

## ASE Technology Holding

## Eye on a better 2024; advanced packaging and testing driving structural growth

Reiterate Rating: BUY | PO: 130.00 TWD | Price: 126.50 TWD

## Reiterate Buy with higher PO of NT\$130

We hosted a conference call with ASE IR Team as a part of our Institutional Investor (II) Tech Call Series on 4 Jan. Investors' questions centered on inventory situation, structural GPM, advanced packaging uptrend, and testing business outlook, while management holds a positively-biased view into 2024, in view of fewer inventory concerns vs. 2023 and better margins on likely higher UTR. We tweak up our 2024/25E earnings by 1-2% to reflect improving end-market dynamics. Overall, we expect things getting better into 2024, and reiterate our Buy on ASE with higher PO of NT\$130 (was NT\$120) based on 1.3x 2024/25E average P/B (was 2024E).

## Rising advanced packaging adoption with solid position

ASE remains constructive on the AI-driven advanced packaging trend with rising adoption as devices become more complicated. The company also reiterates its leading-edge advanced packaging (2.5D, Fan-Out RDL) revenue, which accounted for low-single-digit % of ATM revenue in 2023, to double YoY in 2024. ASE believes it is in a good industry position in terms of business scale, technology leadership, comprehensive offerings, as well as geopolitics. Of note, the company believes it would be more cost effective to adopt RDL-based solutions in longer term (vs. silicon-based interposer).

## Expanding testing business with turnkey solutions

Leveraging its high market shares in packaging areas (especially advanced packaging), ASE has been proactively promoting turnkey solutions to its customers to expand the scope in testing area. As testing business typically carries higher GPM than packaging, we believe ASE's initiatives toward testing should also be positive to corporate GPM expansion moving forward.

Estimates (Dec) (NT\$)	2021A	2022A	2023E	2024E	2025E
Net Income (Adjusted - mn)	68,658	66,840	35,272	54,171	65,104
EPS	14.96	15.15	7.09	11.37	13.88
EPS Change (YoY)	128.5%	1.3%	-53.2%	60.2%	22.1%
Dividend / Share	7.00	8.81	4.30	7.00	8.50
Free Cash Flow / Share	2.52	9.19	9.74	10.68	11.78
ADR EPS (US\$)	1.07	1.02	0.458	0.733	0.895
ADR Dividend / Share (US\$)	0.501	0.591	0.277	0.451	0.548
<b>Valuation (Dec)</b>					
P/E	8.46x	8.35x	17.83x	11.13x	9.11x
Dividend Yield	5.53%	6.96%	3.40%	5.53%	6.72%
EV / EBITDA*	6.02x	5.18x	7.14x	5.47x	4.84x
Free Cash Flow Yield*	1.95%	6.92%	7.68%	8.42%	9.29%

\* For full definitions of *IQmethod*<sup>SM</sup> measures, see page 9.

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**Refer to important disclosures on page 10 to 13. Analyst Certification on page 7. Price Objective Basis/Risk on page 7.**

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Timestamp: 07 January 2024 03:30PM EST

08 January 2024

## Equity

## Key Changes

(NT\$)	Previous	Current
Price Obj.	120.00	130.00
2023E EPS	7.07	7.09
2024E EPS	11.16	11.37
2025E EPS	13.73	13.88
2023E EBITDA (m)	98,430.4	98,344.2
2024E EBITDA (m)	127,013.3	128,365.9
2025E EBITDA (m)	143,650.6	145,128.1

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## Stock Data

Price (Common / ADR)	126.50 TWD / 8.57 USD
Price Objective	130.00 TWD / 8.70 USD
Date Established	8-Jan-2024 / 8-Jan-2024
Investment Opinion	B-1-7 / B-1-7
52-Week Range	9420 TWD-13650 TWD
Market Value (mn)	17,869 USD
Market Value (mn)	554,095 TWD
Shares Outstanding (mn)	4,380.2 / 2,190.1
Average Daily Value (mn)	44.02 USD
Free Float	83.4%
BofA Ticker / Exchange	XSRI / TAI
BofA Ticker / Exchange	ASX / NYS
Bloomberg / Reuters	3711 TT / 3711.TW
ROE (2023E)	11.6%
Net Dbt to Eqty (Dec-2022A)	36.7%

## Exhibit 1: Acronyms

Acronyms and the corresponding full names

Acronym	Full name
AI	Artificial Intelligence
GPM	Gross Profit Margin
RDL	Re-distribution Layer
UTR	Utilization Rate

Source: BofA Global Research

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# iQprofile<sup>SM</sup> ASE Technology Holding

Key Income Statement Data (Dec)	2021A	2022A	2023E	2024E	2025E
(NT\$ Millions)					
Sales	569,997	670,873	581,225	653,315	730,009
Gross Profit	110,368	134,930	90,824	121,795	142,455
Sell General & Admin Expense	(27,191)	(30,385)	(25,833)	(26,990)	(29,203)
Operating Profit	62,124	80,176	39,872	67,947	84,067
Net Interest & Other Income	18,210	1,450	1,189	(1,765)	(3,176)
Associates	NA	NA	NA	NA	NA
Pretax Income	80,334	81,626	41,061	66,182	80,891
Tax (expense) / Benefit	(14,322)	(16,399)	(8,747)	(13,784)	(16,894)
Net Income (Adjusted)	68,658	66,840	35,272	54,171	65,104
Average Fully Diluted Shares Outstanding	4,344	4,219	4,348	4,348	4,348

## Key Cash Flow Statement Data

Net Income	63,907	62,090	30,521	49,420	60,353
Depreciation & Amortization	54,524	55,452	58,473	60,419	61,061
Change in Working Capital	(31,743)	(24,162)	24,656	(5,887)	(13,368)
Deferred Taxation Charge	NA	NA	NA	NA	NA
Other Adjustments, Net	(4,955)	17,621	(13,038)	0	0
Cash Flow from Operations	81,734	111,001	100,611	103,953	108,046
Capital Expenditure	(70,906)	(72,640)	(58,082)	(57,291)	(56,549)
(Acquisition) / Disposal of Investments	23,799	(90)	(368)	(425)	0
Other Cash Inflow / (Outflow)	(1,985)	(1,222)	199	0	0
Cash Flow from Investing	(49,092)	(73,952)	(58,251)	(57,716)	(56,549)
Shares Issue / (Repurchase)	(2,801)	864	789	0	0
Cost of Dividends Paid	(18,083)	(29,991)	(37,841)	(18,923)	(30,641)
Cash Flow from Financing	(5,871)	(62,459)	(44,005)	(19,440)	(35,646)
Free Cash Flow	10,828	38,361	42,529	46,662	51,497
Net Debt	134,053	117,501	110,965	83,227	62,371
Change in Net Debt	1,527	(9,617)	(7,411)	(27,314)	(20,856)

## Key Balance Sheet Data

Property, Plant & Equipment	239,868	268,235	273,891	293,674	312,274
Other Non-Current Assets	140,709	138,467	141,079	154,946	154,946
Trade Receivables	115,462	114,647	106,471	112,272	123,977
Cash & Equivalents	79,007	64,866	69,245	96,467	112,318
Other Current Assets	97,889	120,855	104,767	108,763	113,853
Total Assets	672,934	707,068	695,453	766,121	817,367
Long-Term Debt	164,310	137,799	117,912	117,912	117,912
Other Non-Current Liabilities	23,063	27,083	26,026	26,026	26,026
Short-Term Debt	48,749	44,567	62,299	61,782	56,777
Other Current Liabilities	162,179	177,694	164,414	169,715	172,963
Total Liabilities	398,302	387,143	370,651	375,435	373,677
Total Equity	274,633	319,925	324,803	390,686	443,690
Total Equity & Liabilities	672,934	707,068	695,453	766,121	817,367

## iQmethod<sup>SM</sup> - Bus Performance\*

Return On Capital Employed	10.7%	12.4%	6.1%	9.8%	10.9%
Return On Equity	28.7%	23.8%	11.6%	16.0%	16.4%
Operating Margin	10.9%	12.0%	6.9%	10.4%	11.5%
EBITDA Margin	20.5%	20.2%	16.9%	19.6%	19.9%

## iQmethod<sup>SM</sup> - Quality of Earnings\*

Cash Realization Ratio	1.2x	1.7x	2.9x	1.9x	1.7x
Asset Replacement Ratio	1.4x	1.4x	1.1x	1.1x	1.0x
Tax Rate (Reported)	17.8%	20.1%	21.3%	20.8%	20.9%
Net Debt-to-Equity Ratio	48.8%	36.7%	34.2%	21.3%	14.1%
Interest Cover	21.9x	20.0x	6.6x	11.2x	14.4x

## Key Metrics

\* For full definitions of iQmethod<sup>SM</sup> measures, see page 9.

## Company Sector

Semiconductors

## Company Description

Established in 1984 and headquartered in Taiwan, ASE Technology Holding is the no.1 outsourced assembly and testing (OSAT) firm globally, in terms of market share by revenue. ASE acquired Siliconware Precision (SPIL) in 2018, and had acquired USI in 2010, which became its EMS business segment providing synergies in system-level packaging. 2 shares = 1 ADR.

## Investment Rationale

We rate ASE Buy, considering its better operational efficiency after merging with SPIL, and improving pricing power on the back of industry consolidation. We think ASE could maintain its leading position in the Outsourced Semiconductor Assembly and Test (OSAT) universe, owing to its well-established footprints and widespread service offerings.

## Stock Data

Shares / ADR	2.00
Price to Book Value	1.8x

## Key Changes

(US\$)	Previous	Current
Price Obj.	7.70	8.70
2024E EPS	0.72	0.73
2025E EPS	0.89	0.90

**Exhibit 2: Earnings estimate changes, 2023-25E**

We tweak up 2024-25E EPS by 1-2% to reflect improving end-market dynamics

NT\$bn	2023E			2024E			2025E		
	New	Old	Diff	New	Old	Diff	New	Old	Diff
Revenue	581	579	0.4%	653	647	0.9%	730	721	1.3%
Gross profit	91	90	0.5%	122	120	1.7%	142	140	1.8%
Gross margin	15.6%	15.6%	0.0ppt	18.6%	18.5%	0.1ppt	19.5%	19.4%	0.1ppt
Operating income	40	40	0.5%	68	67	1.9%	84	83	1.7%
Operating margin	6.9%	6.9%	0.0ppt	10.4%	10.3%	0.1ppt	11.5%	11.5%	0.0ppt
Pretax income	41	41	0.4%	66	65	1.9%	81	80	1.1%
Pretax margin	7.1%	7.1%	0.0ppt	10.1%	10.0%	0.1ppt	11.1%	11.1%	0.0ppt
Net income	31	30	0.4%	49	49	1.8%	60	60	1.1%
Net margin	5.3%	5.3%	0.0ppt	7.6%	7.5%	0.1ppt	8.3%	8.3%	0.0ppt
EPS (NT\$)	7.1	7.1	0.3%	11.4	11.2	1.8%	13.9	13.7	1.1%

Source: BofA Global Research estimates

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**Exhibit 3: BofAe versus consensus, 2023-25E**

Our 2023/24/25E earnings are 2% below/12% above/5% above street's consensus

NT\$bn	2023E			2024E			2025E		
	BofA	Consensus	Diff	BofA	Consensus	Diff	BofA	Consensus	Diff
Revenue	581	582	-0.1%	653	656	-0.4%	730	738	-1.1%
Gross profit	91	91	-0.4%	122	114	7.1%	142	139	2.8%
Gross margin	15.6%	15.7%	0.0ppt	18.6%	17.3%	1.3ppt	19.5%	18.8%	0.7ppt
Opt income	40	40	-1.2%	68	59	15.2%	84	76	10.2%
Opt margin	6.9%	6.9%	-0.1ppt	10.4%	9.0%	1.4ppt	11.5%	10.3%	1.2ppt
Pretax income	41	42	-1.9%	66	59	13.1%	81	75	8.3%
Pretax margin	7.1%	7.2%	-0.1ppt	10.1%	8.9%	1.2ppt	11.1%	10.1%	1.0ppt
Net income	31	31	-2.0%	49	44	12.1%	60	57	5.0%
Net margin	5.3%	5.3%	-0.1ppt	7.6%	6.7%	0.8ppt	8.3%	7.8%	0.5ppt
EPS (NT\$)	7.1	7.2	-2.0%	11.4	10.1	12.1%	13.9	13.2	5.0%

Source: BofA Global Research estimates, Bloomberg

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**Exhibit 4: Profit & loss, 2022-25E**

We expect ASE's revenue to increase by 12% YoY in 2024

NT\$mnn; %	1Q23	2Q23	3Q23	4Q23E	1Q24E	2Q24E	3Q24E	4Q24E	2022	2023E	2024E	2025E
Revenue	130,891	136,275	154,167	159,892	139,656	148,525	177,778	187,356	670,873	581,225	653,315	730,009
Cost of Sales	-111,552	-114,535	-129,251	-135,064	-117,079	-120,943	-142,146	-151,353	-535,943	-490,401	-531,521	-587,554
Gross profit	19,339	21,741	24,916	24,829	22,577	27,583	35,632	36,004	134,930	90,824	121,795	142,455
Operating expense	-11,644	-12,329	-13,510	-13,470	-11,439	-12,862	-14,575	-14,972	-54,754	-50,953	-53,848	-58,388
Operating income	7,696	9,412	11,405	11,359	11,138	14,721	21,057	21,031	80,176	39,872	67,947	84,067
Non-operating Inc/Exp	175	699	847	-531	-444	-412	-494	-414	1,450	1,189	-1,765	-3,176
Pretax income	7,870	10,111	12,252	10,827	10,694	14,309	20,562	20,617	81,626	41,061	66,182	80,891
Income tax	-1,778	-1,914	-2,890	-2,165	-2,139	-2,899	-4,623	-4,123	-16,399	-8,747	-13,784	-16,894
Net income	6,093	8,197	9,362	8,662	8,555	11,410	15,940	16,493	65,227	32,313	52,398	63,997
Noncontrolling interest	-276	-457	-586	-474	-474	-653	-918	-932	-3,137	-1,792	-2,978	-3,644
Net income (A)	5,817	7,740	8,776	8,188	8,081	10,757	15,022	15,561	62,090	30,521	49,420	60,353
Diluted EPS (NT\$)	1.30	1.76	2.00	1.88	1.86	2.47	3.46	3.58	15.15	7.09	11.37	13.88
Diluted earnings per ADR (US\$)	0.21	0.29	0.32	0.30	0.29	0.39	0.54	0.56	2.51	1.18	1.89	2.30
<b>% of revenue</b>												
Gross margin	15%	16%	16%	16%	16%	19%	20%	19%	20%	16%	19%	20%
Operating margin	6%	7%	7%	7%	8%	10%	12%	11%	12%	7%	10%	12%
Pretax margin	6%	7%	8%	7%	8%	10%	12%	11%	12%	7%	10%	11%
Net margin	4%	6%	6%	5%	6%	7%	8%	8%	9%	5%	8%	8%
<b>QoQ growth %</b>												
Revenue	-26%	4%	13%	4%	-13%	6%	20%	5%				
Gross profit	-43%	12%	15%	0%	-9%	22%	29%	1%				
Operating income	-61%	22%	21%	0%	-2%	32%	43%	0%				
Net income (A)	-63%	33%	13%	-7%	-1%	33%	40%	4%				
<b>YoY growth %</b>												
Revenue	-9%	-15%	-18%	-10%	7%	9%	15%	17%	18%	-13%	12%	12%
Gross profit	-32%	-37%	-34%	-27%	17%	27%	43%	45%	22%	-33%	34%	17%
Operating income	-52%	-54%	-52%	-43%	45%	56%	85%	85%	29%	-50%	70%	24%
Net income (A)	-55%	-52%	-50%	-48%	39%	39%	71%	90%	-3%	-51%	62%	22%

**Exhibit 4: Profit & loss, 2022-25E**

We expect ASE's revenue to increase by 12% YoY in 2024

Source: BofA Global Research estimates, company data

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**Exhibit 5: ASE group's revenue by application, 2022-25E**

We expect the automotive, consumer &amp; others segment to lead the growth in 2024/25

NT\$mnn; %	1Q23	2Q23	3Q23	4Q23E	1Q24E	2Q24E	3Q24E	4Q24E	2022	2023E	2024E	2025E
<b>Group revenue by application</b>												
Communication	56,787	57,731	67,404	71,010	60,036	64,059	78,239	81,559	306,829	252,932	283,892	312,943
Computer	17,056	18,494	21,489	21,983	18,496	20,618	22,491	22,622	89,464	79,023	84,227	89,098
Automotive, Consumer & Others	57,051	60,271	65,296	66,923	61,144	63,868	77,074	83,204	274,505	249,542	285,291	328,075
Total	130,893	136,497	154,189	159,917	139,676	148,546	177,803	187,385	670,797	581,496	653,410	730,116
<b>Revenue %</b>												
Communication	43%	42%	44%	44%	43%	43%	44%	44%	46%	43%	43%	43%
Computer	13%	14%	14%	14%	13%	14%	13%	12%	13%	14%	13%	12%
Automotive, Consumer & Others	44%	44%	42%	42%	44%	43%	43%	44%	41%	43%	44%	45%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>Sequential growth %</b>												
Communication	-30%	2%	17%	5%	-15%	7%	22%	4%	19%	-18%	12%	10%
Computer	-24%	8%	16%	2%	-16%	11%	9%	1%	28%	-12%	7%	6%
Automotive, Consumer & Others	-22%	6%	8%	2%	-9%	4%	21%	8%	13%	-9%	14%	15%
Total	-26%	4%	13%	4%	-13%	6%	20%	5%	18%	-13%	12%	12%

Source: BofA Global Research estimates, company data

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**Exhibit 6: ASE IC ATM earnings model, 2022-25E**

We model 16% YoY decline in ATM's revenue in 2023, before 13% rebound in 2024E

NT\$mnn; %	1Q23	2Q23	3Q23	4Q23E	1Q24E	2Q24E	3Q24E	4Q24E	2022	2023E	2024E	2025E
Revenue	73,319	76,108	83,684	80,703	77,957	85,032	96,455	96,241	372,176	313,814	355,684	394,952
Cost of Sales	-58,570	-59,947	-65,094	-62,734	-60,717	-63,630	-69,062	-68,744	-266,282	-246,345	-262,153	-284,765
Gross profit	14,749	16,161	18,590	17,969	17,239	21,402	27,392	27,497	105,894	67,469	93,532	110,186
Operating expense	-8,340	-8,756	-9,770	-9,084	-8,035	-9,511	-10,537	-10,565	-39,446	-35,950	-38,649	-41,504
Operating income	6,409	7,405	8,820	8,885	9,204	11,891	16,855	16,932	66,448	31,519	54,883	68,682
Net income	6,509	7,320	8,472	8,525	8,785	10,973	15,015	15,078	59,270	30,826	49,851	61,088
Non-controlling interest	21	23	27	27	28	35	47	48	187	97	157	193
Net income (A)	6,529	7,343	8,499	8,552	8,813	11,008	15,063	15,126	59,458	30,923	50,009	61,281
<b>% of revenue</b>												
Gross profit	20%	21%	22%	22%	22%	25%	28%	29%	28%	21%	26%	28%
Operating income	9%	10%	11%	11%	12%	14%	17%	18%	18%	10%	15%	17%
Net income	9%	10%	10%	11%	11%	13%	16%	16%	16%	10%	14%	16%
<b>QoQ growth %</b>												
Revenue	-22%	4%	10%	-4%	-3%	9%	13%	0%				
Gross profit	-44%	10%	15%	-3%	-4%	24%	28%	0%				
Operating income	-59%	16%	19%	1%	4%	29%	42%	0%				
Net income (A)	-54%	12%	16%	1%	3%	25%	37%	0%				
<b>YoY growth %</b>												
Revenue	-13%	-20%	-15%	-14%	6%	12%	15%	19%	11%	-16%	13%	11%
Gross profit	-36%	-42%	-36%	-31%	17%	32%	47%	53%	19%	-36%	39%	18%
Operating income	-54%	-59%	-53%	-44%	44%	61%	91%	91%	24%	-53%	74%	25%
Net income (A)	-49%	-54%	-49%	-40%	35%	50%	77%	77%	22%	-48%	62%	23%

Source: BofA Global Research estimates, company data

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**Exhibit 7: ASE EMS earnings model, 2022-25E**

We expect EMS revenue to decline 11% YoY in 2023E, followed by 12% rebound in 2024E

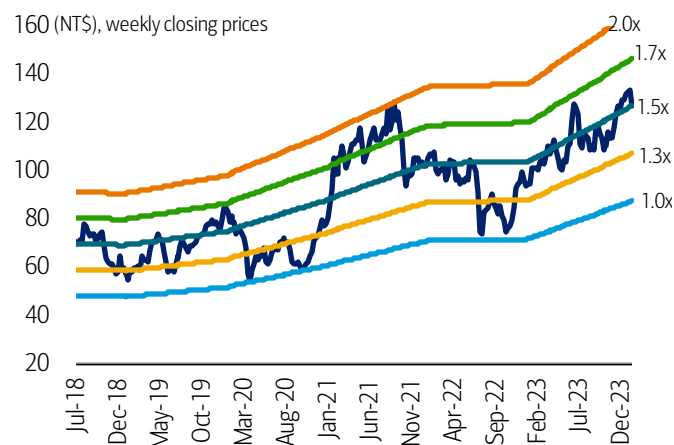
NT\$mn; %	1Q23	2Q23	3Q23	4Q23E	1Q24E	2Q24E	3Q24E	4Q24E	2022	2023E	2024E	2025E
Revenue	57,733	60,424	70,970	79,628	62,110	63,973	81,886	91,712	301,982	268,755	299,682	337,571
Cost of Sales	-53,166	-54,785	-64,500	-72,701	-56,707	-57,704	-73,534	-83,091	-272,951	-245,152	-271,035	-304,811
Gross profit	4,567	5,639	6,470	6,928	5,404	6,269	8,352	8,621	29,031	23,604	28,646	32,759
Operating expense	-3,242	-3,550	-3,703	-4,233	-3,344	-3,548	-4,096	-4,349	-15,075	-14,728	-15,337	-16,884
Operating income	1,325	2,089	2,767	2,695	2,059	2,721	4,256	4,272	13,956	8,876	13,309	15,875
Net income	1,202	1,836	2,398	2,338	1,811	2,360	3,634	3,647	11,990	7,775	11,453	13,582
Non-controlling interest	-290	-443	-579	-565	-437	-570	-877	-881	-2,895	-1,877	-2,765	-3,279
Net income (A)	912	1,393	1,819	1,774	1,374	1,791	2,757	2,767	9,095	5,898	8,688	10,303
<b>% of revenue</b>												
Gross profit	8%	9%	9%	9%	9%	10%	10%	9%	10%	9%	10%	10%
Operating income	2%	3%	4%	3%	3%	4%	5%	5%	5%	3%	4%	5%
Net income (A)	2%	2%	3%	2%	2%	3%	3%	3%	3%	2%	3%	3%
<b>QoQ growth %</b>												
Revenue	-31%	5%	17%	12%	-22%	3%	28%	12%				
Gross profit	-41%	23%	15%	7%	-22%	16%	33%	3%				
Operating income	-67%	58%	32%	-3%	-24%	32%	56%	0%				
Net income (A)	-65%	53%	31%	-3%	-23%	30%	54%	0%				
<b>YoY growth %</b>												
Revenue	-6%	-9%	-22%	-5%	8%	6%	15%	15%	26%	-11%	12%	13%
Gross profit	-15%	-15%	-30%	-11%	18%	11%	29%	24%	35%	-19%	21%	14%
Operating income	-40%	-22%	-46%	-32%	55%	30%	54%	59%	60%	-36%	50%	19%
Net income (A)	-38%	-21%	-45%	-31%	51%	29%	52%	56%	57%	-35%	47%	19%

Source: BofA Global Research estimates, company data

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**Exhibit 8: 12-month forward P/B**

The stock now trades at ~1.3x 2024E P/B

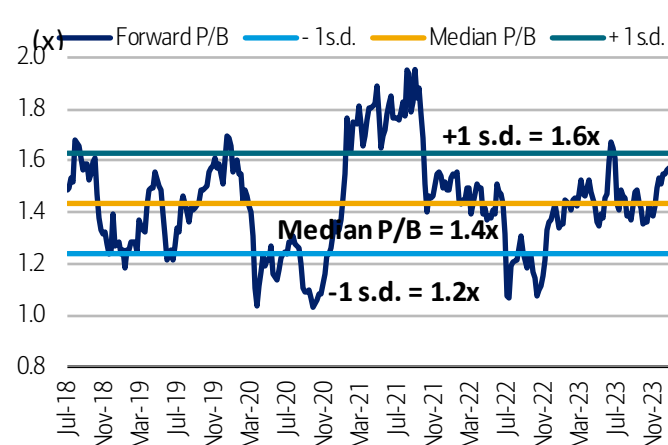


Source: BofA Global Research estimates, Bloomberg

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**Exhibit 9: 12-month forward P/B with +1 to -1 standard deviation**

Current P/B (1.3x 2024E) is below the historical level since 2018



Source: BofA Global Research estimates, Bloomberg

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**Exhibit 10: Valuation comparison**

ASE's 2024E P/B is slightly lower than TW OSAT peers/lower than China OSAT peers, while its ROE figure is higher

Ticker	Company	Share price (LC)	Rating	Mkt cap (US\$mn)	EPS (LC)		PER (X)		PBR (X)		Div. yield (%)		ROE (%)		EV/EBITDA	
					2024E	2025E	2024E	2025E	2024E	2025E	2024E	2025E	2024E	2025E	2024E	2025E
<b>China OSAT</b>																
600584 CH	JCET	26.7	BUY	6,682	1.46	1.90	18.3	14.1	1.6	1.5	0.7	0.7	9.4	11.0	7.8	6.7
002156 CH	TFME	21.1	NC	4,455	0.58	0.88	36.4	23.9	2.2	2.0	0.3	0.7	5.7	8.1	9.2	7.7
002185 CH	TSHT	8.1	NC	3,605	0.21	0.32	38.2	24.9	1.6	1.5	0.3	0.4	4.0	5.8	9.8	8.3
603005 CH	WLCSP	20.5	NC	1,871	0.52	0.73	39.4	28.1	3.0	2.7	0.6	0.8	7.8	10.4	20.1	n.a.
<b>China OSAT average</b>							<b>33.0</b>	<b>22.8</b>	<b>2.1</b>	<b>1.9</b>	<b>0.5</b>	<b>0.7</b>	<b>6.7</b>	<b>8.8</b>	<b>11.7</b>	<b>7.6</b>
<b>Global OSAT</b>																
3711 TT	ASE	126.5	BUY	17,881	11.37	13.88	11.1	9.1	1.5	1.3	5.5	6.7	16.0	16.4	5.5	4.8
6239 TT	Powertech	133.0	Neutral	3,258	9.79	11.00	13.6	12.1	1.7	1.6	5.3	5.6	12.9	13.5	4.6	4.4
2449 TT	KYEC	82.9	NC	3,271	6.10	7.23	13.6	11.5	2.5	2.2	4.5	5.3	18.5	18.8	5.9	5.2
8150 TT	ChipMOS	41.4	NC	972	3.62	5.03	11.4	8.2	1.1	1.1	4.7	6.3	11.8	13.2	4.7	4.2
6147 TT	Chipbond	74.5	NC	1,790	6.40	7.53	11.6	9.9	1.2	1.1	5.0	5.7	10.0	14.1	5.5	4.8
AMKR US	Amkor	30.3	NC	7,437	2.00	2.83	15.1	10.7	1.7	1.5	1.2	1.3	13.1	14.7	5.5	4.7
<b>Global OSAT average</b>							<b>12.8</b>	<b>10.2</b>	<b>1.6</b>	<b>1.5</b>	<b>4.4</b>	<b>5.2</b>	<b>13.7</b>	<b>15.1</b>	<b>5.3</b>	<b>4.7</b>

Source: BofA Global Research estimates, company data, Bloomberg. NC = not covered

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## Price objective basis & risk

### ASE Technology Holding (XSRIF / ASX)

We value ASE Technology Holding at NT\$130 per share (US\$8.7 for ADR), based on 1.3x 2024/25E average P/B (at low- to mid-end of its historical range), in light of weak industry momentum in the near-term during low season 1Q. We use P/B ratio to value ASE as we believe asset based valuation can more accurately reflect ASE's improvement in its operation, profitability and return following a major acquisition.

Downside risks to our PO are 1) share loss and/or ASP erosion owing to Chinese players' cannibalization and/or ASE's worsening execution, 2) weakening end demand due to uncontrollable matters, such as macro halt and/or geopolitical tensions, 3) regulatory issues that could hinder ASE from generating synergies and benefit its competitors.

## Analyst Certification

I, Brad Lin, 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.

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### APR - Semiconductor Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
<b>BUY</b>	Alchip	ALCPF	3661 TT	Mike Yang
	ASE Technology Holding	XSRIF	3711 TT	Brad Lin
	ASE Technology Holding -ADR	ASX	ASX US	Brad Lin
	ASMP	ASMVF	522 HK	Simon Woo, CFA
	Crystal Clear	XPPTF	300655 CH	Dai Shen
	eMemory	XYLWF	3529 TT	Mike Yang
	Global Unichip Corp.	GBUHF	3443 TT	Mike Yang
	GlobalWafers	XWLFF	6488 TT	Brad Lin
	Hwatsing Technology	XSNIF	688120 CH	Dai Shen



**APR - Semiconductor Coverage Cluster**

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
	JCET Group Co Ltd	XJIEF	600584 CH	Mike Yang
	Kingsemi	XKSQF	688037 CH	Dai Shen
	LX Semicon	XLXSF	108320 KS	Simon Woo, CFA
	MediaTek	MDTKF	2454 TT	Brad Lin
	Montage Technology	XRDF	688008 CH	Daley Li, CFA
	Nanya Technology	NNYAF	2408 TT	Simon Woo, CFA
	Novatek	NVKMF	3034 TT	Brad Lin
	Parade	PRDWF	4966 TT	Mike Yang
	Realtek	RLTKF	2379 TT	Brad Lin
	Samsung Elec -G	SSNHZ	SMSN LI	Simon Woo, CFA
	Samsung Electronics	SSNLF	005930 KS	Simon Woo, CFA
	Samsung Electronics Preferred	SSNPF	005935 KS	Simon Woo, CFA
	Silicon Motion	SIMO	SIMO US	Simon Woo, CFA
	SK Hynix	HXSCF	000660 KS	Simon Woo, CFA
	Taiwan Semiconductor Manufacturing Co.	TSM	TSM US	Brad Lin
	Taiwan Semiconductor Manufacturing Co.	TSMWF	2330 TT	Brad Lin
	United Microelectronics Corp.	XUMIF	2303 TT	Brad Lin
	United Microelectronics Corp.	UMC	UMC US	Brad Lin
	Will Semiconductor	XXHQF	603501 CH	Dai Shen
	Winbond Electronics	WBEKF	2344 TT	Dai Shen
	Wonik IPS	XRHQF	240810 KS	Simon Woo, CFA

**NEUTRAL**

	Macronix International	MXICF	2337 TT	Dai Shen
	Powertech Technology	XPPZF	6239 TT	Simon Woo, CFA
	Soulbrain	XSBOF	357780 KS	Simon Woo, CFA
	Vanguard International Semiconductor Co	VGILF	5347 TT	Mike Yang

**UNDERPERFORM**

	ASMedia Technology Inc.	XZSFF	5269 TT	Mike Yang
	Aspeed	XLKMF	5274 TT	Mike Yang
	GigaDevice	XGXIF	603986 CH	Daley Li, CFA
	Hangzhou Silan Microelectronics	XDFRF	600460 CH	Mike Yang
	Hua Hong Semi	HHUSF	1347 HK	Mike Yang
	Ingenic	XISCF	300223 CH	Dai Shen
	Lion Electronics	XDHFF	605358 CH	Dai Shen
	Phison Electronics	PISNF	8299 TT	Simon Woo, CFA
	Powerchip Semiconductor Manufacturing Co	XCHPF	6770 TT	Mike Yang
	Shenzhen Goodix	XQPLF	603160 CH	Mike Yang
	Silegy Corp.	SLEGF	6415 TT	Brad Lin
	VeriSilicon	XMLZF	688521 CH	Mike Yang
	Win Semiconductors	XWIF	3105 TT	Brad Lin



## **IQmethod<sup>SM</sup> Measures Definitions**

### **Business Performance**

Return On Capital Employed

Return On Equity  
Operating Margin  
Earnings Growth  
Free Cash Flow

### **Quality of Earnings**

Cash Realization Ratio  
Asset Replacement Ratio  
Tax Rate  
Net Debt-To-Equity Ratio  
Interest Cover

### **Valuation Toolkit**

Price / Earnings Ratio  
Price / Book Value  
Dividend Yield  
Free Cash Flow Yield  
Enterprise Value / Sales

EV / EBITDA

### **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

### **Numerator**

Cash Flow From Operations  
Capex  
Tax Charge  
Net Debt = Total Debt – Cash & Equivalents  
EBIT

### **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**

Total Assets – Current Liabilities + ST Debt + Accumulated Goodwill  
Amortization  
Shareholders' Equity  
Sales  
N/A  
N/A

### **Denominator**

Net Income  
Depreciation  
Pre-Tax Income  
Total Equity  
Interest Expense

### **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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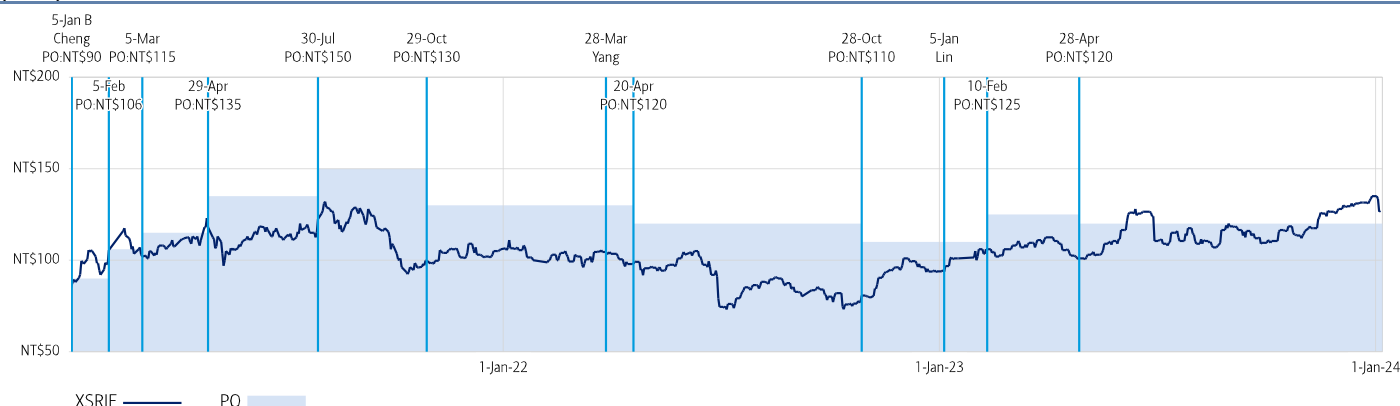
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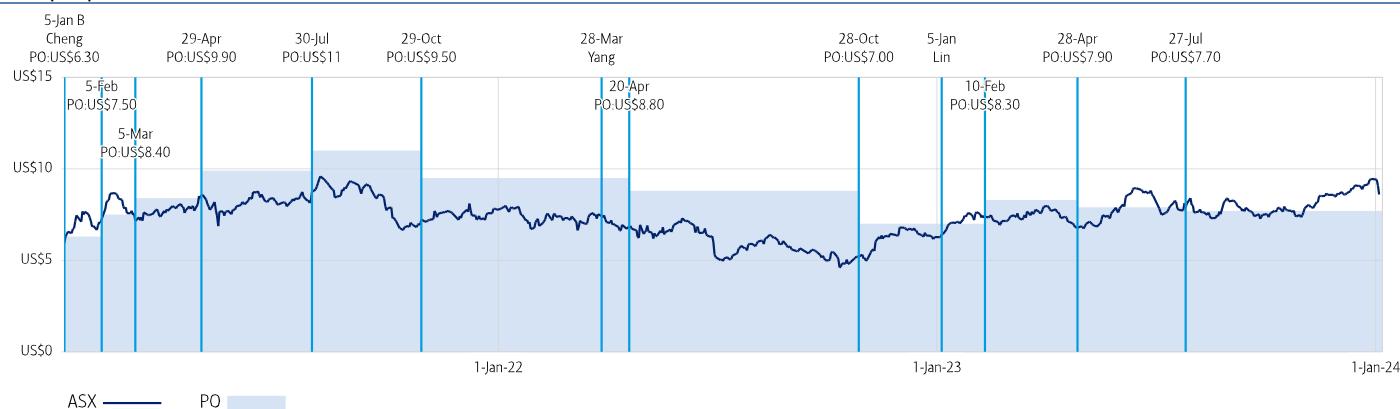
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### ASE (XSRIF) Price Chart



The Investment Opinion System is contained at the end of the report under the heading "Fundamental Equity Opinion Key". Dark grey shading indicates the security is restricted with the opinion suspended. Medium grey shading indicates the security is under review with the opinion withdrawn. Light grey shading indicates the security is not covered. Chart is current as of a date no more than one trading day prior to the date of the report.

### ASE - ADR (ASX) Price Chart



The Investment Opinion System is contained at the end of the report under the heading "Fundamental Equity Opinion Key". Dark grey shading indicates the security is restricted with the opinion suspended. Medium grey shading indicates the security is under review with the opinion withdrawn. Light grey shading indicates the security is not covered. Chart is current as of a date no more than one trading day prior to the date of the report.

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

Coverage Universe	Count	Percent	Inv. Banking Relationships <sup>R1</sup>	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 <sup>R1</sup>	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%

<sup>R1</sup> 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 <sup>R2</sup>
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Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

<sup>R2</sup> 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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