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IT Hardware | North America

4Q22 VAR Survey: Entering The Later Innings Of The Hardware Downcycle

Our 4Q22 VAR and CIO Surveys show a 3rd consecutive cut to 2022 HW budgets, and expectations for 10bps growth deceleration into 2023 (to +1.5%; unchnng from 3Q22), led by flat to declining Server and PC spending vs. LSD Storage growth. At vendor level, IBM/DELL screen more positively than HPQ/LOGI.

4Q22 CIO and VAR Surveys show Hardware growth expectations continuing to moderate into 2023, with Storage expected to outperform PCs and Servers. Our

[4Q22 CIO survey](#) shows that CIOs now expect 2022 IT Hardware spending growth of 1.6%, a 10bps cut from 1.7% Y/Y growth in our 3Q22 CIO survey ([Exhibit 1](#)). CIOs expect hardware growth to decelerate a further 10bps in 2023, to +1.5% Y/Y growth ([Exhibit 2](#)), the slowest of all technology categories, although these expectations are unchanged from our 3Q22 CIO survey ([Exhibit 3](#)). Results from our 4Q22 VAR Survey directionally align with the CIO survey results ([Exhibit 4](#)), and show 2023 growth is expected to decelerate across Servers (down 180bps Y/Y, to -0.1% Y/Y), PCs (down 170bps Y/Y, to +0.1% Y/Y), and Storage (down 170bps Y/Y, to +2.4% Y/Y), with spending up-to-down ratios in 2023 strongest for Storage (4x), and weakest for Servers (1.1x; [Exhibit 5](#)). The macro environment is in large part to blame for the more cautious hardware spending outlook in 2023, as 35% of VARs cite customers cancelling, pausing, or downsizing projects because of macro concerns ([Exhibit 6](#)); however, a normalization of order trends after notable demand pull-forward in 2022 is also a contributing factor to the 2023 slowdown ([Exhibit 7](#)). In response to slowing demand, VARs are seeing an increase in discounting, with a net 38% of VAR respondents pointing to greater Y/Y vendor discounting in 2023 vs. just 13% net in 2021, a sign of greater pricing pressure in 2023 ([Exhibit 8](#)).

However, the 4Q22 survey data also suggests we could be entering the final innings of the hardware downcycle. The 10bps Y/Y reduction to 2022 Hardware budgets in our 4Q22 CIO Survey marks the third consecutive cut to 2022 Hardware budgets ([Exhibit 9](#)), with peak to trough cumulative hardware budget cuts this cycle totaling 90bps (2.5% to 1.6%). Looking at past hardware downcycles (2011, 2016, and 2019), we've typically seen 3-4 consecutive negative CIO Hardware budget cuts totaling 90-180bps cumulatively before budget expectations stabilize ([Exhibit 10](#)). Historically, hardware net income estimates have been revised lower alongside these CIO budget cuts, driving accelerating hardware stock underperformance ([Exhibit 11](#)). The data this cycle is pointing to a

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similar dynamic, as hardware net income expectations have been cut by 5% in the last 9 months alongside the last 3 CIO Hardware budget cuts ([Exhibit 12](#)), driving hardware stock underperformance. However, as the magnitude of hardware budget cuts slows, so does the magnitude of negative net income revisions and the pace of hardware underperformance. As a result, we believe the 4Q22 CIO and VAR data is telling us that there is still some downside risk to 2023 Hardware budgets, but that spending expectations could bottom/stabilize in the next 1-2 quarters, which should lead to moderating negative hardware earnings revisions and slowing Hardware stock underperformance, before budgets potentially recover in 2H23.

Vendor level data from our 4Q22 VAR Survey reads most cautiously for UW rated LOGI and HPQ, while results for DELL were more mixed, and IBM leans positively. VARs expect the rate of business performance to deteriorate Y/Y across all hardware vendors in 2023 ([Exhibit 13](#)), with LOGI spending expected to decline 0.5% Y/Y (-340bps Y/Y), HPQ expected to grow 0.6% Y/Y (-50bps Y/Y), and DELL/EMC expected to grow 1.5% Y/Y (-210bps Y/Y). **Below, we provide additional vendor-level takeaways from our 4Q22 VAR Survey ([Exhibit 13](#)), with slides summarizing our 4Q22 VAR Survey following.**

IBM (OW): Positioning vs. peers improves, but not out of the woods yet.

- **IBM IT services spending intentions improved vs. peers in 4Q.** In 4Q, IT Services net spending intentions with IBM upticked 13 points Q/Q to +5%, a notable improvement. IBM net spending intentions now outpace the IT Services average by 13 points ([Exhibit 14](#)), which we believe reflects the changes IBM has made internally, and traction with IBM Garage.
- **However, IBM remains at risk of IT Services consolidation and budget share losses due to the shift to cloud.** A net 8% of IT Services experts cite IBM is a net budget share donor due to vendor consolidation, tied with Cognizant as the vendor most at risk of budget share losses ([Exhibit 15](#)). We believe this introduces risk into 2023 growth, as customers have diversified IT services providers due to labor shortages and strong demand in 2021 and 2022, but we see the potential for demand to moderate in 2023 due to the macro environment. Additionally, a net 7% of CIOs cite that IBM is expected to be the largest budget share donor due to the shift to the cloud over the last 3 years, flat with the past 3 quarters ([Exhibit 16](#)). This is 7 points ahead of legacy tech peers and marks a strong improvement from 2021 survey data points, however, we'd like to see this improvement persist in the coming quarters.

DELL (EW): Growth expected to decelerate in 2023 as storage partially offsets PC and server weakness.

- **VARs expect growth to decelerate in 2023.** VARs expect spending with DELL to grow 1.5% Y/Y in 2023, a ~210bps deceleration from 3.6% in 2022 ([Exhibit 13](#)), as PC and server demand slows following a robust upgrade cycle/demand pull-forward from 2H20-1H22. Storage is expected to outperform Servers and PCs in 2023, which aligns with DELL management commentary from [F3Q earnings](#) that storage demand remains relatively robust (although not immune to macro pressures), while Server performance missed expectations and PCs face a challenging 2023.

- **PowerStore is gaining further traction.** ~80% of VARs cite seeing increased adoption of DELL PowerStore ([Exhibit 17](#)), up from ~70% in our 4Q21 VAR Survey, which aligns with our consistently improving PowerStore checks and TTM DELL storage share gains. In fact, DELL gained ~170bps of midrange external storage market share Y/Y in 3Q22 on a TTM basis (ex-China), due in part to PowerStore gaining further traction in the mid-market.
- **DELL's positioning in HCI deteriorates, gap with NTNX widens.** 20% of VARs cite DELL as the best positioned hyperconverged infrastructure (HCI) vendor, down 10 points vs. our 4Q21 VAR Survey, while 35% of VARs see NTNX (covered by Meta Marshall) as the top HCI vendor, up 10 points Y/Y ([Exhibit 18](#)). After surpassing NTNX as the best positioned HCI vendor for the first time in our 4Q21 VAR Survey, DELL has fallen back to its #2 positioning. While this reads incrementally negative for DELL, we would note that in our [3Q22 CIO Survey](#), 25% of Hardware domain experts cited that they are using/likely to purchase DELL HCI, surpassing NTNX (22%) for the first time in 6 surveys.

HPQ (UW): Growth expected to be most challenged in 2023 as PC & Peripherals demand decelerates and discounting accelerates.

- **VARs expect just 0.6% Y/Y growth in 2023.** VARs expect spending with HPQ to decelerate by ~50bps Y/Y in 2023, to 0.6% Y/Y, the second weakest growth rate of any Hardware vendor surveyed this quarter. We would note that HPQ's downward growth revision is driven by both smaller (bottom 50% by revenue) and larger (top 50% by revenue) VARs ([Exhibit 19](#)), with the larger downward revision coming from the smaller VARs (down 60bps to 0.4% Y/Y). The deceleration in 2023 growth is largely driven by weaker PC and PC Peripherals spending expectations in 2023, which also reads more cautiously for HPQ's recent acquisition of POLY.
- **HPQ's pricing power set to reverse in 2023.** A net 31% of VARs say that HPQ is discounting *more* today vs. 1 year ago ([Exhibit 20](#)), which is a major reversal from 12 month ago, when a net 12% of VARs said that HPQ was discounting *less* than 1 year ago (i.e. taking pricing). This data aligns with our view that HPQ's pricing strength from the last 12 months, a product of tight supply and strong demand, is eroding as demand moderates and the use of promotions accelerates.

LOGI (UW): Facing peripherals spending declines in 2023.

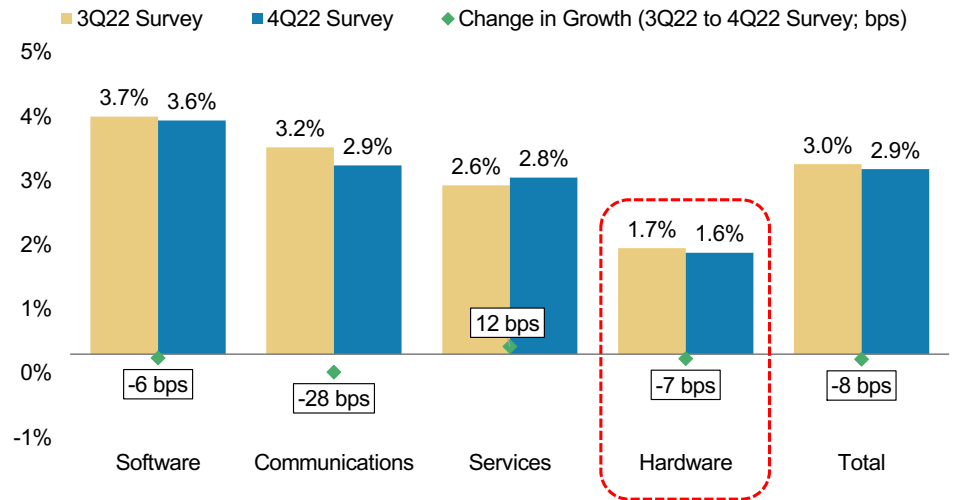
- **Declines in peripherals growth in 2023 reads cautiously for LOGI.** For the first time in 6 quarters, VARs expect PC peripherals spending to decline in NTM, by 0.3% Y/Y (vs. 2-4% Y/Y growth in 2021-2022; [Exhibit 21](#)). As a result, VARs expect LOGI to see the greatest slowdown in business performance in 2023, with growth expected to decelerate 340bps Y/Y, and decline 0.5% Y/Y, below amongst all vendors surveyed. While LOGI's PC peripherals business skews more heavily to consumers (vs. commercial), commercial has been a growing part of LOGI's peripherals business, and when coupled with deteriorating consumer electronics and PC spending intentions in our [AlphaWise Consumer Pulse Survey](#), keeps us more

cautious over the next 12 months.

Key Exhibits

Exhibit 1: CIOs revised their 2022 Hardware budgets 10bps lower, to +1.6% Y/Y, in our 4Q22 survey, the 3rd consecutive cut to hardware budgets.

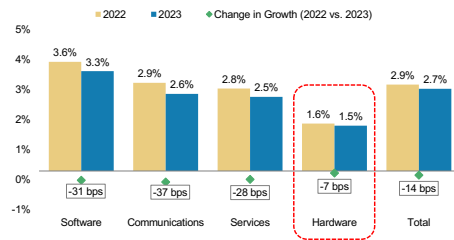
2022 External IT Spending Expectations



Source: AlphaWise, Morgan Stanley Research, n=100

Exhibit 2: CIOs expect hardware budgets to grow 1.5% Y/Y in 2023, a 10bps deceleration from 2022 and the slowest growth of any Tech industry in 2023...

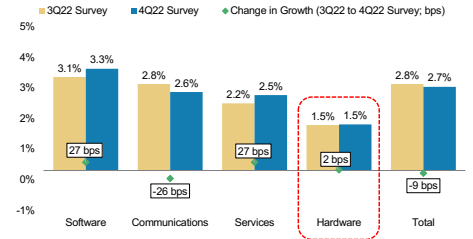
External IT Spending Intentions (4Q22 Survey)



Source: AlphaWise, Morgan Stanley Research, n=100

Exhibit 3: ...however, 1.5% Y/Y growth in 2023 is unchanged from our 3Q22 CIO Survey, showing some stabilization in budgets.

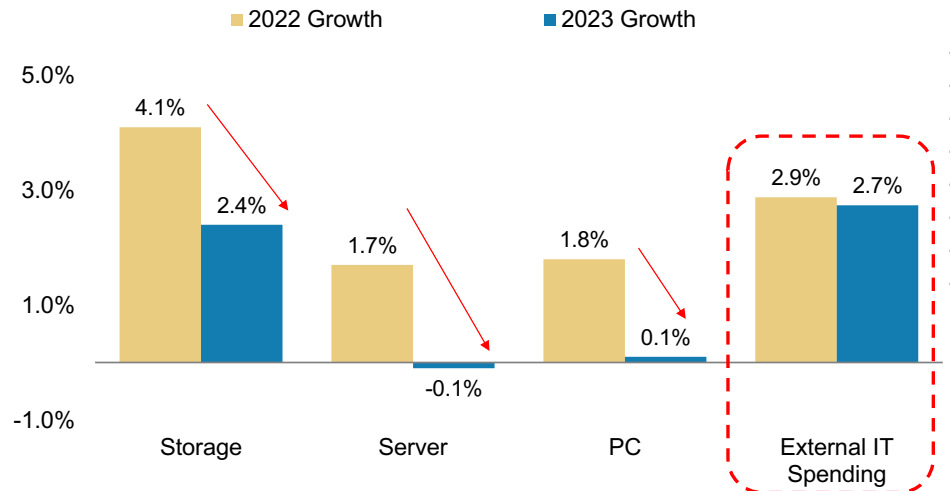
2023 External IT Spending Expectations



Source: AlphaWise, Morgan Stanley Research, n=100

Exhibit 4: Our 4Q22 VAR survey similarly shows expectations for a slowdown in hardware spend in 2023, with storage and PC growth to decelerate by ~170bps Y/Y in 2023, and server growth to inflect to Y/Y declines, down 180bps Y/Y.

VAR Survey: Year-on-Year Average Revenue Growth

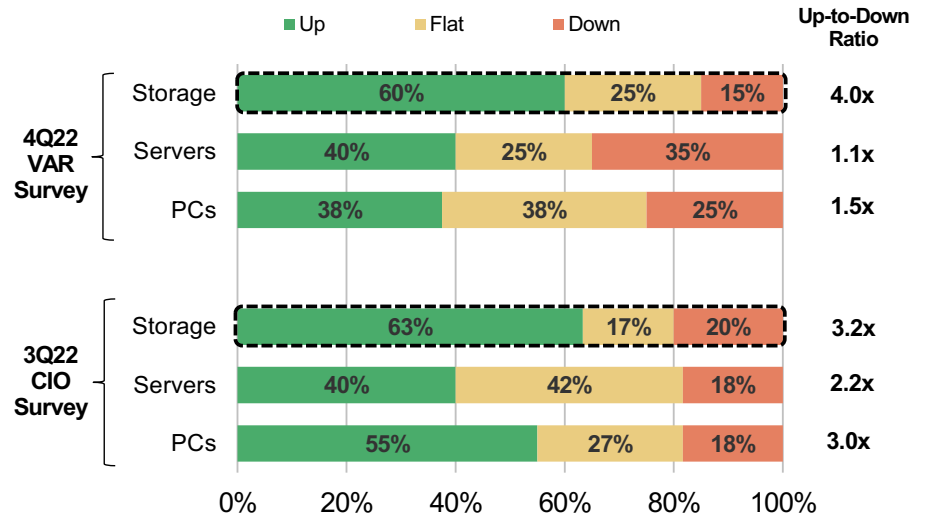


*Historical average from 2016-2019. No historical average for PCs. External IT Hardware results from 4Q22 CIO Survey.

Source: Morgan Stanley Research, AlphaWise (n=20)

Exhibit 5: VARs expect a greater upward revision to storage (4x) spending in 2023 relative to servers (1.1x) and PCs (1.5x).

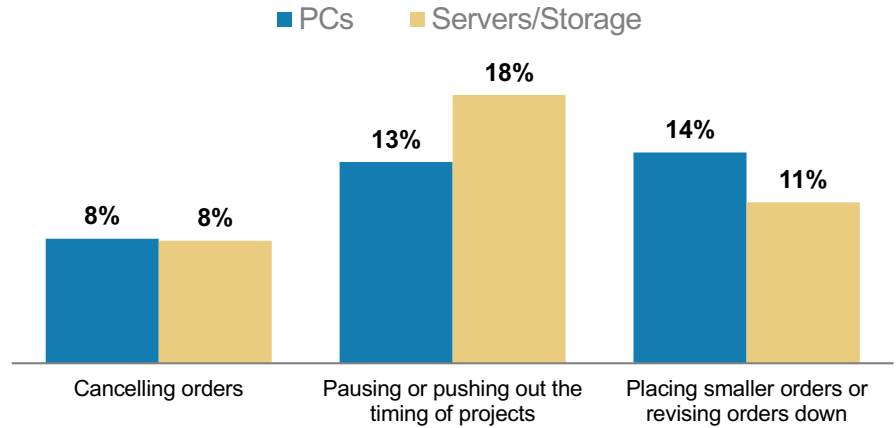
2023 VAR & CIO Spending Expectations by Category



Source: AlphaWise, Morgan Stanley Research. n=60 (US and EU data)

Exhibit 6: VARs indicate macro concerns are a primary culprit of decelerating hardware budget growth, with 35% of VARs citing customers cancelling, pausing, and/or downsizing projects due to the macro environment.

What % of Customers Are Reaction to the Macro Environment by Taking the Following Actions?



Source: Morgan Stanley Research, AlphaWise (n=20)

Exhibit 7: VARs expect the pull-forward of orders for PCs and Servers to moderate Y/Y in 2023, but meaningfully accelerate for Storage.

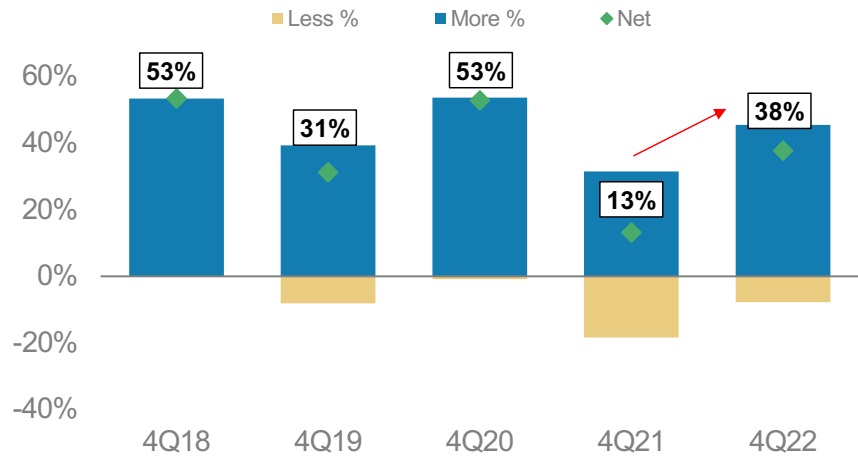
% VARs that Saw/Expect to See Customer Order Pull-Forward by Category



Source: AlphaWise n=60 (US and EU data), Morgan Stanley Research

Exhibit 8: VARs are seeing greater discounting today vs. last year, which we believe is a function of improved supply coupled with weaker demand.

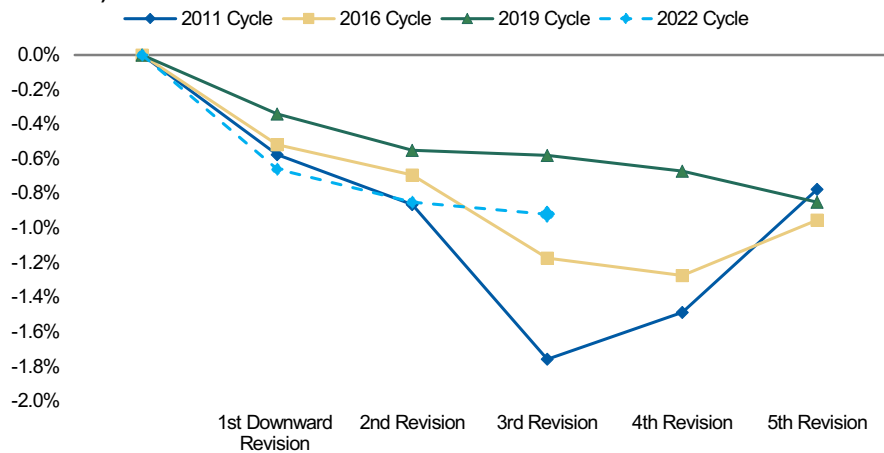
Are Hardware Vendors Offering More, Less or the Same Level of Discounting vs. 1 Year Ago?



Source: Morgan Stanley Research, AlphaWise (n=20)

Exhibit 9: Historically we have seen 3-4 downward revisions to Hardware growth during an enterprise hardware downturn, of 90-180bps in magnitude. Our 4Q22 CIO survey marked the third downward revisions to hardware growth, but budgets are now 90bps lower vs. the peak.

CIO Hardware Budget Cumulative Revisions (After Initial Downward Revision)

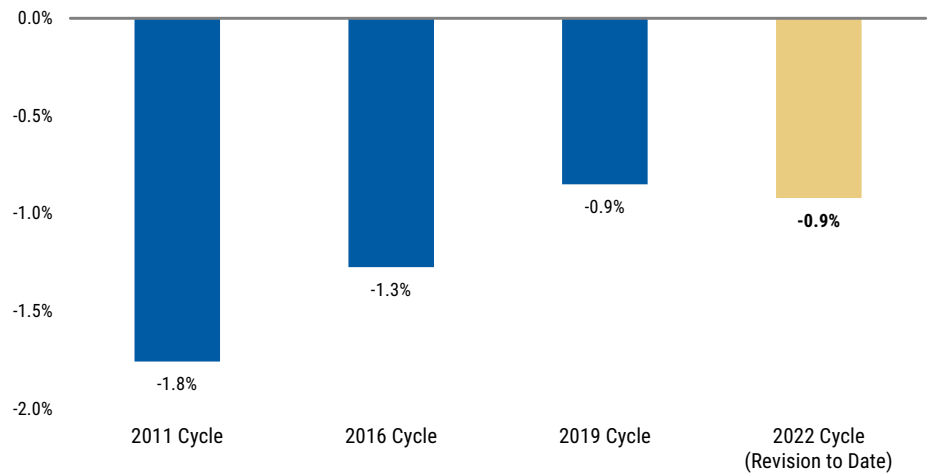


*1Q Survey for 2016 reflects 4Q Survey (Year-1) estimate because question was not asked

Source: Refinitiv, AlphaWise CIO Survey (n=100) (US and EU data), Morgan Stanley Research

Exhibit 10: So far, 2022 Hardware budgets have been revised lower three consecutive times by a total of 92bps, similar to the 2019 hardware downcycle.

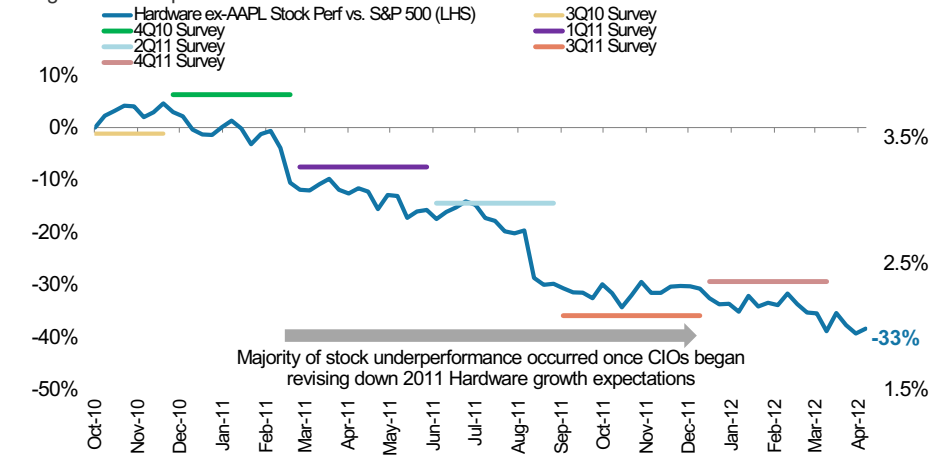
CIO Hardware Negative Budget Revision During Past Cycles (Peak to Trough)



Source: Refinitiv, AlphaWise CIO Survey (n=100) (US and EU data), Morgan Stanley Research

Exhibit 11: In 2011, the initial upward revision to Hardware budgets was followed by a multi-quarter period of downward revisions, which drove 33 points of Hardware stock underperformance vs. the S&P 500.

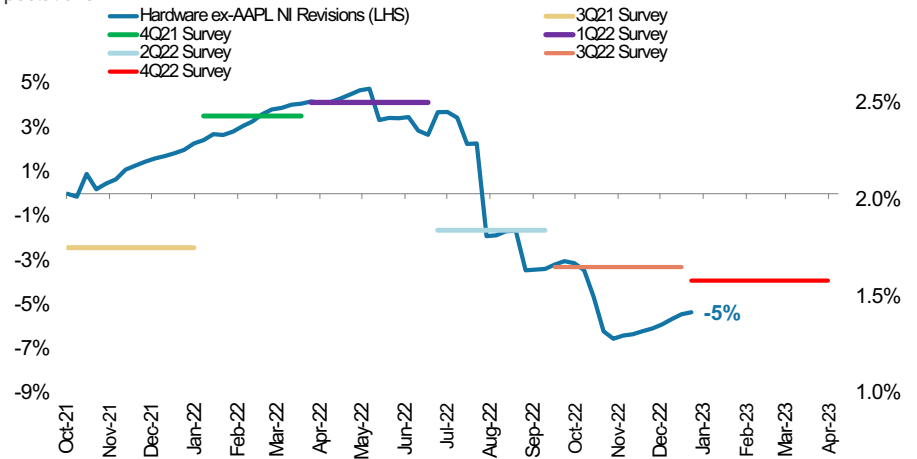
Weighted Average Hardware Stock Performance vs. S&P 500 & CIO 2011 Hardware Budget Growth Expectations



Source: Refinitiv, AlphaWise CIO Survey (n=100) (US and EU data), Morgan Stanley Research

Exhibit 12: Hardware net income estimates have been revised down alongside Hardware budget expectations.

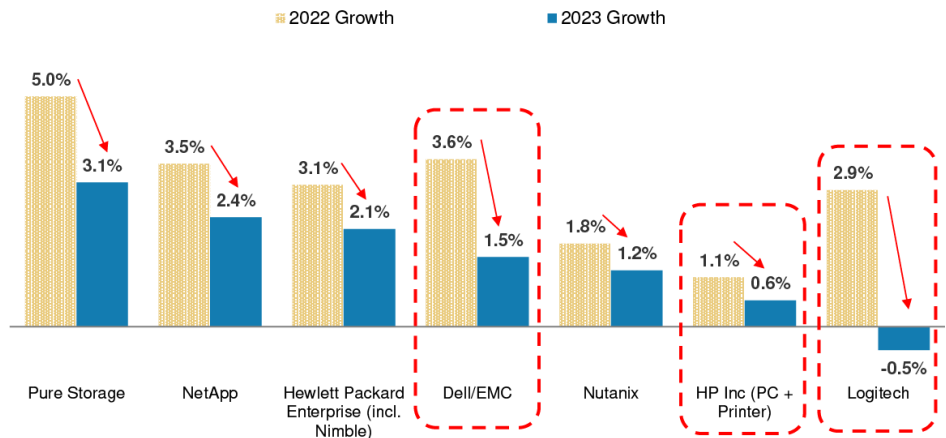
Hardware Net Income Revisions vs. CIO 2022 Hardware Budget Expectations



Source: Refinitiv, AlphaWise CIO Survey (n=100) (US and EU data), Morgan Stanley Research

Exhibit 13: VARs expect spending growth to decelerate across all hardware vendors in 2023.

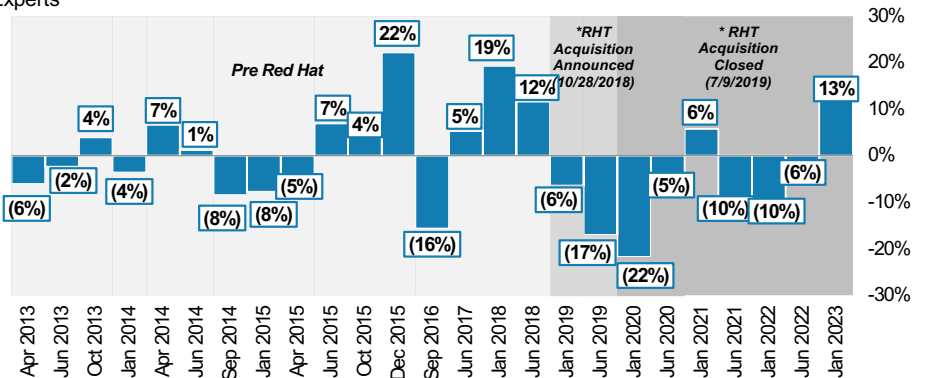
Reseller Business Performance by Vendor (4Q22 Survey)



Source: AlphaWise, Morgan Stanley Research, n=60 (US and EU data)

Exhibit 14: IBM IT Services net spending intentions vs. peers improved to +13% in our 4Q22 CIO Survey.

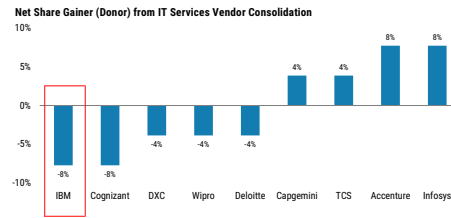
Net Spending Intentions with IBM IT Services vs. Peers from IT Services Domain Experts



* IT Services peers include Accenture, Capgemini, Cognizant, Deloitte, DXC.

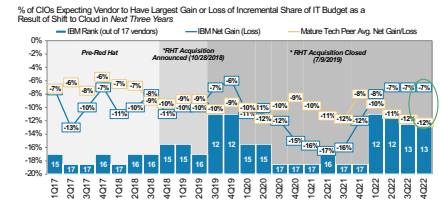
Source: AlphaWise, Morgan Stanley Research, n=100

Exhibit 15: However, IBM remains the most at risk of IT services vendor consolidation.



Source: AlphaWise, Morgan Stanley Research, n=100

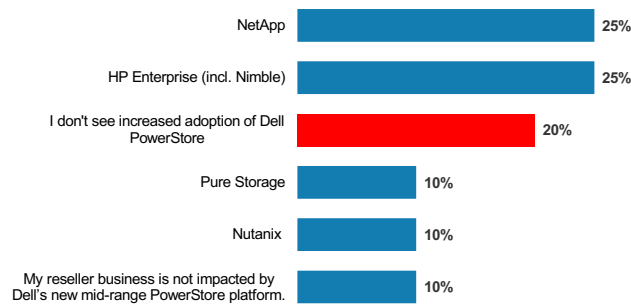
Exhibit 16: While CIOs continue to expect IBM to lose budget share over the next 3 years due to the shift to the cloud, this has improved in recent surveys.



Source: AlphaWise, Morgan Stanley Research, n=100

Exhibit 17: ~80% of VARs see increased adoption of Dell PowerStore, up from 68% in our 4Q21 VAR Survey...

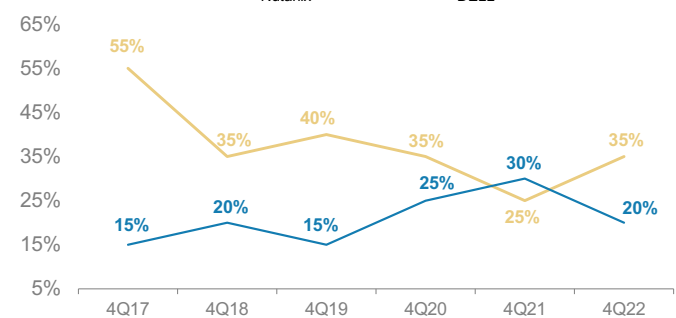
Vendor Most Negatively Impacted by Increased Adoption of Dell PowerStore



Source: Morgan Stanley Research, AlphaWise (n=60)

Exhibit 18: ...but HCI positioning downticked vs. NTNIX.

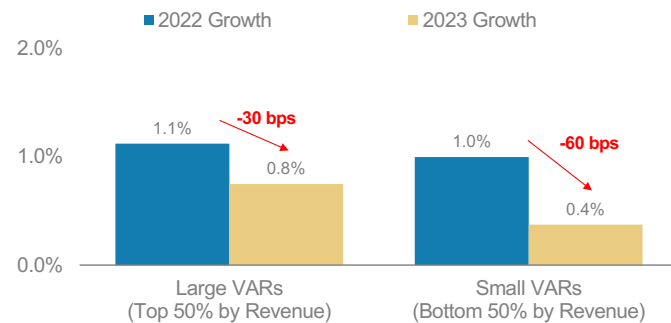
% VARs Citing NutnIX / DELL As Best Positioned HCI Vendor



Source: Morgan Stanley Research, AlphaWise (n=60)

Exhibit 19: The deceleration in HPQ 2023 growth expectation was driven by both large and small VARs.

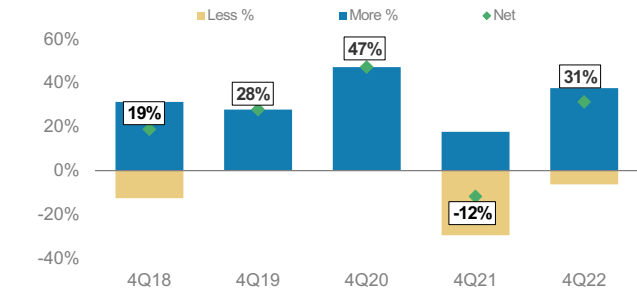
HPQ Growth Expectations by VAR Size



Source: Morgan Stanley Research, AlphaWise (n=60)

Exhibit 20: A net 31% of VARs say that HPQ is discounting more today vs. 1 year ago, indicating a more competitive pricing environment.

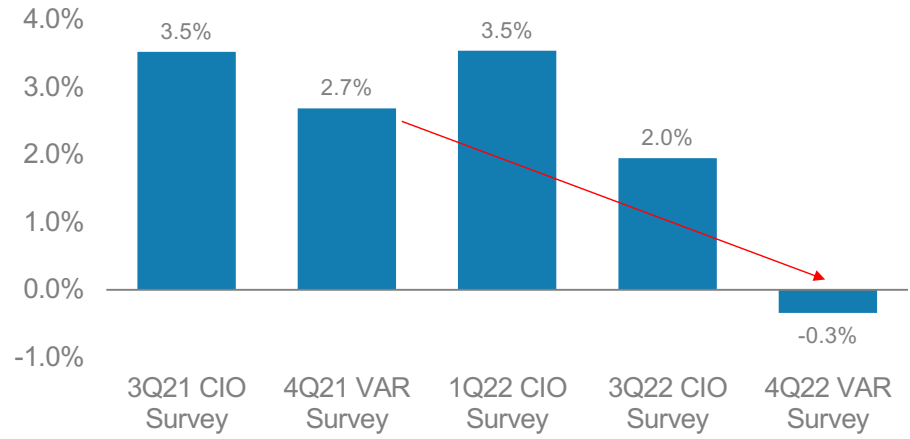
Is HPQ Offering More, Less or the Same Level of Discounting vs. 1 Year Ago?



Source: Morgan Stanley Research, AlphaWise (n=60)

Exhibit 21: VARs now expect PC peripherals spend to decline Y/Y in the next 12 months, down ~300bps Y/Y.

PC Peripherals Growth Expectations (NTM, Y/Y Growth)



Source: AlphaWise, Morgan Stanley Research, n=60

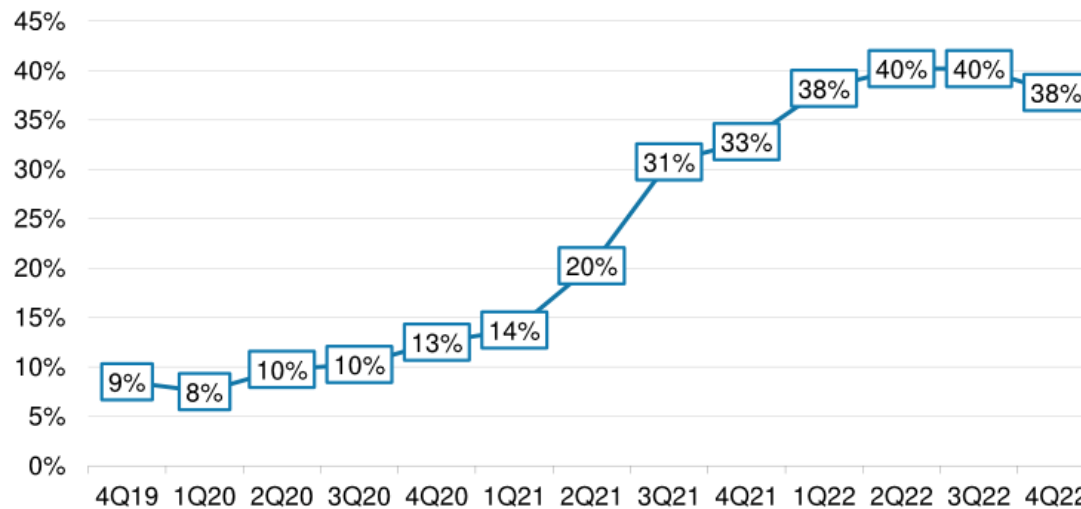
Morgan Stanley

Hardware Growth to Lag Tech Sector in 2023 As Demand Slows Across All Categories

While We Remain Constructive on the Long-Term IT Spending Outlook...

Over the next 3 years, CIO survey results continue to show structurally higher demand for technology post-COVID.

CIO Long Term IT Spending Intentions: Net % of CIOs Expecting an Increase in IT Spend as a % of Revenue Over the Next 3 Years - Trailing 4 Quarter Average

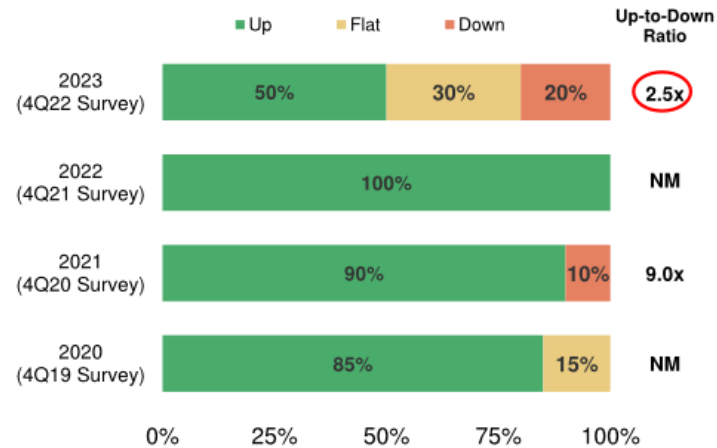


Source: AlphaWise, Morgan Stanley Research. n=100

...IT Growth Is Expected to Moderate in 2023, With Hardware Trailing Other Categories

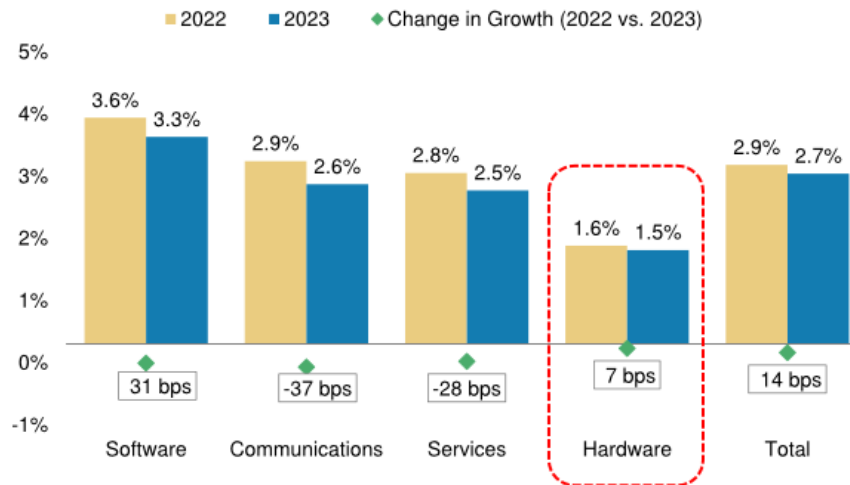
VARs' IT spending up-to-down ratio is the lowest in 4 years...

VAR IT Spending Growth Expectations



...and CIOs expect growth to decelerate across all categories in 2023, with Hardware the slowest growing Tech group.

External IT Spending Intentions (4Q22 Survey)

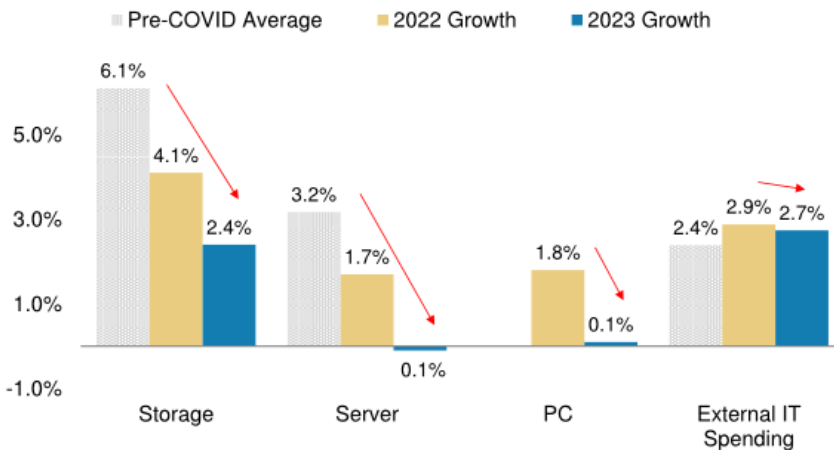


Source: AlphaWise, Morgan Stanley Research. n=100

VARs Cite a Broad Deceleration Across All HW Categories As Macro Eats Into Budgets

VARs expect growth to decelerate across all Hardware categories after working through backlogs in 2022...

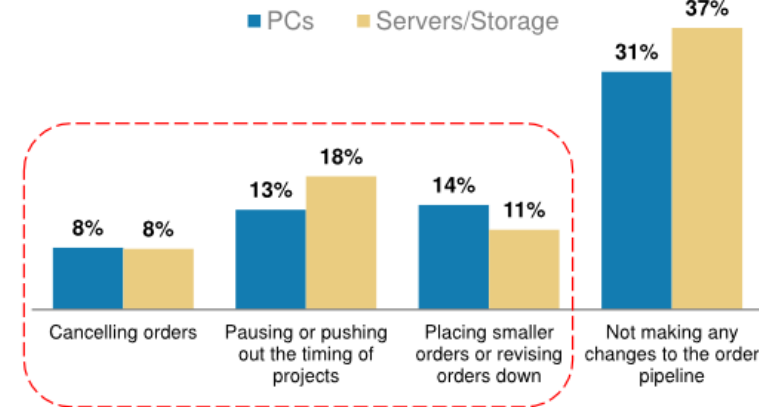
VAR Survey: Year on Year Average Revenue Growth



*Historical average from 2016-2019. No historical average for PCs. External IT Hardware results from 4Q22 CIO Survey.

...with ~35% of VARs citing customers cancelling, pausing, or downsizing projects due to the macro environment.

What % of Customers Are Reaction to the Macro Environment by Taking the Following Actions?

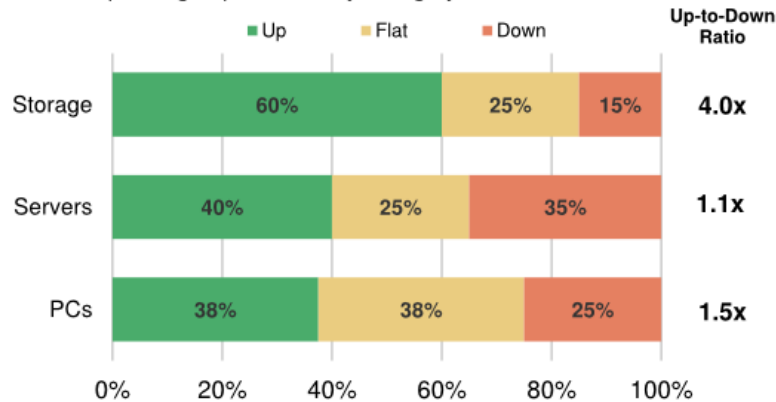


Source: AlphaWise, Morgan Stanley Research. VAR survey (n=60), CIO survey (n=100)

Storage to Be Most Resilient in 2023 Due to Stronger Demand & Order Pull-Forward

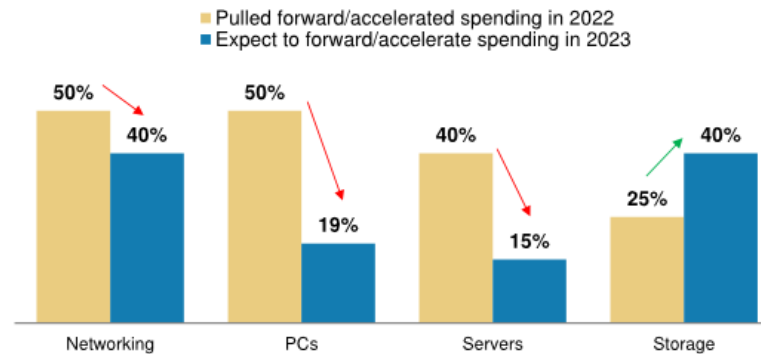
VARs expect storage to maintain the strongest growth and highest up-to-down ratio in 2023.

2023 VAR Spending Expectations by Category



Storage is the only hardware segment expected to see greater order pull-forward in 2023 vs. 2022.

Did Customers Pull-Forward Spend Due to Elongated Lead Times, and Is Pull Forward Expected in 2023?

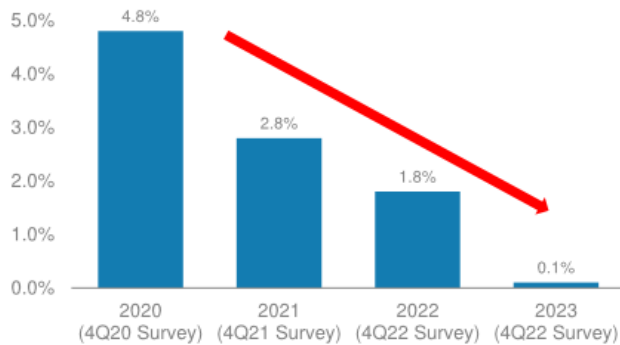


Source: AlphaWise, Morgan Stanley Research. n=60

PC Growth Decelerates Further in 2023, But Upticks in CIO Priority & Defensibility

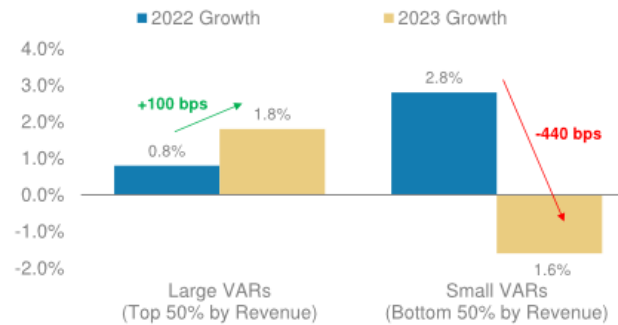
PC growth to decelerate further in 2023 as inventory is worked down and past purchases are digested...

VAR PC Growth Expectations (Y/Y Growth)



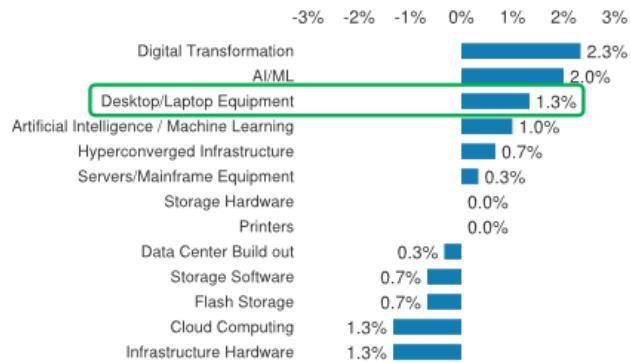
...driven exclusively by smaller VARs that saw stronger growth in 2022.

Year on Year PC Growth Expectations

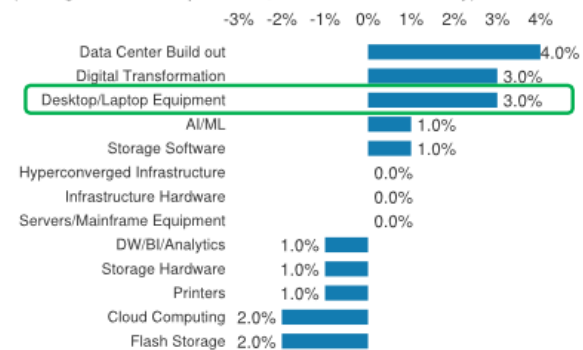


However, PC prioritization & defensibility upticked in 4Q CIO survey.

Change in Hardware Related Project Priority
(Change in % of Respondents; 4Q22 vs. 3Q22 Survey)



Change in Change in Hardware Project Defensibility
(Change in % of Respondents; 4Q22 vs. 3Q22 Survey)

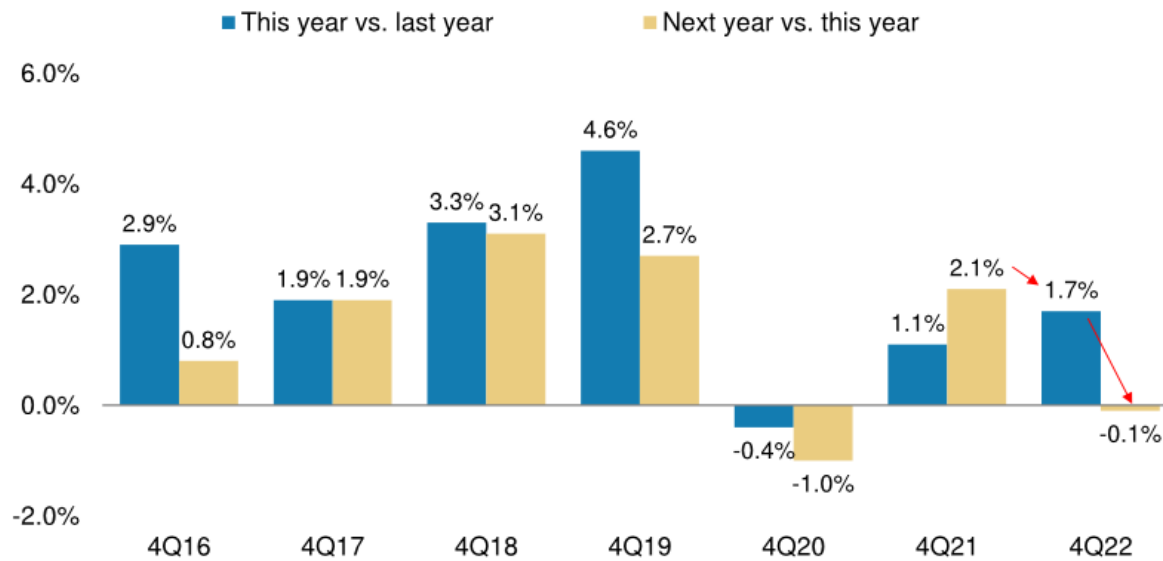


Source: AlphaWise, Morgan Stanley Research. VAR survey (n=60), CIO survey (n=100)

VARs Now Expect Server Spending to Decline in 2023

Server revenue expected to decline in 2023, the first year of declines outside of COVID in the last 6 years, with Servers also exhibiting the lowest up-to-down spending ratio, after clearing backlog in 2022.

VAR Survey: Year-on-Year Server Spending Expectations

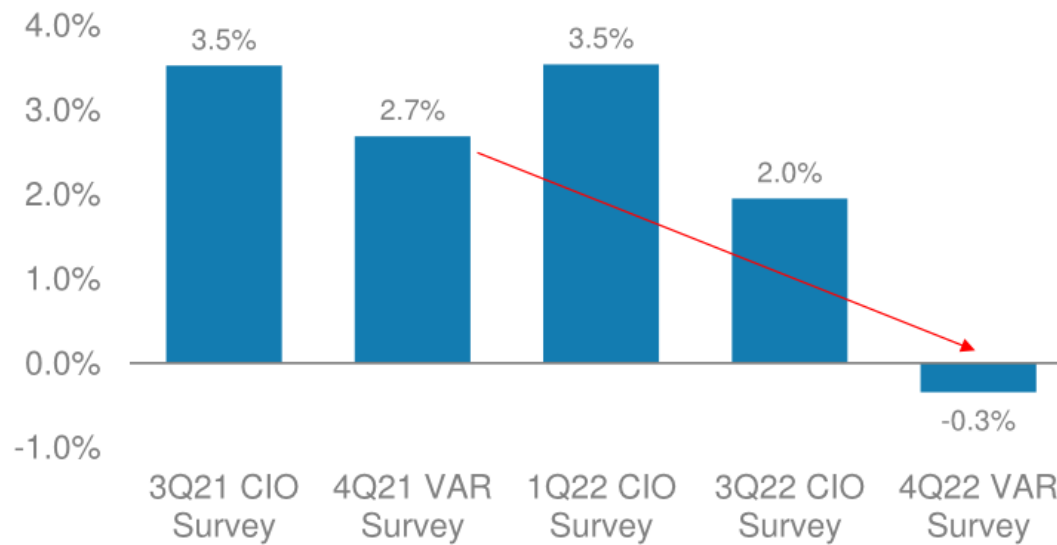


Source: AlphaWise, Morgan Stanley Research. n=60

VARs Also Now Expect PC Peripherals Spending to Decline Y/Y in 2023

VARs expect NTM PC peripherals spending growth to decelerate ~3 points and decline slightly Y/Y.

PC Peripherals Growth Expectations (NTM, Y/Y Growth)

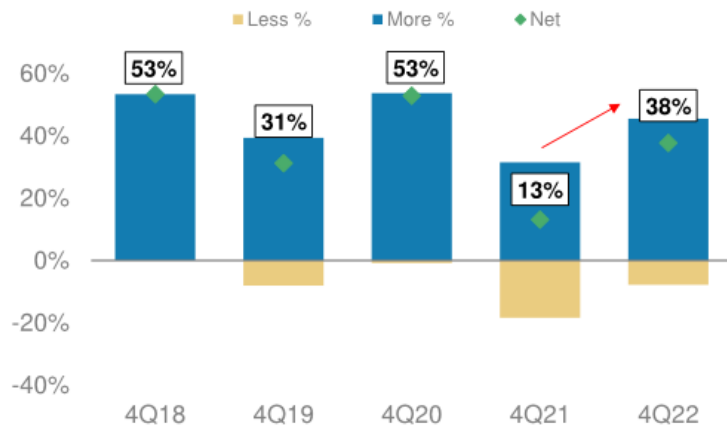


Source: AlphaWise, Morgan Stanley Research. VAR survey (n=60), CIO survey (n=100)

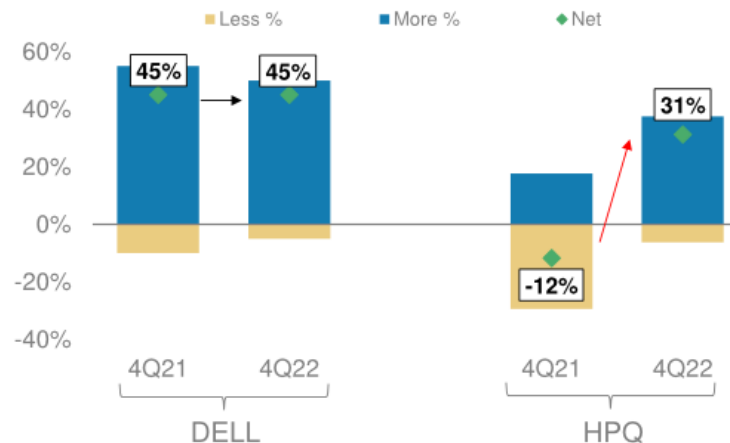
Discounting is Returning, Which Contributes to the HW Growth Deceleration in 2023

VARs expect to see an increase in discounting Y/Y, as the industry moves past supply shortages and demand slows due to macro concerns and demand digestion from prior quarter.

Are Hardware Vendors Offering More, Less or the Same Level of Discounting vs. 1 Year Ago?



Are Hardware Vendors Offering More, Less or the Same Level of Discounting vs. 1 Year Ago?

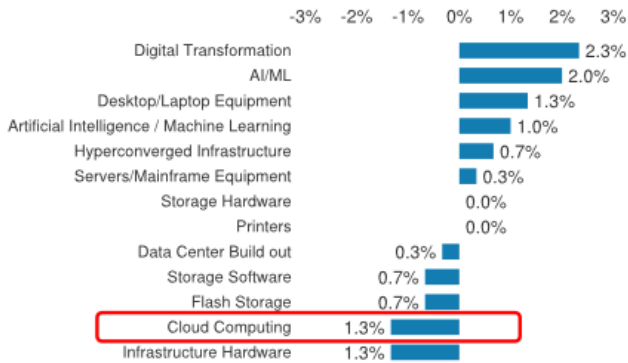


Source: AlphaWise, Morgan Stanley Research. VAR survey (n=60), CIO survey (n=100)

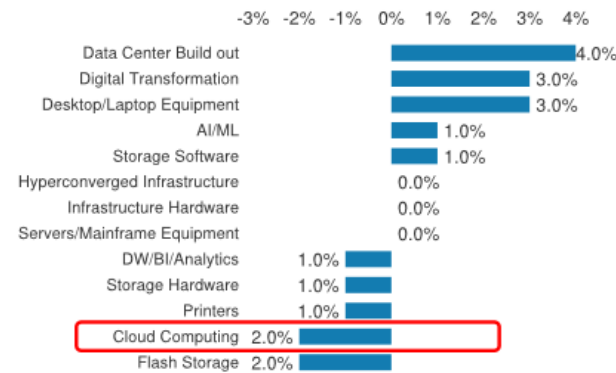
Cloud Growth to Slow Near-Term, But Remains Long-Term Priority

Cloud prioritization and defensibility minorly dnticked in our latest CIO survey...

Change in Hardware Related Project Priority
(Change in % of Respondents; 4Q22 vs. 3Q22 Survey)

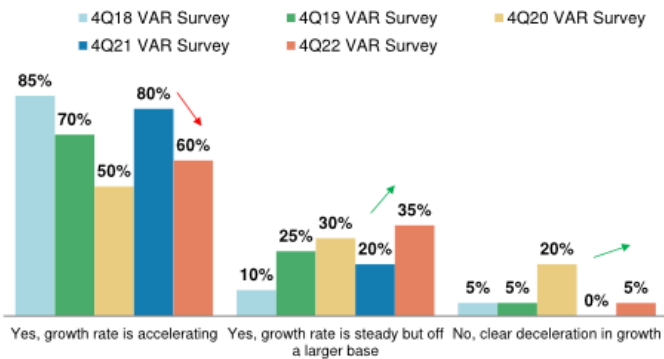


Change in Change in Hardware Project Defensibility
(Change in % of Respondents; 4Q22 vs. 3Q22 Survey)

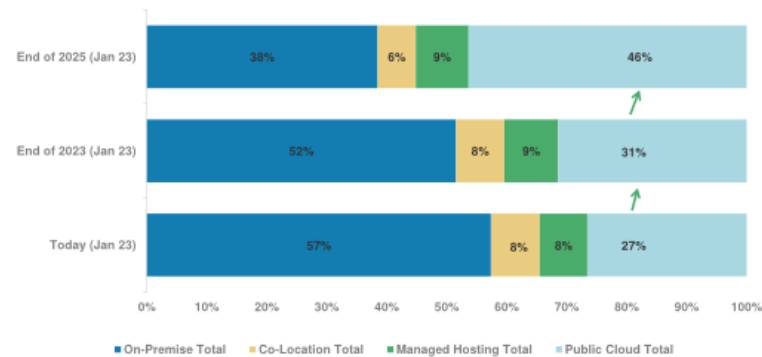


...but CIOs still expect nearly 50% of workloads to reside in the cloud by the end of 2025, a long-term threat to Hardware vendors.

Growth Trajectory of Public Cloud Solutions Demand



Anticipated Location of Application Workloads in 3 Years (% of Total Workloads)



Source: AlphaWise, Morgan Stanley Research. n=100

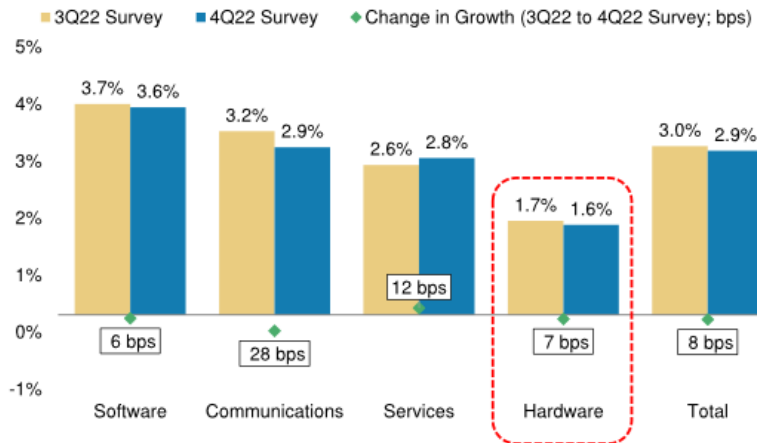
Morgan Stanley

The Incremental Cuts to Hardware Budgets Are Slowing, Suggesting We Could Be Nearing The Bottom

Hardware Sees 3rd Consecutive Cut to CIO Budget Growth in 4Q22 Survey...

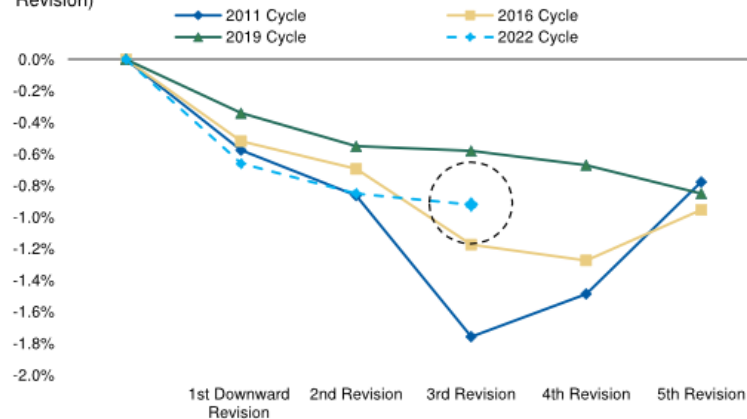
2022 Hardware budget growth was revised 10bps lower in 4Q22...

2022 External IT Spending Expectations



...marking the 3rd consecutive negative revision to growth expectations

CIO Hardware Budget Cumulative Revisions (After Initial Downward Revision)



*1Q Survey for 2016 reflects 4Q Survey (Year 1) estimate because question was not asked

In past cycles, we've typically seen 3-4 negative revisions to Hardware growth before budgets stabilize, indicating we are perhaps close to the end of the cycle.

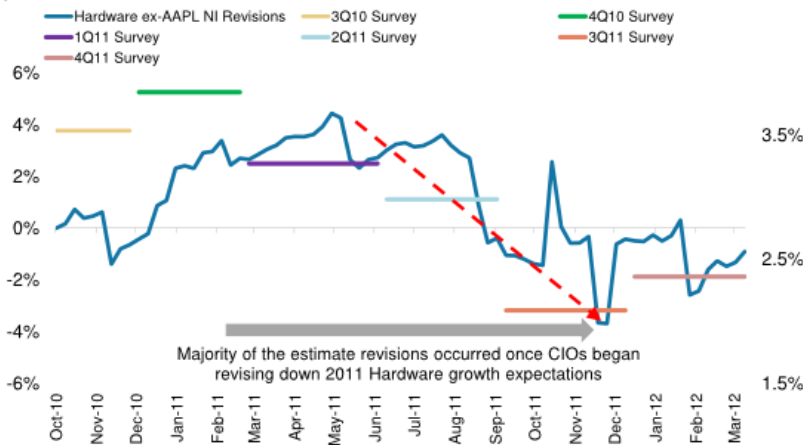
Source: AlphaWise, Morgan Stanley Research. n=100

...Indicating the Majority of Negative Estimate Revisions Could Be Behind Us

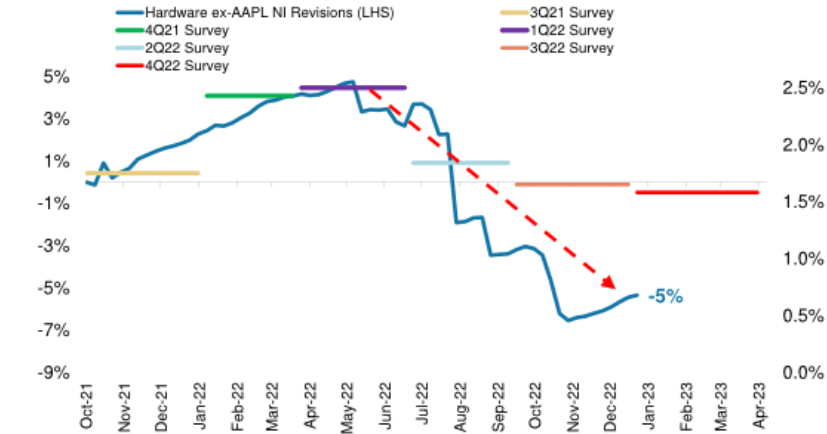
Historically, Hardware net income estimates are revised lower alongside CIO budget cuts...

...and the data is potentially pointing to a similar dynamic playing out this cycle as well.

Hardware Net Income Revisions vs. CIO 2011 Hardware Budget Growth Expectations



Hardware Net Income Revisions vs. CIO 2022 Hardware Budget Growth Expectations



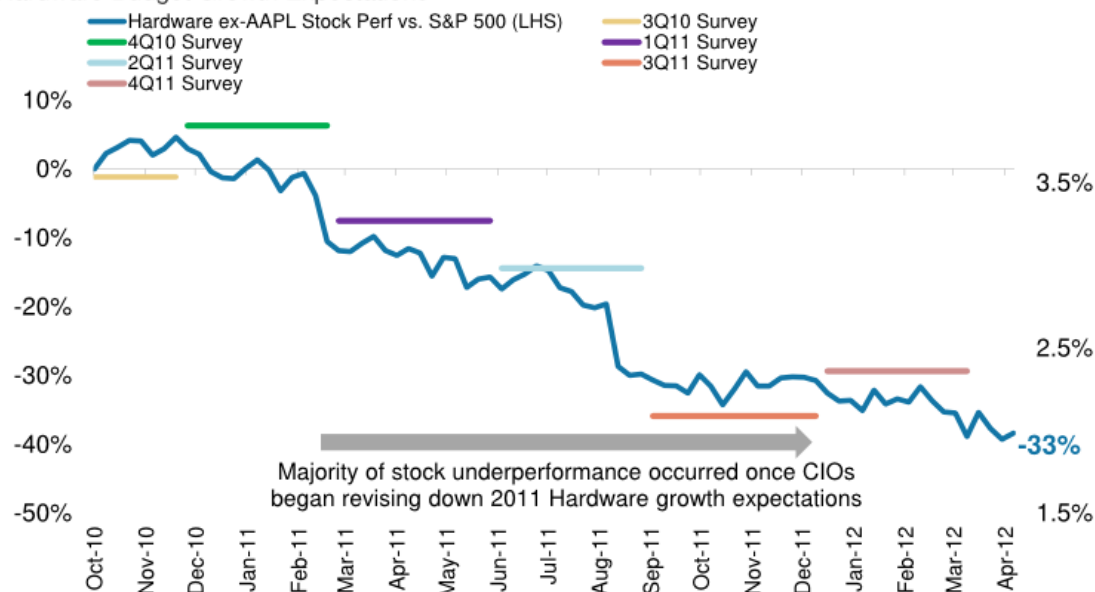
Given we believe we're close to the CIO survey budget growth trough, we believe most negative IT Hardware earnings revisions could be behind us.

Source: AlphaWise, Morgan Stanley Research. n=100

Hardware Stocks Underperform as Growth Expectations Are Revised Lower

Following the Great Financial Crisis, Hardware stock underperformance accelerated as CIOs negatively revised 2011 growth expectations early in the year, but slowed as budget expectations stabilized.

Weighted Average Hardware Stock Performance vs. S&P 500 & CIO 2011 Hardware Budget Growth Expectations



As a result, Hardware stock underperformance should continue into early 2023, but underperformance should slow as budget growth expectations bottom.

Source: Factset, AlphaWise, Morgan Stanley Research. n=100

IT Hardware Company Specific Takeaways:

IBM (OW) Checks Improve, But Not Out of the Woods

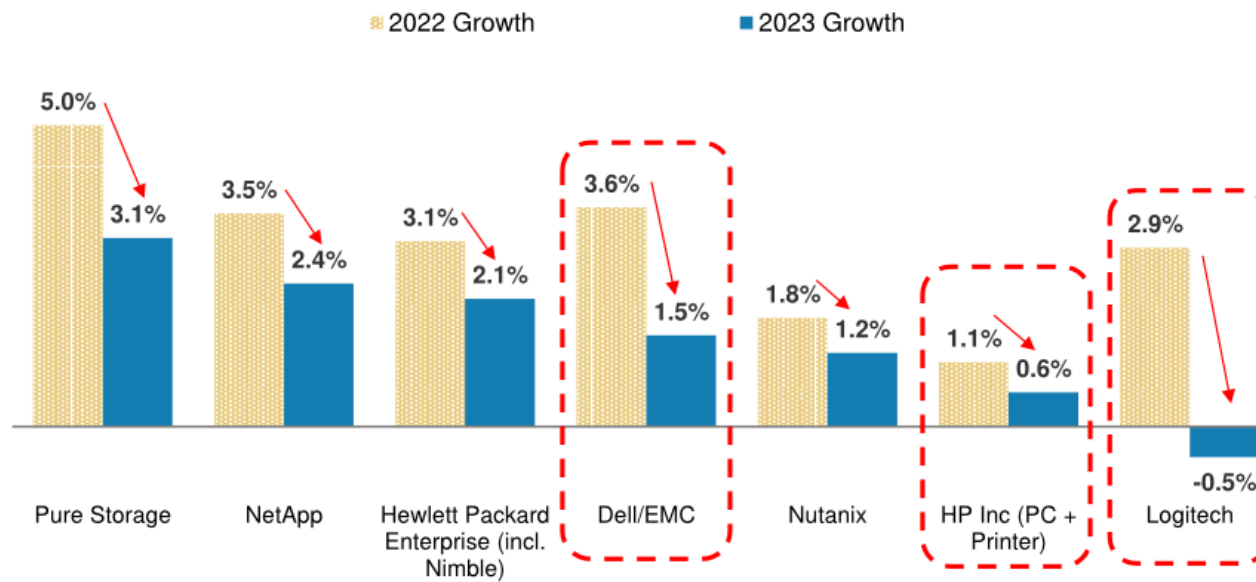
DELL (EW) Growth To Be Supported by Storage

HPQ (UW) Negatively Impacted by PCs & Discounting

LOGI (UW) Facing Peripherals Market Declines in 2023

2023 Growth: VARs Expect Growth to Decelerate Across All Hardware Vendors

Reseller Business Performance by Vendor (4Q22 Survey)

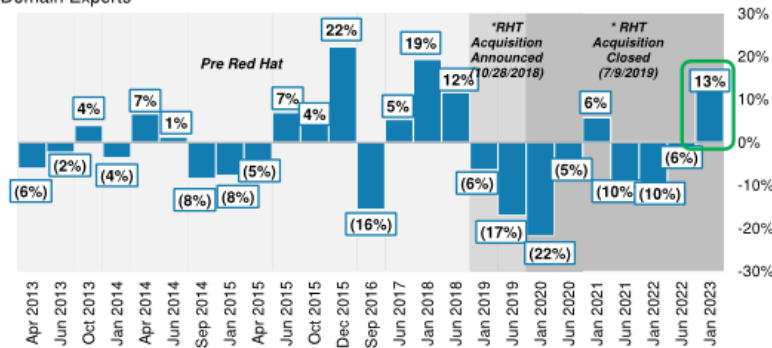


Source: AlphaWise, Morgan Stanley Research. n=60

IBM (OW): See Minor Positioning Improvements, But Still Expect 2023 Deceleration

While IBM IT Services spending intentions vs. peers improved in 4Q...

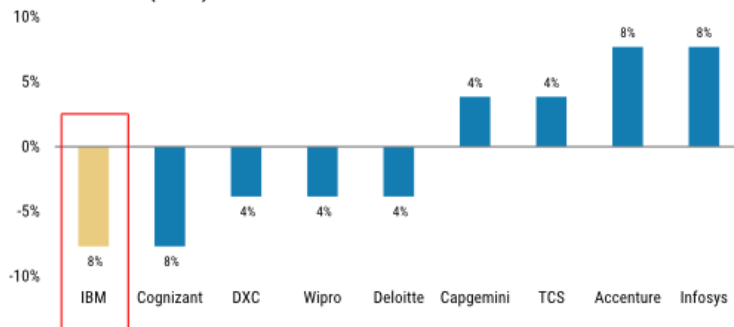
Net Spending Intentions with IBM IT Services vs. Peers from IT Services Domain Experts



* IT Services peers include Accenture, Capgemini, Cognizant, Deloitte, DXC.

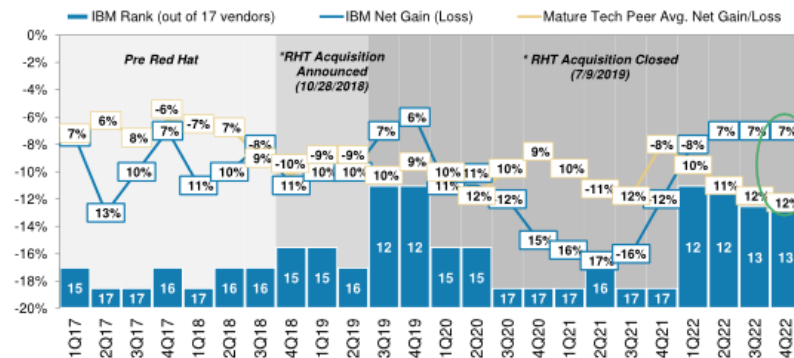
...IBM remains at risk of IT Services vendor consolidation...

Net Share Gainer (Donor) from IT Services Vendor Consolidation



...and budget share loss due to the cloud, although sentiment has improved in recent surveys.

% of CIOs Expecting Vendor to Have Largest Gain or Loss of Incremental Share of IT Budget as a Result of Shift to Cloud in Next Three Years

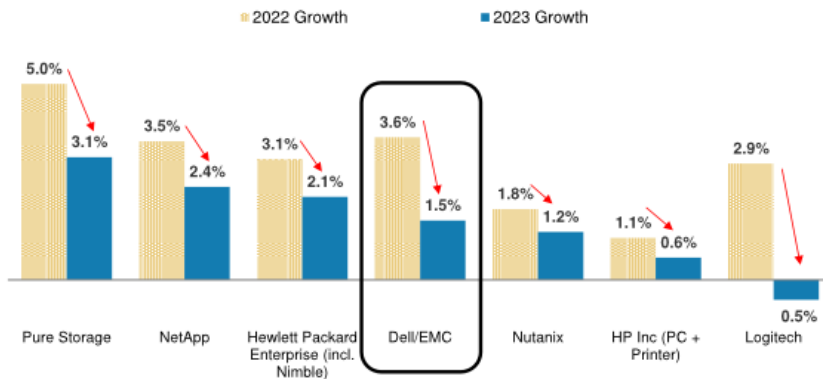


Source: AlphaWise, Morgan Stanley Research. IT Services survey (n=60), CIO survey (n=100)

DELL (EW): Data Points Mixed, But Storage to Support 2023 Growth

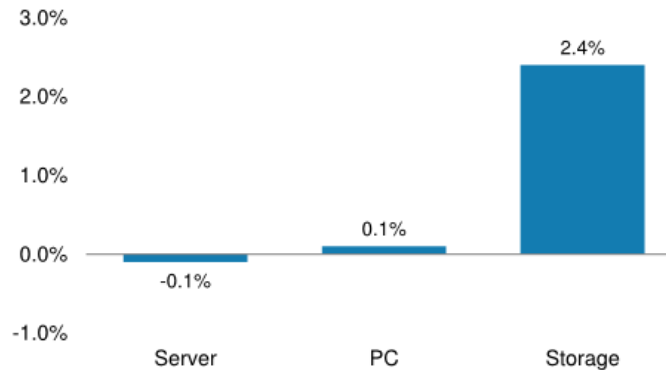
VARs expect DELL growth to decelerate in 2023, but outperform HPQ...

Reseller Business Performance by Vendor (4Q22 Survey)



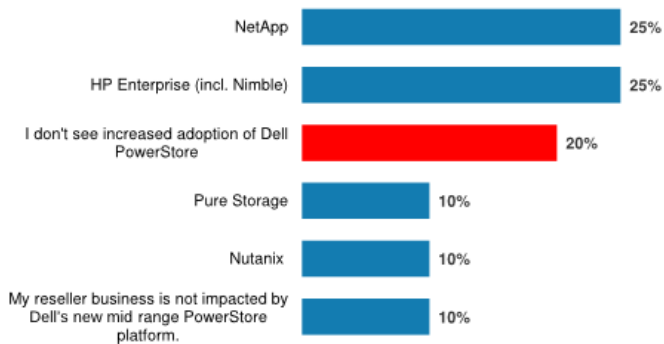
...largely driven by more robust storage demand

VAR Survey: 2023 Revenue Growth (Y/Y Growth)



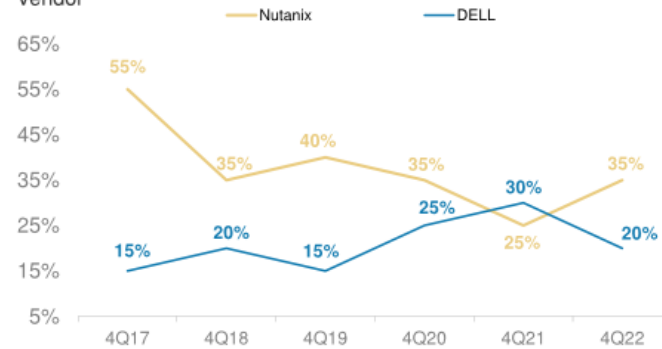
PowerStore traction continues, with 80% of VARs seeing increased adoption (up from 68% in 4Q21)...

Vendor Most Negatively Impacted by Increased Adoption of Dell PowerStore



...but HCI positioning downticks vs. NTNX

% VARs Citing NTNX / DELL As Best Positioned HCI Vendor

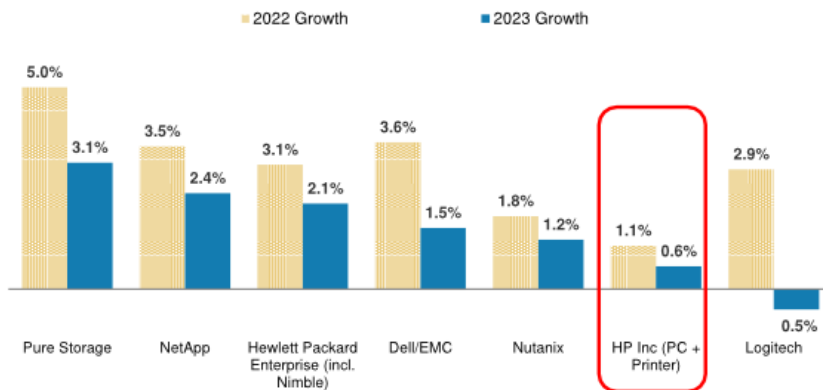


Source: AlphaWise, Morgan Stanley Research. n=60

HPQ (UW): Negatively Impacted by PC Growth Deceleration & Return of Discounting

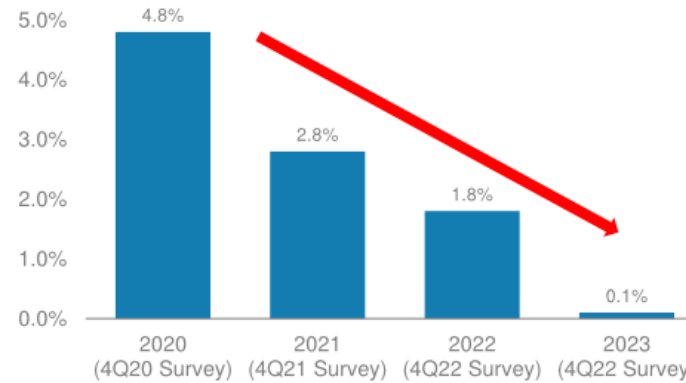
VARs expect HPQ to be one of the slowest growing Hardware vendors in 2023...

Reseller Business Performance by Vendor (4Q22 Survey)



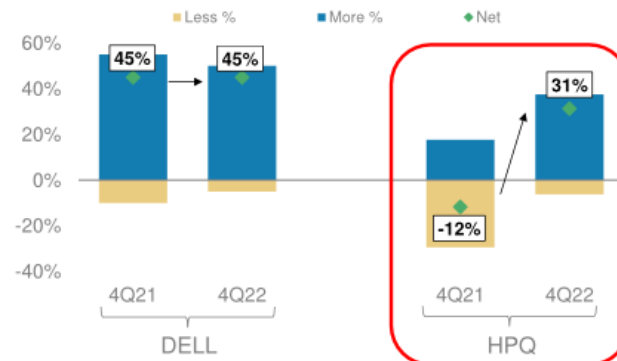
...as PC growth decelerates to roughly flat Y/Y...

VAR PC Growth Expectations (Y/Y Growth)



...and discounting returns more significantly than peers.

Are Hardware Vendors Offering More, Less or the Same Level of Discounting vs. 1 Year Ago?

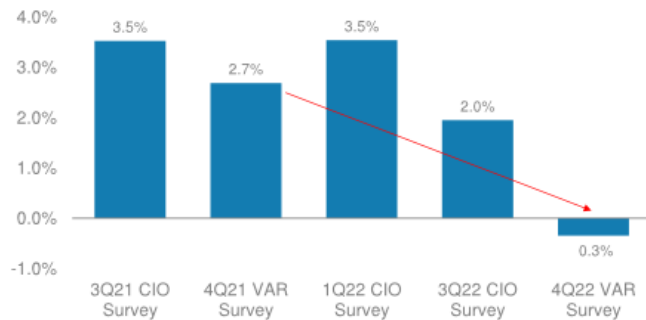


Source: AlphaWise, Morgan Stanley Research. n=60

LOGI (UW): For The First Time, LOGI Faces PC Peripherals Declines in 2023

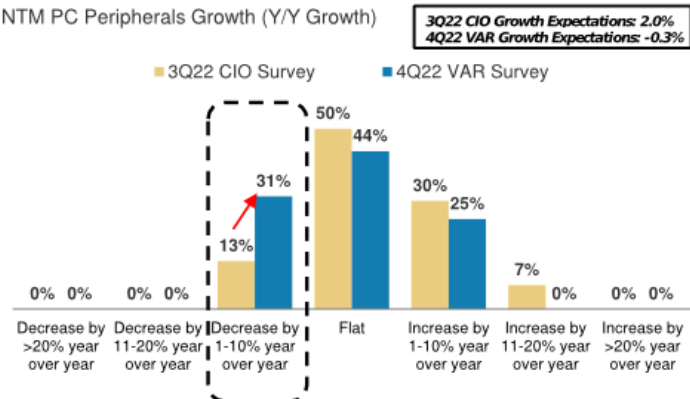
NTM PC peripherals spending expected to decline 0.3% Y/Y in 2023...

PC Peripherals Growth Expectations (NTM, Y/Y Growth)



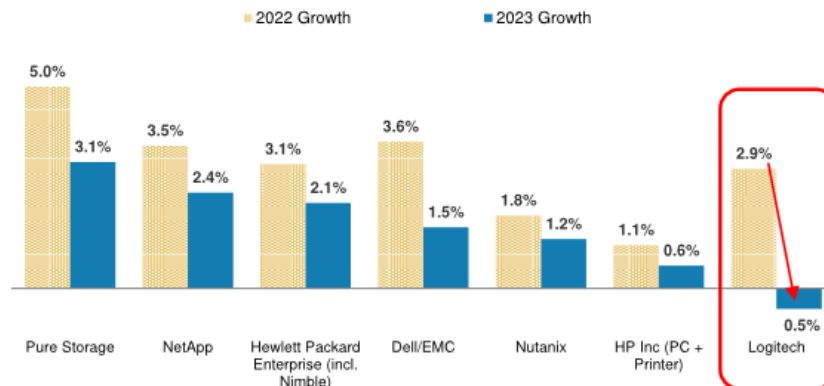
...as more customers digest purchases from the last 2 years as WFH trends normalize.

NTM PC Peripherals Growth (Y/Y Growth)



VARs expect LOGI to see the greatest Y/Y growth deceleration (and slowest growth) in 2023.

Reseller Business Performance by Vendor (4Q22 Survey)



Source: AlphaWise, Morgan Stanley Research. VAR survey (n=60), CIO survey (n=100)

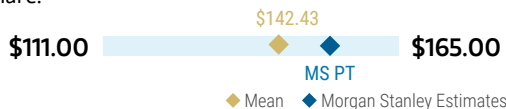
Risk Reward – IBM (IBM.N)

Set to Outperform as Macro Outlook Deteriorates

PRICE TARGET \$152.00

Our \$152 price target reflects a 15.5x EV/FCF 2023 multiple (slightly below average of CSCO, NTAP, VMW, ORCL, CTSH) on \$11.49 FCF/share.

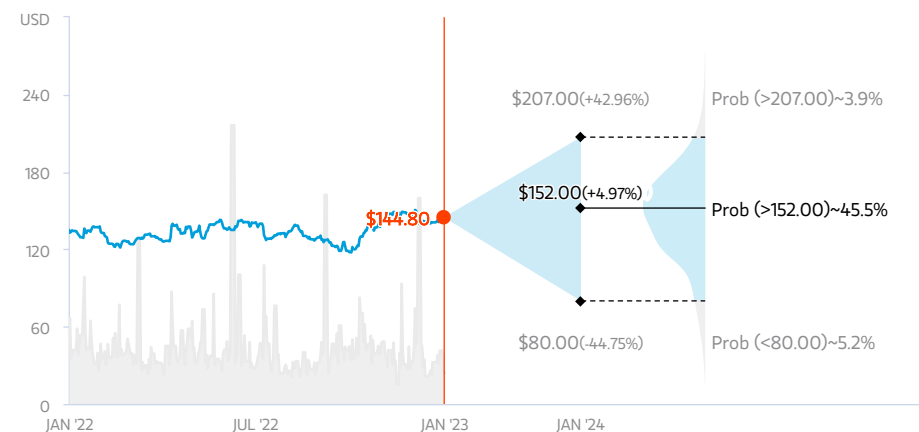
Consensus Price Target Distribution



OVERWEIGHT THESIS

We believe IBM is positioned to outperform through 2022, given that it is a late cycle stock, the company enters new mainframe/ELA cycles in 2H, and any spin transaction outperformance historically happens post-close. Due to 50%+ recurring revenue mix, IBM historically outperforms late cycle due to lower earnings risk and less multiple compression than the rest of IT Hardware. The managed infrastructure services spin puts IBM on a path to achieve sustainable mid-single digit revenue growth, and we view management's focus on revenue growth, go-to-market, M&A, and partnerships positively. Our CIO surveys show improving IBM spending intentions, and we look for this to continue moving forward.

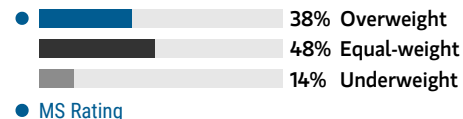
RISK REWARD CHART AND OPTIONS IMPLIED PROBABILITIES (12M)



Key: — Historical Stock Performance ● Current Stock Price ◆ Price Target

Source: Refinitiv, Morgan Stanley Research, Morgan Stanley Institutional Equities Division. The probabilities of our Bull, Base, and Bear case scenarios playing out were estimated with implied volatility data from the options market as of 10 Jan, 2023. All figures are approximate risk-neutral probabilities of the stock reaching beyond the scenario price in either three-months' or one-years' time. View explanation of Options Probabilities methodology [here](#)

Consensus Rating Distribution



Source: Refinitiv, Morgan Stanley Research

Risk Reward Themes

Disruption: *Negative*
 Self-help: *Positive*
 Technology Diffusion: *Positive*

View descriptions of Risk Rewards Themes [here](#)

BULL CASE

\$207.00

19.0x CY23 FCF of \$12.30/share (ex-receivables)

IBM accelerates growth in high-single digit range in CY23, and IBM's hybrid cloud strategy gains traction. IBM CEO's stance on spin & acquisitions drives investors to give credit to SoTP, and partnership & go-to-market investments pay off. IBM accelerates Consulting & Software growth despite tough comps, and the new mainframe cycle lasts longer than expected. We value IBM at 19.0x EV/FCF 2023 ex-financing receivables (median of all hardware, software & services peers).

BASE CASE

\$152.00

15.5x CY23 FCF of \$11.49/share (ex-receivables)

IBM grows mid-single digits Y/Y in 2023. Consulting grows high single digits, Software grows mid-single digits, and Infrastructure declines Y/Y due to lapping the mainframe cycle. IBM starts to get credit for sustainable mid single digit growth. We value IBM at 15.5x EV/FCF 2023 (slightly below average of CSCO, NTAP, VMW, ORCL, CTSH).

BEAR CASE

\$80.00

10.0x EV/FCF CY23 of \$10.69/share (ex-receivables)

Tough macro environment leads to budget cuts, and IBM grows slightly below low-single digit % Y/Y. Companies cut Consulting and mainframe spending due to geopolitical uncertainty, causing Consulting to not reach high single digit growth. RHT growth slows due to share loss, and investments in Software fail to increase portfolio relevancy, driving core growth to decline faster than expected. IBM trades at 10.0x EV/FCF 2023 (below the low-end of hardware peers).

Risk Reward – IBM (IBM.N)

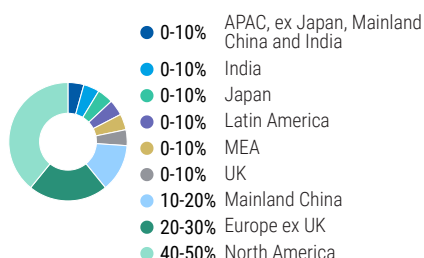
KEY EARNINGS INPUTS

Drivers	2021	2022e	2023e	2024e
Constant Currency Revenue Growth (Y/Y) (%)	(5.1)	(8.4)	3.6	3.1
Cloud and Cognitive CC Revenue Growth (Y/Y) (%)	0.0	0.0	0.0	0.0
Non-GAAP Gross Margin Expansion (bps Y/Y)	0.000	0.000	0.000	0.000
Non-GAAP Operating Income Growth (Y/Y) (%)	27.9	(11.7)	2.5	8.3

INVESTMENT DRIVERS

- New CEO strategy for divestitures & M&A fuel revenue growth
- RHT growth & hybrid cloud traction offset declines in core IBM
- Investments in partnership ecosystem drive topline growth
- Consulting drives growth across the portfolio

GLOBAL REVENUE EXPOSURE



Source: Morgan Stanley Research Estimate
View explanation of regional hierarchies [here](#)

MS ALPHA MODELS

2/5 BEST	24 Month Horizon	2/5 MOST	3 Month Horizon
-----------------	------------------	-----------------	-----------------

Source: Refinitiv, FactSet, Morgan Stanley Research; 1 is the highest favored Quintile and 5 is the least favored Quintile

RISKS TO PT/RATING

RISKS TO UPSIDE

- Greater hybrid cloud interest drives software gains
- More divestitures or M&A accelerate growth
- Partnerships & go-to-market changes drive faster growth

RISKS TO DOWNSIDE

- Macro disruption leads to cuts in Consulting or mainframe spend
- FX is a larger-than-expected headwind
- Accelerated cloud cannibalization in core markets
- RHT cannibalizes core IBM SW spend
- Slowing GDP drives sustained revenue declines

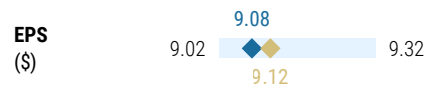
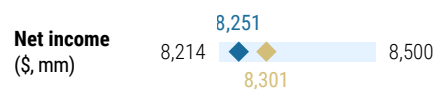
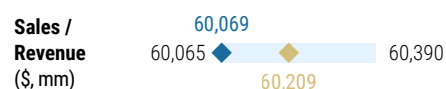
OWNERSHIP POSITIONING

Inst. Owners, % Active	39.6%	
HF Sector Long/Short Ratio	2.1x	
HF Sector Net Exposure	30%	

Refinitiv; MSPB Content. Includes certain hedge fund exposures held with MSPB. Information may be inconsistent with or may not reflect broader market trends. Long/Short Ratio = Long Exposure / Short exposure. Sector % of Total Net Exposure = (For a particular sector: Long Exposure - Short Exposure) / (Across all sectors: Long Exposure – Short Exposure).

MS ESTIMATES VS. CONSENSUS

FY Dec 2022e



◆ Mean ◆ Morgan Stanley Estimates

Source: Refinitiv, Morgan Stanley Research

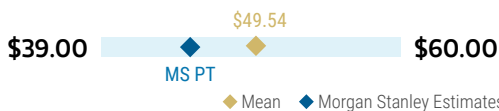
Risk Reward – Dell Technologies Inc. (DELL.N)

Well Positioned For Long-Term, But Valuation Likely Capped By Slowing PC Growth

PRICE TARGET \$45.00

Our \$45 price target is based on a ~7.5x multiple on FY24 (CY23) EPS of \$6.12. Our ~7.5x target multiple reflects a weighted average of peer multiples and DELL's EBIT mix for servers & networking, storage, and PCs.

Consensus Price Target Distribution

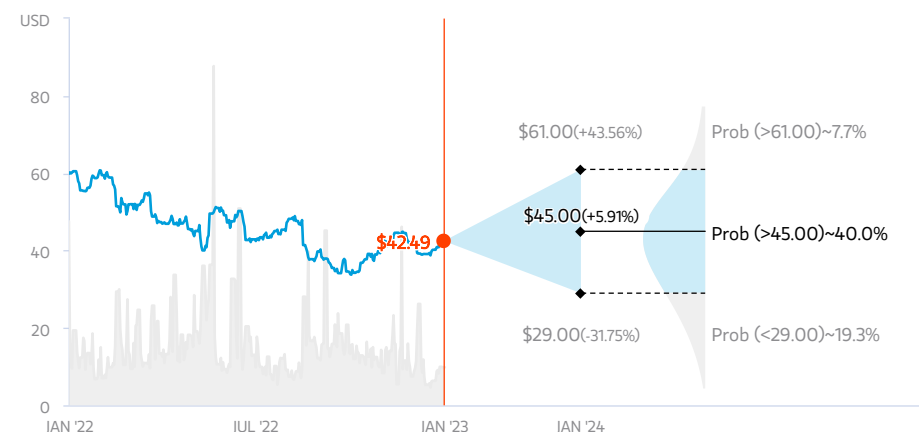


Source: Refinitiv, Morgan Stanley Research

EQUAL-WEIGHT THESIS

DELL is a full stack technology provider managing more data than any other IT provider, which positions the company well to capitalize on the 'Data Era'. Following the VMW spin and recent IG rating, ISG and CSG segments warrant a valuation in-line with peers. DELL is executing through supply chain disruption better than peers and gaining share in core markets. The 2022 outlook for data center infrastructure is strong, but cracks are emerging in the PC outlook. And while DELL's commercial end market exposure should lead to stronger for longer PC demand compared to peers, we believe valuation is likely to be capped by slowing PC growth in the near-term, driving our EW Rating.

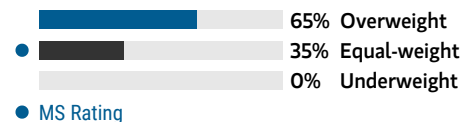
RISK REWARD CHART AND OPTIONS IMPLIED PROBABILITIES (12M)



Key: — Historical Stock Performance ● Current Stock Price ◆ Price Target

Source: Refinitiv, Morgan Stanley Research, Morgan Stanley Institutional Equities Division. The probabilities of our Bull, Base, and Bear case scenarios playing out were estimated with implied volatility data from the options market as of 10 Jan, 2023. All figures are approximate risk-neutral probabilities of the stock reaching beyond the scenario price in either three-months' or one-years' time. View explanation of Options Probabilities methodology [here](#)

Consensus Rating Distribution



Source: Refinitiv, Morgan Stanley Research

Risk Reward Themes

Market Share: *Positive*
New Data Era: *Positive*

View descriptions of Risk Rewards Themes [here](#)

BULL CASE

\$61.00

9.0x FY24 bull case EPS of \$6.73

Demand exceeds expectations in CY23. PC demand rebounds quicker than expected, driven by shorter refresh cycles and high-end consumer/commercial demand and Win11 refresh activity. ISG grows Y/Y in FY24 driven by demand for Hybrid Cloud architectures and edge computing. As a result, revenue is flat Y/Y. DELL gains share across PCs, servers, and storage, which builds confidence in a stronger top line outlook relative to peers. 9.0x implies DELL trades towards the upper end of peers.

BASE CASE

\$45.00

~7.5x FY24 base case EPS of \$6.12

ISG and CSG weakness drive Y/Y declines in FY24. Declines in ISG and CSG demand drives revenue declines of 11% Y/Y in FY24. Lower logistics and component costs help margins expand slightly Y/Y in FY24. DELL continues to buy back stock to offset dilution. Fundamentally, DELL is executing better than peers amid a difficult macro, but the environment remains challenging. ~7.5x represents a weighted average based on peer multiples and DELL's EBIT mix.

BEAR CASE

\$29.00

5.5x FY24 bear case EPS of \$5.20

Demand recovery and share gains prove short lived. A recessionary environment causes further enterprise budget cuts, pressuring ISG & commercial PC results further, and consumer weakness causes an even steeper PC decline. As a result, FY24 revenue declines mid double digits. Meanwhile, inflationary costs and ASP normalization pressure margins, and DELL's \$5B buyback fails to offset lower net income Y/Y, resulting in steeper EPS declining Y/Y. 5.5x assumes DELL trades below the low end of peers.

Risk Reward – Dell Technologies Inc. (DELL.N)

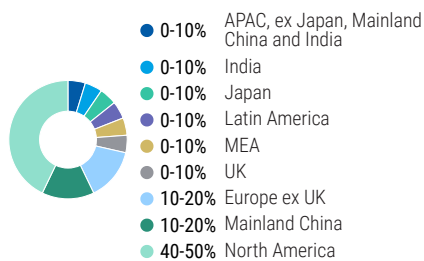
KEY EARNINGS INPUTS

Drivers	2022	2023e	2024e	2025e
Revenue Growth (Y/Y) (%)	13.4	(0.5)	(11.1)	3.3
Non-GAAP Gross Margin (%)	22.4	22.8	23.0	23.3
Non-GAAP Operating Margin (%)	7.7	8.3	7.7	8.3
FCF (\$M) (\$, mm)	7,511	289	4,467	5,211

INVESTMENT DRIVERS

- Stronger for longer PC growth
- ISG growth accelerates driven by Hybrid Cloud demand
- Buyback exceeds expectations
- Continued share gains in Servers, Storage and PCs
- Mix shift to storage benefits gross margin

GLOBAL REVENUE EXPOSURE



Source: Morgan Stanley Research Estimate
View explanation of regional hierarchies [here](#)

MS ALPHA MODELS

1/5 BEST	24 Month Horizon	1/5 MOST	3 Month Horizon
-----------------	------------------	-----------------	-----------------

Source: Refinitiv, FactSet, Morgan Stanley Research; 1 is the highest favored Quintile and 5 is the least favored Quintile

RISKS TO PT/RATING

RISKS TO UPSIDE

- ISG accelerates due to increased Hybrid Cloud and new Edge Compute demand
- Commercial PC refresh; stronger for longer PC demand
- Share gains, especially in PCs and Storage

RISKS TO DOWNSIDE

- Supply chain constraints limit revenue upside and pressure margins
- PC share gains prove short-lived
- PC demand surprises negatively
- Enterprise IT demand cannibalized by cloud workload migration

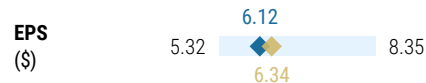
OWNERSHIP POSITIONING

Inst. Owners, % Active	59%
HF Sector Long/Short Ratio	2.1x
HF Sector Net Exposure	30%

Refinitiv; MSPB Content. Includes certain hedge fund exposures held with MSPB. Information may be inconsistent with or may not reflect broader market trends. Long/Short Ratio = Long Exposure / Short exposure. Sector % of Total Net Exposure = (For a particular sector: Long Exposure - Short Exposure) / (Across all sectors: Long Exposure – Short Exposure).

MS ESTIMATES VS. CONSENSUS

FY Jan 2024e



◆ Mean ◆ Morgan Stanley Estimates

Source: Refinitiv, Morgan Stanley Research

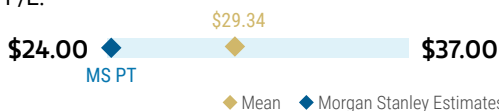
Risk Reward – HP Inc. (HPQ.N)

LT Beneficiary of Hybrid Work, But Challenging PC Backdrop To Drive Growth Decel

PRICE TARGET \$24.00

Our \$24 price target assumes an 7x target P/E multiple on FY23 non-GAAP EPS of \$3.40, slightly below HP's recent 3 month average P/E.

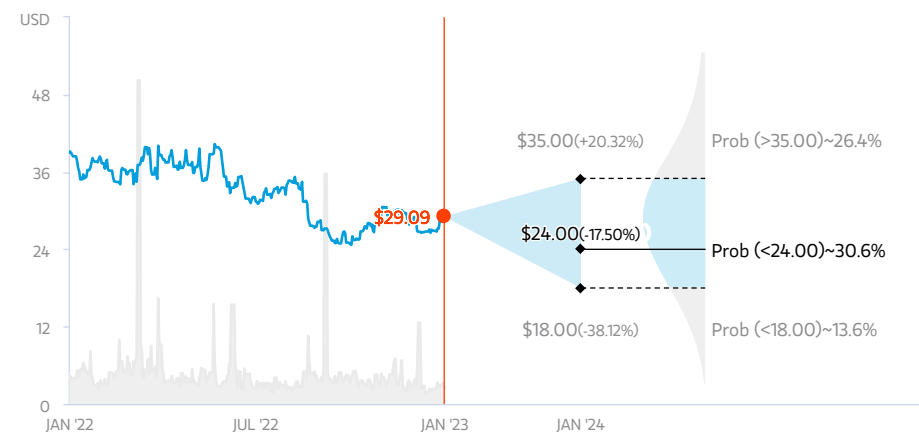
Consensus Price Target Distribution



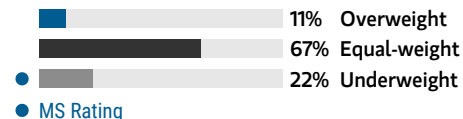
UNDERWEIGHT THESIS

HP should benefit from LT hybrid work demand given its diverse end-market exposure to the consumer and commercial PC & printing markets, but we are more cautious in the near-term as PC demand data points are deteriorating. And given HP has greater exposure to the consumer + education than commercial, and recent share losses, we expect PC demand weakness to manifest in slowing topline growth. PC ASPs and operating margins will be important metrics to watch as well. Historically HPQ's valuation multiple contracts during times of slowing (or declining) revenue growth, and therefore we expect shares to underperform peers over the next 12 months, supporting our Underweight rating.

RISK REWARD CHART AND OPTIONS IMPLIED PROBABILITIES (12M)



Consensus Rating Distribution



Risk Reward Themes

Contrarian: *Negative*
Self-help: *Positive*

View descriptions of Risk Rewards Themes [here](#)

BULL CASE

\$35.00

9.0x Bull Case FY23e EPS of \$3.85

Revenue is flat Y/Y in FY23 and margins surprise positively. Management works through execution issues ahead of schedule and any commercial demand re-accelerates due to shorter refresh cycles, HP gains unit market share. The pivot to HP+ proves fruitful early on, driving printing margins towards the upper end of 16-18% LT target range for the year. Shares trade to 9x P/E, in-line with HP's trailing 3 year avg (pre-COVID) to reflect solid execution and sustainable EPS growth.

BASE CASE

\$24.00

7x FY23e EPS of \$3.40

Lower OpEx partially offsets PC & Print revenue declines, EPS declines 17% Y/Y. Double digit PC shipment declines in FY23 leads to PS revenue declines of 11% in FY23 and -6% Print revenue Y/Y, resulting in total revenue declines of 10% Y/Y in FY23. Op profit declines 15% Y/Y, resulting in FY23 EPS growth of -17% Y/Y. With recent PC share losses and an uneven print recovery, we don't see a clear path to meaningful re-rating. HP trades at a 7x target P/E multiple.

BEAR CASE

\$18.00

6.0x Bear Case FY23e EPS of \$3.00

Weaker consumer + lack of commercial recovery leads to stagnating growth. Hybrid work demand decelerates, while a recessionary environment causes enterprise budget cuts, which pressures Personal Systems and Imaging & Print segments. As a result, HPQ sees minimal operating leverage and reduces capital returns. HP trades to 6.0x P/E, which on bear case FY23 EPS of \$3.00, implies an \$18 bear case valuation.

Risk Reward – HP Inc. (HPQ.N)

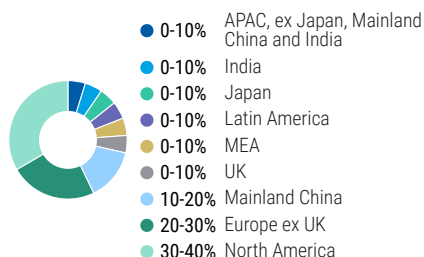
KEY EARNINGS INPUTS

Drivers	2021	2022e	2023e	2024e
Total Revenue Growth (Y/Y) (%)	12.1	(0.8)	(9.7)	2.0
Gross Margin (%)	21.1	19.6	19.3	18.9
Printing and Imaging Operating Income Growth (Y/Y) (%)	45.7	0.4	(14.3)	(5.0)
EPS Growth (Y/Y) (%)	66.5	7.9	(16.7)	2.3
FCF (\$, mm)	5,827	3,698	3,042	3,426

INVESTMENT DRIVERS

- PC market declines and/or share losses
- Margin contraction on the back of more limited pricing power
- Rising channel inventory levels
- Worsening component constraints
- Structural headwinds to a recovery in print demand
- Printer supplies declines

GLOBAL REVENUE EXPOSURE



Source: Morgan Stanley Research Estimate
View explanation of regional hierarchies [here](#)

MS ALPHA MODELS

1/5 BEST	24 Month Horizon	2/5 MOST	3 Month Horizon
-----------------	------------------	-----------------	-----------------

Source: Refinitiv, FactSet, Morgan Stanley Research; 1 is the highest favored Quintile and 5 is the least favored Quintile

RISKS TO PT/RATING

RISKS TO UPSIDE

- Print and PC component supply improves faster
- Better execution/share gains
- Stronger margin expansion through cost cuts
- Industry consolidation
- Stronger quarterly share repurchases

RISKS TO DOWNSIDE

- Challenges in procuring component supply
- Discounting comes back faster
- Component cost inflation
- Commercial print volume/usage remains weak
- Commercial PC demand fails to offset weaker consumer demand
- Dilutive M&A

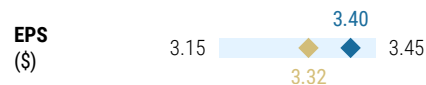
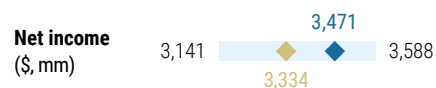
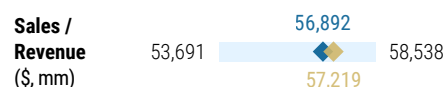
OWNERSHIP POSITIONING

Inst. Owners, % Active	56%	
HF Sector Long/Short Ratio	2.1x	
HF Sector Net Exposure	30%	

Refinitiv; MSPB Content. Includes certain hedge fund exposures held with MSPB. Information may be inconsistent with or may not reflect broader market trends. Long/Short Ratio = Long Exposure / Short exposure. Sector % of Total Net Exposure = (For a particular sector: Long Exposure - Short Exposure) / (Across all sectors: Long Exposure – Short Exposure).

MS ESTIMATES VS. CONSENSUS

FY Oct 2023e



◆ Mean ◆ Morgan Stanley Estimates
Source: Refinitiv, Morgan Stanley Research

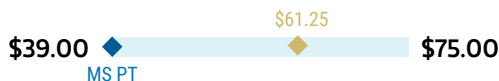
Risk Reward – Logitech International SA (LOGI.O)

Expect Downward Pressure on FY23 Ests As Tech Overconsumption Mean Reverts

PRICE TARGET \$39.00

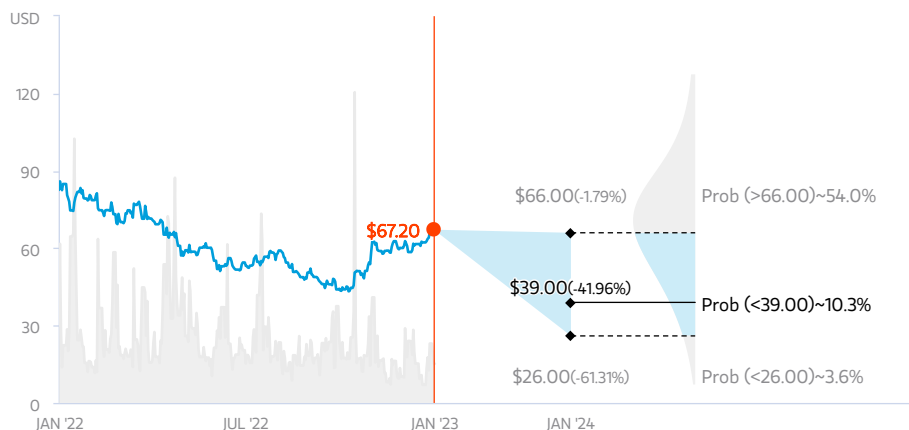
Our 1-year forward price target of \$39 is based on 11.5x our CY23e EPS of \$3.41, which assumes that Logitech trades at a ~35% discount (or 0.65x relative multiple) to the June 2023 S&P 500 target P/E of 17.7x, similar to in 2010-2011. For historical context, this assumes LOGI trades at a ~6x turn discount to its pre-COVID average multiple of 18x, in light of more challenged topline trends.

Consensus Price Target Distribution



Source: Refinitiv, Morgan Stanley Research

RISK REWARD CHART AND OPTIONS IMPLIED PROBABILITIES (12M)



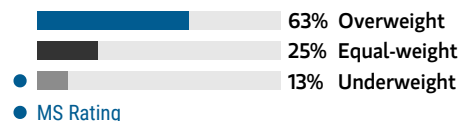
Key: — Historical Stock Performance ● Current Stock Price ◆ Price Target

Source: Refinitiv, Morgan Stanley Research, Morgan Stanley Institutional Equities Division. The probabilities of our Bull, Base, and Bear case scenarios playing out were estimated with implied volatility data from the options market as of 10 Jan, 2023. All figures are approximate risk-neutral probabilities of the stock reaching beyond the scenario price in either three-months' or one-years' time. View explanation of Options Probabilities methodology [here](#)

UNDERWEIGHT THESIS

Over the last 24 months, consumers have allocated spending to goods that have enabled greater productivity and connectivity in a COVID world, which has resulted in what we believe to be a level of technology product overconsumption not seen in over a decade. LOGI has clearly benefitted from this trend. But as we move further from the height of COVID and consumer spending normalizes/shifts to areas of pent up demand, LOGI's revenue trajectory is likely to be pressured, which combined with elevated logistics costs, should have a knock on effect to profitability. We believe this will put downward pressure on consensus estimates and drive underperformance vs. peers, which is why we remain UW.

Consensus Rating Distribution



Source: Refinitiv, Morgan Stanley Research

Risk Reward Themes

Contrarian: *Negative*
Market Share: *Positive*

View descriptions of Risk Rewards Themes [here](#)

BULL CASE

\$66.00

17.5x Bull Case CY23e Non-GAAP EPS of \$3.75

If demand for PC peripherals holds up due to enterprise demand, new products, or another COVID wave, and Gaming and Video Collaboration grow mid-to-high single digits Y/Y, then we believe LOGI's revenue could grow low single digits, with CY23 EPS reaching \$3.75. In this scenario, demand holds, which helps LOGI avoid a channel inventory correction. We assign a 17.5x target P/E, a 3.5x discount to LOGI's 2020-2022 avg. multiple due to slower revenue & EPS growth, resulting in our \$66 bull case.

BASE CASE

\$39.00

11.5x CY23e Non-GAAP EPS of \$3.41

We assume that revenue declines 10% Y/Y at CC in FY23, with declines across all segments, except for Video Collaboration. Inflationary costs and a return of discounting leads to 250 bps Y/Y gross margin contraction. LOGI opex declines slightly less than revenue, resulting in \$3.26 of FY23 EPS or \$3.41 of CY23 EPS. \$39 PT reflects 11.5x P/E, a ~35% discount to the June 2023 target S&P P/E multiple of 17.7x given challenged topline trends.

BEAR CASE

\$26.00

9.0x Bear Case CY23e Non-GAAP EPS of \$2.93

Should consumer demand deteriorate more significantly, we see FY23 revs declining mid-to-high teens at CC. In this scenario, LOGI sees weaker PC peripherals (45% of revenue) and Video Collaboration (highest margin segment) results, channel inventory corrects, discounting returns, and supply chain headwinds lead to margin compression. Our bear case assumes revenue declines mid-to-high teens at CC & CY23 EPS falls to \$2.93, which on a trough P/E multiple of 9.0x drives our \$26 bear case.

Risk Reward – Logitech International SA (LOGI.O)

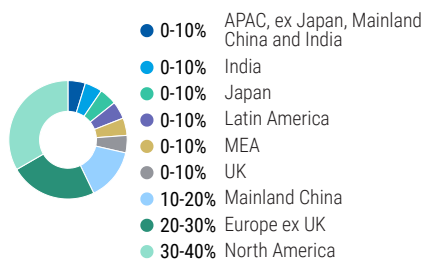
KEY EARNINGS INPUTS

Drivers	2022	2023e	2024e	2025e
Revenue Growth (Y/Y) (%)	4.4	(15.2)	(3.2)	5.4
Non-GAAP Gross Margin (%)	41.7	39.2	39.9	40.6
Non-GAAP Operating Income Growth (Y/Y) (%)	(28.9)	(33.1)	(0.3)	11.3
EPS Growth (Y/Y) (%)	(27.9)	(29.5)	8.4	14.1
Cash Flow from Operations (\$ Thousands) (\$, 000s)	298,318	599,583	675,310	705,696

INVESTMENT DRIVERS

- Negative est revisions on the back of earnings announcements
- Incumbent PC OEMs and/or low cost new market entrants create more competition
- Weaker PC market data points
- Work from home demand rapidly decelerates
- Higher costs drive margin contraction

GLOBAL REVENUE EXPOSURE



Source: Morgan Stanley Research Estimate
View explanation of regional hierarchies [here](#)

MS ALPHA MODELS

4/5 BEST	24 Month Horizon	5/5 MOST	3 Month Horizon
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Source: Refinitiv, FactSet, Morgan Stanley Research; 1 is the highest favored Quintile and 5 is the least favored Quintile

RISKS TO PT/RATING

RISKS TO UPSIDE

- Faster than expected growth drives positive est revisions
- Accelerating enterprise adoption of PC peripherals and VC equipment
- Positive mix shift lifts gross margins
- M&A

RISKS TO DOWNSIDE

- Cyclical tailwinds fade, resulting in sub-seasonal PC peripherals growth
- Gaming & VC growth decelerates faster than expected
- Channel inventory build leads to increased discounting
- Elevated OpEx spend drives operating de-leverage

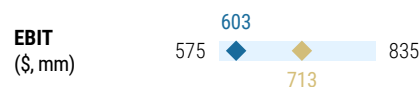
OWNERSHIP POSITIONING

Inst. Owners, % Active	73.5%	<div style="width: 73.5%;"></div>
HF Sector Long/Short Ratio	2.1x	<div style="width: 2.1x;"></div>
HF Sector Net Exposure	30%	<div style="width: 30%;"></div>

Refinitiv; MSPB Content. Includes certain hedge fund exposures held with MSPB. Information may be inconsistent with or may not reflect broader market trends. Long/Short Ratio = Long Exposure / Short exposure. Sector % of Total Net Exposure = (For a particular sector: Long Exposure - Short Exposure) / (Across all sectors: Long Exposure - Short Exposure).

MS ESTIMATES VS. CONSENSUS

FY Mar 2024e



◆ Mean ◆ Morgan Stanley Estimates

Source: Refinitiv, Morgan Stanley Research

Morgan Stanley VAR Survey

This report contains the results of our VAR Survey. During November - December 2022 we conducted telephone and online interviews with 20 Value-Added Resellers and integrators of IT hardware. Survey respondents hold management responsibility in areas including Operations, Sales and Partner relationships and have visibility to company-wide sales performance.

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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: Erik W Woodring.

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In the next 3 months, Morgan Stanley expects to receive or intends to seek compensation for investment banking services from Apple, Inc., CDW Corporation, Cricut Inc, Dell Technologies Inc., GoPro Inc, Hewlett Packard Enterprise, HP Inc., IBM, Logitech International SA, NCR Corp., NetApp Inc, Nutanix Inc, Pure Storage Inc, Resideo Technologies Inc, Seagate Technology, SmartRent, Inc., Snap One Holdings Corp., Sonos Inc., Teradata.

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Global Stock Ratings Distribution

(as of December 31, 2022)

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.

STOCK RATING CATEGORY	COVERAGE UNIVERSE		INVESTMENT BANKING CLIENTS (IBC)			OTHER MATERIAL INVESTMENT SERVICES CLIENTS (MISC)	
	COUNT	% OF TOTAL	COUNT	% OF TOTAL IBC	% OF RATING CATEGORY	COUNT	% OF TOTAL OTHER MISC
Overweight/Buy	1352	37%	278	42%	21%	593	38%
Equal-weight/Hold	1659	45%	309	46%	19%	735	47%
Not-Rated/Hold	3	0%	0	0%	0%	0	0%
Underweight/Sell	651	18%	82	12%	13%	224	14%
TOTAL	3,665		669			1552	

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.

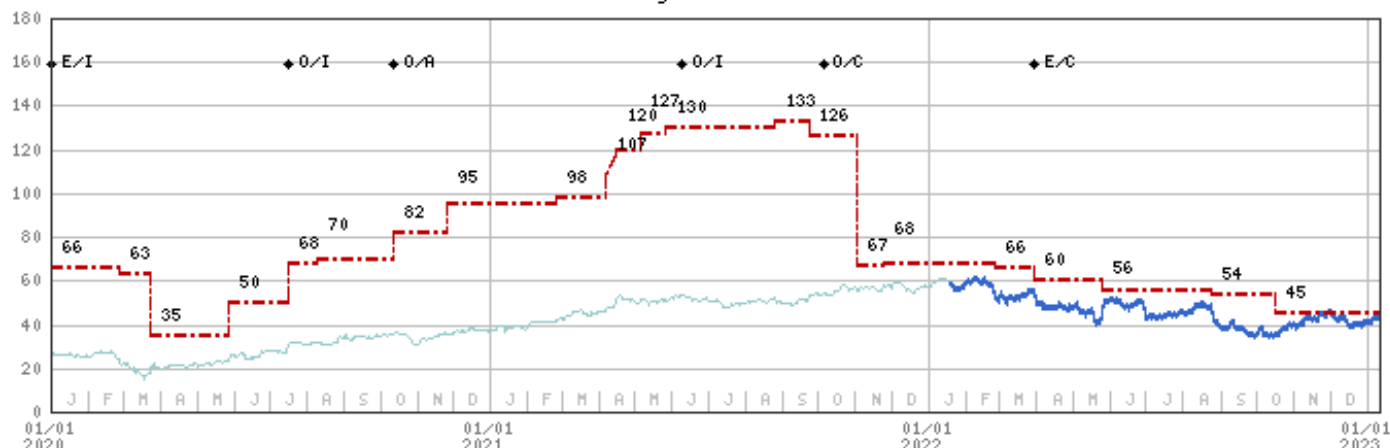
In-Line (I): The analyst expects the performance of his or her industry coverage universe over the next 12-18 months to be in line with the relevant broad market benchmark, as indicated below.

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.

Stock Price, Price Target and Rating History (See Rating Definitions)

Dell Technologies Inc. (DELL.N) - As of 1/10/23 in USD
Industry : IT Hardware



Stock Rating History: 1/1/18 : C; 1/23/18 : A; 1/15/19 : E/I; 7/16/20 : O/I; 10/12/20 : O/A; 6/10/21 : O/I; 10/5/21 : O/C; 3/30/22 : E/C

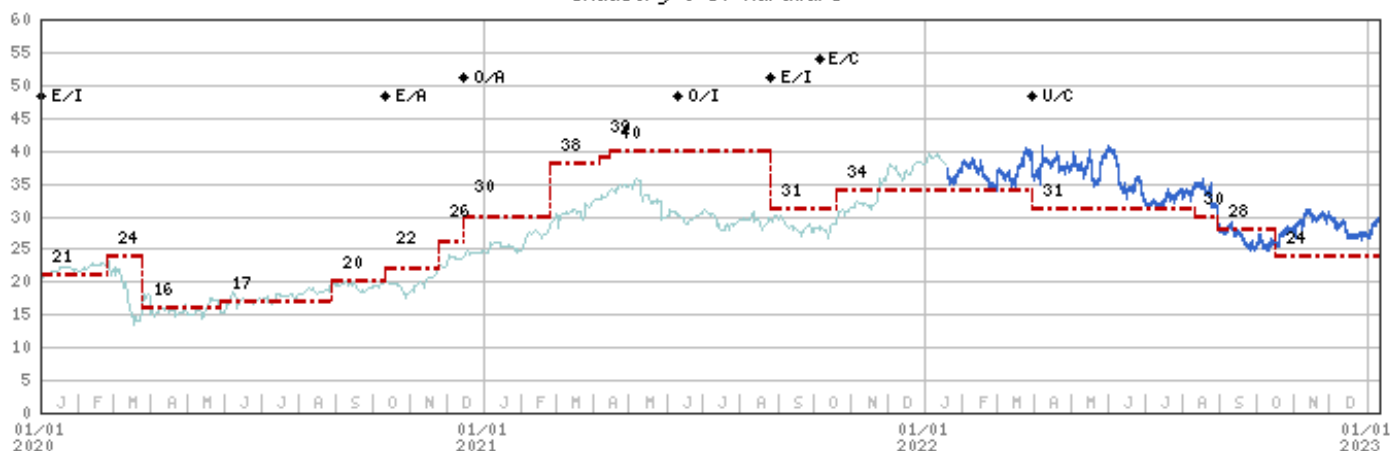
Price Target History: 1/15/19 : 49; 2/27/19 : 60; 3/1/19 : 66; 4/4/19 : 68; 4/30/19 : 74; 5/30/19 : 70; 8/22/19 : 56; 8/29/19 : 57; 9/26/19 : 61; 11/21/19 : 67; 11/26/19 : 66; 2/27/20 : 63; 3/24/20 : 35; 5/28/20 : 50; 7/16/20 : 68; 8/9/20 : 70; 10/12/20 : 82; 11/25/20 : 95; 2/25/21 : 98; 4/7/21 : 107; 4/15/21 : 120; 5/5/21 : 127; 5/27/21 : 130; 8/26/21 : 133; 9/23/21 : 126; 11/24/21 : 67; 2/25/22 : 66; 3/30/22 : 60; 5/26/22 : 56; 8/25/22 : 54; 10/17/22 : 45

Source: Morgan Stanley Research Date Format : MM/DD/YY Price Target --- No Price Target Assigned (NA)
 Stock Price (Not Covered by Current Analyst) --- Stock Price (Covered by Current Analyst) ---
 Stock and Industry Ratings (abbreviations below) appear as + Stock Rating/Industry View
 Stock Ratings: Overweight (O) Equal-weight (E) Underweight (U) Not-Rated (NR) No Rating Available (NA)
 Industry View: Attractive (A) In-line (I) Cautious (C) No Rating (NR)

Effective January 13, 2014, the stocks covered by Morgan Stanley Asia Pacific will be rated relative to the analyst's industry (or industry team's) coverage.

Effective January 13, 2014, the industry view benchmarks for Morgan Stanley Asia Pacific are as follows: relevant MSCI country index or MSCI sub-regional index or MSCI AC Asia Pacific ex Japan Index.

HP Inc. (HPQ.N) - As of 1/10/23 in USD
Industry : IT Hardware



Stock Rating History: 1/1/18 : O/C; 1/23/18 : E/A; 1/15/19 : E/I; 10/12/20 : E/A; 12/15/20 : O/A; 6/10/21 : O/I; 8/26/21 : E/I; 10/5/21 : E/C; 3/30/22 : U/C

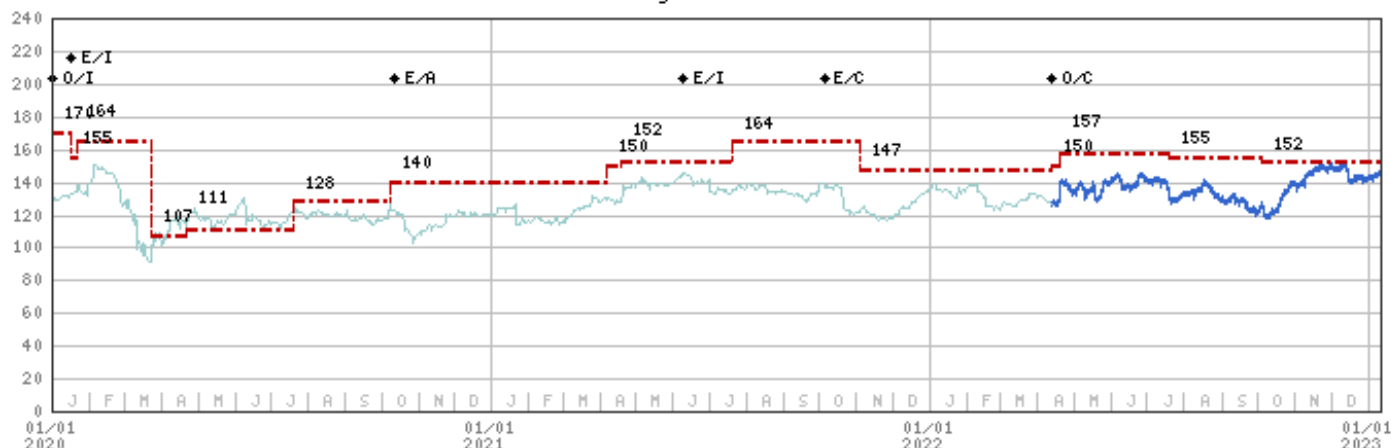
Price Target History: 10/12/17 : 25; 2/22/18 : 27; 5/29/18 : 28; 8/23/18 : 29; 10/3/18 : 28; 1/15/19 : 22; 5/23/19 : 23; 8/22/19 : 21; 10/4/19 : 20; 11/26/19 : 21; 2/24/20 : 24; 3/24/20 : 16; 5/28/20 : 17; 8/28/20 : 20; 10/12/20 : 22; 11/25/20 : 26; 12/15/20 : 30; 2/25/21 : 38; 4/7/21 : 39; 4/15/21 : 40; 8/26/21 : 31; 10/20/21 : 34; 3/30/22 : 31; 8/11/22 : 30; 8/31/22 : 28; 10/17/22 : 24

Source: Morgan Stanley Research Date Format : MM/DD/YY Price Target --- No Price Target Assigned (NA)
 Stock Price (Not Covered by Current Analyst) --- Stock Price (Covered by Current Analyst) ---
 Stock and Industry Ratings (abbreviations below) appear as + Stock Rating/Industry View
 Stock Ratings: Overweight (O) Equal-weight (E) Underweight (U) Not-Rated (NR) No Rating Available (NA)
 Industry View: Attractive (A) In-line (I) Cautious (C) No Rating (NR)

Effective January 13, 2014, the stocks covered by Morgan Stanley Asia Pacific will be rated relative to the analyst's industry (or industry team's) coverage.

Effective January 13, 2014, the industry view benchmarks for Morgan Stanley Asia Pacific are as follows: relevant MSCI country index or MSCI sub-regional index or MSCI AC Asia Pacific ex Japan Index.

IBM (IBM.N) - As of 1/10/23 in USD
Industry : IT Hardware



Stock Rating History: 1/1/18 : O/C; 1/23/18 : O/A; 10/28/18 : NA/A; 12/19/18 : NA/A; 1/15/19 : NA/I; 1/16/19 : NA/I; 8/1/19 : O/I; 1/16/20 : E/I; 10/12/20 : E/A; 6/10/21 : E/I; 10/5/21 : E/C; 4/13/22 : O/C
 Price Target History: 7/18/17 : 192; 1/18/18 : 198; 7/18/18 : 185; 10/16/18 : 168; 10/28/18 : NA; 12/19/18 : NA; 1/16/19 : NA; 8/1/19 : 170; 1/16/20 : 155; 1/21/20 : 164; 3/24/20 : 107; 4/21/20 : 111; 7/20/20 : 128; 10/8/20 : 140; 4/7/21 : 150; 4/19/21 : 152; 7/20/21 : 164; 11/4/21 : 147; 4/13/22 : 150; 4/20/22 : 157; 7/19/22 : 155; 10/5/22 : 152

Source: Morgan Stanley Research Date Format : MM/DD/YY Price Target --- No Price Target Assigned (NA)
 Stock Price (Not Covered by Current Analyst) --- Stock Price (Covered by Current Analyst) ---
 Stock and Industry Ratings (abbreviations below) appear as ♦ Stock Rating/Industry View
 Stock Ratings: Overweight (O) Equal-weight (E) Underweight (U) Not-Rated (NR) No Rating Available (NA)
 Industry View: Attractive (A) In-line (I) Cautious (C) No Rating (NR)

Effective January 13, 2014, the stocks covered by Morgan Stanley Asia Pacific will be rated relative to the analyst's industry (or industry team's) coverage.

Effective January 13, 2014, the industry view benchmarks for Morgan Stanley Asia Pacific are as follows: relevant MSCI country index or MSCI sub-regional index or MSCI AC Asia Pacific ex Japan Index.

Logitech International SA (LOGI.O) - As of 1/10/23 in USD
Industry : IT Hardware



Stock Rating History: 1/1/18 : NA/C; 1/23/18 : NA/A; 1/15/19 : NA/I; 10/12/20 : NA/A; 11/11/20 : O/A; 6/10/21 : E/I; 9/27/21 : U/I; 10/5/21 : U/C
 Price Target History: 11/11/20 : 100; 12/15/20 : 106; 1/13/21 : 113; 1/19/21 : 116; 3/1/21 : 122; 4/15/21 : 123; 4/29/21 : 126; 7/27/21 : 119; 9/27/21 : 82; 10/5/21 : 80; 10/26/21 : 77; 1/25/22 : 74; 3/3/22 : 75; 5/3/22 : 60; 6/14/22 : 53; 7/26/22 : 45; 10/17/22 : 38; 10/25/22 : 39

Source: Morgan Stanley Research Date Format : MM/DD/YY Price Target --- No Price Target Assigned (NA)
 Stock Price (Not Covered by Current Analyst) --- Stock Price (Covered by Current Analyst) ---
 Stock and Industry Ratings (abbreviations below) appear as ♦ Stock Rating/Industry View
 Stock Ratings: Overweight (O) Equal-weight (E) Underweight (U) Not-Rated (NR) No Rating Available (NA)
 Industry View: Attractive (A) In-line (I) Cautious (C) No Rating (NR)

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Effective January 13, 2014, the industry view benchmarks for Morgan Stanley Asia Pacific are as follows: relevant MSCI country index or MSCI sub-regional index or MSCI AC Asia Pacific ex Japan Index.

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INDUSTRY COVERAGE: IT Hardware

COMPANY (TICKER)	RATING (AS OF)	PRICE* (01/10/2023)
Erik W Woodring		
Apple, Inc. (AAPL.O)	O (05/26/2009)	\$130.73
CDW Corporation (CDW.O)	O (03/30/2022)	\$186.38
Circuit City (CRCT.O)	U (08/12/2021)	\$9.47
Dell Technologies Inc. (DELL.N)	E (03/30/2022)	\$42.49
Garmin Ltd (GRMN.N)	E (01/07/2015)	\$98.92
GoPro Inc (GPRO.O)	E (11/11/2021)	\$5.40
HP Inc. (HPQ.N)	U (03/30/2022)	\$29.09
IBM (IBM.N)	O (04/13/2022)	\$144.80
Logitech International SA (LOGI.O)	U (09/27/2021)	\$67.20
NCR Corp. (NCR.N)	E (09/19/2022)	\$24.82
Resideo Technologies Inc (REZI.N)	E (03/16/2021)	\$17.89
Seagate Technology (STX.O)	E (10/05/2021)	\$56.46
SmartRent, Inc. (SMRT.N)	E (02/14/2022)	\$2.97
Snap One Holdings Corp. (SNPO.O)	E (12/08/2021)	\$8.25
Sonos Inc. (SONO.O)	E (06/14/2022)	\$18.05
Teradata (TDC.N)	O (09/19/2021)	\$33.01
Vivint Smart Home Inc (VWNT.N)	E (08/11/2020)	\$11.93
Xerox Corp (XRX.O)	U (02/03/2021)	\$16.46
Meta A Marshall		
Hewlett Packard Enterprise (HPE.N)	U (04/12/2022)	\$17.06
NetApp Inc (NTAP.O)	U (12/13/2022)	\$64.21
Nutanix Inc (NTNX.O)	E (05/28/2019)	\$26.33
Pure Storage Inc (PSTG.N)	O (10/31/2022)	\$26.46

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