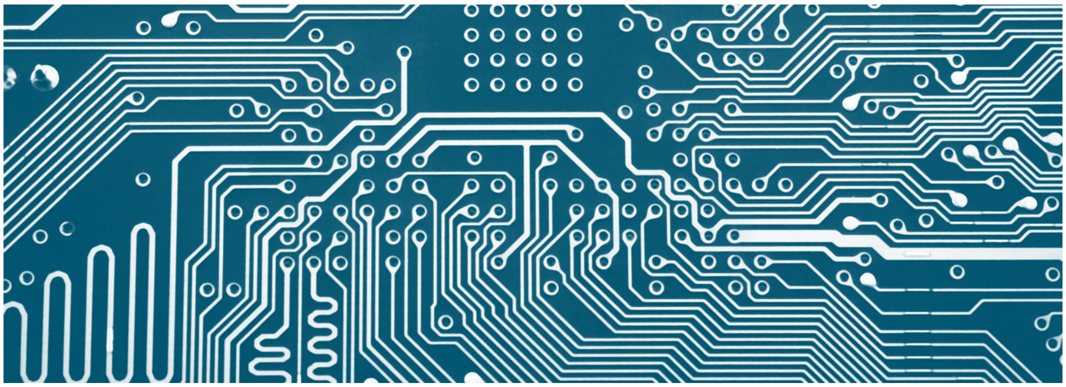
Technology

Technology remains resilient but ratings pressure continues

January 9, 2024

This report does not constitute a rating action.



What's changed?

IT spending will rebound in 2024. We forecast information technology (IT) spending will rebound to 8% in 2024, up from 4% in 2023 and well above global GDP growth. We expect PCs, smartphones, and servers will return to growth, thereby improving the outlook for the semiconductor industry. Software will again grow by about 10%, while IT services remain healthy.

What are the key assumptions for 2024?

Semiconductor industry will grow near mid-teens percent. After falling nearly 10% in 2023, the semiconductor industry is poised for a strong rebound in 2024 as memory fundamentals improve and the artificial intelligence (AI) investment cycle generates strong growth for some issuers, offsetting muted demand across the rest of the market.

Lower-rated issuers will remain pressured. We took many negative rating actions across the speculative-grade landscape in 2023. However, if borrowing costs remain elevated, refinancing risk will grow, potentially leading to an increase in debt restructuring and default activities.

What are the key risks around the baseline?

China. Supply chain diversification may lead to lower profit margins, but rising U.S.-China tensions may prove more difficult to navigate for manufacturers.

Higher interest rates. Trajectory of borrowing cost and business conditions remain key focus areas for issuers rated 'B-' or lower.

Mergers and acquisitions. We believe there is pent-up demand for deal making after two quiet years. An end to the rate hikes removes some uncertainties and will likely improve merger and acquisition (M&A) activity through 2024.

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Ratings Trends: Technology

Chart 1

Ratings distribution

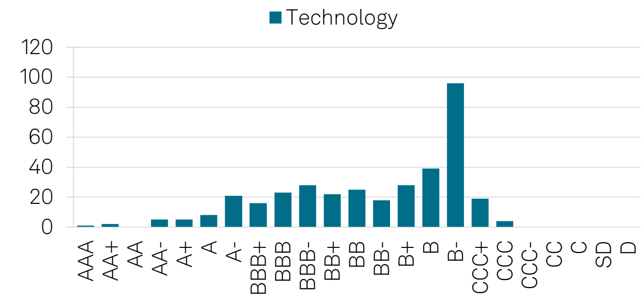


Chart 2

Ratings distribution by region

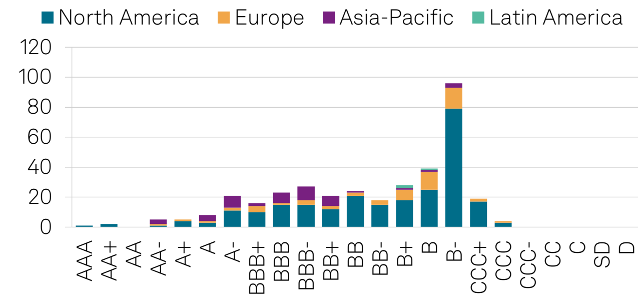


Chart 3

Ratings outlooks

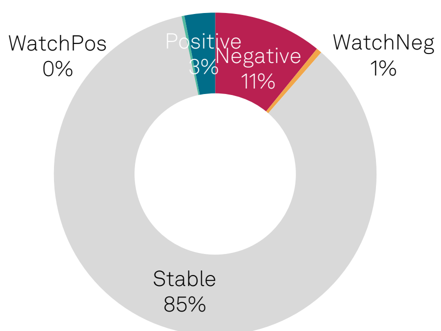


Chart 4

Ratings outlooks by region

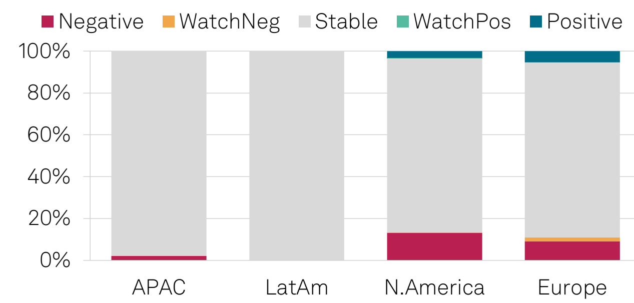


Chart 5

Ratings outlook net bias

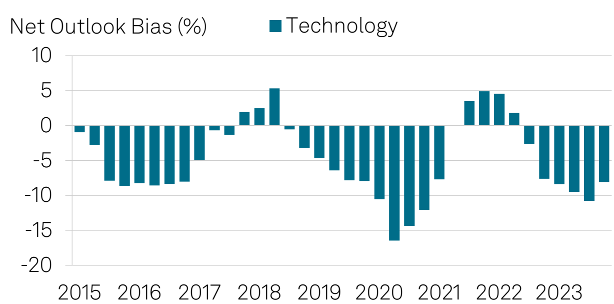
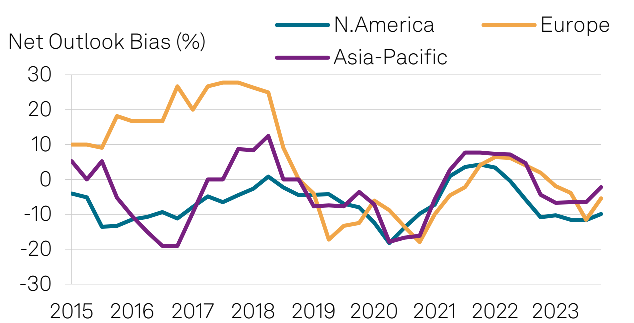


Chart 6

Ratings net outlook bias by region



Source: S&P Global Ratings. Ratings data measured at quarter-end.

Industry Outlook

Ratings trends and outlook

Global technology rating actions remained negative throughout 2023, continuing the trend that began in the spring of 2022 triggered by the Russia-Ukraine conflict. Although the recessions previously expected in the U.S. and Europe did not materialize, 14% of global tech issuers have negative rating outlooks, the same as at the end of 2022, while only 3% of ratings have positive outlooks, lower than the 5% seen a year ago.

Downgrades were most pronounced in the 'B' category as interest rates continued to rise through mid-2023 and remain elevated. Our base-case scenario forecasts that rates have peaked but, despite expectations for some rate cuts in the coming year, will remain elevated in 2024; therefore, we don't see much relief in store for those tech issuers with significant variable-rate debt outstanding. We will also monitor tech issuers with refinancing needs over the next year or two because repricing and refinancing risks will likely grow if debt financing costs remain elevated. Despite the negative rating actions taken through 2023, we believe rating trends will continue to lean negative in 2024.

Main assumptions about 2024 and beyond

1. IT growth will accelerate despite macroeconomic uncertainties.

We forecast IT spending growth will accelerate to around 8% in 2024, supported by a turnaround across the hardware segments including PCs, smartphones, and servers, which will also cascade to a strong semiconductor recovery. Software sales will remain resilient while IT services will grow meaningfully, partly due to ever-growing public cloud infrastructure spending.

2. Semiconductor industry is poised to recover.

After a 10% decline in 2023, total semiconductor revenue should rise 14% in 2024, led by a 40% recovery in memory, continued strong demand for AI chips, and the stabilization of the PC, smartphone, and general-purpose data center markets. We believe analog chip sales will remain weak in 2024 and microcontrollers sales are starting to deteriorate because of industrial market weakness and inventory digestion.

3. Focus remains on lower-rated issuers as ratings bias continue to trend negative.

Investment-grade issuers have healthy balance sheets and strong cash flow generation to support their growth and shareholder-return initiatives while preserving current ratings. However, while many 'B' or lower-rated issuers do not face immediate refinancing needs, we believe repricing and refinancing risks will grow if debt-financing costs remain elevated, potentially leading to a pick-up in debt restructuring and default activities.

IT growth will accelerate despite macroeconomic uncertainties. Global macroeconomic and geopolitical uncertainties, lingering impact from supply chain issues, and rising inflation suppressed both enterprise and consumer spending through 2023. We expect hyperscale cloud services will grow more than 20% as enterprise customers continue their migration to the cloud, keeping overall IT services segment growth above mid-single digits (see table 1). Software sales were mostly resistant to macroeconomic concerns and grew in the low-teens percent again, reflecting the power of the recurring subscription model--although growth rates among smaller software providers were much lower. The PC and smartphone industries struggled for a second year in a row, with shipments falling an estimated 13% and 4%, respectively, in 2023 as pandemic-related pull-forward demand hurt sales and the aftermath of supply chain disruptions and rising inflation reduced household purchasing power and consumer confidence.

Coupled with weak demand across storage and server markets reflecting overall muted enterprise IT budgets, the semiconductor industry endured a severe downturn with memory revenues plummeting between 25%-30% and the rest of the industry declining near 5%. In all, we estimate global IT spending grew near 4% on a constant currency basis in 2023, materially weaker than the estimated nominal global GDP growth near 7% (real GDP growth was near 3.3%).

Our global GDP growth forecast for 2024 is 2.8% (nominal growth near 6%), reflecting the ongoing macroeconomic and geopolitical uncertainties. Major central banks (excluding Japan) have raised policy rates by about 400 basis points (bps)-500 bps since the first half of 2022 to slow inflation. The effort to curb inflation appears to be succeeding, but macroeconomic performance has varied widely.

The U.S. economy continues to outperform prior expectations, posting nearly 5% annualized growth in the third quarter of 2023, led by strong consumer spending and an inventory rebuild, but we forecast a much weaker GDP growth of 1.5% in 2024. Europe activity has flatlined in recent quarters, and we expect only a modest recovery in 2024 at just 0.8% growth.

China's growth has stabilized, reflecting targeted government stimulus. However, household confidence remains weak, and the property sector remains under stress. We forecast a slowdown to just 4.6% GDP growth in 2024. Inflation and policy rates have likely peaked, but interest rates may take longer to decline given caution among developed-market central banks in cutting rates too soon. We note the uncertainties around the transmission of cumulative rate hikes to financial conditions and the real economy, which will erode consumer confidence and keep enterprise spending subdued.

Table 1

Global IT growth forecasts

	2022	2023e	2024e
Macro			
Global GDP growth (real)	3.6%	3.3%	2.8%
U.S. GDP growth	1.9%	2.4%	1.5%
Eurozone GDP growth	3.5%	0.6%	0.8%
China GDP growth	3.0%	5.4%	4.6%
Global IT spending (nominal)	**6.1%**	**3.9%**	**7.9%**
Revenues			
IT services	6.0%	6.0%	7.0%
Software	8.8%	12.0%	11.0%
Semiconductors	3.3%	(10.0%)	14.0%
Network equipment	5.0%	7.0%	(3.0%)
Mobile telecom equipment	5.0%	(3.0%)	(2.0%)
External storage	7.2%	(2.0%)	5.0%
Shipments			
PC	(16.2%)	(13.0%)	4.0%
Smartphone	(11.3%)	(4.0%)	3.0%
Server	5.0%	(7.0%)	6.0%
Printer	(3.3%)	(3.0%)	(3.0%)

e—Estimate. Source: S&P Global Ratings.

Despite macroeconomic headwinds, we forecast global IT spending will grow a robust 8% in 2024, which is higher than in 2023 (near 4%), and greater than our expectations for global GDP growth (nominal) in 2024 near 6%. Enterprises are entering 2024 with a still-cautious view given the muted macroeconomic expectations, delaying some noncritical, long-term projects while continuing their transition to the cloud and ramping up their investments in nascent generative AI projects.

We believe hyperscalers will continue to generate significant revenue growth near 20% in 2024, reaching around $250 billion in revenues, and contribute to an overall strong IT services growth near 7%. Software segment will continue to outpace the overall IT industry, growing around 11% with many investment-grade issuers growing well in excess of this figure. We believe the continued strong growth among software vendors validates their strategy of providing productivity gains and lowering customers' operational costs.

Importantly, we believe hardware spending will improve materially in 2024, with PC and smartphone shipments growing for the first time since 2021 and solid growth across both servers and storage segments. In turn, we expect the semiconductor industry to rebound from its cyclical declines in 2024. We believe the memory industry is nearing the trough and will see improvements through 2024, growing 40% overall after a dismal 2023. Solid growth among logic providers, including forecasted 45% growth at NVIDIA Corp., will more than offset expected declines in the analog market.

As in the past, we view China as the wild card; it accounts for about 10% of the worldwide IT spending but plays an outsized role in the credit-sensitive hardware and semiconductor space, accounting for around 20% of global consumption. Further deterioration in its relationship with U.S. or Taiwan, or interruption to the global supply chain given its role as a dominant manufacturer, will have a disproportionate impact on overall global IT consumption.

Despite a challenging 2023, we maintain a positive long-term view of the technology industry. We think pockets of volatility within hardware and semiconductor segments are here to stay. Issuers that outsource manufacturing in geopolitically sensitive regions face the tail risk of significant supply chain disruptions. At the same time, we believe the technology sector will become less cyclical as it matures. IDC Corp. estimates that as-a-service now makes up over 40% of enterprise technology spending and that it will increase to over 50% by 2025. This spending is sticky, recurring, and less prone to shutting down even during economic downturns because both customers and providers have entered into long-term commitments.

In our view, technology is a deflationary force especially during inflationary times. Every industry will increase their investments in IT to increase sales and achieve operational efficiency. Investments in generative AI, while a blip in overall IT budget today, has the chance to be a significant driver of overall IT growth in three to five years. We believe enterprise spending on IT products and services will continue to increase as a percentage of budget as a result.

Below we discuss the outlooks for key technology products.

Software: We expect the software industry will grow about 11% in 2024, similar to 2023 (12%). As enterprises continue their digital transformation and explore use cases for AI, software remains a critical enabler of business automation and plays a key role in ensuring cybersecurity in increasingly complex workloads. We expect continued strong growth in 2024 given our belief that the current view of macroeconomic risks is somewhat more benign than at the same time last year, which we expect will result in more generous IT budgets. We expect larger investment-grade issuers to grow faster than sponsor-owned speculative-grade issuers as customers seek to consolidate their software spending with fewer vendors.

Secular trends supporting the industry remain intact, such as demand for lower ownership cost, scalability, and ease of implementation. As enterprises continue to move their workloads to the cloud, software providers enable on-premises customers to transition to the software as a service (SaaS) delivery of their applications.

Furthermore, customers can more easily scale applications, get quicker access to the latest updates, and have more predictable software expenditures as they shift their spending from capital expenditure (capex) budgets to operating expense budgets. Lastly, SaaS customers also experience lower upfront costs and less-complex implementations, making purchase decisions easier.

Despite being very early in the adoption cycle, we expect AI to support the growth of the industry over the longer term. Key software vendors like Microsoft and Salesforce are rolling out features aiming to enhance their customers' worker productivity. Enterprises are experimenting with how to incorporate AI in their operations, capture productivity gains, shorten innovation cycles, and defend against competitors who will look to capture the same opportunities.

Services: We expect the IT services industry to grow at a rate well above that of global GDP, at around 7% in 2024, as demand remains strong in areas such as digital transformation, public cloud migration, and automation. We expect hyperscale cloud providers will continue to generate robust revenue growth near 20% in 2024 as enterprises continue their transition to the public cloud and ramp up their AI investments. This is a $250 billion market that will grow well above 10% percent annually for next several years, benefitting leaders like Amazon.com Inc., Microsoft Corp., and Alphabet Inc.

IT services spending is still mired in an elongated project cycle, but we believe it has troughed and the potentially reduced scope of work for some issuers could drive faster revenue recognition into 2024. Cost optimization through more automation and vendor consolidation is likely to free up budgets for executing more digital transformational projects in cloud and AI areas.

We expect the margin and cash flow trajectory of most IT services issuers to improve in 2024 given the enhanced focus on higher-value digital services, highly variable cost base, cost reduction, and moderate capital intensity. We also see strong growth rates from higher-margin services linked to mission-critical functions or enabling operational efficiencies, including AI, digital transformation, and cyber security. Additionally, as labor and equipment cost pressures ease, lead times are steadily normalizing for most services providers and distributors as well.

The performance of value-added resellers remains exposed to budget constraints and sales cycle elongation. However, for most of these issuers, we expect some resilience because of their long-tenured customer base with growing IT budgets, and exposure to sectors that tend to outperform in downturns (e.g. health care).

For value-added resellers like Worldwide Technologies, we expect revenue expansion will continue to slow toward the 4%-6% as key customers (especially telecoms) defer capital spending amid rising macroeconomic uncertainty. Credit downside could be limited despite the macroeconomic uncertainty since most issuers have not seen order cancelations or customers moving to other providers. Despite a normalizing supply chain environment, we forecast inventory levels will continue to increase modestly through mid-2024 to support demand.

Large projects, such as enterprise resource planning (ERP), software implementations, and consulting engagements tend to have long implementation periods and involve the development or modernization of front-end application, back-end platforms, and infrastructure across areas such as customer engagement, cloud, AI, big data, analytics, and cyber security. As businesses embed more technology in their operating environment, IT services vendors will have an everlarger role to play as trusted business partners, favoring those with the most digital expertise but also superior customer service.

Furthermore, we believe hybrid work is here to stay and IT services will accelerate the shift from on-premises to private and public cloud environments. We saw large IT services vendors such as Accenture report strong bookings in 2023 amid macroeconomic concerns, and DXC has demonstrated a strong ability to convert the pipeline to revenues. Generally for IT services providers, we expect a modest improvement in book-to-bill ratios into 2024, especially for business transformation projects.

We see two big risks ahead for IT services vendors. First, their ability to navigate labor supply challenges will be tested by high utilization rates, attrition rates, and wage inflation; companies able to attract and retain skilled workers and that possess pricing power will be the most effective in offsetting margin headwinds. Second, if economic conditions worsen more than we currently forecast, enterprises could defer large and capital-intensive projects.

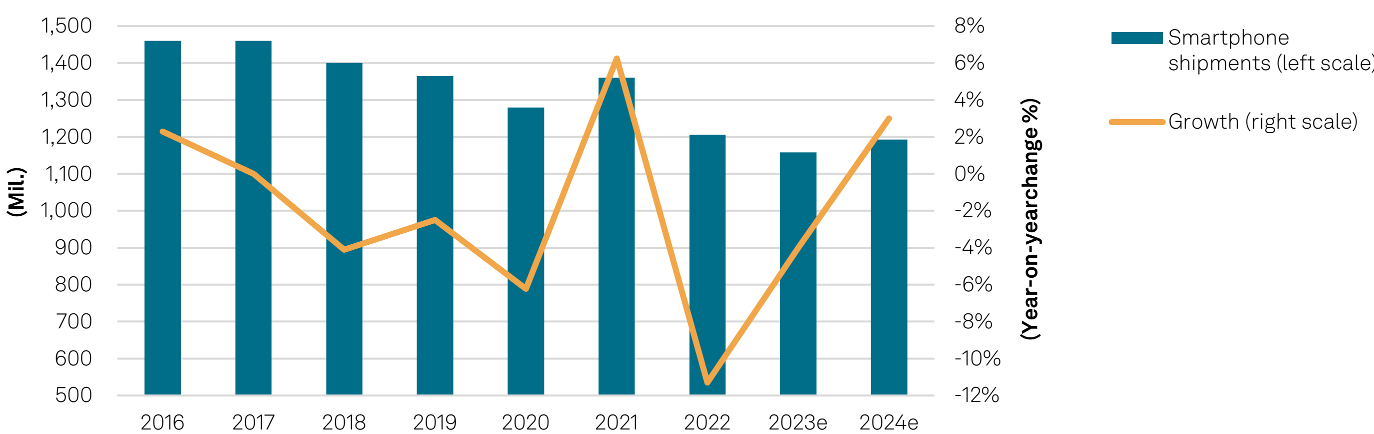
Discretionary consulting projects remain the wild card because they are less predictable due to the varying length and size of contracts, with some clients showing caution in budgeting into 2024.

Semiconductors: After a 10% revenue decline in 2023 due to macroeconomic uncertainty and inventory correction across both memory and nonmemory segments, we forecast revenues will rebound 14% in 2024. (Please refer to page 12 for further discussion of recent industry trends and longer-term outlook.)

Smartphones: We expect smartphone unit shipments will grow about 2.8% in 2024, rebounding from a decline of 4.2% (estimated) in 2023 (see chart 7). The reversal is due to better replacement demand in China, given an already stretched replacement cycle, and increasing smartphone penetration in markets such as Africa, Southeast Asia, and Latin America. Moderating the recovery would be the flattish to slightly negative shipment in the U.S. and Europe. The macroeconomic headwinds associated with high inflation and funding rate will likely inhibit consumer spending in those markets.

Chart 7

Smartphone sales will return to growth in 2024



e—Estimate. Source: S&P Global Ratings.

Most smartphone original equipment manufacturers (OEMs) have reached inventory normalization over the past several quarters. This may portend tempering of promotions and sales discount, and allow for more flexibility in new model development and release schedule to cater to changing consumer preference. However, the overstocking issue in the past will likely make OEMs, particularly Android brands, more cautious on inventory management. It's possible OEMs may split procurement orders into smaller tranches, compensated by higher ordering frequency and delivery urgency. The transition to a more just-in-time production mode could mean new challenges to the smartphone supply chain.

We expect demand will be more weighed toward entry-level and premium models, rather than mid-range products. And with Huawei's comeback and Xiaomi's premiumization strategy, competition in the premium subsegment would intensify. This particularly threatens Apple Inc.'s sales in China, which make up about 20% of the U.S. OEM's total shipment.

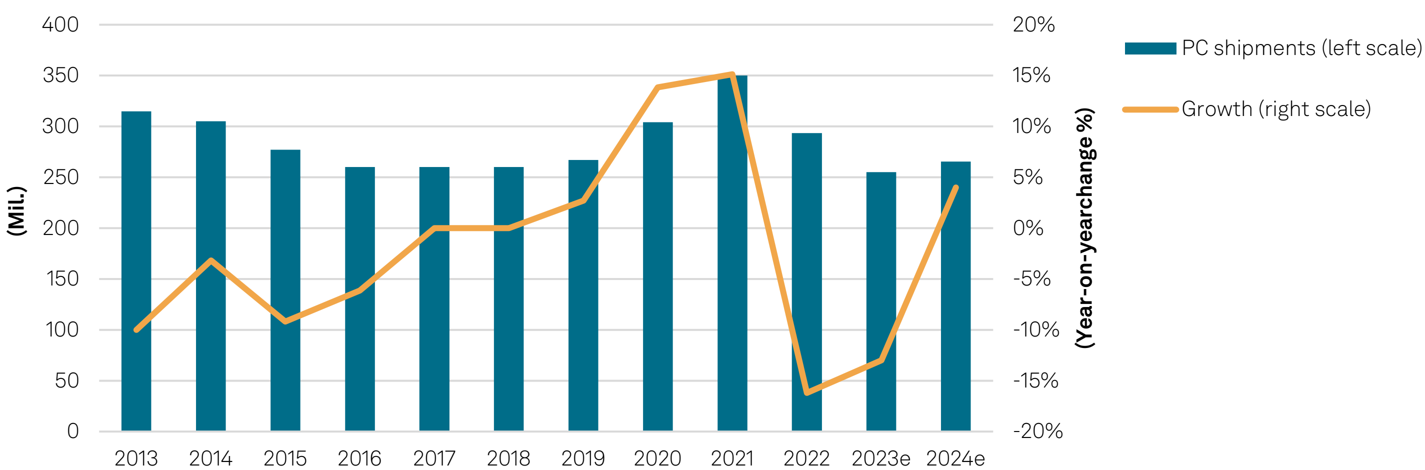
We forecast Apple's global shipment will be flattish in 2024. Samsung Electronics Co. Ltd. will likely see limited impact to its flagship models from such a development, given its minimal exposure to China. Yet in the entry-level subsegments, we think both Samsung and Xiaomi Corp. will face substantial challenges from Transsion, a dedicated feature phone maker, in emerging markets. We forecast Samsung and Xiaomi's global market share will be around 20% and 13%, respectively, in 2024.

We expect a low- to mid-single-digit percentage growth in smartphone average selling price (ASP) in 2024 due to reduced promotion and discounting after OEMs' destocking and their attempts to pass through some rebounds in component cost (such as memories chips) as demand recovers. Moderating the ASP growth is Chinese OEMs seeking domestic replacement of foreign smartphone components. For instance, these brands have increasingly adopted OLED display panels from BOE Technology and Shenzhen China Star Optoelectronics Technology Co. Ltd., even in their flagship models, rather than from Samsung and LG Electronics Inc. We also expect more Chinese demand for CMOS image sensor to shift to OmniVision Technologies, a subsidiary of a Chinese firm (Will Semiconductor), from Sony.

PCs: We estimate that for a second consecutive year, global PC unit shipments declined by more than 10% in 2023. This would take unit shipments in 2023 to below pre-COVID levels after massive growths in 2020 and 2021 (see chart 8). In 2023, macroeconomic uncertainty led enterprises to postpone refreshes while China consumer demand was tepid.

Chart 8

PC shipments should finally grow in 2024



e—Estimate. Source: S&P Global Ratings.

At the same time, we do see signs of green shoots. Shipments declined for the eighth consecutive quarter in September 2023, but the pace of decline slowed (9% decline year over year), with indications that the PC market is nearing the bottom of the cycle, with vendors having made gradual progress toward reducing PC inventory to normal levels.

We expect global PC unit shipment growth will improve in 2024 to 4% area. Enterprise demand remains weak, but we anticipate Windows 10's end of life will spur a strong replacement cycle in 2024. We believe commercial demand will come back stronger than consumer demand, lifting overall ASP. We expect China demand will gradually recover throughout the year as well. Our forecast does not assume additional PC demand arising from yet-to-be released AI-enabled PCs; we believe this will start to impact overall demand in 2025.

Annual PC shipments jumped from around 250 million units pre-pandemic to nearly 350 million units in 2021. Despite the volatile industry trends over the past four years, we believe the PC total addressable market is now larger than that of pre-COVID; also, we believe unit shipments will likely remain well above 250 million in 2024 and beyond given the need to refresh a greater number of installed PCs.

Servers: We estimate server shipments plunged around 7% in 2023 as enterprises--and to a lesser extent, cloud providers--delayed new purchases given macroeconomic uncertainty and worked through the inventory that they accumulated through the pandemic. Excluding the small but robust demand for AI-enabled servers, we estimate traditional server shipments likely declined near double digits in 2023.

That said, we believe demand for servers has slowly improved over the past two quarters such that we now expect a meaningful turnround in 2024. We believe traditional server unit shipments will grow between 3%-5% as enterprises return to investing in cloud, edge computing, software defined infrastructure (SDI), and data analytics. We think cloud providers, while focused on building out their AI infrastructure, will also grow traditional server purchases.

We forecast AI server demand will explode in 2024, growing well north of 50%, given comments made by chip makers and OEMs, such as Dell Technologies Inc. and HP Enterprises Corp., which have reported a significant jump in AI-server orders and backlogs. These AI servers can cost upward of $250,000 due to high graphic processing unit (GPU) content, as much as a 25-fold increase over traditional server prices. While we forecast 6% growth in total server shipment in 2024, industry revenues will be significantly higher going forward because AI server shipments will grow much faster than traditional server shipments.

At the same time, we believe AI servers will only make up around 5% of total server shipments in 2024. Furthermore, we believe legacy hardware providers will underperform market growth rates as large cloud providers design their own servers through original design manufacturers (ODMs). In fact, cloud providers account for about half of all server purchases and this number is rising, according to IDC.

Storage: We expect external storage systems revenue will grow about 5% in 2024 following a decline of roughly 2% in 2023. Macroeconomic slowdown and cautious enterprise budgets contributed to the decline. It also comes after high-single-digit growth in 2021 and 2022, in which enterprises expanded their storage budgets to support emerging workloads such as AI and machine learning and to digitize workloads overall.

We think long-term mid-cycle growth for the segment will be in the 2%-3% range, which is below IT spending in general, because enterprises are increasingly meeting their storage needs using cloud services rather than on-premises hardware. In 2024, improving IT budgets and the need to support growing data and greater data protection will support a nice rebound in storage spending. Growing AI workload will also improve storage prospects, in our view, with some research firms anticipating that 20% of storage sales will come from AI-related spending by 2026.

According to IDC, storage revenues declined 5% year over year in the second quarter of 2023, with hard disc drives (HDD) falling 25%, while all-flash array (AFA) declined just 3% and hybrid flash array (HFA) grew 3%. AFA now makes up 45% of the external storage market, up from 40% in 2020 and 20% in 2016. Over the longer term, we expect AFA will continue taking share from HDD and hybrid systems as continued NAND price declines narrow the cost of flash memory relative to HDDs.

We are seeing large cloud providers leverage their scale to custom-build storage infrastructure instead of purchasing it from major branded OEMs such as Dell, HP, and NetApp Inc., so the adoption of the hybrid cloud approach--whereby some workloads remain on premises as others shift to the cloud--is critical for the viability of the external storage systems market. Meanwhile, we expect enterprise customers, who have traditionally been major purchasers of external storage systems and have growing storage needs, will leverage software to optimize their storage capacity.

Networking equipment: We expect the networking equipment market to fall 3% in 2024 after growing a robust 7% in 2023, owing to an inventory correction. Networking was one of the end markets that took the longest for supply chain constraints to ease so it is one of the last to face an inventory correction. In response to these constraints, customers put in lots of orders and built up safety stocks. The industry benefitted in 2023 from executing on large backlogs. As supply conditions have eased, customers have determined that the risk of a stock-out is now lower and doesn’t warrant the cost of carrying safety inventory, so they have begun to draw inventory down.

Order trends have been negative for several quarters for companies such as Cisco Systems Inc. and Juniper Networks Inc., and we now believe there isn’t sufficient backlog to generate revenue growth over the near term. As the demand environment will be muted for the foreseeable future, we expect the industry’s pricing power to weaken and gross margin to fall.

We predict AI will be a long-term tailwind for the industry as infrastructure providers leverage ethernet switching to take advantage of power efficiency, scalability, and a large open ecosystem. Nevertheless, we don’t expect this demand to show up in time to result in revenue growth in 2024. Increasing software content also continues to decrease volatility for the sector.

Mobile telecommunications equipment: We expect the mobile telecom equipment market to decline moderately in 2023 and 2024 due to the slowdown in 5G investments (primarily in North America) and macroeconomic headwinds. Investments in 5G have been front-loaded compared with previous technology cycles, leading to high growth in 2020-2022, particularly in North America where 5G will already represent about 60% of mobile subscriptions. In addition to coverage investments, supply chain issues that led customers to build up inventory also boosted market growth until 2022. As the supply chain normalizes, customers have invested less in new equipment in 2023 as they reversed their inventory levels. This was particularly visible in North America, one of the world’s largest markets, which experienced a significant downturn in 2023, and we think the decline could continue in the next few months.

Furthermore, the economic environment has pushed some telecom providers to delay their investments, for instance in Latin America. In markets that invested early to establish initial 5G coverage, weaker-than-expected pricing uplift for 5G plans and a lack of demand from new use cases has slowed the migration to higher frequency 5G densification. Also, the overall market is negatively impacted by a decline in older technologies, including 4G, which is peaking in 2023 and will start to decline.

Despite these temporary headwinds, we think the mobile equipment market could return to modest growth beginning in the second half of 2024, as we continue to expect steady 5G investments for many years; also, the drawdown of inventory levels eventually ending will help the year-on-year comparison. This is because we think 5G technology overall is still at a relatively early stage--global 5G subscriptions only represent about 18% of all mobile subscriptions worldwide. Even if the global coverage in 5G has reached 45% of the population, there is still a lot of 5G coverage investment ahead. Investment dynamics differ by country, and many regions still have low 5G coverage, including Latin America, India, and some European countries.

Furthermore, even after coverage investments are complete, capacity investments will gradually intensify to support increasing data consumption (so far, 5G utilizing mid-band spectrum has been deployed in only about 30% of existing 4G sites globally). We expect these investments will be demand-driven, and therefore gradual, unless and until new cases are widely adopted, leading to a spike in demand. To some extent, we also expect growing demand from enterprises for advanced use cases requiring higher speed and lower latency, which could support additional investments in 5G.

Printers: We continue to take a more conservative view on printer unit growth, which we expect will decrease 2%-3% again in 2024 after declining about 2%-3% in 2023. Longer term, we expect printers will continue to lose momentum in the battle with digital alternatives. In the meantime, however, growth from low-internet-penetrated countries within Asia-Pacific (APAC) and South America--particularly China, India, and Brazil--will keep the overall industry relatively stable.

More normalized channel inventories and reduced vendor backorders are proof that COVID-19-induced supply chain issues have reduced. However, in 2023, geopolitical-induced economic restrictions on Chinese chip manufacturers, labor shortages, and an absence of raw materials caused a shortage of chips needed to produce print-related goods, further slowing the production of printers, ink, and toners.

Higher interest rates have also dragged on advertising expenditure, leading to lower printing activity. The industry also saw a competitive pricing environment in 2023 due to a weaker Japanese Yen, creating pricing pressures. While we expect these issues to carry into 2024, we also expect them to improve.

We believe a continued return to office in 2024 will shift demand from at-home printers to commercial printers, while industrial printers continue benefitting from more secular growth drivers. Units sold will also benefit from organizations seeking to modernize their IT infrastructure by continuing to enhance traditional printers, with more advanced printers that have cloud, security, AI, and other capabilities.

As a result, we expect industrial printer unit growth to be near-flat to slightly positive, commercial unit growth to be near-flat to slightly negative, and at-home unit growth to be slightly negative, even when all are compared to weaker annual figures.

The most promising factors for growth in 2024 and beyond, especially within mature economies, can also be linked to emerging applications, like 3-D printers and HP's Site Print for commercial site printing. While we expect these to have a minimal impact on the total print market in 2024, their recent success provides potential for future growth.

Semiconductor industry is poised to recover in 2024. We expect global semiconductor industry revenue to fall 10% in 2023 after 4% growth in 2022, led by a sharp decline of nearly 30% in memory segment revenue due to weaker PC, smartphone, and data center end markets. However, this is an improvement compared to our original expectation for revenues to be down 35%, which we revised given the gradual recovery that occurred in the fourth quarter of 2023. NVIDIA prospered, with revenue set to more than double in calendar 2023 as hyperscale data center customers invest heavily in GPUs and networking chips to build infrastructure to train generative AI models.

Enterprise customers' optimization of their cloud spending slowed hyperscale capex growth to 13% this year from 24% last year, and AI spending has crowded out non-AI-related IT spending; these two factors have severely constrained investment in general purpose computing chips in the data center market. PC and smartphone unit shipments, which we estimate declined 13% and 4%, respectively, in 2023, are also weighing on the general-purpose market. Excluding the memory segment and NVIDIA, we estimate the semiconductor revenues declined around 12% in 2023.

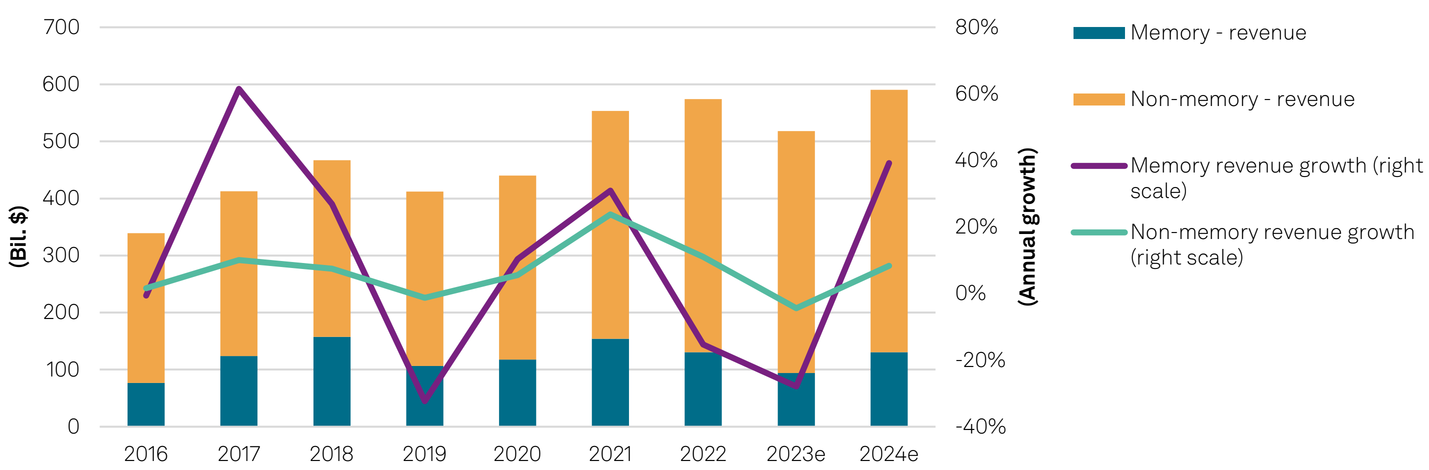
In 2024, we expect total semiconductor revenue to be up 14%, but that figure falls to 8% after removing the memory segment and just 3% after removing NVIDIA (see chart 9). We chalk this up to the stabilization of the PC, smartphone, and general-purpose data center markets offset by a weakening industrial outlook. We expect a return to positive unit growth in PCs and smartphones in 2024 after two years of declines following the COVID-related peaks in 2021, with PCs growing 4% and smartphones 3%. Furthermore, these markets were the first to reach normalized inventory levels because they were the first to correct post-COVID.

In addition, we expect the general-purpose data center market will benefit from reacceleration in cloud data center revenues as enterprise customers gain more confidence in the macroeconomic picture. We also believe the cloud players have digested meaningful inventory and must resume investment to support strong demand. We expect these markets to drive mid-to-high teens percent revenue growth for Intel and AMD. We believe Qualcomm will also enjoy a solid boost from recovering smartphone sales.

Chart 9

Semiconductor industry is poised to grow in 2024 as end markets recover

Semiconductor industry revenue by segment



e—Estimate. Source: S&P Global Ratings.

On the flip side, analog sales will remain weak in 2024 and microcontrollers revenues are starting to turn negative because of industrial market weakness and inventory digestion. Inventory in these markets has taken longer to correct than in the PC and smartphone markets because end demand held up and kept supplies tight. The analog correction started toward the beginning of 2023, but microcontrollers are just starting theirs after a strong run over the last 12 quarters, confirmed by poor guidance from Microchip Technology Inc. and others.

Significant demand and supply constraints in the post-COVID era supported both segments, but as supply has improved and lead times shortened, customers have moderated their inventory. In addition, macroeconomic uncertainty has constrained demand from industrial customers. Pricing is stable so far, but pressure could emerge over the next few quarters. The automotive market is holding up, supported by increasing content for electrification and computing power, although growth in this market is starting to decelerate.

We see revenue growth of about 40% for the memory segment in 2024 after a two-year cumulative decline around the same amount. We expect pricing will continue to recover because the industry has maintained supply discipline in order to return margins to sustainable levels. The market will gradually improve through the year, but we believe mid-cycle conditions won't materialize until 2025. Hyperscale data centers will be a key demand driver for high-margin, high-bandwidth memory (HBM) DRAM for AI applications in 2024 and memory will support growth in general purpose workloads.

Samsung recently commented that it has received more inquiries for strategic purchases due to awareness that memory is reaching a bottom. A key watchpoint will be whether industry players can maintain supply discipline long enough to complete the inventory adjustment, or whether they will bring back idled capacity early to take market share, which would prolong the time to achieve mid-cycle margins. Capex decisions are less flexible than production ones, and they determine long-term supply. We view the signs as encouraging, with the memory players planning for only modest capex growth in 2024 from very low 2023 levels, and for spending to support technology migrations more than capacity expansion.

In the AI space, GPU demand so far has been due to the need to train AI models. That demand will remain robust, and we forecast 45% revenue growth for NVIDIA in calendar 2024, but we expect spending for inferencing (applying AI models to specific cases) to emerge more prominently in 2024. We believe this will open space for more players besides NVIDIA to win, as has been the case in 2023. Intel and AMD will likely see more demand for CPUs, GPUs, and FPGAs for inferencing; HBM and networking providers will also benefit. Custom AI chips are also likely to gain more traction, helping Broadcom Inc. and Marvell Technology Inc.

The semiconductor market continues to face significant geopolitical risk stemming from U.S.-China tensions. Further bifurcation in the semiconductor supply chain and retaliatory policies are likely, which would likely increase inefficiencies and raise prices to end users. U.S., China, Europe, and other countries in Asia will continue to incentivize local chip production, which could add volatility because it may encourage overinvestment. We believe the restrictions will push domestic Chinese technology companies to rely more heavily on indigenous suppliers, which may result in efficiencies over time with enough support from domestic customers, benefitting domestic producers like Semiconductor Manufacturing International Corp. (SMIC).

We expect more U.S. policies and regulations directed at China, a risk for both western suppliers that have large revenue exposures to China and for Chinese technology companies reliant on western suppliers. By our assessment, U.S. regulators look likely to stick with a "small yard and high fence" policy. It's possible this could change, with more restrictions and penalties if China progresses with advanced chip production using foreign equipment and materials.

Focus remains on lower-rated issuers as ratings bias continue to trend negative in 2024.

North America: Similar to last year, we expect technology investment-grade issuers will be stable, while speculative-grade companies--especially those rated ‘B’ or lower--will face heightened rating downgrade risk. We no longer include a U.S. recession in our base-case scenario in 2024. However, the Fed has indicated it will keep interest rates higher for longer, which will likely dampen economic growth, as reflected by our S&P Global economists’ below-trend growth (below 2%) assumptions for 2024-2026.

We believe the excitement about AI will continue to drive IT infrastructure spending and benefit many of our rated issuers such as Microsoft, NVIDIA, AMD, and Dell Technologies. From a ratings perspective, investment-grade issuers have healthy balance sheet and strong cash flow generation to support their growth and shareholder return initiatives while preserving their current ratings. With the exception of Intel Corp. (A/Negative/A-1), the rest of our investment-grade issuers have stable outlooks.

Higher interest rates have disproportionately hurt many of our highly leveraged issuers, including software companies that have highly recurring revenue and cash flow characteristics, because much of their free operating cash flow (FOCF) generation is consumed by the higher debt service costs. Many of our highly leveraged tech issuers have significant variable-rate term loan structures that made them ill-prepared for the rapid and significant interest cost increases over the past 18 months. Additionally, the resilient U.S. economy supported by consumer spending has not provided any material boost to overall IT spending. Enterprise and commercial customers still view the macroeconomic outlook as uncertain and have kept their IT budget tight, except for AI investments.

We've had a negative rating bias in the U.S. tech sector since March 2022, and we expect this will continue, evidenced by our 10 U.S. tech issuers rated 'B-' with negative outlooks and 14 companies rated in the 'CCC' category, where many continue to face business and cash flow pressures.

Like the U.S., the Canadian tech sector also shows a negative rating bias, with companies such as Mitel and Cascade Parent facing significantly higher interest expense. This leads to much lower cash flow from operations and weaker cash flow coverage measures. The negative outlook on OpenText reflects the debt-financed Microfocus acquisition that significantly increased the company's leverage.

While many of our lower-rated U.S. tech issuers do not face immediate refinancing needs, we believe the repricing and refinancing risks will grow if debt financing costs remain elevated. As capital market conditions remain challenging for lower-rated issuers, debt restructuring activity and defaults may tick up.

Asia-Pacific: APAC tech firms mostly have sufficient financial buffer against the market downturn and high interest rate environment. However, the financial buffer has narrowed over the past several quarters with weakening profitability and cash flow. The negative rating bias for Asia-Pacific tech firms stayed at 10%-12% for most of 2023. We believe this has reached near bottom and could improve gradually in 2024 as end demand recovers despite the tepid macroeconomic conditions, which could add uncertainty to the pace of recovery.

A majority of the negative outlooks are related to businesses that are cyclical and commodity-like, such as memory and panel suppliers. As end demand is likely to pick up in 2024 due to new products and technologies, we expect the rating pressure for those companies to ease gradually over the next few quarters.

Shipment of PCs and smartphones have bottomed in 2023 and will bring relief for some rated Asian tech companies in 2024. However, downstream tech vendors in industrial and auto end markets are still correcting their inventory, and this will delay the recovery for some upstream semiconductor companies and foundries with higher exposure to these end markets.

On the other hand, the APAC IT services sector is likely to continue to benefit from strong growth in digital transformation and automation, as well as demand for more efficiency and cost control. We anticipate this will support Japanese and Indian issuers' credit profiles in 2024. In addition, we believe multiyear projects and diversified downstream market exposure will continue to generate recurring cash flows for these companies and hold up against the impact from a slower macroeconomic environment.

Europe: We expect steady performance for European tech issuers in 2024. Of our rated issuers, 83% have a stable outlook, 11% have negative outlooks or are on CreditWatch (CW) with negative implications, and 4% carry positive outlooks or are on CW with positive implications.

Rating actions also had a negative bias in 2023, although, factoring out multiple rating actions on Technicolor Creative Studios, which defaulted (we withdrew our rating at issuer request), it is more balanced at seven upgrades and eight downgrades. The downgrades were mainly the result of idiosyncratic factors including dividend recapitalizations and sustainability concerns on heavily leveraged capital structures. In contrast, the upgrades were mainly due to operation-led improvement in credit ratios for companies like SAP (A+/Stable/--), STMicroelectronics (BBB+/Stable/A-2), Capgemini (BBB+/Stable/--), Nokia (BBB-/Stable/A-3), Particle Investments (B+/Stable/--), Verisure (B+/Stable/--), and Global Blue (B+/Stable/--).

That said, the risk of a recession would increase rating downside risk compared to our base case of near zero real GDP growth in the eurozone. While a weaker macroeconomic backdrop would likely weigh on our demand expectation, our forecasts already incorporate more conservative growth expectations.

We expect a sustained growth trajectory for semiconductor issuers such as STMicroelectronics and Infineon (BBB/Positive/--), with mid- to high-single-digit growth in 2024 as they benefit from resilient automotive demand. Similarly, we expect growth to be challenging in the next few quarters for mobile telecom equipment makers including Nokia and Ericsson (BBB-/Developing/--) as 5G deployments take a pause and inventory overhang is worked through after a strong initial rollout of low-band coverage.

We believe software and IT services providers have good growth prospects that will support stable ratings. We think the efficiency and competitive benefits of their cloud migration and digitalization offerings will drive demand for their products, which we expect will remain relatively resistant to our low GDP growth forecast. However, companies struggling to make the transition to cloud services from legacy hardware and on-premises IT infrastructure management (like Atos (BB-/CW Negative/--) or those with exposure to concentrated pockets of weakening customer demand, face more material downgrade risks.

We expect greater downside risk for speculative-grade issuers. We believe European speculative-grade issuers that have near-term maturities face increased refinancing risk if debt capital markets remain volatile and less receptive to weaker issuers. Additionally, we expect mounting rating pressures for issuers rated in the ‘B’ category or lower (about 72% of European technology ratings) because the higher interest rate environment will impede FOCF generation and weaken credit ratios.

Latin America: Our base-case view for Latin American issuers in 2024 has diverse considerations. All our rated issuers have stable outlooks. However, the trajectory of each company’s operating and financial results may differ in terms of specific sub-sector trends. While IT spending dynamics have strengthened since 2022 and 2023, the sector remains exposed to soft macroeconomic conditions in the region for 2024.

For instance, we expect the leading e-commerce and payment platform MercadoLibre Inc. (BB+/Stable/--) to maintain a strong revenue growth in line with growing commerce and financial services digitalization in the region, which still lags behind other developed and emerging markets. The company is also well-positioned to translate this growth into improved profitability and credit metrics, but the exposure to Argentina could weigh on rating upside.

At the same time, Mexican IT services and data center operator Sixsigma Networks Mexico (B+/Stable/--) also continues to post steady revenue and EBITDA growth prospects and relevant investments to enlarge its footprint in Mexico, while also entering new markets, such as

Colombia. Nevertheless, the upcoming 2024 federal elections in Mexico will continue to highlight the sizable contribution to revenues stemming from public-sector contracts, emphasizing the relevance of contract renewal negotiations and cash collections.

In Brazil, lower demand from corporate and retail clients due to the high interest rate environment continues to affect hardware issuers. We believe improving macroeconomic conditions would cascade to better results. IT equipment rental companies exhibit a more favorable outlook and growth prospects, which could be boosted by a higher adoption of equipment rental or leasing from both corporate and public clients.

Credit metrics and financial policy: We expect financial policy will lean conservative in 2024 for rated technology issuers under a higher-for-longer interest rate environment and a muted global economic outlook. Investment-grade issuers' balance sheets have remained mostly healthy despite weakening market conditions through 2023.

Two large acquisitions finally closed during the year: Microsoft funded the $69 billion acquisition of Activision Blizzard with cash and commercial paper borrowings with no impact to the 'AAA' rating; and Broadcom belatedly closed its $61 billion acquisition of VMware Inc. in November 2023 with roughly $30 billion of term loans. We upgraded the company to 'BBB' because of improved business mix and S&P Global Ratings-adjusted leverage that was well below previous acquisitions.

Announced M&A deals were quiet for the most part, except for Cisco's proposed acquisition of Splunk for $28 billion. If the deal receives regulatory approval we would not expect any ratings impact given Cisco's strong balance sheet.

We expect deal making to pick up in 2024 given the pent-up investor demand. While we expect rates will stay higher for longer, an end to the Federal Reserve's hiking cycle will likely improve the outlook for buyers and sellers. Buyers remained interested in deal making during 2023 but were unable to close on transactions as sellers were slow to acknowledge falling valuations. Removing some of the volatility from the global economic forecast will likely help bridge the gap between sellers and buyers.

Share repurchases slowed starting in the second quarter of 2022 and remained low through 2023. Through the 12 months ended June 2023, technology companies under S&P 500 Index repurchased a total of $211 billion of stock, down 26% from the prior year through June 2022. We estimate a similar slowdown for the remainder of 2023.

Companies with significant balance sheet capacity such as Microsoft and Apple Inc. continue to execute sizable share repurchases utilizing their excess liquidity, and therefore our ratings on them remain unchanged. We expect lower-rated investment-grade issuers, especially those in hardware and semiconductor industries, to exercise caution with shareholder returns in 2024. Given higher interest rates, we believe they will lean more toward preserving liquidity or making long-term capital investments.

Despite weaker-than-expected IT spending and rising rates, most investment-grade issuers faced limited ratings pressure through 2023. Even within the semiconductor memory end market, which faced massive revenue declines, we expect our ratings on SK Hynix and Micron will remain at 'BBB-'. We maintained our stable outlook on Micron despite our forecast for significant negative cash flow in 2023 and into 2024 because the company maintains a solid balance sheet and conservative financial policy that corresponds to an investment-grade rating.

The lone investment-grade issuer downgrade in our U.S. portfolio was Intel Corp. (A/Negative/A-1), mainly attributable to the severe cyclical declines experienced in the PC and data center end markets that began in late 2022. Although we anticipated these markets would improve gradually in 2024, Intel continues to face competitive pressures and high capital expenditure requirements that leave little cushion for its credit risk profile at the current rating.

In the speculative-grade space, rating pressure continues to build. Operating results generally fell short of expectations in 2023 for issuers in the lower end of the ratings spectrum ('B' and below) because revenue growth was weaker than expected and debt service costs increased. They had little cushion to absorb execution missteps given limited free cash flow (FCF) generation after debt service.

We expect interest burden to remain elevated for many of the sponsor-owned companies in 2024, which will further stress liquidity. We expect credit metrics will remain mostly stable for those issuers with high recurring revenues and pricing power, but those competing in a crowded market with weaker pricing power will likely incur weaker credit metrics and cash flow, with the potential for negative rating action.

Key risks or opportunities around the baseline

1. Heightening geopolitical tension and supply chain disaggregation are key risks.

Supply chain diversification creates cost inflation, and potentially hurts margins of tech vendors. Additionally, we believe U.S.-China tensions that spill over to disruptions in the supply at key advanced chip manufacturer Taiwan Semiconductor Manufacturing Co. Ltd. (TSMC), or further expansion of U.S. chip bans, may prove more difficult to navigate for our rated issuers.

2. Elevated interest rates still present challenges for speculative-grade companies.

Rates have probably peaked, and we anticipate they will retreat in 2024. However, we will monitor the pace of the decline and whether they remain higher for longer. While we expect some relief in debt service costs, we will focus on how the trajectory of market rates and business conditions will affect weaker 'B-' and 'CCC+' issuers.

3. M&A activity is poised to rebound in 2024.

Rising rates and uncertain valuations led to another year of slow deal activity in 2023, so we believe there is a pent-up demand by both companies and investors alike. We anticipate rate stabilization will lead to an improving acquisition appetite and, in turn, potentially weaken credit metrics for buyers.

Heightening geopolitical tension and supply chain disaggregation are key risks. Technology firms across the globe are looking to diversify their supply chains amid heightening geopolitical tension and regulatory restrictions. This will lead to higher costs and reduced efficiencies because these firms must manage a more dispersed supply chain and operate in regions with underdeveloped infrastructure, higher labor costs, or more limited options of local suppliers. We estimate, for example, that the operating expenses of TSMC will be 40% higher at a planned Arizona facility, versus a plant in its home market.

In China, the latest round of U.S. restrictions will push Chinese technology companies to adopt more domestic suppliers and increase the proportion of domestically produced components and equipment. This could also increase costs for domestic tech companies that must work with domestic suppliers to improve product quality and production efficiency.

Growing government support for local semiconductor industries could also lead to an excess semiconductor capacity over the next several years. Such oversupply could be particularly meaningful for mature chip production. Over the past year, the U.S. and EU separately announced legislation that will provide up to $53 billion and €43 billion, respectively, to support domestic semiconductor research and chip production over the next 10 years. Japan also announced plans to triple the sale of domestically produced semiconductors to more than $113 billion by 2030.

China is also aggressively expanding its own mature chip capacity through domestic companies such as SMIC, China's largest domestic chip manufacturer. We estimate that SMIC could increase its wafer manufacturing capacity by 50% over the next three years. China also raised another $41 billion in September 2023 for its China Integrated Circuit Industry Investment Fund (CIIF) to support its domestic chip industry.

However, most global technology issuers have sufficient cash flows, funding access, and cash reserves to mitigate the impact from oversupply risks and higher costs. Companies such as TSMC and Samsung Electronics Ltd. have material net cash positions and strong cash flows to help offset higher investments and operating costs. Moreover, such companies are likely to receive local government subsidies for the construction of new plants.

We think electronic manufacturing services (EMS) companies in Taiwan will be able to manage the supply-chain diversification better than their peers in mainland China, given their established presence in Vietnam, India, and Mexico.

Other issuers such as Lenovo, NVIDIA, AMD, and Intel will have to navigate the increasingly complex web of U.S. regulatory restrictions on semiconductor exports into China. Such restrictions will be updated as necessary to meet U.S. objectives on limiting China's access to high-performance computing capabilities, particularly for AI. This could limit their access to the large China market or, in a worst-case scenario for Lenovo, hinder its ability to manufacture AI servers.

Elevated interest rates present challenges for speculative-grade companies. Our S&P Global economists' baseline scenario is for a soft landing. We anticipate receding inflation will prompt the Fed to begin cutting rates by 50 bps-100 bps in late 2024 and further in 2025. A benign interest rate environment would be a welcome relief for companies with significant floating-rate debt and high debt-to-EBITDA ratios.

Over the past year, issuers managed onerous interest burdens but struggled with pressured free cash flows and less liquidity flexibility. Although we expect the IT spending environment will improve in 2024, slower-than-expected rate cuts or rates remaining elevated in general will continue to pressure the credit quality of tech companies that have meaningful cash flow volatility, limited liquidity, or face debt maturities over the near term.

Besides elevated rates, business-specific risks will be a key focus in 2024 for those at the lower end of the rating spectrum. For example, Polaris Parent LLC (Solera; B-/Stable/--) elected to pay the payment-in-kind (PIK) interest on its second-lien debt for two quarters to provide flexibility against elevated cash calls from one-time payments, which pressured near-term liquidity and cash flows. The company also navigated revenue headwinds from a large customer loss and acquisition integrations. We view the PIK interest election as Solera being cautious in the current business environment and increasingly willing to pursue opportunities to preserve cash.

Rating outlook changes to negative or downgrades to 'CCC+' or lower increased in 2023 as the high debt service costs take a toll on FCF generation at a time when companies are operating in an increasingly challenging environment. Interestingly, we saw several negative actions on software issuers that generally have good FCF profiles, mainly because of the unexpected and rapid pace of rate increases.

For example, we downgraded Veritas Holdings Ltd. to CCC+/Negative/-- from B-/Negative/-- because the challenging operating environment hurt new business growth. This exacerbated cash flow pressures stemming from its subscription model transition and significant interest expense on $4.2 billion of debt due in September 2025.

U.S. technology speculative-grade rating actions have been overwhelmingly negative over the past 12 months, and this trend may continue if a higher-for-longer scenario plays out. As such, FCF will be a primary focus given concerns that it may deteriorate beyond an already depressed level or remain poor if rate trends reverse.

For 'B-' rated issuers, we forecast average interest coverage of 1.45x in 2024 (versus 1.23x in 2023) and FOCF to debt of 2.85% in 2024 (versus 0.99% in 2023) (see table 2). While we embed benefits of rate cuts, modest improvements might not be enough to protect ratings, particularly if persistent macroeconomic uncertainties slow new business activity and capital investments.

Lower-rated tech companies have less cushion to withstand unexpected business underperformance, especially those that had negative FCF last year. 'CCC+' rated issuers are far more vulnerable because they tend to have very weak interest coverage of less than 1%, negative FOCF to debt, and business-specific challenges. Many of our ‘CCC+’ credits don’t face an imminent liquidity squeeze or debt maturities, providing some breathing room. Still, favorable market and business conditions are critical to maintaining adequate cash flows for debt service.

Table 2

U.S. technology credit metrics improve due to expectations for lower rates

	'B-' rated credits		'CCC+' rated credits	
	2023e	2024e	2023e	2024e
Interest coverage (x)	1.23	1.45	0.48	0.97
FOCF to debt (%)	0.99	2.85	(4.79)	(1.07)

e—Estimate. FOCF—Free operating cash flow. Source: S&P Global Ratings.

M&A activity is poised to rebound in 2024. Global M&A deal announcements and total deal value fell for the second consecutive year in 2023 as rising interest rates sidelined deal-making (see chart 10). Any optimism for recovery faded early in the year after turmoil in the financial services sector led to three large bank failures in the U.S. and the forced sale of Credit Suisse in Europe. Banks, and debt capital markets in general, have since increasingly restricted credit, making access to acquisition financing more challenging.

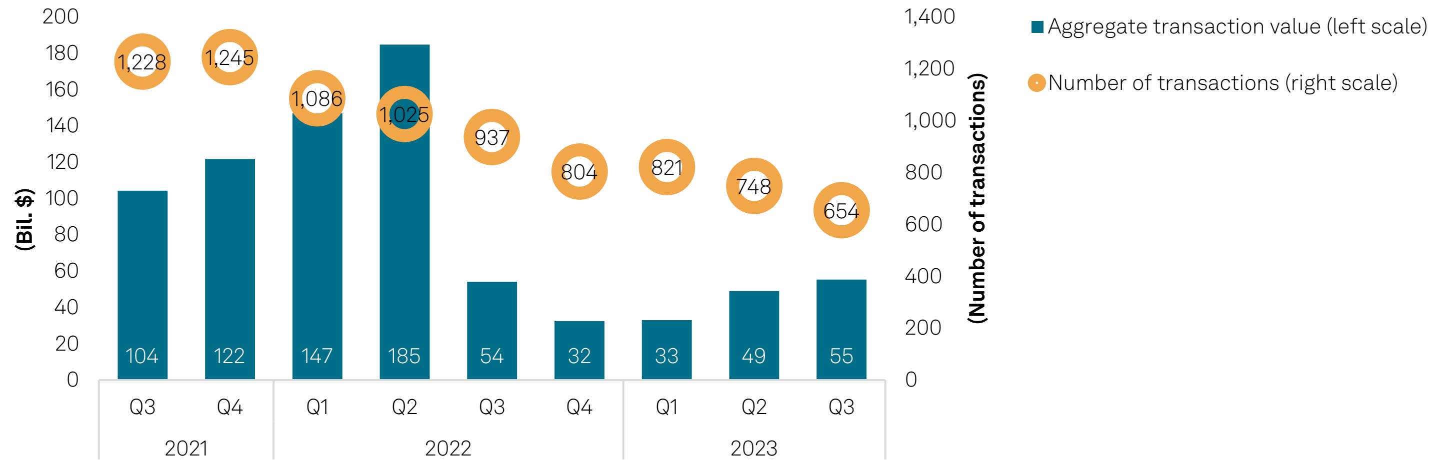
We don’t believe M&A activity will suddenly rebound, but we think pent-up investor demand and the end of rate hikes will gradually improve acquisition activity throughout 2024. Concerns over a possible global recession are being replaced by an expectation for slower growth, particularly in the U.S., with mild recessions forecast for many Western European countries, according to S&P Global economists.

While we expect rates will stay higher for longer, an end to the Federal Reserve’s hiking cycle would improve the outlook for M&A. Under a stable rate environment, buyers get a better understanding of their deal costs, even if financing remains expensive. This clarity gives them greater conviction to pursue acquisitions. We believe that during 2023, buyers remained interested in deal-making but were unable to close transactions because sellers were slow to acknowledge falling valuations. We think removing some of the volatility from the global economic forecast will help bridge the gap between sellers and buyers.

Chart 10

Deal activity has declined for the past two years

U.S. M&A deals since Q3 2021 - technology, media and telecommunications



Source: S&P Global Ratings.

A wildcard is how AI will impact tech M&A in 2024 and beyond. Potential acquirers will seek AI capabilities to enhance or merely protect their existing business positions. On the other hand, the possibility of AI meaningfully disrupting the world of business may give potential acquirers pause in taking on excessive M&A risks.

As for the technology sector, Microsoft's acquisition of Activision Blizzard and Broadcom's acquisition of VMWare Inc. were both announced in 2022 but finally closed in 2023 after arduous regulatory approval processes. The technology sector mostly lacked large deal announcements in 2023, outside of Cisco's $28 billion offer for cloud protection software provider Splunk and Silver Lake's deal for Qualtrics for $13 billion mid-year. Overall, smaller consolidation and divestitures made up the bulk of 2023 deal flow as many traditional strategic buyers turned inward, focusing on belt tightening in the face of weakening growth prospects.

The higher cost of capital has weighed heavily on unprofitable companies and the preferred targets have become older companies with more stable recurring revenue. Looking ahead, we believe subsectors that have the potential to see pick-up in M&A include companies that offer productivity and efficiency gains in areas such as customer service, supply chain tracking, and marketing. Large but fragmented markets, such as cyber security, will likely see further consolidation.

Large deals will continue to face hurdles, especially in the U.S. where antitrust concerns have been a focus of regulators. Still, we expect that an end to central banks' rate-hiking cycles, along with greater economic clarity, will lead to more transactions. We expect China will continue to be a potential roadblock for large deal approvals given the escalating geopolitical tensions and export bans the U.S. has placed on certain key technologies to China. Lastly, 2024 is an election year in the U.S.; any uncertainty heading into the election could push transactions into 2025.

Rising rates and concerns over a possible recession reduced private equity activity in 2023. Through the third quarter of 2023, the total value of private equity and venture capital investments stood at $170 billion, down 57% year over year and the lowest total through three quarters since at least 2019, according to S&P Market Intelligence. If borrowing costs and valuations stabilize, private equity firms could be enticed to accelerate acquisitions in 2024. They certainly have plenty of cash; global private equity cash reserves stood at a record $2.49 trillion at mid-2023, up 11% since 2022.

Increased acquisition activity has the potential to weaken credit metrics. We took multiple negative rating actions in the technology sector in 2023 on companies that engaged in debt-funded acquisitions and those who ran into slow top-line growth, falling short of their projections. Their leverage profile weakened considerably, and cash flow often turned negative under much higher interest expenses. While we expect deal activity to rise in 2024, elevated interest rates will keep financing costs high, and we believe stabilizing rates will allow buyers to better anticipate cash flow impact and, ultimately, manage their credit metrics.

Related Research

- Gen AI Is Writing A New Credit Story For Tech Giants, Nov. 13, 2023
- U.S. Tech Earnings Q3 2023: Cautious Enterprise Spending And Weakening Industrial Market Hinder Results, Nov. 9, 2023
- Credit FAQ: More Risks Ahead For Global Technology Companies As U.S. Restrictions Tighten, Nov. 8, 2023
- China's Chip 'Moonshot' –The Response To Restrictions, Nov. 2, 2023

Industry Forecasts: Technology

Chart 11

Revenue growth (local currency)

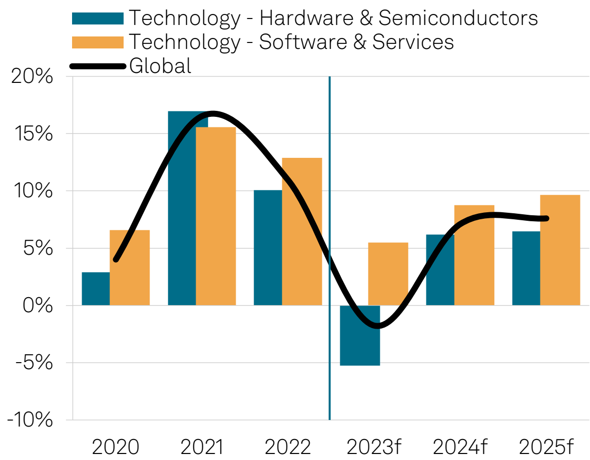


Chart 12

EBITDA margin (adjusted)

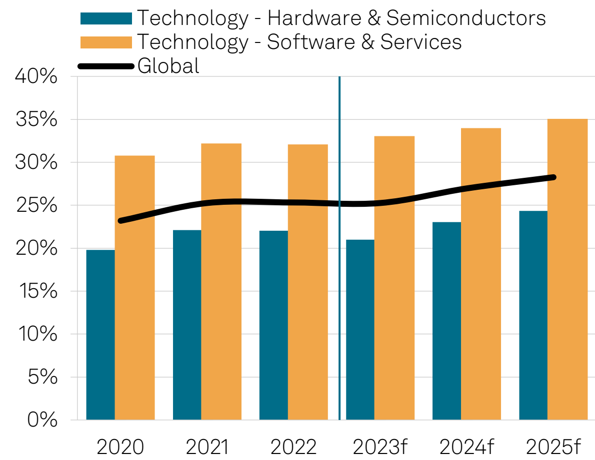


Chart 13

Debt / EBITDA (median, adjusted)

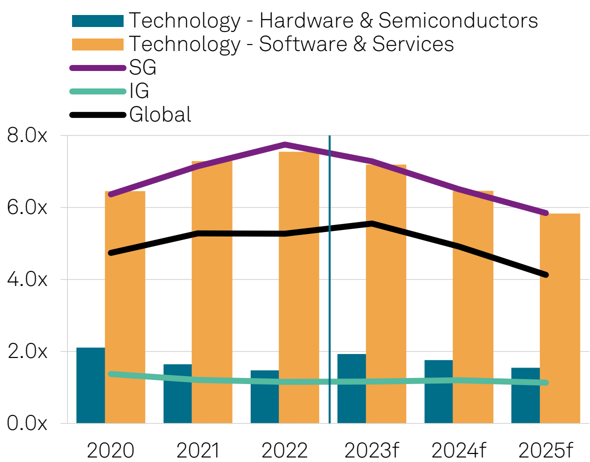
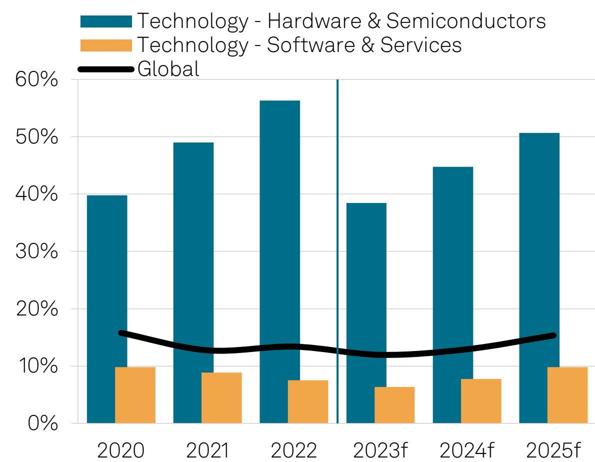


Chart 14

FFO / Debt (median, adjusted)



Source: S&P Global Ratings. f = Forecast.
Revenue growth shows local currency growth weighted by prior-year common-currency revenue share. All other figures are converted into U.S. dollars using historic exchange rates. Forecasts are converted at the last financial year-end spot rate. FFO—Funds from operations.

Cash, Debt, And Returns: Technology

Chart 15

Cash flow and primary uses

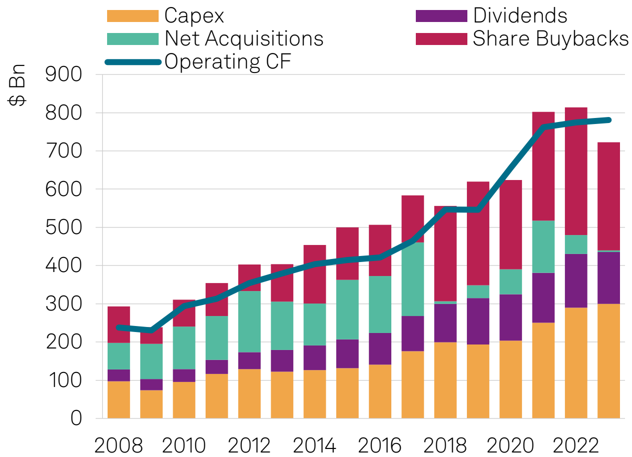


Chart 16

Return on capital employed

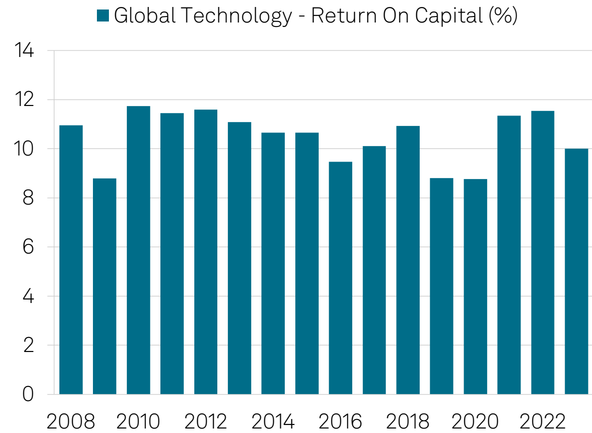


Chart 17

Fixed- versus variable-rate exposure

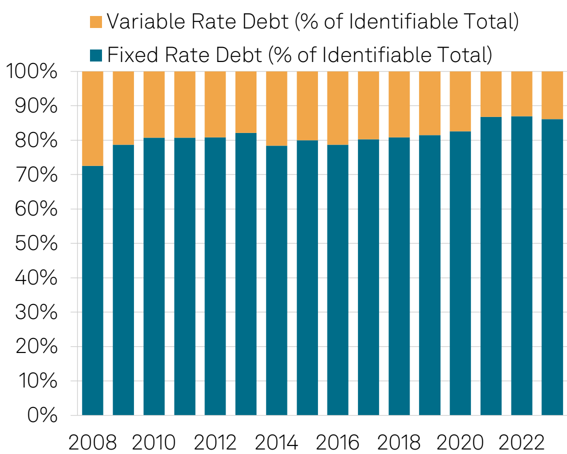


Chart 18

Long-term debt term structure

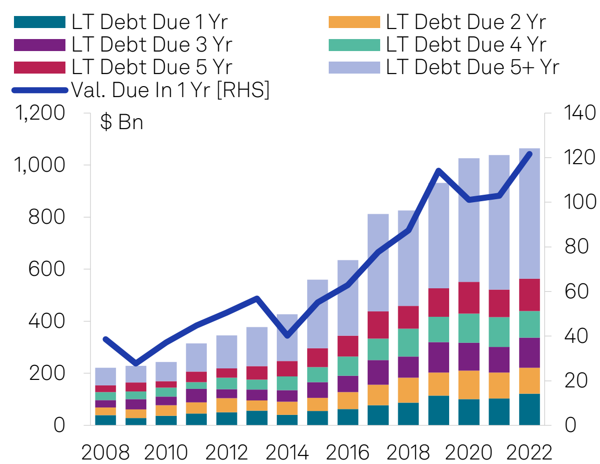


Chart 19

Cash and equivalents / Total assets

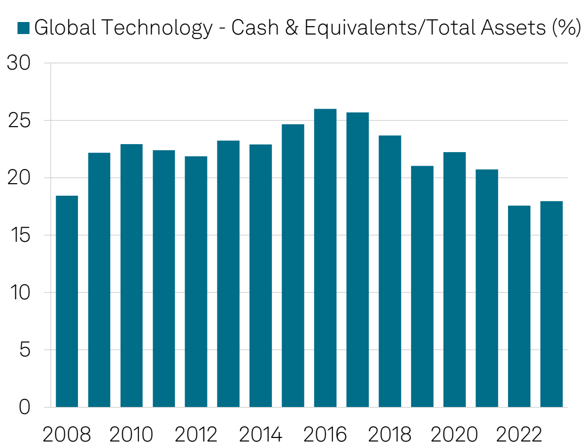
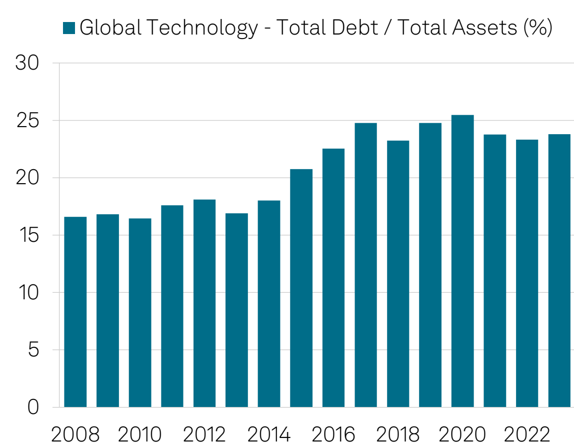


Chart 20

Total debt / Total assets



Source: S&P Capital IQ, S&P Global Ratings calculations. Most recent (2023) figures use the last 12 months' data.