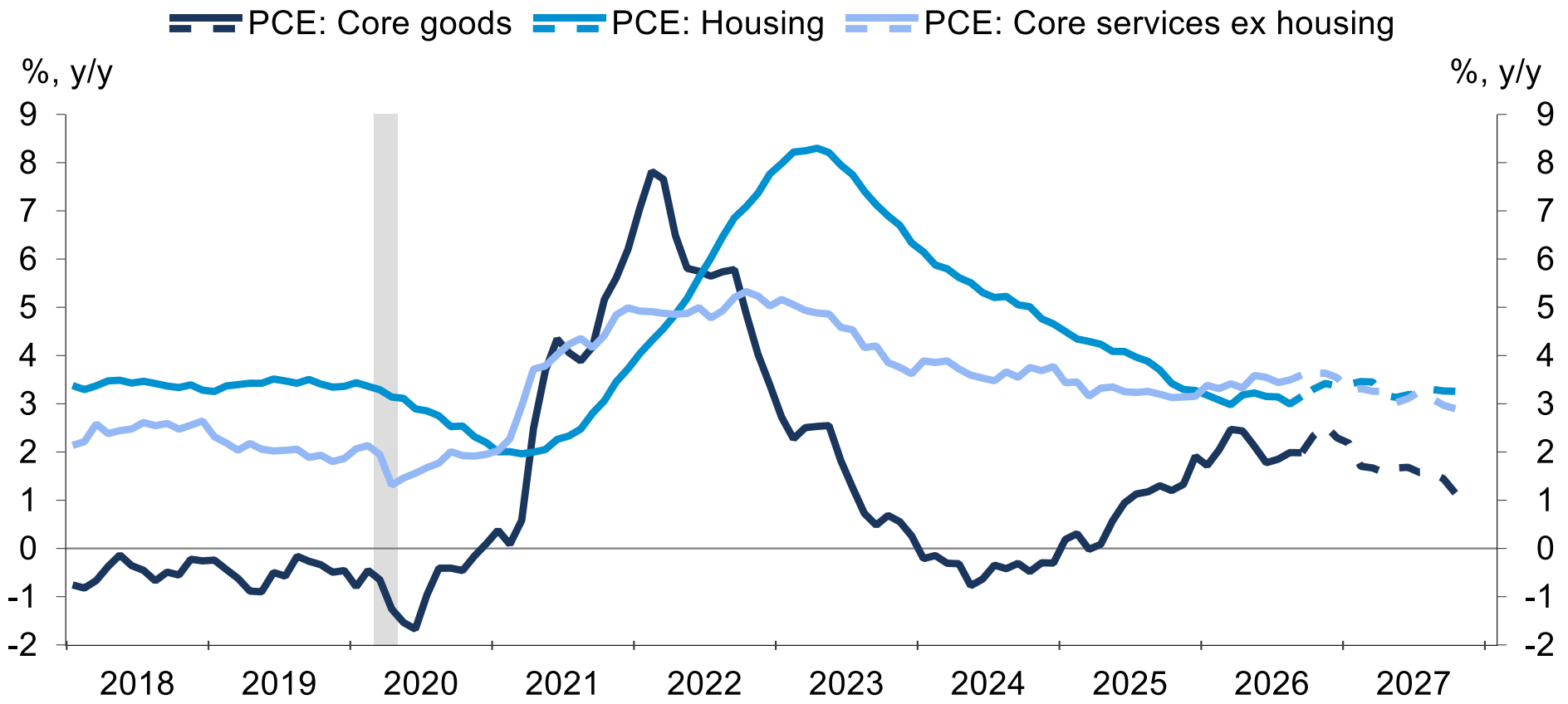


Source: FRB, BEA, CFS, Haver Analytics, Deutsche Bank Research

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DB core PCE inflation forecast by component – stickiness is evident this year, some improvement in 2027

Core PCE component forecasts

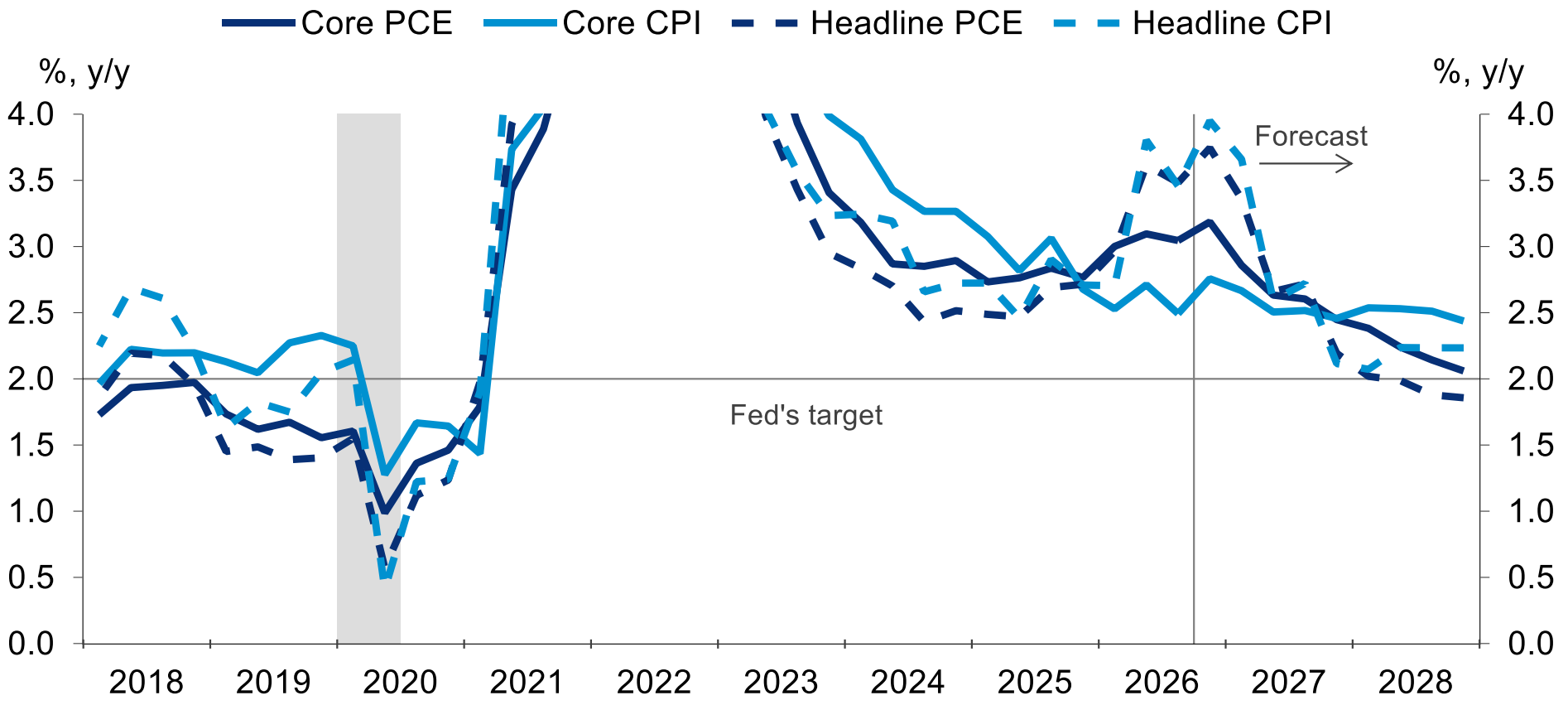


Source: BEA, Macrobond, Deutsche Bank

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DB forecasts do not see inflation fully returning to 2% until 2028

DB inflation forecasts



Source: BEA, BLS, Macrobond, Deutsche Bank

Source: BEA, BLS, Haver Analytics, Deutsche Bank

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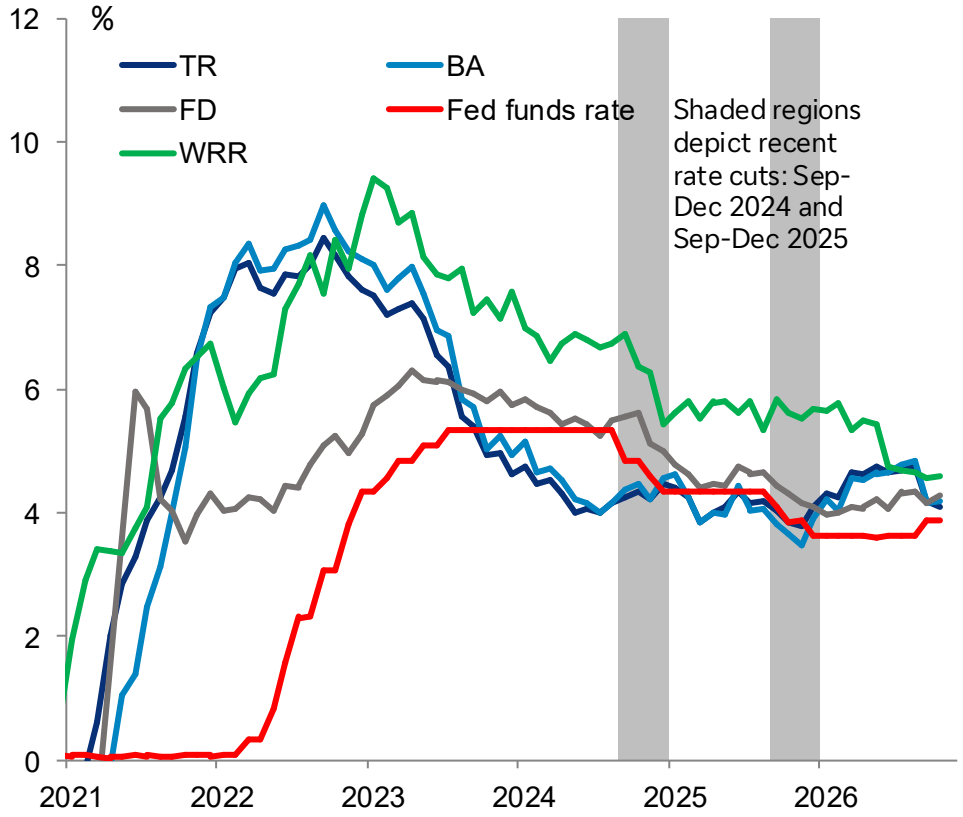
5.

Fed: How high to tighten FCIs?

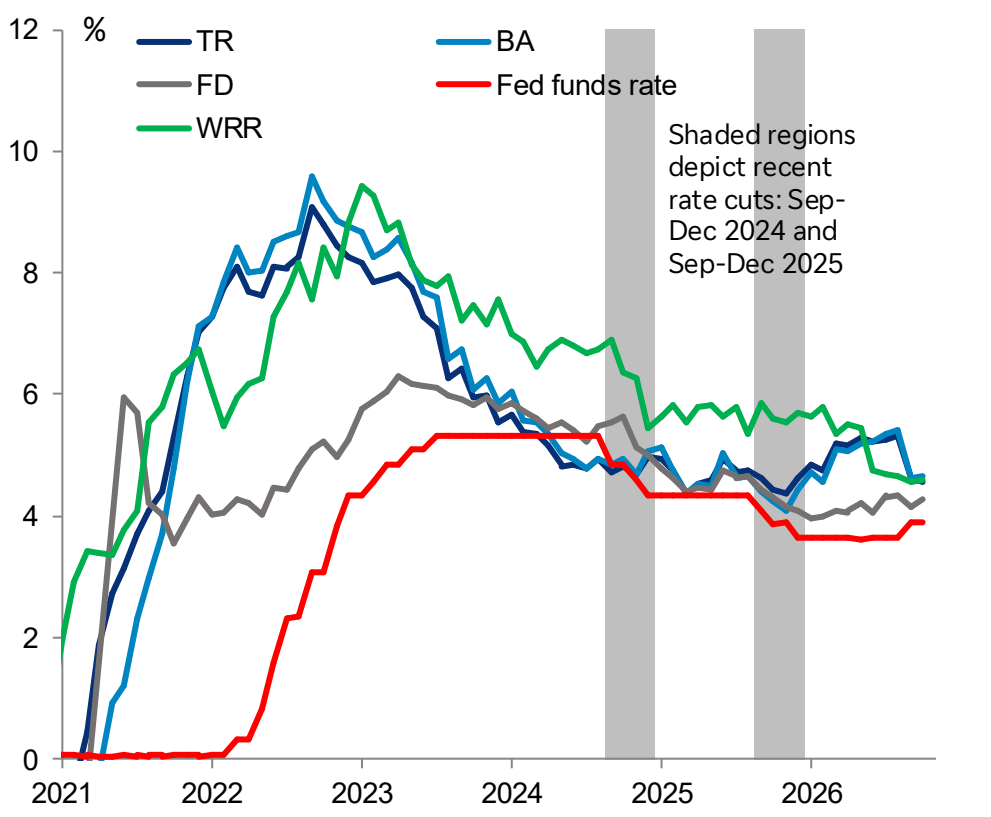
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The policy rate is still below policy rules

Fed funds rate versus rules w/ Fed r-star



Fed funds rate versus rules w/ DB r-star

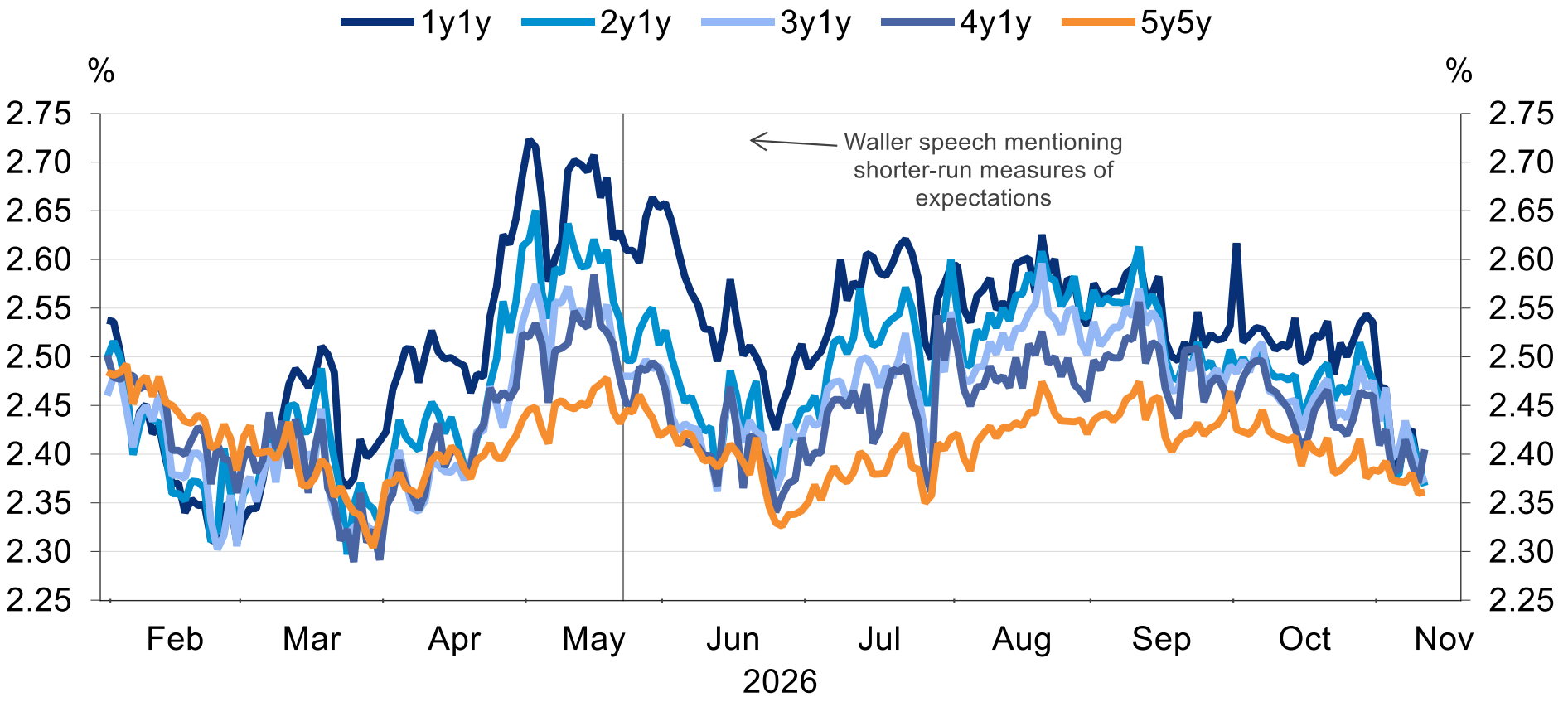


Source: FRB, BLS, CBO, Haver Analytics, Deutsche Bank

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Forward measures of market inflation expectations have moved lower

Market-based inflation expectations (swaps)

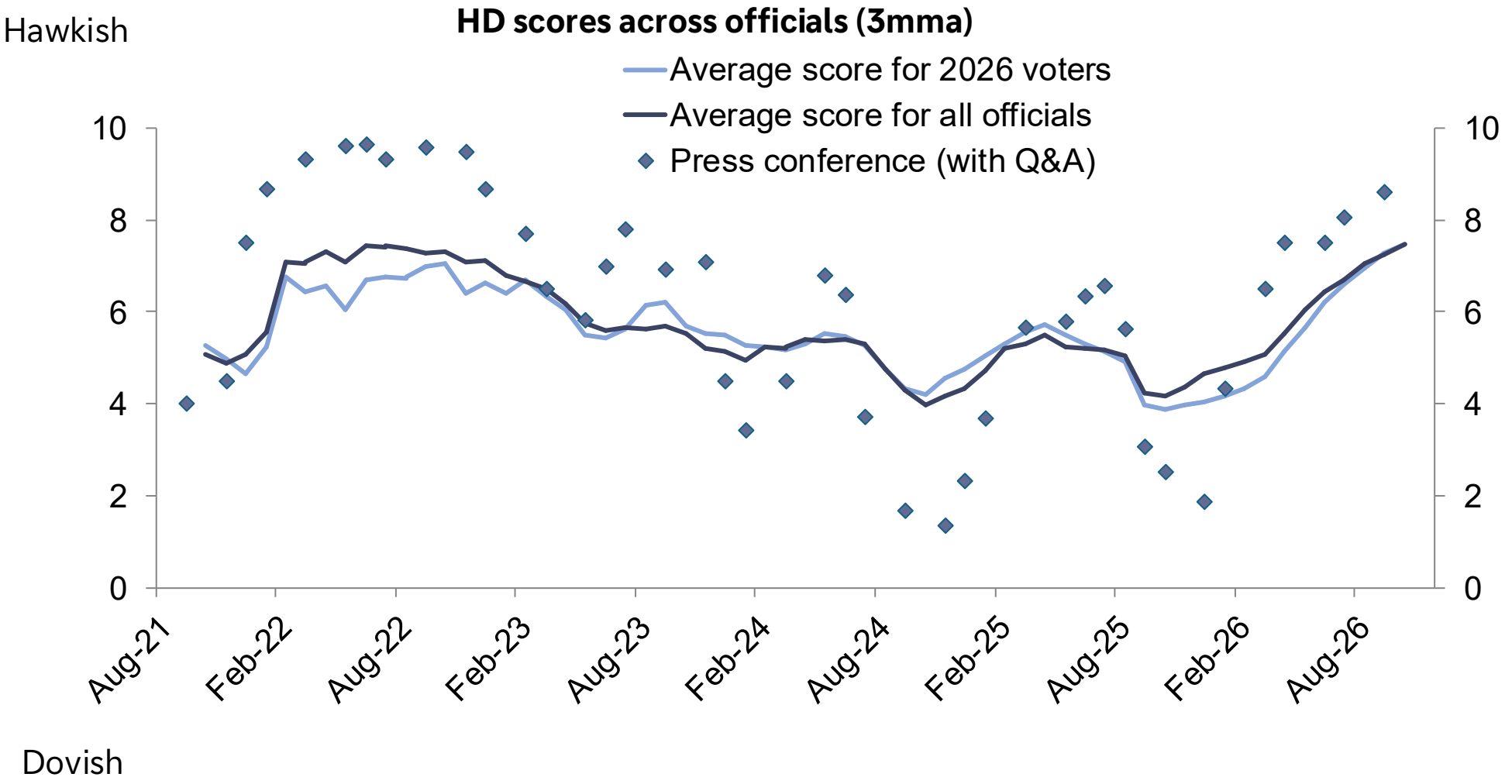


Source: Bloomberg Finance LP, Macrobond, Deutsche Bank

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DB's AI tool shows Fedspeak moved in a hawkish direction in recent months

DB hawk-dove scores

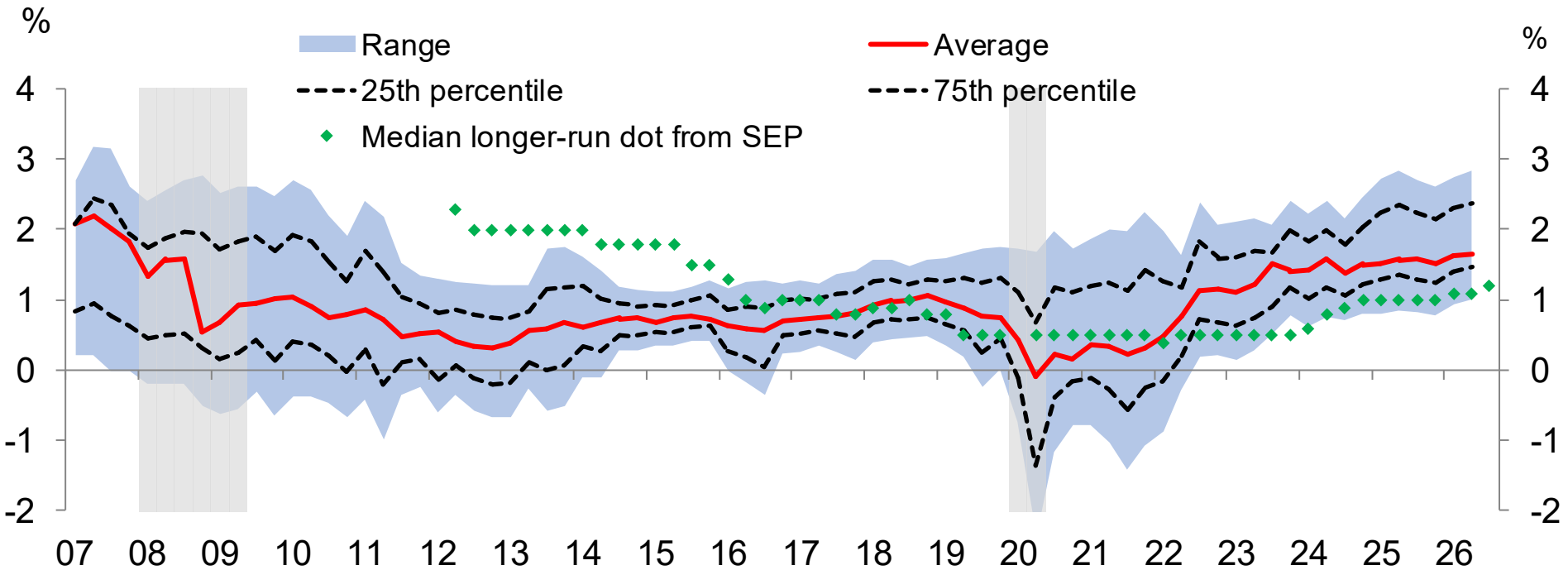


Source: Federal Reserve Banks, Deutsche Bank

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DB's r-star dashboard: Real neutral rate around 1.8%

R-star measures



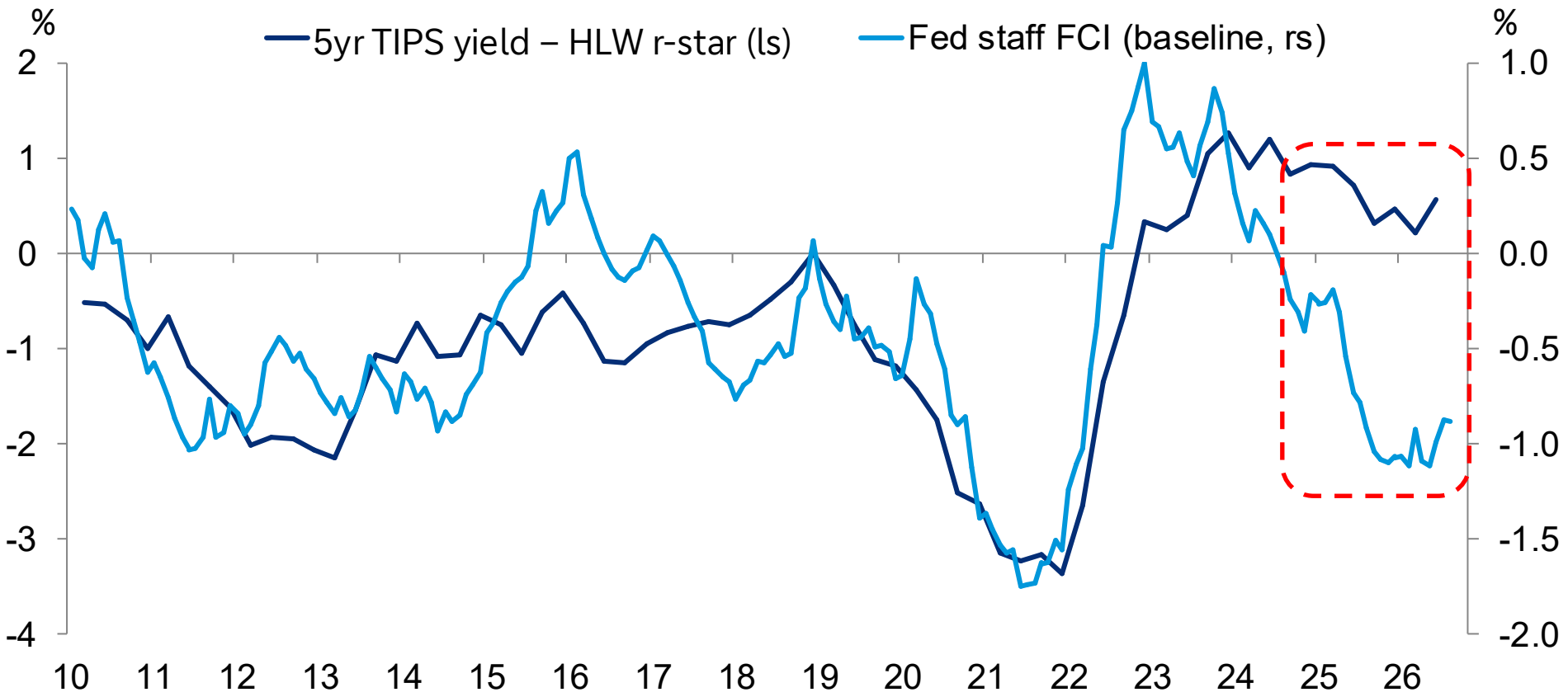
	Macro model							Term structure			Market pricing				
Latest	LW	HLW	Lubik-Matthes	DB Macro	Cleveland Fed	FRB staff estimate	FRBSF_medium run estimate	DKW model	ACM risk neutral	CR model	High frequency	5y5y real OIS	5y5y TIPS	Bond-equity correlation	Average
Average (2012-19)	1.11	0.92	1.11	0.53	1.09	0.35	0.35	0.28	0.72	0.34	0.59	0.12	0.70	0.58	0.63
Latest	1.65	1.01	1.85	1.09	1.40	1.73	1.55	1.51	2.07	1.27	1.79	2.53	3.33	2.17	1.78
Difference	0.55	0.09	0.74	0.56	0.31	1.38	1.20	1.23	1.34	0.93	1.20	2.40	2.63	1.60	1.15

Source: FRB, FRBNY, FRB Richmond, FRB Cleveland, FRB San Francisco, Bloomberg Finance LP, Haver Analytics, Deutsche Bank

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Loose financial conditions indicate that R-star is likely higher

Fed policy stance and FCI



Source: FRB, FRB NY, Haver Analytics, Deutsche Bank

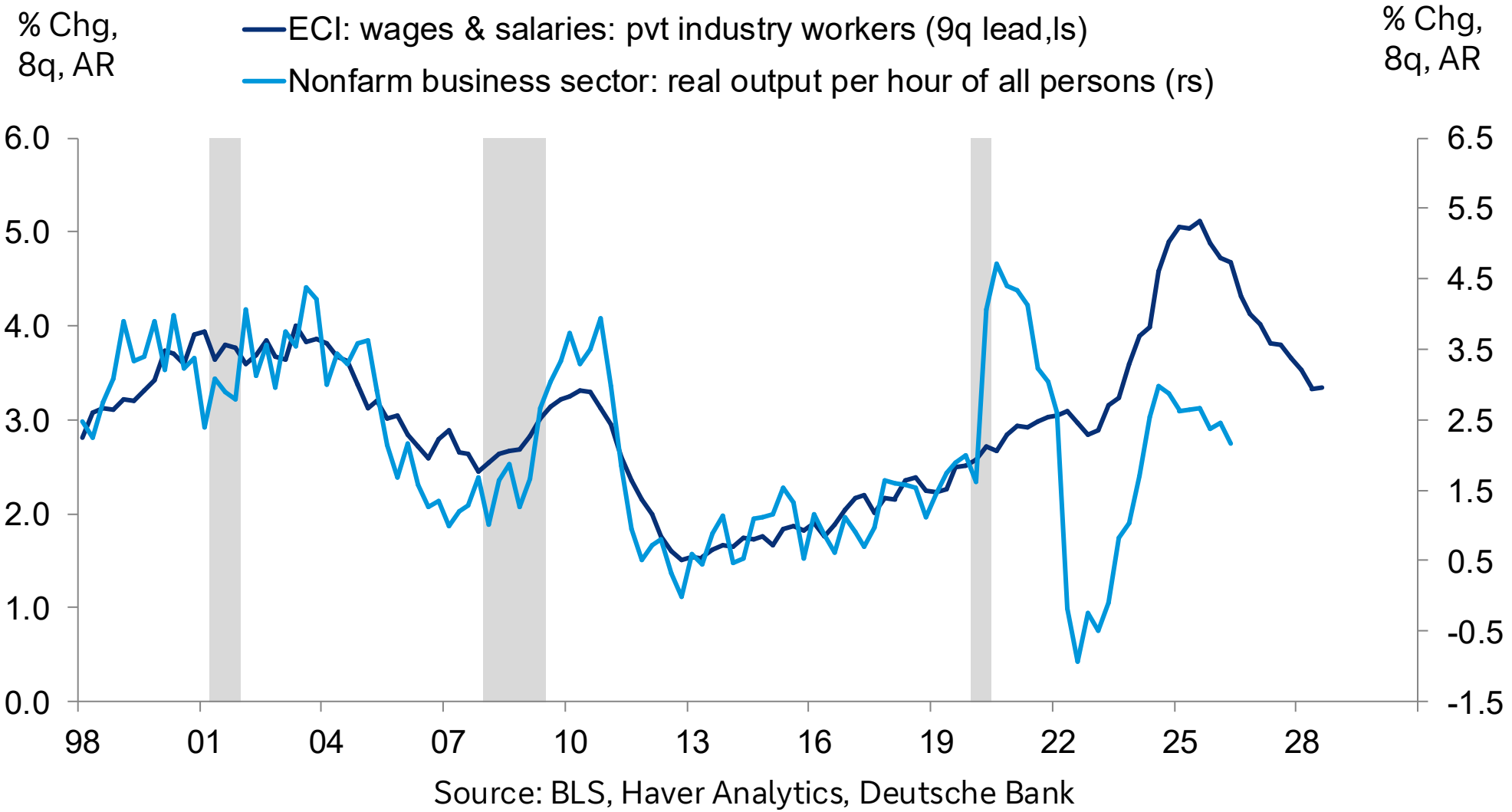
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6. Productivity growth and other long-term issues

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Strong productivity growth has so far been about a record tight labor market post Covid

Wage growth

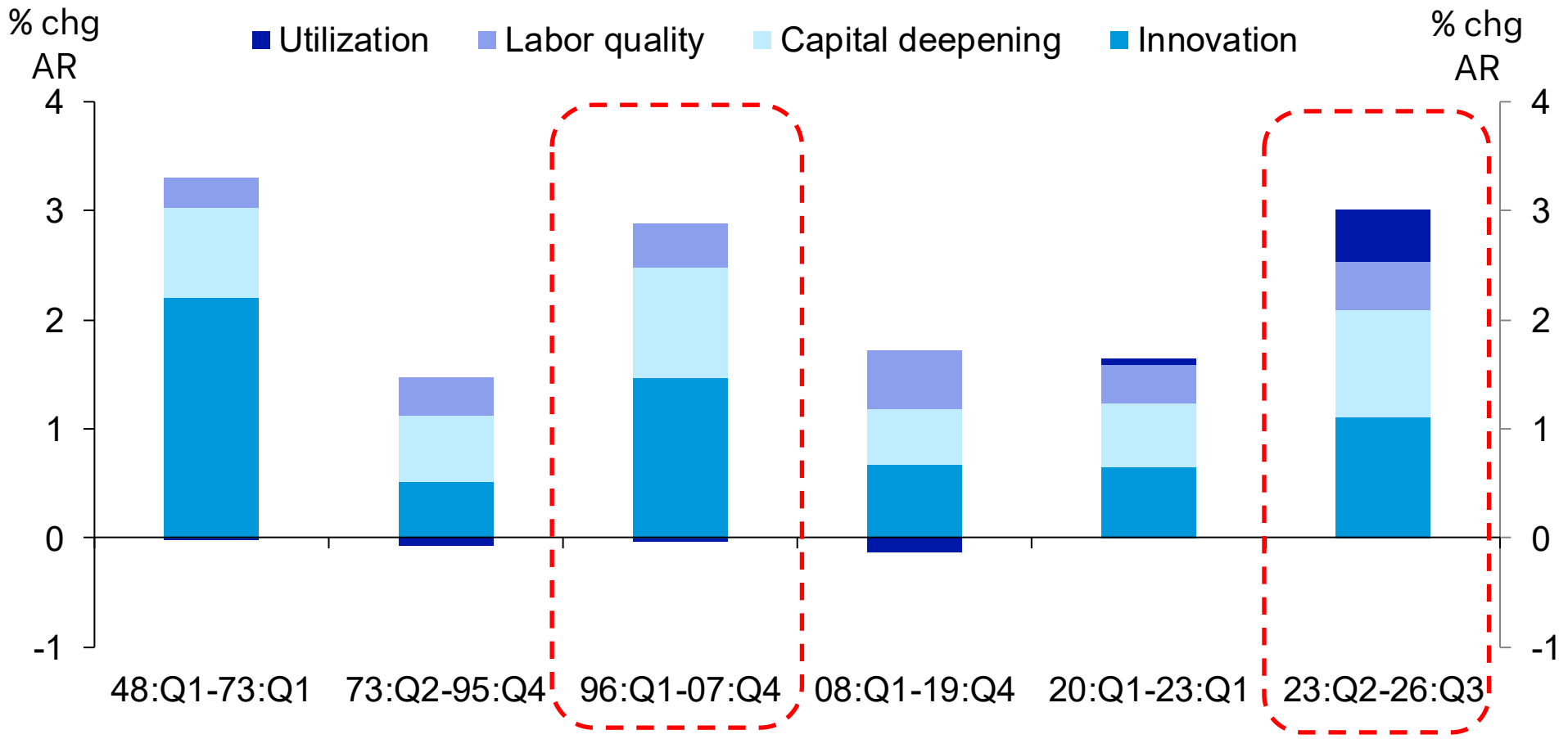


Source: BLS, Haver Analytics, Deutsche Bank

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Productivity strength driven by capex and innovation (as well as utilization), like previous boom periods

Productivity growth decomposition

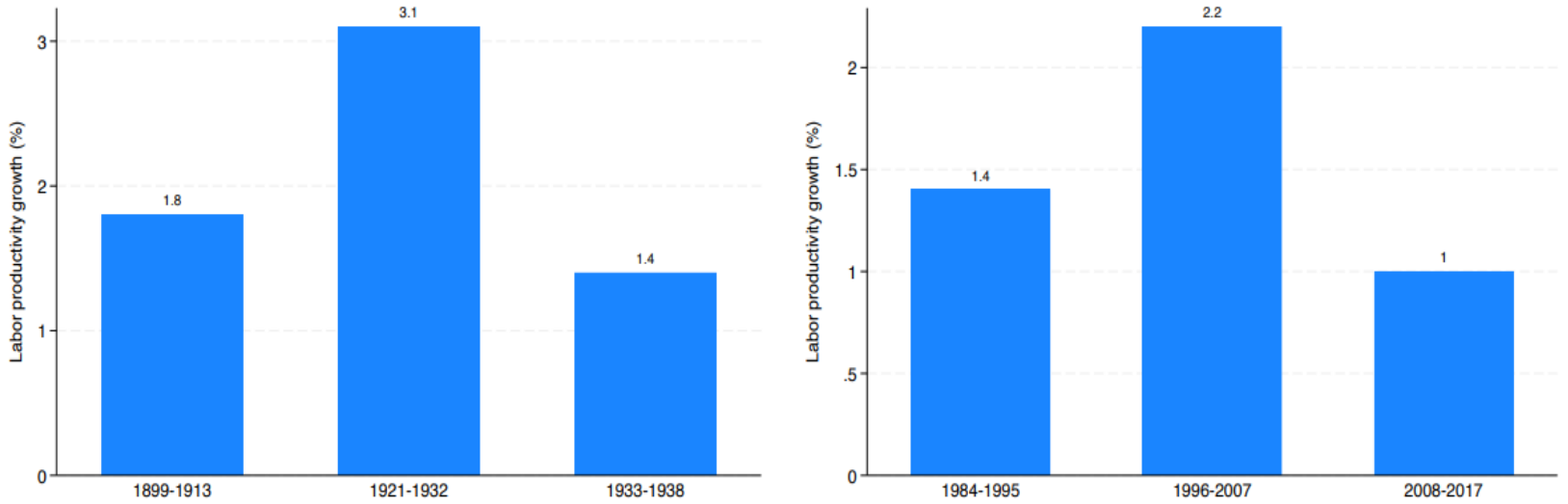


Source: FRB San Francisco, Haver Analytics, Deutsche Bank

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Some historical regularities in past technological revolutions and the impact on productivity

Figure 2: Effect of previous technological revolutions on productivity growth



(a) Wave of electricity in Europe

(b) Wave of ICT in the US

Note: In order to avoid the effect of WW1 and the post-war reconstruction of productivity growth, we delete data from the time period 1914-1920. Data from Bergeaud et al. (2016).

Source: Aghion and Bunel (2024), Bergeaud et al. (2016), Deutsche Bank

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Academic research on AI impact on productivity finds divergent results centered around 0.5-0.75pp per year

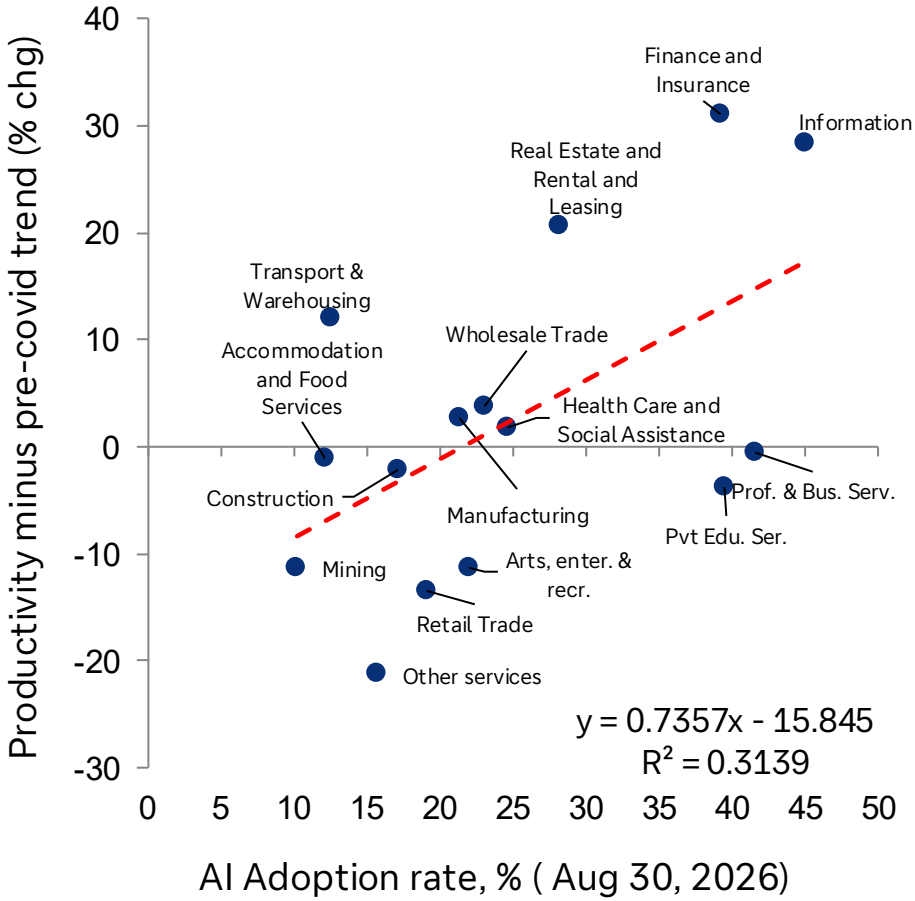
AI impact on annual productivity growth:	
Source	**Impact**
Acemoglu (2024)	0-0.1%
CBO's February budget outlook (2026)	0.10pp per year
Arnon (2025)	0.20 pp per year
Filippucci et al. (2024)	0.25-0.60pp
Yotzov, Bloom and Davis (2026)	0.45pp per year
Aghion and Bunel (2024)	0.7-1.3pp per year
Yale budget lab (May 2026)	0.70 pp per year
Baily et al. (2023)	1.7%
Tamkin and McCrory (2025)	1.8pp per year

Source: Deutsche Bank

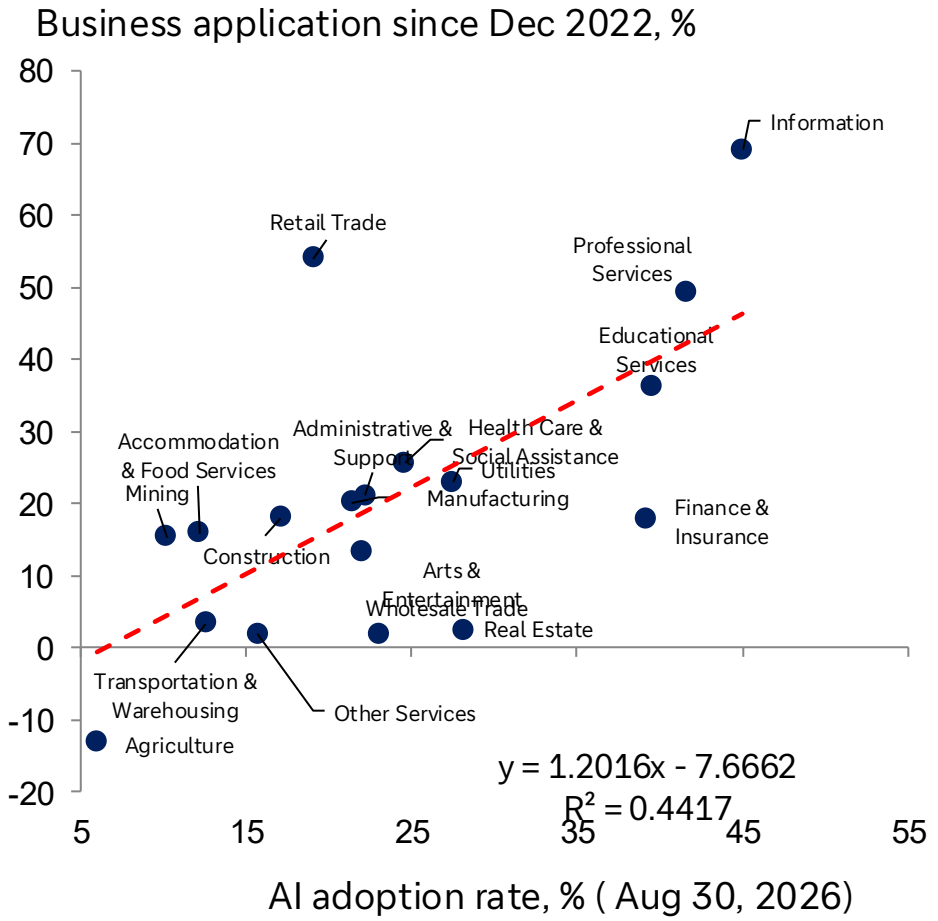
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Positive relationship between AI adoption rate and (1) productivity outperformance, (2) new business formation

AI adoption versus productivity growth



AI adoption versus business application growth

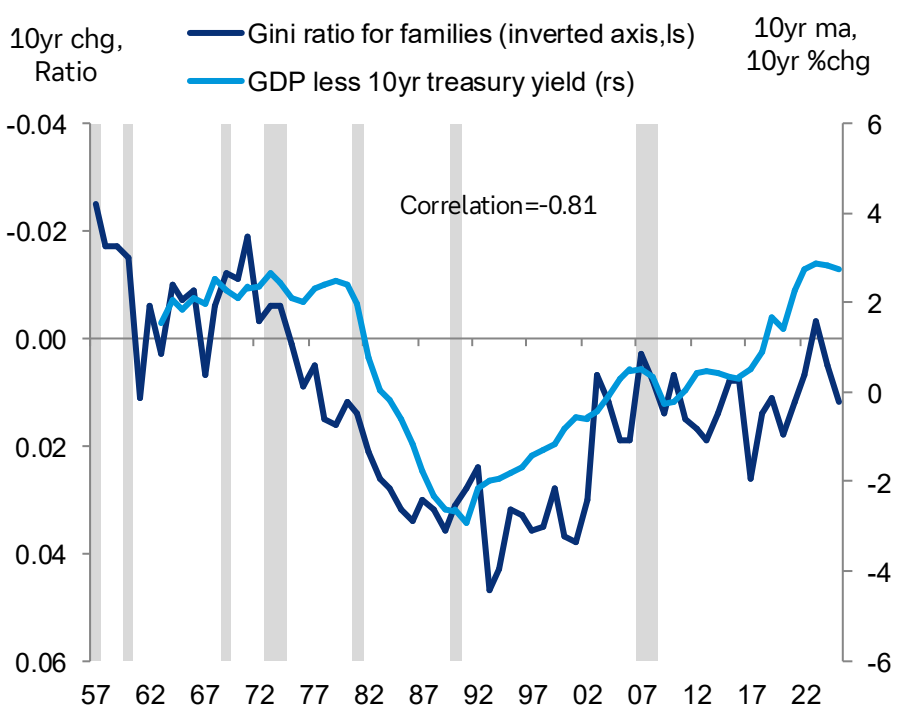


Source: BEA, BLS, Census, Haver Analytics, Macrobond, Deutsche Bank

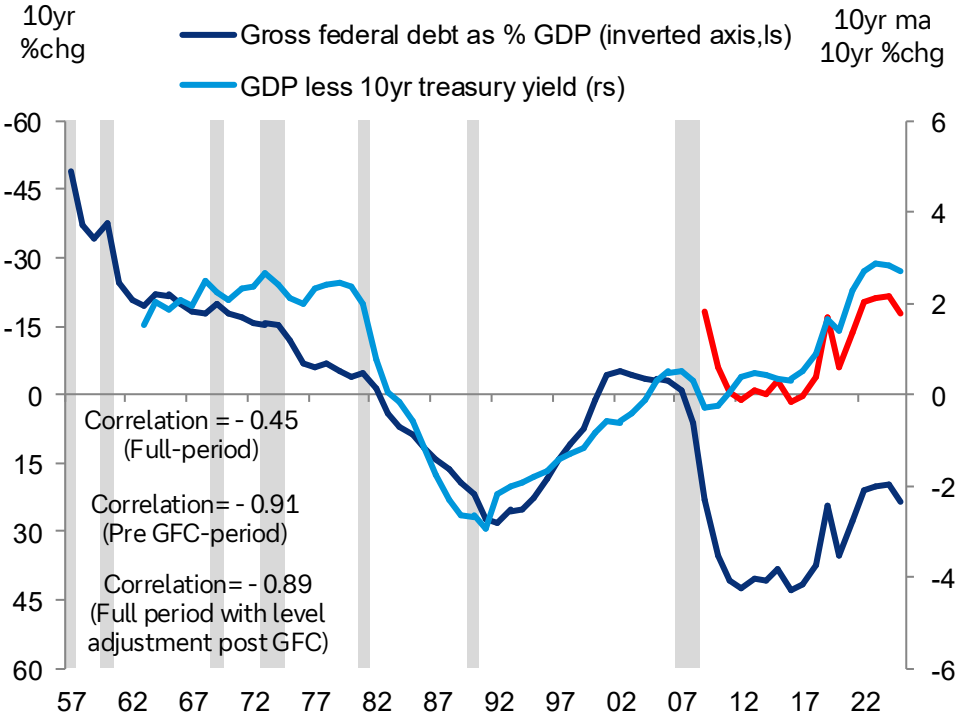
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Over time, higher nominal GDP growth relative to the 10y Treasury yields lowers inequality and debt-to-GDP

G-R versus Gini



G-R versus debt-to-GDP

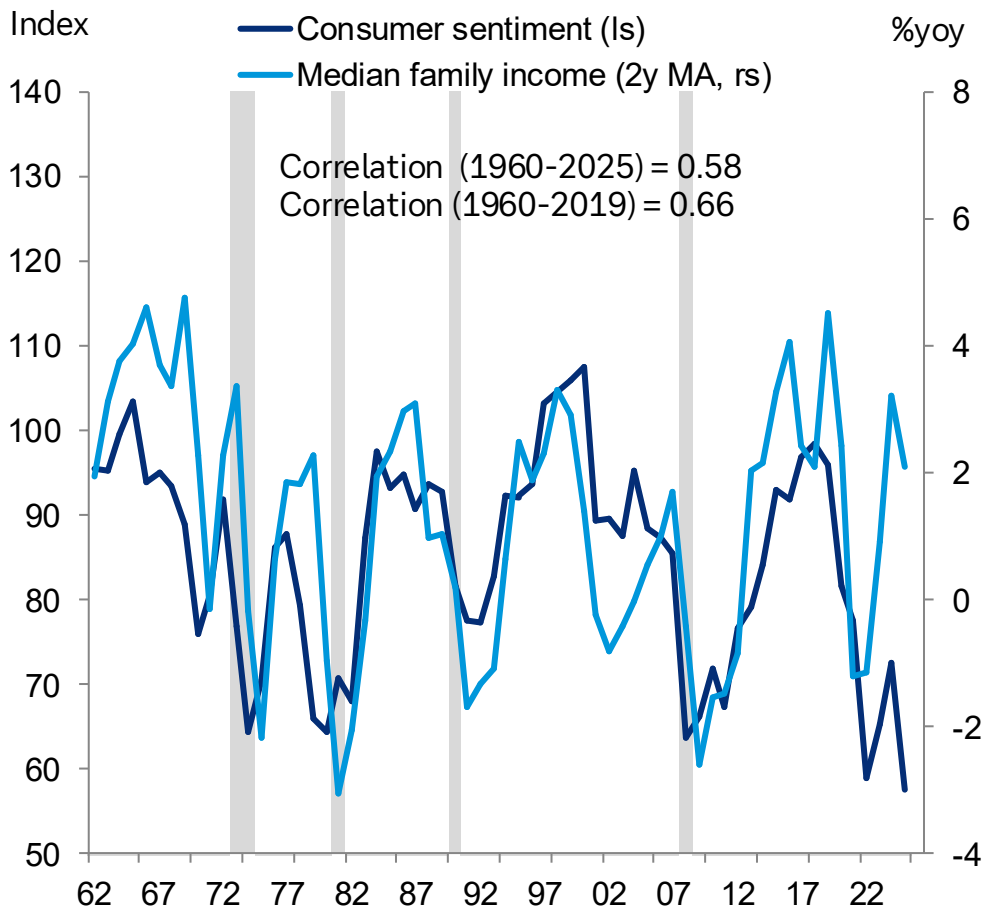


Source: Census, BEA, FRB, OMB, Haver Analytics, Deutsche Bank

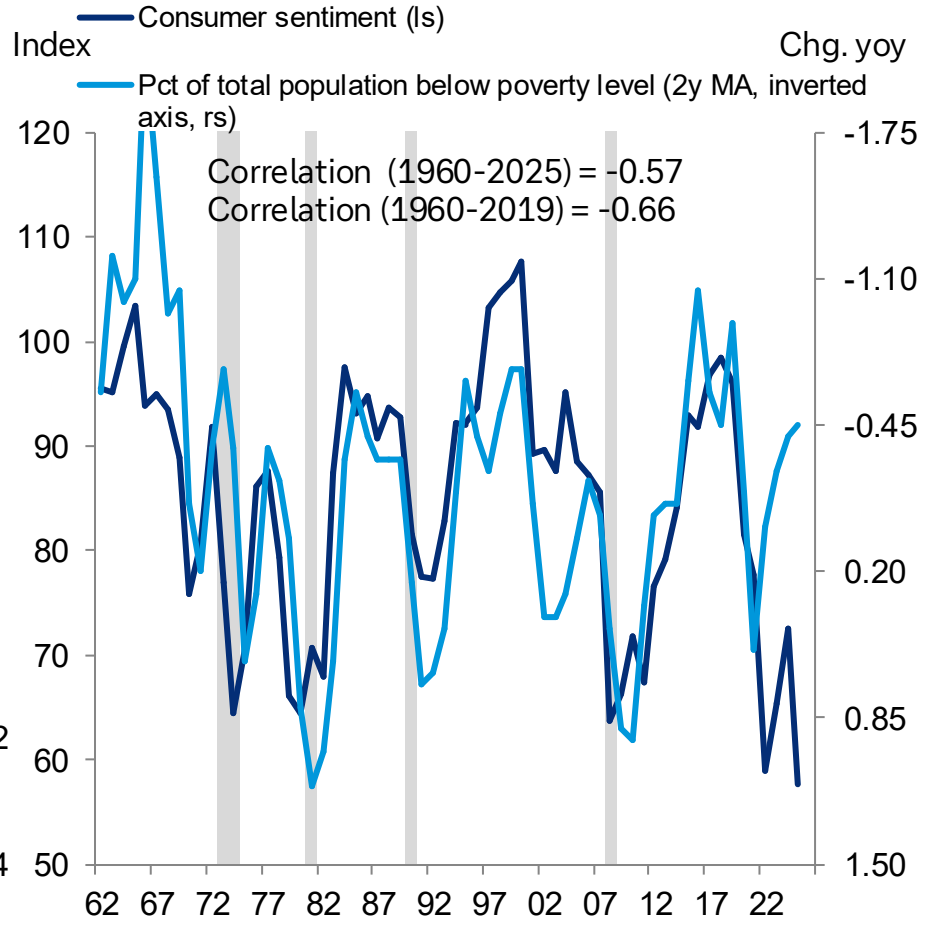
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Consumer sentiment has disconnected from median income growth and the poverty rate

Consumer sentiment versus median income growth



Consumer sentiment versus poverty rate



Source: Univ. of Michigan, Census Bureau, Haver Analytics, Deutsche Bank

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DB US economic forecast

Economic Activity	2026				2027				2028				2026F	2027F	2028F
(% qoq, saar)	Q1	Q2	Q3	Q4F	Q1F	Q2F	Q3F	Q4F	Q1F	Q2F	Q3F	Q4F	Q4/Q4	Q4/Q4	Q4/Q4
GDP	2.5	2.2	3.4	1.9	1.9	2.5	2.4	2.0	2.2	1.9	2.2	2.0	2.5	2.2	2.1
Private consumption	0.7	3.8	3.8	2.1	2.0	2.4	2.3	2.0	2.3	2.2	2.3	2.1	2.6	2.2	2.2
Investment	7.2	4.6	19.4	9.2	5.9	6.7	6.1	5.0	4.5	3.4	4.2	3.5	10.0	5.9	3.9
Nonresidential	9.9	9.0	12.7	10.9	7.0	7.0	6.1	5.5	3.9	4.1	4.0	4.3	10.6	6.4	4.1
Residential	-7.6	2.8	-3.4	-3.5	-0.5	-0.5	-0.5	-0.5	2.5	2.3	2.4	2.0	-3.0	-0.5	2.3
Gov't consumption	4.7	-0.1	5.3	1.2	2.0	2.0	2.0	2.0	-0.3	-0.5	-0.3	-0.3	2.8	2.0	-0.3
Exports	13.9	5.0	-5.7	5.5	3.0	3.1	3.0	3.1	2.0	2.1	2.0	2.1	4.4	3.0	2.0
Imports	11.5	12.6	19.7	11.9	8.0	7.1	6.5	6.0	2.7	2.6	2.6	2.2	13.9	6.9	2.5
Contribution (pp):															
Inventories	0.2	-0.5	1.6	0.1	0.0	0.2	0.2	0.1	0.2	-0.1	0.1	-0.1	-0.1	0.2	0.1
Net trade	0.0	-1.1	-3.3	-1.3	-1.0	-0.9	-0.8	-0.7	-0.3	-0.2	-0.2	-0.2	-1.3	-0.7	-0.2
Unemployment rate, %	4.3	4.3	4.1	4.1	4.1	4.1	4.2	4.2	4.2	4.2	4.2	4.2	4.1	4.2	4.2
Prices (% yoy)															
CPI	2.7	3.8	3.5	3.9	3.7	2.6	2.7	2.1	2.1	2.2	2.2	2.2	3.9	2.1	2.2
Core CPI	2.5	2.7	2.5	2.8	2.7	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.8	2.5	2.4
PCE	3.0	3.6	3.5	3.7	3.4	2.7	2.7	2.2	2.0	2.0	1.9	1.9	3.7	2.2	1.9
Core PCE	3.0	3.1	3.1	3.2	2.9	2.6	2.6	2.4	2.4	2.2	2.1	2.1	3.2	2.4	2.1
Fed Funds	3.63	3.63	3.88	4.13	4.63	4.63	4.63	4.63	4.38	4.13	3.88	3.88	4.13	4.63	3.88

Source: BEA, BLS, FRB, Haver Analytics, Deutsche Bank

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