Morgan Stanley | RESEARCH

IDEA

July 27, 2026 09:00 PM GMT

Greater China Semiconductors | Asia Pacific

Old Memory: Divergent Trends in the Near Term

Recent memory cycle debate + CSP FCF concern + China memory position offload have caused a derating of old memory stocks, but we see stronger DDR4 pricing hikes and unprecedented legacy flash pricing power into 3Q. We think 1.0x 2028E BVPS offers good downside support.

Changing tide on mainstream memory: According to Trendforce (Exhibit 1), 3Q26 conventional DRAM mixed pricing is expected to increase by 13-18% Q/Q. Specifically, PC DDR5 pricing is seen rising by 15-20% Q/Q, server DDR5 pricing by 13-18% Q/Q, mobile LPDDR5(X) by 8-13% Q/Q, and NAND pricing by 10-15% Q/Q. Further, for 4Q26, Trendforce estimates price hikes of 3-8% Q/Q for conventional DRAM and 0-5% Q/Q for NAND. These estimated growth rates seem lower than some investors previously expected.

Yet, recently, we've seen stronger legacy memory pricing: Similar to our prior note (link), we believe DDR4 could enjoy continued monthly pricing hikes in 3Q. Compared to our pricing expectations one month ago, we believe CSPs are willing to offer higher pricing on DDR4 and may even try to sign a 1-2 year LTA (volume only) with suppliers. As a result, we believe monthly pricing could rise by 20%+ in 3Q, suggesting the Q/Q pricing hike could be 30% at least. We also continue to expect a 50-60% Q/Q price hike for SLC/MLC NAND in 3Q, and a 30-40% Q/Q price hike for NOR flash in 3Q.

Position offload in A share likely to see some stabilization: GigaDevice issued an announcement (link) that the company's niche memory products may see substantial price declines in the future. We see this warning as a potential longer term trend, rather than a near-term possibility, as we continue to see a structural supply gap across DDR4, SLC/MLC NAND, and NOR flash, supporting continued strong price hikes.

What is the downside support? GigaDevice (603986.SS): as a design house, it is hard to gauge the P/E floor, but the stock has already corrected 45.6% from its peak of Rmb840 as of Jun 29, providing some valuation support. Macronix/Nanya/Winbond trade at 1.5x/1.2x/1.2x 2028E BVPS, respectively; 1.0x historically has been a strong downside support level for greater China IDM companies.

MORGAN STANLEY TAIWAN LIMITED+

Daniel Yen, CFA
Equity Analyst
Daniel.Yen@morganstanley.com +886 2 2730-2863

Charlie Chan
Equity Analyst
Charlie.Chan@morganstanley.com +886 2 2730-1725

MORGAN STANLEY ASIA LIMITED+

Daisy Dai, CFA
Equity Analyst
Daisy.Dai@morganstanley.com +852 2848-7310

MORGAN STANLEY TAIWAN LIMITED+

Tiffany Yeh
Equity Analyst
Tiffany.Yeh@morganstanley.com +886 2 7712-3032

MORGAN STANLEY ASIA LIMITED+

Ethan Jia
Research Associate
Ethan.Jia@morganstanley.com +852 3963-2287

GREATER CHINA TECHNOLOGY SEMICONDUCTORS	
Asia Pacific	
Industry View	Attractive

Key Charts and Exhibits

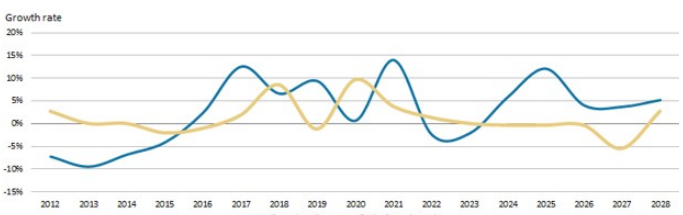
Exhibit 1: Latest pricing forecast for DRAM and NAND

	1Q26	2Q26	3Q26E - Old	3Q26E - New	4Q26E - Old	4Q26E - New
PC DRAM	DDR4: up 120-125% DDR5: up 110-115% Blended ASP: up 110-115%	DDR4: up 35-40% DDR5: up 45-50% Blended ASP: up 45-50%	up 3-8%	DDR4: up 15-20% DDR5: up 15-20% Blended ASP: up 15-20%	up 0-5%	up 3-8%
Server DRAM	DDR4: up 95-100% DDR5: up 93-98% Blended ASP: up 93-98%	DDR4: up 50-55% DDR5: up 53-58% Blended ASP: up 53-58%	up 10-15%	DDR4: up 13-18% DDR5: up 13-18% Blended ASP: up 13-18%	up 3-8%	up 3-8%
Mobile DRAM	LPDDR4X: up 58-63% LPDDR5(x): up 58-63%	LPDDR4X: up 73-78% LPDDR5(x): up 80-85%	up 3-8%	LPDDR4X: up 8-13% LPDDR5(x): up 8-13%	up 0-5%	up 0-5%
Graphics DRAM	GDDR6: up 95-100% GDDR7: up 95-100%	GDDR6: up 30-35% GDDR7: up 40-45%	GDDR6: up 3-8% GDDR7: up 10-15%	GDDR6: up 15-20% GDDR7: up 15-20%	GDDR6: up 0-5% GDDR7: up 3-8%	GDDR6: up 0-5% GDDR7: up 3-8%
Consumer DRAM	DDR3: up 75-80% DDR4: up 75-80%	DDR3: up 55-60% DDR4: up 55-60%	up 10-15%	DDR3: up 35-40% DDR4: up 28-33%	up 3-8%	up 3-8%
Total DRAM	Conventional DRAM: up 93-98% HBM Blended: up 83-88%	Conventional DRAM: up 58-63% HBM Blended: 53-58%	Conventional DRAM: up 8-13%	Conventional DRAM: up 13-18% HBM Blended: 8-13%	Conventional DRAM: up 3-8%	Conventional DRAM: up 3-8%

	1Q26	2Q26	3Q26E - Old	3Q26E - New	4Q26E - Old	4Q26E - New
eMMC **UFS**	up 95-100%	up 75-80%	up 5-10%	up 5-10%	mostly flat	mostly flat
Enterprise SSD	up 75-80%	up 48-53%	up 13-18%	up 18-23%	up 3-8%	up 3-8%
Client SSD	up 105-110%	up 70-75%	up 5-10%	up 13-18%	mostly flat	mostly flat
3D NAND Wafers (TLC & QLC)	up 75-80%	up 28-33%	up 5-10%	up 5-10%	mostly flat	mostly flat
Total NAND Flash	up 85-90%	up 55-60%	up 8-13%	up 10-15%	up 0- 5%	up 0- 5%

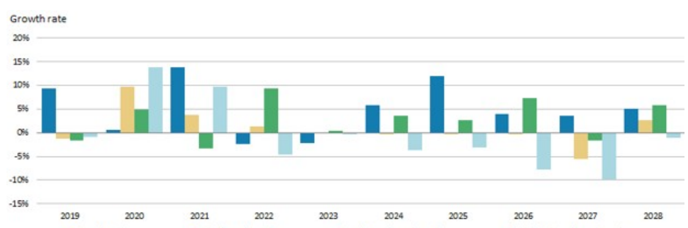
Source: Trendforce, Morgan Stanley Research estimates

Exhibit 2: NOR flash demand and supply growth rates



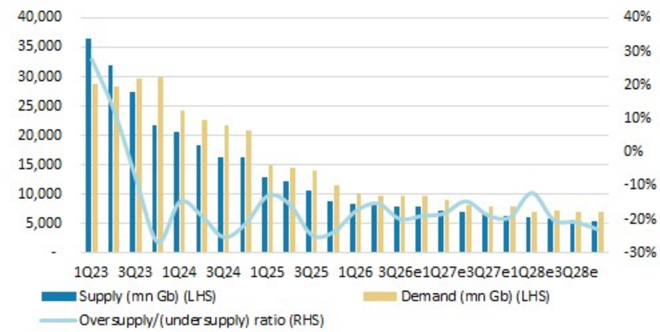
Source: Company data, Morgan Stanley Research

Exhibit 3: NOR flash demand growth and supply growth by density



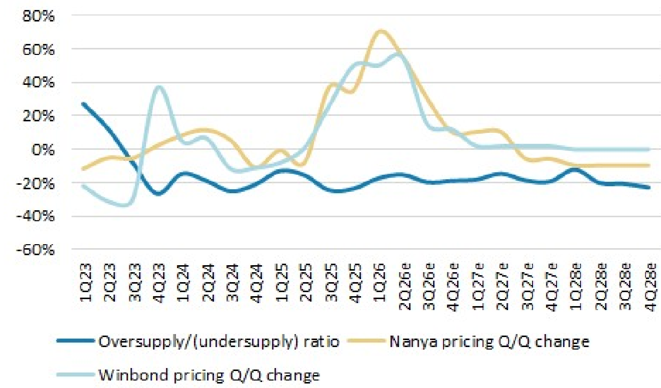
Source: Company data, Morgan Stanley Research

Exhibit 4: DDR4 quarterly supply and demand summary



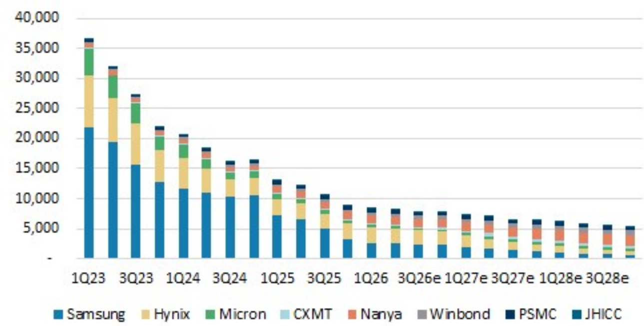
Source: Company data, IDC, Morgan Stanley Research (e) estimates

Exhibit 5: Quarterly oversupply/undersupply ratio vs. Nanya and Winbond pricing Q/Q change



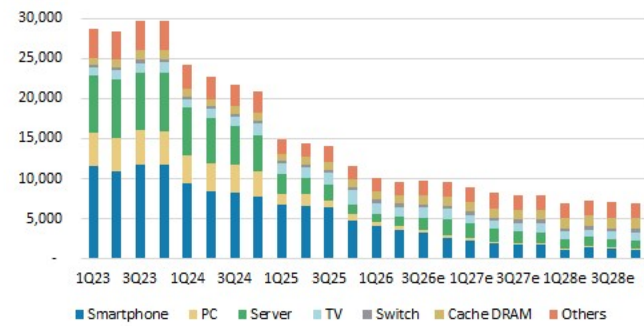
Source: Company data, IDC, Morgan Stanley Research (e) estimates

Exhibit 6: Quarterly supply breakdown (mn Gb)



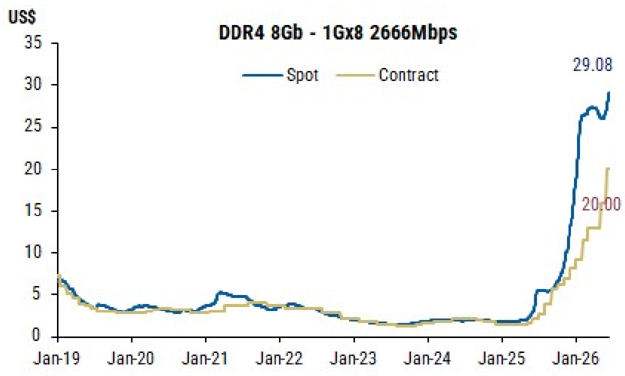
Source: Company data, Morgan Stanley Research (e) estimates

Exhibit 7: Quarterly demand breakdown by product (mn Gb)



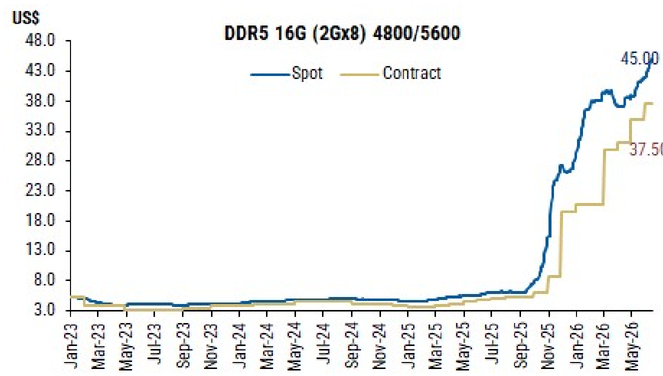
Source: IDC, Morgan Stanley Research (e) estimates

Exhibit 8: DDR4 8Gb (1Gx8) pricing chart



Source: DRAMeXchange, Morgan Stanley Research. Data as of Jun 2026.

Exhibit 9: DDR5 16Gb (2Gx8) pricing chart



Source: DRAMeXchange, Morgan Stanley Research. Data as of Jun 2026.

Disclosure Section

The information and opinions in Morgan Stanley Research were prepared or are disseminated by Morgan Stanley Asia Limited (which accepts the responsibility for its contents) and/or Morgan Stanley Asia (Singapore) Pte. (Registration number 199206298Z) and/or Morgan Stanley Asia (Singapore) Securities Pte Ltd (Registration number 200008434H), regulated by the Monetary Authority of Singapore (which accepts legal responsibility for its contents and should be contacted with respect to any matters arising from, or in connection with, Morgan Stanley Research), and/or Morgan Stanley Taiwan Limited and/or Morgan Stanley & Co International plc, Seoul Branch, and/or Morgan Stanley Australia Limited (A.B.N. 67 003 734 576, holder of Australian financial services license No. 233742, which accepts responsibility for its contents), and/or Morgan Stanley Wealth Management Australia Pty Ltd (A.B.N. 19 009 145 555, holder of Australian financial services license No. 240813, which accepts responsibility for its contents), and/or Morgan Stanley India Company Private Limited having Corporate Identification No (CIN) U22990MH1998PTC115305, regulated by the Securities and Exchange Board of India ("SEBI") and holder of licenses as a Research Analyst (SEBI Registration No. INH000001105); Stock Broker (SEBI Stock Broker Registration No. INZ000244438), Merchant Banker (SEBI Registration No. INM000011203), and depository participant with National Securities Depository Limited (SEBI Registration No. IN-DP-NSDL-567-2021) having registered office at Altimus, Level 39 & 40, Pandurang Budhkar Marg, Worli, Mumbai 400018, India; Telephone no. +91-22-61181000; Compliance Officer Details: Mr. Tejarshi Hardas, Tel. No.: +91-22-61181000 or Email: tejarshi.hardas@morganstanley.com; Grievance officer details: Mr. Tejarshi Hardas, Tel. No.: +91-22-61181000 or Email: msic-compliance@morganstanley.com which accepts the responsibility for its contents and should be contacted with respect to any matters arising from, or in connection with, Morgan Stanley Research, and their affiliates (collectively, "Morgan Stanley"). Morgan Stanley India Company Private Limited (MSICPL) may use AI tools in providing research services. All recommendations contained herein are made by the duly qualified research analysts.

For important disclosures, stock price charts and equity rating histories regarding companies that are the subject of this report, please see the Morgan Stanley Research Disclosure Website at www.morganstanley.com/eqr/disclosures/webapp/generalresearch, or contact your investment representative or Morgan Stanley Research at 1585 Broadway, (Attention: Research Management), New York, NY, 10036 USA.

For valuation methodology and risks associated with any recommendation, rating or price target referenced in this research report, please contact the Client Support Team as follows: US/Canada +1 800 303-2495; Hong Kong +852 2848-5999; Latin America +1 718 754-5444 (U.S.); London +44 (0)20-7425-8169; Singapore +65 6834-6860; Sydney +61 (0)2-9770-1505; Tokyo +81 (0)3-6836-9000. Alternatively you may contact your investment representative or Morgan Stanley Research at 1585 Broadway, (Attention: Research Management), New York, NY 10036 USA.

Analyst Certification

The following analysts hereby certify that their views about the companies and their securities discussed in this report are accurately expressed and that they have not received and will not receive direct or indirect compensation in exchange for expressing specific recommendations or views in this report: Charlie Chan; Daisy Dai, CFA; Tiffany Yeh; Daniel Yen, CFA.

.

Global Research Conflict Management Policy

Morgan Stanley Research has been published in accordance with our conflict management policy, which is available at www.morganstanley.com/institutional/research/conflictpolicies. A Portuguese version of the policy can be found at www.morganstanley.com.br

Important Regulatory Disclosures on Subject Companies

As of June 30, 2026, Morgan Stanley beneficially owned 1% or more of a class of common equity securities of the following companies covered in Morgan Stanley Research: ACM Research Inc, Advanced Micro-Fabrication Equipment Inc, Advanced Wireless Semiconductor Co, Alchip Technologies Ltd, AllRing Tech Co., AP Memory Technology Corp, ASE Technology Holding Co. Ltd., ASMPT Ltd, Cambricon Technology Corporation, Dosilicon Co Ltd, FOCI Fiber Optic Communications Inc, GigaDevice Semiconductor Beijing Inc, GlobalWafers Co Ltd, Gudeng Precision, Hangzhou Silan Microelectronics Co. Ltd., King Yuan Electronics Co Ltd, Macronix International Co Ltd, MediaTek, Montage Technology Co Ltd, Parade Technologies Ltd, Phison Electronics Corp, Powerchip Semiconductor Manufacturing Co, SG Micro Corp., Shanghai Fudan Microelectronics, Silergy Corp., Silicon Motion, TSMC, UMC, Unigroup Guoxin Microelectronics Co Ltd, Vanguard International Semiconductor, WIN Semiconductors Corp, Winbond Electronics Corp, WPG Holdings, WT Microelectronics Co. Ltd..

Within the last 12 months, Morgan Stanley managed or co-managed a public offering (or 144A offering) of securities of Alchip Technologies Ltd, Iluvatar CoreX Semiconductor Co., Ltd., Montage Technology Co Ltd, Powerchip Semiconductor Manufacturing Co.

Within the last 12 months, Morgan Stanley has received compensation for investment banking services from ASMPT Ltd, Iluvatar CoreX Semiconductor Co., Ltd., Montage Technology Co Ltd, Powerchip Semiconductor Manufacturing Co.

In the next 3 months, Morgan Stanley expects to receive or intends to seek compensation for investment banking services from Advanced Micro-Fabrication Equipment Inc, Alchip Technologies Ltd, AP Memory Technology Corp, ASE Technology Holding Co. Ltd., ASMedia Technology Inc, ASMPT Ltd, Aspeed Technology, Espressif Systems, GigaDevice Semiconductor Beijing Inc, GlobalWafers Co Ltd, Gudeng Precision, Himax Technologies Inc, Hua Hong Semiconductor Ltd, Iluvatar CoreX Semiconductor Co., Ltd., Innoscience, King Yuan Electronics Co Ltd, Macronix International Co Ltd, MediaTek, MetaX Integrated Circuits, Montage Technology Co Ltd, Novatek, Phison Electronics Corp, Powerchip Semiconductor Manufacturing Co, Realtek Semiconductor, SG Micro Corp., Shenzhen Longsys Electronics Co Ltd, SICC Co Ltd, Silergy Corp., Silicon Motion, TSMC, UMC, Universal Scientific Ind. (Shanghai), Vanguard International Semiconductor, Winbond Electronics Corp, WinWay Technology Co Ltd, WPG Holdings, WT Microelectronics Co. Ltd..

Within the last 12 months, Morgan Stanley has received compensation for products and services other than investment banking services from ASE Technology Holding Co. Ltd., King Yuan Electronics Co Ltd, MediaTek, Nanya Technology Corp., Novatek, Nuvoton Technology Corporation, Realtek Semiconductor, Silicon Motion, SMIC, TSMC, UMC, Universal Scientific Ind. (Shanghai), Winbond Electronics Corp, WT Microelectronics Co. Ltd..

Within the last 12 months, Morgan Stanley has provided or is providing investment banking services to, or has an investment banking client relationship with, the following company: Advanced Micro-Fabrication Equipment Inc, Alchip Technologies Ltd, AP Memory Technology Corp, ASE Technology Holding Co. Ltd., ASMedia Technology Inc, ASMPT Ltd, Aspeed Technology, Espressif Systems, GigaDevice Semiconductor Beijing Inc, GlobalWafers Co Ltd, Gudeng Precision, Himax Technologies Inc, Hua Hong Semiconductor Ltd, Iluvatar CoreX Semiconductor Co., Ltd., Innoscience, King Yuan Electronics Co Ltd, Macronix International Co Ltd, MediaTek, MetaX Integrated Circuits, Montage Technology Co Ltd, Novatek, Phison Electronics Corp, Powerchip Semiconductor Manufacturing Co, Realtek Semiconductor, SG Micro Corp., Shenzhen Longsys Electronics Co Ltd, SICC Co Ltd, Silergy Corp., Silicon Motion, TSMC, UMC, Universal Scientific Ind. (Shanghai), Vanguard International Semiconductor, Winbond Electronics Corp, WinWay Technology Co Ltd, WPG Holdings, WT Microelectronics Co. Ltd..

Within the last 12 months, Morgan Stanley has either provided or is providing non-investment banking, securities-related services to and/or in the past has entered into an agreement to provide services or has a client relationship with the following company: ASE Technology Holding Co. Ltd., Iluvatar CoreX Semiconductor Co., Ltd., King Yuan Electronics Co Ltd, MediaTek, Montage Technology Co Ltd, Nanya Technology Corp., Novatek, Nuvoton Technology Corporation, Realtek Semiconductor, Silicon Motion, SMIC, TSMC, UMC, Universal Scientific Ind. (Shanghai), Winbond Electronics Corp, WT Microelectronics Co. Ltd..

The equity research analysts or strategists principally responsible for the preparation of Morgan Stanley Research have received compensation based upon various factors, including quality of research, investor client feedback, stock picking, competitive factors, firm revenues and overall investment banking revenues. Equity Research analysts' or strategists' compensation is not linked to investment banking or capital markets transactions performed by Morgan Stanley or the profitability or revenues of particular trading desks.

Morgan Stanley and its affiliates do business that relates to companies/instruments covered in Morgan Stanley Research, including market making, providing liquidity, fund management, commercial banking, extension of credit, investment services and investment banking. Morgan Stanley sells to and buys from customers the securities/instruments of companies covered in Morgan Stanley Research on a principal basis. Morgan Stanley may have a position in the debt of the Company or instruments discussed in this report. Morgan Stanley trades or may trade as principal in the debt securities (or in related derivatives) that are the subject of the debt research report.

Certain disclosures listed above are also for compliance with applicable regulations in non-US jurisdictions.

STOCK RATINGS

Morgan Stanley uses a relative rating system using terms such as Overweight, Equal-weight, Not-Rated or Underweight (see definitions below). Morgan Stanley does not assign ratings of Buy, Hold or Sell to the stocks we cover. Overweight, Equal-weight, Not-Rated and Underweight are not the equivalent of buy, hold and sell. Investors should carefully read the definitions of all ratings used in Morgan Stanley Research. In addition, since Morgan Stanley Research contains more complete information concerning the analyst's views, investors should carefully read Morgan Stanley Research, in its entirety, and not infer the contents from the rating alone. In any case, ratings (or research) should not be used or relied upon as investment advice. An investor's decision to buy or sell a stock should depend on individual circumstances (such as the investor's existing holdings) and other considerations.

Global Stock Ratings Distribution

(as of June 30, 2026)

The Stock Ratings described below apply to Morgan Stanley's Fundamental Equity Research and do not apply to Debt Research produced by the Firm.

For disclosure purposes only (in accordance with FINRA requirements), we include the category headings of Buy, Hold, and Sell alongside our ratings of Overweight, Equal-weight, Not-Rated and Underweight. Morgan Stanley does not assign ratings of Buy, Hold or Sell to the stocks we cover. Overweight, Equal-weight, Not-Rated and Underweight are not the equivalent of buy, hold, and sell but represent recommended relative weightings (see definitions below). To satisfy regulatory requirements, we correspond Overweight, our most positive stock rating, with a buy recommendation; we correspond Equal-weight and Not-Rated to hold and Underweight to sell recommendations, respectively.

	Coverage Universe		Investment Banking Clients (IBC)			Other Material Investment Services Clients (MISC)	
Stock Rating Category	Count	% of Total	Count	% of Total IBC	% of Rating Category	Count	% of Total Other MISC
Overweight/Buy	1544	42%	453	49%	29%	757	44%
Equal-weight/Hold	1577	43%	390	42%	25%	769	44%
Not-Rated/Hold	3	0%	1	0%	33%	1	0%
Underweight/Sell	544	15%	89	10%	16%	204	12%
Total	3,668		933			1731	

Data include common stock and ADRs currently assigned ratings. Investment Banking Clients are companies from whom Morgan Stanley received investment banking compensation in the last 12 months. Due to rounding off of decimals, the percentages provided in the "% of total" column may not add up to exactly 100 percent.

Analyst Stock Ratings

Overweight (O). The stock's total return is expected to exceed the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

Equal-weight (E). The stock's total return is expected to be in line with the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

Not-Rated (NR). Currently the analyst does not have adequate conviction about the stock's total return relative to the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

Underweight (U). The stock's total return is expected to be below the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

Unless otherwise specified, the time frame for price targets included in Morgan Stanley Research is 12 to 18 months.

Analyst Industry Views

Attractive (A): The analyst expects the performance of his or her industry coverage universe over the next 12-18 months to be attractive vs. the relevant broad market benchmark, as indicated below.

In-Line (I): The analyst expects the performance of his or her industry coverage universe over the next 12-18 months to be in line with the relevant broad market benchmark, as indicated below.

Cautious (C): The analyst views the performance of his or her industry coverage universe over the next 12-18 months with caution vs. the relevant broad market benchmark, as indicated below.

Benchmarks for each region are as follows: North America - S&P 500; Latin America - relevant MSCI country index or MSCI Latin America Index; Europe - MSCI Europe; Japan - TOPIX; Asia - relevant MSCI country index or MSCI sub-regional index or MSCI AC Asia Pacific ex Japan Index.

Important Disclosures for Morgan Stanley Smith Barney LLC Customers

Important disclosures regarding any material conflict of interest that can reasonably be expected to have influenced Morgan Stanley Smith Barney LLC's choice of a third-party research provider or the subject company of a third-party research report, are available on the Morgan Stanley Wealth Management disclosure website at www.morganstanley.com/online/researchdisclosures.

For Morgan Stanley specific disclosures, you may refer to https://www.morganstanley.com/eqr/disclosures/webapp/generalresearch.

Each Morgan Stanley research report is reviewed and approved on behalf of Morgan Stanley Smith Barney LLC. This review and approval is conducted by the same person who reviews the research report on behalf of Morgan Stanley. This could create a conflict of interest.

Other Important Disclosures

Morgan Stanley Research policy is to update research reports as and when the Research Analyst and Research Management deem appropriate, based on developments with the issuer, the sector, or the market that may have a material impact on the research views or opinions stated therein. In addition, certain Research publications are intended to be updated on a regular periodic basis (weekly/monthly/quarterly/annual) and will ordinarily be updated with that frequency, unless the Research Analyst and Research Management determine that a different publication schedule is appropriate based on current conditions.

Morgan Stanley is not acting as a municipal advisor and the opinions or views contained herein are not intended to be, and do not constitute, advice within the meaning of Section 975 of the Dodd-Frank Wall Street Reform and Consumer Protection Act.

Morgan Stanley produces an equity research product called a "Tactical Idea." Views contained in a "Tactical Idea" on a particular stock may be contrary to the recommendations or views expressed in research on the same stock. This may be the result of differing time horizons, methodologies, market events, or other factors. For all research available on a particular stock, please contact your sales representative or go to Matrix at http://www.morganstanley.com/matrix.

Morgan Stanley Research is provided to our clients through our proprietary research portal on Matrix and also distributed electronically by Morgan Stanley to clients. Certain, but not all, Morgan Stanley Research products are also made available to clients through third-party vendors or redistributed to clients through alternate electronic means as a convenience. For access to all available Morgan Stanley Research, please contact your sales representative or go to Matrix at http://www.morganstanley.com/matrix.

Any access and/or use of Morgan Stanley Research is subject to Morgan Stanley's Terms of Use (http://www.morganstanley.com/terms.html). By accessing and/or using Morgan Stanley Research, you are indicating that you have read and agree to be bound by our Terms of Use (http://www.morganstanley.com/terms.html). In addition you consent to Morgan Stanley processing your personal data and using cookies in accordance with our Privacy Policy and our Global Cookies Policy (http://www.morganstanley.com/privacy_pledge.html), including for the purposes of setting your preferences and to collect readership data so that we can deliver better and more personalized service and products to you. To find out more information about how Morgan Stanley processes personal data, how we use cookies and how to reject cookies see our Privacy Policy and our Global Cookies Policy (http://www.morganstanley.com/privacy_pledge.html). Please use the provided link to review the Terms and Conditions and Most Important Terms and Conditions for Morgan Stanley India Company Private Limited (https://www.morganstanley.com/assets/pdfs/about-us-global-offices/india/Terms_and_conditions.pdf) and the following link to review the audit report (https://ny.matrix.ms.com/eqr/research/webapp/researchdocs/MSICPL_Morgan_Stanley_Research_Audit_Report.pdf).

If you do not agree to our Terms of Use and/or if you do not wish to provide your consent to Morgan Stanley processing your personal data or using cookies please do not access our research.

Morgan Stanley Research does not provide individually tailored investment advice. Morgan Stanley Research has been prepared without regard to the circumstances and objectives of those who receive it. Morgan Stanley recommends that investors independently evaluate particular investments and strategies, and encourages investors to seek the advice of a financial adviser. The appropriateness of an investment or strategy will depend on an investor's circumstances and objectives. The securities, instruments, or strategies discussed in Morgan Stanley Research may not be suitable for all investors, and certain investors may not be eligible to purchase or participate in some or all of them. Morgan Stanley Research is not an offer to buy or sell or the solicitation of an offer to buy or sell any security/instrument or to participate in any particular trading strategy. The value of and income from your investments may vary because of changes in interest rates, foreign exchange rates, default rates, prepayment rates, securities/instruments prices, market indexes, operational or financial conditions of companies or other factors. There may be time limitations on the exercise of options or other rights in securities/instruments transactions. Past performance is not necessarily a guide to future performance. Estimates of future performance are based on assumptions that may not be realized. If provided, and unless otherwise stated, the closing price on the cover page is that of the primary exchange for the subject company's securities/instruments.

The fixed income research analysts, strategists or economists principally responsible for the preparation of Morgan Stanley Research have received compensation based upon various factors, including quality, accuracy and value of research, firm profitability or revenues (which include fixed income trading and capital markets profitability or revenues), client feedback and competitive factors. Fixed Income Research analysts', strategists' or economists' compensation is not linked to investment banking or capital markets transactions performed by Morgan Stanley or the profitability or revenues of particular trading desks.

The "Important Regulatory Disclosures on Subject Companies" section in Morgan Stanley Research lists all companies mentioned where Morgan Stanley owns 1% or more of a class of common equity securities of the companies. For all other companies mentioned in Morgan Stanley Research, Morgan Stanley may have an investment of less than 1% in securities/instruments or derivatives of securities/instruments of companies and may trade them in ways different from those discussed in Morgan Stanley Research. Employees of Morgan Stanley not involved in the preparation of Morgan Stanley Research may have investments in securities/instruments or derivatives of securities/instruments of companies mentioned and may trade them in ways different from those discussed in Morgan Stanley Research. Derivatives may be issued by Morgan Stanley or associated persons.

With the exception of information regarding Morgan Stanley, Morgan Stanley Research is based on public information. Morgan Stanley makes every effort to use reliable, comprehensive information, but we make no representation that it is accurate or complete. We have no obligation to tell you when opinions or information in Morgan Stanley Research change apart from when we intend to discontinue equity research coverage of a subject company. Facts and views presented in Morgan Stanley Research have not been reviewed by, and may not reflect information known to, professionals in other Morgan Stanley business areas, including investment banking personnel.

Morgan Stanley Research personnel may participate in company events such as site visits and are generally prohibited from accepting payment by the company of associated expenses unless pre-approved by authorized members of Research management.

Morgan Stanley may make investment decisions that are inconsistent with the recommendations or views in this report.

To our readers based in Taiwan or trading in Taiwan securities/instruments: Information on securities/instruments that trade in Taiwan is distributed by Morgan Stanley Taiwan Limited ("MSTL"). Such information is for your reference only. The reader should independently evaluate the investment risks and is solely responsible for their investment decisions. Morgan Stanley Research may not be distributed to the public media or quoted or used by the public media without the express written consent of Morgan Stanley. Any non-customer reader within the scope of Article 7-1 of the Taiwan Stock Exchange Recommendation Regulations accessing and/or receiving Morgan Stanley Research is not permitted to provide Morgan Stanley Research to any third party (including but not limited to related parties, affiliated companies and any other third parties) or engage in any activities regarding Morgan Stanley Research which may create or give the appearance of creating a conflict of interest. Information on securities/instruments that do not trade in Taiwan is for informational purposes only and is not to be construed as a recommendation or a solicitation to trade in such securities/instruments. MSTL may not execute transactions for clients in these securities/instruments.

Certain information in Morgan Stanley Research was sourced by employees of the Shanghai Representative Office of Morgan Stanley Asia Limited for the use of Morgan Stanley Asia Limited. Morgan Stanley is not incorporated under PRC law and the research in relation to this report is conducted outside the PRC. Morgan Stanley Research does not constitute an offer to sell or the solicitation of an offer to buy any securities in the PRC. PRC investors shall have the relevant qualifications to invest in such securities and shall be responsible for obtaining all relevant approvals, licenses, verifications and/or registrations from the relevant governmental authorities themselves. Neither this report nor any part of it is intended as, or shall constitute, provision of any consultancy or advisory service of securities investment as defined under PRC law. Such information is provided for your reference only.

Morgan Stanley Research is disseminated in Brazil by Morgan Stanley C.T.V.M. S.A. located at Av. Brigadeiro Faria Lima, 3600, 6th floor, São Paulo - SP, Brazil; and is regulated by the Comissão de Valores Mobiliários; in Mexico by Morgan Stanley México, Casa de Bolsa, S.A. de C.V which is regulated by Comision Nacional Bancaria y de Valores. Paseo de los Tamarindos 90, Torre 1, Col. Bosques de las Lomas Floor 29, 05120 Mexico City; in Japan by Morgan Stanley MUFG Securities Co., Ltd. and, for Commodities related research reports only, Morgan Stanley Capital Group

INDUSTRY COVERAGE: Greater China Technology Semiconductors

COMPANY (TICKER)	RATING (AS OF)	PRICE* (07/27/2026)
Charlie Chan		
ACM Research Inc (ACMR.O)	O (03/07/2023)	US$84.32
Advanced Micro-Fabrication Equipment Inc (688012.SS)	O (11/06/2023)	Rmb399.77
Advanced Wireless Semiconductor Co (8086.TWO)	U (07/14/2025)	NT$121.50
Alchip Technologies Ltd (3661.TW)	O (05/14/2021)	NT$3,460.00
ASE Technology Holding Co. Ltd. (3711.TW)	O (09/15/2024)	NT$608.00
Cambricon Technology Corporation (688256.SS)	O (04/27/2026)	Rmb1,241.02
Global Unichip Corp (3443.TW)	O (06/24/2026)	NT$4,050.00

GlobalWafers Co Ltd (6488.TWO)	E (05/19/2026)	NT$1,065.00
Gudeng Precision (3680.TWO)	O (11/25/2025)	NT$450.50
Hua Hong Semiconductor Ltd (1347.HK)	E (03/12/2026)	HK$148.60
Iluvatar CoreX Semiconductor Co., Ltd. (9903.HK)	O (04/27/2026)	HK$597.00
King Yuan Electronics Co Ltd (2449.TW)	O (03/03/2023)	NT$276.00
Maxscend Microelectronics Co Ltd (300782.SZ)	U (01/11/2021)	Rmb72.90
MediaTek (2454.TW)	O (11/28/2025)	NT$3,680.00
MetaX Integrated Circuits (688802.SS)	E (04/27/2026)	Rmb830.20
Nanya Technology Corp. (2408.TW)	O (05/28/2026)	NT$436.00
NAURA Technology Group Co Ltd (002371.SZ)	O (11/06/2023)	Rmb770.00
OmniVision Integrated Circuits Group Inc (603501.SS)	E (11/17/2025)	Rmb95.31
Phison Electronics Corp (8299.TWO)	E (02/25/2026)	NT$1,820.00
SG Micro Corp. (300661.SZ)	E (11/03/2025)	Rmb98.89
Silergy Corp. (6415.TW)	U (05/19/2026)	NT$449.00
SMIC (0981.HK)	O (10/21/2025)	HK$70.65
TSMC (2330.TW)	O (02/07/2022)	NT$2,350.00
UMC (2303.TW)	O (05/19/2026)	NT$126.00
Vanguard International Semiconductor (5347.TWO)	E (01/14/2026)	NT$157.00
WIN Semiconductors Corp (3105.TWO)	U (07/14/2025)	NT$355.00
Daisy Dai, CFA		
ASMPT Ltd (0522.HK)	O (07/24/2025)	HK$161.60
China Resources Microelectronics Limited (688396.SS)	U (03/02/2026)	Rmb60.74
Empyrean Technology Co Ltd (301269.SZ)	E (01/17/2025)	Rmb92.22
Hangzhou Silan Microelectronics Co. Ltd. (600460.SS)	U (08/25/2025)	Rmb32.33
Hygon Information Technology Co., Ltd. (688041.SS)	O (07/03/2026)	Rmb313.59
Innoscience (2577.HK)	E (10/13/2025)	HK$44.12
JCET Group Co Ltd (600584.SS)	E (01/16/2026)	Rmb82.35
Shanghai Fudan Microelectronics (1385.HK)	O (03/07/2025)	HK$24.88
SICC Co Ltd (688234.SS)	O (03/20/2026)	Rmb100.00
StarPower Semiconductor Ltd (603290.SS)	E (05/14/2026)	Rmb84.88
Unigroup Guoxin Microelectronics Co Ltd (002049.SZ)	U (01/10/2023)	Rmb66.00
Universal Scientific Ind. (Shanghai) (601231.SS)	O (11/05/2025)	Rmb24.77
Yangjie Technology (300373.SZ)	O (06/10/2022)	Rmb93.22
Daniel Yen, CFA		
AP Memory Technology Corp (6531.TW)	O (07/11/2025)	NT$773.00
ASMedia Technology Inc (5269.TW)	U (10/03/2025)	NT$1,385.00
Aspeed Technology (5274.TWO)	O (06/09/2025)	NT$14,695.00
Egis Technology Inc (6462.TWO)	E (01/28/2026)	NT$98.70
Elan Microelectronics Corp (2458.TW)	O (10/03/2025)	NT$166.00
Espressif Systems (688018.SS)	O (05/15/2023)	Rmb104.23
GigaDevice Semiconductor Beijing Inc (603986.SS)	O (05/15/2025)	Rmb434.03
Macronix International Co Ltd (2337.TW)	O (09/18/2025)	NT$125.50
Montage Technology Co Ltd (6809.HK)	O (03/18/2026)	HK$322.00
Montage Technology Co Ltd (688008.SS)	O (03/18/2026)	Rmb227.45
Novatek (3034.TW)	U (02/04/2026)	NT$518.00
Nuvoton Technology Corporation (4919.TW)	U (11/10/2025)	NT$132.50
Parade Technologies Ltd (4966.TWO)	O (05/27/2026)	NT$615.00
Powerchip Semiconductor Manufacturing Co (6770.TW)	O (10/27/2025)	NT$61.90
Realtek Semiconductor (2379.TW)	E (01/30/2026)	NT$762.00
Shenzhen Goodix Technology Co Ltd (603160.SS)	U (07/14/2025)	Rmb50.31
Winbond Electronics Corp (2344.TW)	O (05/28/2026)	NT$160.00
WPG Holdings (3702.TW)	O (03/16/2026)	NT$116.00
WT Microelectronics Co. Ltd. (3036.TW)	O (01/27/2026)	NT$203.50
Duan Liu		
Dosilicon Co Ltd (688110.SS)	U (09/06/2024)	Rmb115.15

Shenzhen Longsys Electronics Co Ltd (301308.SZ)	E (02/25/2026)	Rmb373.90
Tiffany Yeh		
AllRing Tech Co. (6187.TWO)	O (09/23/2025)	NT$1,035.00
FOCI Fiber Optic Communications Inc (3363.TWO)	O (01/15/2025)	NT$598.00
Himax Technologies Inc (HIMX.O)	E (02/04/2026)	US$12.62
Hon Precision (7769.TW)	O (04/17/2026)	NT$6,110.00
MPI Corporation (6223.TWO)	O (04/17/2026)	NT$5,720.00
Silicon Motion (SIMO.O)	O (05/06/2024)	US$270.90
WinWay Technology Co Ltd (6515.TW)	O (04/17/2026)	NT$6,395.00

Stock Ratings are subject to change. Please see latest research for each company.

* Historical prices are not split adjusted.