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Global Fixed Income, Tech Diffusion, & GenAI

Bridging a $1.5tr Data Center Financing Gap

We think credit markets – led by private but aided by corporate and securitized – will be critical to meet $1tr+ of data center financing needs through 2028. We remain bullish on the growth and return potential in private credit and data center ABS/CMBS. Corporate credit should see manageable bond issuance skewed to higher quality. Risks to financing capacity in credit are sharply lower rates/weaker growth, which could dampen end-investor demand.

Contributors

MORGAN STANLEY & CO. LLC
Vishwas Patkar
Strategist
+1 212 761-8041
Vishwas.Patkar@morganstanley.com

MORGAN STANLEY & CO. LLC
Lindsay A Tyler
Credit Analyst
+1 212 761-2734
Lindsay.Tyler@morganstanley.com

MORGAN STANLEY & CO. LLC
Carolyn L Campbell
Strategist
+1 212 761-3748
Carolyn.Campbell@morganstanley.com

MORGAN STANLEY & CO. LLC
Vishwanath Tirupattur
Strategist
+1 212 761-1043
Vishwanath.Tirupattur@morganstanley.com

MORGAN STANLEY & CO. LLC
Stephen C Byrd
Equity Strategist
+1 212 761-3865
Stephen.Byrd@morganstanley.com

MORGAN STANLEY & CO. LLC
James Egan
Strategist
+1 212 761-4715
James.F.Egan@MorganStanley.com

MORGAN STANLEY & CO. LLC
Kyle B Yellin
Credit Analyst
+1 212 761-4706
Kyle.Yellin@morganstanley.com

MORGAN STANLEY & CO. LLC
Catherine Liu
Strategist
+1 212 761-0222
Catherine.Liu2@morganstanley.com

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Bridging a $1.5tr Data Center Financing Gap

Key Takeaways

- We project a $800bn+ growth opportunity around data center investment via private credit, led by asset-based finance. This supports the structural growth story in private credit, especially in higher-quality segments.
- We also view DC securitized credit as a secular growth story that is relatively insulated from potential macro pressures, and project $150bn of DC ABS/CMBS issuance through 2028.
- We expect $200bn of incremental IG tech bond issuance, and think credit spreads can remain tight given the manageable magnitude and higher credit quality.
- We think credit markets have significant capacity to meet these financing needs with broad AUM growth across segments. Risks are much slower growth and lower yields.
- Our equity analysts flag alt. asset managers, banks, and other companies that benefit directly from capital deployment and growth in private credit (not just limited to AI).

Tech Diffusion
A Morgan Stanley Research Key Theme of 2025

Filling an estimated $1.5tr medium-term financing gap for data center investments: We forecast $2.9tr of capex for global data centers (DC) through 2028 across build and hardware costs. Total investment needs significantly exceed our expectation for $1.4tr of hyperscaler capex funded by cash flows (leveraging company guidance and Morgan Stanley equity research estimates). In effect, we see a $1.5tr financing gap that needs to be met by external capital, and expect credit markets to play a big role here.

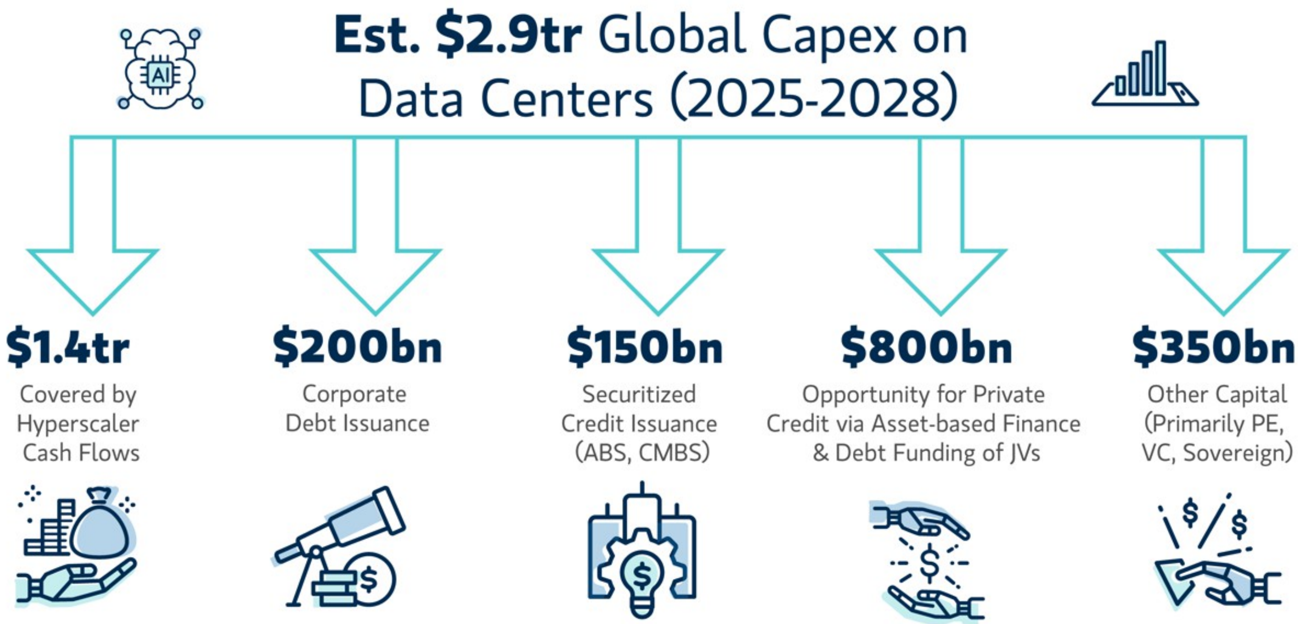
$800bn opportunity for private credit, led by asset-based finance (ABF): Private credit sits at the intersection of significant AUM growth in a higher rates environment on the one hand, vs. complex, large-scale, global, and customized financing needs on the other. With corporate bond and securitized credit funding limited by issuer willingness and market capacity, respectively, we estimate private credit in many forms, but led by ABF will need to fill over half of the gap identified above. We project a ~$800bn growth opportunity for private credit through 2028.

We forecast ~$200bn incremental investment-grade technology bond supply through 2028: Hyperscalers have been regular issuers in the corporate bond market, yet remain under-indexed relative to the stock market, and have significant capacity to increase debt without pressuring credit ratings. Yet, we project just $200bn of incremental corporate debt issuance through 2028. We think these players may be disinclined to debt-fund capex early in the investment cycle, leaning more on internal cash flows and leases to start. Faster revenue monetization (vs. expectations) could mean corporate bond issuance is higher than our estimates.

Expect securitized credit to play an increasingly important role in financing data centers; forecast $150bn new issuance across DC ABS/CMBS through 2028: To date, roughly 10% of US capacity has backed ~$50bn in issuance in these products, but we expect to see an increasingly high rate of securitization, with 25% of new GWs in the US securitized market by 2028. Indeed, DC developers that have already begun issuing into securitized credit markets have ambitious growth plans, with their global capacity set to increase substantially in coming years; they have not yet securitized a majority of their operational capacity. We see considerable potential for supply in these markets, aided by the relatively competitive costs of financing achieved through securitization and by leveraging their contracts with high-IG tenants.

Financing capacity in credit, and risks to our estimates: We think credit markets should see continued inflows from multiple channels, and should have significant capacity to absorb investment needs; we do not expect a financing bottleneck. Further, we emphasize that private credit mandates are growing in higher-quality mandates like ABF, which is well tailored for DC financing needs. The risk in the medium term is a sharp slowdown in growth and significant policy easing (beyond our base case) in which real yields collapse. This would weigh on new demand, especially from long-term end investors like insurance companies/pension funds.

Exhibit 1: We present five main financing paths for medium-term global data center spend



Source: Morgan Stanley Research

Executive Summary – The Growing Role of Credit Markets in Financing GenAI

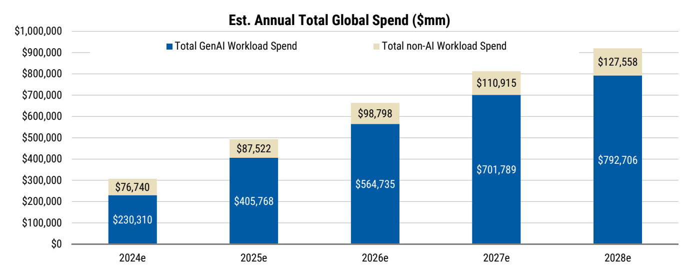
Forecasting ~$3tr global data center spend through YE28

Generative artificial intelligence (AI) and tech diffusion remains a key theme for Morgan Stanley's Research division, shaping market performance and the economy over the coming years. However, this transformative technology comes with sizeable investment needs. **We forecast roughly $2.9tr on global data center (DC) spend, not inclusive of power investments, through 2028 (see Exhibit 2), of which roughly $2.5tr will be specifically for AI-related workloads.** The $2.9tr includes roughly $1.6tr on hardware (chips/servers) and $1.3tr on building out data center infrastructure, including real estate, build costs, and maintenance, among others (see Exhibit 3).

Beyond the scope of this note, we expect that building out the incremental power infrastructure could cost at least $300bn.

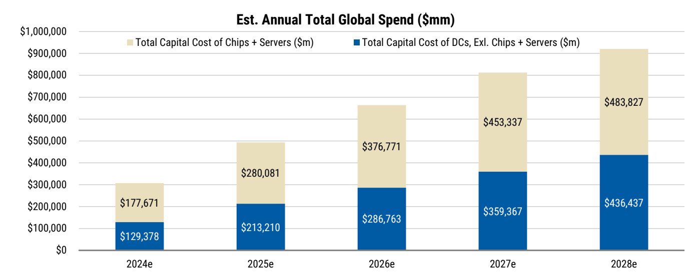
On an annual basis, financing needs increase to just over $900bn in 2028. A detailed breakdown of these capex numbers is in the following section . These are large numbers any way we look at them, through both macro or micro lenses. **For context, all companies in the S&P 500 combined spent ~$950bn on capex in 2024, comparable to our DC-only number for 2028.** Our US economists estimate that AI-related capex will contribute 0.4-0.5% to GDP growth over 2025-26, while our China economists have flagged notable support to GDP through 2027.

Exhibit 2: Total global annual spend on AI and non-AI workloads



Source: Morgan Stanley Research estimates

Exhibit 3: Total global annual spend on DC infrastructure and chips & servers



Source: Morgan Stanley Research estimates

Estimating incremental financing needs and paths

The AI-capex cycle has been in motion for some time now, with hyperscaler spend alone going from ~ $125bn two years ago to ~$200bn in 2024, and expected by consensus/guidance to exceed $300bn in 2025. So far, internal cash flows from hyperscalers have been more than sufficient to match these requirements. Our equity analysts are optimistic about AI monetization, and project that GenAI revenues could exceed $1tr by 2028, with close to 70% variable margins, compared to just $45bn in 2024.

That said, over the horizon of 2025 through 2028, investment needs ramp sharply, hyperscaler cash flow usage is constrained both by willingness and capital allocation, and there is a lag between the timeline of spending vs. monetization. This implies a significant gap in capital needs that will need to be financed.

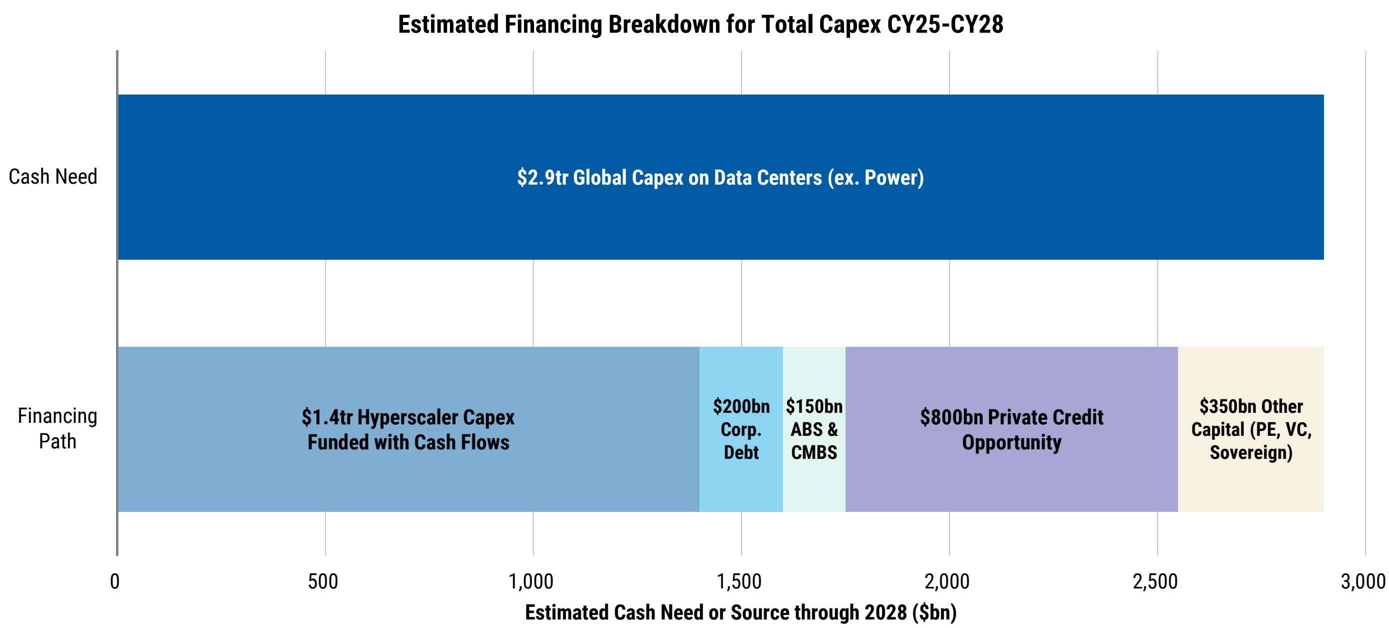
In this collaborative report, we look at the role that different capital/lending markets will play in meeting these financing needs over the coming years. In particular, we focus on credit markets – corporate, securitized, private/asset-based lending – which we see gaining traction as a more efficient provider of capital. **We think there is a favorable alignment of significant and growing dry powder across credit markets with attractive real yields on offer, the ideal nature of investment needs (e.g., long horizon, complex, fragmented, early stage), and a sticky end-investor base (e.g., insurance, HNW retail, sovereign wealth funds) that needs high-quality asset exposure well suited to meet these capex needs.**

In Exhibit 4 , we show our estimate of how the ~$2.9tr capex could be broken down across different markets, with each category discussed in detail in later sections.

We caveat that making projections several years out comes with considerable assumptions and admittedly some guesswork. Clearly, the premise that underlies our assumptions can shift dramatically over the horizon. Certain forms of financing like sovereign spend can be especially hard to estimate. In addition, over a long horizon like we are predicting, financing can shift from one form to the other (e.g., from asset-based financing to asset-backed securities) depending on several factors, which might mean "undercounting" certain forms of capital deployment.

These caveats aside, we think that our collaborative approach, which embeds our equity analysts' assumptions around revenue, capex, and cash flows, expertise across different credit markets (top-down and bottom-up), and empirical observations provides a reasonable framework to scope out the numbers.

Exhibit 4: Our estimated breakdown of data center financing needs (ex Power)



Source: Morgan Stanley Research

Estimate $1.4tr hyperscaler capex may be funded with cash flows, leaving a $1.5tr financing gap

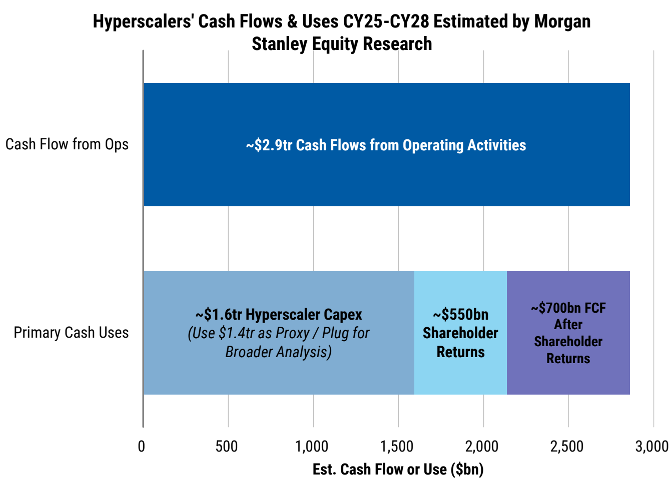
Hyperscaler AI capex has been largely self-funded by cash flows so far. Rising cash flows may be able to continue to support elevated, and even growing, capex. For this part of our analysis, we focus on large-cap technology companies that generate sizable cash flow from operations that cover their AI- and/or data center-related capex needs.

Capital intensity remains elevated, with the hyperscalers' combined 2025 capex guide at >$300bn. And looking at the four-year period of 2025-2028, our equity research counterparts forecast capex growth and almost $1.6tr of cumulative spend among those players. Over that time frame, our equity research counterparts do forecast cash flow from operations to grow and sum to almost $3tr. Thus, while there is capacity to cover more spend via cash flows, we think shareholder returns, potential acquisitions and allowing for cash build for optionality may imply that practical estimates for AI-capex spend are lower.

Considering our estimate that there could be $200bn of related corporate debt issuance, as we introduce next, we use $1.4tr in our analysis to represent capex spend in our broader framework that may be covered by hyperscaler cash flows. Remaining cash flows may be used for shareholder returns and for cash build. Capital allocation changes, specifically increased shareholder returns and/or acquisitions, can impact this analysis on a single-name idiosyncratic basis.

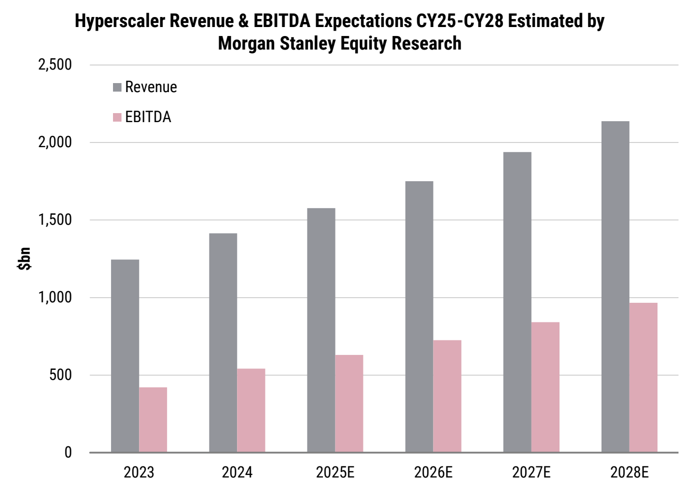
Overall, this leaves a remaining sizable $1.5tr gap relative to the ~$2.9tr spend estimate we laid out above. The rest of this spend will need to come from external sources of capital. We discuss some thoughts and numbers around how this $1.5tr gap could land across different markets next.

Exhibit 5: Large-cap corporate cash flows are significant, but after accounting for shareholder returns and potential cash build, still leave a gap to our broader 4Y capex estimates



Source: Company filings, Bloomberg, Morgan Stanley Equity Research (select models by Keith Weiss and Brian Nowak). Note: Not AI and/or data center specific.

Exhibit 6: GenAI monetization could have implications for timing of outside funding



Source: Company filings, Bloomberg, Morgan Stanley Equity Research (select models by Keith Weiss and Brian Nowak). Note: Not AI and/or data center specific.

$200bn of corporate debt issuance – willingness to issue debt a bigger constraint than ability

On the surface, corporate debt provides a scalable and cheap form of financing, with yields around 5%. The US investment grade corporate bond market is well established and nearly $9tr in size. The technology sector has grown as a percentage of that market, from just 2% two decades ago to 9.6% now, and hyperscalers have been established issuers for a decade or more.

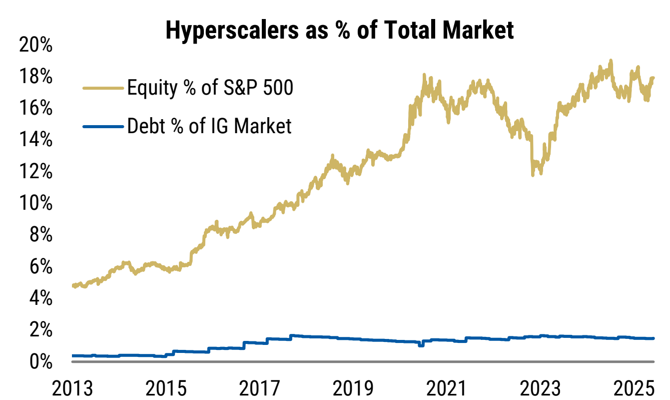
We do think that the US IG unsecured public market is set up well to take on any necessary funding for AI capex needs out of technology names. The technology sector is relatively higher credit quality than other IG sectors, illustrated by its lower net leverage and tighter trading levels, thereby implying capacity to add debt, in our view. We see >$500bn of illustrative issuance capacity across just three large-cap technology issuers, using simple math against their respective downgrade adj. debt/EBITDA thresholds for current ratings. This could even be understated given expectations for continued EBITDA growth.

All that said, actual issuance has been quite low over the past few years, despite rising capex needs (see Exhibit 8). In our view, this comes down to the nature and horizon of investment needs and the risks around them. We think that large-cap technology companies may be averse to significant on-balance sheet debt funding for capex, which could pressure price/valuation multiples. In particular, hyperscalers might take a measured approach around significant debt-funding for data center build (as opposed to hardware), given long-term risks.

Therefore, we think that ~$200bn is a reasonable estimate to use in our financing spend calculation to represent potential technology corporate debt issuance. We find support for this number specifically from a technical lens, both from the micro and macro perspectives. First, we see sizable capacity for major tech hyperscaler issuers to grow their index debt levels toward the balances of the largest non-financial IG issuers (i.e., telecom/cable players AT&T, CMCSA, VZ), with ~$150bn of capacity across just three issuers. Second, the credit market is significantly under-indexed to the space, as the technology index contributes <10% of the IG index's market value (hyperscalers themselves ~2%), while the IT sector contributes ~30% of the market cap of the S&P 500 (hyperscalers ~20%). Therefore, the IG Technology Index has room to grow its contribution and could reasonably support an additional $200bn of net supply through YE28, pushing its contribution to 12% of the broader IG market all else equal. The IG Technology Index even saw $120bn of amount outstanding growth over the past four years.

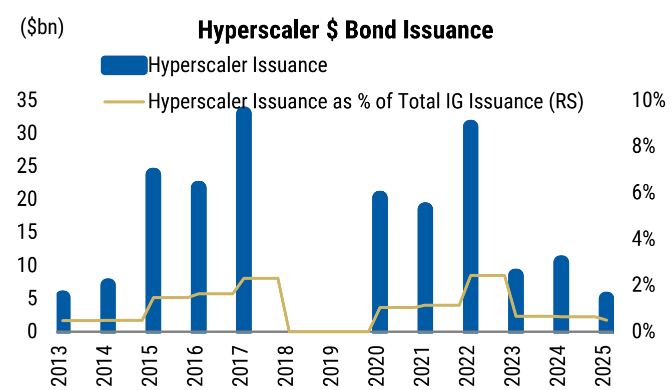
Given current cash flow coverage of capex for many players and the still relatively nascent role of tech in the credit world, we expect reliance on unsecured corporate debt to grow in phases and accelerate later in our horizon through 2028. In this early stage of the investment cycle, we think hyperscalers will lean on cash flows, leases, and bespoke financing solutions with alternative asset managers. But as monetization accelerates, we think investors will have a clearer line of sight to facilitate unsecured debt issuance. All this said, we think management teams will also consider cost of funding and issuance windows. The average cost of issuing IG debt, even at today's elevated yields, is ~5%, much lower than comparable yield on leasing data centers from developers (which is typically high single digits-to-double digits). We expect management teams will be opportunistic around issuing in times of lower yields, just like we saw in the '19-'21 period.

Exhibit 7: Hyperscalers account for less than 2% of the IG market, roughly 20% of the equity market



Source: Morgan Stanley Research, Bloomberg

Exhibit 8: Hyperscale $ bond issuance has been fairly low in recent years



Source: Morgan Stanley Research, Bloomberg

It makes sense for us to focus on IG large-cap tech companies and their possible USD unsecured bond issuance in this report as a starting point. However, we do see numerous other financing paths for players and also issuers outside of these large-cap tech names. Specifically, we acknowledge leases as another form of financing, recent IG tech issuance in other currencies, recent IG tech issuance for AI-related M&A, data center REIT unsecured issuance ahead, and more.

Read more later in this report: Technology Credit: Expect ~$200bn of Bond Issuance to Complement Sizable Cash Flows and New Leases .

Securitized credit markets – data center ABS and CMBS market to finance ~$150bn through 2028

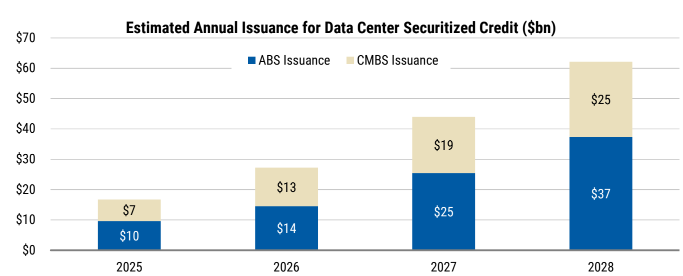
Post-construction and tenant occupancy, we think securitized credit markets will play an increasingly important role in supplying capital at reasonable levels to data center developers. While these developers will likely raise initial financing from a handful of other sources (e.g., bank lending, construction loans), we expect many developers to leverage ABS or CMBS markets as a takeout option once tenants begin to pay rent, securitizing the properties themselves or the cash flows from the leases. **Given the deeper and more established securitization markets in the US, we expect that the opportunity from securitized credit will be greater for US-based assets in the early stages of the investment cycle. However, we expect to see expansion of transactions to include non-US based assets over time. Already, Canadian data centers have been included in some US deals, and there have been two European deals to date.**

At present, we have seen approximately $50bn of securitized credit for data centers with around ⅔ in ABS and ⅓ in CMBS. We estimate that this represents around 4GW of power in the US, with a further 300MWs in other countries – roughly 10% of the US data center capacity. As the markets mature, demand grows, and liquidity improves, we see up to 25% of the MWs in data centers backed by ABS or CMBS by 2028. Indeed, many of the issuers which have already used the ABS or CMBS markets have ambitious growth plans. We estimate that around 45% of the data centers that are operational and owned by ABS issuers currently back outstanding issuances; of the data centers that are planned, operational, or under construction, we estimate around a quarter back ABS deals (by count). Moreover, these issuers alone have likely securitized to date just a tenth of their planned global capacity. Indeed, 14 of 17 ABS issuers for which data were available combine to have nearly 25GW of planned total capacity; a higher reliance on the ABS or CMBS markets could see these markets grow considerably. **Thus, we don't view supply as a constraint on growth, and indeed we think we will see issuers increasingly tap the ABS/CMBS markets once they have sufficiently tested the waters.**

Issuing into the securitized credit market provides the issuer with a more competitive cost of capital for a comparable duration than it might have been able to achieve elsewhere through private credit, construction financing, or indeed unsecured credit. Since 2022, issuers in the ABS market have had an average financing cost of around 5.5%, which we expect would be lower than they would achieve should they have issued into the unsecured market. Indeed, the US ABS coupons are comparable to USD IG debt (4-7y) coupons and are significantly lower than the average HY coupon over the same time period. At present, we think these issuers would be unlikely to achieve an IG rating; the securitized credit markets thus allow for them to directly leverage their contractual relationships with IG-rated tenants and issue debt at lower coupons.

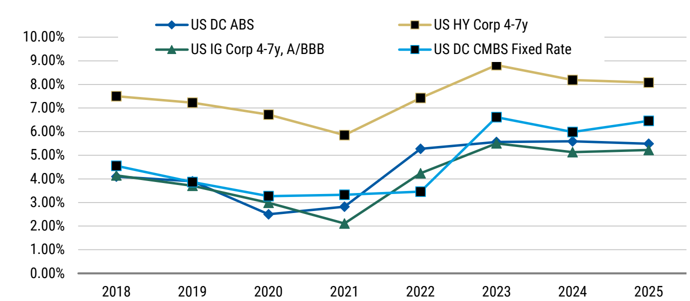
Read more later in this report: Securitized Credit: An Increasingly Sought-After Take-out Option .

Exhibit 9: Estimated annual issuance of data center-backed securitized credit could reach >$60bn p.a. by 2028 ($ in bn)



Source: Morgan Stanley Research estimates

Exhibit 10: Securitized credit market financing rates are closer to IG funding costs than HY



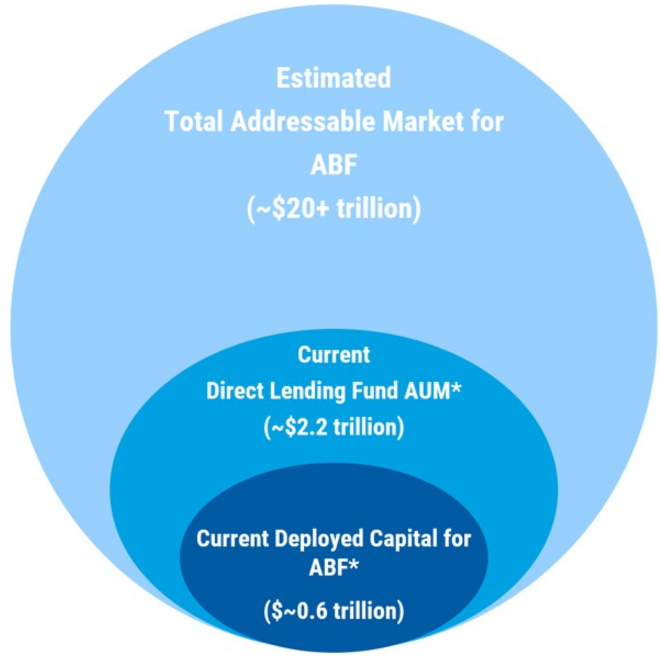
Source: Morgan Stanley Research, Intex

An $800bn opportunity for private credit, led by ABF (asset-based financing)

As discussed above, our corporate credit and ABS market forecasts add up to roughly $350bn of financing needs through 2028, which even when added to the $1.4tr of hyperscaler cash flows, leaves a sizeable gap to the total $2.9tr number. **We think private capital – in particular, credit – will play a key role in meeting a majority of the remaining financing gap** as it sits optimally at the intersection of significant expansion in AUM in a higher rate environment and the complex, global, and customized financing needs that are associated with AI build-out.

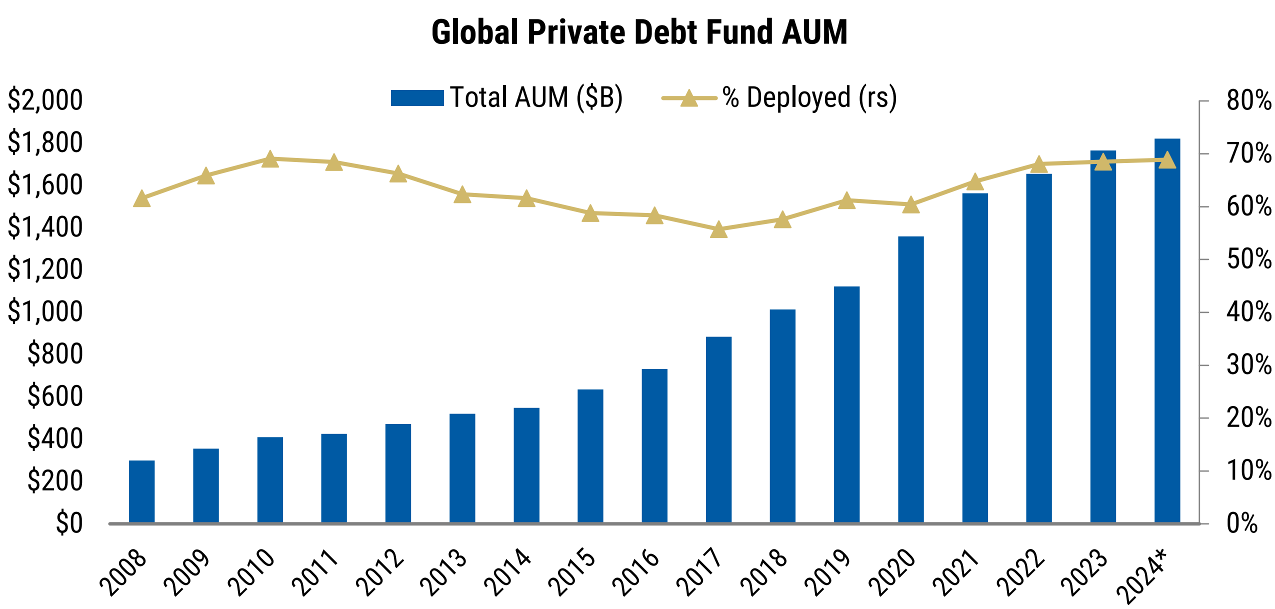
Taking a step back, it is important to clarify what we mean by private credit. **While this term is often conflated with corporate loans to middle market companies, the universe of private credit is much larger.** It also encompasses private IG placements, asset-based finance (ABF), infrastructure lending, mezzanine loans, construction loans, among others. Private credit has been a significant growth area for institutional asset managers over the past few years (see Exhibit 12). But importantly, much of the end asset growth is coming from investors like insurance companies, sovereign wealth funds and pension funds that need high-quality asset exposure (as opposed to lending to highly-levered companies).

Exhibit 11: The total addressable market (TAM) for ABF is significantly larger than direct lending



Source: Morgan Stanley Research estimates. Note: *Direct lending fund AUM from Cobalt; current deployed capital for ABF does not include securitizations.

Exhibit 12: Private credit AUM has grown sharply in recent years



Source: Morgan Stanley Research, Pitchbook LCD, Bloomberg. *Note: Data as of 6/30/2024

The case for further expansion in private credit AUM remains strong across institutional and retail channels, especially if rates stay elevated vs. their post-GFC averages. Insurance cos. AUM is growing rapidly, and retail investors are significantly "under-exposed" to private assets. With an increasing appetite for returns that are more stable and uncorrelated to macro drivers, we think there is a clear case for further expansion.

What form could private credit financing take around AI infrastructure? We think asset-based finance will play a key role here. We discuss more details in the private credit section, but for readers who are not familiar, ABF is a broad term for financing agreements that are secured by loans and contractual cash flows such as leases with or without hard assets, a concept widely used in securitizations. Unlike construction loans specific to a single entity or a single project, ABF is a broader category in which loans are secured by a broader pool of assets that generate predictable cash flows.

We think this style of lending is tailored to meet data center financing needs. At a very basic level, it provides a beneficial arrangement for many parties involved. Hyperscalers/other companies get to lease a data center without incremental cash usage or debt funding. The investor earns significant current income (HSD to low double digit), as the cash flows on the leases are coming from highly credit-worthy companies (in most cases). And for the developer, it allows a more efficient form of financing than using highly-dilutive equity capital.

Our equity analysts have flagged alt. asset managers and banks that can benefit directly from capital deployment and growth in private credit (not just limited to AI). Key beneficiaries are discussed here.

Read more later in this section: An $800bn Opportunity in Private Credit, Led by Asset-Based Finance (ABF) .

Other capital sources – $350bn across sovereigns, PE, VC, bank lending, and others

Similar to credit markets, there is substantial dry powder and active fund-raising underway for equity capital. While notable AI-related equity investments are emerging, they are primarily concentrated in data center joint ventures between REITs and private equity firms, as well as in venture capital financing. Publicly-disclosed examples of private equity participation have largely taken the form of data center REIT take-privates and subsequent JV partnerships. Over the past five years, following transactions such as KKR/GIP's acquisition of CONE, we have observed JV agreements between remaining public data center REITs (typically BBB-rated) and private equity capital—most notably, a $15 billion+ JV between Equinix (EQIX) and GIC/CPP.

Meanwhile, AI remains a top priority for venture capital. According to PitchBook, nearly 60% of global VC investment in 1Q 2025—totaling $73 billion—was directed toward AI and machine learning startups. This share was even higher in North America, with more than half of the deal value concentrated in just three companies: OpenAI, Anthropic, and Groq.

Another source of capital that could be sizeable in building data center financing needs is sovereign spend. We already have seen several announcements to this effect, from Saudi Arabia, France, South Korea, China, among others.

Ultimately, how these investments are funded (i.e., direct outlays vs. sovereign fund investments vs. debt being raised in markets) remains unclear. If it happens through the channel of sovereign wealth funds/ public pension funds, we think that effectively is a form of capital market financing, which gets captured by the categories we discussed above. On the other hand, if governments are willing to spend surplus cash or raise sovereign debt for this spend, then that is an additional form of financing to consider.

Ultimately, there are too many moving parts/unknowns in these "other" categories, including bank lending, to have micro precision. Instead, what we assume is that the $1.15tr gap left after excluding hyperscaler cash flows/bonds/securitized credit is split 70/30 between private credit (discussed above), and the other sources. We think the 70/30 split has some intuition based on 1) debt-equity mix of typical project financing/construction loans, and 2) empirical evidence based on debt financing within observed strategic partnerships between corporates and alt. asset managers.

We expand on this in more detail later in the An $800bn Opportunity in Private Credit, Led by Asset-Based Finance (ABF) section.

Risks, other considerations, and implications

1) Significant capacity in the credit market; we don't expect a financing bottleneck

In the securitized credit section later, we discuss the possibility of power bottleneck in data center build-out as a real risk over time. Given the scope of this report, it also worth discussing that could there also be a financing bottleneck considering how large some of the numbers are. For instance, the $800bn private credit number we have estimated compares to the entire HY bond market at $1.4tr in size.

At the risk of stating the obvious, much depends on how the macro environment shapes up, but based on our assessment of credit conditions today, we don't see a lack of financing capacity. At a very high level, credit markets are seeing inflows across several investor types, life insurance companies, pension funds, and overseas buyers. In contrast, credit issuance has been fairly tepid over the past three years. The high level of rates, along with rolling uncertainties (e.g., inflation, geopolitics, trade policy), have meant that issuance has been crowded out from credit markets. If at all, credit markets have a "too much demand, not enough supply" problem right now.

More specifically, within overall credit, private credit is seeing significant demand. And as flagged above, higher-quality segments are growing, rather than purely non-IG business loans. **In this context, the right comparison for our $800bn private credit number is not the leveraged finance market, but instead the investment grade market (which is $9tr).**

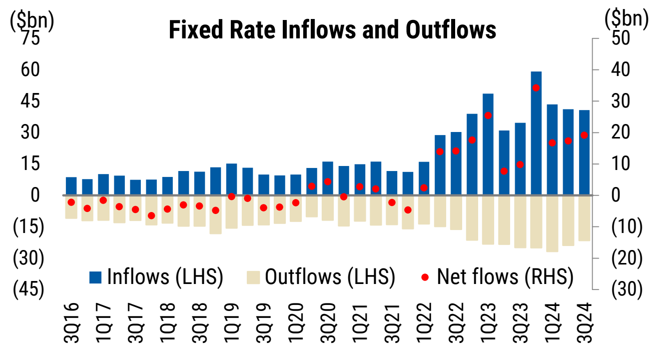
The total asset-based financing (ABF) market is around $25tr, and with this, the "private" portion (i.e., by non-banks) is already at $2tr. As alt. asset managers continue to focus on ABF, we think there will be significant growth in this market. In fact, as we noted in a BluePaper last fall, ABF has become the new frontier for insurance balance sheets, allowing private credit managers to originate a broader set of assets and place them through structuring and credit enhancement that make these assets suitable for investment.

2) What could challenge the capacity of credit markets to provide this financing?

The macro environment matters here, and slower growth would naturally raise some fundamental concerns. However, the related bigger risk, in our view, is if rates fall sharply. In particular, the growth in capital inflows into credit has been supported by steep yield-curves, and positive real rates. These have driven significant growth into insurance products, including but not limited to fixed-rate annuities. In addition, while corporate bonds remain the biggest allocations for insurance companies, they are increasing the share of securitized credit and private credit notably.

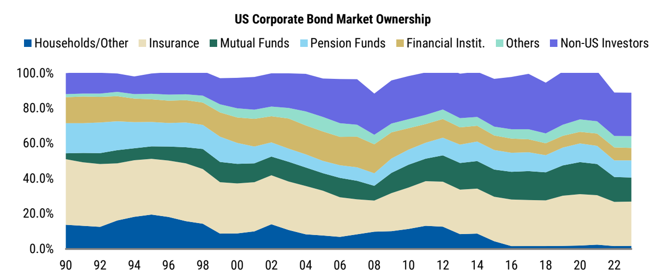
If rates go down sharply, we think this channel of significant inflows could be disrupted. As shown above, fixed annuity inflows were quite negligible in the pre-COVID era when yields were much lower. Lower

Exhibit 13: Insurance companies are seeing significant inflows this cycle with higher rates, supporting demand for credit



Source: LIMRA, Morgan Stanley Research

Exhibit 14: Insurance companies are large end-owners of credit markets



Source: Federal Reserve, Morgan Stanley Research

rates could also hurt demand from pension funds and overseas investors as the value proposition in USD-denominated credit erodes. So this is certainly a risk worth watching, especially as our economists expect the Fed to cut 7 times next year.

But we want to clarify that the rate decline would have to be quite substantial and well beyond our economists' base case expectation. While this topic requires an in-depth report by itself, we flag that despite lower rates, our forecasts see real rates remaining positive and yield-curve remaining steep. We think risks of sharply weaker inflows rises if/when rates drop significantly below 3%.

3) Time to monetization can affect funding choices

Our estimates across the different financing opportunities are broadly based on: 1) headline capex needs, 2) hyperscaler cash flow and revenue estimates through 2028, 3) capital allocation decisions around debt-funded capex, and 4) strategic trends such as rapid growth in IG-rated private credit mandates. Should revenue growth be higher and faster than our equity analyst estimates, financing paths could shift.

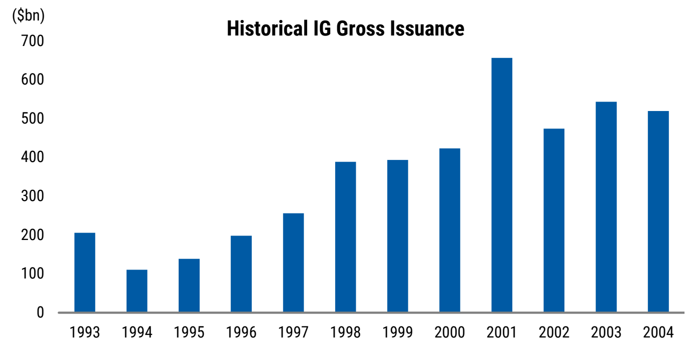
In particular, we think the public credit market could play a bigger role in this scenario as companies become more comfortable with it, as it remains the cheapest source of financing. On the other hand, weak macro conditions and slower revenue growth could mean even more reliance on external capital, specifically private credit.

4) Long-term macro implications of significant capex + credit growth — some similarities to the 1990s, but many differences

The last time a capex cycle of this magnitude played out was back in the mid-to-late 1990s, driven by investment in hardware, technology, and web services. Seasoned credit investors will recall that through the later part of the decade, corporates were very aggressive with their capital allocation, and debt/leverage increased sharply. The period ultimately ended with the sharpest default cycle in recent history from 2000-04.

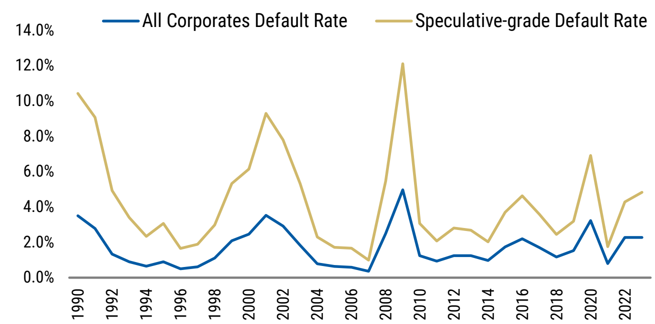
Arguably, it is too early in the current investment cycle to be concerned about risks on the other side. Clearly, debt growth of this magnitude run into the risk of obsolescence, slower monetization, and weak macro conditions. **An encouraging sign, though, is the diverse pools of capital that are available today, which can distribute the warehousing of credit risk (unlike the late 1990s when it was concentrated on corporate balance sheets).** Further, the ultra-high-quality credit profile of hyperscalers and significant cash on hand mean less sensitivity to macro conditions.

Exhibit 15: Capex growth was sizeable through the late 1990s, and debt funding was a big driver



Source: Dealogic, Morgan Stanley Research

Exhibit 16: The cycle culminated with a meaningful default cycle



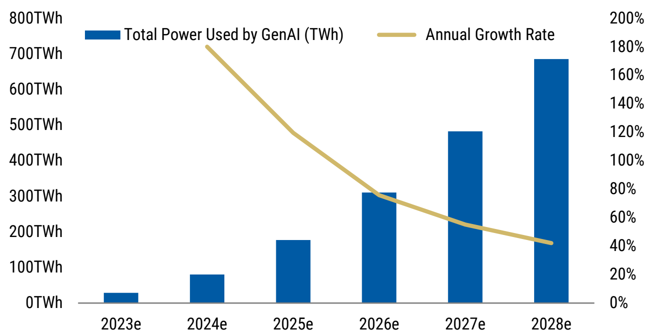
Source: Moody's, Morgan Stanley Research

Sizing the Spend: A ~$2.9tr Opportunity

Sizing investment spend on AI

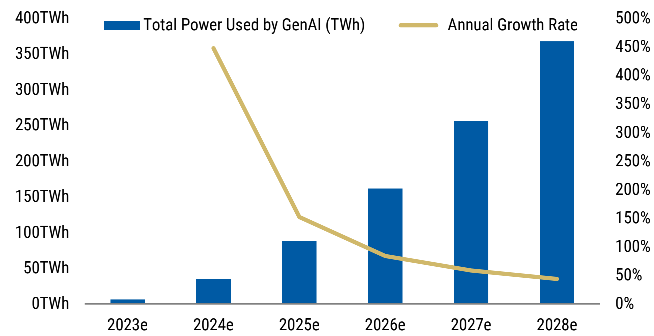
We expect that data center growth in the US and globally will accelerate rapidly in the coming years, driven predominantly by the greater need for high-performance compute (HPC). Morgan Stanley Research estimates that the total power used by GenAI will rise from 29TWh in 2023 to 686TWh in 2028 globally. This expansion of power for GenAI will drive total data center power usage (including traditional workloads like cloud/enterprise) from 370TWh in 2023 to 1235TWh in 2028 (or said another way, from 56GW of capacity in 2023, up to 188GW in 2028). We expect that about 55% of the GenAI power will be in the US. For more details on our approach for sizing the power demand from GenAI, please see our reports here and here. **Please ask us for a copy of our GenAI model and our financing model.**

Exhibit 17: Total power used by GenAI (TWh), Global



Source: Morgan Stanley Research estimates

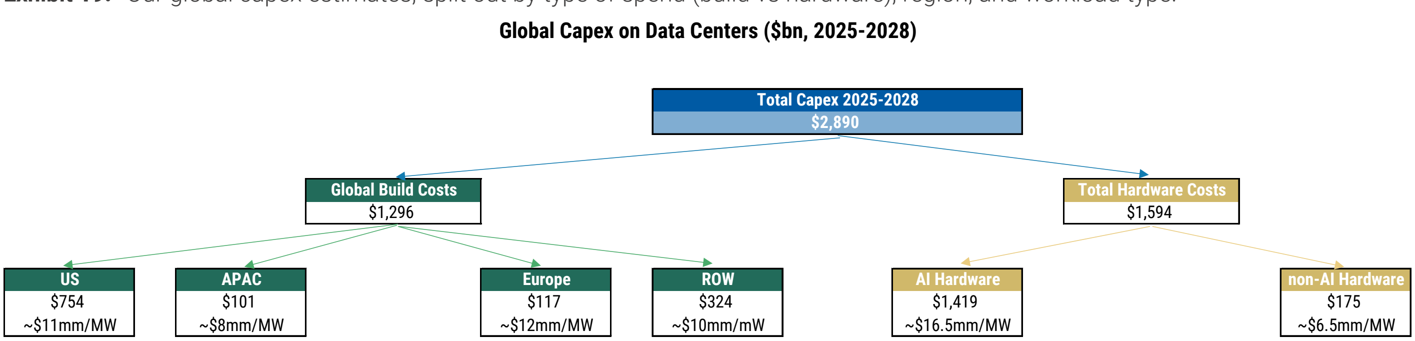
Exhibit 18: Total power used by GenAI (TWh), US



Source: Morgan Stanley Research estimates

We forecast that the cost of building new data centers, for both AI and non-AI workloads, could total ~$2.9tr cumulatively from 2025-2028 on a global basis, or ~$1.7tr in the US alone. To size the market, we break down the spend into two distinct categories: the cost of the chips and servers, and the cost of everything else (Exhibit 20). We build our model by using our power estimates and by estimating the dollar cost per MW for both the build and the chips that will be hooked up to the power; as such, the costs are placed in the year the data center becomes operational, but we note of course that data center constructions are multi-year projects, and some of this spend will be spent ahead of the calendar year of operation.

Exhibit 19: Our global capex estimates, split out by type of spend (build vs hardware), region, and workload type.



Source: Morgan Stanley Research estimates

Total spend on hardware will come to around $1.6tr, by our estimates. We expect that spend on Nvidia (and other) GPUs and custom silicon (+servers) will average around $17mn/MW over the next four years, assuming 8 chips per server. The mix of the types of chips sold will change over time, as will the power consumption per chip, and we expect costs to fall marginally on a $/MW basis through 2028 (from $19.2mm/MW in 2024 to $13.7mm/MW in 2028). We build our estimates using quantity, power, and cost estimates for over 35 types of AI chips. We expect spend on non-AI chips and servers will be around $7mn/MW. Note that we expect that between 60-80% of the growth in power will be for GenAI workloads, with the balance for the non-AI workloads.

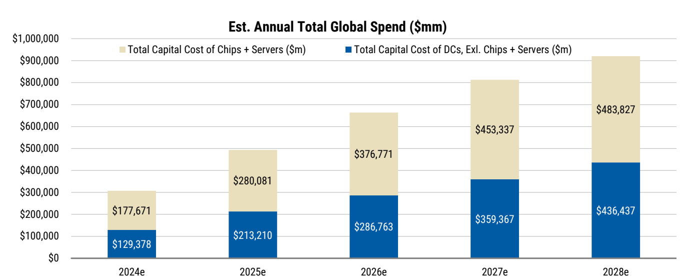
Total spend on the build will be around $1.3tr, by our estimates. For the non-hardware spend, we expect that costs to construct a new data center will vary by region, with some of the lowest global costs in Southeast Asia. Included in those costs are the costs of cooling, the land, building fit-out and mechanical costs, the networking equipment, transceivers, cabling, and other costs. We also expect that the costs of a data center suitable for the AI workloads will be more expensive than non-AI workloads.

Exhibit 20: We estimate a spend of $2.9tr for new data center construction between 2025 and 2027, globally

Global	2024e	2025e	2026e	2027e	2028e
Gen-AI Workload					
Capital Cost of DCs, Excluding Chips + Servers ($m)	$83,331	$160,887	$228,227	$294,489	$362,345
Capital Cost of GPUs/ASICs + Servers ($m)	$146,978	$244,881	$336,509	$407,300	$430,361
Total GenAI Workload Spend	$230,310	$405,768	$564,735	$701,789	$792,706
Cumulative Spend AI Spend 2025-2028		**$405,768**	**$970,503**	**$1,672,292**	**$2,464,998**
Non-AI Workload					
Capital Cost of DCs, Excluding Chips + Servers ($m)	$46,047	$52,323	$58,536	$64,878	$74,092
Capital Cost of non-AI Chips + Servers ($m)	$30,693	$35,199	$40,262	$46,037	$53,466
Total non-AI Workload Spend	$76,740	$87,522	$98,798	$110,915	$127,558
Cumulative Spend non-AI Spend 2025-2028		**$87,522**	**$186,321**	**$297,236**	**$424,794**
	2024e	2025e	2026e	2027e	2028e
Total Capital Cost of DCs, Exl. Chips + Servers ($m)	$129,378	$213,210	$286,763	$359,367	$436,437
Total Capital Cost of Chips + Servers ($m)	$177,671	$280,081	$376,771	$453,337	$483,827
Total ($m)	$307,049	$493,290	$663,534	$812,704	$920,264
Cumulative Spend (2025-28) ($m)		**$493,290**	**$1,156,824**	**$1,969,528**	**$2,889,792**

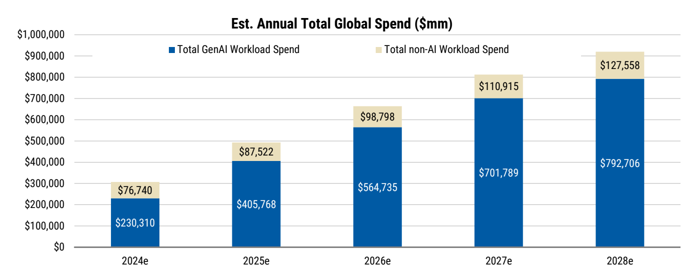
Source: Morgan Stanley Research estimates

Exhibit 21: Total global annual spend on DC infrastructure and chips & servers



Source: Morgan Stanley Research estimates

Exhibit 22: Total global annual spend on AI and non-AI workloads



Source: Morgan Stanley Research estimates

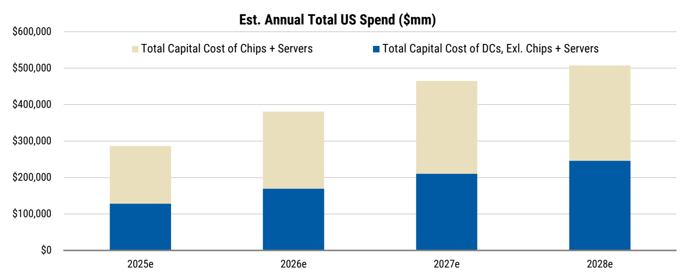
We expect that 55% of the GenAI workload will be situated in the US, with a total estimated spend of ~$290-500bn (including non-AI DCs). In the US, we assume that the data center costs, excluding the GPUs and servers, will be around $12mn/MW for GenAI and slightly lower at $10mn/MW for non-AI DCs. We see the main risk to our view that 55% of the data center workloads will be in the US is the power bottleneck (described more below); we would expect that should there be insufficient capacity in the US to power data centers, that capacity would likely be sourced elsewhere in the world, and that best efforts would be made to get chips online and operational *somewhere.*

Exhibit 23: In the US, we expect a cumulative spend of ~$1.6tr between 2025 and 2028

US	$mm/MW	2024e	2025e	2026e	2027e	2028e
Total Data Center Power Growth (MW)		7,189	11,205	14,678	18,154	21,194
GenAI Data Center Power Growth (MW)		4,334	8,065	11,223	14,355	17,014
Non-AI DC Power Growth (MW)		2,855	3,140	3,454	3,800	4,179
Gen-AI Workload						
Data Center Cost, Excl. GPUs + Servers	$12					
Capital Cost of DCs, Excluding Chips + Servers ($m)		$52,012	$96,784	$134,681	$172,257	$204,173
Capital Cost of GPUs/ASICs + Servers ($m)		$83,398	$138,036	$189,171	$228,743	$232,501
Total GenAI Workload Spend		$135,410	$234,819	$323,852	$401,000	$436,675
Total Cumulative GenAI Spend , 2025-2028			**$234,819**	**$558,671**	**$959,671**	**$1,396,346**
Non-AI Workload						
Data Center Cost, Excl. GPUs + Servers	$10					
Capital Cost of DCs, Excluding Chips + Servers ($m)		$28,546	$31,401	$34,541	$37,995	$41,795
Capital Cost of non-AI Chips + Servers ($m)		$17,416	$19,841	$22,634	$25,855	$28,885
Total Non-AI Workload Spend		$45,962	$51,242	$57,175	$63,850	$70,679
Total Cumulative non-AI Spend , 2025-2028			**$51,242**	**$108,417**	**$172,267**	**$242,947**
		2024e	2025e	2026e	2027e	2028e
Total Capital Cost of DCs, Exl. Chips + Servers		$80,558	$128,185	$169,222	$210,252	$245,968
Total Capital Cost of Chips + Servers		$100,813	$157,877	$211,805	$254,598	$261,386
Annual Total		**$181,372**	**$286,062**	**$381,027**	**$464,850**	**$507,354**
Cumulative Spend, 2025-2028			**$286,062**	**$667,089**	**$1,131,939**	**$1,639,293**

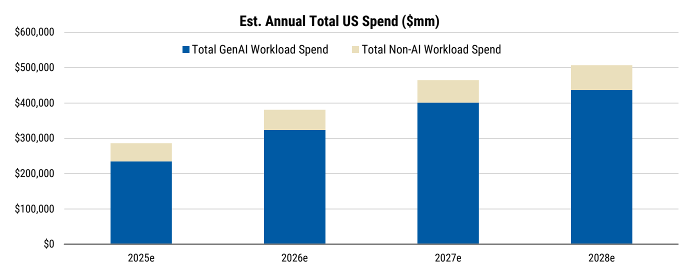
Source: Morgan Stanley Research estimates

Exhibit 24: Total annual US spend on DC infrastructure and chips & servers



Source: Morgan Stanley Research estimates

Exhibit 25: Total annual US spend on AI and non-AI workloads



Source: Morgan Stanley Research estimates

We expect most of the AI data center growth to be new builds, with an estimated cost of around $21-$31mn/MW (including GPUs + servers) or ~$8-$14mn/MW (excluding GPUs + servers). However, the time to power for a new build can be multiple years from the time the shovel first hits the ground, with power challenges particularly acute in the US. A report from the Lawrence Berkeley National Lab highlighted that "projects built in 2022 took 5 years from the interconnection request to commercial operations, compared to 2 years in 2015 and <2 years in 2008." We expect that the opportunity to convert existing large load assets, particularly those that are currently used for Bitcoin mining or the conversion of old Industrial facilities, will be an important part of the build in the near term as data center developers look for solutions that can provide a time advantage for bringing their hardware online faster. However, even if a powered shell is purchased from another use, significant costs will need to be spent on the retrofit; we estimate that the cost of the powered shell, plus the electrical, building fit-out, and mechanical work accounts for ~15% of the total data center cost (including hardware).

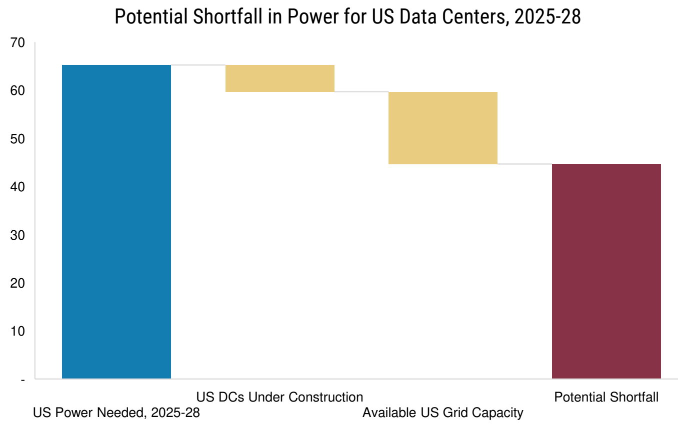
Risks to growth: underappreciated and overstated risks

Access to power in the US is the number one risk to growth at the moment. We estimate that there is a potential shortfall of ~45GW of power in the US through 2028; a recent survey by Schneider Electric found that 92% of respondents see grid constraints as a challenge, with long utility wait times slowing down expansion. (The Schneider Electric survey respondents further cited permitting issues, fiber availability, and access to chips as the next three causes of slowed down data center construction.) This power bottleneck is driven by a number of factors, including long lead times to secure new grid interconnection, power equipment shortages, an aging power transmission system, and greater weather extremes placing strains on grid reliability, among other reasons.

There are a number of de-bottlenecking solutions that will likely need to be drawn upon to fill this 45GW gap, including 1) converting crypto mining sites into data centers (which could provide >10GW of suitable US capacity; however, this option becomes more expensive with a rising cost of bitcoin), 2) siting data centers at large US nuclear power plants (20-25 GW of suitable US capacity, though with significant regulatory uncertainty for "behind the meter" data centers, which could reduce this solution down to 10-15GW), 3) building new natural gas-fired power plants (though capacity here is constrained by long build times and waitlists), and 4) on-site fuel cells (see more details here).

We think concerns that hardware and software efficiency gains will reduce the overall demand for compute (and hence data centers) are overblown. While some unconfirmed media reports suggest that some of the major players (here and here) are pulling back from lease discussions, and investors may interpret that news as a harbinger of a wider problem of data center overcapacity, we do not think this is the case, and we expect any excess capacity to be picked up by other players. Further, developments with respect to step-function improvements in the cost of training large language models should usher in a more rapid transition from training to inference rather than stymie the growth in data center development. Indeed, our equity research colleagues' channel checks suggest that demand for GPUs remains strong, and there are signs of continued strength in US AI infrastructure spend from the major hyperscalers.

Exhibit 26: Potential shortfall of power for US data centers, 2025-2028



Source: Morgan Stanley Research estimates

Moreover, while we have heard concerns that AI infrastructure capex will not yield an attractive ROI for the key players, thus slowing down/reducing development, our equity research colleagues do not share that view. They expect that GenAI yields a positive ROI starting this year and with total benefits over $1tr by 2028 (see their BluePaper here). More specifically, they expect that GenAI could drive a $1.1tr revenue opportunity in 2028 (up from $45bn in 2024) with margins approaching 70%. In addition, they estimate the consumer impact of GenAI on e-commerce, search, social, autonomous, and wearables will drive an additional $680 billion of spending by 2028. With this monetization of GenAI on the horizon, we expect that data center demand is likely to remain very strong, and the spend is justified by the fundamentals.

Technology Credit: Expect ~$200bn of Bond Issuance to Complement Sizable Cash Flows and New Leases

Large-cap tech cash flows may cover ~$1.4tr of our 4Y AI spend estimate

As the starting point for our entire financing path breakdown, we estimate $1.4tr of spend through YE28 may be funded with cash flows of large-cap tech companies. To date, we've seen hyperscaler AI capex largely self-funded by cash flows. We expect that could continue near term.

To help size funding needs, the hyperscalers' combined 2025 capex guide is >$300bn. This 2025 run-rate could imply >$1.2tr of cumulative capex spend for 2025-2028. Our equity research counterparts forecast almost $1.6tr of cumulative spend during that time frame, with embedded YoY growth (Exhibit 27). Sizable spend is specifically for technology infrastructure, like servers, data centers, and networking.

Theoretically, the multi-year sum of cash flow from operations is high enough to cover the total capex spend we laid out earlier. But a combination of capital allocation decision-making (e.g., investments, shareholder returns, acquisitions) and lack of visibility into long-term funding needs may mean that, in practice, the amount of cash flow that may be earmarked for capex may be much lower, with excess cash after other financial policy priorities going to build the cash balance.

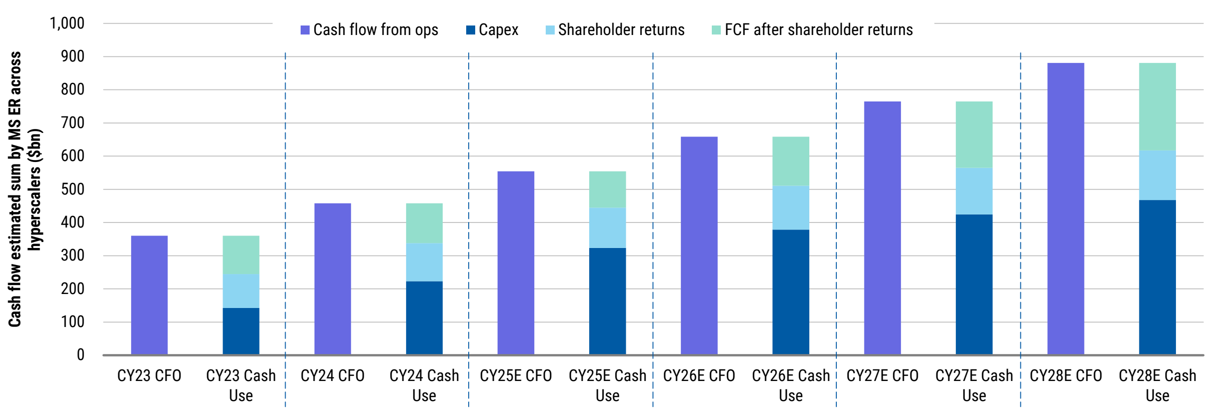
Hence, we lean into our equity research capex estimates, specifically that $1.6tr Morgan Stanley equity research 4Y aggregated capex number, to come up with the internal cash flow component of our financing breakdown. From that number, we remove $200bn, which represents potential corporate debt issuance. **Therefore, we think it is fair to use a $1.4tr number in our analysis to represent capex spend in our broader framework that may be covered by hyperscaler cash flows.**

We recognize that our analysis is basic as not all capex is necessarily for data center and/or AI spend, and we are excluding adjacent spending. Overall, this leaves a remaining sizable $1.5tr gap relative to the ~$2.9tr spend estimate.

It is worth noting as well that current cash balances in this space are already sizable. These provide an additional cushion for spend aside from future cash flow generation. For example, just Alphabet (GOOGL) and Microsoft (MSFT) combined have $175bn of cash, cash equivalents, and short-term investments as of 3/31/25.

Shareholder returns and acquisitions are other key uses of cash. For many of the large-cap technology companies, shareholder returns are sizable but manageable. However, capital allocation changes, specifically increased shareholder returns and/or acquisitions, can impact this analysis on a single-name idiosyncratic basis as changes could increase the need for debt funding and/or lessen the focus on investment. In our view, the use of cash flow for investment, rather than shareholder returns, is constructive from the credit perspective, something we flagged for ORCL specifically in our recent note.

Exhibit 27: Cash flow from ops should continue to cover capex needs for hyperscalers in the medium term, per Morgan Stanley equity research forecasts



Source: Company filings, Bloomberg, Morgan Stanley Equity Research (select models by Keith Weiss and Brian Nowak)

Technology sector credit quality & ratings provide significant issuance cushion, on paper

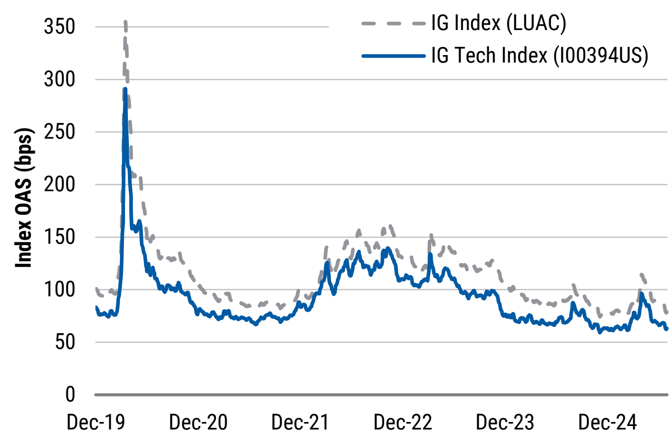
From a fundamental lens, the technology sector has stronger credit quality than other sectors across the IG market, thereby implying capacity to add debt, in our view. The sector carries considerably lower leverage (Exhibit 28), with 0.8x net leverage vs. the broader non-financial IG space up at 1.8x and other sectors in the 1.5x-2.0x (excl. outlier Utilities). We also take note of a significantly higher cash/debt ratio, a higher average credit rating (A2/A3), and other supportive metrics. We see this credit quality reflected in valuations, with the tech index trading at a ~15bp premium to the IG index (Exhibit 29).

Exhibit 28: The technology sector has notably lower leverage than other IG sectors

Select Credit Metrics by Sector at 1Q25			
Sector	Gross Leverage	Net Leverage	Cash / Debt
Communication Services	2.4x	2.0x	40%
Consumer	2.4x	1.9x	18%
Energy	1.8x	1.5x	11%
Health Care	2.4x	1.7x	27%
Information Technology	***1.8x***	***0.8x***	***56%***
Industrials	2.1x	1.7x	16%
Materials	2.3x	1.8x	15%
Utilities	5.6x	5.6x	1%
Non-Fin IG	**2.4x**	**1.8x**	**17%**

Source: Bloomberg, Morgan Stanley Research. See more in the Credit Strategy 1Q25 Fundamentals deck (slide 15).

Exhibit 29: Technology remains one of the tightest trading sectors, trading at a ~15bp YTD average premium to broader IG, reflecting its credit quality



Source: Bloomberg, Morgan Stanley Research. Updated 7/10/25, using a 5-day ma. Note: IG Technology Index excludes select hyperscalers but is a good proxy.

We see >$500bn of illustrative issuance capacity across just three issuers (and >$200bn for just one), using simple math against their respective downgrade thresholds for current ratings. For each corporate issuer, each rating agency provides not only a rating for the name, but also specific commentary around how an upgrade or a downgrade may be achieved. Typically that commentary focuses on debt/EBITDA ratios, but can also include FCF/debt and/or qualitative factors. In this case, we focus on three issuers that had the most sizable FY24 capex spend. These are very highly-rated names, and S&P provides a similar 1-1.5x sustained net adj. debt/EBITDA metric as a threshold across the respective downgrade commentaries. We found that the downgrade threshold at Moody's for these is more qualitative, hence our focus more on S&P.

In our illustrative adj. debt cushion analysis in Exhibit 30 , we calculate an estimate for additional adjusted debt cushion, using FY25E EBITDA and accounting for current adjusted debt. For just three issuers, we arrive at a sum of >$500bn of illustrative issuance capacity. For Alphabet specifically, at the time of its USD/EUR bond deals this spring, S&P called out that the company would have to increase its net debt by >$200bn before reaching the 1x adj. net leverage downgrade threshold for the AA+ rating (4/28/25 note).

In this simple analysis, we may be understating capacity in two ways. First, we do account for near-term EBITDA growth through FY25, but we're not looking through YE28. Second, we assess capacity just based on the current ratings level. It is possible companies may be willing to fall to a lower ratings tier. We saw lower-quality ORCL let itself fall a few tiers a few years back as it debt-funded shareholder returns and an acquisition. However, on the other hand, it is important to clarify that the "debt" we quantify here is not just unsecured bond issuance, but would include increases in leases (debt-like liabilities included in agency-adjusted debt balances), as we discuss later .

Exhibit 30: We present >$500bn of illustrative issuance capacity across just three issuers, using a simplistic approach against adj. debt/EBITDA downgrade thresholds for current ratings

Illustrating Sizable Debt Cushion Under Select Tech Bond Ratings' Downgrade Thresholds			
Issuer	**GOOGL**	**MSFT**	**AMZN**
Agency for analysis	S&P	S&P	S&P
Rating	AA+	AAA	AA
Select downgrade threshold details (focus more on quantitative rather than qualitative)	Sustained lev >1x, as result of acq. or change in financial policy	Lev >1x sustained, most likely from sustained heavy capex & large acq.	Lev exceeds 1.5x, among other metrics & considerations
Reported recent adj. leverage	NM	0.2x	0.4x
Reported recent adj. debt ($bn)	(54.8)	29.2	58.6
Agency est. FY25E adj. EBITDA ($bn)	172.2	161.2	155.9
Illustrative issuance capacity ($bn)	**227.0**	**132.0**	**175.2**
FY25 end for reference	12/31/25	6/30/25	12/31/25
Select info above as of…	*12/31/24*	*6/30/24*	*12/31/24*
Source: Note dated…	*3/6/25*	*5/21/25*	*5/6/25*

Source: Company filings, S&P, Morgan Stanley Research.

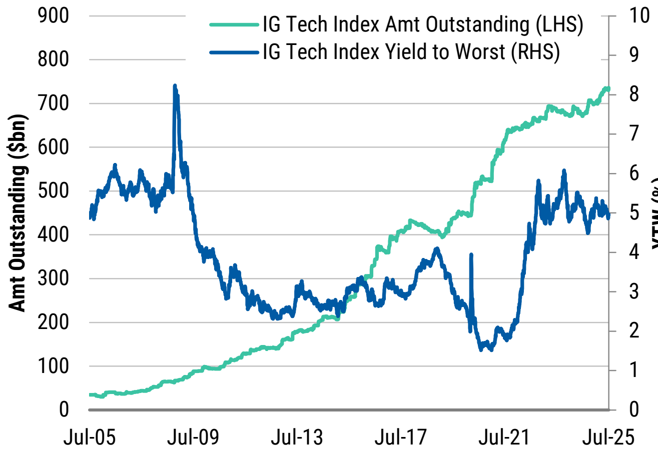
Companies may lack willingness for significant & immediate on-balance-sheet funding but will be opportunistic

We think technology companies would like to avoid major debt funding, such as the hundreds of billions implied by ratings cushion capacity, and we would expect reliance on unsecured corporate debt to grow in phases. We think that large-cap technology companies may have an aversion to significant on-balance sheet debt funding for capex, which could pressure price/valuation multiples. This has implications not only for the size of balance sheet debt, but also for the timeline for such funding too.

We think equity investors would probably prefer a piecemeal and limited approach vs. sizable jumps in unsecured on-balance-sheet debt, especially when ROI is in question and there are risks of tech obsolescence. Given current cash flow coverage of capex for many players, and the still relatively nascent role of tech in the credit world, we expect reliance on unsecured corporate debt to grow in phases, and accelerate later in our horizon through 2028. In this early stage of the investment cycle, we think hyperscalers will lean on cash flows, cash on hand, leases, and more. But as monetization accelerates, we think investors may have a clearer line of sight to facilitate unsecured debt issuance.

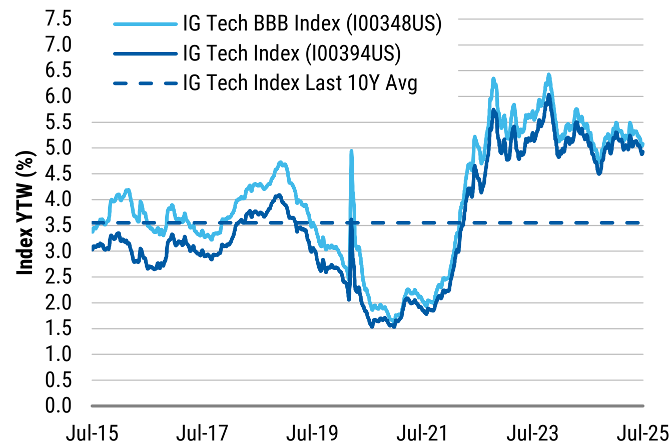
All this said, in regards to time frame, we think management teams will still be opportunistic around cost of funding and issuance windows, even if issuance is not extreme in size. In the tech space in the past, many management teams have been efficient with a quantitative approach to capital allocation, issuing debt when rates are lower (and most often using that to buy back stock and/or build cash). This is illustrated by the three-year-period between late 2018 and late 2021, when the IG Tech Index YTW fell significantly by almost 2 percentage points and index debt jumped by more than 50% (Exhibit 31). Currently, the IG index is sporting a 5.1% YTW, which compares to recent lows of 4.6% in September 2024 and five-year highs of 6.4% in fall 2023, but is still well above the tights of the past decade in the 2% context (Exhibit 32). Our macro strategists see interest rates moving notably lower, forecasting 10Y UST yields at 3.45% 1Y out and the 30Y at 4.15%, while our US Credit Strategists forecast little movement in IG spreads with their base case of 90bp at 2Q26 end.

Exhibit 31: We saw IG Tech index debt jump, as index YTW dropped, in the '18-'21 time frame, but still grew by $120bn in the '21-'25 time frame



Source: Bloomberg, Morgan Stanley Research. Updated 7/10/25, using a 3-day ma.

Exhibit 32: The IG tech index is still yielding ~1.4 percentage points more than the past-decade-average



Source: Bloomberg, Morgan Stanley Research. Updated 7/10/25, using a 7-day ma.

Single-name index levels and tech sector index weighting provide reasonable framework for ~ $200bn issuance capacity plug

We think that ~$200bn is a reasonable estimate to use in our financing spend calculation to represent potential technology corporate debt issuance. This is lower than what we may see from the fundamental perspective above, i.e. the >$500bn of cushion vs. ratings thresholds. But we think our view on technology issuer willingness to fund with on-balance sheet debt is an important qualitative consideration. And further, **we find support for a $200bn estimate for IG tech corporate issuance from a technical lens in two ways: 1) from a micro perspective, assessing single-name index debt levels relative to telco/cable issuers, and 2) from a macro perspective, using the IG Technology Index weighting and historical amount outstanding growth.**

First, from a micro perspective, we see capacity for major tech issuers to grow their index debt levels toward telco/cable balances, specifically ~$150bn of capacity for just three of them. When thinking about unsecured debt issuance, we think it is reasonable to cap technology issuers' index debt balances at the largest non-financial corporate issuers' index debt balances, considering when the market might be "full" from a technical standpoint. Those largest names happen to be in the TMT space, but in Communications (AT&T and Comcast), with both posting total par value index debt of ~$80bn+. Our illustrative debt cushion math assesses the difference between a potential $85bn cap and the current index debt balances of three issuers, those with the most sizable CY24 capex spend (Exhibit 33). We arrive at ~$150bn cushion summed across just those three.

This may be a conservative approach given 1) numerous other technology issuers, 2) a potential argument for a cap >$85bn supported by the higher credit quality of many tech issuers relative to lower-rated Comcast (A3/A-/A-) and AT&T (Baa2/BBB/BBB+), and 3) higher telco index debt balances in the past, with AT&T's par value contribution to the index exceeding >$100bn back in 2017. But this approach does seem more reasonable than our earlier ratings-implied capacity math.

This idea of index debt levels has come up in the context of ORCL credit, a larger and lower-quality balance sheet that did a US$7.75bn six-part bond deal earlier this year (though proceeds were largely for refinancing). We discussed in a recent note how the total debt growth we expect over the next two years, if all eligible, could put ORCL in contention for the top nonfinancial issuer index spot vs. telco peers, AT&T specifically. Read more: TMT Credit Research: ORCL Credit: Opening the (Star)Gate to More Capex, Bond Issuance, and Leases (17 Jun 2025).

Exhibit 33: We arrive at ~$150bn of illustrative issuance capacity across just three technology credits when we solely focus on index debt of each vs. the top non-financial IG index constituents; in this exhibit, we list the top IG index constituents in order of par value index debt outstanding

US Corporate IG Index (LUAC) - Top 25 Members

Ticker	GICS Sector	Par Index Debt ($bn)	Ticker	GICS Sector	Par Index Debt ($bn)
JPM	Financials	177.7	DUK	Utilities	66.8
BAC	Financials	175.1	**TMUS**	**Communication Services**	**62.0**
MS	Financials	144.8	**AVGO**	**Information Technology**	**56.9**
C	Financials	118.7	ABBV	Health Care	56.4
WFC	Financials	117.9	**CHTR**	**Communication Services**	**52.8**
GS	Financials	114.8	AMGN	Health Care	52.2
T	**Communication Services**	**86.8**	GM	Consumer Discretionary	50.7
HSBC	Financials	84.0	AMZN	Consumer Discretionary	50.3
CMCSA	**Communication Services**	**80.8**	CVS	Health Care	50.1
ORCL	**Information Technology**	**80.0**	NEE	Utilities	49.9
VZ	**Communication Services**	**78.7**	PFE	Health Care	49.6
AAPL	Information Technology	75.5	F	Consumer Discretionary	46.3
UNH	Health Care	73.4			

Illustrative Index Debt Cushion for Select Tech Credits vs. Top Non-Financial IG Index Constituents

Issuer	GOOGL	MSFT	AMZN
Imposed index debt cap (approx T/CMCSA balance)	85.0	85.0	85.0
Current index debt of hyperscaler	16.0	42.6	50.3
Implied index debt technical cushion	**69.0**	**42.4**	**34.8**

Source: Bloomberg, Morgan Stanley Research. Notes: Bold tickers in top table denote names covered by MS TMT Credit Research (all by Lindsay Tyler, with exception of CHTR coverage led by David Hamburger). AVGO balance includes VMW. Updated 7/10/25.

++ Rating and estimates for this company have been removed from consideration in this report because, under applicable law and/or Morgan Stanley policy, Morgan Stanley may be precluded from issuing such information with respect to this company at this time.

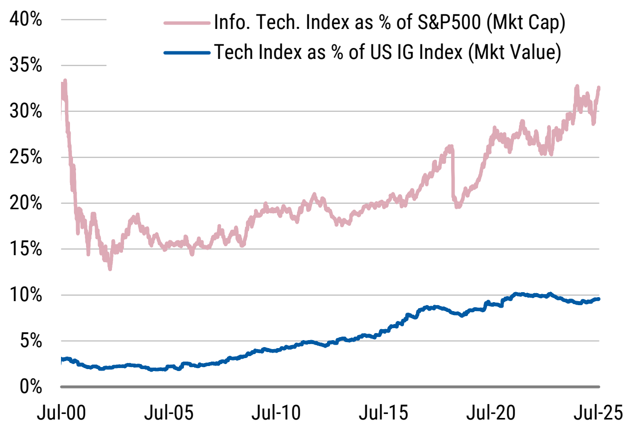
Further, from a broader macro perspective, the IG Technology Index has room to grow and could reasonably support an additional $200bn of net supply through YE28, in our view. The sector has now grown over the past two decades, from ~2% to 9.6% of the US IG corporate credit market now, illustrating the growing importance of the sector to investors and impact on the market broadly (Exhibit 34). This current contribution to the IG market roughly aligns with that of healthcare/pharma, communications, and utilities.

We think the ratio of IG Tech Index/IG Index debt could increase, even beyond the high of ~10.1% in spring 2023. In our simplified illustrative sensitivity analysis in Exhibit 35 , we find that the ratio could move up to ~12% if ~$200bn of net new IG technology index-eligible debt was hypothetically added to the IG index. This is a conservative approach assuming no other net supply in other sectors, so such a bump could yield a lower ratio.

We also think it is supportive that the sector has seemingly held back on borrowing for some time but is slowly starting to ramp back up. The growth of tech debt outstanding, relative to the broader IG market, has slowed since 2020, but year-to-date, has moved 0.4 percentage points higher. Further, the technology sector's role in credit still pales in comparison vs. its ~30% market cap contribution to the S&P 500. Lastly, the index grew by ~$120bn in amount outstanding during the last four years (shown in Exhibit 31).

All in all, while select data center players sit outside of the IG Tech Index, we think it is a good proxy to confirm our initial micro analysis technical takeaways.

Exhibit 34: Tech debt has grown to represent almost 10% of the broader IG market, while ~30% of S&P 500 market cap is in information technology names



Source: Bloomberg (using I00394US, LUACTRUU, S5INFT, SPX), Morgan Stanley Research. Updated 7/10/25.

Exhibit 35: Sensitivity analysis to illustrate the impact of $0-200bn of additional IG tech index debt on its weighting in the IG index

Impact of Add'l Tech Debt, All Else Equal	
Additional Tech Index Debt ($bn)	Implied IG Tech / IG Index Ratio
0	9.6%
50	10.3%
100	10.9%
150	11.5%
200	12.1%

Index Balances For Reference	
Index Name	Current Mkt Value ($bn)
IG Tech (I00394US)	678
IG Index (LUACTRUU)	7,049

Source: Bloomberg, Morgan Stanley Research. Updated 7/10/25.

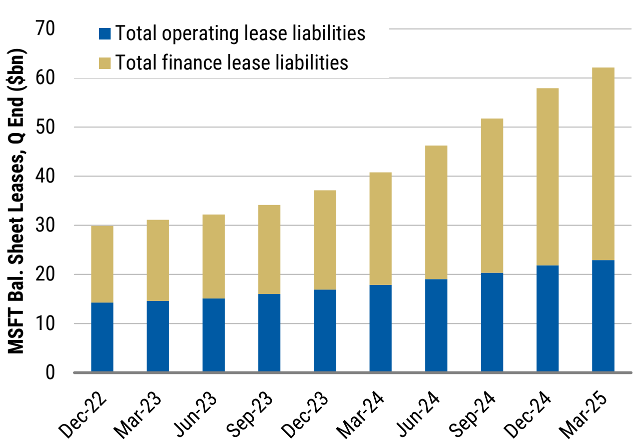
Notable lease liability uptick by select IG hyperscalers, a debt-like liability, in our view

Data center leases are another funding vehicle for corporates' AI-related spend, and we're seeing MSFT and ORCL use these in size. As we discussed in our recent note on ORCL credit, for the hyperscaler names, leases are typically for facilities such as data centers and offices. A few benefits of using leases are that companies are looking to address additional data center capacity needs quickly (build vs. rent), and this part of the financing doesn't get rolled up into balance sheet debt. ORCL management discussed on its last earnings call that it has building partners that charge the company rent once data center construction is finished. But when ORCL has suddenly higher capex, it means the company is filling out data centers, buying components to build computers, and putting them on the floor.

MSFT's lease liabilities between operating and finance have more than doubled since CY22, and it has "not yet commenced" lease balance peaked above $115bn in mid-2024 (Exhibit 36 , Exhibit 37). Meanwhile, we've seen ORCL's operating leases more than double over the past two years, while additional lease commitments that haven't yet commenced stand at $43bn.

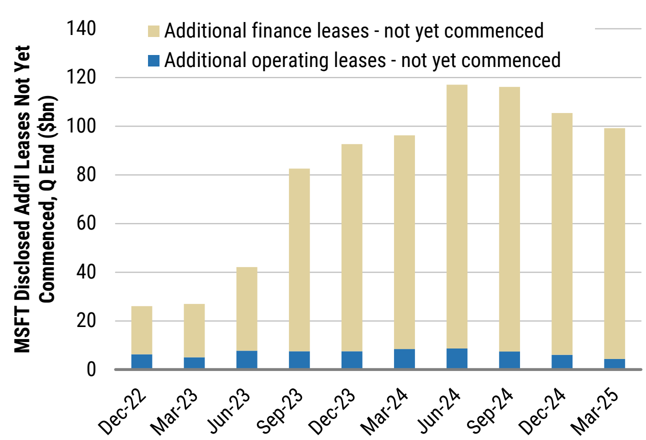
Rating agencies treat leases as an adjustment added for the adjusted debt balance. Therefore, the additional lease commitments may result in a more sizable differential between reported balance sheet debt and rating agency-adjusted debt balances.

Exhibit 36: MSFT's lease liabilities, across operating and financing, have more than doubled since CY22 end and now rival its reported balance sheet debt number



Source: Company filings, Morgan Stanley Research

Exhibit 37: MSFT's additional finance leases that haven't yet commenced, primarily for DCs, peaked above $100bn in CY2Q24 and CY3Q24



Source: Company filings, Morgan Stanley Research

Other AI-related corporate issuance by DC REITs & HY neocloud, or for AI-related M&A, or in other currencies

This report is meant as a high-level starting point on this topic, so it makes sense for us to be focusing on IG hyperscalers and their possible USD unsecured bond issuance. However, we do see adjacent financing paths, cash uses, and issuers. **Our comments below regarding EQIX's funding plans, hyperscaler issuance in other currencies, and new HY neocloud issuance serve to substantiate our ~$200bn corporate issuance plug.**

Data center REIT unsecured issuance: Over the past few years, we've seen data center REIT take-privates (ex. KKR/GIP for CyrusOne in a $15bn deal), and those developers are now issuers in the ABS market rather than in the corporate market. The current USD-denominated bond balances of the two remaining large IG-rated data center operators, Equinix (EQIX) pales in comparison relative to the hyperscalers, with $8.9bn of index debt relative to MSFT's $42.6bn. EQIX has a JV in place with GIC and CPP, and has been active in issuance in other currencies, given the lower cost of funding. However, we could see more issuance in USD in the future. Specifically, in March 2025 at the MS TMT Conference, EQIX management outlined its plans to be in the debt capital markets in the US and highlighted 1-2 turns of rating agency capacity for leverage. EQIX then hosted an Analyst Day in late June 2025 and disclosed plans to raise $16bn of debt over the next five years, including 2025, with $8bn of refinancing and $8bn of incremental debt.

IG tech bond issuance in other currencies: For example, Alphabet (GOOGL) did a US$5bn four-part bond deal and a €6.75bn five-part bond deal in April 2025.

High-yield bond & loan issuance: For example, neocloud company CoreWeave (CRWV) priced a $2bn 5NC2 at par to yield 9.25% in late May 2025, following its private credit deals and IPO. Use of proceeds were earmarked for general corporate purposes, including repayment of outstanding indebtedness.

IG tech bond issuance for AI-related M&A: While not directly for data center spend, we have seen IG technology issuance over the past few years for acquisitions where AI was mentioned in the deal announcement releases. For example, Cisco (CSCO) did a $13.5bn seven-part bond deal in February 2024, with use of proceeds for general corporate purposes, including to partially finance the acquisition of Splunk. Hewlett Packard Enterprise (HPE) did a $9bn six-part bond deal in Sept. 2024, with use of proceeds to help fund the recently-closed Juniper acquisition. Synopsys (SNPS) did a $10bn six-part bond deal in March 2025 with net proceeds to fund part of the cash portion of the still-pending Ansys deal.

Presence of preferreds and converts as alternative: For example, in connection with the aforementioned acquisition of Juniper, HPE priced $1.35bn of Series C Mandatory Convertible Preferred Stock in September 2024. Super Micro Computer (SMCI), a maker of AI servers that doesn't have corporate unsecured bonds outstanding, was recently in the market with a new zero-coupon convertible due in 2030.

Worth following hyperscalers' involvement in venture capital, major AI funding partnerships, power partnerships

Paired with their direct investments in data centers, Big Tech companies are getting involved in venture capital funding, especially of large headline start-ups, partnerships/projects with other corporates and funds, and power agreements with players like in the nuclear space. These developments are worth following and can act in the form of current/future cash uses or sources.

IG tech companies' involvement in venture capital: More broadly, AI investments remain a priority for venture capital, with PitchBook flagging almost 60% of global VC dollars invested in 1Q25 going to AI and machine learning startups (with a higher percentage for North America). As reported by Business Insider, of the >$90bn in deal value in the US in 1Q25, more than half was accounted for by OpenAI's $40bn round, Anthropic's two funding rounds totaling $4.5bn, and Groq's $1.5bn round; large-cap corporates have been involved in funding for all three (ex. MSFT in OpenAI since 2019 and AMZN in Anthropic). Corporates continue to be significant contributors of venture dollars, alongside VC firms, with PitchBook highlighting that, of the $192bn in venture dollars invested in the US in 2024, corporate venture capital (CVC) participated in $108bn worth of deals.

Partnerships with asset managers, funds, other corporates: We have seen not only JVs between data center REITs and private equity, but also large fund announcements between hyperscalers and other players. The AI Infrastructure Partnership (AIP) was formed by BlackRock, Global Infrastructure Partners (GIP), Microsoft, and MGX last year. Further, the Stargate project was announced in January 2025.

IG tech companies' agreements with power players for data centers: Our colleagues earlier highlighted the potential shortfall of power in the US in the medium term. There is rising demand for electricity by data centers, and we've seen Big Tech make requests for power and announced agreements with power players. For example, Talen Energy announced in June 2025 an expanded nuclear energy partnership to supply electricity from a Pennsylvania plant to Amazon AWS data centers. Another example was the announcement between Microsoft and Constellation Energy in the fall.

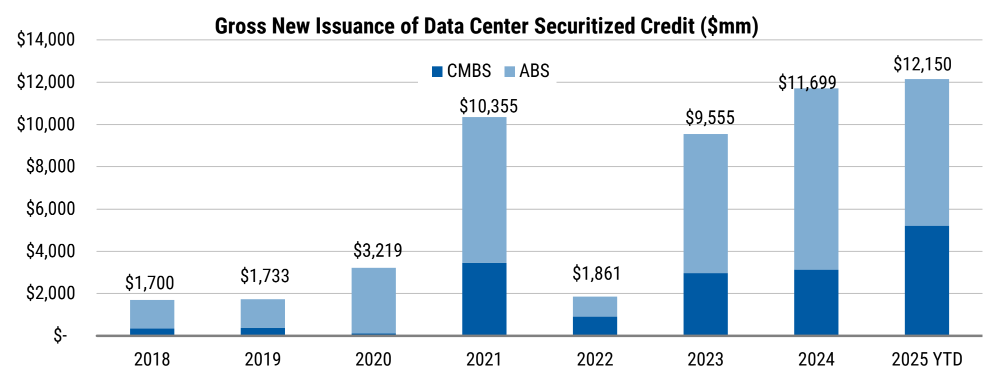
Securitized Credit: An Increasingly Sought-After Take-out Option

We estimate that the securitized credit data center market – including here ABS and CMBS – could provide around $150bn of financing between 2025-2028 to the US data center industry. Data center leases, on a per megawatt basis, are the underlying source of income for the data center owners. These owners are likely to achieve a more favorable cost of financing by leveraging these contractual relationships with investment grade tenants.

Securitized credit products are generally issued only once data centers have achieved some level of stabilized performance state and are operational with tenants in place. The financing raised by these issuances are often used to refinance the developers' existing debt, including project finance or construction loans necessary to build the data center in the first place, or to fund the development of new construction projects. More recently, however, we have seen a CMBS issuer (GSMS 2025-800D) experimenting with securitizing financing backed by a data center that is under construction, the first securitized credit data center deal to feature a data center that is highly transitional in nature.

Sizing the securitized credit opportunity

Exhibit 38: Supply of data center securitized credit bonds in 2025 has already surpassed previous annual highs



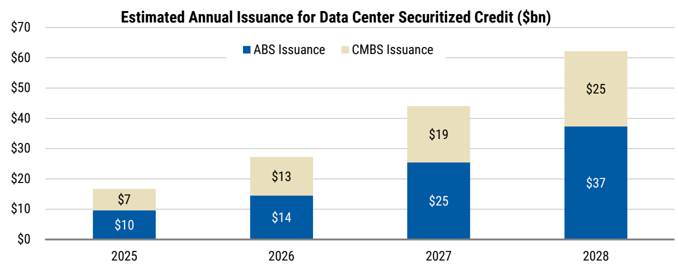
Source: Finsight,Trepp, Morgan Stanley Research. Issuance data as of June 30, 2025.

We estimate that over $50bn of data center-backed debt has been raised in USD securitized credit to date since 2018, with roughly ⅔ ($36bn) through the ABS market and a further ⅓ ($17bn) in the CMBS markets.[1] There have also been two European ABS deals for data centers in the UK and Germany issued in recent years for a total of roughly $1.1bn. Overall, data center backed securitized debt is growing rapidly with supply in 2025 already surpassing the entirety of 2024 (~$12.2bn this year vs $11.7bn last year). We anticipate that the ABS and CMBS markets will be an increasingly attractive option for data center developers through which they refinance their existing debt or fund new developments as the market matures and liquidity improves.

The securitized credit market for data centers will supply around $150bn in ABS and CMBS issuance from 2025-2028, by our estimate. Using disclosures from the deal documents, we estimate that roughly 2.6GW underpin the US ABS deals (with a further 300MWs in Canada, UK, and Germany) and around 1.4GW underpin the CMBS deals. We estimate that there are around 42GW of installed data center capacity in the US, and so we believe that the securitization market to date backs just under 10% of total capacity in the US. We think the rate at which new GWs that come online will be securitized will increase in the coming years as the markets mature, and hence, we expect to see an annual securitization rate up to 25% across both ABS and CMBS markets by 2028.

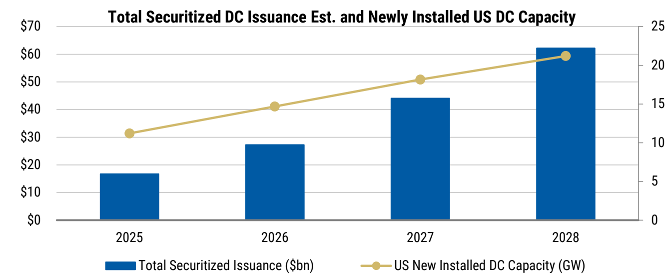
1. Note that figures are as of June 30th, 2025.

Exhibit 39: ABS and CMBS supply forecast through 2028



Source: Morgan Stanley Research estimates

Exhibit 40: Securitized credit issuance vs newly-installed DC capacity

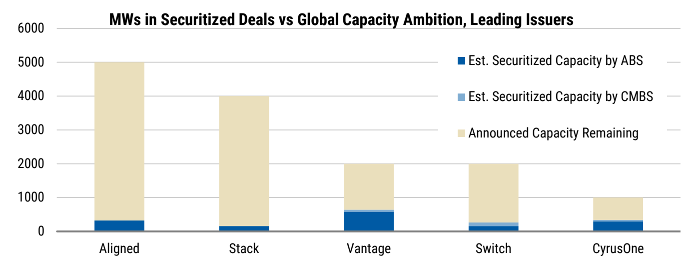


Source: Morgan Stanley Research estimates

Most of the issuers which have already come to market have ambitious growth plans. We estimate that around 45% of the data centers that are operational and owned by ABS issuers currently back outstanding issuances (with an average rate per developer of ~50%); of data centers that are planned, operational, or under construction, we estimate just around a quarter back ABS deals (by count) (with an average rate per developer of 35%). Moreover, these issuers alone have likely securitized to date just around 10% of their planned global capacity (17% on average). Indeed, 14 of 17 ABS issuers for which data were available combine to have nearly 25GW of planned total capacity; a higher reliance on the ABS or CMBS markets could see these markets grow considerably. **Thus, we don't view supply as a constraint on growth, and indeed we think we will see issuers increasingly tap the ABS/CMBS markets once they have sufficiently tested the waters.**

At least three issuers have also used both the ABS and CMBS markets, including Switch and CyrusOne. Indeed, we think to date that preference for one market over another has been largely due to familiarity with the market rather than because of a fundamental preference for one structure over another. Moreover, we have heard that issuers foresee large financing needs over the coming decade and thus prefer to test out the waters, so to speak, in multiple markets sooner rather than later. Over time, we think it is likely that ABS markets lend themselves more to developers that lean heavily into diversity (both in terms of type and quantity of tenants, and also number of data center campuses in each deal), while the CMBS market may be better suited, through its SASB structure, to large training facilities with few or one hyperscaler tenants. That said, there is crossover between the types of collateral found via the two financing structures, and so we think that the collateral usage may be fluid across both ABS and CMBS going forward.

Exhibit 41: Est. securitized capacity vs global ambitions, sample of leading ABS/CMBS issuers



Source: Deal docs, corporate disclosures, Morgan Stanley Research. Data as of June 30, 2025.

The securitization market could potentially be a global solution, though it is highly concentrated in the US for now. The ABS market thus far has primarily financed US data centers, with ~90% of MWs underpinning the deals located in the USA and the balance spread out across Canada, the UK, and Germany. Many of the US data center developers also operate campuses in Canada (primarily British Columbia, Ontario, and Quebec); most also have global growth ambitions with developments across Europe and APAC. We thus see the possibility of increased CAD, GBP, or EUR data center ABS supply in coming years, but we would be hesitant to quantify the expansion as we think the limitations there are primarily demand-side. While recent European Commission's legislative proposals for revamping securitization regulation, following last year's consultation, make us optimistic about the revival of European securitization markets, we temper our enthusiasm pending the finalization of the regulatory changes due next year (see here for more details from our European securitized analyst, Vasundhara Goel).

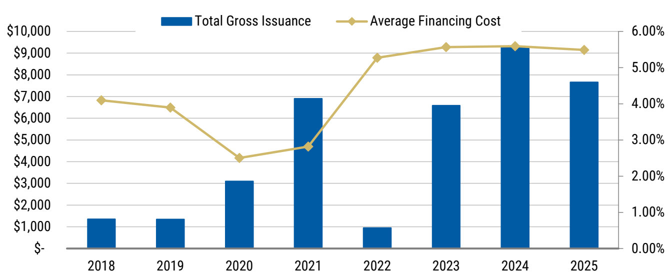
The securitization market has also only financed the build of data centers rather than the underlying hardware, but we see an opportunity for securitization of GPUs going forward too. Tenants primarily lease space (on a per MW basis) and provide their own hardware (the servers and chips). However, there is an emerging class of companies that provide GPUs as a service (GPUsaaS), such as CoreWeave. These companies lease out GPUs to hyperscaler clients, and we think these contracts could ultimately be securitized into an ABS structure with the hardware leases backing the deals. Unlike data center ABS, we would expect a GPU ABS to be amortizing given the useful shelf life of a chip (4-8y, for example) compared to a data center (>20y).

Relative cost of financing

Issuing into the securitized credit market provides the issuer with a more competitive cost of capital for a comparable duration than it might have been able to achieve elsewhere through private credit, construction financing, or indeed unsecured credit. Since 2022, issuers in the ABS market have had an average financing cost of around 5.5%, which we expect would be lower than they would achieve should they have issued into the unsecured market. Indeed, the US ABS coupons are comparable to USD IG debt (4-7y) coupons, and significantly lower than the average HY coupon over the same time period. At present, we think these issuers would be unlikely to achieve an IG rating; the securitized credit markets thus allow for them to directly leverage their contractual relationships with IG-rated tenants and issue debt at lower coupons. As these developers mature, it is possible that they could transition to preferring unsecured debt once they would be eligible for an IG rating.

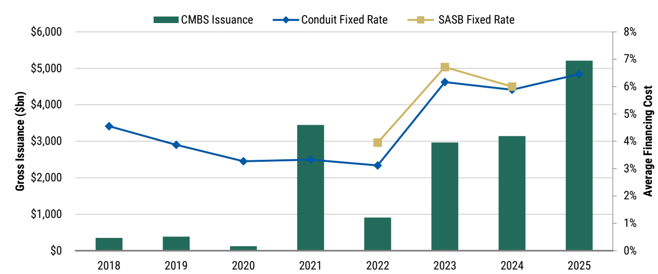
Spreads should tighten in the next 12 months, in our view. We think existing pools of demand are robust, particularly from insurance funds and other yield buyers, and we think there are potential pockets of demand from securitized credit investors that are still sitting on the sidelines as they ramp up from an education standpoint on the space.

Exhibit 42: Average financing cost over time vs gross issuance, US DC ABS market



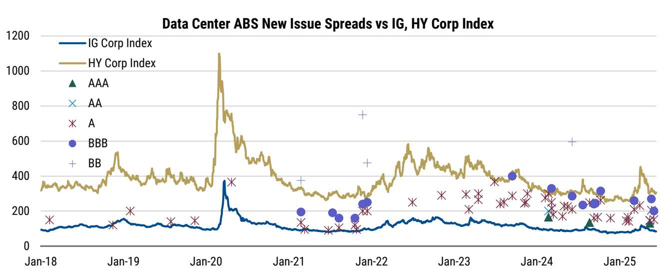
Source: Finsight, Morgan Stanley Research. Data as of June 30, 2025

Exhibit 43: Average CMBS cost of financing on fixed-rate bonds over time



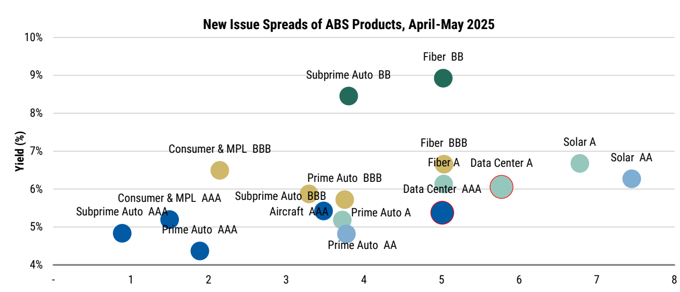
Source: Trepp, Morgan Stanley Research Estimates. Data as of June 30, 2025

Exhibit 44: New issue US DC ABS vs IG and HY corporate spreads



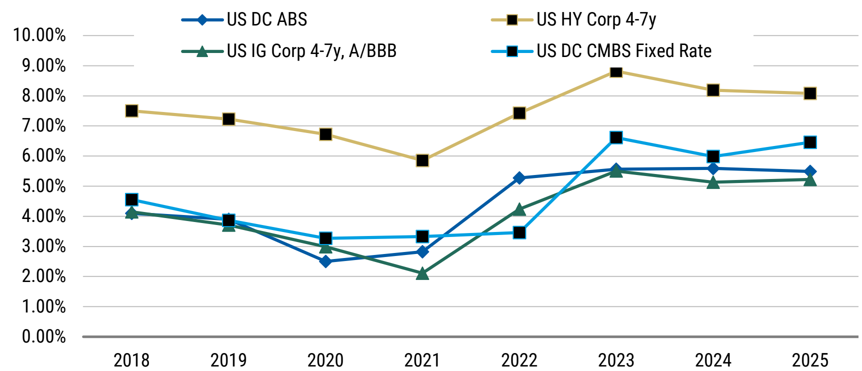
Source: Finsight, Bloomberg, Morgan Stanley Research. Data as of June 30, 2025

Exhibit 45: Recent new issue data center ABS vs other ABS products



Source: Finsight, Morgan Stanley Research. Data as of June 30, 2025

Exhibit 46: US ABS coupons and CMBS fixed rate vs HY and IG USD corporate coupons over time



Source: Finsight, Bloomberg, Morgan Stanley Research. Data as of June 30, 2025

Risks to market growth

1. Shift in preference to other debt types: While many data center developers have looked to the securitized credit markets as their primary source of capital from capital markets in recent years, we think it is possible that a maturation of the industry could result in 1) more favorable terms in private credit or 2) higher credit ratings, and hence a shift to unsecured corporate credit. We believe the data center players have large ambitions and will require significant financing to meet their goals, but it is possible that they come to view securitized markets as less preferable to some other debt options; we highlight two examples below.

- Aligned (ADC), for example, issued ABS four times between 2021 and 2023 for a total of $2.6b with 323MW across 7 data centers in its mastertrust structure with a weighted-average cost of 4.2%. Aligned has a stated goal to deploy 5GW+ of capacity, and we estimate that 12 of its 30 announced data centers are already operational. However, ADC has not returned to public markets since its last ABS transaction in 2023, and indeed completed a $12bn financing round in January 2025 ($5bn in equity and $7bn of new debt commitments).
- Equinix (EQIX) is one of two of the largest data center developers in the US, and indeed, there are only two publicly-traded data center companies. Equinix has not issued securitized debt, and instead has issued BBB-rated bonds to finance its global operations.

2. Data center obsolescence: Some market participants are concerned that data center construction will exceed demand for MWs over the next decade. Headlines about LLM developer DeepSeek earlier this year prompted concerns that there will be frequent step-function improvements in LLM training capabilities, and the amount of capacity being built will not be needed. Quantum computing, as a further extreme, could dramatically reduce the demand for traditional GPUs and re-imagine the entire compute industry. Securitized products investors are concerned that the data centers that collateralize current ABS structures may see weak demand in five years when their refinancing dates come due, either because of a secular industry challenge (broad decline in demand for compute) or because of a local challenge (decreased demand for data centers in a particular region, for example due to more demand for inference compute (which needs to be proximal to major urban centers) over training (which can be situated in remote areas)).

3. Power constraints: As mentioned in this report, the main bottleneck to US data center development at present is the availability of power. Chip demand is global, though, and so we believe that if there is insufficient power capacity in the US that chips will find power in other regions with excess power (even if on a 1-2y delay). However, the securitization market is a predominantly American phenomenon, and our estimates of growth are predicated on our assumption that 55% of capacity will be in the US. Should this number prove to be too high, we would expect to see lower issuance than we have predicted.

4. Concentration limits: On the demand side, while we believe appetite for these products is growing and will continue to swell as these products become more mainstream, we are cautious around concentration limits. Fixed-income investors, we believe, are indeed looking for ways to allocate to GenAI growth, and we think data center securitized credit is one important way to do so. However, we think fixed income funds will have a soft upper limit of tech exposure comparable to the equity market and will need to gradually build up to those levels. If pricing becomes less favorable in ABS/CMBS if demand wanes, we would expect to see other financing options (such as HY unsecured credit, or private credit) take up the workload.

An $800bn Opportunity in Private Credit, Led by Asset-Based Finance (ABF)

With the corporate bond and securitized credit financing numbers above adding to ~$350bn, that still leaves a sizeable gap to the $1.5t number we raised earlier in the Estimating incremental financing needs and paths sub-section. We think private capital, especially credit, will play a significant role in meeting this additional gap. Our thesis not based purely on a process of elimination. Instead, we think the type and magnitude of end-investor demand growth in private credit, evolution of the asset class, and need for high/mid-quality asset exposure make it ideal to finance data centers early in the investment cycle.

Why private credit is tailored to meet DC financing?

It is helpful to start with a quick assessment of the data center financing cycle. At the outset, capital is needed for acquiring land to build the data center facility. Over time, more capital is needed as construction begins, milestones are met, and the physical infrastructure/power needs to be set up. Initial financing can often raised in the form of a construction/commercial mortgage loan or project financed by the developer (hyperscaler or another investor) in the facility (that provides the equity capital).

For smaller-scale projects, bank lending alone may suffice in a form of a commercial loan. However, the size of investment needs in aggregate are very large, compared to the total outstanding C&I lending pie from banks, which is around $3tr. In other words, direct bank lending does not have the capacity to meet the investment pie. Further, these construction loan facilities typically have shorter horizons, so it is fair to assume that developers would want to take out any initial bank lending and transition towards deeper/scalable/stickier sources of credit.

Public data center REITs are another investment channel, but these companies have a very small presence in the public debt and equity market, after numerous take-privates over the past decade. For instance, Equinix is a large public data center REIT with a market cap of ~$74bn and just $9bn of total debt in the $ IG index. The company is rated within the lower tiers of investment grade across the agencies (mid-to-low BBB).

Hyperscalers have the capacity and knowledge to build data centers by themselves, but we think there are limits given the size of investment needs and risks. According to a recent report from Apollo, hyperscalers do self-build, but that is typically 20%-45% of their data center capacity needs. The exception is Oracle, which only leases for data centers, although the company does spend on capex for hardware.

Asset-based finance: the new frontier for insurance balance sheets

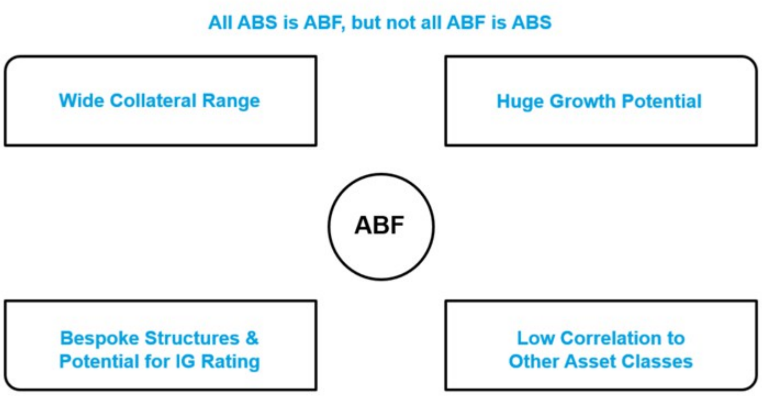
In common parlance and often in media articles, private credit gets conflated simply with direct company loans made to businesses, typically those that are small/mid-sized and sub-investment grade. Private credit, though, is a broad umbrella term that goes well beyond middle-market lending and includes ABF (asset-based financing), mezzanine lending, distressed loans, private IG placements (the "4a2" market), and realistically any other bespoke bilateral financing done by a non-banking institution. **In the context of financing data centers, we put special emphasis on the growth in ABF.**

Exhibit **47:** What is asset-backed finance?

ABF Definition

What is asset-backed finance:

Asset-backed finance (ABF), or asset-based finance, involves lending secured by **contractual cash flows** with or without hard assets as collateral, and the repayment to investors comes primarily from the cash flows generated by these assets.



Source: Morgan Stanley Research

Broadly, we consider financing of assets secured by contractual cash flows, with or without hard assets to fall under the term ABF. Unlike the standardized data center ABS/CMBS structures discussed earlier (see Securitized Credit: An Increasingly Sought-After Take-out Option), ABF structures can be highly bespoke, enabling customization to fit the specific needs of investors with varying levels of risk tolerance, returns, ratings, term, and duration. The standardization in ABS/CMBS structures, driven mainly by rating agencies, often require stabilized cash flows with strict requirements of lessee characteristics and residual value guarantees in cases where hard assets are part of the collateral package.

In the context of data center financing, ABF opens up a range of possible structures and financing options to include assets in different stages of development, ranging from data centers with fully stabilized cash flows to others that are in early stages of construction and build with just land or with land and power access established. They could be single asset/facility financing, as well as include a portfolio of multiple assets/facilities in different stages of development. Given the need for data centers to be located across geographies and jurisdictions, contractual cash flows have a built-in diversification potential. Given the nascent stage of the industry, there is significant scope for innovation in structuring and collateral packages.

The ABF construct works well in conjunction with hyperscalers that (as noted earlier) will have a preference to progressively use financial leases to ramp their data center access as the investment cycle progresses. In such cases, hyperscalers would lease the facility from the developer, thereby avoiding additional capital outlay that would reflect on their balance sheets, either as less cash or more debt. This financing arrangement is mutually beneficial for the hyperscaler, developer, and investor. Lease costs are typically mid- to high-single digits (annual 7-10% of the upfront cost), so they're more expensive than unsecured debt costs. Yet, these are quite affordable for cash-rich hyperscalers, especially if this means avoiding large capital spend.

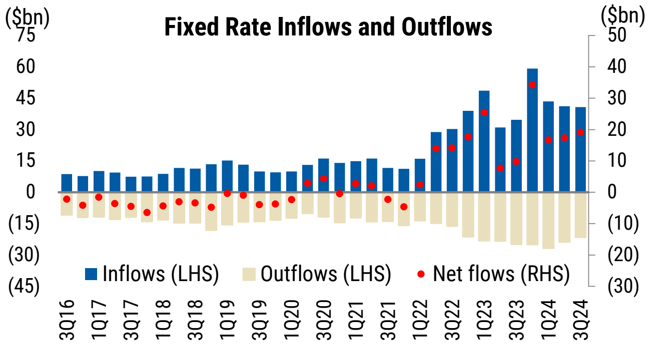
For the developer that raises cash through ABF, funding costs are likely cheaper than the unsecured bond market. It is hard to know the exact comparable bond market number, but most private developers may not meet the requirements to raise debt at IG-like ratings, so unsecured BB/B yields might be a better reference point.

End-investors, on the other hand, are receiving very attractive yields, and exposure is diversified from many other risk-assets and somewhat insulated from macro conditions. Even though it is ultimately the developer responsible for paying the end investors, the cash flow risk (especially when a DC is pre-leased) is to a higher-credit quality company, i.e., a hyperscaler. Typical hyperscaler-only leases tend to be significantly long in duration (10+ years), implying that investors have significant horizon.

Why the growth in ABF within the private credit universe?

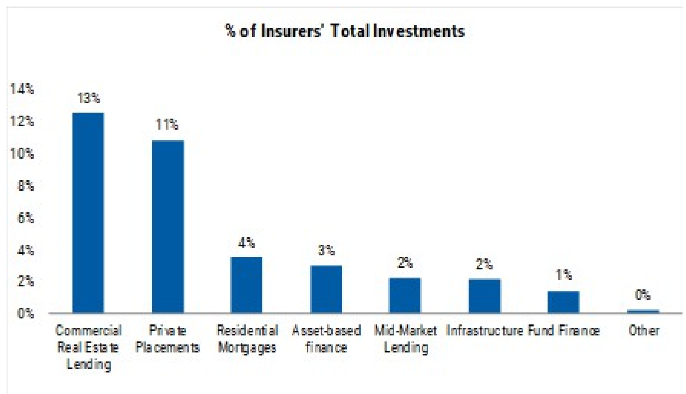
As we have noted in Risks, other considerations, and implications , life insurers, especially US life insurers, have seen a considerable rise in inflows into their tax-advantaged wealth accumulation products with insurance wrappers such as fixed annuities. This significant portfolio AUM growth needs high-quality spread products, but with little alpha and dispersion in the public IG market with tight spreads. ABF provides insurers with exposure to potentially investment-grade-rated assets that have significant excess spread vs. the public market, but also provide uncorrelated returns, attractive Sharpe ratios, and potential for diversification to sectors otherwise underexposed.

Exhibit 48: Insurance companies are seeing significant inflows into fixed annuity products



Source: LIMRA, Morgan Stanley Research

Exhibit 49: ABF now accounts for ~3% of insurance investments, implying significant room for growth



Source: Moody's, Morgan Stanley Research

The need for such assets is by no means limited to life insurance companies. Pension funds, both public and private, as well as foundations and endowments have looked to private assets to access uncorrelated returns. Thus far, the majority of such allocations have been to private equity assets. However, higher interest rates and macro uncertainties have resulted in a meaningfully slower private equity deal environment pushing investors to expand into new areas, including a variety of asset-based financing structures. In our view, data center ABF is among the most attractive of such opportunities, providing scalable opportunities with diversification potential.

It is also important to highlight the backdrop of an accelerated transition of lending from banks to non-banks (see Extending Credit: The Evolving Role of Wholesale Banks in Credit Markets for an expansive discussion). In the context of data center financing needs, this transition represents a strategic inflection point for both banks and non-banks to develop and adapt their business models to deploy multiple long-dated sources of capital into an investment opportunity with scale. These shifts could lead to significant changes in the industry and lead to a new breed of partnerships, joint-ventures, and business models.

An example of AI-related ABF private credit that has attracted investor attention recently is CoreWeave's facilities. CoreWeave special purpose vehicles (SPVs) entered delayed draw term loan facilities, secured by GPUs and other equipment, in summer 2023 and again in spring 2024. The funding was led by Blackstone, Magnetar, and others. Bloomberg reported that there are investment grade and non-IG tranches (read more here NSN SDMZMLT0G1KW).

70/30 split among the residual funding needs gets us to $800bn of private credit financing

Drilling into our estimates for private credit financing of data centers, to refresh, once we add corporate debt ($200bn) and securitized debt ($150bn) to the $1.4tr hyperscaler cash flow number, we are still left with a $1.15tr gap in capital needed. **Assuming a 70/30 split between debt vs. "other capital" within this $1.15tr gap, we arrive at our estimate of ~$800bn of potential private credit growth primarily (but not limited to) via the ABF channel.**

Clearly, we are making a fairly simplistic assumption about a large number over a fairly long time frame. The intuition behind the 70/30, though, comes from a few different angles.

First, the current environment generally remains challenging for large equity capital deployment despite significant dry powder. Older vintages have been hard to exit for sponsors and distributed capital to LPs remains sub-par relative to history. In the public market, IPO activity has been subdued for the past few years, and qualitatively, we would expect this to accelerate later in the cycle, as we approach monetization. Further, the cost of issuing debt should also get cheaper over time as the Fed cuts rates (MS economists expect 7 cuts in 2026). Putting all these factors together, we think it is difficult to see equity capital competing 1:1 with credit capital at this stage of the cycle.

Second, data center loans or many commercial mortgage loans for that matter are often originated with a 70-80% loan-to-value, which validates our assumption. As our TMT credit analysts highlighted in a recent note, ORCL Chairman Larry Ellison had commented back in January at the White House that the first of the Stargate projects under construction is in Abilene, Texas, as reported by Bloomberg here. Recent disclosures point to >60% debt funding using construction loans. At the end of May, Newmark disclosed the second phase of a $15bn JV to fund the 1.2 GW AI data center in Abilene, featuring just over $9bn of construction loans ($2.3bn initial and $7.1bn additional).

Another sizable construction loan of note year-to-date was an announced $2bn financing to complete the build-out of Novva Data Centers' flagship 175MW Salt Lake City data center, which followed previous equity commitments from CIM.

Third, we found that the initial disclosed plans for both the AI Infrastructure Partnership and Stargate project more broadly help support the approximate 70/30 assumption we are making for the split. The AI Infrastructure Partnership (AIP), formerly known as the Global AI Infrastructure Investment Partnership (GAIIP), was formed by BlackRock, Global Infrastructure Partners (GIP), Microsoft, and MGX last year, with NVDA and xAI joining the partnership this year. The original release states: “The partnership will initially seek to unlock $30 billion of private equity capital over time from investors, asset owners, corporates, which in turn will mobilize up to $100 billion in total investment potential when including debt financing.”

Separately, the aforementioned Stargate project was announced in January 2025, with plans to begin deploying $100bn “immediately”. It is our understanding that the project intends to arrange project finance on a data center-by-data center basis, with a limited 10-20% equity portion.

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	Coverage Universe		Investment Banking Clients (IBC)			Other Material Investment Services Clients (MISC)	
Stock Rating Category	Count	% of Total	Count	% of Total IBC	% of Rating Category	Count	% of Total Other MISC
Overweight/Buy	1497	40%	372	45%	25%	702	41%
Equal-weight/Hold	1632	44%	380	46%	23%	776	45%
Not-Rated/Hold	4	0%	0	0%	0%	2	0%
Underweight/Sell	593	16%	79	10%	13%	233	14%
Total	3,726		831			1713	

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The Americas
1585 Broadway
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20 Bank Street, Canary Wharf
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United Kingdom
Tel: +44 (0) 20 7 425 8000

Japan
1-9-7 Otemachi, Chiyoda-ku
Tokyo 100-8104
Japan
Tel: +81 (0) 3 6836 5000

Asia/Pacific
1 Austin Road West
Kowloon
Hong Kong
Tel: +852 2848 5200