

Analog Devices Inc.

Step one of three-step recovery begins, raise estimates, Reit. \$225 PO

Reiterate Rating: BUY | PO: 225.00 USD | Price: 189.40 USD

Reiterate Buy, raise estimates, reit. \$225 PO

FQ1 (JanQ) slightly better, FQ2 (AprilQ) sales outlook mid-pt \$2.1bn (-16% QoQ, -37% YoY) below \$2.36bn likely stale consensus but ahead of our recent large cut to \$1.9bn. ADI suggested bookings continue to improve though it's still shipping below demand to reduce channel inventory further. The goal is to get to normalized inventory levels within the current quarter. No specific 2H outlook was given, but we assume flattish QoQ F3Q, and then mid-single digit recovery in FQ4. Overall, we now model FY24E sales -27% YoY to \$8.96bn but then a 12.5% YoY recovery in FY25E to \$10bn. EPS wise we raise FY24/25E by 9%/7% to \$5.62/\$6.92. Our \$225 PO unchanged, though now on lower 34x CY25E EV/FCF, versus 37x prior, as earnings start to normalize in 2H, though still in historical 15x-37x range. Reiterate Buy as ADI not firmly in Step one of recovery – inventory normalization, typically followed by demand recovery, and then above-trend growth in specific product cycles/pricing. We also note ADI's strong FCF generation with 28% TTM FCF margins, which we forecast will head towards 35-40% over the next two years, well above peer TXN in the 20%-26% range.

Likes: Channel mgmt., FCF margins, bookings recover

1) Channel inventory remains at low levels despite persistent inventory correction across all segments, with inventory weeks now below the 7-8 week target range as management underships end demand; 2) Opex management (-7% QoQ in AprQ and anticipate -10% YoY in FY24E) keeping FCF strong at 33%/35% of sales in CY24E/25E vs peers TXN (23%/22%) and MCHP (32%/29%); and 3) Bookings increased QoQ in OctQ and JanQ across all segments, signaling positive set-up for 2H24E recovery.

Risks: Profit margins, limited EPS upside, prem. valuation

1) GM and OpM in AprQ (67%/37%) falling below the 70%/40% trough floor given at last analyst day following worse-than-expected inventory correction period; 2) Even with potential CY25E/26E recovery, forecasted EPS of \$7.17/\$8.45 remains below the FY23 peak of over \$10/sh; 3) Premium valuation at 34x at high-end of historical 15x-37x range reflects downturn but limits further near-term expansion.

Estimates (Oct) (US\$)	2022A	2023A	2024E	2025E	2026E
EPS	9.57	10.09	5.62	6.92	8.07
GAAP EPS	5.25	6.55	2.37	4.02	5.21
EPS Change (YoY)	48.6%	5.4%	-44.3%	23.1%	16.6%
Consensus EPS (Bloomberg)			7.00	8.72	10.32
DPS	3.04	3.34	3.96	4.35	4.79
Valuation (Oct)					
P/E	19.8x	18.8x	33.7x	27.4x	23.5x
GAAP P/E	36.1x	28.9x	79.9x	47.1x	36.4x
Dividend Yield	1.6%	1.8%	2.1%	2.3%	2.5%
EV / EBITDA*	12.0x	11.9x	18.0x	16.0x	14.6x
Free Cash Flow Yield*	4.0%	3.8%	3.3%	3.6%	4.1%

* For full definitions of *IQmethod*SM measures, see page 13.

21 February 2024

Equity

Key Changes

(US\$)	Previous	Current
2024E Rev (m)	8,580.7	8,957.7
2025E Rev (m)	9,523.5	10,074.8
2026E Rev (m)	10,576.5	10,867.0
2024E EPS	5.15	5.62
2025E EPS	6.47	6.92
2026E EPS	7.84	8.07
2024E DPS	3.70	3.96

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Stock Data

Price	189.40 USD
Price Objective	225.00 USD
Date Established	15-Dec-2023
Investment Opinion	B-1-7
52-Week Range	154.99 USD - 202.77 USD
Mkt Val (mn) / Shares Out (mn)	93,912 USD / 495.8
Free Float	99.6%
Average Daily Value (mn)	649.69 USD
BofA Ticker / Exchange	ADI / NAS
Bloomberg / Reuters	ADI US / ADI.OQ
ROE (2024E)	7.8%
Net Dbt to Eqty (Oct-2023A)	13.9%
ESGMeter™	High

ESGMeter is not indicative of a company's future stock price performance and is not an investment recommendation or rating. ESGMeter is independent of BofA Global Research's equity investment rating, volatility risk rating, income rating, and price objective for that company. For full details, refer to "BofA ESGMeter Methodology".

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Timestamp: 21 February 2024 03:07PM EST

iQprofileSM Analog Devices Inc.

iQmethodSM – Bus Performance*

(US\$ Millions)	2022A	2023A	2024E	2025E	2026E
Return on Capital Employed	10.6%	11.4%	6.6%	7.9%	8.9%
Return on Equity	13.4%	14.2%	7.8%	9.4%	10.7%
Operating Margin	49.4%	48.9%	38.5%	41.4%	43.9%
Free Cash Flow	3,776	3,556	3,130	3,376	3,896

iQmethodSM – Quality of Earnings*

(US\$ Millions)	2022A	2023A	2024E	2025E	2026E
Cash Realization Ratio	0.9x	0.9x	1.4x	1.2x	1.2x
Asset Replacement Ratio	0.5x	0.9x	0.6x	0.6x	0.7x
Tax Rate	13.0%	11.8%	11.9%	12.5%	12.5%
Net Debt-to-Equity Ratio	13.9%	13.9%	11.8%	12.1%	12.0%
Interest Cover	31.4x	26.3x	12.7x	15.8x	18.1x

Income Statement Data (Oct)

(US\$ Millions)	2022A	2023A	2024E	2025E	2026E
Sales	12,014	12,306	8,958	10,075	10,867
% Change	64.2%	2.4%	-27.2%	12.5%	7.9%
Gross Profit	8,842	8,925	6,085	6,990	7,744
% Change	70.5%	0.9%	-31.8%	14.9%	10.8%
EBITDA	8,237	8,308	5,515	6,197	6,779
% Change	97.1%	0.9%	-33.6%	12.4%	9.4%
Net Interest & Other Income	(189)	(229)	(273)	(264)	(264)
Net Income (Adjusted)	5,005	5,104	2,798	3,422	3,945
% Change	93.1%	2.0%	-45.2%	22.3%	15.3%

Free Cash Flow Data (Oct)

(US\$ Millions)	2022A	2023A	2024E	2025E	2026E
Net Income from Cont Operations (GAAP)	2,749	3,315	1,183	1,988	2,546
Depreciation & Amortization	2,297	2,293	2,064	2,022	2,006
Change in Working Capital	(884)	(646)	445	(180)	(112)
Deferred Taxation Charge	(327)	(453)	(102)	0	0
Other Adjustments, Net	640	308	268	302	326
Capital Expenditure	(699)	(1,261)	(728)	(756)	(869)
Free Cash Flow	3,776	3,556	3,130	3,376	3,896
% Change	57.9%	-5.8%	-12.0%	7.9%	15.4%
Share / Issue Repurchase	(2,577)	(2,891)	(431)	(1,400)	(1,600)
Cost of Dividends Paid	(1,545)	(1,679)	(1,930)	(2,145)	(2,332)
Change in Debt	(223)	(2,158)	(2,782)	0	0

Balance Sheet Data (Oct)

(US\$ Millions)	2022A	2023A	2024E	2025E	2026E
Cash & Equivalents	1,471	958	1,715	1,546	1,510
Trade Receivables	1,800	1,470	1,135	1,315	1,436
Other Current Assets	1,667	1,956	1,728	1,768	1,777
Property, Plant & Equipment	2,401	3,219	3,571	4,024	4,567
Other Non-Current Assets	42,963	41,191	40,691	40,691	40,691
Total Assets	50,302	48,794	48,839	49,343	49,981
Short-Term Debt	0	0	0	0	0
Other Current Liabilities	2,443	3,201	2,940	2,980	2,998
Long-Term Debt	6,549	5,902	5,947	5,947	5,947
Other Non-Current Liabilities	4,846	4,126	3,970	3,970	3,970
Total Liabilities	13,837	13,229	12,857	12,897	12,915
Total Equity	36,465	35,565	35,981	36,446	37,066
Total Equity & Liabilities	50,302	48,794	48,839	49,343	49,981

* For full definitions of iQmethodSM measures, see page 13.

Company Sector

Semiconductors

Company Description

Analog Devices is a leading analog semiconductor company focused on high performance analog signal processing chips including data converters, amplifiers, interface, power management and digital signal processors. It is a highly diversified company with 60,000+ customers across the industrial, automotive, communications infrastructure and consumer end-markets.

Investment Rationale

We rate ADI Buy on its growth projects in communications, automotive and industrial markets along with best in class free cash flow growth. We value ADI at the higher end of peer comps due to ADI's growth potential and free cash flow generation. Risks to our outlook are 1) macro/cycle risks related to potential China slowdown, 2) lumpy telecom capex, and 3) high operating expenses, which could limit free cash flow generation.

Stock Data

Average Daily Volume 3,430,265

Quarterly Earnings Estimates

	2023	2024
Q1	2.75A	1.73A
Q2	2.83A	1.26E
Q3	2.49A	1.26E
Q4	2.01A	1.36E

Summary of model changes

Exhibit 1: Summary of sales and EPS

We model CY24E sales/EPS down roughly 23%/40% YoY

	Sales (\$mn)			Non-GAAP EPS		
	Old	NEW	delta	Old	NEW	delta
Jan-24	\$2,500	\$2,513	\$13	\$1.70	\$1.73	\$0.03
Apr-24E	\$1,927	\$2,100	\$173	\$1.02	\$1.26	\$0.23
Jul-24E	\$1,951	\$2,120	\$168	\$1.05	\$1.26	\$0.21
Oct-24E	\$2,202	\$2,225	\$23	\$1.38	\$1.36	(\$0.01)
FY24E	\$8,581	\$8,958	\$377	\$5.15	\$5.62	\$0.46
YoY%	-30.3%	-27.2%	4.4%	-48.9%	-44.3%	9.0%
Jan-25E	\$2,217	\$2,414	\$197	\$1.40	\$1.59	\$0.19
Apr-25E	\$2,342	\$2,535	\$193	\$1.57	\$1.75	\$0.18
Jul-25E	\$2,451	\$2,535	\$83	\$1.72	\$1.75	\$0.03
Oct-25E	\$2,514	\$2,592	\$78	\$1.79	\$1.83	\$0.04
FY25E	\$9,524	\$10,075	\$551	\$6.47	\$6.92	\$0.45
YoY%	11.0%	12.5%	5.8%	25.6%	23.2%	6.9%
CY24E	\$8,297	\$8,859	\$562	\$4.85	\$5.47	\$0.63
YoY%	-28.2%	-23.4%	6.8%	-46.4%	-39.7%	12.9%
CY25E	\$9,810	\$10,234	\$424	\$6.87	\$7.17	\$0.29
YoY%	18.2%	15.5%	4.3%	41.8%	30.9%	4.3%

Source: BofA Global Research estimates, company report

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FQ1 reported vs. expectations

Exhibit 2: Summary of FQ1 reported numbers vs expectations

ADI reported JanQ sales of \$2.5bn, 1% above Street and EPS 1% above Street expectations

	Jan-23	Oct-23	Jan-24						
			Guidance	Consensus	BofA	Reported	Delta v Consensus	QoQ	YoY
pf Sales (\$mn, Non-GAAP)	3,250	\$2,717	\$2,500 (+/- \$100)	\$2,500	\$2,500	\$2,513	0.5%	-7.5%	-22.7%
QoQ%	0.1%	-11.7%		-8.0%	-8.0%	-7.5%			
YoY %				-23.1%	-23.1%	-22.7%			
pf Industrial	1,741	1,354		1,207	1,218	1,197	-0.8%	-11.6%	-31.3%
pf Automotive	681	731		708	702	739	4.4%	1.1%	8.5%
pf Communications	477	340		317	313	303	-4.7%	-11.1%	-36.6%
pf Consumer	351	291		268	267	274	2.3%	-5.9%	-21.8%
Gross Margin % (Non-GAAP)	73.6%	70.2%		68.7%	68.4%	69.0%	33	(119)	(460)
Gross Profit (Non-GAAP)	2,392	1,907			1,710	1,734		-9.1%	-27.5%
R&D	414	407			380	391		-3.7%	-5.5%
SG&A	326	289			272	290		0.4%	-11.1%
Opex Total (Non-GAAP)	733	692		\$674	673	679	0.7%	-1.8%	-7.3%
Op Inc (Non-GAAP)	1,659	1,215		\$1,043	1,037	1,054	1.1%	-13.2%	-36.4%
Op Margin % (Non-GAAP)	51.1%	44.7%	41.5% (+/- .7)	41.7%	41.5%	42.0%	26	(275)	(909)
Financial Income (Non-GAAP)	(60)	(65)			(65)	(75)			
Pretax Income (Non-GAAP)	1,599	1,150			972	980		-14.8%	-38.7%
Tax expense (Non-GAAP)	(194)	(144)			(121)	(116)		-19.6%	-40.3%
Tax rate (Non-GAAP)	12.1%	12.5%			12.5%	11.8%	1181	(70)	(31)
Net Income (Non-GAAP)	1,405	1,006			850	864		-14.1%	-38.5%
Diluted EPS (Non-GAAP)	\$2.75	\$2.01	\$1.70 (+/- \$0.10)	\$1.71	\$1.70	\$1.73	1.1%	-13.8%	-37.0%
Diluted Shares	511	500			500	499		-0.3%	-2.4%

Source: BofA Global Research estimates, company report, Bloomberg

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FQ2 guidance vs. expectations

Exhibit 3: FQ2 guidance vs expectations summary

ADI guided AprQ sales over \$300mn below Street. EPS guide missed by 32c

	Jan-24		Apr-24E		
	Reported	BofA	Cons	Guidance	New BofA
Sales (\$mn)	\$2,513	\$1,927	\$2,359	\$2,100 +/- \$100mn	\$2,100
QoQ%	-7.5%	-22.9%	-5.7%		-16.4%
YoY%	-22.7%	-40.7%	-27.4%		-35.4%
Industrial	1,197	950	1,132		1,016
Automotive	739	527	677		606
Communications	303	250	302		248
Consumer	274	200	241		230
Gross Margin % (Non-GAAP)	69.0%	67.5%	68.5%		67.0%
Gross Profit (Non-GAAP)	1,734	1,301			1,407
R&D	391	373			374
SG&A	290	258			267
Opex Total (Non-GAAP)	679	652	\$659		630
Op Inc (Non-GAAP)	1,054	649	\$957		777
Op Margin % (Non-GAAP)	42.0%	33.7%	40.6%	37% +/- 100bps	37.0%
Financial Income (Non-GAAP)	(75)	(2)			(66)
Pretax Income (Non-GAAP)	980	647			711
Tax expense (Non-GAAP)	-116	(81)			(85)
Tax rate (Non-GAAP)	11.8%	12.5%			12.0%
Net Income (Non-GAAP)	864	566			626
Diluted EPS (Non-GAAP)	\$1.73	\$1.02	\$1.58	\$1.26 +/- 10c	\$1.26
Diluted Shares	499	500			498

Source: BofA Global Research estimates, company report, Bloomberg

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Balance sheet, cash flow snapshot

Exhibit 4: Balance Sheet and Cash Flow snapshot

Net cash increased QoQ. Inventory dollars decreased

	Jan-23	Apr-23	Jul-23	Oct-23	Jan-24	QoQ%	YoY%
ST Debt	\$1,670	\$1,178	\$1,149	\$958	\$1,304	36.1%	-22.0%
LT Debt	\$0	\$0	\$0	\$0	\$0		
Total Debt	\$6,543	\$6,476	\$6,438	\$5,902	\$5,947		
Net Cash	(\$4,873)	(\$5,298)	(\$5,288)	(\$4,944)	(\$4,643)		
Net Cash/Share	(\$9.53)	(\$10.41)	(\$10.50)	(\$9.88)	(\$9.31)		
DSO	45.6	45.1	47.8	49.2	43.3		
DPO	56.7	60.3	60.6	55.4	46.5		
Inventory \$	\$1,523	\$1,648	\$1,709	\$1,642	\$1,553	-5.4%	2.0%
Inventory Turns	2.3	2.2	2.0	1.9	1.9		
Inventory Days	155.5	168.4	179.3	188.8	187.2	(1.6)	31.7
Cash Conversion days	144.4	153.2	166.5	182.7	184.0		
Cash Flow from Ops	\$1,406	\$1,082	\$1,142	\$1,187	\$1,139	-4.1%	-19.0%
Capex	(\$176)	(\$284)	(\$325)	(\$476)	(\$223)		
Free cash flow	\$1,230	\$797	\$818	\$711	\$916	28.8%	-25.5%
FCF as % of sales (ttm)	33.9%	30.7%	28.7%	28.9%	28.0%		
Dividend payments	\$385	\$435	\$430	\$428	\$426	-0.4%	10.5%
Stock repurchases	\$655	\$1,153	\$687	\$470	\$180		
Shareholder returns as % of FCF (ttm)	110.8%	129.9%	134.2%	130.6%	129.8%		

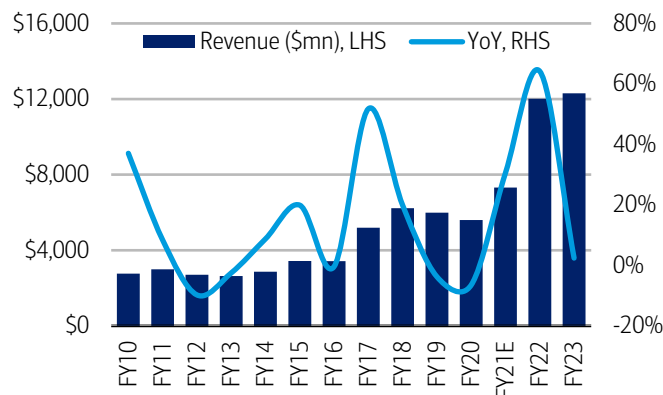
Source: BofA Global Research estimates, company report

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Key charts

Chart 1: ADI annual revenue and YoY growth

ADI sales trajectory will likely recover in FY24E

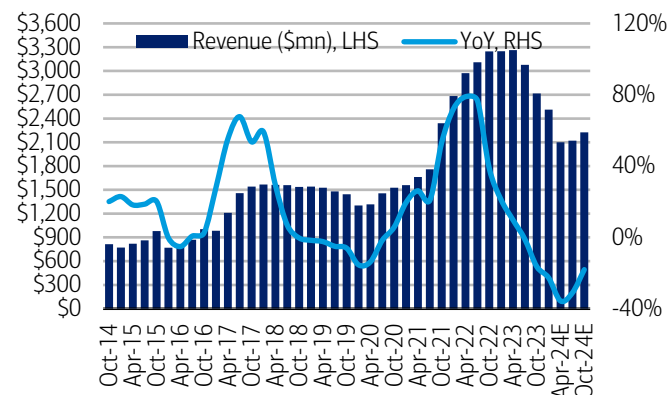


Source: BofA Global Research estimates, company reports

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Chart 2: ADI quarterly revenue and YoY growth

Quarterly sales will decline in 2Q24E

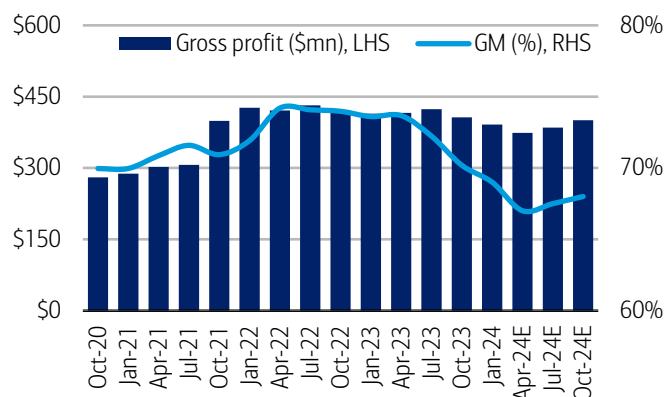


Source: BofA Global Research estimates, company reports

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Chart 3: ADI quarterly gross profit and gross margin

Gross Margins will likely fall to around 67%

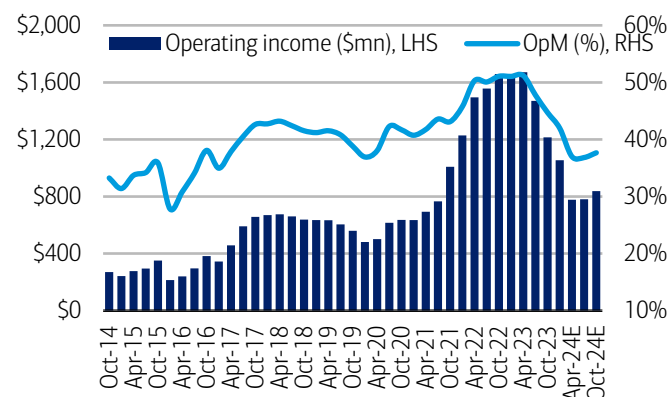


Source: BofA Global Research estimates, company reports

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Chart 4: ADI quarterly operating income and operating margin

Operating margins should be 37% in AprQ

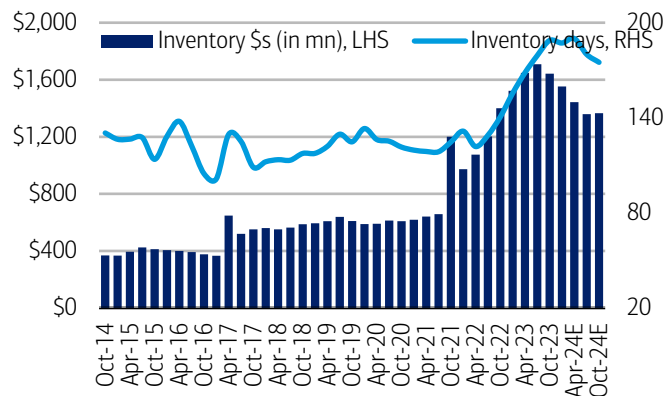


Source: BofA Global Research estimates, company reports

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Chart 5: ADI inventory dollars and days

ADI inventory days elevated

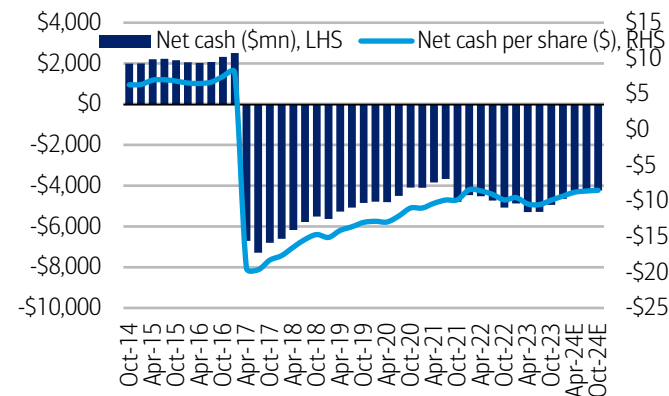


Source: BofA Global Research estimates, company reports

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Chart 6: ADI net cash and net cash per share

ADI net cash and net cash per share lowering over time

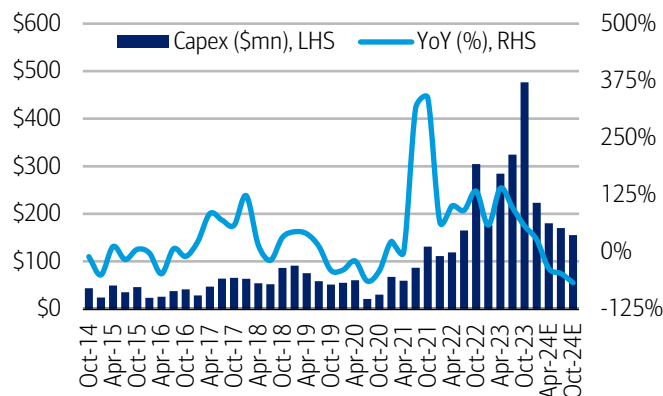


Source: BofA Global Research estimates, company reports

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Chart 7: ADI quarterly capex and YoY growth

ADI capex to slightly decrease from long-term levels

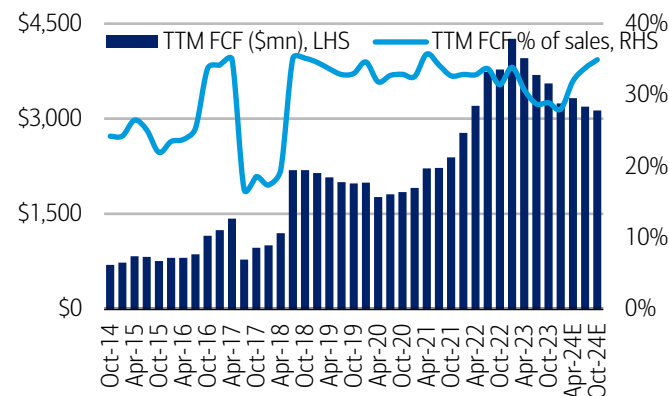


Source: BofA Global Research estimates, company reports

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Chart 8: ADI TTM FCF and FCF as a % of sales

ADI TTM FCF margins amongst best in class



Source: BofA Global Research estimates, company reports

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Exhibit 5: ADI – Income statement (\$mn, historical not adjusted for MXIM)

We expect ADI sales growth to decline in CY24E

	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2E	Q3E	Q4E	FY22	FY23	FY24E	FY25E	CY22	CY23	CY24E
FY (Oct)	Jan-22	Apr-22	Jul-22	Oct-22	Jan-23	Apr-23	Jul-23	Oct-23	Jan-24	Apr-24E	Jul-24E	Oct-24E	Oct-22	Oct-23	Oct-24E	Oct-25E	Jan-23	Jan-24	Jan-25E
Revenues	\$2,684	\$2,972	\$3,110	\$3,248	\$3,250	\$3,263	\$3,076	\$2,716	\$2,513	\$2,100	\$2,120	\$2,225	\$12,014	\$12,306	\$8,958	\$10,075	\$12,579	\$11,569	\$8,859
QoQ	15%	11%	5%	4%	0%	0%	-6%	-12%	-8%	-16%	1%	5%							
YoY	72%	79%	77%	39%	21%	10%	-1%	-16%	-23%	-36%	-31%	-18%	64%	2%	-27%	12%	49%	-8%	-23%
Cost of Sales	1,282	1,028	1,067	1,105	1,125	1,118	1,115	1,070	1,039	953	949	972	4,481	4,428	3,912	4,024	4,324	4,342	3,857
Gross Profit	1,402	1,945	2,043	2,143	2,124	2,145	1,962	1,647	1,474	1,147	1,171	1,253	7,532	7,877	5,045	6,051	8,255	7,227	5,002
Non-GAAP Gross Profit	1,931	2,205	2,304	2,403	2,392	2,404	2,222	1,907	1,734	1,407	1,431	1,513	8,842	8,925	6,085	6,990	9,303	8,266	6,017
R&D Expense	427	421	432	421	414	416	424	407	391	374	385	400	1701	1660	1551	1626	1688	1638	1560
SG&A Expense	297	305	327	337	326	324	334	289	290	267	276	285	1266	1274	1118	1132	1295	1237	1110
Total Non-GAAP Opex	702	710	747	744	733	733	752	692	679	630	650	675	2903	2910	2634	2815	2933	2857	2652
Non-GAAP Operating Income	1228	1495	1557	1659	1659	1671	1470	1215	1054	777	781	838	5939	6014	3450	4175	6370	5410	3364
Interest/other Income	(41)	(39)	(45)	(54)	(57)	(40)	(55)	(63)	(73)	(65)	(65)	(65)	(180)	(215)	(268)	(260)	(196)	(230)	(260)
Pretax Income	1185	1454	1510	1602	1599	1623	1413	1150	980	711	715	772	5750	5786	3178	3911	6165	5166	3100
Tax expense	(158)	(192)	(200)	(196)	(194)	(186)	(158)	(144)	(116)	(85)	(86)	(93)	(745)	(682)	(379)	(489)	(781)	(603)	(377)
Net Income (Non-GAAP)	1027	1262	1310	1406	1405	1438	1255	1006	864	626	629	680	5005	5104	2798	3422	5384	4563	2724
Diluted EPS (Non-GAAP)	\$1.94	\$2.40	\$2.52	\$2.73	\$2.75	\$2.83	\$2.49	\$2.01	\$1.73	\$1.26	\$1.26	\$1.36	\$9.57	\$10.09	\$5.62	\$6.92	\$10.38	\$9.07	\$5.47
Diluted EPS (GAAP)	\$0.53	\$1.49	\$1.44	\$1.82	\$1.88	\$1.92	\$1.74	\$1.00	\$0.93	\$0.44	\$0.45	\$0.55	\$5.25	\$6.55	\$2.37	\$4.02	\$6.62	\$5.60	\$2.31
Diluted Shares	530	526	521	516	511	509	504	500	499	498	498	498	523	506	498	495	518	503	498
Margin Analysis %																			
Gross Margin	71.9%	74.2%	74.1%	74.0%	73.6%	73.7%	72.2%	70.2%	69.0%	67.0%	67.5%	68.0%	73.6%	72.5%	67.9%	69.4%	74.0%	71.5%	67.9%
Opex	26.2%	23.9%	24.0%	22.9%	22.6%	22.5%	24.4%	25.5%	27.0%	30.0%	30.7%	30.3%	24.2%	23.6%	29.4%	27.9%	23.3%	24.7%	29.9%
Operating Income	45.8%	50.3%	50.1%	51.1%	51.1%	51.2%	47.8%	44.7%	42.0%	37.0%	36.8%	37.7%	49.4%	48.9%	38.5%	41.4%	50.6%	46.8%	38.0%
Tax rate	13.3%	13.2%	13.2%	12.2%	12.1%	11.4%	11.2%	12.5%	11.8%	12.0%	12.0%	12.0%	13.0%	11.8%	11.9%	12.5%	12.7%	11.7%	12.1%
Net Income	38.3%	42.5%	42.1%	43.3%	43.3%	44.1%	40.8%	37.0%	34.4%	29.8%	29.7%	30.5%	41.7%	41.5%	31.2%	34.0%	42.8%	39.4%	30.7%

Source: BofA Global Research estimates, company report

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Exhibit 6: ADI – Segment model (\$mn)

Broad-based weakness expected 1H24E

FY (Oct)	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	FY22	FY23	FY24E	FY25E	CY22	CY23	CY24E
Sales by end-market	Jan-22	Apr-22	Jul-22	Oct-22	Jan-23	Apr-23	Jul-23	Oct-23	Jan-24	Apr-24E	Jul-24E	Oct-24E	Oct-22	Oct-23	Oct-24E	Oct-25E	Jan-23	Jan-24	Jan-25E
Industrial	1,371	1,538	1,600	1,700	1,741	1,820	1,682	1,359	1,197	1,016	1,016	1,057	6,209	6,602	4,285	4,809	6,579	6,058	4,240
Automotive	537	610	631	643	681	735	727	727	739	606	606	630	2,421	2,870	2,582	2,866	2,565	2,928	2,523
Consumer	368	357	399	405	351	270	309	294	274	230	250	277	1,529	1,223	1,032	1,234	1,511	1,146	1,057
Communications	408	467	480	500	477	438	359	337	303	248	248	261	1,855	1,611	1,059	1,165	1,924	1,437	1,038
Total	2,684	2,972	3,110	3,248	3,250	3,263	3,077	2,717	2,513	2,100	2,120	2,225	12,014	12,306	8,958	10,075	12,579	11,569	8,859
% of sales																			
Industrial	51%	52%	51%	52%	54%	56%	55%	50%	48%	48%	48%	48%	52%	54%	48%	48%	52%	52%	48%
Automotive	20%	21%	20%	20%	21%	23%	24%	27%	29%	29%	29%	28%	20%	23%	29%	28%	20%	25%	28%
Consumer	14%	12%	13%	12%	11%	8%	10%	11%	11%	11%	12%	12%	13%	10%	12%	12%	12%	10%	12%
Communications	15%	16%	15%	15%	15%	13%	12%	12%	12%	12%	12%	12%	15%	13%	12%	12%	15%	12%	12%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
QoQ% (Annual YoY%)																			
Industrial	16%	12%	4%	6%	2%	5%	-8%	-19%	-12%	-15%	0%	4%	55%	6%	-35%	12%	45%	-8%	-30%
Automotive	19%	14%	3%	2%	6%	8%	-1%	0%	2%	-18%	0%	4%	94%	19%	-10%	11%	67%	14%	-14%
Consumer	3%	-3%	12%	1%	-13%	-23%	14%	-5%	-7%	-16%	9%	11%	76%	-20%	-16%	20%	43%	-24%	-8%
Communications	16%	14%	3%	4%	-5%	-8%	-18%	-6%	-10%	-18%	0%	5%	55%	-13%	-34%	10%	45%	-25%	-28%
Total	15%	11%	5%	4%	0%	0%	-6%	-12%	-8%	-16%	1%	5%	64%	2%	-27%	12%	49%	-8%	-23%

Source: BofA Global Research estimates, company report

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**Exhibit 7: ADI – Balance sheet**

ADI is conservatively leveraged

FY (Oct)	Q1 Jan-22	Q2 Apr-22	Q3 Jul-22	Q4 Oct-22	Q1 Jan-23	Q2 Apr-23	Q3 Jul-23	Q4 Oct-23	Q1 Jan-24	Q2E Apr-24E	Q3E Jul-24E	Q4E Oct-24E	FY22 Oct-22	FY23 Oct-23	FY24E Oct-24E	FY25E Oct-25E	CY22 Jan-23	CY23 Jan-24	CY24E Jan-25E
Assets																			
Cash & equivalents	1,790	1,738	1,525	1,471	1,670	1,178	1,149	958	1,304	1,581	1,665	1,715	1,471	958	1,715	1,546	1,670	1,304	1,599
Short term investments	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Accounts receivable	1,637	1,608	1,743	1,800	1,630	1,616	1,616	1,470	1,197	1,070	1,087	1,135	1,800	1,470	1,135	1,315	1,630	1,197	1,212
Inventory	973	1,075	1,203	1,400	1,523	1,648	1,709	1,642	1,553	1,443	1,359	1,366	1,400	1,642	1,366	1,406	1,523	1,553	1,394
Other current assets	237	213	219	267	338	303	360	314	362	362	362	362	267	314	362	362	338	362	362
Total current assets	4,637	4,634	4,690	4,938	5,162	4,745	4,835	4,384	4,416	4,456	4,474	4,577	4,938	4,384	4,577	4,629	5,162	4,416	4,568
Property, plant & equipment	2,037	2,094	2,180	2,401	2,525	2,742	2,923	3,219	3,282	3,391	3,490	3,571	2,401	3,219	3,571	4,024	2,525	3,282	3,679
Investments	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goodwill	26,941	26,924	26,920	26,913	26,913	26,913	26,913	26,913	26,913	26,913	26,913	26,913	26,913	26,913	26,913	26,913	26,913	26,913	26,913
Total Assets	51,216	50,801	50,346	50,302	50,235	49,545	49,347	48,794	48,388	48,538	48,655	48,839	50,302	48,794	48,839	49,343	50,235	48,388	48,938
Liabilities & Shareholders Equity																			
Accounts payable	436	451	545	582	535	569	569	493	398	424	413	415	582	493	415	455	535	398	431
Deferred Income	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Income taxes payable	400	337	446	266	514	309	0	309	410	410	410	410	266	309	410	410	514	410	410
Other current liabilities	1,385	1,537	1,450	1,595	1,385	1,768	2,262	2,399	2,115	2,115	2,115	2,115	1,595	2,399	2,115	2,115	1,385	2,115	2,115
Total current liabilities	2,222	2,326	2,441	2,443	2,434	2,646	2,831	3,201	2,923	2,949	2,938	2,940	2,443	3,201	2,940	2,980	2,434	2,923	2,957
Long-term debt	6,254	6,253	6,253	6,549	6,543	6,476	6,438	5,902	5,947	5,947	5,947	5,947	6,549	5,902	5,947	5,947	6,543	5,947	5,947
Deferred income taxes	3,952	3,873	3,764	3,623	3,477	3,325	3,151	3,128	2,976	2,976	2,976	2,976	3,623	3,128	2,976	2,976	3,477	2,976	2,976
Total non-current liabilities	11,566	11,375	11,266	11,394	11,269	10,885	10,612	10,028	9,917	9,917	9,917	9,917	6,644	6,584	11,559	11,566	11,269	9,917	9,917
Total shareholders' equity	37,427	37,100	36,639	36,465	36,531	36,013	35,904	35,565	35,548	35,672	35,800	35,981	36,465	35,565	35,981	36,446	36,531	35,548	36,064
Total Liab. & Equity	51,216	50,801	50,346	50,302	50,235	49,545	49,347	48,794	48,388	48,538	48,655	48,839	50,302	48,794	48,839	49,343	50,235	48,388	48,938
Cash and Liquidity Ratios																			
Total Cash	1,790	1,738	1,525	1,471	1,670	1,178	1,149	958	1,304	1,581	1,665	1,715	1,471	958	1,715	1,546	1,670	1,304	1,599
Short-term debt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Long-term debt	6,254	6,253	6,253	6,549	6,543	6,476	6,438	5,902	5,947	5,947	5,947	5,947	6,549	5,902	5,947	5,947	6,543	5,947	5,947
Total debt	6,254	6,253	6,253	6,549	6,543	6,476	6,438	5,902	5,947	5,947	5,947	5,947	6,549	5,902	5,947	5,947	6,543	5,947	5,947
Net Cash	-4,463	-4,515	-4,728	-5,078	-4,873	-5,298	-5,288	-4,944	-4,643	-4,366	-4,281	-4,232	-5,078	-4,944	-4,232	-4,401	-4,873	-4,643	-4,348
Net Cash/dil. share	-\$8.42	-\$8.58	-\$9.08	-\$9.85	-\$9.53	-\$10.41	-\$10.50	-\$9.88	-\$9.31	-\$8.77	-\$8.60	-\$8.50	-\$9.71	-\$9.77	-\$8.50	-\$8.90	-\$9.40	-\$9.23	-\$8.74
Cash conversion ratios																			
Days Sales Outstanding (DSO)	55.5	49.2	51.0	50.4	45.6	45.1	47.8	49.2	43.3	46.4	46.7	46.4							
Payable Days (DPO)	52.7	53.6	61.5	62.7	56.7	60.3	60.6	55.4	46.5	55.7	54.6	53.0							
Inventory Turns	2.8	3.0	2.8	2.6	2.3	2.2	2.0	1.9	1.9	1.9	2.0	2.1							
Inventory Days	131.6	121.8	129.0	140.5	155.5	168.4	179.3	188.8	187.2	190.0	180.0	175.0							
Cash Conversion Days	134.4	117.5	118.4	128.3	144.4	153.2	166.5	182.7	184.0	180.7	172.1	168.4							

Source: BofA Global Research estimates, company report

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Exhibit 8: ADI – Cash flow statement

FCF margins at upper end of semis peers

FY (Oct)	Q1 Jan-22	Q2 Apr-22	Q3 Jul-22	Q4 Oct-22	Q1 Jan-23	Q2 Apr-23	Q3 Jul-23	Q4 Oct-23	Q1 Jan-24	Q2E Apr-24E	Q3E Jul-24E	Q4E Oct-24E	FY22 Oct-22	FY23 Oct-23	FY24E Oct-24E	FY25E Oct-25E	CY22 Jan-23	CY23 Jan-24	CY24E Jan-25E
Operating Activities - Cash Flow																			
Net income	280	783	749	936	961	978	877	498	463	221	224	275	2749	3315	1183	1988	3430	2816	1151
Depreciation	65	72	76	71	85	80	86	83	84	70	71	75	283	335	301	302	303	334	289
Amortization	505	504	503	502	502	502	501	453	441	441	441	441	2014	1958	1764	1720	2012	1897	1753
Stock compensation expenses	87	71	85	81	75	69	83	73	70	63	64	67	323	300	263	302	312	295	266
Excess tax benefits	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Deferred income taxes	(35)	(88)	(82)	(122)	(146)	(134)	(151)	(22)	(102)	0	0	0	(327)	(453)	(102)	0	(438)	(409)	0
Operating assets/liabilities changes	(315)	(84)	(183)	(301)	(81)	(406)	(270)	112	179	263	55	(52)	(884)	(646)	445	(180)	(649)	(386)	177
Cash From Operations	856	1222	1248	1149	1406	1082	1142	1187	1139	1058	855	805	4475	4818	3858	4132	5025	4550	3635
Investing Activities - Cash Flow																			
Capex	(111)	(119)	(165)	(305)	(176)	(284)	(325)	(476)	(223)	(180)	(170)	(155)	(699)	(1261)	(728)	(756)	(764)	(1308)	(686)
Security purchases	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Security sales	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cash From Investing	(103)	(114)	(134)	(306)	(176)	(285)	(327)	(479)	(219)	(180)	(170)	(155)	(657)	(1266)	(724)	(756)	(730)	(1309)	(686)
Financing Activities - Cash Flow																			
Stock Repurchases	(76)	(777)	(906)	(818)	(655)	(1153)	(687)	(470)	(180)	(100)	(100)	(100)	(2577)	(2964)	(480)	(1400)	(3156)	(2490)	(650)
Stock issuance	0	0	0	0	41	26	0	6	50	0	0	0	0	73	50	0	41	81	0
Debt Repayments	(519)	0	0	0	0	(66)	0	0	0	0	0	0	(519)	(66)	0	0	0	(66)	0
Debt Issuance	0	0	0	296	0	254	0	0	0	0	0	0	296	254	0	0	296	254	0
Dividend Payments	(363)	(398)	(394)	(390)	(385)	(435)	(430)	(428)	(426)	(502)	(501)	(501)	(1545)	(1679)	(1930)	(2145)	(1567)	(1720)	(2005)
Cash From Financing	(937)	(1148)	(1318)	(887)	(1030)	(1289)	(844)	(899)	(574)	(602)	(601)	(601)	(4291)	(4063)	(2378)	(3545)	(4384)	(3607)	(2655)
Net Change in Cash/Equ.	(188)	(53)	(213)	(54)	200	(492)	(28)	(191)	345	277	84	49	(507)	(512)	756	(169)	(120)	(366)	295
Cash/Equ. at beginning of period	1978	1790	1738	1525	1471	1670	1178	1150	959	1304	1581	1665	3979	4499	4890	5812	1790	1670	1304
Cash/Equ. at end of period	1790	1738	1525	1471	1670	1178	1150	959	1304	1581	1665	1715	3472	3988	5646	5643	1670	1304	1599
Free Cash Flow	745	1103	1083	845	1230	797	818	711	916	878	685	650	3776	3556	3130	3376	4261	3242	2949
Trailing 4Q FCF	2776	3202	3741	3776	4261	3955	3690	3556	3242	3323	3191	3130							
4Q FCF/Dil Share	\$5.24	\$6.08	\$7.19	\$7.32	\$8.34	\$7.77	\$7.33	\$7.11	\$6.50	\$6.67	\$6.41	\$6.29	\$7.22	\$7.03	\$6.28	\$6.83	\$8.22	\$6.45	\$5.93
FCF/Sales (ttm)	32.9%	32.8%	33.7%	31.4%	33.9%	30.7%	28.7%	28.9%	28.0%	31.9%	33.8%	34.9%	31.4%	28.9%	34.9%	33.5%	33.9%	28.0%	33.3%
Capex/Sales %	4.1%	4.0%	5.3%	9.4%	5.4%	8.7%	10.6%	17.5%	8.9%	7.0%	7.0%	7.0%	5.8%	10.3%	8.1%	7.5%	6.1%	11.3%	7.7%
Depreciation/Sales %	2.4%	2.4%	2.4%	2.2%	2.6%	2.5%	2.8%	3.1%	3.4%	3.4%	3.4%	3.4%	2.4%	2.7%	3.4%	3.0%	2.4%	2.9%	3.3%
Dividends as % of FCF (ttm)	44.8%	43.3%	40.8%	40.9%	36.8%	40.6%	44.5%	47.2%	53.0%	53.8%	58.2%	61.7%	40.9%	47.2%	61.7%	63.5%	36.8%	53.0%	68.0%
Repurchases as % of FCF (ttm)	108.9%	112.8%	116.4%	68.2%	74.1%	89.3%	89.8%	83.3%	76.8%	43.2%	26.7%	15.3%	68.2%	83.3%	15.3%	41.5%	74.1%	76.8%	22.0%
Total return as a % of FCF (ttm)	153.7%	156.1%	157.2%	109.1%	110.8%	129.9%	134.2%	130.6%	129.8%	97.0%	84.8%	77.0%	109.1%	130.6%	77.0%	105.0%	110.8%	129.8%	90.0%

Source: BofA Global Research estimates, company report

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Stocks symbols and abbreviations:

ADI: Analog Devices

TXN: Texas Instruments

ON: onsemi

NXPI: NXP Semiconductor

GM: gross margin

EV: electric vehicle

SAAR: seasonally adjusted annual rate





TTM: trailing twelve months
ADAS: Advanced Driver Assistance System
Q: quarter
Mgmt: management
n-t: near term
OpM: operating margin

Price objective basis & risk

Analog Devices Inc. (ADI)

Our \$225 PO is based on 34x CY2025E EV/FCF, within its historical 15x-37x range, and justified based on ADI's best in class profitability and differentiated/secular comms exposure.

Downside risks to our price objective: 1) Economic downturn, which could reduce demand for automotive, industrial products, impacting gross margins, especially given recent capital expenditures and higher fixed cost footprint. 2) Inability to realize the planned cost synergies from the Maxim combination. 3) Competition from larger vendors, such as TXN, which have lower-cost production facilities.

Analyst Certification

I, Vivek Arya, hereby certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

US - Semiconductors and Semiconductor Capital Equipment Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
BUY				
	Advanced Micro Devices, Inc	AMD	AMD US	Vivek Arya
	Analog Devices Inc.	ADI	ADI US	Vivek Arya
	Applied Materials, Inc.	AMAT	AMAT US	Vivek Arya
	Arm Holdings	ARM	ARM US	Vivek Arya
	Broadcom Inc	AVGO	AVGO US	Vivek Arya
	Cadence	CDNS	CDNS US	Vivek Arya
	Camtek	CAMT	CAMT US	Vivek Arya
	KLA Corporation	KLAC	KLAC US	Vivek Arya
	Lam Research Corp.	LRCX	LRCX US	Vivek Arya
	M/A-COM	MTSI	MTSI US	Vivek Arya
	Marvell Technology Group Ltd.	MRVL	MRVL US	Vivek Arya
	Microchip	MCHP	MCHP US	Vivek Arya
	Micron Technology, Inc	MU	MU US	Vivek Arya
	Nova	NVMI	NVMI US	Vivek Arya
	NVIDIA Corporation	NVDA	NVDA US	Vivek Arya
	NXP Semiconductors NV	NXPI	NXPI US	Vivek Arya
	onsemi	ON	ON US	Vivek Arya
	Synopsys	SNPS	SNPS US	Vivek Arya
NEUTRAL				
	Advanced Energy Industries	AEIS	AEIS US	Duksan Jang
	Allegro MicroSystems	ALGM	ALGM US	Blake Friedman
	Axcelis Technologies	ACLS	ACLS US	Duksan Jang
	Coherent Corp	COHR	COHR US	Vivek Arya
	GlobalFoundries	GFS	GFS US	Vivek Arya
	Intel	INTC	INTC US	Vivek Arya
	Lattice Semiconductor	LSCC	LSCC US	Blake Friedman
	Texas Instruments Inc.	TXN	TXN US	Vivek Arya
UNDERPERFORM				
	Ambarella	AMBA	AMBA US	Vivek Arya
	Credo Technology	CRDO	CRDO US	Vivek Arya
	Lumentum Holdings	LITE	LITE US	Vivek Arya
	Qorvo Inc.	QRVO	QRVO US	Vivek Arya
	Skyworks Solutions, Inc.	SWKS	SWKS US	Vivek Arya
	Teradyne	TER	TER US	Vivek Arya
	Wolfspeed Inc	WOLF	WOLF US	Vivek Arya

iQmethodSM Measures Definitions

Business Performance

Return On Capital Employed

Return On Equity

Operating Margin

Earnings Growth

Free Cash Flow

Numerator

NOPAT = (EBIT + Interest Income) × (1 – Tax Rate) + Goodwill Amortization

Net Income

Operating Profit

Expected 5 Year CAGR From Latest Actual

Cash Flow From Operations – Total Capex

Denominator

Total Assets – Current Liabilities + ST Debt + Accumulated Goodwill

Amortization

Shareholders' Equity

Sales

N/A

N/A

Quality of Earnings

Cash Realization Ratio

Asset Replacement Ratio

Tax Rate

Net Debt-To-Equity Ratio

Interest Cover

Numerator

Cash Flow From Operations

Capex

Tax Charge

Net Debt = Total Debt – Cash & Equivalents

EBIT

Denominator

Net Income

Depreciation

Pre-Tax Income

Total Equity

Interest Expense

Valuation Toolkit

Price / Earnings Ratio

Price / Book Value

Dividend Yield

Free Cash Flow Yield

Enterprise Value / Sales

Numerator

Current Share Price

Current Share Price

Annualised Declared Cash Dividend

Cash Flow From Operations – Total Capex

EV = Current Share Price × Current Shares + Minority Equity + Net Debt +

Other LT Liabilities

Enterprise Value

Denominator

Diluted Earnings Per Share (Basis As Specified)

Shareholders' Equity / Current Basic Shares

Current Share Price

Market Cap = Current Share Price × Current Basic Shares

Sales

Basic EBIT + Depreciation + Amortization

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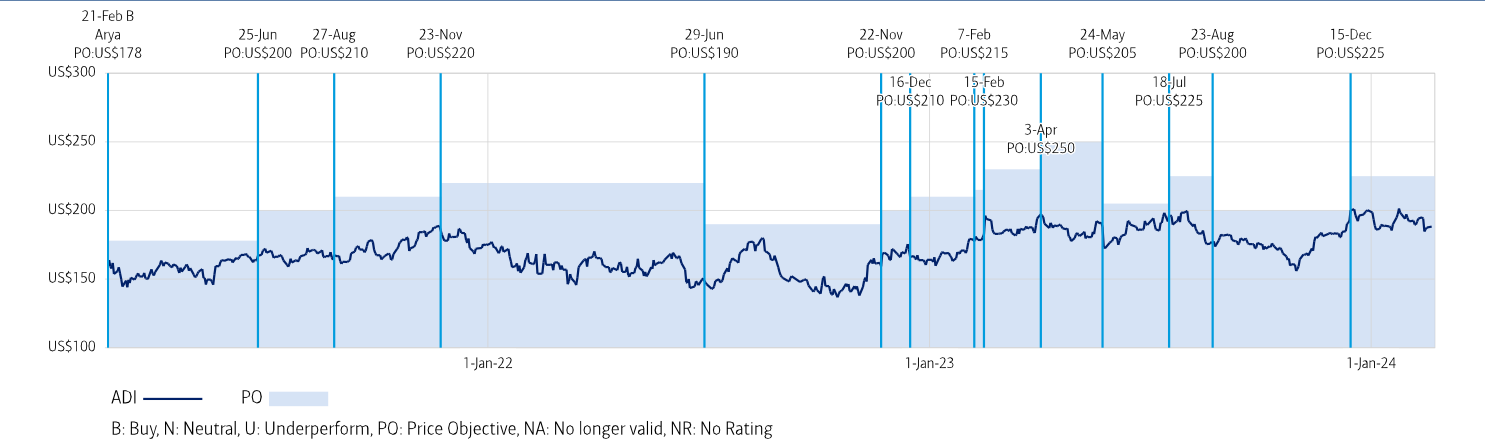
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Analog Devices (ADI) Price Chart



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Equity Investment Rating Distribution: Technology Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships ^{R1}	Count	Percent
Buy	215	53.09%	Buy	111	51.63%
Hold	97	23.95%	Hold	45	46.39%
Sell	93	22.96%	Sell	24	25.81%

Equity Investment Rating Distribution: Global Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships ^{R1}	Count	Percent
Buy	1895	53.62%	Buy	1083	57.15%
Hold	832	23.54%	Hold	454	54.57%
Sell	807	22.84%	Sell	383	47.46%

^{R1} Issuers that were investment banking clients of BofA Securities or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage universe includes only stocks. A stock rated Neutral is included as a Hold, and a stock rated Underperform is included as a Sell.

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster ^{R2}
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

^{R2} Ratings dispersions may vary from time to time where BofA Global Research believes it better reflects the investment prospects of stocks in a Coverage Cluster.

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