



Rating
Buy

North America
 United States

TMT
 IT Hardware and Supply
 Chain

Company
Dell Technologies

Reuters
 DELL.N

Bloomberg
 DELL US

Exchange
 NYS

Ticker
 DELL

Date
 30 November 2023

Forecast Change

Price at 30 Nov 2023 (USD)	75.87
Price target	80.00
52-week range	75.87 - 36.57

F3Q Results: PC weakness masks AI strength and ISG recovery

Near-term weakness, but FY25 growth forecast is positive

F3Q revenue came in below expectations as PC demand weakened after a solid start to the quarter. The weakness is expected to persist in F4Q, leading to a revenue guide also below expectations. On a positive note, AI server momentum continued with \$500m of revenue shipped in F3Q. In addition, demand for traditional servers started to inflect, while storage demand showed normal seasonality. Importantly, DELL expects FY25 growth to be above the long-term target range of 3-4%, and AI server is a key growth driver. Post results, we lower F4Q estimates, but raise our growth assumptions for FY25 albeit at lower margins, resulting in an unchanged EPS estimate of \$7.30 that is above the Street's \$6.85. With potential for further upside from higher growth and share repurchases, we raise our target multiple by one turn, leading to an increase in our price target from \$75 to \$80. Maintain Buy.

What we liked

1) In F3Q, AI-optimized server demand nearly doubled sequentially, accounting for ~33% of total server orders in the quarter. After shipping \$500m of AI server revenues in F3Q, the company exited the quarter with \$1.6b in backlog and a multi-billion-dollar sales pipeline. 2) In ISG, DELL saw an improving demand environment for traditional servers in F3Q, in addition to ASP expansion in traditional servers. The storage business also exhibited normal seasonality. DELL expects ISG revenues to increase by mid single-digits q/q in F4Q. 3) Looking beyond FY24, DELL expects revenue to return to growth in FY25 above its long-term financial framework (3-4% CAGR) on the back of strong AI demand, along with a rebound in traditional servers. 4) F3Q operating margin at 8.8% was better than DBE at 7.5%, with both segments exceeding our expectations. We believe the outperformance was driven by both gross margins (better ASP and deflationary costs) and opex (disciplined spending).

What we monitor

1) In CSG, revenues of \$12.3b, down -11% y/y, were significantly below DBE at -5% y/y, driven by lower-than-expected units, particularly in enterprise and North America. Management expects demand to remain soft and CSG revenue to be down low single-digits sequentially in F4Q. 2) F4Q revenue/EPS guidance of \$22.0b/\$1.70 at the mid-point is worse than our prior estimates at \$23.6b/\$1.80. DELL expects CSG revenue to decline q/q in F4Q (vs. prior DBE of up +2% q/q). The company called out a slow recovery in the PC market. 3) Despite better-than-expected operating margins in F3Q, DELL anticipates operating margin to decline

Valuation & Risks

Sidney Ho
 Research Analyst
 +1-415-262-2061

Ross Seymore
 Research Analyst
 +1-415-617-3268

Key changes			
TP	75.00 to 80.00	↑	6.7%
EPS (USD)	6.30 to 6.63	↑	5.3%
Revenue (USDm)	90,499.9 to 88,105.9	↓	-2.6%
Source: Deutsche Bank			

Deutsche Bank Securities Inc.

IMPORTANT RESEARCH DISCLOSURES AND ANALYST CERTIFICATIONS LOCATED IN APPENDIX 1. Deutsche Bank does and seeks to do business with companies covered in its research reports. Thus, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of this report. Investors should consider this report as only a single factor in making their investment decision. MCI (P) 041/10/2023.



sequentially in F4Q, largely due to an increasingly competitive pricing environment particularly in CSG going forward, as well as the potential for inflationary component costs.

Results and guide

F3Q (Oct) revenues of \$22.3b (down -10% y/y and down -3% q/q) were below DBe/Street at \$23b and the guidance of \$22.5-23.5b. CSG revs of \$12.3b were down -11% y/y (vs. DBe -5% y/y), ISG revs of \$8.5b were down -12% y/y (vs. DBe -12% y/y) and Others revs came in at \$1.5b (vs. DBe \$1.5b). Gross margins at 23.7% were above DBe of 22.6%, and operating margins at 8.8% were above DBe of 7.5%. The resulting EPS of \$1.88 came in above DBe/Street at \$1.45/\$1.46. DELL expects F4Q (Jan) revenue of \$21.5-22.5b (below prior DBe/Street of \$23.6b/\$23.9b) and EPS of \$1.70 +/- \$0.10 (below prior DBe/Street at \$1.80/\$1.81). Post results, we lower our EPS estimates for F4Q from \$1.80 to \$1.70, but raise our FY24E (CY23E) from \$6.30 to \$6.63 and maintain FY25E (CY24E) of \$7.30.

Valuation and risks

Our price target of \$80 (up from \$75) is based on a ~11x CY24E EPS (vs. ~10x prior), which is at a slight premium to its peers as we believe estimates for DELL are more de-risked. We raise our target multiple by one turn to reflect potential upside to our EPS estimates from higher growth and share repurchases. Key downside risks include a slowing IT spending environment and loss of market share in its core businesses (storage, networking, servers, PCs, virtualization).

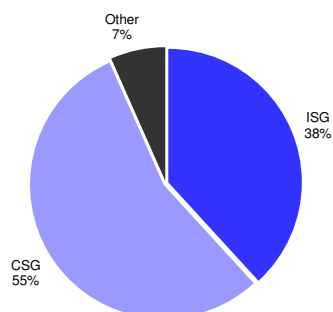


Figure 1: F3Q (Oct-23) results summary

in \$m	Oct-23 DBe	Oct-23 Actual	Actual vs. DBe	Comments
Revenues	\$23,000	\$22,251	(\$749)	Weakness in CSG
q/q	0%	-3%		
y/y	-7%	-10%		
Gross Margin	22.6%	23.7%	113 bps	
Opex	3,459	3,312	(\$147)	
Operating Margin	7.5%	8.8%	129 bps	
Tax rate	22.5%	15.4%		Guide F4Q tax rate of 20%
EPS (adjusted)	\$1.45	\$1.88	\$0.43	Higher GM/lower opex more than offset lower revs
Revenue by Segment				
ISG	\$8,464	\$8,499	\$35	
ISG q/q	0%	0%		Guide F4Q up mid-single digit q/q
ISG y/y	-12%	-12%		
CSG	\$13,017	\$12,276	(\$741)	
CSG q/q	1%	-5%		Guide F4Q down low-single digit q/q
CSG y/y	-5%	-11%		
Other	\$1,519	\$1,476	(\$43)	Guide F4Q down low-20% q/q
Balance sheet				
Cash and marketable securities	\$10,345	\$9,592	(\$753)	Higher working capital and higher share repurchases
Account receivable	\$10,381	\$9,720	(\$661)	
Inventory	\$3,468	\$3,381	(\$87)	
LT debt	\$26,638	\$26,617	(\$21)	
Cash flow				
Cash flow from operations	\$2,515	\$2,152	(\$363)	Higher working capital
Capital expenditures	(\$697)	(\$704)	(\$7)	
Free cash flow	\$1,818	\$1,448	(\$370)	
Share repurchases	(\$400)	(\$744)	(\$344)	Repurchased ~11.2m shares
Dividend	(\$267)	(\$266)	\$1	

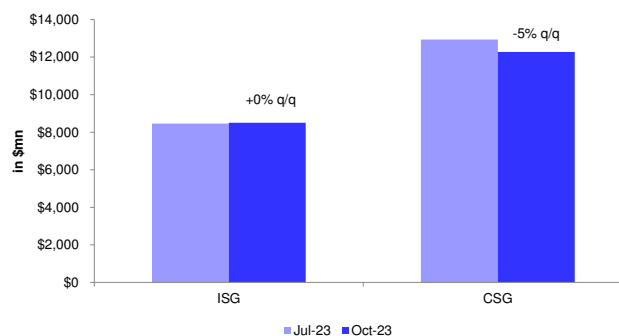
Source : Company Data, Deutsche Bank estimates

Figure 2: Segment revenue mix



Source : Company Data, Deutsche Bank

Figure 3: Q/Q growth by segment



Source : Company Data, Deutsche Bank



Guidance and Estimates

DELL provided the following guidance for F4Q24 (Jan) and FY24 :

- F2Q23 (Jan)
 - **Revenues:** \$21.5-22.5b
 - **Gross margin:** down q/q
 - **Diluted share count:** 729-733m
 - **Non-GAAP EPS:** \$1.70 +/- \$0.10
- FY24 (ending Jan 2024)
 - **Tax Rate:** 19.5%
 - **Non-GAAP EPS:** \$6.63 +/- \$0.10

Figure 4: Summary of estimate changes

Year end: Jan	Oct-23		Jan-24E		Apr-24E		FY24E/CY23E		FY25E/CY24E	
(in \$m)	Old	Actual	Old	New	Old	New	Old	New	Old	New
Sales	23,000	22,249	23,644	22,001	22,406	21,169	90,500	88,108	93,749	91,081
q/q growth	0%	-3%	3%	-1%	-5%	-4%				
y/y growth	-7%	-10%	-6%	-12%	7%	1%	-12%	-14%	4%	3%
Gross margin	22.6%	23.7%	23.2%	23.6%	23.0%	23.4%	23.6%	24.0%	23.6%	23.6%
Operating margin	7.5%	8.8%	8.6%	8.4%	7.9%	7.8%	8.1%	8.4%	8.6%	8.4%
Adjusted EPS	\$1.45	\$1.88	\$1.80	\$1.70	\$1.53	\$1.50	\$6.30	\$6.63	\$7.30	\$7.30

Source : Company Data, Deutsche Bank estimates

Valuation and Risks

Our price target is based on ~11x CY24E EPS, which is at a slight premium to its peers as we believe estimates for DELL are more de-risked. Key downside risks include a slowing IT spending environment and loss of market share in its core businesses (storage, networking, servers, PCs, virtualization).

Figure 5: DELL income statement summary

Year End January	FY2023				FY2024E				FY2025E				FY2026E				CY21 FY22	CY22 FY23	CY23E FY24E	CY24E FY25E	CY25E FY26E
\$ in millions	1Q Apr-22	2Q Jul-22	3Q Oct-22	4Q Jan-23	1Q Apr-23	2Q Jul-23	3Q Oct-23	4Q Jan-24	1Q Apr-24	2Q Jul-24	3Q Oct-24	4Q Jan-25	1Q Apr-25	2Q Jul-25	3Q Oct-25	4Q Jan-26					
Income Statement																					
Non-GAAP Revenues	\$26,116	\$26,425	\$24,721	\$25,039	\$20,922	\$22,934	\$22,249	\$22,001	\$21,169	\$22,654	\$22,853	\$24,405	\$22,608	\$23,863	\$23,331	\$24,441	\$101,229	\$102,301	\$88,106	\$91,081	\$94,242
Q/Q Change	-7%	1%	-6%	1%	-16%	10%	-3%	-1%	-4%	7%	1%	7%	-7%	6%	-2%	5%					
Y/Y Change	16%	9%	-6%	-11%	-20%	-13%	-10%	-12%	1%	-1%	3%	11%	7%	5%	2%	0%	17%	1%	-14%	3%	3%
Non-GAAP COGS	20,175	20,775	18,856	19,068	15,758	17,398	16,973	16,808	16,211	17,340	17,466	18,577	17,408	18,357	17,887	18,597	78,545	78,874	66,937	69,595	72,250
Non-GAAP Gross Profits	5,941	5,650	5,865	5,971	5,164	5,536	5,276	5,193	4,958	5,313	5,387	5,828	5,200	5,506	5,444	5,843	22,684	23,427	21,169	21,486	21,993
Non-GAAP Gross Margin %	22.7%	21.4%	23.7%	23.8%	24.7%	24.1%	23.7%	23.6%	23.4%	23.5%	23.6%	23.9%	23.0%	23.1%	23.3%	23.9%	22.4%	22.9%	24.0%	23.6%	23.3%
Non-GAAP Selling, General, and Administrative	3,125	3,072	2,808	3,006	2,878	2,854	2,620	2,666	2,639	2,692	2,746	2,911	2,794	2,794	2,822	2,977	12,570	12,011	11,018	10,988	11,388
Non-GAAP Research and Development	681	626	677	795	688	705	692	678	665	685	712	748	710	710	717	753	2,328	2,779	2,763	2,809	2,891
Non-GAAP Total Operating Expenses	3,806	3,698	3,485	3,801	3,566	3,559	3,312	3,344	3,304	3,377	3,458	3,658	3,504	3,504	3,539	3,730	14,898	14,790	13,781	13,796	14,278
% of Sales	14.6%	14.0%	14.1%	15.2%	17.0%	15.5%	14.9%	15.2%	15.6%	14.9%	15.1%	15.0%	15.5%	14.7%	15.2%	15.3%	14.7%	14.5%	15.6%	15.1%	15.2%
Non-GAAP Operating Income	2,135	1,952	2,380	2,170	1,598	1,977	1,964	1,849	1,655	1,937	1,930	2,169	1,695	2,001	1,905	2,113	7,786	8,637	7,388	7,690	7,714
Non-GAAP Operating Margin %	8.2%	7.4%	9.6%	8.7%	7.6%	8.6%	8.8%	8.4%	7.8%	8.5%	8.4%	8.9%	7.5%	8.4%	8.2%	8.6%	7.7%	8.4%	8.4%	8.4%	8.2%
Non-GAAP Interest and Other, Net	(358)	(371)	(353)	(383)	(353)	(366)	(322)	(294)	(252)	(241)	(231)	(231)	(209)	(201)	(191)	(194)	(1,724)	(1,465)	(1,335)	(955)	(796)
Non-GAAP Pre-tax Income	1,777	1,581	2,027	1,787	1,245	1,611	1,642	1,555	1,402	1,696	1,698	1,939	1,486	1,800	1,713	1,919	6,062	7,172	6,053	6,735	6,918
Non-GAAP Pre-tax Margin%	6.8%	6.0%	8.2%	7.1%	6.0%	7.0%	7.4%	7.1%	6.6%	7.5%	7.4%	7.9%	6.6%	7.5%	7.3%	7.8%	6.0%	7.0%	6.9%	7.4%	7.3%
Non-GAAP Income Tax Expense (Benefit)	343	315	322	465	283	328	253	311	315	382	382	436	334	405	385	432	1,137	1,445	1,175	1,515	1,557
Non-GAAP Tax Rate	19.3%	19.9%	15.9%	26.0%	22.7%	20.4%	15.4%	20.0%	22.5%	22.5%	22.5%	22.5%	22.5%	22.5%	22.5%	22.5%	18.8%	20.1%	19.4%	22.5%	22.5%
Non-GAAP Net Income	1,434	1,266	1,705	1,322	962	1,283	1,389	1,244	1,087	1,314	1,316	1,503	1,152	1,395	1,328	1,487	4,925	5,727	4,878	5,220	5,362
Non-GAAP Net Margin %	5.5%	4.8%	6.9%	5.3%	4.6%	5.6%	6.2%	5.7%	5.1%	5.8%	5.8%	6.2%	5.1%	5.8%	5.7%	6.1%	4.9%	5.6%	5.5%	5.7%	5.7%
Adjusted Non-GAAP Net Income To Dell Tech	1,435	1,268	1,707	1,324	965	1,285	1,389	1,244	1,087	1,314	1,316	1,503	1,152	1,395	1,328	1,487	4,924	5,734	4,883	5,220	5,362
Non-GAAP Net Margin %	5.5%	4.8%	6.9%	5.3%	4.6%	5.6%	6.2%	5.7%	5.1%	5.8%	5.8%	6.2%	5.1%	5.8%	5.7%	6.1%	4.9%	5.6%	5.5%	5.7%	5.7%
Non-GAAP EBITDA	2,609	2,449	2,946	2,775	2,204	2,595	2,579	2,466	2,252	2,562	2,523	2,793	2,286	2,615	2,475	2,705	9,051	10,779	9,844	10,131	10,080
Non-GAAP EBITDA Margin %	10.0%	9.3%	11.9%	11.1%	10.5%	11.3%	11.6%	11.2%	10.6%	11.3%	11.0%	11.4%	10.1%	11.0%	10.6%	11.1%	8.9%	10.5%	11.2%	11.1%	10.7%
GAAP Basic Shares Outstanding	754	739	728	716	724	726	722	709	702	696	689	683	676	669	662	656	762	734	720	693	666
Non-GAAP Diluted Shares Outstanding	780	755	742	735	737	738	740	732	725	718	711	705	698	691	684	677	792	753	737	715	687
GAAP Diluted EPS	\$1.37	\$0.68	\$0.33	\$0.84	\$0.79	\$0.63	\$1.36	\$1.18	\$1.01	\$1.30	\$1.31	\$1.56	\$1.11	\$1.44	\$1.37	\$1.60	\$7.36	\$3.24	\$3.96	\$5.18	\$5.52
Non-GAAP Diluted EPS	\$1.84	\$1.68	\$2.30	\$1.80	\$1.31	\$1.741	\$1.88	\$1.70	\$1.50	\$1.83	\$1.85	\$2.13	\$1.65	\$2.02	\$1.94	\$2.20	\$6.22	\$7.61	\$6.63	\$7.30	\$7.80
Dividends per share	\$0.33	\$0.33	\$0.33	\$0.33	\$0.37	\$0.37	\$0.37	\$0.37	\$0.40	\$0.40	\$0.40	\$0.40	\$0.45	\$0.45	\$0.45	\$0.45	\$0.00	\$1.32	\$1.48	\$1.60	\$1.80

Source : Company Data, Deutsche Bank estimates





Appendix 1

Important Disclosures

*Other information available upon request

Disclosure checklist			
Company	Ticker	Recent price*	Disclosure
Dell Technologies	DELL.N	75.87 (USD) 30 Nov 2023	1, 7, 8, 14, 15, 24

*Prices are current as of the end of the previous trading session unless otherwise indicated and are sourced from local exchanges via Reuters, Bloomberg and other vendors. Other information is sourced from Deutsche Bank, subject companies, and other sources. For disclosures pertaining to recommendations or estimates made on securities other than the primary subject of this research, please see the most recently published company report or visit our global disclosure look-up page on our website at <https://research.db.com/Research/Disclosures/EquityResearchDisclosures>. Aside from within this report, important risk and conflict disclosures can also be found at <https://research.db.com/Research/Disclosures/Disclaimer>. Investors are strongly encouraged to review this information before investing.

Important Disclosures Required by U.S. Regulators

Disclosures marked with an asterisk may also be required by at least one jurisdiction in addition to the United States. See Important Disclosures Required by Non-US Regulators and Explanatory Notes.

1. Within the past year, Deutsche Bank and/or its affiliate(s) has managed or co-managed a public offering for this company, for which it received fees.
7. Deutsche Bank and/or its affiliate(s) has received compensation from this company for the provision of investment banking or financial advisory services within the past year.
8. Deutsche Bank and/or its affiliate(s) expects to receive, or intends to seek, compensation for investment banking services from this company in the next three months.
14. Deutsche Bank and/or its affiliate(s) has received compensation from this company within the past year for non-investment banking related services.
15. This company has been a client of Deutsche Bank Securities Inc. within the past year during which time it received investment banking services.

Important Disclosures Required by Non-U.S. Regulators

Disclosures marked with an asterisk may also be required by at least one jurisdiction in addition to the United States. See Important Disclosures Required by Non-US Regulators and Explanatory Notes.

1. Within the past year, Deutsche Bank and/or its affiliate(s) has managed or co-managed a public offering for this company, for which it received fees.
24. Deutsche Bank and/or its affiliate(s) is or has been over the previous 12 months party to an agreement with the company relating to the provision of services set out in Sections A and B of Annex I of Directive 2014/65/EU, or has over the previous 12 months been obliged or entitled (as applicable) to pay or receive compensation relating to the provision of services set out in Sections A and B of Annex I of Directive 2014/65/EU.

For disclosures pertaining to recommendations or estimates made on securities other than the primary subject of this research, please see the most recently published company report or visit our global disclosure look-up page on our website at <https://research.db.com/Research/Disclosures/EquityResearchDisclosures>. Aside from within this report, important risk and conflict disclosures can also be found at <https://research.db.com/Research/Disclosures/Disclaimer>. Investors are strongly encouraged to review this information before investing.

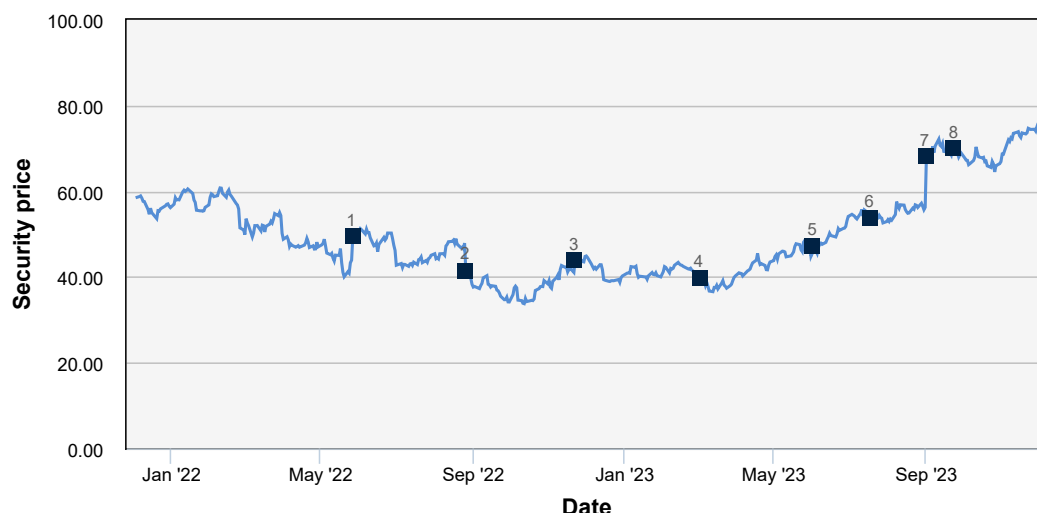
Analyst Certification

The views expressed in this report accurately reflect the personal views of the undersigned lead analyst(s) about the subject issuer and the securities of the issuer. In addition, the undersigned lead analyst(s) has not and will not receive any compensation for providing a specific recommendation or view in this report. Sidney Ho.



Historical recommendations and target price: Dell Technologies (DELL.N)

(as of 11/30/2023)



Current Recommendations

Buy
 Hold
 Sell
 Not Rated
 Suspended Rating

** Analyst is no longer at Deutsche Bank

1. 05/27/2022	Buy, Target Price Change USD 60.00, Current Price USD 49.58 Sidney Ho	5. 06/02/2023	Buy, Target Price Change USD 48.00, Current Price USD 47.27 Sidney Ho
2. 08/26/2022	Buy, Target Price Change USD 55.00, Current Price USD 41.43 Sidney Ho	6. 07/18/2023	Buy, Target Price Change USD 60.00, Current Price USD 53.83 Sidney Ho
3. 11/22/2022	Buy, Target Price Change USD 48.00, Current Price USD 43.85 Sidney Ho	7. 09/01/2023	Buy, Target Price Change USD 68.00, Current Price USD 68.19 Sidney Ho
4. 03/03/2023	Buy, Target Price Change USD 45.00, Current Price USD 39.79 Sidney Ho	8. 09/24/2023	Buy, Target Price Change USD 75.00, Current Price USD 70.05 Sidney Ho

Equity Rating Key

Buy: Based on a current 12-month view of TSR, we recommend that investors buy the stock.

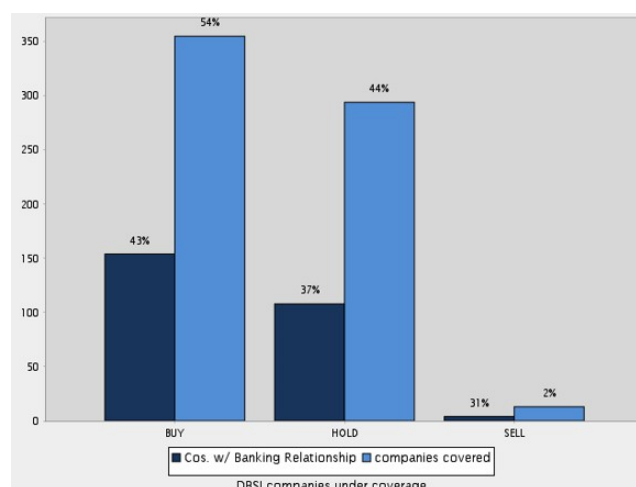
Sell: Based on a current 12-month view of TSR, we recommend that investors sell the stock.

Hold: We take a neutral view on the stock 12-months out and, based on this time horizon, do not recommend either a Buy or Sell.

TSR = Total Shareholder Return. Percentage change in share price from current price to projected target price plus projected dividend yield

Newly issued research recommendations and target prices supersede previously published research.

Equity rating dispersion and banking relationships





Additional Information

The information and opinions in this report were prepared by Deutsche Bank AG or one of its affiliates (collectively 'Deutsche Bank'). Though the information herein is believed to be reliable and has been obtained from public sources believed to be reliable, Deutsche Bank makes no representation as to its accuracy or completeness. Hyperlinks to third-party websites in this report are provided for reader convenience only. Deutsche Bank neither endorses the content nor is responsible for the accuracy or security controls of those websites.

Effective 13 October 2023, Deutsche Bank AG acquired Numis Corporation Plc and its subsidiaries (the "Numis Group"). Numis Securities Limited ("NSL") is a member of the Numis Group and a firm authorised and regulated by the Financial Conduct Authority (Firm Reference Number: 144822). Deutsche Bank AG provides clients with, amongst other services, Investment Research services. NSL provides clients with, amongst other services, non-independent research services.

During an initial integration process, the research departments of Deutsche Bank AG and NSL will remain operationally distinct. Consequently, disclosures relating to conflicts of interest that may exist for Deutsche Bank AG and/or its affiliates do not currently take into account the business and activities of the Numis Group. The conflicts of interest that may exist for the Numis Group, in relation to the provision of research, can be found on the Numis website at <https://www.numis.com/legal-and-regulatory/conditions-and-disclaimers-that-govern-research-contained-in-the-research-pages-of-this-website>. The disclosures on this Numis webpage do not currently take into account the business and activities of Deutsche Bank AG and/or its affiliates which are not members of the Numis Group.

Additionally, any detailed conflicts of interest disclosures pertaining to a specific recommendation or estimate made on a security mentioned in this report or which have been included in our most recently published company report or found on our global disclosure look-up page, do not currently take into account the business and activities of the Numis Group. Instead, details of detailed conflicts of interest disclosures for the Numis Group, relating to specific issuers or securities, can be found at: https://library.numis.com/regulatory_notice. The issuer/security-specific conflict of interest disclosures on this Numis webpage do not take into account the business and activities of Deutsche Bank and/or its affiliates which are not members of the Numis Group.

If you use the services of Deutsche Bank in connection with a purchase or sale of a security that is discussed in this report, or is included or discussed in another communication (oral or written) from a Deutsche Bank analyst, Deutsche Bank may act as principal for its own account or as agent for another person.

Deutsche Bank may consider this report in deciding to trade as principal. It may also engage in transactions, for its own account or with customers, in a manner inconsistent with the views taken in this research report. Others within Deutsche Bank, including strategists, sales staff and other analysts, may take views that are inconsistent with those taken in this research report. Deutsche Bank issues a variety of research products, including fundamental analysis, equity-linked analysis, quantitative analysis and trade ideas. Recommendations contained in one type of communication may differ from recommendations contained in others, whether as a result of differing time horizons, methodologies, perspectives or otherwise. Deutsche Bank and/or its affiliates may also be holding debt or equity securities of the issuers it writes on. Analysts are paid in part based on the profitability of Deutsche Bank AG and its affiliates, which includes investment banking, trading and principal trading revenues.

Opinions, estimates and projections constitute the current judgment of the author as of the date of this report. They do not necessarily reflect the opinions of Deutsche Bank and are subject to change without notice. Deutsche Bank provides liquidity for buyers and sellers of securities issued by the companies it covers. Deutsche Bank research analysts sometimes have shorter-term trade ideas that may be inconsistent with Deutsche Bank's existing longer-term ratings. Some trade ideas for equities are listed as Catalyst Calls on the Research Website (<https://research.db.com/Research/>), and can be found on the general coverage list and also on the covered company's page. A Catalyst Call represents a high-conviction belief by an analyst that a stock will outperform or underperform the market and/or a specified sector over a time frame of no less than two weeks and no more than three months. In addition to Catalyst Calls, analysts may occasionally discuss with our clients, and with Deutsche Bank salespersons and traders, trading strategies or ideas that reference catalysts or events that may have a near-term or medium-term impact on the market price of the securities discussed in this report, which impact may be directionally counter to the analysts' current 12-month view of total return or investment return as described herein. Deutsche Bank has no obligation to update, modify or amend this report or to otherwise notify a recipient thereof if an opinion, forecast or estimate changes or becomes inaccurate. Coverage and the frequency of changes in market conditions and in both general and company-specific economic prospects make it difficult to update research at defined intervals. Updates are at the sole discretion of the coverage analyst or of the Research Department Management, and the majority of reports are published at irregular intervals. This report is provided for informational purposes only and does not take into account the particular investment objectives, financial situations, or needs of individual clients. It is not an offer or a solicitation of an offer to buy or sell any financial instruments or to participate in any particular trading strategy. Target prices are inherently imprecise and a product of the analyst's judgment. The financial instruments discussed in this report may not be suitable for all investors, and investors must make their own informed investment decisions. Prices and availability of financial instruments are subject to change without notice, and investment transactions can lead to losses as a result of price fluctuations and other factors. If a financial instrument is denominated in a currency other than an investor's currency, a change in exchange rates may adversely affect the investment. Past performance is not necessarily indicative of future results. Performance calculations exclude transaction costs, unless otherwise indicated. Unless otherwise indicated, prices are current as of the end of the previous trading session and are sourced from local exchanges via Reuters, Bloomberg and other vendors. Data is also sourced from Deutsche Bank, subject companies, and other parties.



The Deutsche Bank Research Department is independent of other business divisions of the Bank. Details regarding our organizational arrangements and information barriers we have to prevent and avoid conflicts of interest with respect to our research are available on our website (<https://research.db.com/Research/>) under Disclaimer.

Macroeconomic fluctuations often account for most of the risks associated with exposures to instruments that promise to pay fixed or variable interest rates. For an investor who is long fixed-rate instruments (thus receiving these cash flows), increases in interest rates naturally lift the discount factors applied to the expected cash flows and thus cause a loss. The longer the maturity of a certain cash flow and the higher the move in the discount factor, the higher will be the loss. Upside surprises in inflation, fiscal funding needs, and FX depreciation rates are among the most common adverse macroeconomic shocks to receivers. But counterparty exposure, issuer creditworthiness, client segmentation, regulation (including changes in assets holding limits for different types of investors), changes in tax policies, currency convertibility (which may constrain currency conversion, repatriation of profits and/or liquidation of positions), and settlement issues related to local clearing houses are also important risk factors. The sensitivity of fixed-income instruments to macroeconomic shocks may be mitigated by indexing the contracted cash flows to inflation, to FX depreciation, or to specified interest rates - these are common in emerging markets. The index fixings may - by construction - lag or mis-measure the actual move in the underlying variables they are intended to track. The choice of the proper fixing (or metric) is particularly important in swaps markets, where floating coupon rates (i.e., coupons indexed to a typically short-dated interest rate reference index) are exchanged for fixed coupons. Funding in a currency that differs from the currency in which coupons are denominated carries FX risk. Options on swaps (swaptions) the risks typical to options in addition to the risks related to rates movements.

Derivative transactions involve numerous risks including market, counterparty default and illiquidity risk. The appropriateness of these products for use by investors depends on the investors' own circumstances, including their tax position, their regulatory environment and the nature of their other assets and liabilities; as such, investors should take expert legal and financial advice before entering into any transaction similar to or inspired by the contents of this publication. The risk of loss in futures trading and options, foreign or domestic, can be substantial. As a result of the high degree of leverage obtainable in futures and options trading, losses may be incurred that are greater than the amount of funds initially deposited - up to theoretically unlimited losses. Trading in options involves risk and is not suitable for all investors. Prior to buying or selling an option, investors must review the "Characteristics and Risks of Standardized Options", at <http://www.optionsclearing.com/about/publications/character-risks.jsp>. If you are unable to access the website, please contact your Deutsche Bank representative for a copy of this important document.

Participants in foreign exchange transactions may incur risks arising from several factors, including the following: (i) exchange rates can be volatile and are subject to large fluctuations; (ii) the value of currencies may be affected by numerous market factors, including world and national economic, political and regulatory events, events in equity and debt markets and changes in interest rates; and (iii) currencies may be subject to devaluation or government-imposed exchange controls, which could affect the value of the currency. Investors in securities such as ADRs, whose values are affected by the currency of an underlying security, effectively assume currency risk.

Unless governing law provides otherwise, all transactions should be executed through the Deutsche Bank entity in the investor's home jurisdiction. Aside from within this report, important conflict disclosures can also be found at <https://research.db.com/Research/> on each company's research page. Investors are strongly encouraged to review this information before investing.

Deutsche Bank (which includes Deutsche Bank AG, its branches and affiliated companies) is not acting as a financial adviser, consultant or fiduciary to you or any of your agents (collectively, "You" or "Your") with respect to any information provided in this report. Deutsche Bank does not provide investment, legal, tax or accounting advice, Deutsche Bank is not acting as your impartial adviser, and does not express any opinion or recommendation whatsoever as to any strategies, products or any other information presented in the materials. Information contained herein is being provided solely on the basis that the recipient will make an independent assessment of the merits of any investment decision, and it does not constitute a recommendation of, or express an opinion on, any product or service or any trading strategy.

The information presented is general in nature and is not directed to retirement accounts or any specific person or account type, and is therefore provided to You on the express basis that it is not advice, and You may not rely upon it in making Your decision. The information we provide is being directed only to persons we believe to be financially sophisticated, who are capable of evaluating investment risks independently, both in general and with regard to particular transactions and investment strategies, and who understand that Deutsche Bank has financial interests in the offering of its products and services. If this is not the case, or if You are an IRA or other retail investor receiving this directly from us, we ask that you inform us immediately.

In July 2018, Deutsche Bank revised its rating system for short term ideas whereby the branding has been changed to Catalyst Calls ("CC") from SOLAR ideas; the rating categories for Catalyst Calls originated in the Americas region have been made consistent with the categories used by Analysts globally; and the effective time period for CCs has been reduced from a maximum of 180 days to 90 days.

United States: Approved and/or distributed by Deutsche Bank Securities Incorporated, a member of FINRA, NFA and SIPC. Analysts located outside of the United States are employed by non-US affiliates that are not subject to FINRA regulations.

European Economic Area (exc. United Kingdom): Approved and/or distributed by Deutsche Bank AG, a joint stock corporation with limited liability incorporated in the Federal Republic of Germany with its principal office in Frankfurt am Main. Deutsche Bank AG is authorized under German Banking Law and is subject to supervision by the European Central Bank and



by BaFin, Germany's Federal Financial Supervisory Authority.

United Kingdom: Approved and/or distributed by Deutsche Bank AG acting through its London Branch at Winchester House, 1 Great Winchester Street, London EC2N 2DB. Deutsche Bank AG in the United Kingdom is authorised by the Prudential Regulation Authority and is subject to limited regulation by the Prudential Regulation Authority and Financial Conduct Authority. Details about the extent of our authorisation and regulation are available on request.

Hong Kong SAR: Distributed by Deutsche Bank AG, Hong Kong Branch except for any research content relating to futures contracts within the meaning of the Hong Kong Securities and Futures Ordinance Cap. 571. Research reports on such futures contracts are not intended for access by persons who are located, incorporated, constituted or resident in Hong Kong. The author(s) of a research report may not be licensed to carry on regulated activities in Hong Kong and, if not licensed, do not hold themselves out as being able to do so. The provisions set out above in the 'Additional Information' section shall apply to the fullest extent permissible by local laws and regulations, including without limitation the Code of Conduct for Persons Licensed or Registered with the Securities and Futures Commission. This report is intended for distribution only to 'professional investors' as defined in Part 1 of Schedule of the SFO. This document must not be acted or relied on by persons who are not professional investors. Any investment or investment activity to which this document relates is only available to professional investors and will be engaged only with professional investors.

India: Prepared by Deutsche Equities India Private Limited (DEIPL) having CIN: U65990MH2002PTC137431 and registered office at 14th Floor, The Capital, C-70, G Block, Bandra Kurla Complex, Mumbai (India) 400051. Tel: + 91 22 7180 4444. It is registered by the Securities and Exchange Board of India (SEBI) as a Stock broker bearing registration no.: INZ000252437; Merchant Banker bearing SEBI Registration no.: INM000010833 and Research Analyst bearing SEBI Registration no.: INH000001741. DEIPL's Compliance / Grievance officer is Ms. Rashmi Poddar (Tel: +91 22 7180 4929, email ID: complaints.deipl@db.com). Registration granted by SEBI and certification from NISM in no way guarantee performance of DEIPL or provide any assurance of returns to investors. Investment in securities market are subject to market risks. Read all the related documents carefully before investing. DEIPL may have received administrative warnings from the SEBI for breaches of Indian regulations. Deutsche Bank and/or its affiliate(s) may have debt holdings or positions in the subject company. With regard to information on associates, please refer to the "Shareholdings" section in the Annual Report at: <https://www.db.com/ir/en/annual-reports.htm>.

Japan: Approved and/or distributed by Deutsche Securities Inc.(DSI). Registration number - Registered as a financial instruments dealer by the Head of the Kanto Local Finance Bureau (Kinsho) No. 117. Member of associations: JSDA, Type II Financial Instruments Firms Association and The Financial Futures Association of Japan. Commissions and risks involved in stock transactions - for stock transactions, we charge stock commissions and consumption tax by multiplying the transaction amount by the commission rate agreed with each customer. Stock transactions can lead to losses as a result of share price fluctuations and other factors. Transactions in foreign stocks can lead to additional losses stemming from foreign exchange fluctuations. We may also charge commissions and fees for certain categories of investment advice, products and services. Recommended investment strategies, products and services carry the risk of losses to principal and other losses as a result of changes in market and/or economic trends, and/or fluctuations in market value. Before deciding on the purchase of financial products and/or services, customers should carefully read the relevant disclosures, prospectuses and other documentation. 'Moody's', 'Standard Poor's', and 'Fitch' mentioned in this report are not registered credit rating agencies in Japan unless Japan or 'Nippon' is specifically designated in the name of the entity. Reports on Japanese listed companies not written by analysts of DSI are written by Deutsche Bank Group's analysts with the coverage companies specified by DSI. Some of the foreign securities stated on this report are not disclosed according to the Financial Instruments and Exchange Law of Japan. Target prices set by Deutsche Bank's equity analysts are based on a 12-month forecast period.

Korea: Distributed by Deutsche Securities Korea Co.

South Africa: Deutsche Bank AG Johannesburg is incorporated in the Federal Republic of Germany (Branch Register Number in South Africa: 1998/003298/10).

Singapore: This report is issued by Deutsche Bank AG, Singapore Branch (One Raffles Quay #18-00 South Tower Singapore 048583, 65 6423 8001), which may be contacted in respect of any matters arising from, or in connection with, this report. Where this report is issued or promulgated by Deutsche Bank in Singapore to a person who is not an accredited investor, expert investor or institutional investor (as defined in the applicable Singapore laws and regulations), they accept legal responsibility to such person for its contents.

Taiwan: Information on securities/investments that trade in Taiwan is for your reference only. Readers should independently evaluate investment risks and are solely responsible for their investment decisions. Deutsche Bank research may not be distributed to the Taiwan public media or quoted or used by the Taiwan public media without written consent. Information on securities/instruments that do not trade in Taiwan is for informational purposes only and is not to be construed as a recommendation to trade in such securities/instruments.

Qatar: Deutsche Bank AG in the Qatar Financial Centre (registered no. 00032) is regulated by the Qatar Financial Centre Regulatory Authority. Deutsche Bank AG - QFC Branch may undertake only the financial services activities that fall within the scope of its existing QFCRA license. Its principal place of business in the QFC: Qatar Financial Centre, Tower, West Bay, Level 5, PO Box 14928, Doha, Qatar. This information has been distributed by Deutsche Bank AG. Related financial products or services are only available only to Business Customers, as defined by the Qatar Financial Centre Regulatory Authority.



Russia: The information, interpretation and opinions submitted herein are not in the context of, and do not constitute, any appraisal or evaluation activity requiring a license in the Russian Federation.

Kingdom of Saudi Arabia: Deutsche Securities Saudi Arabia (DSSA) is a closed joint stock company authorized by the Capital Market Authority of the Kingdom of Saudi Arabia with a license number (No. 37-07073) to conduct the following business activities: Dealing, Arranging, Advising, and Custody activities. DSSA registered office is Faisaliah Tower, 17th Floor, King Fahad Road - Al Olaya District Riyadh, Kingdom of Saudi Arabia P.O. Box 301806.

United Arab Emirates: Deutsche Bank AG in the Dubai International Financial Centre (registered no. 00045) is regulated by the Dubai Financial Services Authority. Deutsche Bank AG - DIFC Branch may only undertake the financial services activities that fall within the scope of its existing DFSA license. Principal place of business in the DIFC: Dubai International Financial Centre, The Gate Village, Building 5, PO Box 504902, Dubai, U.A.E. This information has been distributed by Deutsche Bank AG. Related financial products or services are available only to Professional Clients, as defined by the Dubai Financial Services Authority.

Australia and New Zealand: This research is intended only for 'wholesale clients' within the meaning of the Australian Corporations Act and New Zealand Financial Advisors Act, respectively. Please refer to Australia-specific research disclosures and related information at https://www.dbresearch.com/PROD/RPS_EN-PROD/PROD000000000521304.xhtml. Where research refers to any particular financial product recipients of the research should consider any product disclosure statement, prospectus or other applicable disclosure document before making any decision about whether to acquire the product. In preparing this report, the primary analyst or an individual who assisted in the preparation of this report has likely been in contact with the company that is the subject of this research for confirmation/clarification of data, facts, statements, permission to use company-sourced material in the report, and/or site-visit attendance. Without prior approval from Research Management, analysts may not accept from current or potential Banking clients the costs of travel, accommodations, or other expenses incurred by analysts attending site visits, conferences, social events, and the like. Similarly, without prior approval from Research Management and Anti-Bribery and Corruption ("ABC") team, analysts may not accept perks or other items of value for their personal use from issuers they cover.

Additional information relative to securities, other financial products or issuers discussed in this report is available upon request. This report may not be reproduced, distributed or published without Deutsche Bank's prior written consent.

Backtested, hypothetical or simulated performance results have inherent limitations. Unlike an actual performance record based on trading actual client portfolios, simulated results are achieved by means of the retroactive application of a backtested model itself designed with the benefit of hindsight. Taking into account historical events the backtesting of performance also differs from actual account performance because an actual investment strategy may be adjusted any time, for any reason, including a response to material, economic or market factors. The backtested performance includes hypothetical results that do not reflect the reinvestment of dividends and other earnings or the deduction of advisory fees, brokerage or other commissions, and any other expenses that a client would have paid or actually paid. No representation is made that any trading strategy or account will or is likely to achieve profits or losses similar to those shown. Alternative modeling techniques or assumptions might produce significantly different results and prove to be more appropriate. Past hypothetical backtest results are neither an indicator nor guarantee of future returns. Actual results will vary, perhaps materially, from the analysis.

The method for computing individual E,S,G and composite ESG scores set forth herein is a novel method developed by the Research department within Deutsche Bank AG, computed using a systematic approach without human intervention. Different data providers, market sectors and geographies approach ESG analysis and incorporate the findings in a variety of ways. As such, the ESG scores referred to herein may differ from equivalent ratings developed and implemented by other ESG data providers in the market and may also differ from equivalent ratings developed and implemented by other divisions within the Deutsche Bank Group. Such ESG scores also differ from other ratings and rankings that have historically been applied in research reports published by Deutsche Bank AG. Further, such ESG scores do not represent a formal or official view of Deutsche Bank AG. It should be noted that the decision to incorporate ESG factors into any investment strategy may inhibit the ability to participate in certain investment opportunities that otherwise would be consistent with your investment objective and other principal investment strategies. The returns on a portfolio consisting primarily of sustainable investments may be lower or higher than portfolios where ESG factors, exclusions, or other sustainability issues are not considered, and the investment opportunities available to such portfolios may differ. Companies may not necessarily meet high performance standards on all aspects of ESG or sustainable investing issues; there is also no guarantee that any company will meet expectations in connection with corporate responsibility, sustainability, and/or impact performance.

Copyright © 2023 Deutsche Bank AG



David Folkerts-Landau

Group Chief Economist and Global Head of Research

Pam Finelli
Global Chief Operating Officer
Research

Steve Pollard
Global Head of Company
Research and Sales

Jim Reid
Global Head of
Macro and Thematic Research

Tim Rokossa
Head of Germany
Research

Gerry Gallagher
Head of European
Company Research

Matthew Barnard
Head of Americas
Company Research

Peter Milliken
Head of APAC
Company Research

Debbie Jones
Global Head of
Company Research ESG

Sameer Goel
Global Head of EM & APAC
Research

Francis Yared
Global Head of Rates Research

George Saravelos
Global Head of FX Research

Peter Hooper
Vice-Chair of Research

International Production Locations

Deutsche Bank AG

Deutsche Bank Place
Level 16
Corner of Hunter & Phillip Streets
Sydney, NSW 2000
Australia
Tel: (61) 2 8258 1234

Deutsche Bank AG

Equity Research
Mainzer Landstrasse 11-17
60329 Frankfurt am Main
Germany
Tel: (49) 69 910 00

Deutsche Bank AG

Filiale Hongkong
International Commerce Centre,
1 Austin Road West, Kowloon,
Hong Kong
Tel: (852) 2203 8888

Deutsche Securities Inc.

2-11-1 Nagatacho
Sanno Park Tower
Chiyoda-ku, Tokyo 100-6171
Japan
Tel: (81) 3 5156 6000

Deutsche Bank AG

1 Great Winchester Street
London EC2N 2EQ
United Kingdom
Tel: (44) 20 7545 8000

Deutsche Bank Securities Inc.

The Deutsche Bank Center
1 Columbus Circle
New York, NY 10019
Tel: (1) 212 250 2500