October 23, 2023 04:01 AM GMT

Software | North America

Valuation Views 10/23/23 - SMB Concerns Start To Surface

Software stocks fell -1%, outperforming the broader market as more balanced Fedspeak and tighter financial conditions suggest little appetite for near-term rate hikes. Low multiple names (ETWO, SCWX, BIGC, WKME) outperformed, while SMB-exposed names (BILL, SPT, DOCN, HUBS) underperformed.

Assessing Software - Price Performance

					Perfor	mance			52 V	Veek High
Company		1	Week	1 Month	3 Month	YTD	1 Year 3	Year	Price	% Below
Software Mean			-1.3%	-5.0%	-10.1%	15.5%		18.1%		26.8%
Software Median			-1.4%	-5.6%	-10.6%	15.3%		22.2%		24.6%
S&P 500			-3.2% -2.4%	-3.6% -4.0%	-7.7% -6.9%	24.1% 10.0%		2.7%		
Top 10	Short i	nterest %	1	Week Price	ce Move	1 Month	Price Move	T	YT	D.
Rank	Ticker	10/20/2023	Ti	cker '	10/20/2023	Ticker	10/20/2023	Ti	cker	10/20/2023
1	Al	31.8%	ΕT	wo	24.9%	SPLK	23.4%	PI	LTR	150.9%
2	SPT	13.8%	SC	CWX	11.7%	PLTR	9.3%		ΑI	117.2%
3	EGHT	12.6%	В	IGC	5.7%	DOCS	9.1%	1	ОТ	83.6%
4	PRO	10.2%	VI	RNS	5.4%	CRWD	9.1%	FS	SLY	79.0%
5	DOCN	10.1%	W	KME	5.0%	VERX	7.5%	М	DB	75.9%
6	FSLY	9.9%	FF	RSH	4.6%	WKME	7.3%	P.A	NW	74.2%
7	TWOU	9.2%	AS	SAN	4.4%	SCWX	6.5%	SI	PLK	71.4%
8	QLYS	8.8%	SE	EMR	4.3%	ZI	6.5%	CF	RWD	69.8%
9	AYX	8.8%	TV	VOU	3.4%	ASAN	6.3%	AI	PPF	69.0%
10	CFLT	8.6%	A	MPL	2.7%	RPD	6.1%	l c	XM	62.3%

Bottom 10	Short in	nterest %	1 Week Price Move		1 Month Price Move		YTD	
Rank	Ticker	10/20/2023	Ticker	10/20/2023	Ticker	10/20/2023	Ticker	10/20/2023
1	SCWX	0.1%	VMW	-15.1%	ETWO	-38.4%	CHGG	-66.8%
2	DCBO	0.2%	OKTA	-9.0%	FSLY	-24.3%	TWOU	-66.0%
3	VERX	0.5%	BILL	-8.8%	SABR	-17.8%	EGHT	-48.1%
4	WKME	0.5%	VEEV	-7.3%	TWOU	-16.5%	ETWO	-47.9%
5	MSFT	0.5%	PLTR	-7.2%	PD	-16.2%	ZI	-43.6%
6	ORCL	0.6%	SPT	-7.2%	DOMO	-15.7%	DOMO	-39.9%
7	SWI	0.7%	PANW	-6.3%	FROG	-15.5%	SABR	-39.3%
8	INST	0.8%	DOCN	-6.2%	HCP	-15.4%	DOCS	-34.2%
9	CRM	0.8%	SNOW	-6.0%	HUBS	-15.0%	AYX	-31.0%
10	SSNC	0.8%	HUBS	-6.0%	BASE	-14.6%	MTTR	-28.6%

Source: Eikon

Assessing Software – Where Are the Multiples?



+1 212 761-4149

MORGAN	STANL	EY &	CO.	LLC

Keith Weiss, CFA

Equity Analyst

Keith.Weiss@morganstanley.com

Sanjit K Singh

Equity Analyst

Sanjit.Singh@morganstanley.com +1 415 576-2060

Meta A Marshall

Equity Analyst

Meta.Marshall@morganstanley.com +1 212 761-0430

Josh Baer, CFA

Equity Analyst

Josh.Baer@morganstanley.com +1 212 761-4223

Hamza Fodderwala

Equity Analyst

Hamza.Fodderwala@morganstanley.com +1 212 761-1083

Elizabeth Porter, CFA

Equity Analyst

Elizabeth.E.Porter@morganstanley.com +1 212 761-3632

SOFTWARE

North America Industry View

Attractive

Morgan Stanley does and seeks to do business with companies covered in Morgan Stanley Research. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of Morgan Stanley Research. Investors should consider Morgan Stanley Research as only a single factor in making their investment decision.

For analyst certification and other important disclosures, refer to the Disclosure Section, located at the end of this report.

Exhibit 1: Overall Software Coverage Group Trading at 42% Below the Trailing 5-Year Average...

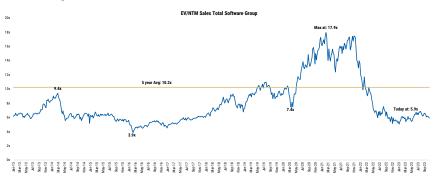
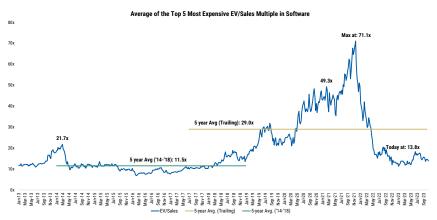
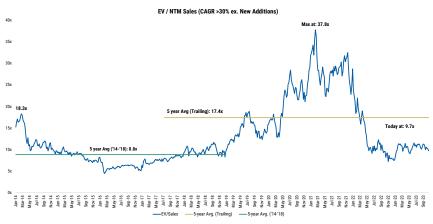


Exhibit 2: The Highest Multiple Software Names Trading at 52% Below the Trailing 5-Year Average



Source: Morgan Stanley Research, Refinitiv, Company data

Exhibit 3: ...And the Broader High Growth Group a 44% Discount to the Trailing 5-year Average...



Source: Morgan Stanley Research, Refinitiv, Company data

Exhibit 4: ...With the 15-30% Growth Group Trading at 33% Below the Trailing 5-year Average...

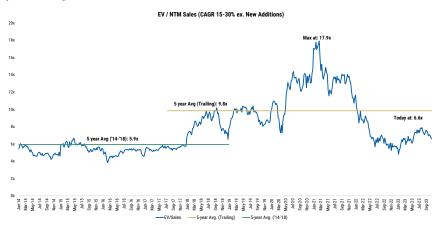
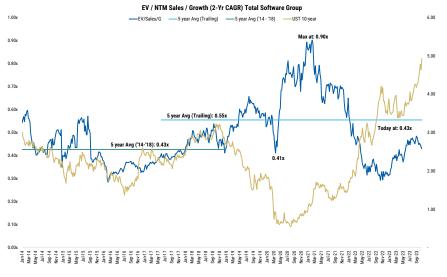


Exhibit 5: ...And Slow Growers Trading 16% Below the Trailing 5-year Average...



Source: Morgan Stanley Research, Refinitiv, Company data

Exhibit 6: ...On a Growth Adjusted Basis, Software Trading Below the Historical Averages



Source: Morgan Stanley Research, Refinitiv, Company data

Exhibit 7: Overall FCF Multiples \sim 56% Off the Peak, and 27% Below the Trailing 5-Year Average

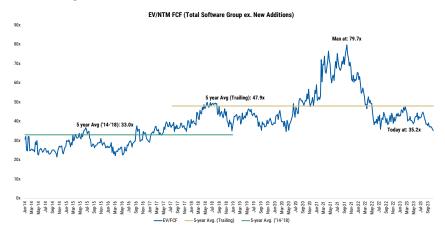
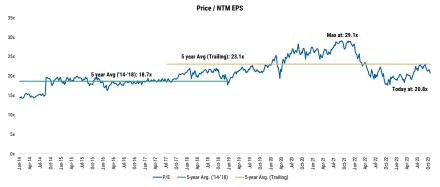


Exhibit 8: Overall P/E Multiples 29% Off the Peak, and 10% Below the Trailing 5-Year Average...



Source: Morgan Stanley Research, Refinitiv, Company data

Assessing the Pullback - Growth and Performance Versus Multiples

Exhibit 9: Average High Growth Company -74% Below 52Wk High — Avg. 2-Year Sales CAGR of 32%, Avg. EV/CY24 Sales of 8.1x

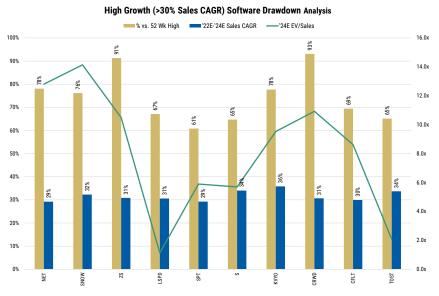
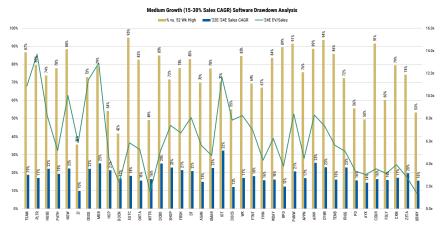
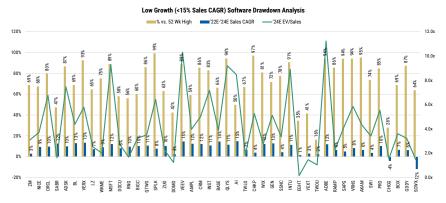


Exhibit 10: Average Med. Growth Company -74% Below 52Wk High — Avg. 2-Year Sales CAGR of 19%, Avg. EV/CY24 Sales of 6.3x



Source: Morgan Stanley Research, Refinitiv, Company data

Exhibit 11: Average Low Growth Company -72% Below 52Wk High — Avg. 2-Year Sales CAGR of 8%, Avg. EV/CY24 Sales of 4.4x



Morgan Stanley is acting as financial advisor to Broadcom Inc. ("Broadcom") in connection with its definitive merger agreement to acquire VMware, Inc. ("VMware"), as announced on May 26, 2022. The proposed transaction is subject to the approval of VMware's shareholders, regulatory approvals, and other customary closing conditions. This report and the information provided herein is not intended to (i) provide voting advice, (ii) serve as an endorsement of the proposed transaction, or (iii) result in the procurement, withholding or revocation of a proxy or any other action by a security holder. Broadcom has agreed to pay fees to Morgan Stanley for its financial services that are contingent upon the consummation of the transaction. Please refer to the notes at the end of the report.

Morgan Stanley is acting as financial advisor to Splunk Inc. ("Splunk") in relation to its definitive agreement to be acquired by Cisco Systems Inc., as announced on September 21, 2023. The proposed acquisition is subject to regulatory approvals and other customary closing conditions, including, among others, approval by Splunk's shareholders. This report and the information provided herein is not intended to (i) provide voting advice, (ii) serve as an endorsement of the proposed transaction, or (iii) result in the procurement, withholding or revocation of a proxy or any other action by a security holder. Splunk has agreed to pay fees to Morgan Stanley for its financial advisory services, including transaction fees that are contingent upon the consummation of the proposed transaction. Please refer to the notes at the end of this report.



Disclosure Section

The information and opinions in Morgan Stanley Research were prepared by Morgan Stanley & Co. LLC, and/or Morgan Stanley C.T.V.M. S.A., and/or Morgan Stanley Mexico, Casa de Bolsa, S.A. de C.V., and/or Morgan Stanley Canada Limited. As used in this disclosure section, "Morgan Stanley" includes Morgan Stanley & Co. LLC, Morgan Stanley C.T.V.M. S.A., Morgan Stanley Mexico, Casa de Bolsa, S.A. de C.V., Morgan Stanley Canada Limited and their affiliates as necessary.

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/researchdisclosures, 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: Keith Weiss, 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 September 29, 2023, Morgan Stanley beneficially owned 1% or more of a class of common equity securities of the following companies covered in Morgan Stanley Research: 2u Inc, Adobe Inc., Akamai Technologies, Inc., Alteryx Inc, Appian Corp, Asana Inc, Atlassian Corporation PLC, Autodesk, BigCommerce Holdings, Inc., Bill.com Holdings, Blackline Inc, Box Inc, C3.ai, Chegg Inc, Cloudflare Inc, Couchbase, Inc., CrowdStrike Holdings Inc, CyberArk Software Ltd, Datadog, Inc., DocuSign Inc, Fastly Inc., Five9 Inc, Fortinet Inc., Freshworks Inc, GoDaddy Inc, HashiCorp, Intuit, Klaviyo, Inc, Liveramp Holdings Inc, Microsoft, MongoDB Inc, Okta, Inc., PagerDuty, Inc., Palantir Technologies Inc., Palo Alto Networks Inc, Qualys Inc, Sabre Corp, Salesforce.com, Samsara Inc, SentinelOne, Inc., ServiceNow Inc, Shopify Inc, Snowflake Inc., Splunk Inc, Sprinklr Inc, Sprout Social Inc, Toast, Inc., Twilio Inc, UiPath Inc, Wix.Com Ltd, Workday Inc, Zoom Video Communications Inc, ZoomInfo Technologies Inc.

Within the last 12 months, Morgan Stanley managed or co-managed a public offering (or 144A offering) of securities of Akamai Technologies, Inc., Alteryx Inc, Intuit, Klaviyo, Inc, LegalZoom.com Inc, RingCentral Inc.

Within the last 12 months, Morgan Stanley has received compensation for investment banking services from 2u Inc, Akamai Technologies, Inc., Alteryx Inc, Autodesk, GoDaddy Inc, Intuit, Klaviyo, Inc, LegalZoom.com Inc, PagerDuty, Inc., Palo Alto Networks Inc, RingCentral Inc, Shopify Inc.

In the next 3 months, Morgan Stanley expects to receive or intends to seek compensation for investment banking services from 2u Inc, Adobe Inc., Akmai Technologies, Inc., Alteryx Inc, Amplitude Inc., Appian Corp, Asana Inc, Atlassian Corporation PLC, Autodesk, BigCommerce Holdings, Inc., BilLcom Holdings, Blackline Inc., Box Inc., C3.ai, Check Point Software Technologies Ltd., Chegg Inc., Cloudflare Inc., Confluent, Inc., Couchbase, Inc., Coursera, Inc., CrowdStrike Holdings Inc, CyberArk Software Ltd, Datadog, Inc., DigitalOcean Holdings Inc., Docebo Inc., Docebo Inc., DocuSign Inc., Fastly Inc., Fireshworks Inc., Gen Digital Inc., GoDaddy Inc., HashiCorp, HubSpot, Inc., Instructure Holdings Inc, Intuit, JFrog Ltd., Karooooo Ltd., Klaviyo, Inc., LegalZoom.com Inc., Lightspeed POS Inc., Liveramp Holdings Inc, Matterport Inc, Microsoft, MongoDB Inc., New Relic Inc., NICE Ltd., Okta, Inc., Oracle Corporation, PagerDuty, Inc., Palantir Technologies Inc., Palo Alto Networks Inc., Qualys Inc., RingCentral Inc, Sabre Corp, Salesforce.com, Samsara Inc, Semrush Holdings Inc. -A, SentinelOne, Inc., ServiceNow Inc., Shopify Inc, Smartsheet Inc, Snowflake Inc., Solarwinds Corp, Splunk Inc, Sprinklr Inc, Sprout Social Inc., Tenable Holdings Inc., Toast, Inc., Twilio Inc, Udemy Inc, UiPath Inc, Varonis Systems, Inc., Vertex Inc., WalkMe Ltd, Wix.Com Ltd, Workday Inc, Zeta Global Holdings Corp, Zoom Video Communications Inc, ZoomInfo Technologies Inc., Zscaler Inc.

Within the last 12 months, Morgan Stanley has received compensation for products and services other than investment banking services from Adobe Inc., Atlassian Corporation PLC, Autodesk, Box Inc, Check Point Software Technologies Ltd., Cloudflare Inc, Confluent, Inc., DocuSign Inc, Freshworks Inc, Gen Digital Inc., GoDaddy Inc, Intuit, Microsoft, NICE Ltd., Oracle Corporation, Palo Alto Networks Inc, Qualys Inc, RingCentral Inc, Sabre Corp, Salesforce.com, Snowflake Inc., Solarwinds Corp, UiPath Inc, Zoom Video Communications Inc, Zscaler Inc.

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: 2u Inc, Adobe Inc., Akamai Technologies, Inc., Alteryx Inc., Amplitude Inc., Appian Corp, Asana Inc, Atlassian Corporation PLC, Autodesk, BigCommerce Holdings, Inc., Bill.com Holdings, Blackline Inc, Box Inc., C3.ai, Check Point Software Technologies Ltd., Chegg Inc, Cloudflare Inc, Confluent, Inc., Couchbase, Inc., Coursera, Inc., CrowdStrike Holdings Inc, CyberArk Software Ltd, Datadog, Inc., DigitalOcean Holdings Inc, Docebo Inc., Docebo Inc., DocuSign Inc, Five9 Inc, Five9 Inc., Five9 Inc., Freshworks Inc., Gen Digital Inc., GoDaddy Inc, HashiCorp, HubSpot, Inc., Instructure Holdings Inc, Intuit, JFrog Ltd., Karooooo Ltd, Klaviyo, Inc, LegalZoom.com Inc, Lightspeed POS Inc., Liveramp Holdings Inc, Matterport Inc, Microsoft, MongoDB Inc, New Relic Inc, NICE Ltd., Okta, Inc., Oracle Corporation, PagerDuty, Inc., Palantir Technologies Inc., Palo Alto Networks Inc, Qualys Inc, RingCentral Inc, Sabre Corp, Salesforce.com, Samsara Inc, Semrush Holdings Inc -A, SentinelOne, Inc., ServiceNow Inc, Shopify Inc, Smartsheet Inc, Snowflake Inc., Solarwinds Corp, Splunk Inc, Sprinklr Inc, Sprout Social Inc, Tenable Holdings Inc, Toast, Inc., Twilio Inc, Udemy Inc, UiPath Inc, Varonis Systems, Inc., Vertex Inc., WalkMe Ltd, Wix.Com Ltd, Workday Inc, Zeta Global Holdings Corp, Zoom Video Communications Inc, ZoomInfo Technologies Inc., Zscaler Inc.

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: 2u Inc, 8x8 Inc, Adobe Inc., Akamai Technologies, Inc., Atlassian Corporation PLC, Autodesk, BigCommerce Holdings, Inc., Blackline Inc, Box Inc, Check Point Software Technologies Ltd., Chegg Inc, Cloudflare Inc, Confluent, Inc., CyberArk Software Ltd, Datadog, Inc., DocuSign Inc, Five9 Inc, Fortinet Inc., Freshworks Inc, Gen Digital Inc., GoDaddy Inc, HubSpot, Inc., Intuit, Microsoft, MongoDB Inc, NICE Ltd., Okta, Inc., Oracle Corporation, PagerDuty, Inc., Palo Alto Networks Inc, Qualys Inc, RingCentral Inc, Sabre Corp, Salesforce.com, ServiceNow Inc, Shopify Inc, Snowflake Inc., Solarwinds Corp, Splunk Inc, Twilio Inc, UiPath Inc, Wix.Com Ltd, Workday Inc, Zoom Video Communications Inc, Zscaler Inc.

An employee, director or consultant of Morgan Stanley is a director of Tenable Holdings Inc. This person is not a research analyst or a member of a research analyst's household.

Morgan Stanley & Co. LLC makes a market in the securities of 2u Inc, 8x8 Inc, Adobe Inc., Akamai Technologies, Inc., Alteryx Inc, Amplitude Inc., Appian Corp, Atlassian Corporation PLC, Autodesk, BigCommerce Holdings, Inc., Blackline Inc, Box Inc, C3.ai, Check Point Software Technologies Ltd., Chegg Inc, Confluent, Inc., Couchbase, Inc., Coursera, Inc., CyberArk Software Ltd, Datadog, Inc., DigitalOcean Holdings Inc, Docebo Inc., DocuSign Inc, Domo Inc, Five9 Inc, Fortinet Inc., Freshworks Inc, Gen Digital Inc., GoDaddy Inc, HashiCorp, Instructure Holdings Inc, Intuit, JFrog Ltd., Karooooo Ltd, LegalZoom.com Inc, Liveramp Holdings Inc, Microsoft, New Relic Inc, Oracle Corporation, PagerDuty, Inc., Palo Alto Networks Inc, Qualys Inc, Rapid7 Inc, RingCentral Inc, Sabre Corp, Salesforce.com, Secureworks Corp, Semrush Holdings Inc -A, ServiceNow Inc, Shopify Inc, Smartsheet Inc, Solarwinds Corp, Splunk Inc, Sprout Social Inc, Tenable Holdings



Inc, Udemy Inc, Varonis Systems, Inc., Vertex Inc., VMware Inc, WalkMe Ltd, Wix.Com Ltd, Workday Inc, Zeta Global Holdings Corp, Zoom Video Communications Inc, ZoomInfo Technologies Inc. Zscaler Inc.

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 September 30, 2023)

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.

	Coverag	e Universe	Inves	stment Banking Clients	s (IBC)		nvestment Services s (MISC)
Stock Rating Category	Count	% of Total	Count	% of Total IBC	% of Rating Category	Count	% of Total Other MISC
Overweight/Buy	1350	37%	281	43%	21%	608	39%
Equal-weight/Hold	1673	46%	303	46%	18%	709	46%
Not-Rated/Hold	3	0%	0	0%	0%	1	0%
Underweight/Sell	608	17%	68	10%	11%	225	15%
Total	3.634		652			1543	

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 (1): 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 & E*TRADE Securities LLC Customers

Important disclosures regarding the relationship between the companies that are the subject of Morgan Stanley Research and Morgan Stanley Smith Barney LLC or Morgan Stanley or any of their affiliates, 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 www.morganstanley.com/researchdisclosures.

Each Morgan Stanley research report is reviewed and approved on behalf of Morgan Stanley Smith Barney LLC and E*TRADE Securities 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 & Co. International PLC and its affiliates have a significant financial interest in the debt securities of 2u Inc, Adobe Inc., Akamai Technologies, Inc., Alteryx Inc, Autodesk, Billcom Holdings, Blackline Inc, Box Inc, Chegg Inc, Confluent, Inc., CrowdStrike Holdings Inc, DigitalOcean Holdings Inc, DocuSign Inc, Fortinet Inc., Intuit, LegalZoom.com Inc, Microsoft, NICE Ltd., Okta, Inc., Oracle Corporation, Palantir Technologies Inc., Palo Alto Networks Inc, Rapid7 Inc, RingCentral Inc, Salesforce.com, Toast, Inc., Twilio Inc, Workday Inc, Zscaler Inc.

A member of Research who had or could have had access to the research prior to completion owns securities (or related derivatives) in the Microsoft. This person is not a research analyst or a member of research analyst's household.

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).

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.

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 Japan Co., Ltd; in Hong Kong by Morgan Stanley Asia Limited (which accepts responsibility for its contents) and by Morgan Stanley Bank Asia Limited; in Singapore by 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 by Morgan Stanley Bank Asia Limited, Singapore Branch (Registration number T14FC0118)); in Australia to "wholesale clients" within the meaning of the Australian Corporations Act by 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; in Australia to "wholesale clients" and "retail clients" within the meaning of the Australian Corporations Act by 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; in Korea by Morgan Stanley & Co International plc, Seoul Branch; in India by 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. INHO00001105); 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 18th Floor, Tower 2, One World Center, Plot-841, Jupiter Textile Mill Compound, Senapati Bapat Marg, Lower Parel, Mumbai 400013, India Telephone no. +91-22-61181000; Compliance Officer Details: Mr. Anil Shenoy, Tel. No.: +91-22-61181000 or Email: Anil. Shenoy@morganstanley.com; Grievance officer details: Mr. Anil Shenoy, Tel. No.: +91-22-61181000 or Email: msic-compliance@morganstanley.com; in Canada by Morgan Stanley Canada Limited; in Germany and the European Economic Area where required by Morgan Stanley Europe S.E., authorised and regulated by Bundesanstalt fuer Finanzdienstleistungsaufsicht (BaFin) under the reference number 149169; in the US by Morgan Stanley & Co. LLC, which accepts responsibility for its contents. Morgan Stanley & Co. International plc, authorized by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority, disseminates in the UK research that it has prepared, and research which has been prepared by any of its affiliates, only to persons who (i) are investment professionals falling within Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (as amended, the "Order"); (ii) are persons who are high net worth entities falling within Article 49(2)(a) to (d) of the Order; or (iii) are persons to whom an invitation or inducement to engage in investment activity (within the meaning of section 21 of the Financial Services and Markets Act 2000, as amended) may otherwise lawfully be communicated or caused to be $communicated. RMB \, Morgan \, Stanley \, Proprietary \, Limited \, is \, a \, member \, of \, the \, JSE \, Limited \, and \, A2X \, (Pty) \, Ltd. \, RMB \, Morgan \, Stanley \, Proprietary \, Limited \, is \, a \, joint \, venture \, owned \, equally \, by \, Morgan \, Communicated \, and \, A2X \, (Pty) \, Ltd. \, RMB \, Morgan \, Stanley \, Proprietary \, Limited \, is \, a \, joint \, venture \, owned \, equally \, by \, Morgan \, Communicated \, and \, A2X \, (Pty) \, Ltd. \, RMB \, Morgan \, Stanley \, Proprietary \, Limited \, is \, a \, joint \, venture \, owned \, equally \, by \, Morgan \, Communicated \, and \, A2X \, (Pty) \, Ltd. \, a$ Stanley International Holdings Inc. and RMB Investment Advisory (Proprietary) Limited, which is wholly owned by FirstRand Limited. The information in Morgan Stanley Research is being disseminated by Morgan Stanley Saudi Arabia, regulated by the Capital Market Authority in the Kingdom of Saudi Arabia, and is directed at Sophisticated investors only.

The information in Morgan Stanley Research is being communicated by Morgan Stanley & Co. International plc (DIFC Branch), regulated by the Dubai Financial Services Authority (the DFSA), and is directed at Professional Clients only, as defined by the DFSA. The financial products or financial services to which this research relates will only be made available to a customer who we are satisfied meets the regulatory criteria to be a Professional Client. A distribution of the different MS Research ratings or recommendations, in percentage terms for Investments in each sector covered, is available upon request from your sales representative.

The information in Morgan Stanley Research is being communicated by Morgan Stanley & Co. International plc (QFC Branch), regulated by the Qatar Financial Centre Regulatory Authority (the QFCRA), and is directed at business customers and market counterparties only and is not intended for Retail Customers as defined by the QFCRA.

As required by the Capital Markets Board of Turkey, investment information, comments and recommendations stated here, are not within the scope of investment advisory activity. Investment advisory service is provided exclusively to persons based on their risk and income preferences by the authorized firms. Comments and recommendations stated here are general in nature. These opinions may not fit to your financial status, risk and return preferences. For this reason, to make an investment decision by relying solely to this information stated here may not bring about outcomes that fit your expectations.

The trademarks and service marks contained in Morgan Stanley Research are the property of their respective owners. Third-party data providers make no warranties or representations relating to the accuracy, completeness, or timeliness of the data they provide and shall not have liability for any damages relating to such data. The Global Industry Classification Standard (GICS) was developed by and is the exclusive property of MSCI and S&P.

Morgan Stanley Research, or any portion thereof may not be reprinted, sold or redistributed without the written consent of Morgan Stanley.

Indicators and trackers referenced in Morgan Stanley Research may not be used as, or treated as, a benchmark under Regulation EU 2016/1011, or any other similar framework.

The issuers and/or fixed income products recommended or discussed in certain fixed income research reports may not be continuously followed. Accordingly, investors should regard those fixed income research reports as providing stand-alone analysis and should not expect continuing analysis or additional reports relating to such issuers and/or individual fixed income products. Morgan Stanley may hold, from time to time, material financial and commercial interests regarding the company subject to the Research report.

Registration granted by SEBI and certification from the National Institute of Securities Markets (NISM) in no way guarantee performance of the intermediary or provide any assurance of returns to investors. Investment in securities market are subject to market risks. Read all the related documents carefully before investing.

INDUSTRY COVERAGE: Software

COMPANY (TICKER)	RATING (AS OF)	PRICE* (10/20/2023)
Chris Quintero		
Blackline Inc (BL.O)	E (09/18/2023)	\$53.70
Vertex Inc. (VERX.0)	O (09/18/2023)	\$22.90
Elizabeth Porter, CFA		
Amplitude Inc. (AMPL.0)	E (10/25/2021)	\$10.32
Freshworks Inc (FRSH.0)	E (10/18/2021)	\$18.55



CaDaddy Inc (CDDV NI)	F (07/10/2021)	\$74.49
GoDaddy Inc (GDDY.N)	E (07/19/2021)	\$429.07
HubSpot, Inc. (HUBS.N)	0 (03/21/2023)	\$429.07
Klaviyo, Inc (KVYO.N) LegalZoom.com Inc (LZ.O)	E (10/16/2023) U (07/28/2022)	\$10.14
Liveramp Holdings Inc (RAMP.N)	O (07/15/2019)	\$28.20
. ,	· · · · · · · · · · · · · · · · · · ·	\$2.00
Matterport Inc (MTTR.0)	E (04/19/2022)	\$8.31
Semrush Holdings Inc -A (SEMR.N)	E (06/06/2022)	\$13.26
Sprinklr Inc (CXM.N) Sprout Social Inc (SPT.O)	E (07/19/2021)	\$45.05
	E (11/17/2020)	\$83.16
Wix.Com Ltd (WIX.O)	E (05/19/2022) E (07/06/2021)	\$8.38
Zeta Global Holdings Corp (ZETA.N) ZoomInfo Technologies Inc (ZI.O)	O (11/18/2020)	\$16.99
	0 (11/10/2020)	<u> </u>
Hamza Fodderwala	F (10/16/2022)	012465
Check Point Software Technologies Ltd. (CHKP.0)	E (10/16/2023)	\$134.65
CrowdStrike Holdings Inc (CRWD.0)	E (08/27/2023)	\$178.76
CyberArk Software Ltd (CYBR.O)	0 (10/01/2020)	\$163.61 \$56.36
Fortinet Inc. (FTNT.0)	0 (10/07/2022)	
Gen Digital Inc. (GEN.O)	E (03/29/2022)	\$17.16
Okta, Inc. (OKTA.0)	E (09/01/2022)	\$75.57
Palo Alto Networks Inc (PANW.0)	0 (10/10/2017)	\$243.10
Qualys Inc (QLYS.0)	U (02/09/2021)	\$155.79
Rapid7 Inc (RPD.0)	E (08/11/2015)	\$49.76
Secureworks Corp (SCWX.0)	E (09/09/2020)	\$6.42
SentinelOne, Inc. (S.N)	0 (06/12/2023)	\$15.98 \$42.70
Tenable Holdings Inc (TENB.0)	E (01/12/2023)	\$32.22
Varonis Systems, Inc. (VRNS.0) Zscaler Inc (ZS.0)	0 (10/16/2023) E (01/12/2023)	\$162.19
	L (01/12/2023)	\$102.19
Josh Baer, CFA	F (11 (0 A (0000))	40.10
2u Inc (TWOU.0)	E (11/24/2020)	\$2.13
Asana Inc (ASAN.N)	E (10/26/2020)	\$18.36
BigCommerce Holdings, Inc. (BIGC.0)	E (05/11/2021)	\$9.45
Box Inc (BOX.N)	0 (10/03/2022)	\$24.05
Chegg Inc (CHGG.N)	E (11/02/2021)	\$8.39
Coursera, Inc. (COUR.N)	0 (04/26/2021)	\$17.84
DigitalOcean Holdings Inc (DOCN.N)	E (08/11/2023)	\$21.52
Docebo Inc. (DCBO.0)	0 (08/17/2023)	\$39.48
DocuSign Inc (DOCU.0)	U (10/03/2022)	\$40.27
Instructure Holdings Inc (INST.N)	0 (12/09/2021)	\$25.55
Lightspeed POS Inc. (LSPD.N)	E (02/18/2021)	\$13.46
Sabre Corp (SABR.O)	E (03/16/2021)	\$3.75
Smartsheet Inc (SMAR.N)	0 (05/22/2018)	\$41.02
Toast, Inc. (TOST.N)	0 (12/16/2021)	\$17.58
Udemy Inc (UDMY.O)	E (11/23/2021)	\$9.21 \$8.95
WalkMe Ltd (WKME.O)	E (06/07/2022)	\$6.93
Keith Weiss, CFA	0 (07 (04 (0000)	A.T. 40.00
Adobe Inc. (ADBE.O)	0 (07/31/2023)	\$540.96
Akamai Technologies, Inc. (AKAM.O)	E (04/29/2020)	\$104.02
Atlassian Corporation PLC (TEAM.O)	0 (01/13/2020)	\$187.07
Autodesk (ADSK.O)	E (08/19/2021)	\$202.69
Bill.com Holdings (BILL.N)	E (06/12/2023)	\$101.00
Cloudflare Inc (NET.N)	E (06/18/2020)	\$59.38
Intuit (INTU.0)	0 (10/05/2020)	\$506.81
Microsoft (MSFT.0)	0 (01/13/2016)	\$326.67
Oracle Corporation (ORCL.N)	E (01/15/2019)	\$101.85
Palantir Technologies Inc. (PLTR.N)	U (08/31/2023)	\$16.11



Salesforce.com (CRM.N)	E (07/31/2023)	\$203.73
Samsara Inc (IOT.N)	E (03/23/2023)	\$22.82
ServiceNow Inc (NOW.N)	0 (11/12/2020)	\$542.51
Shopify Inc (SHOP.N)	E (06/24/2022)	\$51.14
Snowflake Inc. (SNOW.N)	0 (02/07/2022)	\$147.67
Splunk Inc (SPLK.0)	++	\$147.53
UiPath Inc (PATH.N)	E (09/07/2022)	\$15.53
VMware Inc (VMW.N)	++	\$150.91
Workday Inc (WDAY.0)	0 (04/14/2020)	\$211.16
Meta A Marshall		
8x8 Inc (EGHT.O)	E (01/13/2020)	\$2.24
Five9 Inc (FIVN.0)	E (10/10/2022)	\$60.09
NICE Ltd. (NICE.O)	0 (10/16/2023)	\$156.30
RingCentral Inc (RNG.N)	E (08/08/2023)	\$27.64
Twilio Inc (TWLO.N)	0 (09/19/2019)	\$53.33
Zoom Video Communications Inc (ZM.0)	E (10/11/2022)	\$61.71
Roy D Campbell		
Karooooo Ltd (KARO.O)	O (04/27/2021)	\$23.77
Sanjit K Singh		
Alteryx Inc (AYX.N)	O (09/18/2023)	\$34.94
Appian Corp (APPN.O)	E (12/03/2021)	\$41.05
C3.ai (Al.N)	U (01/04/2021)	\$24.31
Confluent, Inc. (CFLT.0)	0 (04/12/2023)	\$28.62
Couchbase, Inc. (BASE.O)	E (08/16/2021)	\$14.92
Datadog, Inc. (DDOG.0)	0 (05/21/2021)	\$86.08
Domo Inc (DOMO.0)	E (01/20/2023)	\$8.56
Fastly Inc. (FSLY.N)	E (04/20/2023)	\$14.66
HashiCorp (HCP.0)	E (01/03/2022)	\$20.23
JFrog Ltd. (FROG.0)	E (10/12/2020)	\$22.39
MongoDB Inc (MDB.0)	0 (04/12/2023)	\$346.28
New Relic Inc (NEWR.N)	++	\$85.70
PagerDuty, Inc. (PD.N)	O (01/20/2023)	\$19.65
Solarwinds Corp (SWI.N)	E (11/13/2018)	\$9.01

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

© 2023 Morgan Stanley

^{*} Historical prices are not split adjusted.