

Summer Series 2023: Software Grinding Through The Plateau

Enterprise Software

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Introduction



Mark R. Murphy

- *Covering the Enterprise Software industry since 1997*
- *Over 20 years experience*
- *Cornell University*

Arti Vula, CFA

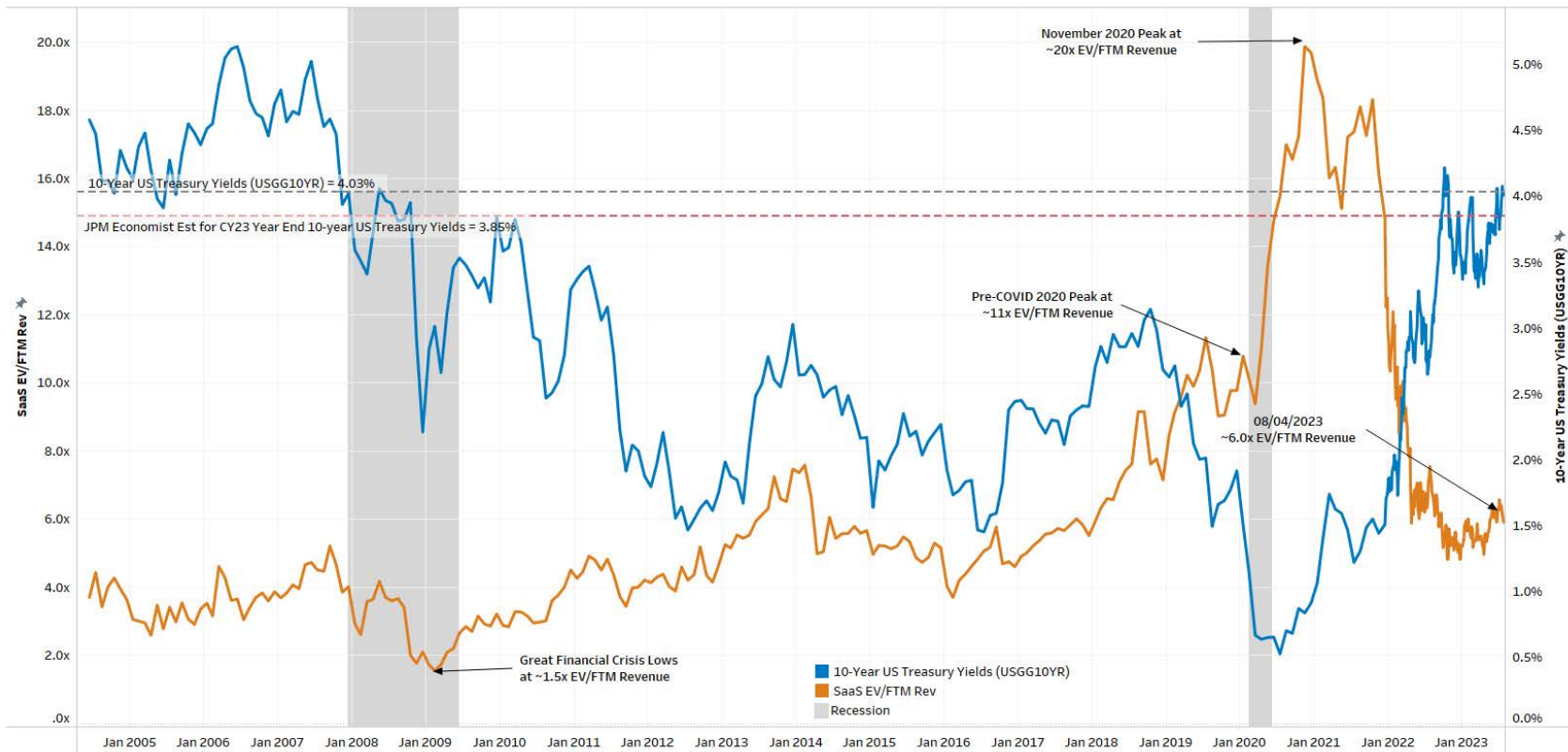
- *Four years' experience in private equity*
- *Vanderbilt University, MSF and Univ. of Kentucky, Economics & Political Science BA*

Sonak Kolar

- *Covering Enterprise Software since 2019 at Bloomberg Intelligence*
- *Johns Hopkins University, Economics and International Studies B.A.*

SaaS Valuations vs. 10-Year U.S. Treasury Yields

SaaS Peer Group EV/FTM Revenue Multiple Over the Last 18 Years



Takeaways

- This chart depicts the average EV/FTM sales multiple for ~120 SaaS companies since mid-2004 against the 10-year U.S. Treasury yield, with recessions overlaid in grey shading, and dashed lines showing the level of the current and J.P. Morgan Economist projected CY23 year-end 10-year Treasury yield.
- It could be informative to consider the level of SaaS valuations in prior periods when the 10-year yield sat between 3% and 4%, given current level ~4.0%.

Source: J.P. Morgan Research, Bloomberg Finance L.P. Note: Data is as of 08/10/23. Not all companies were publicly traded for the entire history of this chart.

Positive & Negative Divergences in Recent Months

■ Positive:

- *NOW (Solid Q2, cRPO Growth Ahead of Consensus, Raised FY Outlook, Expects Strong 2H, Premium AI SKUs)*
- *MSFT (Establishing Clear GenAI Leadership, Azure Growth Lands at High-End, 50%+ Price Uplift With Copilots)*
- *HUBS (Q2 Revenue Upside, FY Guidance Raised, Strong Up-Market Traction, Multi-Hub Adoption Trend)*

■ Negative:

- *DDOG (Healthy Q2 But FY Revenue Guide Down, Slower Large-Customer Usage Growth, Low-End Churn)*
- *ZI (Q2 Revenue Light, Renewal Pressure in Software Vertical, Elevated Write-Offs, FY Revenue Guide-Down)*
- *PAYC (Muted Beat & Raise Cadence, Decel in Ex-Float Revenue Growth to Low-20s, Friction in Beta Migrations)*

Q2 Sequential Growth of Leading Indicators: Softer Contraction

SEQUENTIAL GROWTH TRAJECTORY: Q2 CY2022 vs. Q2 CY2023						
Company	Ticker	Metric	Q2 CY2022	Q2 CY2023	Delta (Abs)	Delta (%)
Amazon (AWS)	AMZN	Calculated Annualized RPO	9.7%	17.3%	7.6%	78.2%
Microsoft	MSFT	Dynamics Revenue Growth	5.1%	7.5%	2.4%	46.7%
Akamai*	AKAM	Revenue Growth	(0.0%)	2.2%	2.2%	N/A
ServiceNow	NOW	cRPO Growth	1.0%	2.7%	1.7%	168.7%
Microsoft	MSFT	Total Revenue Growth	5.1%	6.3%	1.2%	24.2%
Dropbox*	DBX	Deferred Revenue Growth	0.0%	0.9%	0.9%	N/A
Alphabet (GCP)	GOOG	GCP Revenue Growth	7.8%	7.7%	(0.1%)	(1.0%)
Dropbox	DBX	Total Organic Revenue Growth	1.8%	1.7%	(0.2%)	(9.3%)
Adobe	ADBE	CC Creative ARR Growth	3.4%	3.1%	(0.3%)	(8.1%)
Adobe	ADBE	CC Document Cloud ARR Growth	5.3%	4.9%	(0.4%)	(8.1%)
HubSpot	HUBS	Billings Growth	2.3%	1.7%	(0.6%)	(25.7%)
Ceridian	CDAY	Dayforce Recurring Rev (ex-Float, ex-Tax Migration)	1.8%	1.1%	(0.7%)	(38.9%)
Paycom	PAYC	Recurring Revenue (includes float income)	(10.5%)	(11.2%)	(0.7%)	(6.7%)
Microsoft	MSFT	Azure Revenue Growth	8.7%	7.8%	(0.9%)	(9.9%)
Oracle	ORCL	Total Revenue Growth	12.6%	11.6%	(1.0%)	(8.0%)
Microsoft	MSFT	LinkedIn Revenue Growth	8.0%	5.7%	(2.3%)	(28.3%)
Semrush	SEMR	Billings Growth	(2.0%)	(4.5%)	(2.5%)	(122.7%)
Amazon (AWS)	AMZN	AWS Revenue Growth	7.0%	3.7%	(3.4%)	(47.7%)
Cloudflare	NET	Calculated Billings Growth	13.9%	9.9%	(4.0%)	(28.6%)
Twilio	TWLO	Total Revenue Growth	7.8%	3.1%	(4.7%)	(60.1%)
DoubleVerify	DV	Organic Revenue Growth	13.9%	9.1%	(4.9%)	(34.8%)
Oracle	ORCL	ST RPO	16.9%	11.3%	(5.7%)	(33.5%)
BigCommerce	BIGC	Enterprise Account ARR Growth	9.3%	3.3%	(6.0%)	(64.3%)
Datadog	DDOG	Revenue Growth	11.9%	5.8%	(6.1%)	(51.5%)
Average					(1.2%)	(12.3%)
Median					(0.7%)	(17.8%)

Sources: Company Filings, JP Morgan Estimates.

*These line items were excluded from the Delta (%) calculations due to being outliers.

CY23 Growth Compression and Full Year Guidance Revision

Company	Metric	Revenue Growth				Absolute Change			
		CY22A	CY23 Guidance After C4Q:22	CY23 Guidance After C1Q:23	CY23 Guidance After C2Q:23	After C1Q: Change to CY23 Guidance	After CQ2: Change to CY23 Guidance	After CQ1: CY23E Growth (Decel) / Accel	After CQ2: CY23E Growth (Decel) / Accel
ServiceNow	Subscription Revenue	23.6%	22.9%	23.3%	24.7%	0.4%	1.4%	(0.4%)	1.0%
Akamai	Total Revenue	4.5%	3.4%	4.0%	4.5%	0.6%	0.5%	(0.5%)	0.0%
Dropbox	Total Revenue	7.7%	6.8%	6.6%	7.2%	-0.2%	0.6%	(1.2%)	(0.6%)
Ceridian	Total Revenue	21.7%	19.6%	19.6%	20.4%	0.0%	0.8%	(2.1%)	(1.3%)
Adobe	Total Revenue	11.5%	9.1%	9.1%	9.6%	0.0%	0.6%	(2.4%)	(1.9%)
Paycom	Total Revenue	30.3%	23.7%	24.6%	24.8%	0.9%	0.1%	(5.7%)	(5.5%)
HubSpot	Total Revenue	33.1%	18.7%	20.4%	22.4%	1.7%	2.0%	(12.7%)	(10.7%)
DoubleVerify	Total Revenue	36.0%	23.1%	24.4%	24.4%	1.3%	0.0%	(11.5%)	(11.5%)
Semrush	Total Revenue	35.3%	20.9%	20.9%	21.1%	0.0%	0.2%	(14.4%)	(14.2%)
Cloudflare	Total Revenue	48.6%	37.0%	31.5%	31.8%	-5.5%	0.3%	(17.1%)	(16.8%)
BigCommerce	Total Revenue	26.9%	10.0%	10.0%	10.0%	0.0%	0.0%	(16.9%)	(16.9%)
ZoomInfo	Total Revenue (GAAP)	47.0%	16.6%	16.6%	12.0%	0.0%	-4.6%	(30.4%)	(35.0%)
Datadog	Total Revenue	62.8%	24.2%	24.8%	22.7%	0.6%	-2.1%	(38.1%)	(40.1%)
Min		4.5%	3.4%	4.0%	4.5%	(5.5%)	(4.6%)	(38.1%)	(40.1%)
Average		29.9%	18.1%	18.1%	18.1%	(0.0%)	(0.0%)	(11.8%)	(11.8%)
Median		30.3%	19.6%	20.4%	21.1%	0.0%	0.3%	(11.5%)	(10.7%)
Max		62.8%	37.0%	31.5%	31.8%	1.7%	2.0%	(0.4%)	1.0%

Sources: Company Filings and Guidance

Reaffirming our Bullish-Outlier View of Generative AI

1. Seminal moment in tech, more so than the Internet or iPhone (we stated this last year)
2. We were not impressed by IoT, Metaverse, Blockchain, 3D printing: GenAI is very different
3. GenAI is doing things today, everyone agreed were physically impossible 9-12 months ago
4. It will Evolve at Light Speed; ChatGPT capabilities are different today than 3 weeks ago
5. ChatGPT vastly outperforms the typical person in the Bar, LSATs, SATs, GRE...
6. LLMs can work in >1,200 dimensions; human beings struggle with 3 dimensions
7. GenAI is applying Logic & Reasoning, connecting abstract thoughts in ways that its engineers did not predict and cannot fully explain
8. Microsoft / OpenAI have potential for Escape Velocity, although it will become increasingly competitive
9. VC investments pivoting rapidly from Cloud & Crypto to GenAI; material % of Y Combinator companies are AI
10. At software user conferences, loudest visceral responses by far coming from GenAI code-generation demos
11. GPT-4-32K can understand / store a 50-page document
12. Potential for Massive Workforce Productivity Boom, Next 1-3 years; could affect shape of economic cycle
13. Potential for Mass-Scale white collar job wipeout, 4-8 years out (Customer Service, Data Entry, Content Creation, Paralegals, Teachers, Doctors, Authors, Photographers, Graphic Artists, Tax Preparers, and many more)

J.P. Morgan Generative AI CIO Survey – Executive Summary

Major Hyperscalers Definitely Benefit from Generative AI...

- Across 85 surveyed CIOs of large global firms, ~84% of their Generative AI activity / spend will occur on public clouds vs. only 16% for on-prem / private cloud. **Across Amazon, Google, and Microsoft, spending impact due to Generative AI is lopsidedly positive, with a net 47% to 68% of their installed bases, respectively, seeing increased spend due to the advent of Gen-AI** and the planned activity to support these projects.

...with Microsoft / OpenAI Taking a Commanding Early Lead

- Though Microsoft is already recognized as an early leader in Gen-AI, **the quantifiable magnitude of Microsoft's lead is far greater than investors might have expected.** For example, **CIOs expect 66% of their cloud-based Gen-AI activity / spend to go to Microsoft over the next three years, vs. 14-16% for Google and Amazon, respectively.** While the landscape will evolve, products from OpenAI and Microsoft dominate CIO mentions for the most impressive technologies, conveying a very commanding mindshare lead at the early stages of Gen-AI market formation.

Modern SaaS, Security Leaders Also Stand to Benefit as CIOs Plan to Ramp Gen AI Investments

- In addition to Microsoft, Google, and Amazon, CIOs expect the rise of Generative AI to drive higher spending on **Databricks, CrowdStrike, ServiceNow, Palo Alto Networks, Fortinet, Atlassian, Elastic, Salesforce, and Zscaler.**

Some CIOs Mentioning Early Days...

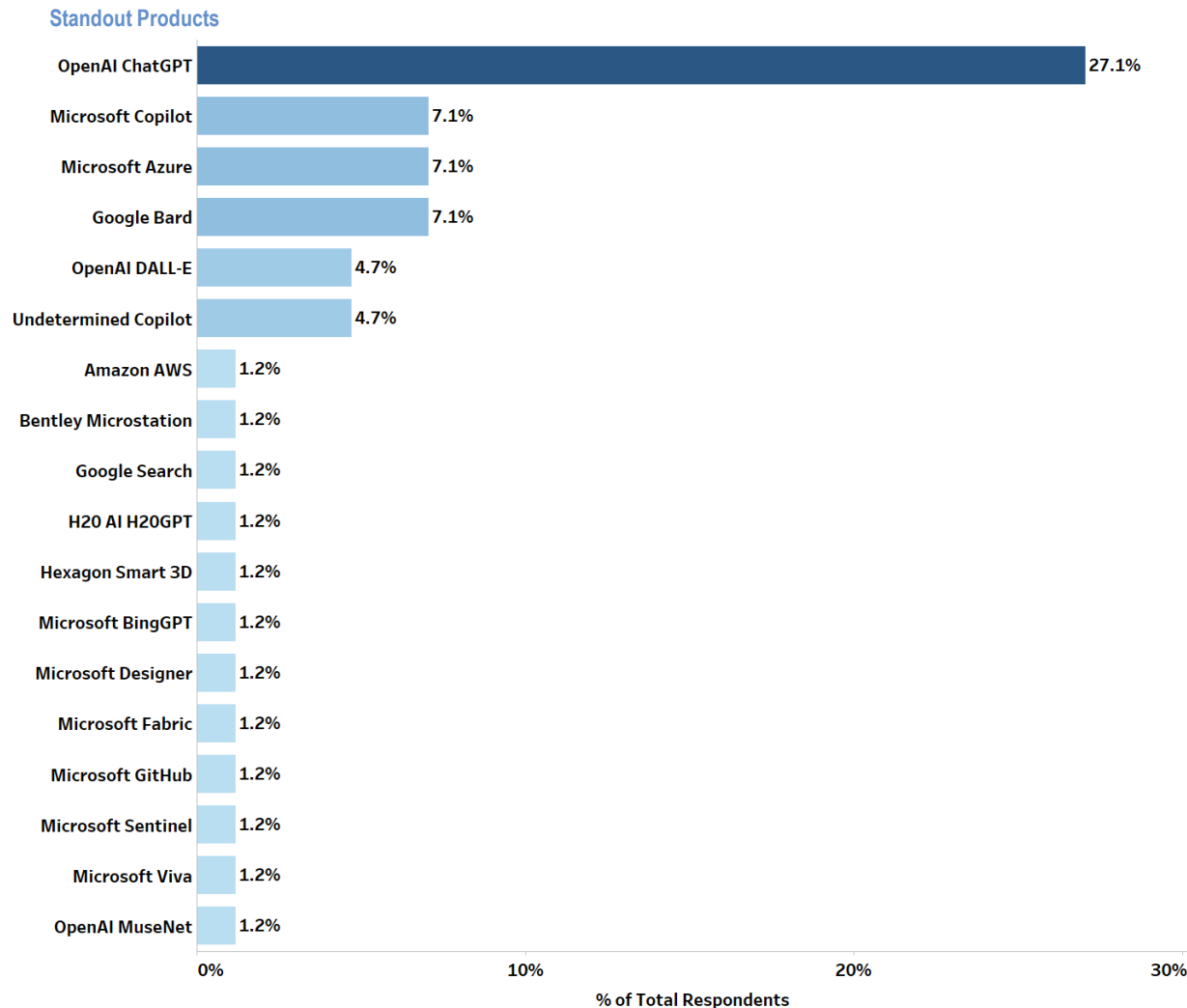
- At this early stage, a portion of CIOs see their Gen-AI plans as “**exploratory**”, stating that they are “**cautiously**” discovering “**the opportunities and threats created by Generative AI**” with many considering the potential for “**reduction in headcount**”, “**labor to be disrupted**”, and “**potentially reducing staffing needs.**”

...But Convey Excitement and Envision a Broad Swath of Transformational Vectors

- Many CIOs relay that “**...there is a lot of interest across the board**”, stating that they are “**Impressed**” by the technologies which are “**...fascinating and game-changing**”, while conveying that ultimately “**AI will come out on top.**” Planned use cases span across image generation (4 mentions of Dall-E, 3 mentions of Midjourney), assessing job applicants, creating content, handling fraud detection, creating “**virtual humans**”, medical diagnosis, writing doctors’ letters, molecular modeling, generating proposals, understanding consumer behavior, producing emails and blog posts, and dozens of other areas, showing **surprisingly broad applicability of Generative AI.**

Standout Software Products for GenAI Investments

Describe how your organization will approach Generative AI investments, and which two to three specific Generative AI products are impressing you the most?



Source: J.P. Morgan Research.

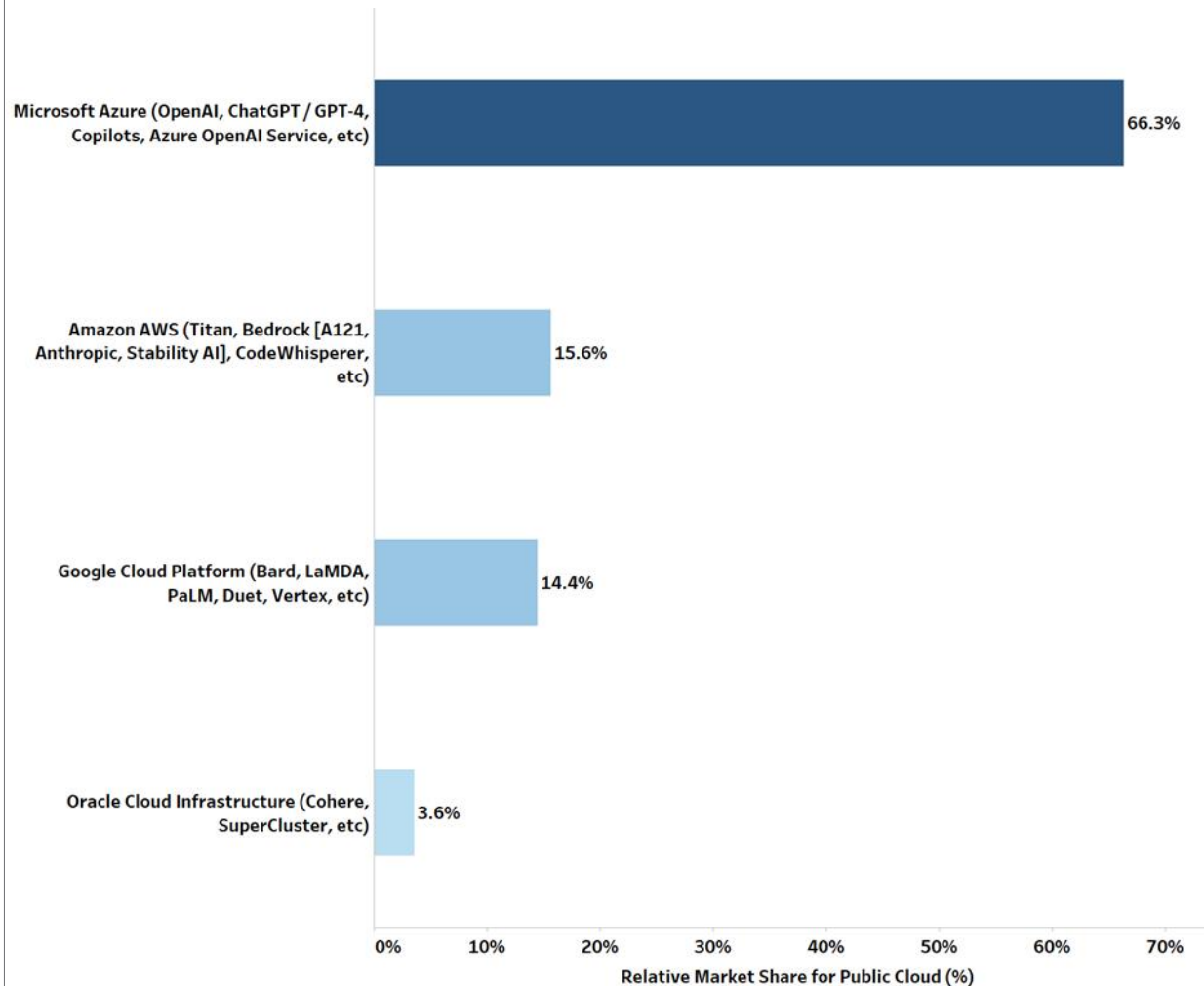
Key Takeaways

- This chart is also distilled from qualitative commentary provided by 85 CIOs in answering a question about the generative AI products that are impressing them the most.
- Only 5 clearly vendor-attributable products received multiple mentions: OpenAI ChatGPT, Microsoft Copilot, Microsoft Azure, Google Bard, and OpenAI DALL-E.
- In addition, the term “Copilot” was mentioned by ~5% of CIOs without a direct company reference, and while most of these mentions are probably linked to Microsoft, other vendors have also adopted the “Copilot” branding.
- 12 other products received a single mention.
- ***Again, the combined presence of OpenAI and Microsoft products conveys disproportionate, early leadership of Generative AI.***

Generative AI Activity / Spending, Next Three Years for Cloud

Please indicate what percentage of your organization's Generative AI Activity / Spending will be conducted on each of the Generative AI platforms listed below, during the NEXT THREE YEARS?

Relative Market Share Among Hyperscalers for Generative AI Platforms (%)



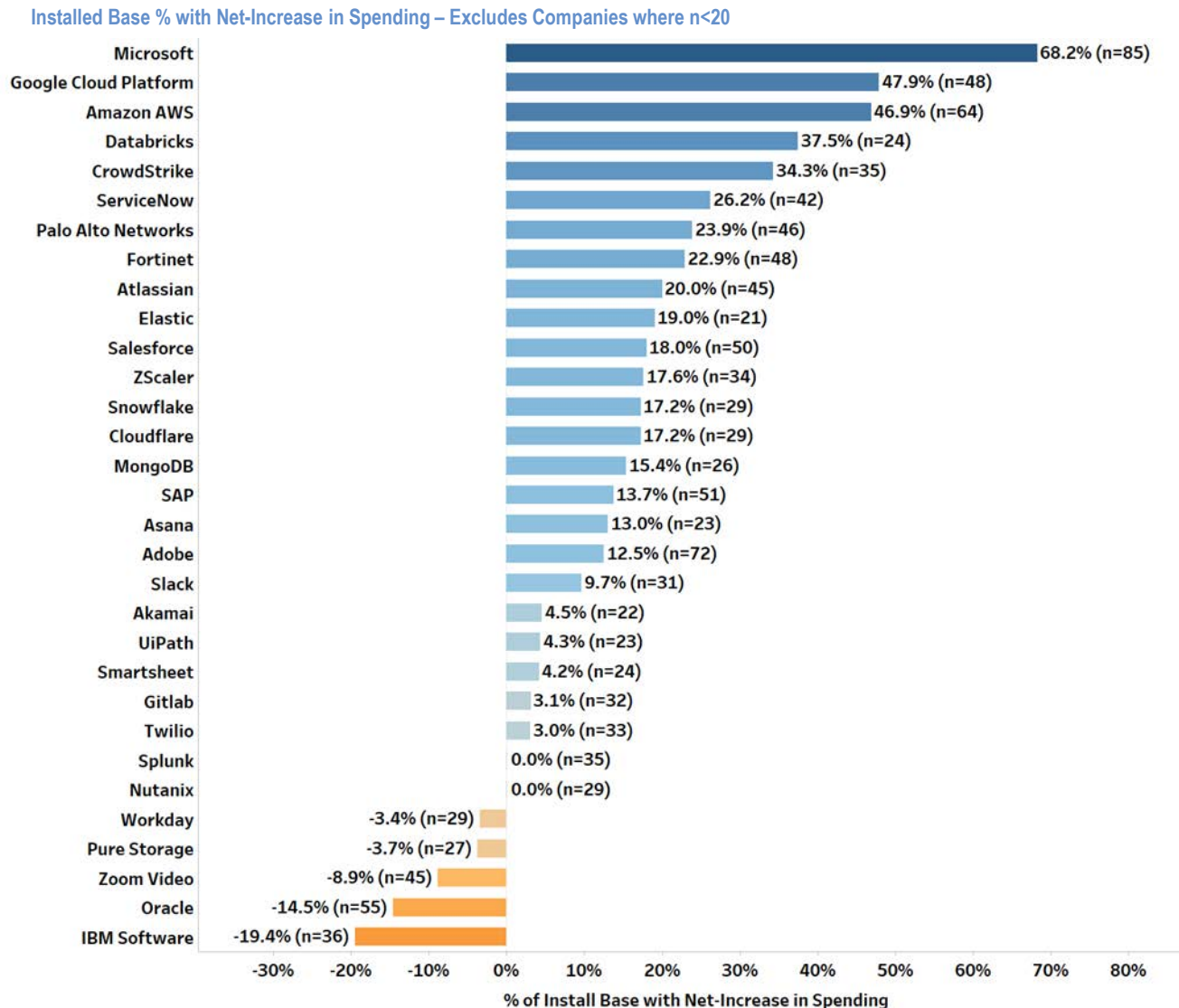
Source: J.P. Morgan Research.

Key Takeaways

- This chart takes the data on the prior page and removes the on-premise / private cloud category to show relative public cloud market share.
- We show the data this way because it is aligned with the gravitation of workloads into public cloud, it shows where a vast majority of Generative AI activity will occur, and it eliminates the issue of substantial vendor fragmentation within the on-premise / private cloud category.
- To the extent Microsoft is able to preserve some of its early mindshare lead in the Generative AI market, it is possible that it will experience spillover benefits into other product lines such as Azure, Office 365, Dynamics, GitHub, Security, Power Platform, among others.

Combined Installed Base Spending Intentions

Please indicate whether the rise of Generative AI technologies will cause you to spend MORE or LESS than you otherwise would have, with the following companies:



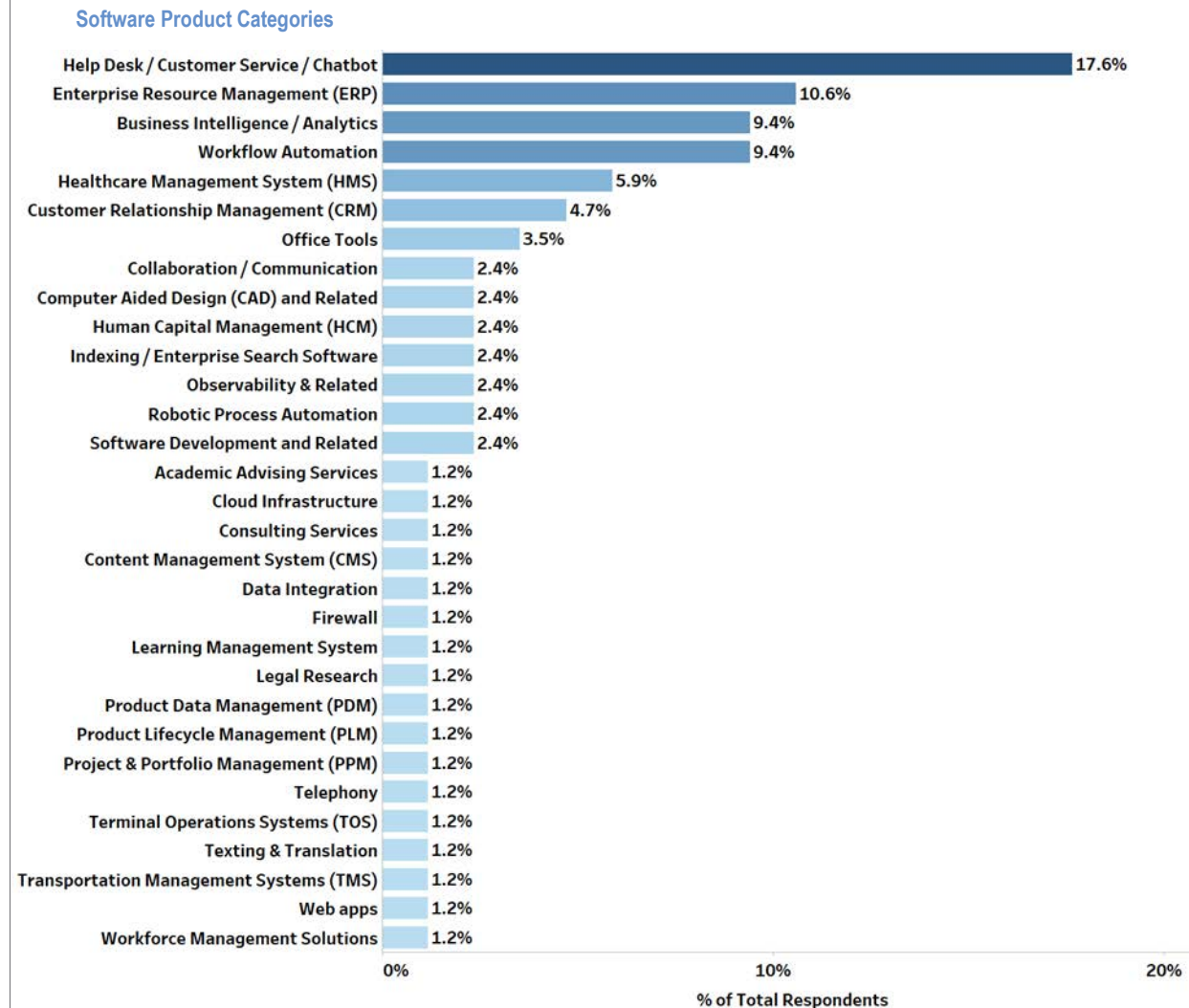
Source: J.P. Morgan Research.

Key Takeaways

- This chart combines the two groupings of software companies displayed on the prior slides, while excluding companies with a small sample size where n < 20.
- This representation of the data clearly conveys that the big three hyperscaler platforms all stand to materially benefit from the advent of Generative AI technologies.
- We also see positive surprises in the performances for key security software providers CrowdStrike, Palo Alto Networks, Fortinet, and Zscaler, and believe the indications for ServiceNow, Elastic, and Salesforce show more positively than investors may have expected.

Software Product Categories – AI Disruption Potential

Please name 1 or 2 software products within your organization's IT stack which will get *Disrupted* by Generative AI - in other words, software products for which you will consume dramatically less or require far fewer seat licenses?

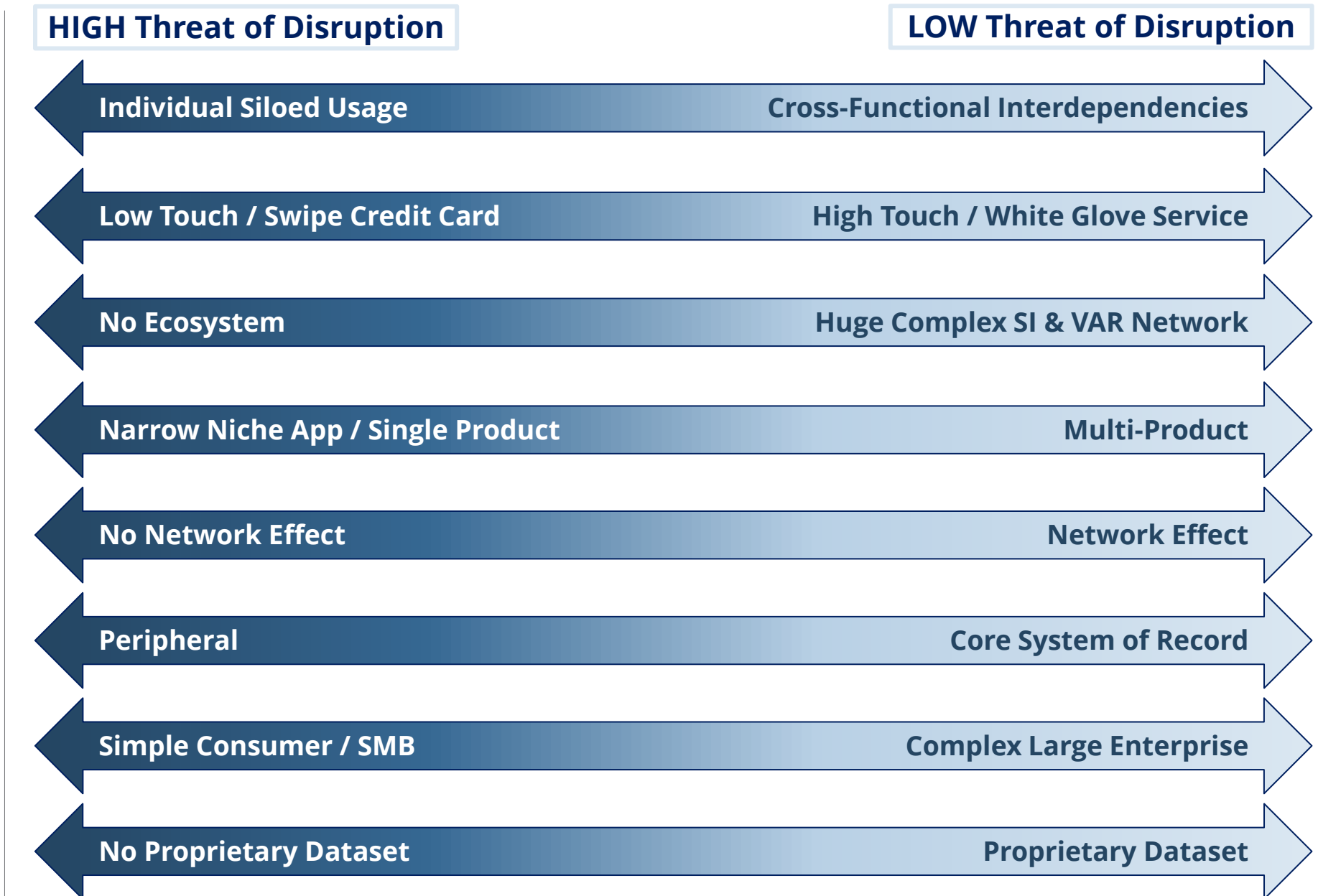


Source: J.P. Morgan Research.

Key Takeaways

- This chart distills qualitative comments to reveal software categories deemed to face disruption potential due to Generative AI.
- ***The major categories CIOs cite as being ripe for disruption / innovation include Help Desk / Customer Service / Chatbot, ERP, Business Intelligence / Analytics, Workflow Automation, Healthcare Management Systems (HMS), CRM, and Office Tools.***
- ***This chart conveys how broadly and pervasively CIOs believe Generative AI technologies can disrupt or modernize a wide swath of key software systems at both the application and infrastructure layers.***
- We recommend reading the detailed comments on the following pages to gain a deeper understanding of the underlying thought processes.

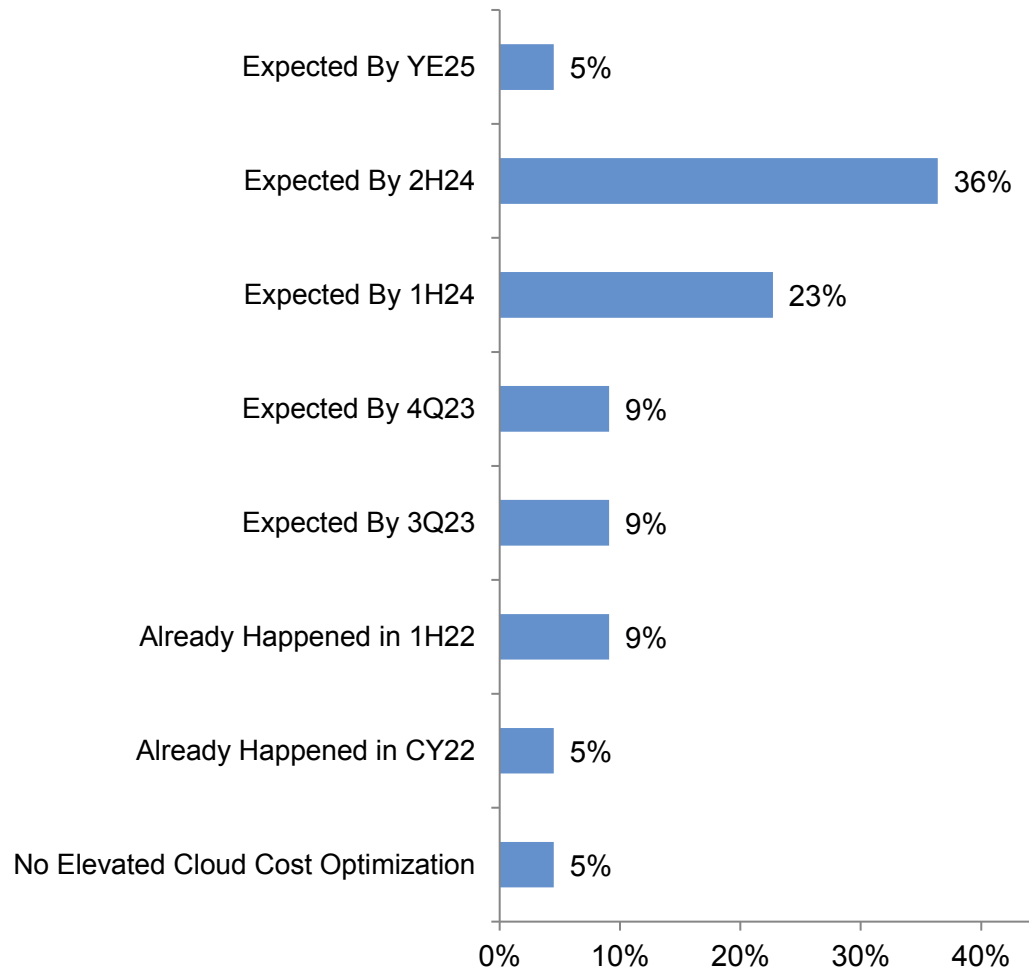
Generative AI Risk and Opportunity Framework for Software



Optimizations Could Linger Through Year-End

Recently the major hyperscaler platforms (AWS, Azure, GCP, etc.) have suffered from a revenue slowdown due to elevated customer activity to "OPTIMIZE" cloud infrastructure spending (reducing their spend by identifying mismanaged resources to eliminate waste, using cheaper storage, using smaller/cheaper servers, etc.). Considering current macro-economic conditions, WHEN IS THE MOST LIKELY TIMEFRAME FOR YOUR CUSTOMERS TO HAVE COMPLETED THE BULK OF THIS EXTRA OPTIMIZATION ACTIVITY and begin getting back to normal? (N=23)

Optimization Cycle Expectations*



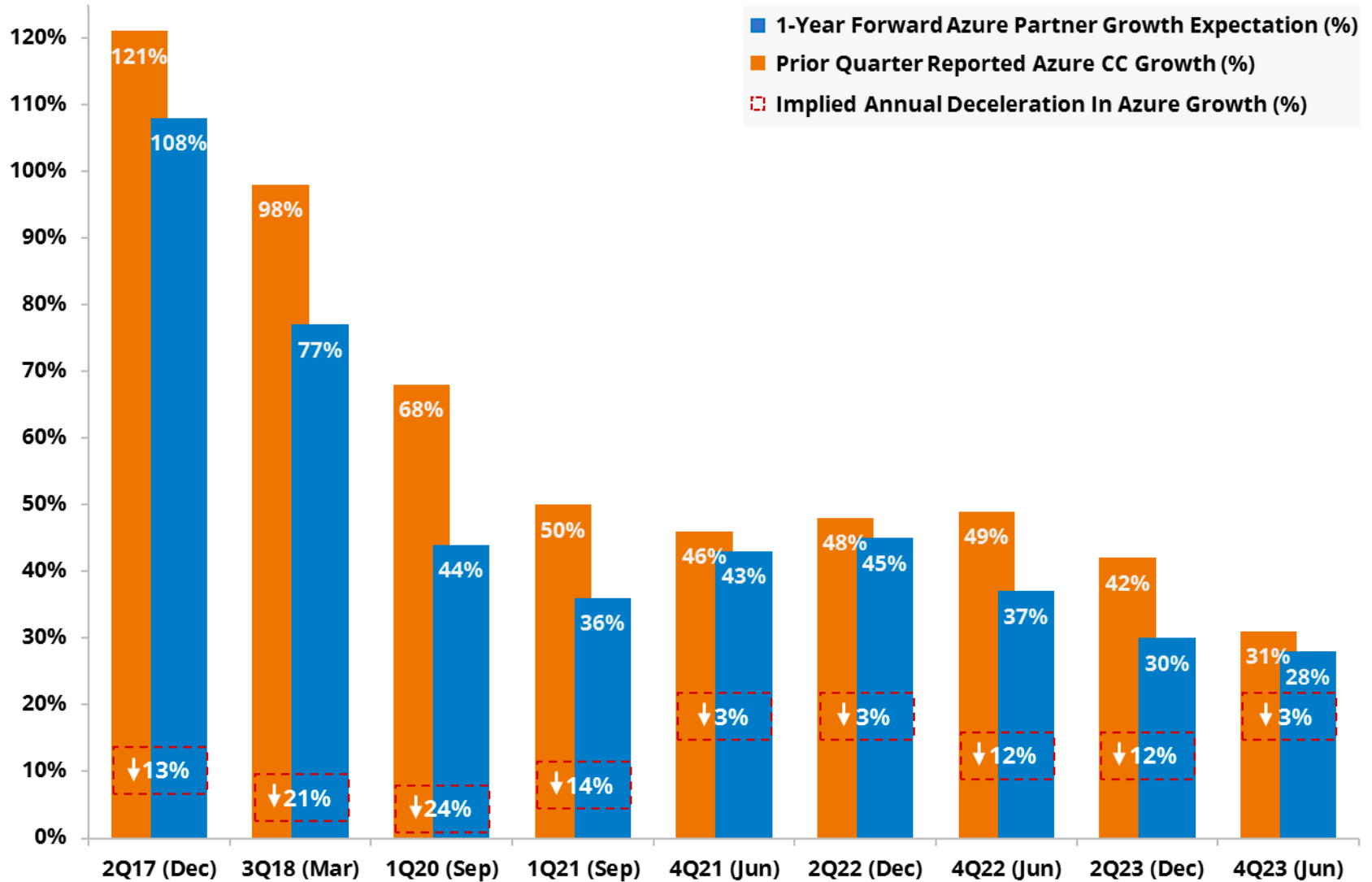
Source: J.P. Morgan Research.

Key Takeaways

- **The majority, 82%, of respondents do not believe that the bulk of extra optimization activity has completed. 64% of respondents expect the elevated levels of optimizations to continue into at least 2024.**
- **Of the 82% who do not believe the elevated optimizations have yet completed, respondents suggest it will take ~3.25 quarters before the extra optimizations are completed, implying early-mid CY24.**
- This assessment marks a clear area of disappointment relative to the consensus viewpoint that the optimization trough and return to normalcy could begin as soon as Sep / Oct. In our view, seeing net-better Azure indications across the survey combined with the idea that elevated optimization would continue well into CY24 suggests that generative AI activity and cloud migrations may be counteracting optimization headwinds.

Microsoft Partner Surveys: Azure 1-Yr Forward Growth Expectations

Microsoft Partners 1-Year Forward Azure Growth Expectations, Implied Annual Deceleration

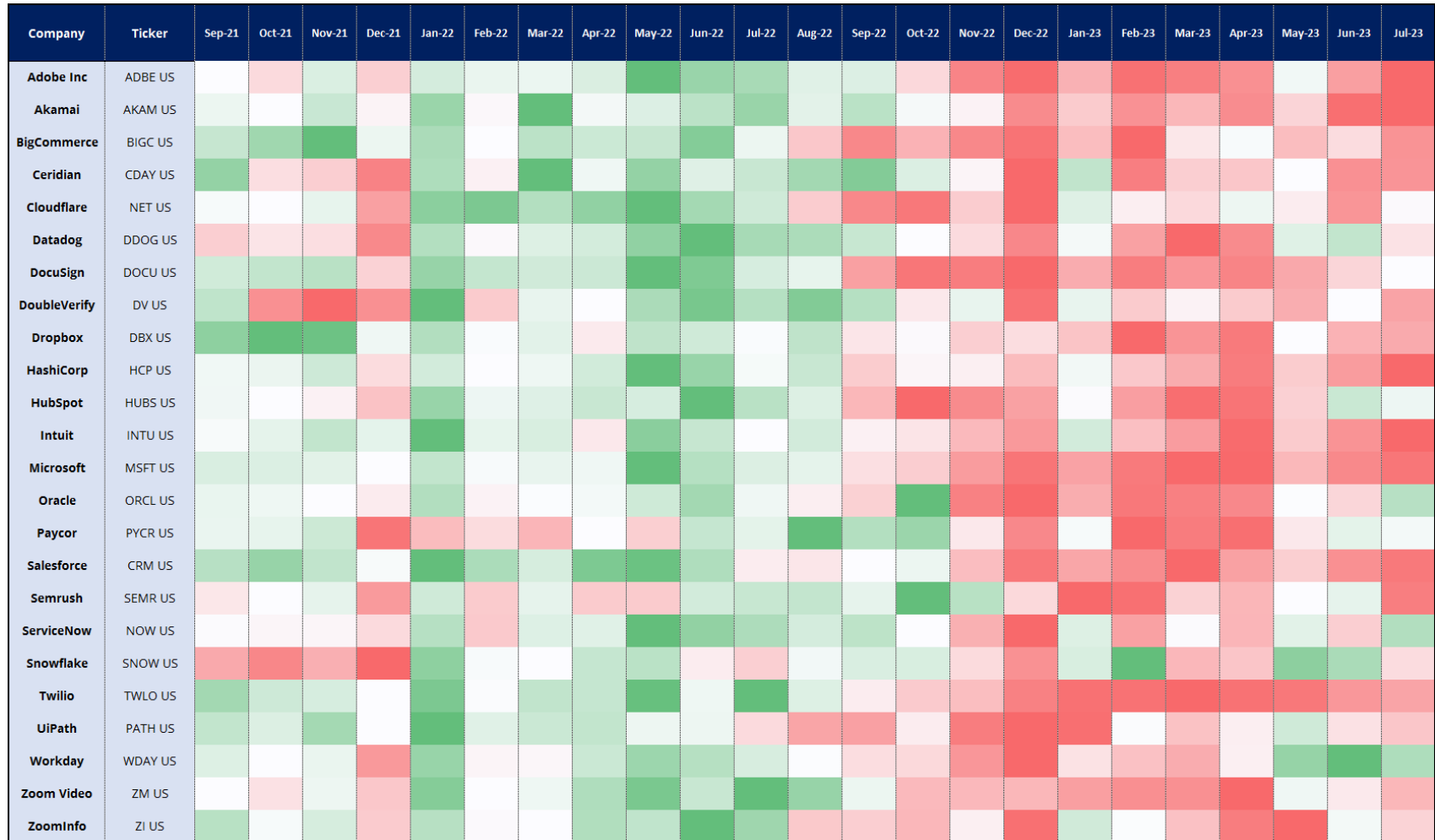


Source: J.P. Morgan Research.

Note: '1-Year Forward Azure Partner Growth Expectation (%)' refers to results from our quarterly Microsoft Partner Surveys, in which we ask partners to estimate Azure growth 1-year out. 'Prior Quarter Reported Azure CC Growth (%)' refers to Microsoft's as reported CC Azure growth rate in the preceding quarter of the survey result, used to calculate the implied annual deceleration 1-year out.

Gross New Hiring Trends Leading to Margin Expansion

Absolute Gross New Hiring by Month (Does Not Reflect Layoffs)

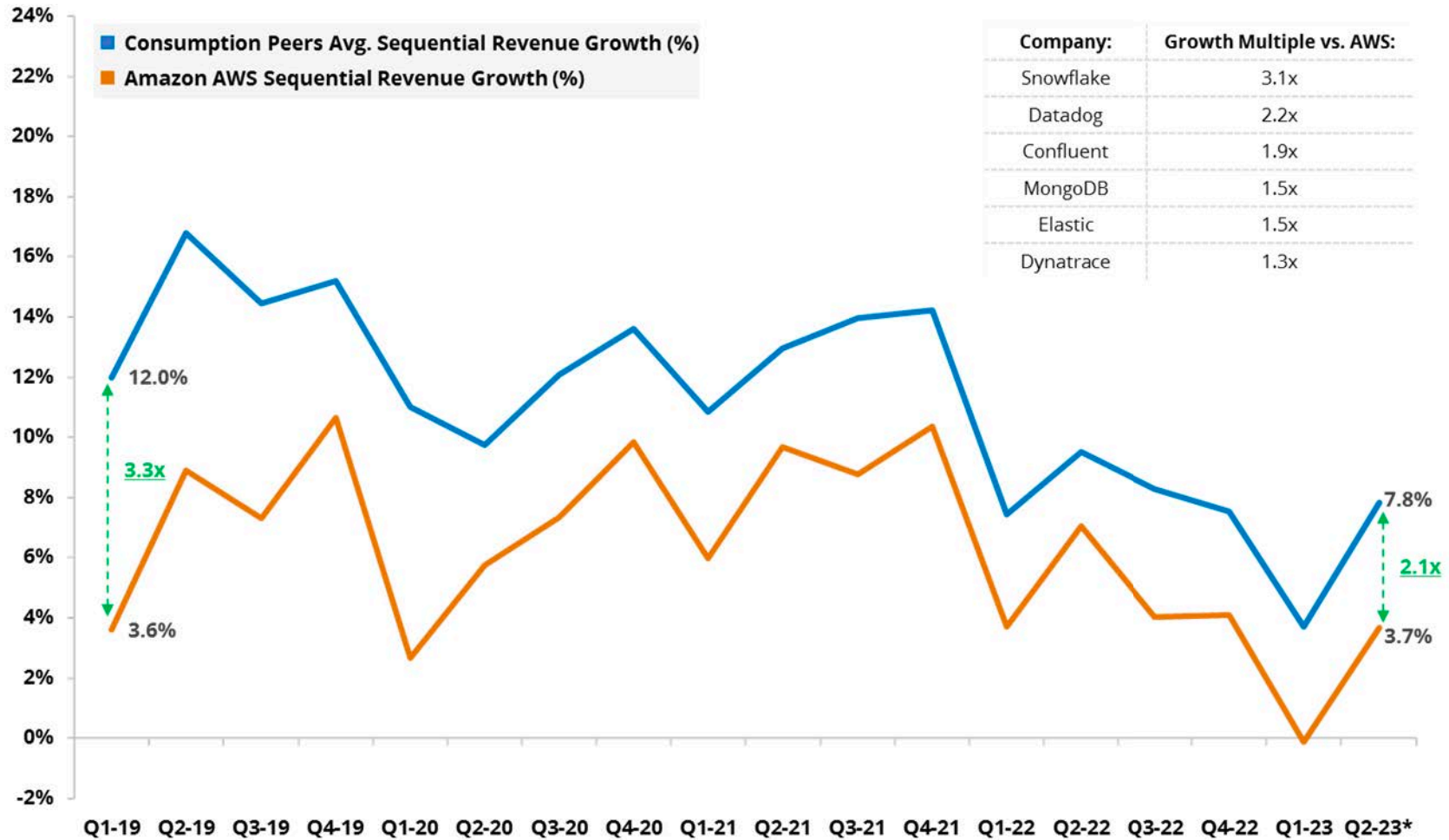


Source: J.P. Morgan Research, LinkedIn data.

Note Color scale is specific to each company, rather than applying to the aggregated data set. Excludes subsidiaries. Represents absolute values in terms of gross new hires. Paycom has been excluded as this data is not available for the company.

Consumption-Based Models Mirror AWS Growth Trends

Amazon AWS Sequential Revenue Growth vs. Consumption-Based Peer Group



Source: J.P. Morgan Research.

Note: Consumption peer group includes Snowflake (SNOW), Datadog (DDOG), Confluent (CFLT), MongoDB (MDB), Elastic (ESTC), and Dynatrace (DT). *Q2-23 peer group data includes only DDOG and CFLT, as SNOW, MDB, ESTC, and DT are yet to report Q2 earnings as of 8/11/23. Q1-19 peer group data excludes CFLT, as the company's data is not publicly available for that period. Table showing growth multiple vs. AWS for each company excludes Q1-23 due to AWS sequential contraction. Amazon (AMZN) is covered by JPM Internet analyst Doug Anmuth; Confluent (CFLT), Elastic (ESTC), and Dynatrace (DT) are covered by JPM SMID Cap Software analyst Pinjalim Bora.

What Could Help / What Could Surprise Positively?

- *Perhaps Q4/Q1/Q2 earnings seasons created a clearing event due to estimate cuts*
- *Inflation has peaked; clogged decision-making cycles w/ extra scrutiny may gradually start to break free and re-engage*
- *Soft Landing scenario still a possibility*
- *USD may have peaked / FX becoming material tailwind in 2H*
- *Europe had its warmest winter on record, avoiding the worst energy / inflation crisis scenarios*
- *China reopening post-COVID could help with global trade / supply chain*
- *Easy Bookings comps start to help late in 2023*
- *Generative AI (OpenAI, Dall-E-2, ChatGPT, Large Language Models) likely to catalyze a large wave of productivity/monetization & startups; perhaps an underappreciated potential*
- *Stocks tend to bottom before growth rates bottom*
- *Fed Pause/Pivot speculation may cause rotation into beaten-down long-duration growth assets*
- *Labor market remains healthy as of now*
- *Software M&A may benefit washed-out & dislocated software stocks*

Our Key Fundamental Bull Thesis For Software

- ***Core projects on pause, but will resume:*** automation, AI/ML, companies becoming data-driven, Digital Transformations
- ***Software a deflationary force in an inflationary world,*** as it enhances productivity and streamlines business processes
- ***The next phoenix is rising from the ashes of the current wreckage,*** as we firmly see Generative AI as the seminal moment for technology, moreso than the internet
- ***Global economic growth increasingly driven by “Digital”,*** while non-Digital decreases in relevance
- Opportunity for ***Generative AI to increase global GDP by as much as 10% (\$7-10T)***
- Target-rich environment for investors seeking ***recurring models with high gross margin***
- ***Potential for Tech spending to double*** as % of GDP in the coming decade

Potential Hurdles to the Bull Thesis

- *Guidance and tone **continues to show signs of macro-constraint** for a majority of companies in the recent earnings season*
- ***Layoffs drive a long lag-effect** for software; layoffs started mostly in July-Aug-Sept '22 and might have peaked in Q1/Q2 '23*
- *S/W valuations have returned to fairly normal, but **nowhere near prior bear market lows***
- ***SBC / GAAP discussion ongoing** in the background & big issue for Software vs. other sectors*
- *Software **demand was pulled forward** during the pandemic to support remote work; double-whammy when combined with macro slowdown*
- *Net-New Bookings down y/y, **many software companies have cut growth rates significantly***
- ***Recession indicators continue to warrant caution***
- *Historically, **much bear market damage can sometimes occur AFTER Fed Pause/Pivot**, as the economy continues to suffer from higher WACC*
- ***Generative AI** may begin to disrupt established software markets*
- *Tech led the last bull market; **usually a different sector leads the next cycle***
- ***Regional bank turmoil** may reduce access to funding, impact business confidence*
- ***Higher cost of capital** may adversely affect M&A takeout valuations/volumes*

Summary of Coverage Performance

Company Name	Ticker	8/10/2022 Price	12/31/2022 Price	8/10/2023 Price	1-Yr Return	YTD Return	Current Rating	Rating Changes During LTM
Akamai Technologies	AKAM	\$95.99	\$84.30	\$103.95	8%	23%	UW	Assumed Coverage at UW on 10/5/22
Adobe	ADBE	438.40	336.53	515.83	18%	53%	N	Assumed Coverage at N on 9/16/22
BigCommerce	BIGC	20.67	8.74	10.76	-48%	23%	N	
Ceridian	CDAY	68.31	64.15	73.76	8%	15%	N	
Cloudflare	NET	78.61	45.21	63.29	-19%	40%	N	Assumed Coverage at N on 11/28/22
Datadog	DDOG	117.76	73.50	90.72	-23%	23%	N	Assumed Coverage at N on 9/23/22
DocuSign	DOCU	75.39	55.42	50.29	-33%	-9%	UW	D/G to UW on 3/10/23
DoubleVerify	DV	27.50	21.96	32.27	17%	47%	N	
Dropbox	DBX	24.69	22.38	27.65	12%	24%	OW	
HashiCorp	HCP	40.85	27.34	27.98	-32%	2%	N	
HubSpot	HUBS	407.07	289.13	507.03	25%	75%	OW	
Intuit	INTU	478.09	389.22	501.47	5%	29%	N	Assumed Coverage at N on 10/3/22
Microsoft	MSFT	289.16	239.82	322.93	12%	35%	OW	
Oracle	ORCL	77.54	81.74	112.99	46%	38%	OW	
Paycom	PAYC	377.33	310.31	291.51	-23%	-6%	N	
Paycor	PYCR	31.71	24.47	23.56	-26%	-4%	N	
Salesforce	CRM	188.61	132.59	208.25	10%	57%	OW	
Semrush	SEMR	13.89	8.14	9.38	-32%	15%	OW	
ServiceNow	NOW	516.20	388.27	555.00	8%	43%	OW	Assumed Coverage at OW on 10/11/22
Snowflake	SNOW	174.40	143.54	155.02	-11%	8%	OW	U/G to OW on 6/23/22
Twilio	TWLO	86.23	48.96	60.58	-30%	24%	OW	
UiPath	PATH	21.82	12.71	15.42	-29%	21%	N	
Workday	WDAY	171.33	167.33	227.87	33%	36%	OW	
Zoom Video	ZM	112.01	67.74	67.47	-40%	0%	N	Assumed Coverage at N on 10/7/22
ZoomInfo	ZI	49.90	30.11	18.40	-63%	-39%	OW	

Index		8/10/2022 Price	12/31/2022 Price	8/10/2023 Price	1-Yr Return	YTD Return
S&P 500	^SPX	4,210.24	3,839.50	4,468.83	6%	16%
IGV	IGV	312.94	255.85	341.50	9%	33%

Sources: Bloomberg Finance L.P., Company Filings

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