

Surging AI capex: Macro implications of its size and return on investment?



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S&P 500 equity wealth and now its surging AI capex have become macro forces

Three topics dominating investor deliberations are outlooks for: 1) inflation and interest rates, 2) how the elections will steer fiscal and other government policies, and 3) the potential of artificial intelligence. This note quantifies surging S&P 500 capex on AI relative to other US investment spending categories and compares this capex to the federal deficit. We consider the implications for interest rates and the capacity for other private investment alongside heightened fiscal spending while AI capex booms. We contemplate how the return on this AI capex might affect the broader cost of capital and perhaps real interest rates. Much has been said about how AI might lower inflation by boosting worker productivity, but it might first require a notable draw on the US savings pool to fund this investment. This could crowd out other private investment like new housing and it might contribute to raising the interest cost of deficits, pushing against the grander plans for social, climate and industrial related policy spending.

AI or butter?: If the private call on capital reawakes, the public call should rest

High expected ROI opportunities on AI (observe capex trends and valuations at tech), could sustain elevated real interest rates over the intermediate term. If high ROI materializes, it should lower real interest rates over time by accelerating the growth of the saving pool from high returns earned. This reasoning takes a Solow model approach to contemplating how high ROI available on large scale private investments can affect the general interest rate (i). A higher intermediate-term i from a higher risk adjusted opportunity cost of capital present and a lower long-term i from a saving pool boosted by high returns. However, if this ROI is poor, it will leak the savings pool and raise risk aversion. When private enterprise capex climbs with promising but uncertain returns, public spending should slow; or it risks higher real interest rates crimping household investment and essential government spending.

Big tech companies commit to more AI capex and more dividends and buybacks

Tech titans have the cash and cash flow to boost the share of earnings spent on investment capex and raise shareholder payout ratios, but their cash balances will likely shrink from these actions unless returns are high. Corporate cash is generally invested in money markets and short-term securities. S&P 500 capex was \$1trn the last 4 quarters with 1Q24 up 10% from last year. We expect \$2T in S&P profits in 2024 and capex at least \$1.1T, \$0.3T over D&A, for a 15% organic reinvestment ratio. We expect \$200bn in capex, up \$50bn, from just four S&P firms pursuing AI, (see capex exhibits inside). Some see this as just the beginning of the AI related capex upturn with 10-20% growth through 2026. Data centers could add 1.5% to US electricity demand annually through '28, from 200 now to 600TWh or from about 5% to 15% of total generation. This compares to flat total demand from 2000 to 2020.

US investment spending: Slow outside of AI and electrification related segments

Total private investment spending of US GDP is about \$4.5T in 2023, \$1T residential. Non-residential: \$1.25T on structures, \$1.75T on equipment & software, \$0.5T intellectual property. About \$300bn is capex on computers & communications equipment. Oil, gas and other mining capex about \$100bn. Private data center and AI related investment could be \$225-250bn in 2024, up from \$150bn in 2023, growing 20% annually to \$350bn in 2026. Raising data center and AI from 4% to 10% of total non-res.

US deficit spending: high deficits risk crowding out private investment, but not AI

The deficit remains near \$2T and while it's unlikely to crowd out AI capex given high expected ROIs, high deficits and high AI capex might crowd out growth in other investment spending segments. Construction and equipment spending outside of data center equipment, power generation and distribution could be sluggish for years to come especially if real interest rates stay high. That said, these segments of investment are big parts of S&P Tech Equipment and Industrial Capital Goods. US residential and commercial real estate investment will likely be crowded out (should support values), by the call on capital, materials and labor by big brother AI and uncle Sam. Beware defense spending.

Our S&P 500 and Tech valuation models assume strong economic profit growth

As we continue to deliberate just how high of a growth premium to assign above a steady-state PE for the high return on reinvestment and economic profit growth potential at what are already giant tech firms, we think it important to contemplate how the gravity of this pulls on the broad opportunity cost of capital. Returns above the risk adjusted cost of capital on new investment by segments of the economy as large as the S&P 500 and its digital titans has many macro consequences, including likely an upward push on the broad opportunity cost of capital itself. At the macroeconomic aggregate level, the incremental return available on capital and the cost of capital for a given level of risk are tethered.

2024E S&P EPS fine-tuned at \$245, slightly higher at digital and lower elsewhere

We raise our 2024E S&P EPS to \$245 from \$243 and put 2025E at \$265. We trimmed 2024E Energy earnings slightly and boosted Consumer Discretionary, but the main changes are fine-tuning industry estimates and raising estimates at the biggest companies pursuing AI and related semiconductors.

Contributor: Ju Wang, Portfolio Manager Equity

Global Equity Index Forecasts: 12-months			
Index	Mar 2025F	NTM EPS Growth	Target PE
S&P 500	5,300	8.2%	21.5
EuroStoxx 50	5,000	3.5%	13.5
Stoxx 600	515	4.7%	13.9
MSCI Japan	1,740	11.2%	15.8
MSCI Asia xJ	675	15.3%	14.0
MSCI EM	1,050	11.9%	13.0

S&P 500 Outlook at Yearend			
	2022	2023	2024F
S&P 500	3840	4770	5200
Dividend Yield	1.75%	1.50%	1.50%
S&P EPS	\$222	\$223	\$245
Trailing PE	17.3	21.5	21.5
DPS	\$67	\$70	\$76

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Next 5%+ Price Move
(Up / Balanced Risk / **Down**)
Risk of 10%+ correction within 12-months
(Low / Moderate / **High**)

Taxable U.S. Investor Asset Allocations		
Asset Class	Long-term	Current
Fixed Income/Cash	30-35%	29%
Equities	55-60%	60.5%
US Equities	40%	40%
S&P 500	35%	36%
Small Caps	0-10%	4%
Foreign DM	10-15%	15.5%
Foreign EM	0-10%	5%
Alternatives	10%	10.5%

Key CIO Views		
Macro signal:	Dec 2023	Mar 2025F
U.S. Fed Funds rate	5.25%-5.50%	4.5%-4.75%
10yr Treasury yield	4.20%	4.20%
US IG Corp Spreads	140bp	85bp
US High Yield Spreads	420bp	400bp
Crude Oil (WTI) \$/bbl	69	84
EUR / USD FX rate	1.06	1.10

GDP Forecasts			
Region	2023	2024F	2025F
US	2.5%	1.8%	1.6%
World	3.1%	3.0%	3.1%
Euro area	0.5%	0.7%	1.1%
China	5.2%	4.8%	4.4%
Japan	1.9%	0.5%	1.1%

* Q4/Q4 GDP growth.
EPS = Earnings Per Share
GDP = Gross Domestic Product
FX = Foreign Exchange
TIPs – Treasury Inflation Protected Securities
Source: DWS Investment Management GmbH. All opinions and claims are based upon data on 5/14/2024 and may not come to pass. This information is subject to change at any time, based upon economic, market and other considerations and should not be construed as a recommendation. All foreign asset exposures are not FX hedged unless otherwise noted. For illustrative purposes only. Past performance may not be indicative of future results. Forecasts are not a reliable indicator of future returns.



S&P 500 Sector and Industry views

	Market	Allocated	Sector	2022	2023	2024	Overweight	2022	2023	2024	Equal weight	2022	2023	2024	Underweight	2022	2023	2024	
Over-weight	12.1%	15.9%	Health Care	17.4	21.7	19.3	Biotechnology Health Care Equipment & Supplies Pharmaceuticals	13.6 26.3 14.8	18.6 26.5 25.0	18.6 24.6 18.2	Health Care Providers & Services	17.0	15.8	15.2	Life Sciences Tools & Services	25.5	29.8	29.8	
	13.1%	14.7%	Financials	19.1	17.3	16.5	Banks Insurance	13.3 20.5	11.4 17.0	12.3 14.2	Financial Services	29.2	25.4	23.7	Capital Markets Consumer Finance	20.5 12.7	21.3 14.4	19.0 14.0	
	9.3%	10.4%	Communication Services	29.1	22.9	19.6	Entertainment Interactive Media & Services	84.9 41.9	34.0 29.8	28.2 23.1	Diversified Telecommunication Ser Wireless Telecommunication Serv	7.3 79.3	7.9 23.4	8.5 18.9	Media	11.0	10.7	10.7	
	2.5%	3.6%	Utilities	20.4	19.2	17.5	Electric Utilities	21.6	19.5	17.5	Gas Utilities Independent Power & Renewable E Multi-Utilities Water Utilities	20.3 12.0 18.0 30.2	18.2 11.5 18.7 27.0	16.4 9.8 17.6 24.3					
	4.0%	5.0%	Energy	9.0	12.1	13.4	Energy Equipment & Services	22.7	15.3	13.5	Oil Gas & Consumable Fuels	8.6	11.9	13.4					
Equal-weight	8.8%	8.8%	Industrials	28.2	24.1	22.3	Aerospace & Defense Electrical Equipment Passenger Airlines	41.1 31.2 20.2	36.8 31.2 7.5	27.3 25.0 7.5	Construction & Engineering Industrial Conglomerates Machinery	41.9 16.7 23.3	38.3 13.5 18.4	31.9 18.6 18.5	Air Freight & Logistics Building Products Commercial Services & Supplies Ground Transportation Professional Services Trading Companies & Distributors	12.8 22.6 41.9 59.8 30.3 27.7	17.8 28.4 43.2 29.3 28.4 23.0	17.8 23.0 34.1 26.7 26.0 21.8	
	6.1%	6.1%	Consumer Staples	22.6	21.4	20.2	Beverages Personal Care Products	26.0 53.1	23.4 23.7	22.2 24.6	Consumer Staples Distribution & R Food Products Household Products	26.5 15.1 29.2	25.5 15.9 26.9	21.4 16.2 25.6	Tobacco	13.1	12.8	12.7	
	2.4%	2.4%	Materials	16.4	21.2	22.1					Chemicals Metals & Mining	17.6 11.0	22.1 17.0	22.7 19.3	Construction Materials Containers & Packaging	51.6 15.5	35.1 18.6	29.5 20.1	
Under-weight	2.2%	1.8%	Real Estate	17.6	17.6	16.6	Specialized REITs	18.1	18.1	17.3	Hotel & Resort REITs Office REITs Retail REITs	10.3 11.5 13.0	9.8 11.7 13.5	9.4 11.7 12.2	Health Care REITs Industrial REITs Residential REITs Real Estate Mgmt. & Development	20.2 20.9 18.4 27.4	20.7 19.5 17.2 37.1	17.5 17.2 17.0 39.5	
	10.3%	6.8%	Consumer Discretionary	40.8	28.5	25.9	Automobile Components	16	14.1	11.9	Distributors Hotels Restaurants & Leisure Leisure Products Textiles Apparel & Luxury Goods	17 66.0 13.7 25.1	17.1 24.4 21.2 32.6	16.5 23.2 17.6 23.4	Automobiles Household Durables Broadline Retail Multiline Retail Specialty Retail	20 11.8 -2180 21.4	21.1 11.9 59.1 22.5	23.2 12.8 39.6 22.2	
				20.4	21.1	23.2	Automobiles												
				-2180	59.1	39.6	Broadline Retail												
	29.4%	24.7%	Information Technology	36.9	34.6	29.4	Communications Equipment IT Services	19.0 22.4	17.2 20.3	17.2 19.4	Software Technology Hardware Storage & P	43.5 29.1	37.5 29.6	32.8 27.2	Electronic Equipment Semiconductors	22.8 46.2	26.7 43.5	23.7 31.9	
Aggregate PE: DWS View							Overweight	21.1	20.4	18.5	Equalweight	22.5	22.8	22.0	Underweight	30.4	28.4	24.9	
S&P 500								5221				2022, 2023& 2024 EPS	217.33	223.00	245.00	2022, 2023 & 2024 PE	24.0	23.4	21.3
												Bottom-up Consensus EPS	217.33	223.42	245.46	Bottom-up Cons. PE	24.0	23.4	21.3
																2022, 2023 & 2024 Ex Energy PE	24.4	24.4	22.0
																Bottom-up Cons. Ex Energy PE	25.9	24.3	22.1

Sector OW	8.89%
Sector UW	-8.89%
Industry OW	18.05%
Industry UW	-18.05%

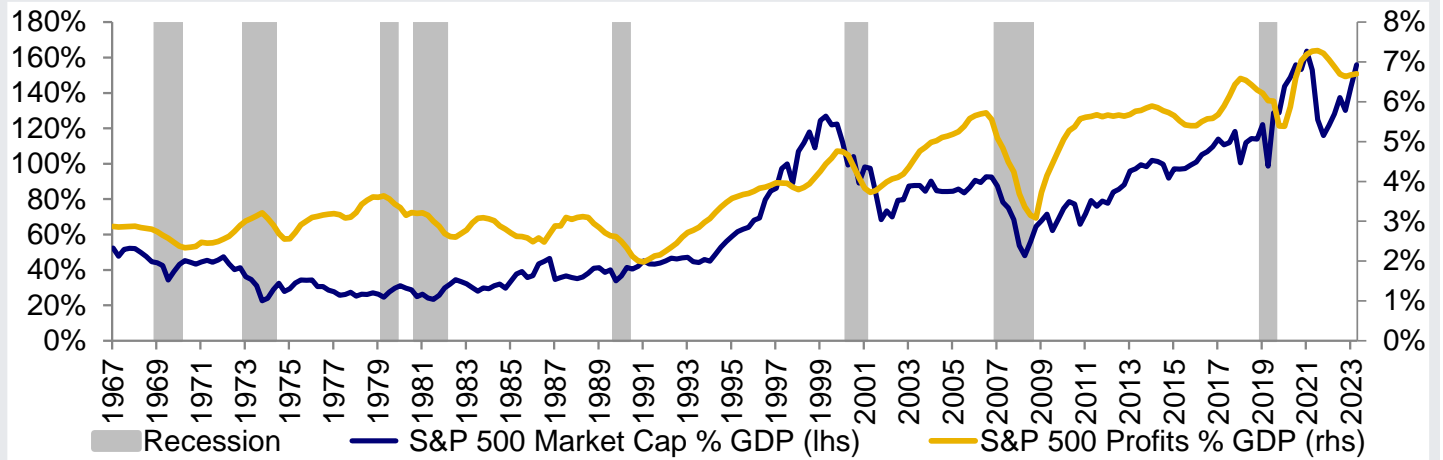
Macro tilts:	
Cyclicals	-4.57%
Defensive	4.57%
Value (Financial+Energy)	2.59%
Growth	-0.32%
Growth ex Health Care	-4.15%
Consumer	-3.45%
Services/experience	0.02%
Disc. Goods	-3.53%
Retailing	-2.27%
Durables	-1.26%
Staples Goods/Retail	0.06%
Commodity	1.13%
Energy	1.02%
Metals/Chemicals	0.11%
Capex	6.71%
Capacity additions	3.58%
Productivity	3.13%
Health Care	3.83%
Innovation	3.45%
Marketers	1.86%
Insurers	-0.10%
Financials	1.57%
Up rates/low spreads	0.66%
Capital Markets	-0.53%
Insurance	1.44%
Bond Substitutes	0.73%
Weak FX \$ plays	0.15%
High R&D plays	1.80%
Transports	-0.78%
Geopolitical risk	1.89%
Weak oil prices	-0.12%
Inflation shock	-0.04%
Stagflation Protection	4.08%
Domestic GDP	-3.04%
Global GDP	-5.74%
Consumer TMT	-0.28%
Trade sensitive	-2.38%

More details on sector earnings forecast and sector intrinsic valuation can be found towards the back of this note.

Price as of 5/13/2024

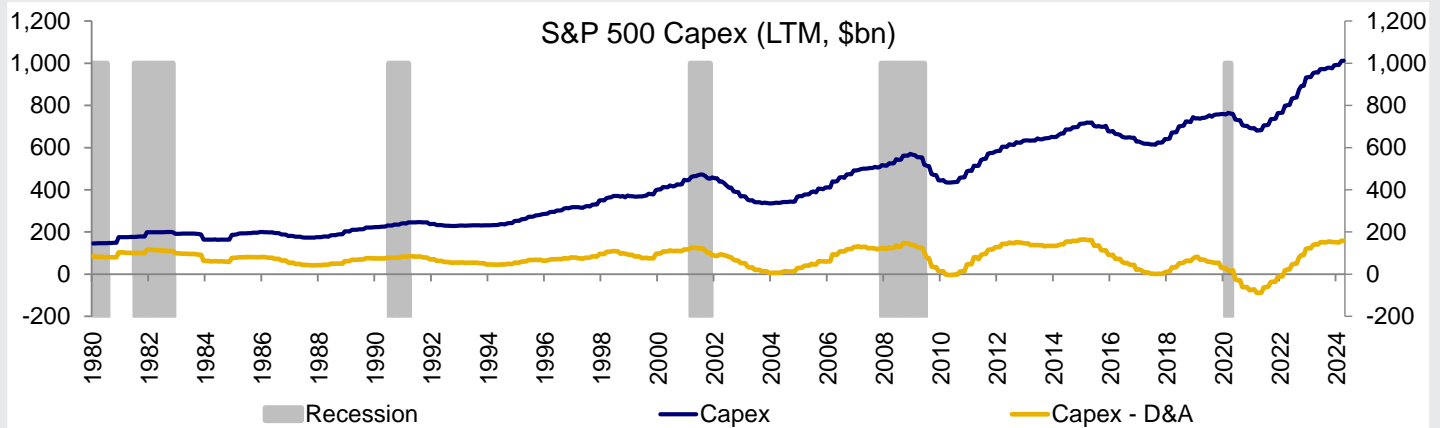
Source: DWS Investment Management GmbH. Past performance may not be indicative of future results.

S&P 500 market cap and profits % of U.S. GDP



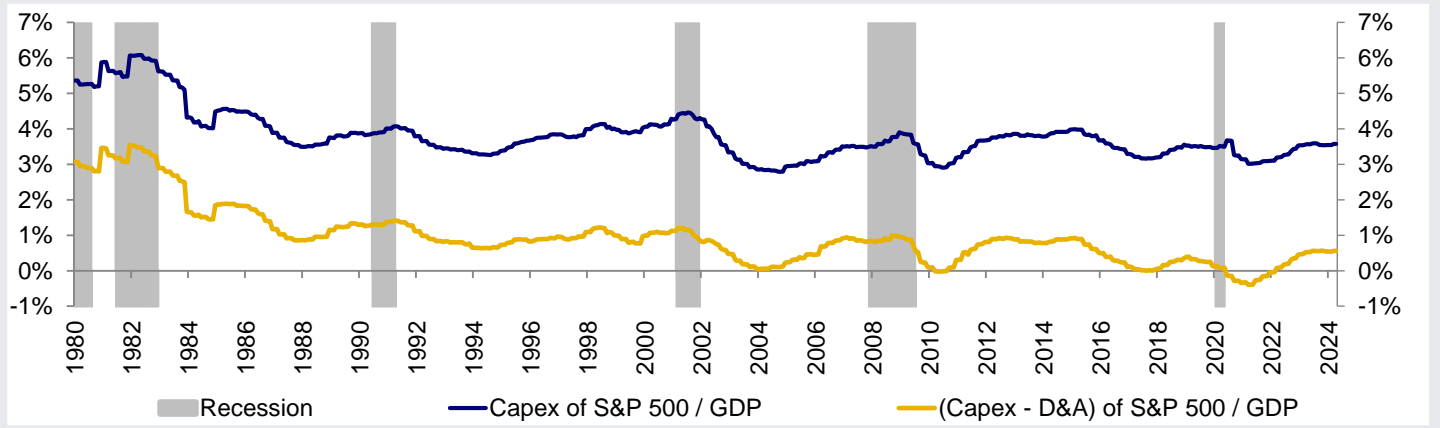
Source: Haver, DWS Investment GmbH as of 1Q2024. Past performance may not be indicative of future results.

S&P 500 capex



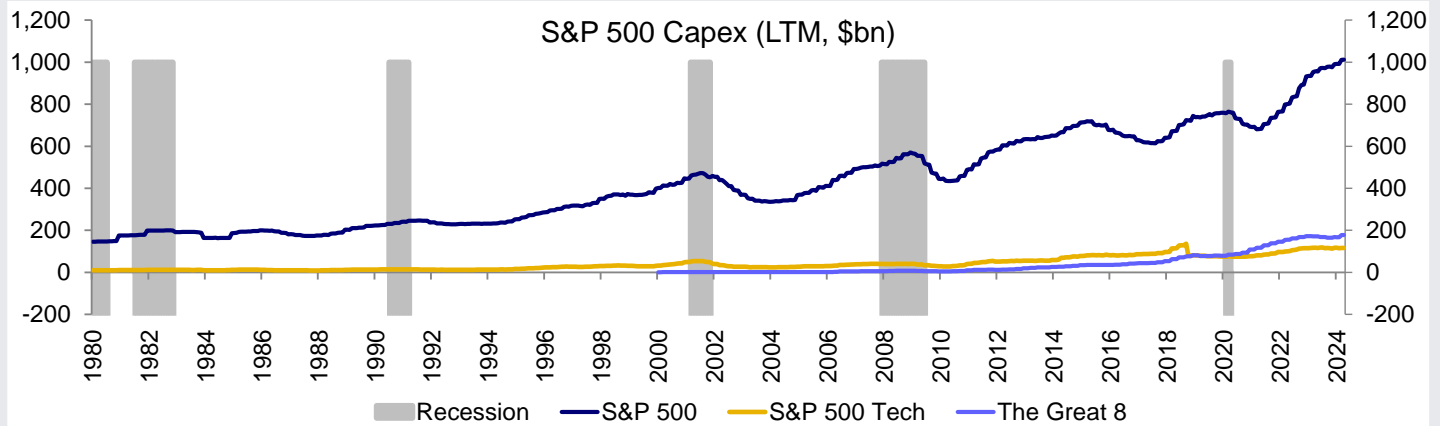
Source: Haver, DWS Investment GmbH as of 1Q2024. Past performance may not be indicative of future results.

S&P 500 capex % of U.S. GDP



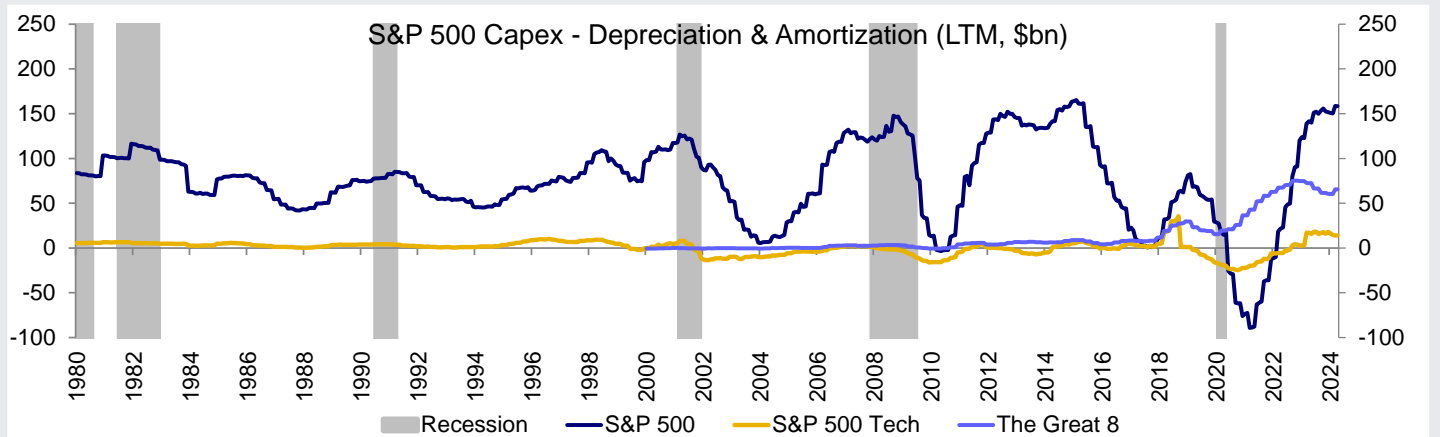
Source: Haver, DWS Investment GmbH as of 1Q2024. Past performance may not be indicative of future results.

S&P 500, Tech and the Great 8 capex



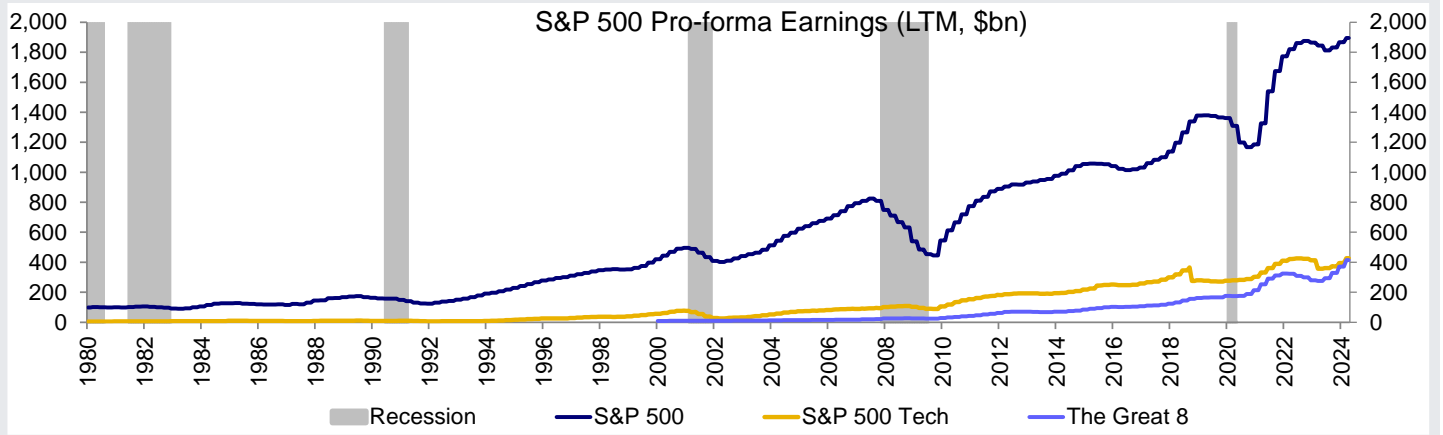
The Great 8: AAPL, AMZN, GOOG/GOOGL, META, MSFT, NFLX, NVDA, TSLA
 Source: Haver, DWS Investment GmbH as of 1Q2024. Past performance may not be indicative of future results.

S&P 500, Tech and the Great 8 capex – D&A



The Great 8: AAPL, AMZN, GOOG/GOOGL, META, MSFT, NFLX, NVDA, TSLA
 Source: Haver, DWS Investment GmbH as of 1Q2024. Past performance may not be indicative of future results.

S&P 500, Tech and the Great 8 profits



The Great 8: AAPL, AMZN, GOOG/GOOGL, META, MSFT, NFLX, NVDA, TSLA
 Source: Haver, DWS Investment GmbH as of 1Q2024. Past performance may not be indicative of future results.

Top 10 companies with the largest capex outside of Energy, Industrials, Materials, Utilities and Financials sectors

Total			59,338	52,162	14%	58,426	256,249	210,690	22%	215,754	217,866	129,970	350,786	36%
Company Name	Sector	Industry	1Q24			Consensus Capex 2024		Capex LTM (2Q23-1Q24)		Consensus Net Income 2024		(Capex - D&A) / Net Income		
			Capex 1Q24	Capex 1Q23	vs. 1Q23	Capex 4Q23	Capex 2024	Capex 2023	vs. Capex 2023	Capex 2022	D&A 2023	2024	2024	Net Income
AMAZON.COM INC	Consumer Discretionary	Broadline Retail	14,925	14,207	5%	14,588	62,478	52,729	18%	63,645	53,447	48,663	41,463	33%
ALPHABET INC	Communication Services	Interactive Media & Services	12,012	6,289	91%	11,019	47,670	32,251	48%	31,485	37,974	11,946	44,581	80%
MICROSOFT CORP	Information Technology	Software	10,952	6,607	66%	9,735	43,430	35,202	23%	24,768	39,547	17,303	93,070	28%
META PLATFORMS INC	Communication Services	Interactive Media & Services	6,400	6,842	-6%	7,665	36,991	27,266	36%	31,431	26,824	11,178	44,327	58%
INTEL CORP	Information Technology	Semiconductors & Semiconductor Equipment	5,970	7,413	-19%	6,696	22,765	25,750	-12%	24,844	24,307	9,602	4,647	283%
TESLA INC	Consumer Discretionary	Automobiles	2,777	2,073	34%	2,307	10,938	8,899	23%	7,163	9,603	4,667	7,057	89%
APPLE INC	Information Technology	Technology Hardware, Storage & Peripherals	1,996	2,916	-32%	2,392	9,551	9,564	0%	11,692	8,644	11,451	97,971	-2%
ORACLE CORP	Information Technology	Software	1,674	2,628	-36%	1,080	9,615	6,935	39%	6,678	5,981	6,172	9,503	36%
MICRON TECHNOLOGY	Information Technology	Semiconductors & Semiconductor Equipment	1,384	2,205	-37%	1,796	7,802	7,023	11%	11,251	6,202	7,750	3,472	2%
TEXAS INSTRUMENTS	Information Technology	Semiconductors & Semiconductor Equipment	1,248	982	27%	1,148	5,008	5,071	-1%	2,797	5,337	1,238	4,696	80%

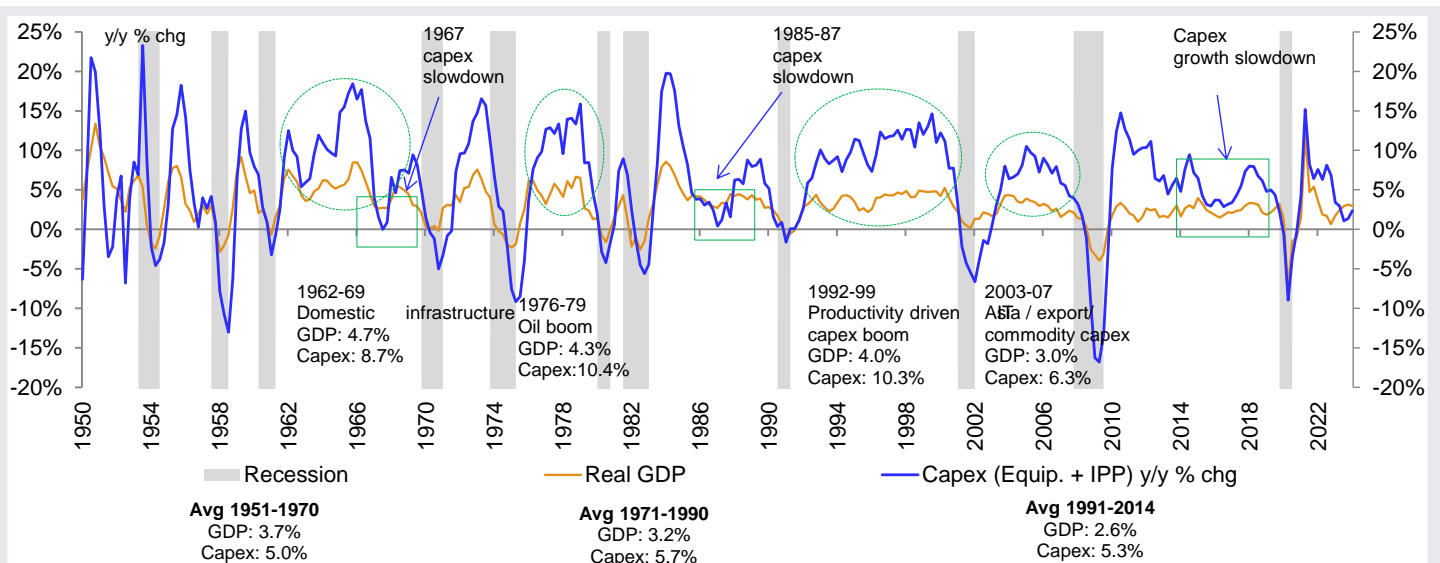
Source: Clarifi, DWS Investment GmbH as of 1Q2024. Past performance may not be indicative of future results.

S&P 500 capex by sector

Sector	1Q24			1Q24 vs. 1Q23		Capex 4Q23		Consensus Capex 2024		Capex vs. Capex 2023		Capex LTM (2Q23-1Q24)		Consensus Net Income 2024		(Capex - D&A) / Net Income	
	Capex 1Q24	Capex 1Q23	1Q24 vs. 1Q23	Capex 4Q23	Consensus Capex 2024	Capex 2023	vs. Capex 2023	Capex 2022	vs. Capex 2023	Capex 2022	D&A 2023	2024	2024	Net Income			
Communication Services	48,990	40,350	21%	49,139	214,057	171,627	25%	181,034	180,298	126,951	210,691	41%					
Consumer Discretionary	36,379	31,997	14%	38,535	133,260	134,943	-1%	133,826	138,683	101,729	175,678	18%					
Consumer Staples	17,161	15,268	12%	20,100	68,637	70,237	-2%	60,172	70,799	45,427	127,929	18%					
Energy	26,380	25,188	5%	29,080	109,615	106,735	3%	89,391	107,927	91,929	134,623	13%					
Financials	11,520	10,612	9%	13,659	47,537	49,260	-3%	46,387	50,098	83,134	362,348	-10%					
Health Care	13,115	14,058	-7%	16,411	57,573	58,339	-1%	53,582	57,539	98,141	262,106	-15%					
Industrials	20,054	17,781	13%	24,233	80,457	83,712	-4%	78,061	86,444	68,460	172,372	7%					
Information Technology	29,259	29,400	0%	28,985	124,985	116,642	7%	109,678	116,550	100,237	444,334	6%					
Materials	10,979	8,940	23%	11,480	42,001	39,868	5%	32,718	41,906	30,423	47,552	24%					
Real Estate	2,422	1,852	31%	3,085	20,314	9,149	122%	7,981	9,719	29,350	54,387	-17%					
Utilities	37,289	34,967	7%	40,153	167,656	150,023	12%	131,201	152,345	58,734	58,831	185%					
S&P 500	253,548	230,414	10%	274,860	1,066,091	990,536	8%	924,030	1,012,308	834,515	2,050,850	11%					

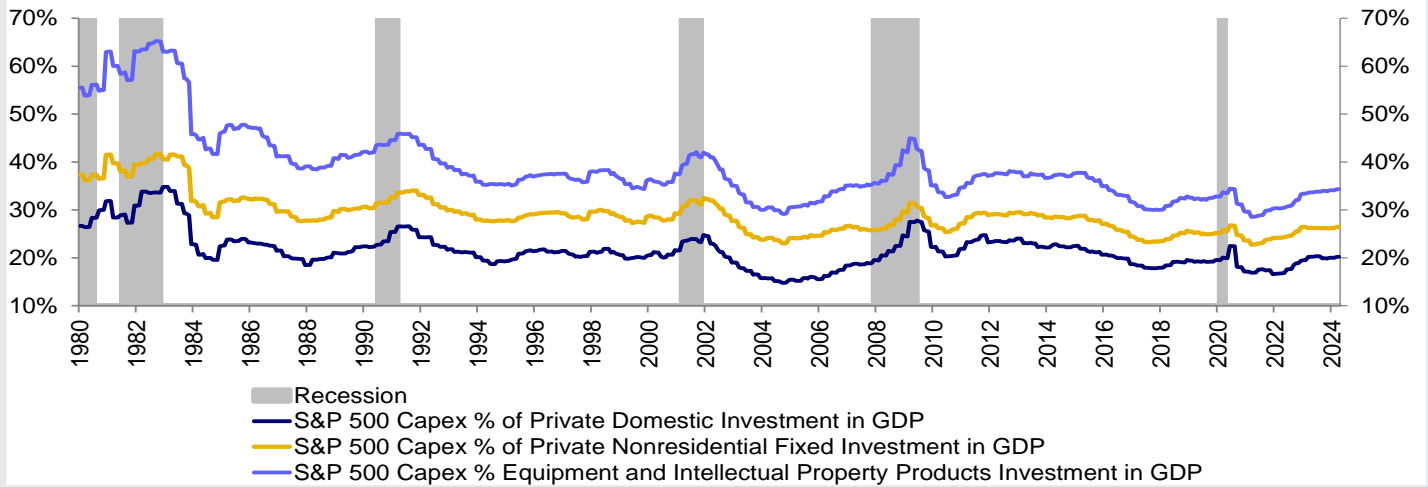
Source: Clarifi, DWS Investment GmbH as of 1Q2024. Past performance may not be indicative of future results.

Capex vs. GDP



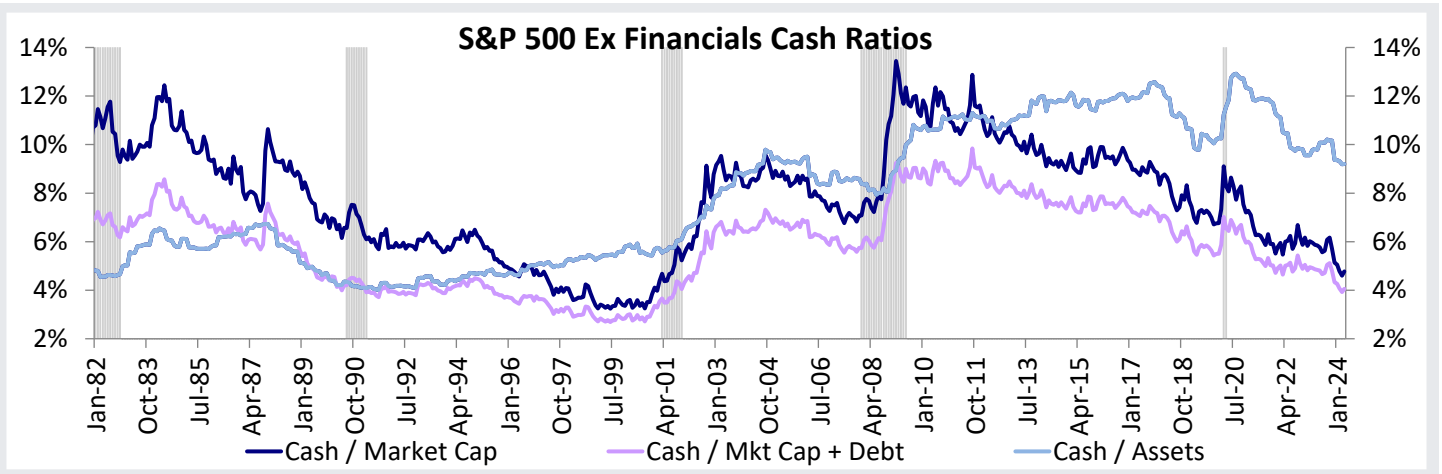
Source: Haver, DWS Investment GmbH as of 1Q2024. Past performance may not be indicative of future results.

S&P 500 capex as % of capex from GDP accounts



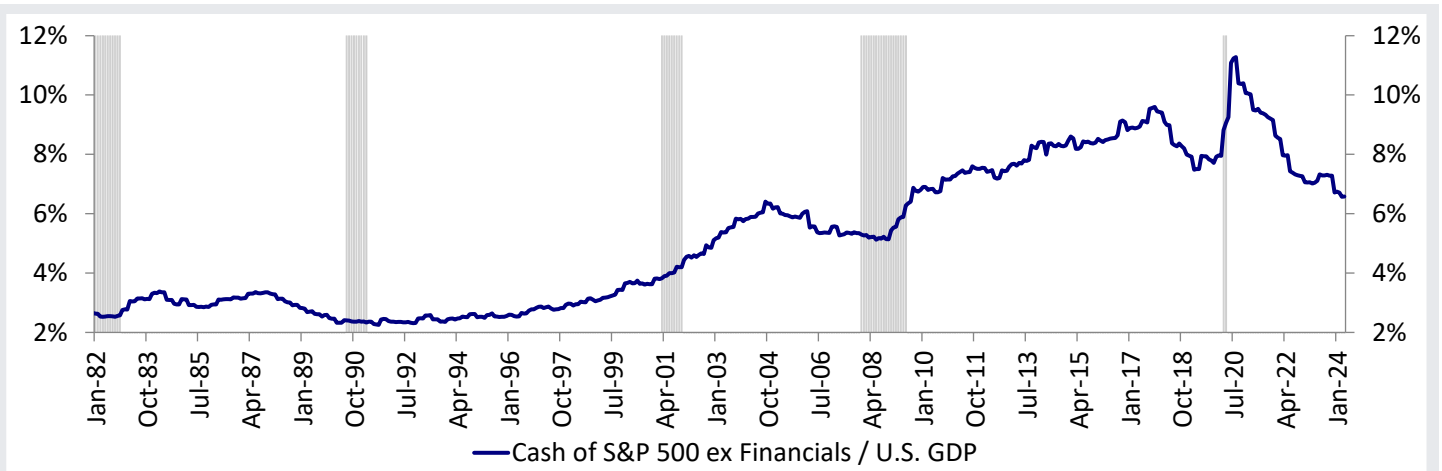
Source: Haver, DWS Investment GmbH as of 1Q2024. Past performance may not be indicative of future results.

S&P 500 ex Financials cash ratios



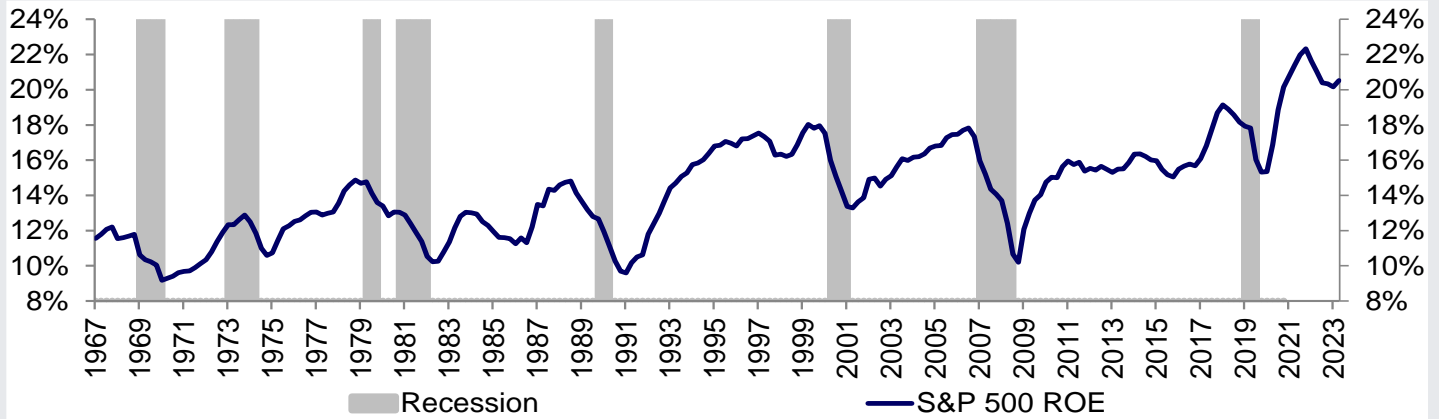
Source: Haver, DWS Investment GmbH as of 1Q2024. Past performance may not be indicative of future results.

S&P 500 ex Financials cash % of U.S. GDP



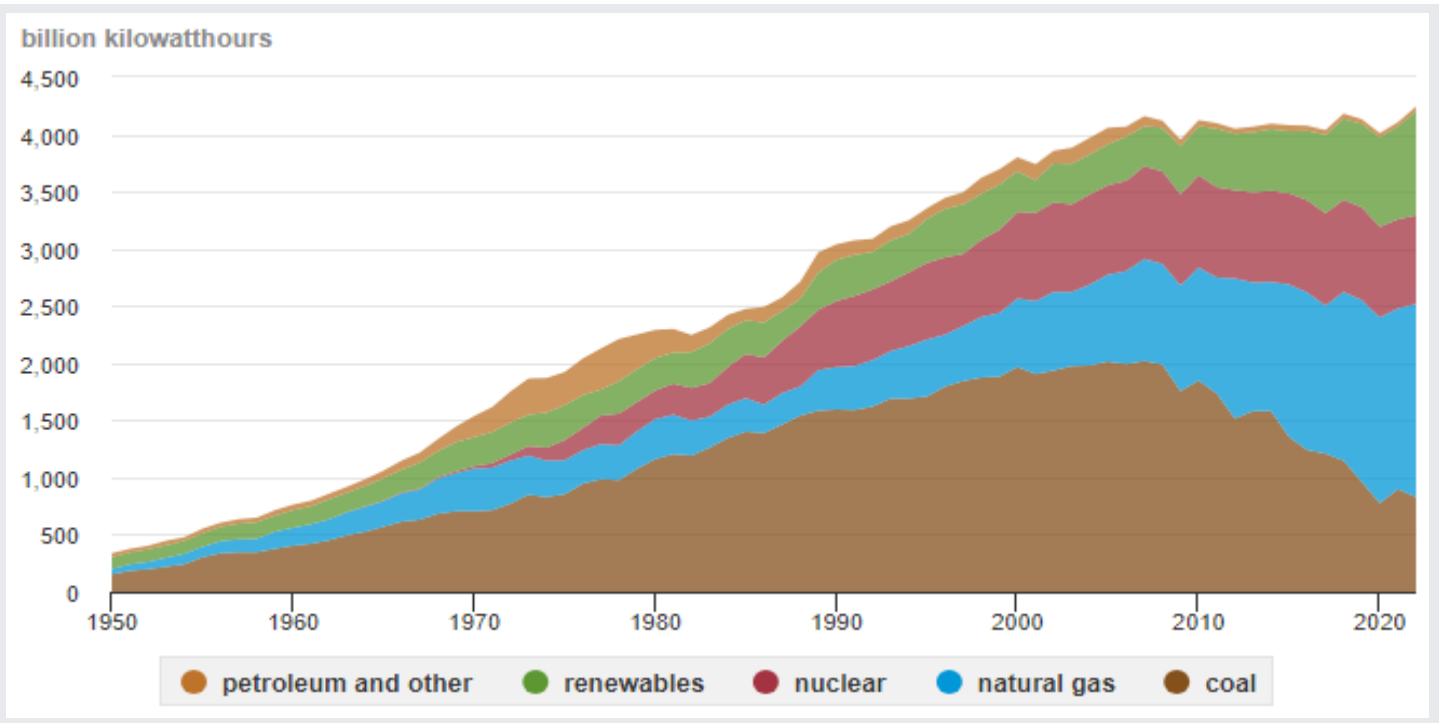
Source: Haver, DWS Investment GmbH as of 1Q2024. Past performance may not be indicative of future results.

S&P 500 ROE



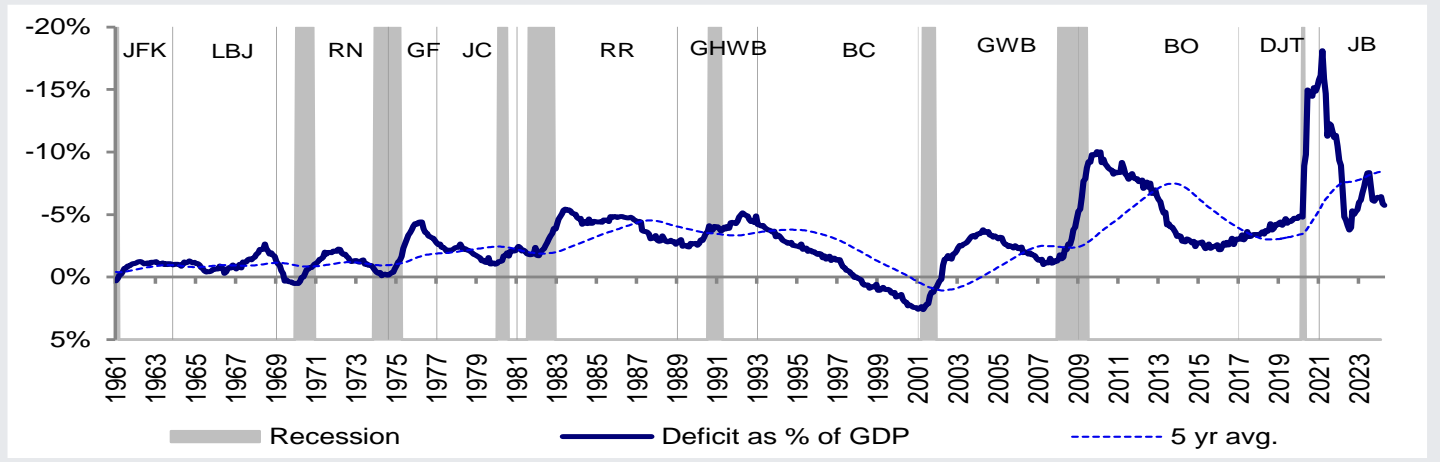
Source: Haver, DWS Investment GmbH as of 4/30/2024. Past performance may not be indicative of future results.

U.S. electricity production



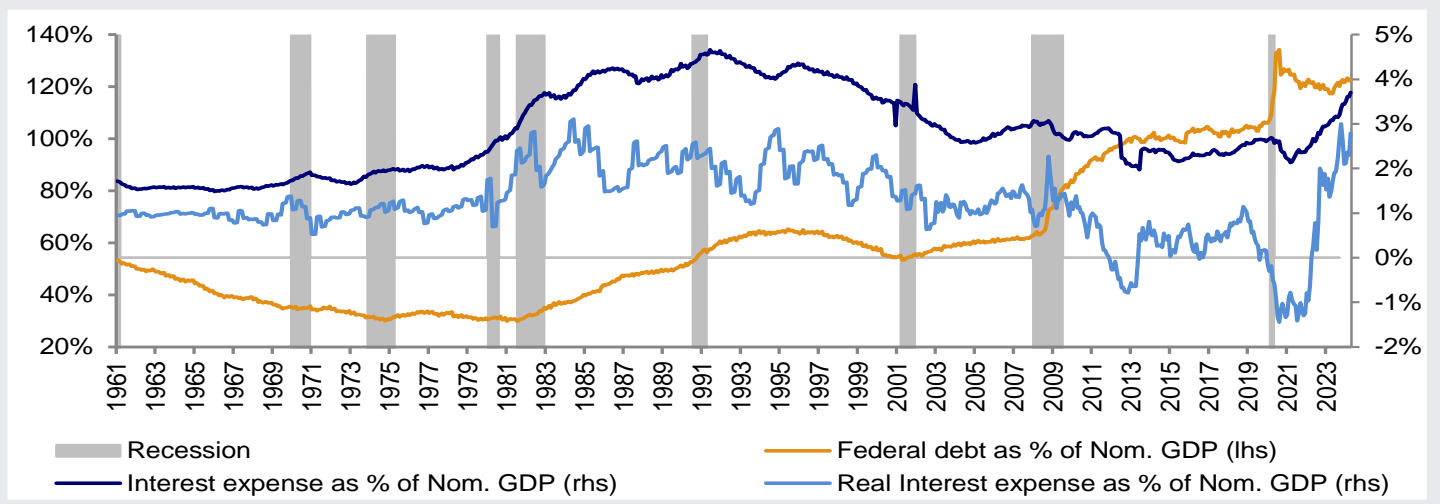
Source: EIA, DWS Investment GmbH as of 5/13/2024. Past performance may not be indicative of future results.

U.S. federal deficit % of GDP



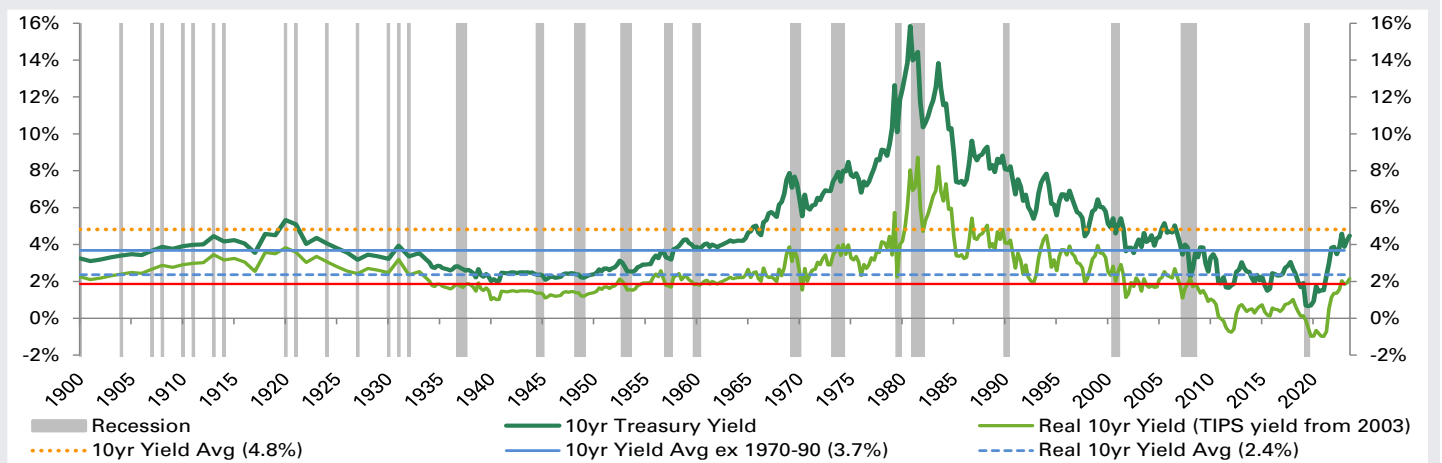
Source: Haver, DWS Investment GmbH as of 4/30/2024. Past performance may not be indicative of future results.

U.S. federal debt and interest expense % of GDP



Source: Haver, DWS Investment GmbH as of 4/30/2024. Past performance may not be indicative of future results.

U.S. nominal and real 10 year treasury yields



Source: Haver, DWS Investment GmbH as of 5/13/2024. Past performance may not be indicative of future results.



DWS Investment GmbH S&P 500 Annual EPS Outlook

	2014A	2015A	2016A	2017A	2018A	2019A	2020A	2021A	2022A	2023A	y/y	Bottom-up Consensus (IBES)				DWS View				Normalized 2024	
												2024E	y/y	2025E	y/y	2024E	y/y	2025E	y/y	(\$)	% of 2023
S&P 500 EPS (historical index)	\$118.82	\$117.46	\$118.10	\$132.00	\$161.93	\$162.93	\$139.72	\$208.12	\$218.09	\$221.36	1.5%										
S&P 500 EPS (current constituents)	\$116.65	\$117.00	\$117.29	\$129.20	\$155.28	\$159.34	\$141.80	\$206.93	\$217.33	\$222.24	2.3%	\$245	10.4%	\$279	13.7%	\$245	10.2%	\$265	8.2%	\$245	100%
Sector (\$ bn)																					
Communication Services	66.3	76.8	88.9	96.9	121.2	127.9	131.9	183.9	143.9	173.1	20.3%	211.7	22.3%	237.9	12.4%	213.0	23.0%	230.0	8.0%	210.4	99%
Consumer Discretionary	57.7	67.6	75.3	79.6	94.8	93.1	62.3	121.6	110.5	156.8	41.9%	177.7	13.3%	203.6	14.6%	174.2	11.1%	188.0	7.9%	178.7	103%
Consumer Staples	84.0	82.8	85.5	89.8	96.9	98.0	105.3	118.0	111.9	124.5	11.3%	128.3	3.1%	138.3	7.8%	125.0	0.4%	131.2	5.0%	123.4	99%
Energy	94.2	39.5	10.4	36.9	69.5	49.1	-6.6	78.7	200.4	141.5	-29.4%	136.2	-3.7%	148.1	8.8%	135.0	-4.6%	142.5	5.6%	136.0	101%
Financials	184.3	200.0	203.8	213.3	262.6	276.6	225.6	363.2	308.5	333.7	8.2%	364.4	9.2%	401.8	10.3%	357.0	7.0%	381.5	6.9%	346.6	97%
Health Care	137.9	152.9	157.8	172.2	189.0	207.0	227.0	293.1	308.5	244.0	-20.9%	264.2	8.3%	313.2	18.6%	278.5	14.1%	302.0	8.4%	277.3	100%
Industrials	100.6	104.1	98.1	107.1	130.8	113.9	61.2	112.2	135.9	161.5	18.8%	172.5	6.8%	197.9	14.7%	172.3	6.7%	183.3	6.4%	173.9	101%
Information Technology	162.2	168.2	176.4	206.4	237.4	231.9	264.1	345.5	355.2	375.1	5.6%	443.8	18.3%	524.2	18.1%	445.0	18.6%	500.5	12.5%	466.0	105%
Materials	24.6	23.4	22.5	28.7	36.2	34.1	32.5	61.5	63.9	48.4	-24.3%	47.5	-1.7%	54.9	15.5%	47.5	-1.8%	49.5	4.2%	46.6	98%
Real Estate	22.9	24.2	28.4	31.7	35.7	37.1	37.0	44.0	51.6	54.0	4.6%	54.7	1.4%	58.0	6.0%	54.7	1.3%	56.0	2.3%	53.2	97%
Utilities	32.9	33.1	35.7	37.1	40.9	45.0	46.9	49.6	50.9	52.6	3.3%	58.9	12.1%	63.8	8.2%	59.5	13.1%	63.5	6.8%	61.5	103%
S&P 500	967.7	972.4	982.8	1099.8	1314.9	1313.6	1187.3	1771.3	1841.1	1865.1	1.3%	2059.9	10.4%	2341.7	13.7%	2061.7	10.5%	2228.0	8.1%	2073.6	101%
S&P ex. Energy (\$bn)	873.5	932.9	972.4	1062.8	1245.4	1264.6	1193.8	1692.5	1640.7	1723.6	5.1%	1923.8	11.6%	2193.6	14.0%	1926.7	11.8%	2085.5	8.2%	1937.6	101%
S&P ex. Tech (\$bn)	805.5	804.2	806.4	893.3	1077.5	1081.7	923.2	1425.7	1485.9	1489.9	0.3%	1616.2	8.5%	1817.5	12.5%	1616.7	8.5%	1727.5	6.9%	1607.6	99%
S&P 500 Sales/Share (historical index)	\$1,163	\$1,127	\$1,151	\$1,232	\$1,339	\$1,415	\$1,362	\$1,567	\$1,753	\$1,872	6.8%										
S&P 500 Non-GAAP Net Margin	10.2%	10.4%	10.3%	10.7%	12.1%	11.5%	10.3%	13.3%	12.4%	11.8%											

S&P 500 EPS	Year	1Q	2Q	3Q	4Q
2019A	163	39	41	41	42
2020A	140	33	28	38	42
2021A	210	49	53	54	54
2022A	222	55	58	56	53
2023A	223	53	54.25	58.5	57.25
2024E	245	58	60	62	65

S&P 500 EPS historical constituents represents the earnings per share (EPS) of S&P 500 index constituents at the time, while S&P 500 EPS current constituents represents the earnings per share of index constituents as of the date the data was compiled 3/31/2024.

Source: Factset, DWS Investment GmbH as of 5/13/2024. Past performance may not be indicative of future results. Forecasts are not a reliable indicator of future returns.



DWS Investment GmbH View: S&P 500 fair value by sector: Assuming a ~5.50% real cost of equity (CoE) for overall S&P 500

	Market Value (\$bn)	Current 2024 PE	2024E Earnings (\$bn)	Normal Ratio	Normal 2024E Earnings	Accounting Quality Adjustment	Fully Adjusted Earnings	Net Debt / Market Cap	FCF / EPS	Real CoE	Steady State Value	Growth Premium	2024 Start Fair Value (\$bn)	2024E Dividend Yield	2024 End Fair Value (\$bn)	PE on Normal 2024E EPS	2024 End Upside %	2024 End Upside vs. S&P 500
Communication Services	4,184	19.6	213.0	99%	210.4	-7%	195.6	11%	0.83	5.50%	3,557	20%	4,268	0.9%	4,573	21.7	9%	11%
Consumer Discretionary	4,510	25.9	174.2	103%	178.7	-6%	168.0	10%	0.74	5.50%	3,054	33%	4,072	1.0%	4,356	24.4	-3%	-1%
<i>Automobiles</i>	580	23.2	25.0	95%	23.8	-8%	21.9	30%	0.99	6.50%	336	40%	471	0.5%	511	21.5	-12%	-10%
<i>Broadline (Internet) Retail</i>	1,684	39.6	42.5	120%	51.0	-5%	48.5	0%	0.18	5.25%	923	75%	1,615	0.0%	1,740	34.1	3%	5%
<i>ex. Auto & Broadline (Internet) Retail</i>	2,246	21.1	106.7	97%	104.0	-6%	97.7	13%	0.75	5.44%	1,795	11%	1,987	1.5%	2,115	20.3	-6%	-4%
Consumer Staples	2,522	20.2	125.0	99%	123.4	-6%	116.0	14%	0.84	5.25%	2,210	5%	2,320	2.8%	2,436	19.7	-3%	-1%
Energy	1,806	13.4	135.0	101%	136.0	-10%	122.4	13%	0.91	6.20%	1,974	-18%	1,619	2.1%	1,726	12.7	-4%	-2%
Financials	5,901	16.5	357.0	97%	346.6	-7%	320.6		1.10	6.00%	5,344	-3%	5,184	1.8%	5,533	16.0	-6%	-4%
<i>Banks</i>	1,532	12.3	125.0	95%	118.8	-7%	110.4		1.11	7.00%	1,578	-10%	1,420	2.7%	1,517	12.8	-1%	1%
Health Care	5,370	19.3	278.5	100%	277.3	-8%	255.1	10%	1.14	5.40%	4,725	15%	5,433	1.3%	5,789	20.9	8%	10%
Industrials	3,837	22.3	172.3	101%	173.9	-7%	161.8	15%	0.88	5.50%	2,941	10%	3,235	1.6%	3,443	19.8	-10%	-8%
Information Technology	13,105	29.4	445.0	105%	466.0	-3%	452.0	2%	0.95	5.25%	8,610	35%	11,623	0.8%	12,429	26.7	-5%	-3%
Materials	1,050	22.1	47.5	98%	46.6	-7%	43.3	15%	0.89	5.75%	753	10%	828	1.4%	885	19.0	-16%	-14%
Real Estate	908	16.6	54.7	97%	53.2	-5%	50.6	34%	1.80	5.60%	903	5%	948	3.8%	989	18.6	9%	11%
Utilities	1,039	17.5	59.5	103%	61.5	-7%	57.2	80%	-0.64	5.50%	1,040	5%	1,092	3.4%	1,142	18.6	10%	12%
S&P 500 (\$ bn)	44,232	21.5	2061.7	101%	2073.6	-6.3%	1942.7			5.50%	35,111	15.7%	40624	1.4%	43,302	20.9	-2%	0%
S&P 500 Index (\$/sh)	5221	21.3	245.0	100%	245.0	-6.1%	230.0	10%	0.93	5.50%	4182	16.6%	4878	1.4%	5192	21.2	-1%	0%



Source: IBES, DWS Investment GmbH as of 5/13/2024. Past performance may not be indicative of future results. Forecasts are not a reliable indicator of future returns.

S&P 500 EPS historical constituents represents the earnings per share (EPS) of S&P 500 index constituents at the time, while S&P 500 EPS current constituents represents the earnings per share of index constituents as of the date the data was compiled 3/31/2024.

The estimated 2024 year end upside is on absolute valuation basis of each sector, not on relative sector valuation basis.

DWS Investment GmbH View: S&P 500 fair value by sector and industry: Assuming a ~5.50% real cost of equity (CoE) for overall S&P 500 (1 of 2)

	Market Value (\$bn)	Current 2024 PE	2024E Earnings (\$bn)	Normal Ratio	Normal 2024E Earnings	Accounting Quality Adjustment	Fully Adjusted Earnings	Net Debt / Market Cap	FCF / EPS	Real CoE	Steady State Value	Growth Premium	2024 Start Fair Value (\$bn)	2024E Dividend Yield	2024 End Fair Value (\$bn)	PE on Normal 2023/4 EPS	2024 End Upside %	2024 End Upside vs. S&P 500
CONSUMER DISCRETIONARY	4,510	25.9	174.2	103%	178.7	-6.0%	168	10%	0.74	5.50%	3,054	33.3%	4,072	1.0%	4,356	24.4	-3%	-1%
Automobile Components	31,023	11.9	2,600	100%	2,600	-7%	2,418	22%	0.90	6.75%	35,822	0%	35,822	0.3%	39,019	15.0	26%	28%
Automobiles	579,671	23.2	25,000	95%	23,750	-8%	21,850	30%	0.56	6.50%	336,154	40%	470,615	0.5%	510,676	21.5	-12%	-10%
Distributors	49,619	16.5	3,000	95%	2,850	-7%	2,651	16%	0.98	5.50%	48,191	0%	48,191	2.2%	51,009	17.9	3%	5%
Hotels Restaurants & Leisure	904,155	23.2	39,000	100%	39,000	-5%	37,050	18%	0.95	5.25%	705,714	15%	811,571	1.3%	864,235	22.2	-4%	-2%
Household Durables	172,377	12.8	13,500	90%	12,150	-15%	10,328	0%	0.99	6.75%	153,000	0%	153,000	0.9%	165,837	13.6	-4%	-2%
Broadline Retail	1,683,960	39.6	42,500	120%	51,000	-5%	48,450	0%	0.18	5.25%	922,857	75%	1,615,000	0.0%	1,739,625	34.1	3%	5%
Leisure Products	7,941	17.6	450	90%	405	-7%	377	34%	1.01	5.50%	6,848	-20%	5,479	4.6%	5,665	14.0	-29%	-27%
Specialty Retail	878,869	22.2	39,500	97%	38,315	-5%	36,399	13%	0.91	5.25%	693,319	10%	762,651	1.7%	808,680	21.1	-8%	-6%
Textiles Apparel & Luxury Goods	202,254	23.4	8,650	100%	8,650	-6%	8,131	-3%	0.98	5.50%	147,836	15%	170,012	1.2%	181,630	21.0	-10%	-8%
CONSUMER STAPLES	2,522	20.2	125.0	99%	123.4	-6%	116	14%	0.84	5.25%	2,210	5%	2,320	2.8%	2,436	19.7	-3%	-1%
Beverages	638,198	22.2	28,700	100%	28,700	-5%	27,265	14%	0.88	5.25%	519,333	15%	597,233	2.7%	627,585	21.9	-2%	0%
Consumer Staples Distribution & Retail	651,984	21.4	30,500	100%	30,500	-6%	28,670	8%	0.63	5.25%	546,095	10%	600,705	1.6%	637,438	20.9	-2%	0%
Food Products	365,222	16.2	22,500	100%	22,500	-7%	20,925	26%	0.90	5.25%	398,571	-10%	358,714	2.9%	375,997	16.7	3%	5%
Household Products	565,404	25.6	22,100	100%	22,100	-6%	20,774	8%	0.97	5.25%	395,695	15%	455,050	2.4%	479,339	21.7	-15%	-13%
Personal Care Products	66,499	24.6	2,700	110%	2,970	-7%	2,762	14%	0.97	5.50%	50,220	25%	62,775	3.0%	65,915	22.2	-1%	1%
Tobacco	234,979	12.7	18,500	90%	16,650	-8%	15,318	30%	1.03	5.20%	294,577	-25%	220,933	6.4%	223,855	13.4	-5%	-3%
Energy	1,806	13.4	135.0	101%	136.0	-10%	122	13%	0.91	6.20%	1,974	-18%	1,619	2.1%	1,726	12.7	-4%	-2%
Energy Equipment & Services	134,677	13.5	10,000	110%	11,000	-10%	9,900	12%	0.93	6.50%	152,308	5%	159,923	2.2%	170,735	15.5	27%	29%
Oil Gas & Consumable Fuels	1,671,197	13.4	125,000	100%	125,000	-10%	112,500	13%	0.90	6.25%	1,800,000	-20%	1,440,000	3.0%	1,522,568	12.2	-9%	-7%
FINANCIALS	5,901	16.5	357.0	97%	346.6	-7%	321	0%	1.10	6.00%	5,344	-3%	5,184	1.8%	5,533	16.0	-6%	-4%
Capital Markets	1,255,271	19.0	66,000	95%	62,700	-10%	56,430	2%	1.08	6.00%	940,500	0%	940,500	2.1%	1,001,060	16.0	-20%	-18%
Banks	1,532,348	12.3	125,000	95%	118,750	-7%	110,438	N/A	1.11	7.00%	1,577,679	-10%	1,419,911	2.8%	1,515,140	12.8	-1%	1%
Consumer Finance	252,541	14.0	18,000	95%	17,100	-15%	14,535	N/A	1.16	6.25%	232,560	-10%	209,304	1.4%	224,617	13.1	-11%	-9%
Financial Services	1,893,185	23.7	80,000	100%	80,000	-5%	76,000	2%	1.02	5.10%	1,490,196	10%	1,639,216	0.4%	1,757,959	22.0	-7%	-5%
Insurance	967,583	14.2	68,000	100%	68,000	-7%	63,240	N/A	1.23	5.75%	1,099,826	-10%	989,843	1.5%	1,056,928	15.5	9%	11%
Health Care	5,370	19.3	278.5	100%	277.3	-8%	255	10%	1.14	5.40%	4,725	15%	5,433	1.3%	5,789	20.9	8%	10%
Biotechnology	835,603	18.6	45,000	105%	47,250	-10%	42,525	11%	1.23	5.50%	773,182	20%	927,818	2.3%	980,282	20.7	17%	19%
Health Care Equipment & Supplies	1,058,576	24.6	43,000	105%	45,150	-7%	41,990	8%	1.17	5.00%	839,790	25%	1,049,738	1.1%	1,117,361	24.7	6%	8%
Health Care Providers & Services	1,177,431	15.2	77,500	95%	73,625	-7%	68,471	10%	1.05	5.50%	1,244,932	5%	1,307,178	1.4%	1,393,767	18.9	18%	20%
Life Sciences Tools & Services	626,003	29.8	21,000	105%	22,050	-5%	20,948	10%	1.15	5.50%	380,864	20%	457,036	0.3%	492,334	22.3	-21%	-19%
Pharmaceuticals	1,672,671	18.2	92,000	97%	89,240	-10%	80,316	10%	1.15	5.50%	1,460,291	15%	1,679,335	2.4%	1,773,893	19.9	6%	8%
INDUSTRIALS	3,837	22.3	172.3	101%	173.9	-7%	162	15%	0.88	5.50%	2,941	10%	3,235	1.6%	3,443	19.8	-10%	-8%
Aerospace & Defense	846,149	27.3	31,000	115%	35,650	-7%	33,155	16%	1.12	5.50%	602,809	10%	663,090	1.3%	707,677	19.9	-16%	-14%
Air Freight & Logistics	204,847	17.8	11,500	95%	10,925	-7%	10,160	14%	0.75	5.75%	176,700	0%	176,700	3.1%	185,782	17.0	-9%	-7%
Passenger Airlines	79,065	7.5	10,500	90%	9,450	-20%	7,560	72%	-0.22	10.0%	75,600	0%	75,600	0.9%	84,394	8.9	7%	9%
Building Products	241,413	23.0	10,500	95%	9,975	-7%	9,277	10%	1.04	5.50%	168,668	5%	177,102	1.2%	189,077	19.0	-22%	-20%
Commercial Services & Supplies	259,467	34.1	7,600	100%	7,600	-5%	7,220	10%	0.89	5.25%	137,524	10%	151,276	0.9%	161,688	21.3	-38%	-36%
Construction & Engineering	38,297	31.9	1,200	110%	1,320	-7%	1,228	8%	1.21	5.25%	23,383	10%	25,721	0.1%	27,679	21.0	-28%	-26%

Source: IBES, DWS Investment GmbH as of 5/13/2024. Past performance may not be indicative of future results. Forecasts are not a reliable indicator of future returns.

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The estimated 2024 year end upside is on absolute valuation basis of each sector, not on relative sector valuation basis.

DWS Investment GmbH View: S&P 500 fair value by sector and industry: Assuming a ~5.50% real cost of equity (CoE) for overall S&P 500 (2 of 2)

	Market Value (\$bn)	Current 2024 PE	2024E Earnings (\$bn)	Normal Ratio	Normal 2024E Earnings	Accounting Quality Adjustment	Fully Adjusted Earnings	Net Debt / Market Cap	FCF / EPS	Real CoE	Steady State Value	Growth Premium	2024 Start Fair Value (\$bn)	2024E Dividend Yield	2024 End Fair Value (\$bn)	PE on Normal 20234 EPS	2024 End Upside %	2024 End Upside vs. S&P 500
Electrical Equipment	299,669	25.0	12,000	110%	13,200	-7%	12,276	7%	1.17	5.25%	233,829	20%	280,594	1.3%	298,787	22.6	0%	2%
Industrial Conglomerates	195,148	18.6	10,500	100%	10,500	-7%	9,765	12%	1.12	5.25%	186,000	10%	204,600	3.2%	213,971	20.4	10%	12%
Machinery	803,643	18.5	43,500	95%	41,325	-7%	38,432	18%	0.97	5.50%	698,768	10%	768,645	1.4%	819,584	19.8	2%	4%
Professional Services	298,672	26.0	11,500	100%	11,500	-5%	10,925	6%	1.08	5.25%	208,095	15%	239,310	1.7%	253,851	22.1	-15%	-13%
Ground Transportation	439,907	26.7	16,500	100%	16,500	-7%	15,345	15%	0.70	5.00%	306,900	10%	337,590	1.3%	358,561	21.7	-18%	-16%
Trading Companies & Distributors	130,832	21.8	6,000	100%	6,000	-7%	5,580	10%	0.63	5.50%	101,455	10%	111,600	1.3%	119,101	19.9	-9%	-7%
INFORMATION TECHNOLOGY	13,105	29.4	445.0	105%	466.0	-3%	452	2%	0.95	5.25%	8,610	35%	11,623	0.8%	12,429	26.7	-5%	-3%
Communications Equipment	360,439	17.2	21,000	100%	21,000	-5%	19,950	-4%	1.06	5.50%	362,727	5%	380,864	2.1%	403,476	19.2	12%	14%
Technology Hardware Storage & Peripherals	2,961,472	27.2	109,000	100%	109,000	-2%	106,820	2%	1.00	5.00%	2,136,400	25%	2,670,500	0.6%	2,855,358	26.2	-4%	-1%
Electronic Equipment Instruments & Components	272,531	23.7	11,500	100%	11,500	-7%	10,695	9%	1.04	5.50%	194,455	15%	223,623	0.9%	239,409	20.8	-12%	-10%
IT Services	456,292	19.4	23,500	100%	23,500	-3%	22,795	9%	1.23	5.00%	455,900	15%	524,285	2.2%	552,179	23.5	21%	23%
Semiconductors & Semiconductor Equipment	4,459,623	31.9	140,000	110%	154,000	-5%	146,300	2%	0.85	5.75%	2,544,348	35%	3,434,870	0.6%	3,696,263	24.0	-17%	-15%
Software	4,594,673	32.8	140,000	105%	147,000	0%	147,000	1%	0.91	5.00%	2,940,000	50%	4,410,000	0.6%	4,713,876	32.1	3%	5%
MATERIALS	1,050	22.1	47.5	98%	46.6	-7%	43	15%	0.89	5.75%	753	10%	828	1.4%	885	19.0	-16%	-14%
Chemicals	692,070	22.7	30,500	100%	30,500	-5%	28,975	15%	0.94	5.50%	526,818	15%	605,841	1.8%	643,202	21.1	-7%	-5%
Construction Materials	73,784	29.5	2,500	100%	2,500	-10%	2,250	9%	0.93	6.00%	37,500	0%	37,500	0.6%	40,470	16.2	-45%	-43%
Containers & Packaging	100,271	20.1	5,000	100%	5,000	-10%	4,500	36%	0.84	6.00%	75,000	0%	75,000	2.6%	79,390	15.9	-21%	-19%
Metals & Mining	183,498	19.3	9,500	90%	8,550	-10%	7,695	6%	0.78	6.50%	118,385	0%	118,385	1.5%	127,217	14.9	-31%	-29%
REAL ESTATE	908	16.6	54.7	97%	53.2	-5%	51	34%	1.80	5.60%	903	5%	948	3.8%	989	18.6	9%	11%
Health Care REITs	78,781	17.5	4,500	100%	4,500	-5%	4,275	28%	5.76	5.25%	81,429	0%	81,429	3.7%	84,717	18.8	8%	10%
Hotel & Resort REITs	13,190	9.4	1,400	90%	1,260	-10%	1,134	23%	1.90	7.00%	16,200	0%	16,200	4.3%	17,046	13.5	29%	31%
Industrial REITs	85,858	17.2	5,000	95%	4,750	-5%	4,513	28%	1.56	5.25%	85,952	5%	90,250	4.1%	93,515	19.7	9%	11%
Office REITs	27,010	11.7	2,300	85%	1,955	-7%	1,818	79%	2.44	7.00%	25,974	0%	25,974	5.1%	27,128	13.9	0%	3%
Residential REITs	125,671	17.0	7,400	90%	6,660	-5%	6,327	32%	1.82	5.25%	120,514	0%	120,514	3.8%	125,241	18.8	0%	2%
Retail REITs	115,920	12.2	9,500	100%	9,500	-5%	9,025	45%	1.98	6.25%	144,400	0%	144,400	5.7%	148,848	15.7	28%	31%
Specialized REITs	398,347	17.3	23,000	100%	23,000	-4%	22,080	38%	1.32	5.50%	401,455	10%	441,600	3.9%	459,658	20.0	15%	17%
Real Estate Management & Development	63,147	39.5	1,600	100%	1,600	-3%	1,552	-3%	1.19	5.25%	29,562	10%	32,518	-	35,038	21.9	-45%	-42%
COMMUNICATION SERVICES	4,184	19.6	213.0	99%	210.4	-7%	196	11%	0.83	5.50%	3,557	20%	4,268	0.9%	4,573	21.7	9%	11%
Diversified Telecommunication Services	298,632	8.5	35,000	75%	26,250	-15%	22,313	98%	0.85	5.50%	405,682	-25%	304,261	6.4%	309,122	11.8	4%	6%
Entertainment	544,387	28.2	19,300	110%	21,230	-8%	19,532	16%	2.07	5.50%	355,120	40%	497,168	0.3%	535,516	25.2	-2%	0%
Interactive Media & Services	2,985,090	23.1	129,000	105%	135,450	-3%	131,387	-4%	0.66	5.25%	2,502,600	30%	3,253,380	0.4%	3,491,282	25.8	17%	19%
Media	267,428	10.7	25,000	90%	22,500	-10%	20,250	69%	1.03	7.00%	289,286	-15%	245,893	2.4%	263,403	11.7	-2%	1%
Wireless Telecommunication Services	88,762	18.9	4,700	105%	4,935	-8%	4,540	39%	1.01	5.50%	82,549	5%	86,677	1.5%	92,285	18.7	4%	6%
UTILITIES	1,039	17.5	59.5	103%	61.5	-7%	57	80%	-0.64	5.50%	1,040	5%	1,092	3.4%	1,142	18.6	10%	12%
Electric Utilities	703,580	17.5	40,100	105%	42,105	-7%	39,158	81%	-0.66	5.50%	711,957	7%	761,794	3.2%	798,622	19.0	14%	16%
Gas Utilities	16,418	16.4	1,000	100%	1,000	-7%	930	40%	-1.63	5.25%	17,714	0%	17,714	3.0%	18,563	18.6	13%	15%
Independent Power and Renewable Electric	13,755	9.8	1,400	100%	1,400	-15%	1,190	186%	-4.04	8.00%	14,875	0%	14,875	3.4%	15,937	11.4	16%	18%
Multi-Utilities	280,966	17.6	16,000	100%	16,000	-7%	14,880	79%	-0.53	5.50%	270,545	0%	270,545	3.7%	282,283	17.6	0%	3%
Water Utilities	24,311	24.3	1,000	100%	1,000	-5%	950	48%	-1.00	5.00%	19,000	0%	19,000	2.5%	19,959	20.0	-18%	-16%

Source: IBES, DWS Investment GmbH as of 5/13/2024. Past performance may not be indicative of future results. Forecasts are not a reliable indicator of future returns.

S&P 500 EPS historical constituents represents the earnings per share (EPS) of S&P 500 index constituents at the time, while S&P 500 EPS current constituents represents the earnings per share of index constituents as of the date the data was compiled 3/31/2024.

The estimated 2024 year end upside is on absolute valuation basis of each sector, not on relative sector valuation basis.

S&P 500 Intrinsic Valuation Model

S&P 500 Capitalized EPS Valuation		S&P 500 Dividend Discount Model		S&P 500 Long-term EPS & DPS Growth		S&P 500 Cost of Equity & Fair Book Multiple	
DWS 2024E S&P 500 EPS	\$245.00	DWS 2024E S&P 500 DPS	\$76.00	DWS 2024E S&P 500 aggregate ROE	22.3%	Fair long-term nominal return on S&P 500 index	8.00%
		2024E dividend payout ratio	31%	2023E end S&P 500 book value per share	\$1,100	Components of estimated fair S&P 500 return:	
DWS "normal 2024E" S&P 500 EPS	\$245.00	DWS "normal 2024E" S&P 500 DPS	\$76.00	DWS "normal 2024E" S&P 500 aggregate ROE	20.9%	+ Long-term real risk free interest rate	1.75%
"Normal 2024E" EPS / 2024 EPS	100%	Normal dividend payout ratio	33%			+ Long-term fair S&P 500 equity risk premium*	3.75%
						= Long-term real S&P 500 cost of equity	5.50%
Accounting quality adjustment to pro forma EPS	-\$15.00	EPS directed to net share repurchases	\$75.00	S&P EPS retained for true reinvestment	34%	+ Long-term inflation forecast	2.50%
		Normal share repurchase payout ratio	33%	Estimated ROE on reinvested S&P EPS	9.50%		
Normal 2024E S&P 500 EPS fair to capitalize	\$230	Total payout of S&P 500 EPS	\$151.00	Economic margin (EM) or ROE-CoE	1.50%	= S&P 500 nominal cost of equity	8.00%
Key principle: steady-state value = normal EPS / real CoE		Total payout ratio of normal and quality adj. EPS	66%	Sources of long-term earnings growth:		* S&P 500 ERP history 300-400bps, w/ real CoE @ 5% - 6.5%	
				+ Long-term inflation forecast	2.50%		
<u>S&P 500 EPS Capitalization Valuation</u>		<u>S&P 500 DPS Discount Model</u>		+ Fair return on true reinvestment	1.89%	<u>Fair S&P 500 Market Value and Book Value Multiple</u>	
Normal EPS / (real CoE - (EM/payout) - EM):		Normal DPS / (nominal CoE - DPS growth):		+ Value added return on true reinvestment	0.52%	2023E end S&P 500 book value per share	\$1,100
S&P 500 intrinsic value at 2024 start	4878	S&P 500 intrinsic value at 2024 start	4878	= Long-term earnings growth	4.90%	Fair PB = Fair PE * normal aggregate ROE	4.43
S&P 500 intrinsic value at 2024 end	5192	S&P 500 intrinsic value at 2024 end	5192	+ Growth from net share repurchases	1.54%	Fair PE =(inc ROE-g)/(inc real ROE*(real CoE-real g))	19.91
Implied fair fwd PE in early 2024 on 2024E \$245 EPS	19.9	Implied fair forward yield on 2024E DPS of \$76.0	1.56%	= Long-term S&P 500 EPS/DPS growth	6.44%	Implied S&P 500 fair value of book at 2024 start	4878
Implied fair trailing PE at 2024 end on 2024E \$245 EPS	21.2	Implied fair trailing yield on 2024E DPS of \$76.0	1.46%	+ Fair normal dividend yield	1.56%	Steady-state PB = normal agg. ROE / real CoE	3.80
				= Total long-term return at constant PE	8.00%	Confirmed by fair steady-state PE = 1 / real CoE	18.2
Normal EPS / (real CoE-value added EPS growth)	4614	DPS discount model using true DPS (all payout)	4878	Value added growth premium in fair value est.	17%	Normal 2024E economic profit per share	\$169.50

S&P 500 EPS discount model 5 steps to value:

- 1) Estimate normalized S&P 500 EPS
- 2) Adjust normalized EPS for pro forma accounting quality
- 3) Estimate a fair long-term real return on S&P 500 ownership (CoE)
- 4) Capitalize normalized and accounting quality adj. EPS at real CoE
- 5) Consider long-term potential for value added growth opportunities

2024E Normal S&P 500 EPS					
	\$235	\$240	\$245	\$250	\$255
5.00%	5405	5595	5790	5989	6192
5.25%	5117	5294	5474	5659	5847
5.50%	4859	5024	5192	5364	5539
5.75%	4626	4781	4938	5099	5263
6.00%	4415	4561	4709	4860	5014

DWS March 2025 equity index targets

Index	3M relative View	Current Level	Previous Target CIO Day Nov	Target Mar 25	Chg in Target	Expected Total Return Mar 25	thereof		Assumptions							
							EPS growth NTM*	LTM multiple impact	Dividend Yield	EPS NTM* (e)	DWS vs. Cons.	Target LTM P/E in Mar 25	Target PE discount to US	Payout ratio	chg of LTM target PE	
S&P 500		5,153	4,700	5,300	13%	4.3%	USD	8.2%	-5%	1.5%	247	-2.3%	21.5x		31%	2.1x
Stoxx 600		506	465	515	11%	5.0%	EUR	4.7%	-3%	3.3%	37.0	-1.5%	13.9x	-35%	45%	1.1x
EuroStoxx 50		4,993	4,350	5,000	15%	3.3%	EUR	3.5%	-3%	3.2%	370	-1.0%	13.5x	-37%	43%	1.6x
DAX40		17,942	16,600	18,700	13%	4.2%	EUR	4.1%	-3%	3.2%	1458	-1.1%	12.4x	-42%	40%	1.2x
SMI		11,721	10,950	11,450	5%	0.7%	CHF	9.1%	-11%	3.0%	673	-1.2%	17.0x	-21%	52%	0.8x
FTSE 100		7,743	7,400	7,600	3%	2.1%	GBP	-0.6%	-1%	3.9%		-1.4%	11.2x	-48%	45%	0.8x
MSCI EM		1,047	1,010	1,050	4%	3.2%	USD	11.9%	-10%	2.9%	80.7	-6.5%	13.0x	-40%	37%	-0.4x
MSCI AC Asia xJ		661	640	675	5%	4.8%	USD	15.3%	-11%	2.6%	48.3	-5.3%	14.0x	-35%	36%	-0.7x
MSCI Japan		1,643	1,520	1,740	14%	8.2%	YEN	11.2%	-5%	2.3%	109.9	2.5%	15.8x	-27%	34%	0.5x
MSCI Australia		1,547	1,400	1,500	7%	0.9%	AUD	-0.3%	-3%	3.9%	93.0	-0.9%	16.1x	-25%	66%	1.7x

Source: DWS Investment Management GmbH. Forecasts are not a reliable indicator of future returns. No representation or warranty is made by DWS as to the reasonableness or completeness of the forward-looking statements or to any other financial information contained herein.

S&P 500 industry monitor (1 of 2)

Sector	Industry	PE on 2023 EPS	PE on 2024 Consensus EPS	2024 Consensus EPS Growth	2025 Consensus EPS Growth	2024 EPS 3m Revision	3m Total Return Momentum	2024 End Upside (Intrinsic Valuation)	Combined Signal
Consumer Discretionary		25.6	22.3	21.3%	14.6%	4.6%	1.2%	-8.8%	1
	Automobile Components	12.2	9.9	9.1%	23.8%	0.0%	6.2%	34.1%	0
	Automobiles	22.1	20.5	-10.4%	7.5%	-0.3%	-7.9%	-11.9%	-1
	Household Durables	12.1	11.2	6.7%	8.5%	4.5%	9.8%	2.6%	0
	Leisure Products	17.2	14.6	3.1%	17.1%	-7.6%	22.0%	-36.6%	-1
	Textiles Apparel & Luxury Goods	22.6	20.5	15.3%	10.3%	-0.2%	-12.0%	-32.6%	0
	Hotels Restaurants & Leisure	22.6	19.6	29.8%	15.7%	-1.3%	-2.4%	-4.1%	0
	Distributors	16.3	14.9	4.7%	9.5%	-3.3%	1.0%	3.6%	-1
	Broadline Retail	40.0	31.8	99.6%	25.8%	24.0%	8.6%	-11.4%	1
Specialty Retail	21.5	19.8	1.7%	8.7%	-1.8%	-0.5%	-4.6%	-1	
Consumer Staples		20.8	19.3	7.8%	7.8%	-0.3%	6.8%	-6.3%	0
	Consumer Staples Distribution & Retail	25.5	23.5	7.5%	8.7%	0.7%	6.6%	-14.8%	0
	Food Products	15.8	14.8	-2.9%	6.1%	-2.8%	5.3%	2.6%	-1
	Beverages	21.6	20.0	8.7%	8.0%	0.3%	5.9%	-3.5%	0
	Tobacco	12.4	11.6	3.7%	6.8%	-1.7%	13.3%	-4.6%	0
	Household Products	24.5	22.8	12.3%	7.1%	1.9%	7.4%	-17.4%	0
	Personal Care Products	24.3	20.1	433.4%	20.9%	-6.6%	0.3%	2.3%	-1
Energy		12.9	11.9	-10.1%	8.9%	-0.2%	13.9%	-2.5%	0
	Energy Equipment & Services	13.3	11.2	24.0%	18.9%	-0.2%	7.0%	19.0%	0
	Oil Gas & Consumable Fuels	12.9	11.9	-12.1%	8.0%	-0.2%	14.5%	-6.0%	0
Financials		15.9	14.4	10.8%	10.3%	2.4%	7.0%	-10.0%	0
	Banks	11.9	10.8	-5.3%	9.5%	1.6%	15.6%	-7.1%	0
	Financial Services	22.8	20.9	13.4%	9.2%	1.1%	1.9%	-9.3%	0
	Consumer Finance	13.4	11.9	11.8%	12.9%	2.5%	11.8%	-17.6%	1
	Capital Markets	17.9	15.9	20.4%	12.1%	3.5%	5.0%	-31.1%	1
	Insurance	13.7	12.4	38.1%	10.4%	4.3%	6.5%	9.0%	1
Health Care		20.2	17.0	3.5%	19.0%	-6.8%	-0.1%	9.7%	-1
	Health Care Providers & Services	15.1	13.4	5.1%	12.0%	-3.9%	-1.5%	19.1%	-1
	Health Care Equipment & Supplies	25.6	22.6	15.3%	13.1%	1.1%	-0.8%	3.6%	0
	Life Sciences Tools & Services	29.0	25.5	-4.1%	14.0%	-1.7%	3.2%	-28.2%	0
	Biotechnology	18.4	15.7	-6.2%	17.8%	-9.3%	-1.2%	23.6%	-1
	Pharmaceuticals	20.9	16.0	4.7%	30.6%	-12.7%	0.6%	3.2%	-1
Industrials		22.4	19.4	9.4%	15.1%	-2.1%	7.7%	-10.7%	0
	Aerospace & Defense	27.5	22.0	29.0%	25.2%	-8.5%	16.1%	-26.3%	1
	Building Products	21.4	19.4	7.2%	10.3%	1.5%	12.8%	-29.6%	0
	Trading Companies & Distributors	21.6	19.8	9.9%	8.8%	1.4%	1.3%	-8.9%	0
	Electrical Equipment	28.0	24.2	25.1%	15.4%	7.4%	12.1%	-14.3%	1
	Construction & Engineering	32.1	27.9	23.7%	15.0%	0.8%	28.6%	-25.8%	1

Combined signal rules: Green – at least 2 of the following 3 must be green: EPS growth, EPS revision, price momentum

Red – at least 2 of the following 3 must be red: EPS growth, EPS revision, price momentum

Source: Factset, DWS Investment GmbH as of 5/9/2024. Past performance may not be indicative of future results. Forecasts are not a reliable indicator of future returns.

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S&P 500 industry monitor (2 of 2)

Sector	Industry	PE on 2023	PE on 2024	2024	2025	2024 EPS	3m Total	2024 End	Combined
		EPS	Consensus EPS	Consensus EPS Growth	Consensus EPS Growth	3m Revision	Return Momentum	Upside (Intrinsic Valuation)	
	Industrial Conglomerates	17.8	16.3	-4.9%	8.8%	-12.6%	10.3%	96.6%	-1
	Machinery	18.6	17.3	1.5%	7.3%	2.3%	7.7%	-2.4%	0
	Commercial Services & Supplies	33.9	30.7	31.3%	10.5%	3.5%	9.9%	-46.9%	1
	Professional Services	25.2	22.7	11.6%	11.3%	-0.5%	-1.2%	-13.9%	0
	Air Freight & Logistics	16.7	14.3	-5.4%	16.4%	-8.3%	3.5%	-4.8%	-1
	Passenger Airlines	7.8	6.5	-4.0%	19.8%	2.1%	11.7%	14.8%	1
	Ground Transportation	26.5	21.1	12.0%	25.7%	-4.3%	-5.7%	-30.3%	-1
Information Technology		28.9	24.5	23.8%	17.9%	2.2%	1.0%	-5.7%	1
	IT Services	20.2	18.8	5.5%	7.6%	-1.1%	-14.4%	10.2%	0
	Software	32.2	28.3	19.0%	13.9%	2.4%	-4.6%	-2.1%	1
	Communications Equipment	17.0	16.1	-5.4%	5.7%	-4.2%	-0.3%	9.4%	-1
	Technology Hardware Storage & Peripherals	26.2	23.5	14.5%	11.6%	1.8%	-1.6%	-5.7%	0
	Electronic Equipment Instruments & Components	22.9	20.0	3.1%	14.4%	-1.8%	4.3%	-28.6%	-1
	Semiconductors & Semiconductor Equipment	31.4	24.0	53.8%	30.7%	4.2%	11.8%	-30.8%	1
Materials		21.7	18.7	-6.1%	15.8%	-4.8%	10.7%	-23.3%	-1
	Chemicals	22.3	19.1	-5.9%	17.2%	-7.1%	7.7%	-17.1%	-1
	Construction Materials	29.3	25.6	26.8%	14.1%	6.0%	13.8%	-47.2%	1
	Metals & Mining	18.5	16.9	-14.3%	9.9%	-0.6%	19.5%	-38.4%	0
	Containers & Packaging	20.2	16.8	-0.9%	20.1%	-3.6%	14.5%	-18.7%	-1
Real Estate		35.5	32.3	8.5%	9.7%	2.4%	-0.6%	3.5%	0
	Industrial REITs	43.9	37.4	-25.2%	17.6%	-6.0%	-17.6%	-9.9%	-1
	Hotel & Resort REITs	15.4	12.4	13.6%	24.1%	26.9%	-4.9%	32.3%	0
	Office REITs	31.3	31.2	50.1%	0.1%	-4.3%	2.3%	2.6%	0
	Health Care REITs	90.2	61.1	77.4%	47.4%	9.4%	12.0%	-4.8%	1
	Residential REITs	43.6	42.7	-18.3%	2.2%	1.4%	12.4%	1.7%	0
	Retail REITs	28.8	27.4	-1.7%	4.9%	1.0%	2.4%	-3.7%	0
	Specialized REITs	31.3	29.9	27.5%	5.0%	6.1%	-3.2%	10.9%	1
	Real Estate Management & Development	40.7	29.1	-5.8%	39.9%	-16.3%	6.0%	-46.9%	-1
Communication Services		19.3	17.2	35.6%	12.2%	6.8%	6.6%	9.5%	1
	Diversified Telecommunication Services	8.2	8.0	-7.2%	2.8%	-4.5%	2.6%	-2.2%	-1
	Wireless Telecommunication Services	18.3	14.8	39.8%	23.6%	-9.4%	1.9%	20.9%	0
	Media	9.9	9.2	8.5%	6.7%	-2.4%	-4.7%	13.7%	-1
	Entertainment	28.5	23.1	104.1%	23.5%	3.1%	1.9%	0.3%	1
	Interactive Media & Services	22.9	20.1	54.9%	13.8%	14.0%	9.2%	5.8%	1
Utilities		18.0	16.6	18.1%	8.3%	-0.2%	20.5%	-1.7%	0
	Multi-Utilities	17.8	16.3	4.9%	9.3%	-1.7%	14.3%	-4.8%	0
	Water Utilities	25.6	23.7	8.1%	8.2%	1.6%	10.0%	-22.3%	0
	Gas Utilities	17.8	16.6	9.9%	6.8%	0.8%	6.5%	-1.1%	0
	Electric Utilities	17.9	16.6	24.4%	8.0%	0.0%	21.6%	3.0%	1
		Independent Power and Renewable Electricity Producers	16.5	15.3	25.0%	8.4%	4.5%	75.7%	7.4%
S&P 500		21.6	19.0	13.0%	13.9%	0.7%	4.1%	-2.2%	0

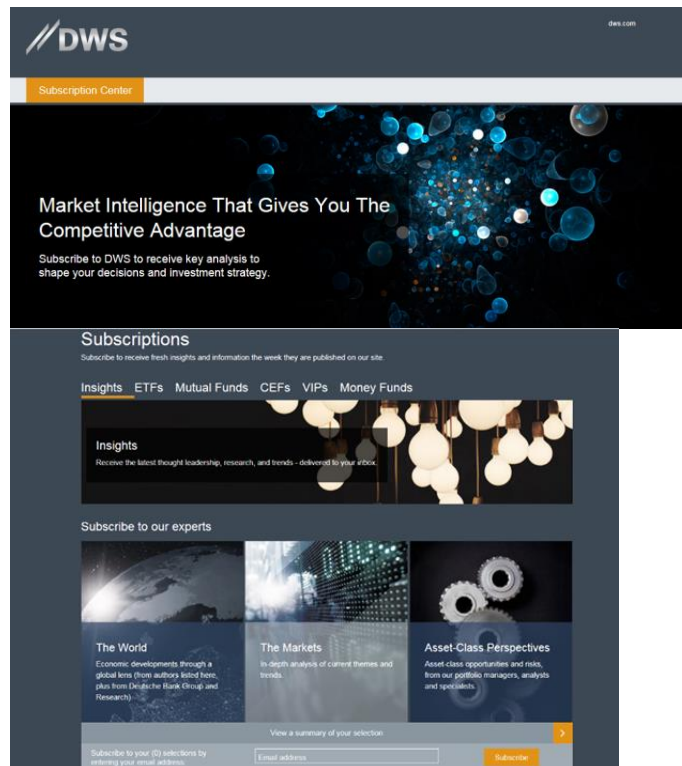
Source: Factset, DWS Investment GmbH as of 5/9/2024. Past performance may not be indicative of future results. Forecasts are not a reliable indicator of future returns.

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