

THE AI INVESTMENT BOOM:
CAPITAL FORMATION, FINANCING
STRUCTURES, INTERCONNECTIONS
AND VULNERABILITIES

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BANCO DE ESPAÑA

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Abstract

This paper examines how the ongoing AI investment cycle is financed and supported, with a focus on the financial and strategic linkages among the main participants in the AI ecosystem. Drawing on a sample of leading firms in the sector, the analysis documents the increasing reliance on private markets to mobilize capital and distribute risk, notably for infrastructure expansion and access to critical components. Particular attention is paid to developments in 2025 and in 2026 to date, with historical data at the group level used to provide context for recent trends. The evidence presented suggests that, while current investment and funding strategies are facilitating rapid capital formation, they may also introduce vulnerabilities associated with long-term commitments, strong interdependencies and the growing use of complex structured arrangements. In this context, the reliance on future cash flows and continued access to external funding and commercial commitments may expose these firms to adverse shocks, especially in a less favorable macro-financial environment.

Keywords: AI-related investment, AI value chain, private markets, non-bank financial institutions, cash flows, bond issuance, lease commitments.

JEL classification: G23, G24, G30.

Resumen

Este documento examina cómo se financia y se sostiene el ciclo actual de inversión en inteligencia artificial (IA), centrándose en los vínculos financieros y estratégicos entre los principales participantes del ecosistema de la IA. A partir de una muestra de empresas líderes en el sector, el análisis documenta la dependencia creciente de los mercados privados para movilizar capital y distribuir el riesgo, especialmente en la expansión de infraestructuras y el acceso a componentes críticos. Además, presta especial atención a la evolución reciente del sector en 2025 y en lo que va de 2026, y ofrece información histórica a nivel de grupo para contextualizar las tendencias observadas. La evidencia sugiere que, si bien las estrategias de inversión y financiación actuales están facilitando una rápida formación de capital, también pueden introducir vulnerabilidades asociadas a compromisos a largo plazo, fuertes interdependencias y un uso cada vez mayor de estructuras complejas. En este contexto, la dependencia de flujos de caja futuros y el acceso continuo a financiación externa y a compromisos comerciales pueden exponer a estas empresas a perturbaciones adversas, especialmente en un entorno macrofinanciero menos favorable.

Palabras clave: inversión relacionada con la IA, cadena de valor de la IA, mercados privados, instituciones financieras no bancarias, flujos de caja, emisión de bonos, compromisos por arrendamiento.

Códigos JEL: G23, G24, G30.

Contents

1	Introduction	8
2	Sample of companies under review and data sources	10
3	Overview of capital formation and investment structures from a financial perspective	13
3.1	Amounts of investment and projections	13
3.2	The role of non-bank financial institutions (NBFI) to build capital	14
3.3	Interconnections within the AI sector	19
3.4	Actors behind AI-related investments and their associated risks	22
4	Funding and forward-looking obligations	24
4.1	Internal financing: the relevance of cash flows	24
4.2	Trends in external financing: rising bond issuance and diversification of funding sources	26
4.3	Forward-looking obligations: lease commitments and total leverage	31
5	Key takeaways on AI-related investment, funding and potential risk implications	35
6	Conclusion	37
	References	38
Appendix	Examples of recent notable private-market transactions	40
	OpenAI Later Stage VC rounds (selected for scale and breadth of participation)	40
	Stargate Project JV (selected for scale)	42
	Meta-Blue Owl JV-SPV to build the Hyperion Data Center (off-balance sheet structure)	43
	Lambda and CoreWeave securing loans through SPVs, backed by NVIDIA chips and future cash flows (off-balance-sheet asset-based lending)	44

1 Introduction

Against the backdrop of widening artificial intelligence (AI) adoption, demand for data center capacity, advanced chips, cloud computing and data storage continues to accelerate, driving a sharp increase in investment across the AI sector. This document explores the strategies employed by major AI-related companies to support and finance their projects. Although the AI financing landscape is extremely broad, focusing on leading AI-related firms allows us to assess how large-scale AI investments are funded, the role played by non-bank financial institutions (NBFIs) and the interconnections that link companies across the sector.

The paper first describes the sample of companies under review and provides a simplified mapping of their position within the AI value chain. It then assesses the scale of the capital formation process, showing that the AI boom is not simply a surge in technology capex, but a broader investment cycle underpinned by private markets, co-investments, strategic alliances and off-balance-sheet financing structures. It further examines the funding sources sustaining this investment cycle, together with the forward-looking obligations arising from the investment and financing activities of the companies in the sample. This approach helps identify who invests, who provides financing, how risks are distributed and where vulnerabilities to potential shocks may emerge across the ecosystem.

The selected company sample seeks to capture the core segments and key participants of the AI ecosystem, encompassing not only hyperscalers but also principal investors in generative AI infrastructure, data center operators, leading suppliers of AI hardware and components and developers of large language models (LLMs). The next section presents the sample of companies and discusses the key challenges related to its selection and data collection, particularly the need to rely on consolidated business data for large technology firms.

Section 3 shows how highly interconnected these companies are, not only through the firms in which they invest or from which they receive investment, but also through a dense network of joint projects and commercial partnerships. This network results in complex financial linkages, sometimes giving rise to future commitments, circular investments or off-balance-sheet exposures spanning a wide set of activities. Throughout the document, the role of NBFIs in building AI capital is described, underscoring their importance in channeling investment and funding. The analysis shows how greater reliance on private market financing shapes investment structures and affects both risk distribution and the transparency of financial exposures within the broader system. One of the main channels identified is venture capital (VC), as well as joint ventures (JV), involving NBFIs participants and, in many cases, other hyperscalers, semiconductor and infrastructure companies in the sample. This collaboration reflects the strategic interdependencies that underpin the technological race in AI, which is unfolding alongside one of the most significant and rapid infrastructure investment cycles in the technology sector in recent decades.¹

Once investment strategies are presented, the focus of the document turns to the financing side at the level of the AI company. In this regard, Section 4 describes the role of cash flow generation as a key factor in supporting current investment, debt servicing and meeting ongoing and future lease obligations. The analysis

¹ It is worth noting that the rapid expansion of AI infrastructure is increasingly shaped by constraints related to energy consumption and other resource-intensive inputs. Specifically, electricity demand, dependence on high-performance semiconductors, extensive cooling requirements and significant water usage can influence cost structures, investment decisions and the spatial distribution of AI-related activity. However, given the focus of this study, a comprehensive analysis of these issues falls beyond the scope of this document. Other issues related to AI-driven productivity gains and their consequences are likewise out of scope.

places particular emphasis on the marked rise in bond issuance and its characteristics, alongside an examination of lease commitments and other features inherent to the AI sector that could shape future leverage trajectories. On equity markets, the discussion highlights additional expected activity, mainly through potential IPOs from OpenAI, Anthropic and Lambda among the companies under review, amid strong investor sentiment toward AI-related securities.

Section 5 summarizes the main evidence from the analysis and provides a preliminary assessment of the potential financial vulnerabilities associated with the sector, taking into account the complexity of the transactions involved, the significant participation of NBFIs and the fact that investments by many AI-related firms also serve as a source of financing for other participants. This interlinked structure may amplify the transmission of shocks, underscoring the importance of understanding the financial and commercial interconnections among key actors.

2 Sample of companies under review and data sources

This document analyses the main companies operating along the AI value chain and provides a representative overview of the industry as of 2026. While not intended to be exhaustive, recognizing the breadth of the sector and the fact that many firms operate across multiple segments, the sample is classified according to the primary role each consolidated company plays within the AI ecosystem:

- **Hyperscalers,² large AI application platforms and key investors in generative AI infrastructure:** Oracle, Meta, Alphabet, Amazon, Microsoft, Apple, Salesforce, Alibaba and IBM. This group is the most heterogeneous, encompassing large technology firms operating across software, cloud (both public and private), digital platforms and AI-enabled services such as advertising. What unifies these companies is their combination of substantial demand for AI compute with significant investment in the underlying infrastructure. Some of these firms also have activities in hardware and component segments or have developed their own AI LLMs (e.g., Google's Gemini).
- **Leading suppliers of AI hardware and components:** NVIDIA, AMD, TSMC, Intel, Samsung, ASML and Broadcom. This category comprises accelerator designers, integrated device manufacturers, foundries³ and semiconductor equipment suppliers. Although these firms differ substantially in their roles in hardware design and production, they are grouped together because they provide the compute inputs required to train and deploy advanced AI systems. Their technologies determine processing power, energy efficiency and scalability, and therefore act as enablers for AI development.
- **Data center operators (mainly colocation) and neocloud⁴ compute providers:** Equinix, Digital Realty, NTT Data,⁵ CoreWeave, Lambda and Nebius. Unlike general-purpose hyperscalers, these data center companies provide infrastructure (space, power, connectivity and sometimes bare-metal) that is leased to tenants, while neoclouds offer dedicated compute resources (bare-metal and GPU-as-a-Service) on top of such infrastructure.
- **Frontier model developers and foundation AI research laboratories:** OpenAI and Anthropic. These entities specialize in AI research and development, building advanced LLMs and pursuing AGI.⁶

2 Note that the term hyperscale data centers ("hyperscalers") has been used since the early 2010s to describe enormous cloud facilities that deliver computing power at industrial scale. Amazon Web Services (AWS), Microsoft Azure and Google Cloud are examples of the most extensive cloud infrastructure solutions worldwide. Currently, the term "hyperscaler" not only refers to companies providing big cloud facilities, but also includes large technology companies with enormous compute, storage and networking resources, available through public cloud offering (as in the traditional examples above) or powering its own global services (e.g. Meta and Apple). This report focuses on this broader definition. A recent article from [datacentremagazine.com](https://datacentremagazine.com/news/top-10-hyperscalers) provides an overview of the hyperscaler landscape and explains how these players are transforming global data center infrastructure through large-scale investment to meet rising AI and digital demand (see [Top 10 Hyperscalers](https://datacentremagazine.com/news/top-10-hyperscalers) <https://datacentremagazine.com/news/top-10-hyperscalers>, DataCenterMagazine.com, 3 December 2025).

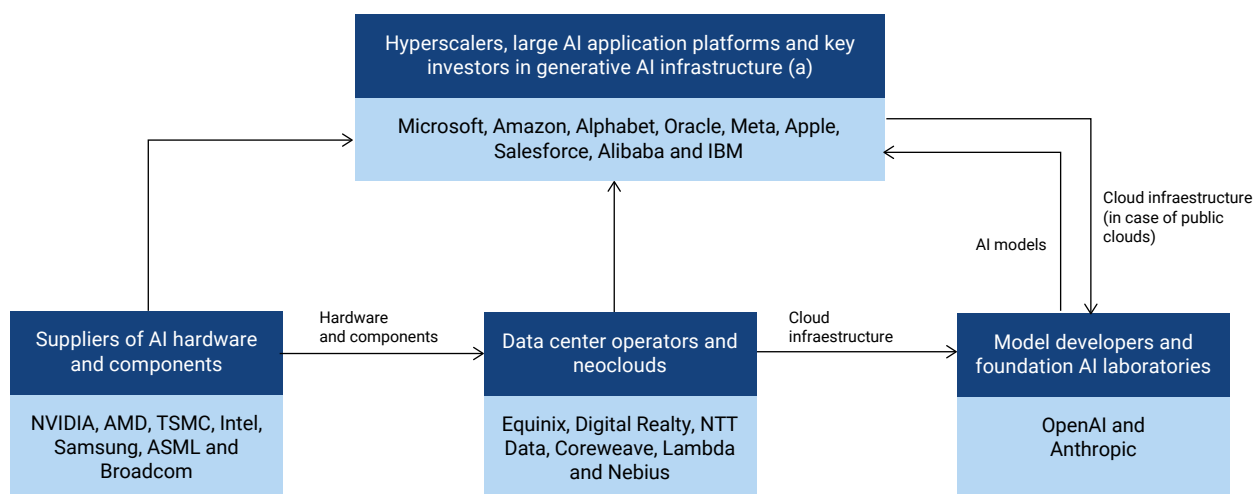
3 A semiconductor foundry (or "fab") is a specialized facility that manufactures microchips and integrated circuits based on designs provided by other technology companies.

4 Neocloud companies are specialized cloud providers focused primarily on delivering GPU-as-a-Service (GPUaaS) for AI, machine learning and high-performance computing. They provide faster and cost-efficient infrastructure tailored to the training and deployment of AI models. The neocloud companies in the sample are CoreWeave, Lambda and Nebius.

5 NTT Data is also active in global IT services and digital infrastructure, with a significant data center business through its Global Data Centers division, one of the world's largest data center platforms. NTT DATA has been fully consolidated within NTT since the second half of 2025.

6 AGI refers to a hypothetical type of artificial intelligence that can understand, learn and apply knowledge across a wide range of tasks at a level comparable to a human being. Importantly, what exactly constitutes "human-level" intelligence is not precisely defined and remains the subject of ongoing debate.

Figure 1
Simplification of the AI value chain



SOURCE: Banco de España.

a Some of these firms also have activities in hardware and component segments.

Figure 1 depicts this broad classification, with the direction of the arrows indicating the flow of key inputs across the value chain.

A related, though not identical, classification is proposed by Gambacorta and Shreeti (2025), which distinguishes between AI application platforms and the cloud businesses operated by hyperscalers. In the present framework, these firms are grouped together, reflecting their substantial demand for AI compute and the scale of investment in the underlying infrastructure. Moreover, the present analysis adopts a consolidated perspective, with hyperscalers usually acting in both segments. Similarly, Gambacorta and Shreeti (2025) acknowledge that large technology firms, particularly hyperscalers, are increasingly vertically integrating across multiple layers of the AI value chain. Consistent with more technically oriented classifications (e.g., Billones, Lauresta, Dellosa, Bong, Stergioulas and Yunus, 2025), they identify training data providers as a separate component of the ecosystem, while in the present analysis data-related dependencies are considered cross-cutting inputs that affect several segments. Other relevant layers of the broader AI landscape, including advanced robotics, autonomous systems and certain industrial AI applications, fall outside the scope of the analysis. Therefore, the findings should be interpreted as relating primarily to the compute-centered AI ecosystem.

At the time this report is published, OpenAI, Anthropic and Lambda are privately held entities with substantial venture capital backing. As such, they are not required to disclose public financial statements (such as 10-K filings) and do not publish them. For this reason, we are unable to present data for these companies in some sections of this document, and some of the information presented is based on contractual commitments, industry disclosures and analyst estimates. It is worth noting that the three companies are expected to consider initial public offerings (IPOs) over the coming months. If realized, such listings would likely rank among the largest venture capital-backed IPOs in the AI sector.

The sample of AI firms is predominantly composed of US-based firms, with only four major Asian exceptions⁷ (Alibaba, TSMC, Samsung and NTT Data) and two European ones (ASML and Nebius). Other notable participants in the AI sector, such as Chinese companies Tencent Cloud, Baidu Cloud and Bytedance, have been omitted from this sample because of differences in reporting standards that hinder comparability with the other firms included.⁸ Nevertheless, their activities are more concentrated in Asian markets than those of the firms in the sample, which may partly mitigate the implications of their exclusion for the analysis.

A key analytical challenge in assessing AI-related investment and financing, not addressed in this document, lies in disentangling AI-specific activities from other business lines within large technology companies. These companies usually operate highly diversified business models in which AI development, deployment and commercialization are deeply embedded within broader platforms. For example, even within Microsoft's business, the Azure segment supports AI workloads and model training, while also providing cloud services for a wide range of non-AI applications, including data storage, enterprise software and general computing. Similarly, within Amazon's business, Amazon Web Services underpins AI-related services while simultaneously meeting traditional cloud infrastructure needs across numerous industries. As a result, revenues, capital expenditure and investment flows reported at the segment level typically reflect a combination of AI-related and non-AI-related activities, making it difficult to precisely attribute financial performance or investment growth exclusively to AI. In the same vein, funding sources and indebtedness are generally reported and will be analyzed in this document at the consolidated level. Furthermore, figures presented in this paper should be interpreted as gross activity because circular financing and investment and SPV structures can result in double counting and obscure ultimate funding sources. Although this is not a perfect solution, it nonetheless provides an indication of the depth of the structural transformation and development underway in the sector.

Consistent with the above, the analysis relies on consolidated firm-level data drawn from Capital IQ (financial statements), PitchBook (investment and private market deals) and Dealogic (capital market deals). In addition, the document compiles information from firms' financial reports and regulatory filings, credit rating agencies, specialized websites and industry analysts. Where possible, priority is given to primary sources, while information from rating agencies and specialized industry sources is used to complement and cross-check the analysis.

Finally, it should be noted that, while the document centers on how large-scale AI investments are funded, the exclusion of smaller AI firms represents a limitation of the analysis, as it may obscure important dynamics related to entry, exit and consolidation within the sector. Smaller firms are often more vulnerable to financing constraints and shifts in investor sentiment, and their omission could therefore result in an incomplete picture of cyclical vulnerabilities and potential amplification mechanisms in the AI ecosystem. To partially address this limitation, where relevant to the analysis, the document complements its core sample with additional company-specific examples and broader sectoral references to capture developments that may not be fully reflected in the firms examined in detail.

⁷ Although Broadcom has Malaysian roots historically, it is currently headquartered in the United States, so it counts as US-based today.

⁸ They operate under a distinct regulatory and reporting framework, resulting in less standardized disclosures, limited comparability of data and significantly lower transparency regarding investment levels. These constraints provide a justification for its exclusion from the sample.

3 Overview of capital formation and investment structures from a financial perspective

3.1 Amounts of investment and projections

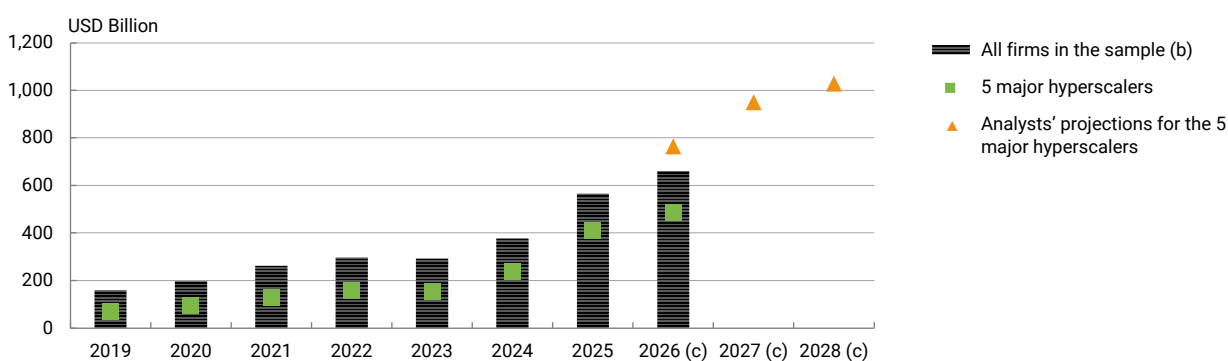
AI-related capital expenditure has expanded significantly since 2019, reflecting an unprecedented build-out of data-center infrastructure, advanced compute and networking capacity. Aggregate capex among the companies in the sample increased from around USD 160 billion in 2019 to nearly USD 600 billion in 2025 on a consolidated basis (Chart 1.a). Of this total in 2025, around 400 billion, equivalent to nearly 1.3% of US nominal GDP, is concentrated in five major US hyperscalers: Alphabet, Amazon, Meta, Microsoft and Oracle.

This acceleration is driven primarily by investments in AI-specific infrastructure rather than traditional cloud spending, underscoring the substantial capacity expansion required following the emergence of generative AI at

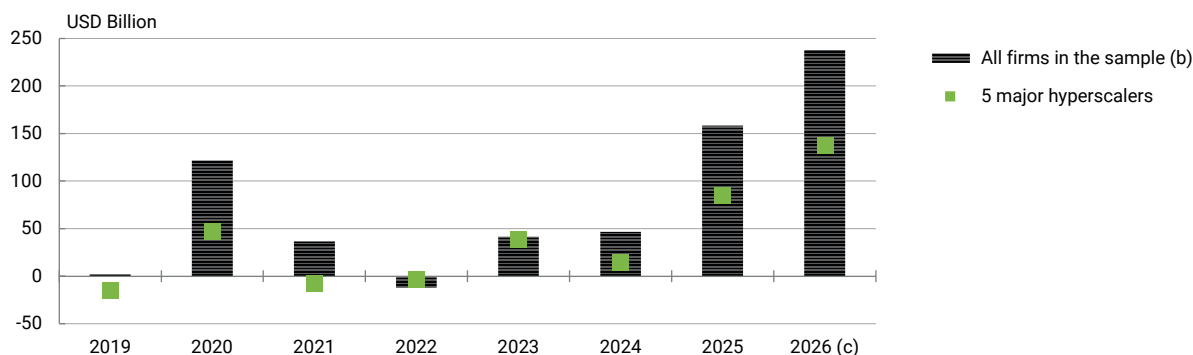
Chart 1

Total investment by firms in the sample (a)

1.a Capex and projections



1.b Net purchase of investment securities and stocks and net acquisition of other companies (d)



SOURCES: Capital IQ, company filings and Bloomberg Data License.

- a Consolidated business, not only AI-related businesses. The major 5 hyperscalers are Oracle, Meta, Google (Alphabet), Amazon and Microsoft.
- b OpenAI, Anthropic and Lambda, are not included because they do not publish public financial statements, as they are privately held companies and are not required to do so. However, these companies are not minor players, as industry disclosures and analyst estimates place their combined 2025 capital expenditures at approximately USD 31 billion. CoreWeave data are reported and included starting in 2022.
- c For 2026, data reflect the latest four quarters available; otherwise, figures are reported on a calendar-year basis. Analysts' projections are also on a calendar-year basis. Cut-off date: 6 July 2026.
- d These investments include net purchases of investment securities, bonds, debentures, stocks and net acquisition of other companies (proceeds from sales are deducted). Together with capex, they make up the 'Investing Activities' line of the cash flow statement.

scale in late 2022.⁹ The latest four quarters of available data, together with analyst projections, indicate a continued intensification of this trend, with aggregate capital expenditures by the five largest US hyperscalers expected to reach approximately 1 trillion by 2028 (see orange triangles in Chart 1.a). Capex levels are expected to remain primarily allocated to data-center development, compute resources and AI-oriented networking systems.¹⁰

Other forms of investment beyond capex have also increased. These investments include purchases of investment securities (both bonds and equities) as well as acquisitions of other companies. In net terms (with proceeds from sales deducted), they exceeded 150 billion USD in 2025 for the aggregate group of companies in the sample and continued to accelerate in the most recent four quarters of available data (Chart 1.b). As discussed later in this document, these figures mainly reflect investments in mergers and acquisitions, venture capital and joint ventures involving other AI companies, as well as equity stakes in AI-related firms. These transactions are usually registered in the Cash Flow Statement as Purchases of Equity Securities or Other Business, whereas they are only classified as Capital Expenditure (capex) if the company directly owns or acquires a majority interest in the physical asset following the investment.¹¹ This underscores the need to consider all forms of investment beyond capex to better understand the capital build-out process. The underlying rationale is that ongoing and future AI infrastructure investment should be viewed as an integrated process of capital formation rather than as a collection of fragmented, firm-specific actions, given its economy-wide effects on capital allocation and long-term growth. Understanding the financing strategies behind this large-scale process, as well as the sector's interconnections and the on- and off-balance-sheet structures created through these investments, is essential from an economic policy perspective.

Furthermore, although these figures are substantial, they should be considered alongside funding provided by non-bank investors, mainly investment funds and asset managers. In particular, as shown in the following section, NBFIs are taking a relevant role in financing capital formation by participating in venture capital funding rounds, entering joint venture arrangements and acquiring private equity stakes, among other forms of private market transactions.

3.2 The role of non-bank financial institutions (NBFI) to build capital

This section examines a subset of the investments discussed in the previous section, drawing on the PitchBook database, which primarily covers private market transactions.¹² Specifically, it analyses deals involving at least one major AI company from the sample and focuses on transactions co-financed by investment funds, asset managers and other private investors. Through these co-investments, NBFIs contribute to the financing of projects by providing both early-stage capital and large-scale funding for expansion, thereby supporting their rapid scaling. Despite some

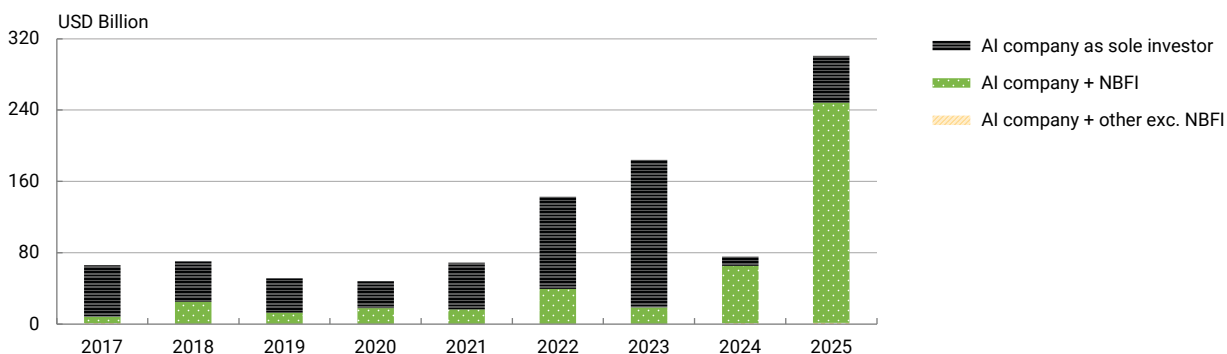
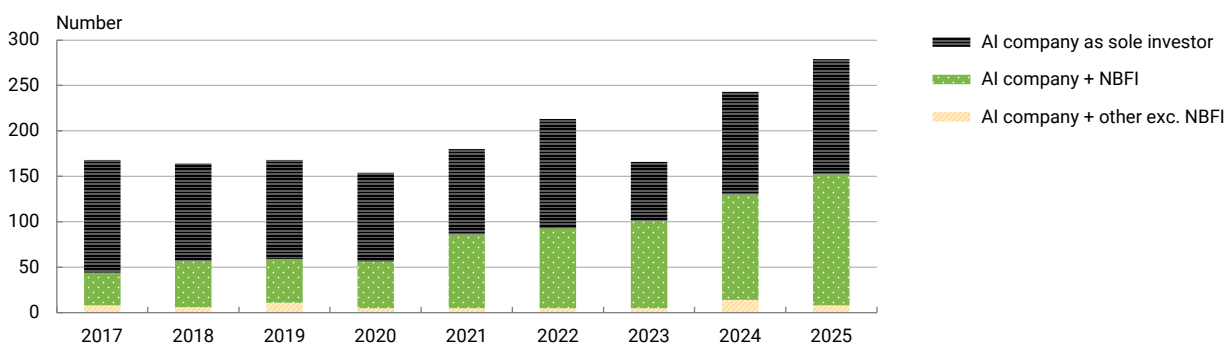
⁹ Generative AI is generally considered to have emerged at scale in 2022, following the public release of large language models such as ChatGPT.

¹⁰ The cost of building new data centers, for both AI and non-AI workloads, was projected at 2.9tr USD cumulatively from 2025–2028 on a global basis, according to Morgan Stanley (2025b). The 2.9 trillion USD includes roughly 1.6 tr on hardware (chips/servers) and 1.3 tr on building out data center infrastructure, including real estate, build costs and maintenance, among others. Their estimates were based on the assumption that total power used by GenAI will rise from 29TWh in 2023 to 686TWh in 2028 globally. According to their model, this expansion of power for GenAI will drive total data center power usage (including traditional work-loads like cloud/enterprise) from 370TWh in 2023 to 1,235TWh in 2028.

¹¹ For example, when creating a Joint Venture for building a data center, if the ownership of the data center belongs to the Joint Venture (JV not consolidated), as in the case of Meta with Blue Owl to build the Hyperion data center, the investment would not be capex but Purchases of Equity Securities or Other Business.

¹² The participation of AI-related firms in these private market deals is generally recorded as purchases of investment securities (included in Chart 1.b), as such transactions typically involve the acquisition of equity stakes rather than direct ownership of the underlying assets. As mentioned in the former section, only the participation in transactions that result in a physical asset controlled by the AI-related company would be recorded as capex (included in Chart 1.a).

Chart 2

Total deal size and number of investments participated by at least one firm in the sample (a)**2.a Deal size of investments****2.b Deal count**

SOURCE: PitchBook.

a Deal size is the amount of capital raised during a specific funding round, this information is missing for a 40% of deals. The "other exc. NBF" category is relatively small and mainly reflects the participation of universities and other non-profit organisations.

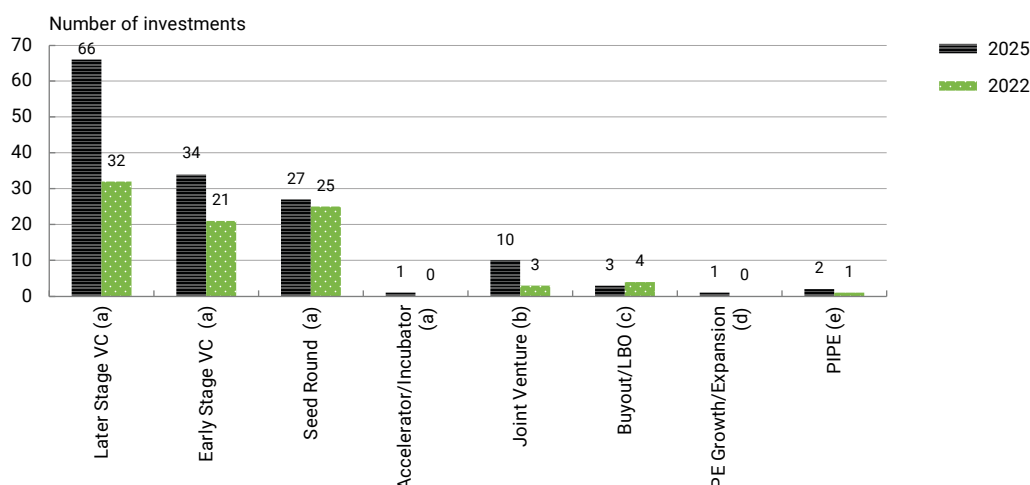
data limitations, this section illustrates how the growing reliance on private market financing is shaping investment structures and influencing the distribution of risks and the transparency of financial exposures.

As shown in Chart 2, the relevance of investments made by the companies in the sample in which NBFs hold a stake (green bars) has increased in recent years, both in terms of size and number of deals. In 2025, 144 of these co-investments were recorded, amounting to a total of 240 billion USD. It is worth noting that this represents a conservative estimate, as approximately 40% of the deals do not disclose a deal size. For its part, the reported size of these co-investments reflects the combined contributions of both the AI companies in the sample and their co-investors, with no direct way of identifying the amount invested by each participant. Nevertheless, the PitchBook data provide valuable insights into co-investment channels.

Notably, co-investment patterns in the sample suggest that, while deal sizes have increased, the overall number of transactions has not expanded at a comparable pace in 2025. This is largely attributable to the presence of a few exceptionally large deals mainly related to venture funding of frontier model developers and data center build out in that year. Among the investment firms and asset managers co-investing with at least one firm in our

Chart 3

Number of investments involving at least one firm in the sample and a NBFi by type of deal



SOURCE: PitchBook.

- a Accelerators/incubators, seed rounds and early- and later-stage venture capital represent different stages of business development financing. These investments provide financing to startups and private companies, typically in exchange for equity ownership and associated investor rights. Accelerators and incubators provide support and initial funding to very early-stage ventures, while seed rounds provide capital to help startups develop products. Early-stage joint ventures focus on developing new business opportunities, whereas later-stage venture capital are typically aimed at commercial expansion, scaling operations and growth.
- b A joint venture is a strategic partnership where two or more companies develop a new entity in order to collaborate on a specific project or venture.
- c LBO stands for Leveraged Buyout, a transaction in which a company is acquired primarily using borrowed funds (debt) to finance the purchase. The acquiring company (investor) contributes only a limited amount of equity, while the target company's assets are often used as collateral to secure the financing.
- d PE stands for Private Equity, which refers to investments in private companies in exchange for ownership stakes and associated investor rights, typically targeting more mature businesses than venture capital investments.
- e A PIPE, Private Investment in Public Equity, is a transaction where investors buy shares of a publicly listed company directly from the company. It provides a fast, efficient fundraising method outside of traditional public offerings.

sample, several stand out, including SoftBank, Sequoia Capital, Andreessen Horowitz, Tiger Global, MGX, Thrive Capital and Lightspeed. These are complemented by other investors that are less specialized in AI, such as Ares Management, Blue Owl, Apollo, KKR, Blackstone and BlackRock. While not exhaustive, this list illustrates the breadth of the investor base, as evidenced by co investment patterns in the sample, where 67% of transactions involved more than 20 participants. Also, in relation to the investor base, we find that 27% of the co-investments in the sample involved two or more of the AI companies under review as co-investors (in addition to at least one NBFi). This suggests that private market investors are allocating capital within a highly interconnected AI ecosystem, as explored in the following section.

The remainder of this section examines the types of deals and financial structures behind these co-investment arrangements. To complement this analysis, the Appendix discusses in detail a selection of recent notable transactions, chosen for their scale, complexity or strategic significance.

Among co-investment transactions, **venture capital (VC)** was by far the most common type of deal,¹³ accounting for around 88% of the total number of these transactions in 2025 (Chart 3). Among VC deals, late-stage

¹³ Investments made by the AI companies in the sample as sole investors (grey bars in Chart 2) present an evidently different pattern: mergers and acquisitions (61%); accelerator/incubator programs - which typically result in the startup being integrated into the company- (16%); and corporate asset purchase (14%). PIPEs represent 3% of their investments, while later and early stage VC represent 2% respectively.

VC rounds have become more prominent than in 2022, overtaking the combined share of seed and early-stage rounds in relative importance. Nevertheless, these earlier-stage operations remain highly relevant within the overall co-investment landscape of AI companies.

Although venture capital has traditionally played a key role in supporting emerging technologies, the scale and rapid growth of investment in the AI sector are particularly significant. For the whole AI firms sector globally, the OECD AI Policy Observatory estimates a VC investment of 258.7 billion USD in 2025 using data from Preqin, which represents more than half of all VC investment of all sectors (USD 427.1 billion), doubling its 2022 share (30%).¹⁴ This reflects the growing importance of AI-related venture capital raising and the increasing weight of AI-related investment within overall capital allocation. Consistent with this, using PitchBook data, we estimate that the share of IT sector over total VC investments represents 54% in 2025, up from 37% in 2022. The Appendix presents a detailed discussion of OpenAI's later-stage VC rounds, selected for their scale, the breadth of investor participation and the commercial commitments involved.

In 2025, the increase in the number of **joint ventures**, compared to 2022 data, was also notable within co-investment activity, largely reflecting the rapid build-out of data centers and other AI-related infrastructure. As these projects have become increasingly capital-intensive, operators have more frequently partnered with institutional investors to mobilize capital, share risks and secure access to power and data center capacity. The Appendix includes the example of the Stargate Project JV, a joint venture involving OpenAI, SoftBank, Oracle and MGX, established to support the development of large-scale AI infrastructure in the United States. Although press coverage at the time of publication of this report points to delays in the initial implementation timeline, the project remains a notable example given its planned scale. Other relevant examples include Digital Realty's expansion strategy through a 7 billion USD hyperscale data center joint venture with Blackstone¹⁵ and the recent announcement of a joint venture involving Google and Blackstone to establish a new company providing data center capacity and networking services alongside Google Cloud's TPU infrastructure.¹⁶

In some cases, joint venture deals enable strategies that keep debt out of the balance sheet of the borrower. In fact, Financial Times estimates over 120 billion USD in data center debt was moved off-balance-sheet via SPVs in 2025 alone.¹⁷ The following stylized diagram illustrates a typical private-capital investment structure in the data center sector. Under this arrangement, the company that is expanding its infrastructure and a private capital fund form a joint venture through a dedicated investment vehicle, generally structured as a holding company or SPV, with both parties providing equity capital. The vehicle then acts as the project owner and may raise additional financing through a combination of debt, real estate, project finance and private-equity channels.

A prominent example is the joint venture between Meta and Blue Owl established in 2025 to develop the Hyperion data center campus. As illustrated in the Appendix, the Meta and Blue Owl Joint Venture is raising 27.3 billion USD of project-finance private debt by a dedicated SPV (Beignet LLC). In return for access to the data center, Meta has committed to long-term lease payments and provided a residual value guarantee, illustrating how large-scale AI infrastructure can be financed through a combination of institutional capital and contractual commitments

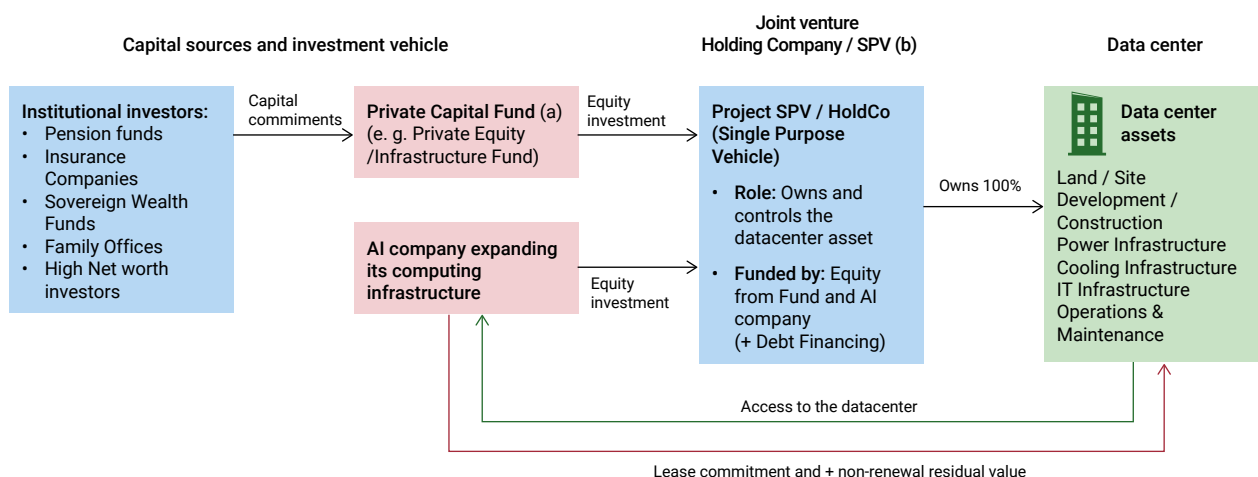
¹⁴ OECD (2026).

¹⁵ For example, the following article from [datacenterdynamics.com](#) illustrated Digital Realty's recent expansion strategy: [Digital Realty launches \\$7bn hyperscale data center JV with Blackstone](#).

¹⁶ See the [announcement by Blackstone](#).

¹⁷ See Financial Times article [Tech groups shift \\$120bn of AI data centre debt off balance sheets](#), 24 December 2025.

Figure 2
Typical Private Capital Investment Into a Datacenter



SOURCES: Bloomberg and Banco de España.

- a The Fund / Asset manager manages the investment, oversees the asset and drives value creation.
b The joint venture refers to the partnership arrangement between the sponsors (which are the entities that establish, fund and retain ownership interests in the venture). The arrangement may be implemented through an SPV or, where an additional ownership layer is required, through a holding company that owns the SPV.

rather than direct corporate borrowing. This arrangement also provides a clear example of lease commitments that have not yet commenced, the implications of which are discussed in Section 4.3.

In addition to data center investment, firms in our sample also established SPVs in 2025 to finance other significant projects: the Intel SPV¹⁸ (Foundry JV HoldCo LLC) created by its JV with Brookfield Asset Management to enable its investment in the construction of two semiconductor facilities in Arizona; or CoreWeave and Lambda using asset-based lending through SPVs to finance their access to NVIDIA GPUs.

The use of GPU-specific leasing via SPVs is a recent practice that increases interconnections across the AI sector, a topic that is analysed in the next section. Although structures vary by case, these SPVs typically acquire GPUs and lease them to AI companies or serve as vehicles for their purchase. These arrangements are often used by NVIDIA to finance its customers' rental or acquisition of GPUs and other AI hardware. Many of these customers are hyperscalers or neoclouds, and through these structures NVIDIA effectively operates as a lender or investor. Additionally, to support the operation, these same SPVs may serve as vehicles for raising debt secured by the acquired (NVIDIA) assets.

In June 2026, Broadcom announced the establishment of the AI XPV Platform, a financing and deployment partnership with Apollo and Blackstone to facilitate large-scale AI infrastructure investments. Although detailed information on the platform is still limited, the initial 35 billion USD tranche represents a sizeable infrastructure

18 Of the 29.4 billion USD in total planned project costs for the facilities, Brookfield is investing 14.6 billion for a 49% equity interest in the joint venture company. Further details on the Intel-Brookfield JV and the debt issuances undertaken by its associated SPV are available at the following [S&P Global assessment](#).

financing program. Furthermore, the available information points to the flexibility of private capital in structuring large-scale financing solutions, as operations are expected to be backed by contracted cash flows and AI chips.¹⁹

A potentially more significant development was announced by NVIDIA in August 2026.²⁰ NVIDIA announced partnerships with Apollo, BlackRock, Blackstone, Brookfield, Goldman Sachs and KKR to establish independent AI compute-backed financing platforms designed to mobilize more than USD 500 billion in third-party capital over time to support the build-out of AI infrastructure. This figure is a mobilization target rather than already committed financing. The intended beneficiaries include hyperscalers, frontier AI laboratories and enterprises seeking to build data centers or acquire NVIDIA-based compute capacity. Unlike arrangements in which NVIDIA directly provides financing or supports transaction-specific SPVs, these platforms would enable third-party investors to independently assess and fund individual opportunities. Nevertheless, according to the announcement, NVIDIA may retain some exposure by providing limited residual-value support for up to 25% of an individual opportunity on a case-by-case basis. The contractual form of this support and the resulting allocation of losses have not yet been disclosed.

Looking forward, co-investment arrangements such as those discussed in this section are likely to remain highly relevant, as private capital is expected to play an increasingly important role in financing AI infrastructure. Bloomberg (2026b), for example, estimates that private investors could cover around 20% of the funding required for the AI boom's digital infrastructure and data center build-out, equivalent to approximately 160 billion USD annually, over the next five years. To provide a more complete picture of this capital formation process, the next two sections examine the vulnerabilities that may emerge as investment activity continues to expand, including those related to growing interconnections and dependencies within the AI ecosystem, and issues associated with complexity, illiquidity and other investment risks.

3.3 Interconnections within the AI sector

Increasingly, co-investment structures that link multiple strategic partners through equity stakes are associated with long-term commercial agreements and shared technological dependencies. These arrangements contribute to a dense network of relationships within the AI sector, blurring the boundaries between investors, suppliers and users of AI infrastructure.

Table 1 presents the main co-investment rounds involving AI-related companies in the sample. The evidence points to NVIDIA as the most frequent co-investor, followed by Microsoft and Alphabet. Indeed, these three firms appear most often together across financing rounds, reflecting their central and complementary roles across key segments of the AI value chain. Amazon is also a relevant co-investor, notably with NVIDIA, consistent with its expanding role in AI-related infrastructure and cloud-based partnerships. In addition, the table illustrates recurring bilateral co-investment patterns, notably between Microsoft and OpenAI, reflecting their long-standing strategic relationship, as well as between AMD and NVIDIA, indicating co-investments even among firms that compete in adjacent hardware markets.

As in the previous section, selected examples are presented in the Appendix to illustrate the nature of these interconnections. The first example describes the co-investment by Amazon, NVIDIA and Microsoft in the February-

¹⁹ See the [press release published by Apollo](#).

²⁰ See NVIDIA's 11 August announcement [NVIDIA AI Factory Compute Is Becoming an Investable Asset Class](#).

Table 1

Number of co-investment rounds participated in by firms in the sample (a)

	NVIDIA	Microsoft	Alphabet	Amazon	Meta	Salesforce	Samsung	OpenAI	AMD	Intel	Alibaba
NVIDIA	—										
Microsoft		—									
Alphabet			—								
Amazon				—							
Meta					—						
Salesforce						—					
Samsung							—				
OpenAI								—			
AMD									—		
Intel										—	
Alibaba											—
Other major AI companies											
Total co-investments with the firms in the sample	52	39	33	25	19	15	12	18	12	11	6
Total unique projects of these co-investments	39	29	25	15	12	9	9	9	8	6	5

[1-2]
 [3-4]
 [5-7]
 8 or more

SOURCE: PitchBook.

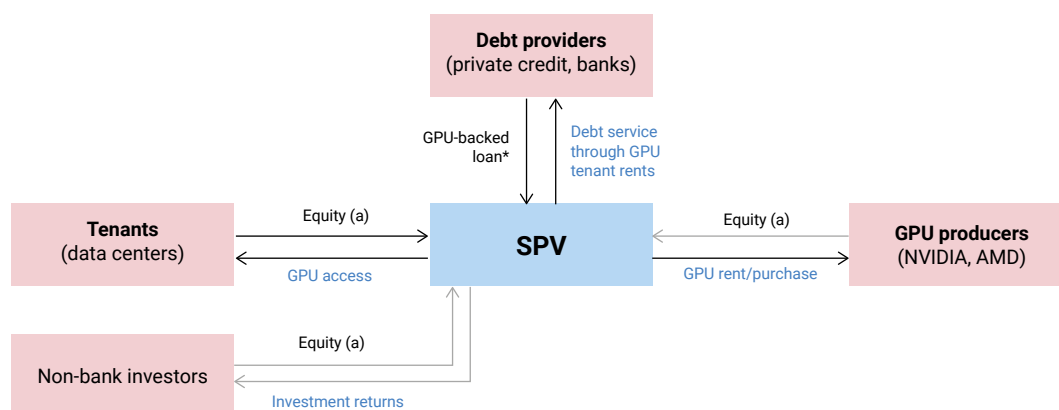
a The table reports companies in the sample with the highest number of co-investments. The group of other major AI companies includes Oracle, Apple, Equinix, TSMC, ASML, CoreWeave and Anthropic. The full matrix covering all companies under review is available upon request. Regarding time coverage, the transactions date from 2012 onwards, with the exception of three earlier cases: Intel-Alphabet (2008), Microsoft-Samsung (2005) and Microsoft-Intel (2000).

April 2026 OpenAI Later Stage VC funding round, while the second illustrates NVIDIA's financial interconnections via SPVs with Lambda and Coreweave. Both examples are cases of circular investment or financing, referring to arrangements in which the firms providing the funds ultimately receive capital back through purchases, contracts or other commercial commitments. Additional examples are published and updated in Bloomberg's interactive diagram of [circular deals underpinning the AI boom](#).

In a nutshell, the first example represents one of the most significant VC transactions in the history of the technology sector and is particularly relevant for understanding the growing interconnections within the AI ecosystem for two reasons. First, several of the same investors participated in VC of competing firms (Amazon, NVIDIA and Microsoft investing not only in OpenAI but also in Anthropic). Second, the transaction illustrates a form of circular investment, as investors also benefit from the commercial arrangements embedded in the deal, including OpenAI's cloud-computing commitments to Amazon Web Services, its reliance on NVIDIA's hardware and Microsoft's continued access to OpenAI's frontier AI models.

The second example is better understood as broader circular financing, given that NVIDIA's GPUs enable financing capacity (by serving as collateral) and the deal simultaneously generates demand for these chips. Figure 3 illustrates the use of GPU-specific leasing via SPVs and includes a table with the amount of asset-based credit raised by these arrangements.

Figure 3

Typical off-balance sheet asset-based lending: GPU-based finance

* Notable GPU-backed loans

Borrower / Project	Amount of asset-based credit	Lenders (private credit providers or banks)
CoreWeave DDTL 4.0	\$8.5 billion in 2026	Morgan Stanley, MUFG, Goldman Sachs, JPMorgan and Blackstone
CoreWeave DDTL 3.0	\$2.6 billion in 2025	Morgan Stanley and MUFG
CoreWeave DDTL 2.0	\$7.5 billion in 2024	Blackstone, Magnetar, BlackRock, Coatue, Carlyle, CDPQ, DigitalBridge Credit, Eldridge Industries and Great Elm.
CoreWeave DDTL 1.0	\$2.3 billion in 2023	Magnetar, Blackstone, Coatue, DigitalBridge, BlackRock, PIMCO, Carlyle and Great Elm
Lambda	\$500 million in 2024	Macquarie Group, Industrial Development Funding
Crusoe	\$200 m (2023) + 225 m (2025)	Upper90 among others
xAI	\$6.9 billion combined (2025 and 2026)	Apollo

SOURCE: Center for Public Enterprise (2025), company's filings and Banco de España.

- a The SPV is typically established by the tenant (e.g. CoreWeave or Lambda), often in partnership with non-bank investors. GPU vendors, in some cases, also co-invest or support the financing structure (e.g. xAI case, with NVIDIA providing significant equity investment in the SPV). As non-banks and GPU vendors are not consistently involved in every case, their participation is shown using lighter-coloured lines.

The AI compute infrastructure financing platforms announced by NVIDIA in August 2026 would enable NVIDIA-based compute infrastructure (not limited to GPUs, according to the announcement) to support financing through the cash flows it generates and its expected residual value, while also generating demand for NVIDIA's platform. As discussed at the end of the previous section, the novelty is that these platforms would provide a broader framework through which third-party investors mobilize capital for AI infrastructure projects.²¹ Although these projects may ultimately involve SPVs or asset-backed financing, their legal and collateral structures have not yet been disclosed.

These examples have been selected due to their operational linkages and complexity. Such arrangements can make it difficult to determine how much capital is actually entering the sector, rather than being recycled among participants, and who ultimately bears the risks. However, other literature examines the interconnections across the sector from a comprehensive strategic and economic perspective. Gambacorta and Shreeti (2025) emphasize

21 Recent statements and media reports suggest that AI compute could emerge as an investable asset class. See the Forbes article [Nvidia's \\$500 Billion Bet To Make AI Compute Wall Street's Next Asset Class](#) for an analysis of NVIDIA's announcement from a financing perspective.

supply chain interconnections and dynamics of the AI sector, including the challenges and implications associated with a concentrated AI ecosystem. Morgan Stanley (2025a) and J.P. Morgan (2025a) focus on AI monetization and the challenges of an increasingly interconnected ecosystem. They present OpenAI as the leading model originator driving hyperscaler investment, while pointing to its need to establish sustainable revenue generation. In line with this document, their analyses present NVIDIA's role as both supplier and financier, reinforcing interdependencies and returns, but also vulnerabilities.

Another takeaway reflected in the literature and examples presented in this paper, is that value creation is expected to concentrate at the software layer, but physical inputs remain key sources of competitive advantage. Therefore, firms with integrated hardware and software capabilities, or stable interconnections with both segments of the value chain, are best positioned. This conclusion may support investor demand in potential OpenAI and Anthropic IPOs, although outcomes will depend on monetization prospects, governance, profitability and market conditions. Both companies are not only leading AI software companies, but are also increasingly supported by private investments and infrastructure partnerships with major hyperscalers.²² These interconnections help secure OpenAI and Anthropic access to cloud infrastructure and to established distribution channels. OpenAI benefits from its deep partnership with Microsoft, which provides access to Azure and maintains the deployment of its AI capabilities across corporate and consumer workflows, including through Microsoft 365. Anthropic is more linked to Amazon, accessing cloud infrastructure through AWS and Bedrock and Amazon's custom chips (mainly Trainium), while also benefiting from distribution and adoption through Amazon's hyperscaler ecosystem.

3.4 Actors behind AI-related investments and their associated risks

The previous sections show that the investment wave underpinning recent AI-related developments is driven by a heterogeneous group of private market investors. Investment companies and asset managers play a central role, primarily raising capital through **venture capital** investment funds and participating in joint ventures mainly through equity investments by private equity, infrastructure, real estate or wealth funds. These funds, in turn, raise capital from limited partners such as pension funds, insurance companies, endowments, sovereign wealth funds, other asset-management firms and high-net-worth private investors. In parallel, technology firms and their corporate venture capital arms (NVentures of NVIDIA, M12 of Microsoft, GV of Alphabet...) have increased their investment activity, often pursuing strategic objectives and alliances alongside financial returns. Private equity funds are also increasingly involved, primarily in later-stage financing rounds or through stakes and structured investments, such as those observed in prominent AI firms (the examples of OpenAI or Beignet are shown).

These investors seek high expected returns associated with rapid technological progress and value creation. In addition, such investments are often perceived as offering diversification benefits, as returns are less closely correlated with traditional financial markets and more dependent on firm-specific innovation, scalability and results. Strategic investors may also seek indirect benefits, including access to technology, data or long-term partnerships that complement their core business activities.

Despite the benefits, these investment structures entail risks, mainly related to liquidity, timing of cash flows and financial complexity. Under VC, capital is typically locked in for long periods, often between 7 and 12

²² Bloomberg (2026a) describes hyperscalers' private investments in Anthropic, OpenAI and SpaceX, outlining their current estimated valuation gains and their reported earnings impact.

years, and investors cannot easily exit their positions. Moreover, commitments to VC funds are not paid upfront. Instead, investors commit capital that is drawn over time through capital calls as investment opportunities arise. If funding needs increase unexpectedly, or if capital calls coincide with a deterioration in macro-financial conditions, investors may face asset-liability mismatches, especially when their own funding sources are less flexible. Cash flow profiles in VC funds are also highly uncertain, with returns materialising only after a prolonged period. This increases sensitivity to valuation corrections, delays in monetization or weaker-than-expected exit markets. Private equity investments share similar illiquidity risks, as the limited depth of secondary markets makes it difficult to rebalance portfolios or unwind exposures in stress scenarios. Furthermore, deal structures can be complex and opaque, involving layered financing, preferred equity or contingent commitments. Finally, there is the risk of overbuilding capacity in anticipation of future demand, which may amplify financial fragilities if revenue growth or technological adoption falls short of expectations.

Regarding additional vulnerabilities related to co-investments within the AI sector and circular investment structures, increasing attention has been drawn to the multiple roles played by major technology firms. These firms often participate jointly in financing rounds while also supplying critical inputs to the recipient company. Other complex interconnections can be found in off-balance-sheet asset-based lending agreements via SPVs, linking different actors in the AI value chain. In the cases presented in the previous sections, separate legal entities (SPVs) raise debt secured by specific assets, such as GPUs or data center infrastructure and their associated cash flows, while keeping the debt off the parent's books. However, these structures carry risks, including potential declines in GPU or infrastructure values or weaker-than-expected cash flows, which could impair the SPV's ability to service its debt.

Overall, the arrangements analyzed through the examples in this document are frequently tied to forward-looking operational commitments that help secure future demand and other strategic benefits for the investing firms. Such structures support AI capacity expansion and coordination, but they also give rise to dense interdependencies and increased reliance on future cash flows. Notably, financing and infrastructure provision are often concentrated among a small number of strategically important firms. This interconnectedness and concentration may reinforce systemic vulnerabilities, as disruptions affecting one segment (such as constraints in chip supply, asset obsolescence or changes in cloud service conditions) can propagate across both financial and operational channels.²³ The vulnerabilities discussed above should be viewed alongside those associated with leverage and forward-looking obligations (examined in Section 4), as well as the broader implications highlighted in the key takeaways of the analysis in Section 5.

²³ Empirical evidence from the network literature suggests that the interaction between production and financial linkages can amplify shock propagation, providing a useful framework for interpreting some of the interdependencies documented in this section, see Huremović, Jiménez, Moral-Benito, Peydró and Vega-Redondo (2026).

4 Funding and forward-looking obligations

4.1 Internal financing: the relevance of cash flows

On aggregate, the rapid increase in cash flow generation has supported the expansion of investment spending. In recent years, the group of companies in the sample recorded total investment (capital expenditures, net purchases of securities and equities and net acquisitions of other companies) equivalent to around 50% of their operating cash flows (see Chart 4). Nevertheless, this ratio increased in 2025, surpassing 60%, which points to a continued acceleration in investment activity relative to funds generated internally. At the same time, a closer look at individual companies reveals considerable dispersion, as the extent to which total investment can be covered by operating cash flows varies significantly across firms, reflecting differences in investment needs, financing strategies and developments in their core activities (see Chart 5).

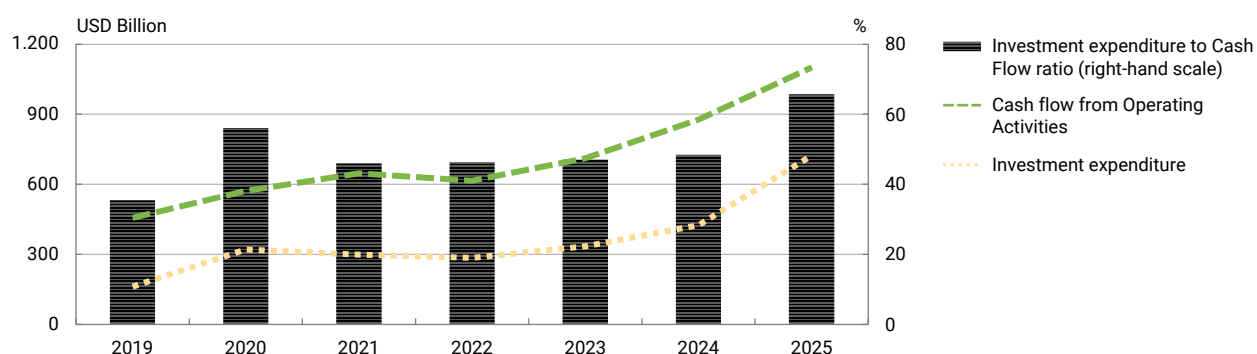
Many companies in the sample exhibit an investment-to-cash flow ratio below 80%, together accounting for almost half of total investment in 2025. Within this group, six companies exhibit a ratio below 60%, consisting mainly of suppliers of AI hardware and components (NVIDIA, ASML, TSMC and Broadcom), together with Salesforce and Apple. For suppliers of AI hardware and components in particular, cash-flow growth has markedly outpaced the expansion of their investments in recent years.

Notably, close to USD 240 billion of investment is concentrated in the group of firms with ratios of investment-to-cash flow in the 60-80% range: Microsoft, Alphabet, IBM and AMD. Similarly to companies with lower ratios, this group includes suppliers of AI hardware and components as well as large hyperscalers. In general terms, this group of large companies have established and diversified business models, as they entered the market several years ago. They generate substantial and stable cash flows while requiring very high levels of capital expenditure to sustain their leadership in AI deployment.

With lower cash-flow margins, we find the data center operators Digital Realty and NTT Data, together with Meta and Samsung (investment-to-cash flow ratios between 80 and 100%). Among firms whose investment

Chart 4

Total investment of firms in the sample relative to Cash Flow from Operating Activities (a)

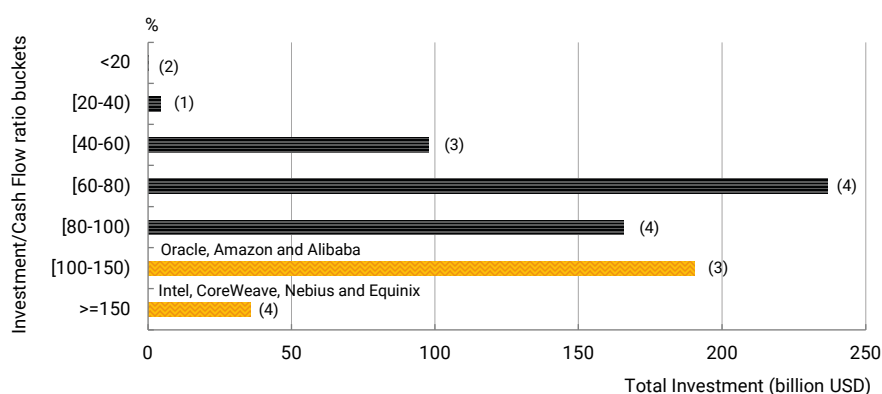


SOURCE: Capital IQ.

a Calendar year data. Investment includes both capex and net purchase of securities and stocks and net acquisition of other companies. Lambda Labs, OpenAI and Anthropic are not included because they do not publish public financial statements, as they are privately held companies and are not required to do so. CoreWeave data are reported and included starting in 2022.

Chart 5

Total investment of firms in the sample by Investment/Cash Flow ratio buckets in 2025 (a) (b)



SOURCE: Capital IQ.

- a Number of companies under each bucket in parenthesis. Calendar year data. Investment includes both capex and net purchase of securities and stocks and net acquisition of other companies.
- b Apple disinvestments in securities and stocks surpassed capex in 2025, resulting in a negative investment ratio and dragging down aggregate investment within the first bucket. Lambda Labs, OpenAI and Anthropic are not included because they do not publish public financial statements, as they are privately held companies and are not required to do so.

slightly exceeds operating cash flows (100-150%), we find Amazon, Oracle and Alibaba. Aggregate investment by these seven companies amounted to approximately 350 billion USD in 2025. Amazon has historically maintained exceptionally high levels of capital expenditure, reflecting the nature of its business model, which combines large-scale AI infrastructure build-out with substantial investment in its global e-commerce logistics network. However, in the last two years, it has accelerated investment significantly, almost at the same pace as the rest of the companies of the group. This acceleration is driven mainly by higher capital expenditure, primarily related to cloud and data center infrastructure. For Alibaba, the higher capital expenditure reflects an international shift, while the strong growth in Oracle's capital expenditure in 2025 mainly reflects the expansion of its cloud infrastructure business, aimed at scaling capacity to compete with hyperscalers and support growing enterprise workloads.

At the upper extreme, with investment-to-cash flow ratios exceeding 150%, we find the data center companies CoreWeave, Nebius and Equinix, as well as Intel. Total investment by this group in 2025 is lower than that of the previous group, but remains non-negligible, at around USD 36 billion, particularly given the smaller size of these firms. Data center companies in this group show exceptionally high growth in capital expenditure, driven by the need to scale facilities and meet rapidly rising AI-related demand. In the case of CoreWeave and Nebius,²⁴ their status as relatively new entrants further underscores the intensity of their current investment needs. As regards Intel, higher investment reflects efforts to rebuild manufacturing capabilities and establish a viable foundry business, with future cash flow generation contingent on AI-related demand for advanced semiconductor manufacturing capacity.

Generally, data center companies currently exhibit the highest levels of investment relative to their cash flows. However, this situation may evolve over time, given their substantial lease commitments that are set to boost future cash flows, and the large amount of capacity they are bringing. Naturally, companies undertaking new

²⁴ Nebius Group was created in 2024 when Yandex N.V., the Dutch parent company of Yandex, sold all of its Russian assets and reorganised its remaining international businesses into a new AI-infrastructure company.

strategic initiatives tend to exhibit high levels of investment relative to their operating cash flows as well. Overall, at present, these firms do not face significant constraints, as newly deployed data center capacity continues to be absorbed by market demand. However, this pattern may prove less persistent as supply expands and demand growth gradually moderates.

4.2 Trends in external financing: rising bond issuance and diversification of funding sources

While a number of firms in the sample continue to generate sufficient internal cash flows to fund capital expenditures and other investments, there is a growing reliance on leverage.

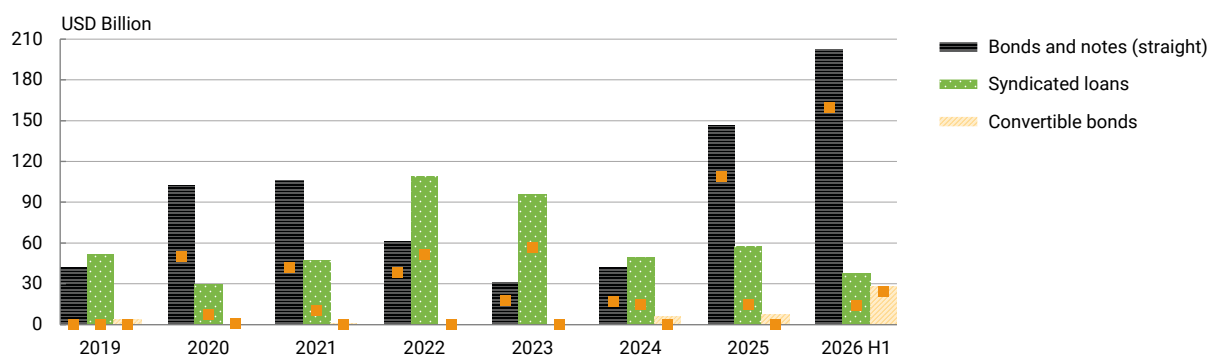
Strong increase in bond issuance

On the external financing side, the key development is the sharp increase in bond issuance that has accompanied the acceleration of large-scale AI investment.²⁵ This trend speeded up in 2025, reaching almost 150 billion USD²⁶ for the aggregate group of companies in the sample (see Chart 6), and continues to be the main funding channel in 2026.²⁷ In fact, issuance levels in the first half of 2026 have already surpassed those of the full year 2025. On the balance sheet, compared with other forms of debt, bonds accounted for 62% of the group's total debt stock at end-2025 (see Chart 7, grey bar over total).

In line with capital expenditure, the substantial increase in 2025 bond issuance was heavily concentrated among the five major US hyperscalers (Alphabet, Amazon, Meta, Microsoft and Oracle) amounting to approximately USD 108 billion. The trend has accelerated further in 2026, with issuances amounting to approximately USD 160

Chart 6

Bond Issuance and syndicated loan financing by firms in the sample (a)



SOURCE: Dealogic.

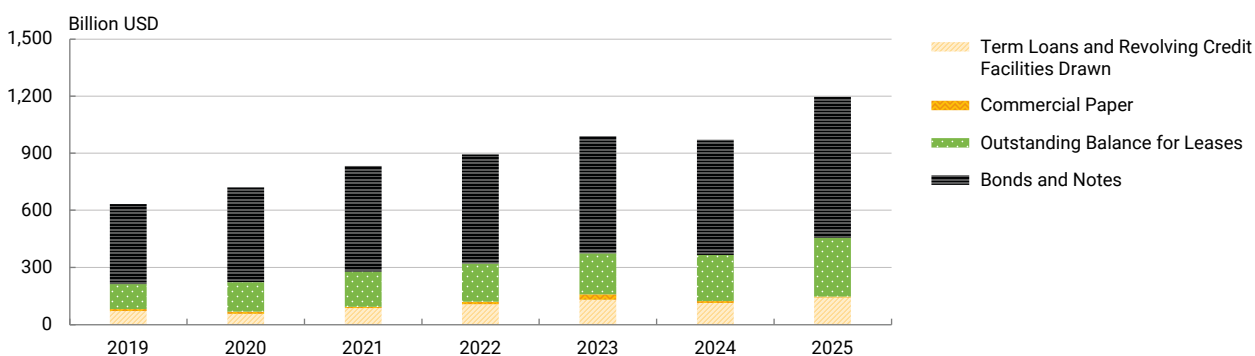
a Orange dots represent the five major hyperscalers: Oracle, Meta, Alphabet (Google), Amazon and Microsoft.

²⁵ Bond issuance may reflect the strategy to preserve liquidity and optimize capital structure while accelerating investment beyond what current cash flows could comfortably support.

²⁶ This value includes bonds denominated in non-USD currencies, given that Dealogic provides USD-converted figures by applying the relevant exchange rate at the time of the deal's pricing or closing.

²⁷ Aligned with Chart 6, a recent comprehensive study by S&P Global (2026b) indicates that, as of end-April 2026, US hyperscalers had raised approximately 115 billion USD, already surpassing their total issuance for the full year 2025. The report estimates that capital expenditure, projected at around 700 billion USD for the year, are likely to sustain elevated issuance volumes among hyperscalers in 2026.

Chart 7

Breakdown of total debt on the balance sheets of the firms in the sample (a) (b)

SOURCE: Capital IQ.

a Undrawn credit facilities are not included as debt. If they were, they would represent around 8% in 2025.

b Calendar year data. Lambda Labs, OpenAI and Anthropic are not included because they do not publish public financial statements, as they are privately held companies and are not required to do so.

billion in the first half. Notably, bond issuance has benefited from strong credit quality, as reflected in ratings assigned by major credit rating agencies. Among firms in the sample that have accessed public bond markets, issuances have been investment-grade since 2019, with the exception of CoreWeave (BB-).

The increase in bond issuance observed in 2025 and the first half of 2026 was also supported by access to the euro-denominated bond market. As shown in Chart 8, euro-denominated bonds accounted for 16% of total issuance by the companies in the sample during this period. Access to the euro market appears to have complemented firms' funding strategies by allowing issuers to diversify financing sources, broaden their investor base and benefit from favorable pricing conditions in European capital markets. Moreover, for companies with significant operations or revenues in Europe, euro-denominated issuance may help mitigate currency mismatches on their balance sheets.

Another factor that shaped bond issuance in 2025 and thus far in 2026 was the trend toward longer maturities. Recent bond issuances by Alphabet (Google), Oracle, Meta and Amazon at very long maturities stand out, as they contribute significantly to the stock of debt outstanding beyond the ten-year horizon. These firms have issued bonds with tranches extending up to 40 years and, in the case of Alphabet (Google), up to 50 years. Amazon has also issued bonds with maturities of up to 50 years in 2026. Such very long maturities are rare, although not without historical precedent for US technological companies, such as IBM which issued a 100-year maturity bond in 1996 or Motorola in 1997.

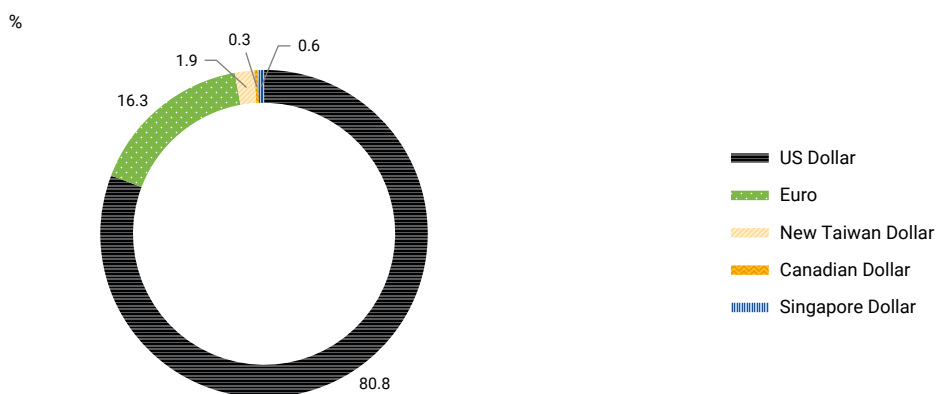
In this context, an analysis of outstanding bond maturities across the full sample of companies under review shows that the bulk of debt is scheduled to be repaid within the next ten years, while a non-negligible share extends to much longer horizons (see Chart 9).

Among the companies in the sample, only a small number have not accessed bond markets: OpenAI, Anthropic and Lambda, which are not publicly listed companies and rely primarily on venture capital for external financing. Excluding these few exceptions, bond issuance is widespread, even among relatively new companies.

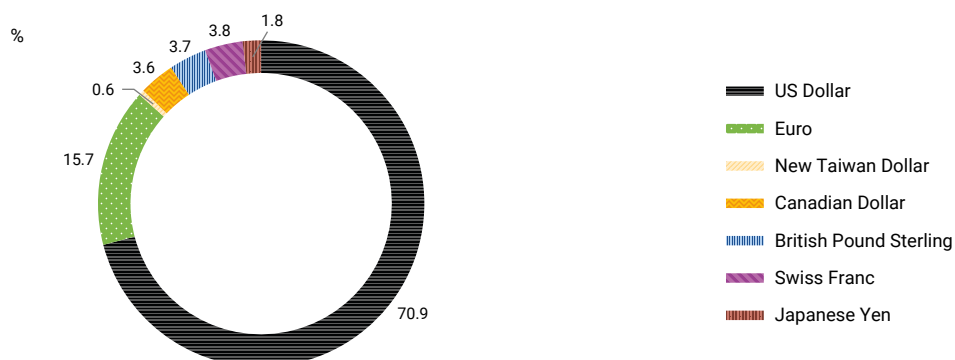
Chart 8

Currency breakdown of bond issuance by sample firms in 2025 and H1 2026 (a)

8.a 2025



8.b 2026 H1

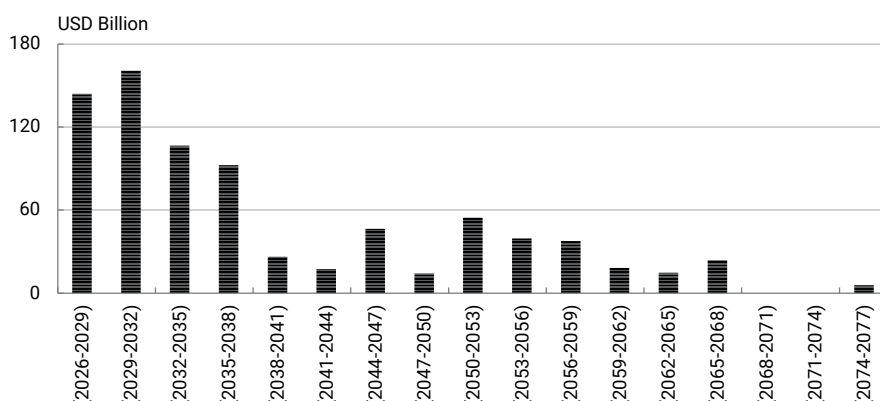


SOURCE: Dealogic.

a In 2024, bond issuance spanned more currencies, with Alibaba issuing in renminbi and Equinix in Swiss francs.

Chart 9

Bond maturity profile of the firms in the sample (a) (b)



SOURCE: Dealogic.

a Bonds primarily represent long-term issuances, as short- and medium-term notes are rare, with only a few examples recorded in 2023.

b The 100-year maturity IBM bond maturing in 2096 is not shown, to avoid extending the chart's axis, but amounts to 850 million USD.

In this context, new entrants in the cloud infrastructure sector are financing part of their high investment needs through privately placed convertible notes, such as Nebius or CoreWeave in 2025 and 2026.²⁸

A noteworthy feature of the 2026 financing landscape was the increased use of convertible bonds, including by some major hyperscalers. In particular, Oracle and Alphabet publicly raised approximately 5 billion and more than 19 billion USD, respectively, through such instruments. This development is notable given the relatively limited issuance of convertible bonds in recent years and may reflect efforts by AI-related firms to secure additional financing flexibility as investment requirements continue to expand. Unlike straight bonds, convertible bonds have hybrid debt-equity characteristics and are therefore presented separately in Chart 6. Including convertible bonds would raise total bond issuance in the first half of 2026 to around USD 230 billion.

Lower reliance on syndicated loans and only limited use of direct private lending, given that the latter is typically targeted at smaller firms

Developments in syndicated loan volumes present a different picture than bonds, as volumes declined in 2024 and 2025 relative to 2023, with a reduced share attributable to the five major hyperscalers (Chart 6). As bond markets have remained receptive, especially for investment-grade issuers, firms in the sample have generally substituted syndicated loans with direct bond issuance. Compared with syndicated loans, bonds often offer longer maturities, fixed interest rates, greater flexibility on covenants and larger upfront amounts aligned with long-term infrastructure investment cycles.

Among the companies in the sample, only CoreWeave (in 2024 and 2023) and Lambda (in 2024) have made use of direct private lending, as this form of private debt is typically extended to middle-market or smaller firms. These transactions were discussed in Section 3.3 and in the Appendix as examples of interconnections within the sector, as they involved private loans secured by NVIDIA GPUs and the related future cash flows. The transaction completed in 2024 by Coreweave ranks among the largest private debt financing ever, amounting to 7.5 billion USD²⁹ (Figure 4). The SPV linked to the Meta-Blue Owl JV, discussed in Section 3.2 and the Appendix, also raised credit from private investors.

However, it is worth noticing that other smaller firms (not in the sample) are increasingly turning to private debt, reflecting the tailored nature of these financing arrangements. Private debt offers greater flexibility in amortization profiles and capital structures, including unitranche facilities³⁰ or hybrid instruments that incorporate equity-like features, as well as more adaptable collateral definitions (e.g., infrastructure assets, contracts or intellectual property-linked cash flows, which are common in the technology sector). While the companies analysed in this document are larger and typically rely on bond issuance, thus making limited use of private debt, estimates indicate that the outstanding stock of private debt across the AI sector exceeds USD 200 billion.³¹

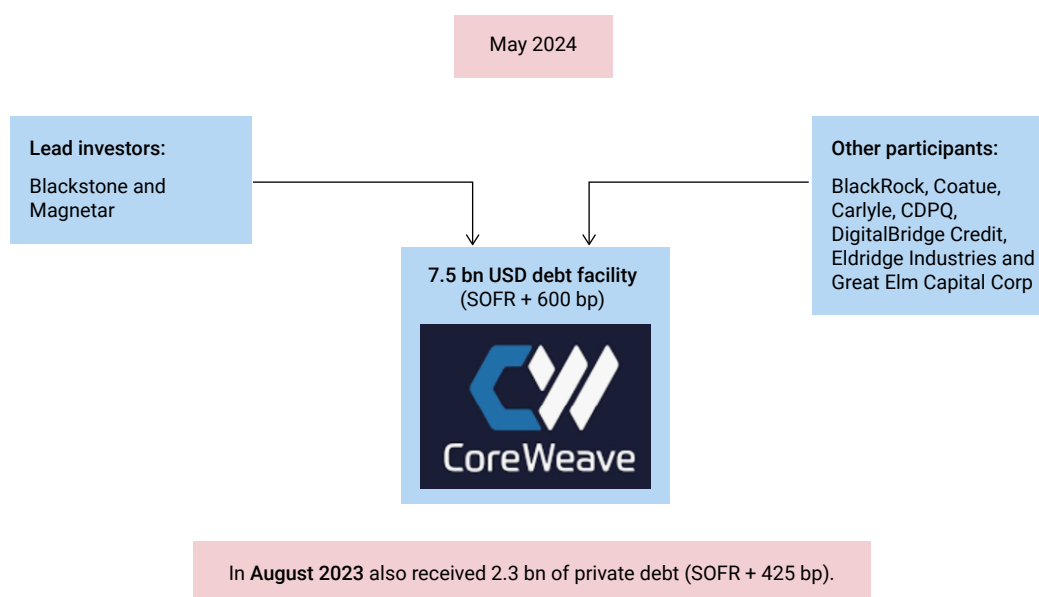
²⁸ See press releases on this topic for Nebius (2025 and 2026) and Coreweave (2025 and 2026). In CoreWeave's case, despite being a relatively young company, convertible notes form part of a broader funding strategy that also includes high-yield corporate bonds, leveraged loans and asset-based lending facilities, as described in this document.

²⁹ See the [press release on the 2024 transaction](#).

³⁰ A unitranche facility is a hybrid debt structure that combines senior and subordinated debt into a single loan with a blended interest rate. Unitranche debt is typically privately arranged and tailored to specific borrowers, and may simplify transactions as it is usually documented in a single loan agreement.

³¹ Aldasoro et. al (2026) estimates point to outstanding amounts of over USD 200 billion for US AI-related firms, referring mainly to private direct lending, which constitutes the predominant form of private debt. Our own estimates suggest that the global outstanding amount reaches around USD 240 billion at the end of 2025. These estimates, together with the analysis of the broader participation of NBFIs in AI investment activities, underscore the growing importance of private markets in supporting the AI ecosystem.

Figure 4

CoreWeave's private debt funding

SOURCE: CoreWeave's website and PitchBook.

ABS and CMBS financing in the data center sector, but not by firms in the sample, owing to their access to bond markets and bank financing

Finally, although some data center operators have issued ABS or CMBS, firms in our sample generally do not rely on such structures. Key issuers include Aligned, Vantage, CyrusOne, STACK, Switch and QTS.³² Morgan Stanley (2025b) estimates that outstanding securitized credit in the sector is approximately 50 billion USD, with around two-thirds in ABS and one-third in CMBS. While bank debt also remains a relevant source of financing, these operators benefit from securitization because the underlying collateral (data center facilities) supports coupons comparable to US investment-grade debt at 4-7 year tenors (below high-yield levels). By contrast, the data center operators in our sample typically have access to senior unsecured bond markets and, together with bank financing, do not require recourse to securitization. Meanwhile, neoclouds in our sample, which have newer business models primarily focused on GPUs and software (rather than real estate assets), rely on alternative structures such as GPU-backed lending, SPV-based leasing arrangements and private credit, as discussed above in this document.

Equity financing gains importance, with further activity expected

Regarding equity financing, only newer companies have increasingly turned to equity capital markets to raise funding. Net equity issuance among younger firms (such as Nebius, Equinix and CoreWeave) has been positive in recent years. By contrast, for more established companies, net common equity issuance has generally been negative,

³² See examples of press releases from [Aligned](#) or [Vantage](#) describing their securitizations. The CNBC covered the [Vantage first ever euro denominated deal](#). Other specialized websites described [different operations by CyrusOne and QTS](#), including information about the lead managers and bookrunner involved (DatacenterDynamics.com).

reflecting share repurchases exceeding new issuances, with the notable exceptions of Intel and IBM. Indeed, share buybacks and repurchases have historically been a common practice in the technology sector, serving to return excess cash to shareholders, support earnings per share and signal confidence in long-term growth prospects. Above all, these firms have relied mainly on bond issuance for external financing. Nevertheless, recent funding needs to accelerate AI investment projects have led Alphabet to return to a sizeable equity capital raise starting in June 2026, estimated at 80 billion.³³

Also, relevant activity in equity capital markets is expected in the coming months, with potential IPOs from OpenAI, Anthropic and Lambda. SpaceX, while not included in the sample under review, completed its IPO in June 2026 in what became the largest public offering on record, providing informative signals for this group of companies. Investor demand for AI-related equities has remained highly supportive, with stocks posting substantial gains since late 2022, following the emergence of large language models and the optimism about the technology's potential. Market sentiment has been underpinned by strong profitability and has persisted despite more skeptical views, including concerns over the scale of infrastructure investment, the uncertainty surrounding its monetization and the increasing circularity of investment within the AI value chain.³⁴

4.3 Forward-looking obligations: lease commitments and total leverage

Hyperscalers, large AI application platforms and LLM developers increasingly rely on long-term lease commitments for data center facilities and, to a lesser extent, hardware (mainly GPUs), to ensure the substantial capacity required for training and deploying large-scale AI models. Renting data center facilities and hardware enables companies to secure additional capacity rapidly, avoiding the long lead times and execution risks associated with building new infrastructure, while preserving operational flexibility. Although historically such arrangements were often viewed as a way to expand capacity without increasing reported debt, recent accounting standards have substantially reduced the differentiation between leased and debt-financed assets. Specifically, under both US GAAP (ASC 842) and IFRS (IFRS 16), lease commitments have to be recognized on the balance sheet as right-of-use assets with corresponding lease liabilities, which are debt-like in nature.³⁵

As illustrated in Section 4.2, lease commitments account for 26% of total debt on the 2025 balance sheets of the aggregate group of companies in the sample (see Chart 7, green bar over total). This component is more significant for hyperscalers and large AI platforms, accounting for 38% of total debt (Chart 10), as discussed above, mainly reflecting long-term data-center leases that entail fixed payment obligations. Notably, the LLM developers in the sample (OpenAI and Anthropic) rely heavily on leased data center capacity, but as they do not publish detailed financial statements, the scale of their lease commitments is not visible. Nevertheless, available news reports

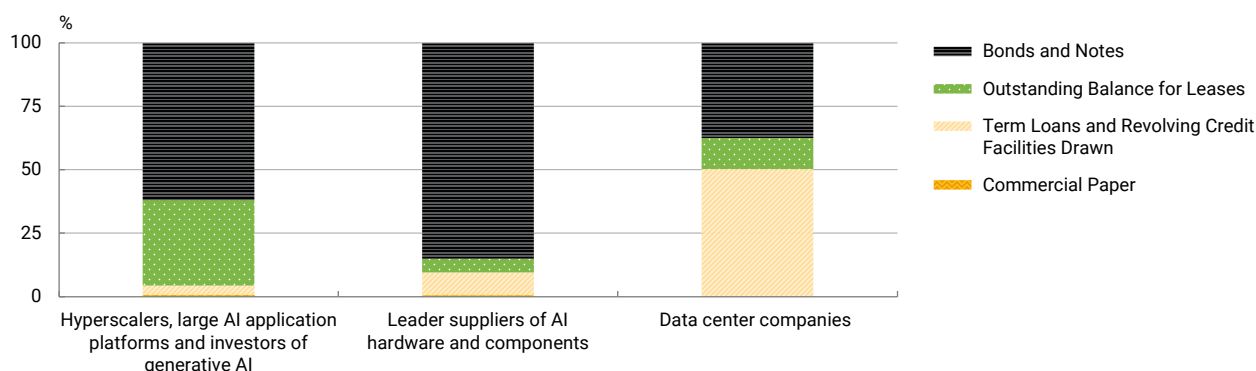
³³ See the [SEC registration](#) and the [Alphabet's announcement](#). Roughly USD 40 billion was raised immediately through concurrent underwritten offerings, while an additional USD 40 billion was authorized for issuance through an at-the-market (ATM) offering program expected to commence in Q3 2026.

³⁴ Stock market optimism regarding AI-related equities has been extensively analysed and compared with previous investment cycles, such as the dot com era. For instance, Albori, Nispi Landi and Taboga (2025), using model-based evidence, find that market prices do not appear implausible given the underlying drivers of recent and expected performance. However, they note that some caution is warranted, as certain industries still struggle to identify reliable applications and face increasing competition from abroad. Other documents, such as Lock and Walters (2025), also examine potential triggers for a reassessment of future earnings that could lead to a correction in AI-related stock prices.

³⁵ In some cases, there are arrangements for the use of data center facilities or hardware embedded within broader strategic partnerships and alliances, which are structured as service or supply contracts rather than formal lease agreements, thereby limiting the recognition of lease liabilities on balance sheets or directly avoiding debt commitments. These agreements often combine infrastructure provision with equity investments, preferred supply relationships or revenue-sharing mechanisms, giving rise to circular investment structures within the AI sector.

Chart 10

Breakdown of total debt on 2025 balance sheets by type of firm in the sample (a) (b)



SOURCE: Capital IQ.

- a Calendar year data. Undrawn credit facilities are not included as debt. Lease commitments include both operational and finance leasing, so figures of US GAAP companies are comparable to the IFRS ones.
- b Data center companies include neocloud providers. Lambda Labs and the LLM developers OpenAI and Anthropic are not included because they do not publish public financial statements.

consistently point to extensive long-term arrangements with data center operators and hyperscalers, often including access to GPU infrastructure.³⁶

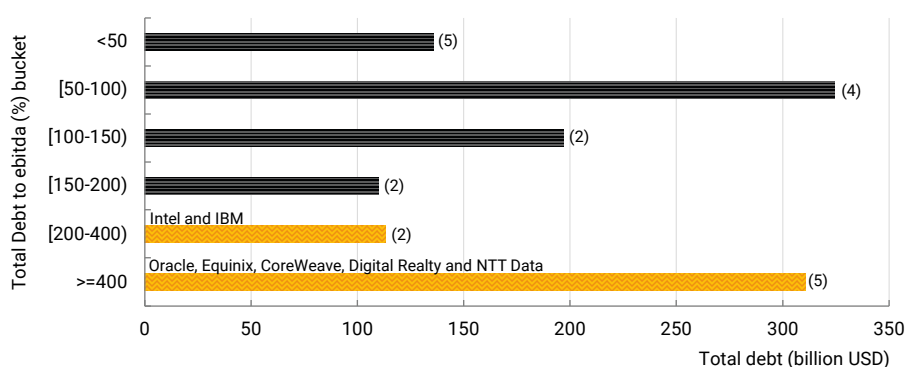
Against this backdrop, a comprehensive assessment of AI-related leverage should not be limited to outstanding bonds and loans, but should also incorporate lease liabilities, which have become a material component of the sector's overall financial obligations. Therefore, the total debt-to-Ebitda ratio reported in this section (Chart 11) includes lease liabilities in the numerator. This proxy for total leverage is especially high for data center firms and companies that have recently relied on debt to finance accelerated investment without a corresponding increase in Ebitda. Specifically, companies with total debt-to-Ebitda ratios above 400% in 2025 were Oracle, Equinix, CoreWeave, Digital Realty and NTT Data. Nebius also stands out, as it represents a distinct case given that its Ebitda was negative in 2025. This section does not revisit firm-specific developments or financing strategies but highlights the importance of sustainable future Ebitda generation to service elevated leverage.

Looking ahead, it is also very relevant to consider lease commitments that have been contractually agreed but have not yet started. Such commitments, for example, data center capacity with deferred start dates, are generally not recognized on balance sheets, as companies are not required to record them under current GAAP and IFRS rules. Instead, these obligations are disclosed as off-balance-sheet commitments in the notes to the financial statements. While such forward lease commitments do not increase reported debt or leverage ratios now (therefore they are not included in the figures of Chart 11), they represent significant future obligations. In anticipation of their impact, credit rating agencies typically take into account these contractually agreed lease commitments that have

³⁶ For these two companies, financing and access to infrastructure are closely linked through circular investment structures with hyperscalers. As analysed in Section 3, hyperscalers provide venture funding and form long-term service agreements ensuring the availability of compute resources and infrastructure, notably through Microsoft Azure, Amazon Web Services and Google Cloud, and more recently, Oracle Cloud. Some news on this topic are: [Anthropic seeks data center leasing deals in Europe and Australia](#) (Datacenterdynamics.com, 20 April 2026) and [OpenAI's data center pivot underscores Wall Street spending concerns ahead of IPO](#) (CNBC 22 March 2026).

Chart 11

Total debt of firms in the sample by debt to Ebitda ratios buckets in 2025 (a)

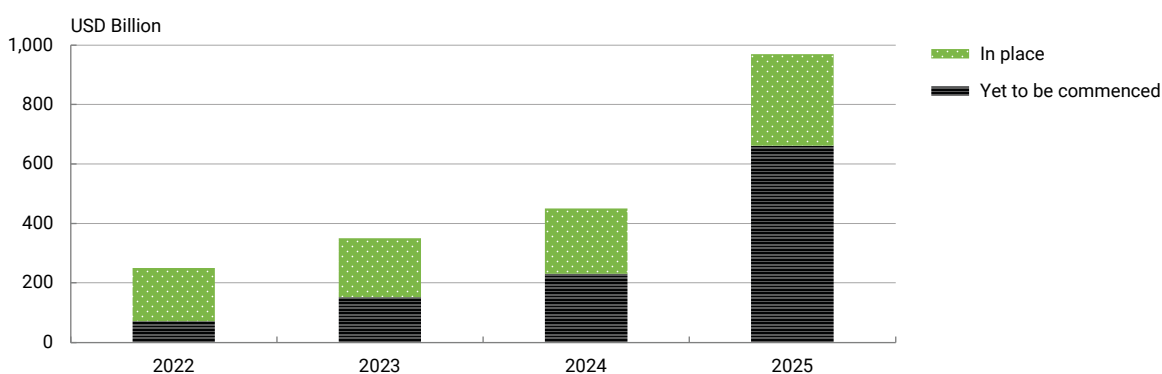


SOURCE: Capital IQ.

a Calendar year data. Lambda Labs, OpenAI and Anthropic do not publish public financial statements. Nebius is not shown as reported negative Ebitda in 2025. Total debt includes lease commitments. Number of companies in parenthesis.

Chart 12

Major hyperscalers current and future lease commitments (a)



SOURCE: Moody's Ratings.

a Figures show the aggregate of the five major hyperscalers: Oracle, Meta, Google (Alphabet), Amazon, and Microsoft. Lease commitments include both operational and finance leasing, so figures of US GAAP companies are comparable to the IFRS ones.

not yet begun when assessing adjusted leverage and overall creditworthiness of the companies. In fact, a report by Moody's Ratings (2026) shows that Amazon, Meta, Alphabet, Microsoft and Oracle collectively hold around 969 billion USD in future data center lease commitments, of which 662 billion relates to leases that have not yet commenced (Chart 12). Moody's notes that these commitments related to leases not yet commenced amount to roughly 113% of adjusted debt at the end of 2025 (consistent with 662 billion over their total debt of 593 billion estimated in this report), indicating a substantial off-balance-sheet exposure that will emerge as facilities become operational.

In this context of growing reliance on lease-based capacity, it is also important to consider the implications for companies owning and operating data center facilities and AI hardware leased. These arrangements expose such

firms to key risks related to technological obsolescence and the sustainability of tenant demand over time.³⁷ The rapid pace of innovation in AI may render data-center infrastructure and hardware outdated before the associated debt is fully repaid, thereby increasing lease renewal risk. At the same time, rapid technological obsolescence has pushed tenants towards shorter-term leases (typically 1–6 years), compared with the historical 10–15 years. These shorter commitments, combined with limited upfront recognition of renewals, may leave landlords more exposed to non-renewals. These risks are compounded by the reliance on multiple tenants over time and may be further amplified where operators are highly exposed to a limited number of counterparties. In addition, operational risks may also arise, as tenants may exit leases in the event of construction delays affecting lease commitments that have not yet commenced. Finally, it should be noted that access to power constitutes a major constraint, and the growing demand for electricity may progressively shift exposure towards power-generation financing for data-center operators, but also for companies requiring computational power.

Overall, assessing the financial outlook of AI-related firms requires a forward-looking perspective that goes beyond current balance-sheet positions and traditional debt metrics. While leasing reduces tenants' upfront capital expenditure, a heavy reliance on such arrangements may constrain financial and operational flexibility. For providers of leased data center and compute infrastructure, key risks stem from rapid technological obsolescence and uncertain tenant demand, as well as operational challenges related to construction delays and access to power. Taken together, these dynamics reinforce the importance of incorporating lease exposures when evaluating the risks and long-term sustainability of AI-driven investment.

³⁷ Under both GAAP and IFRS, renewal options are included in the measurement of lease liabilities only when they are reasonably certain to be exercised; otherwise, they are excluded. In practice, uncertainty around the pace of technological change and evolving capacity needs may lower the likelihood that tenants assess such options as reasonably certain, implying that future lease commitments are typically kept off balance sheet. A similar accounting treatment applies to residual value guarantees included in certain contracts. Such treatments may reduce investors' visibility into potential future obligations of the company.

5 Key takeaways on AI-related investment, funding and potential risk implications

Private markets are playing a pivotal role in enabling the recent acceleration of AI development by providing the substantial upfront financing required to scale compute-intensive technologies and bring them to market. The analysis of investments undertaken by leading AI-related firms points to a notable increase in transactions involving NBFIs, particularly through their participation alongside other investors in VC rounds. This pattern aligns with the increasing share of AI-related VC within total VC investment. In parallel, joint ventures with NBFI involvement have also been significant, largely driven by the expansion of data center infrastructure, as operators increasingly partner with institutional investors to finance capital-intensive projects and share risks.

Focusing on co-investment structures involving several AI-related firms, the analysis also shows how core actors in the AI ecosystem are forming strategic alliances that give rise to significant financial interlinkages. These alliances span the AI value chain, including demand-side drivers (AI application platforms and hyperscalers developing generative AI services), supply-side compute enablers (semiconductors and key components), infrastructure operators (data center providers and neoclouds) and frontier model developers (LLM laboratories). Major technology firms are participating jointly in financing rounds while simultaneously acting as providers of critical inputs, such as cloud computing capacity, advanced semiconductors and proprietary software stacks. As a result, capital provision is frequently linked to forward-looking operational commitments that secure future demand for the same firms involved in the financing, thereby reinforcing interdependencies across the AI value chain.

The sector's interconnected structure can amplify vulnerabilities, particularly in the event of financial distress affecting a key participant. Main risks are related to potential asset-liability mismatches, which may arise both among NBFIs supplying long-term capital and among AI-related companies that, in addition to providing capital, often enter into sizeable forward commitments (e.g. data center and hardware lease or commercial agreements associated with strategic investments). Other sources of risk and channels for shock amplification include customer or supplier (and, in some cases, financier) concentration, technological obsolescence and the complexity or opacity of certain investment structures.

SPV arrangements allow firms to separate asset-related risks from their balance sheets while retaining access to the infrastructure (basically, data centers facilities or GPUs). Although these structures can provide financial flexibility, they may also increase complexity, obscure the allocation of risks across participants and, where leverage is employed, create additional refinancing and collateral-related vulnerabilities (these SPVs typically raise additional financing by pledging data center and infrastructure assets, as well as the cash flows generated by those assets, as collateral). Furthermore, although the assets are held by the SPV, the AI-related firm may retain contingent exposure through guarantees, contractual commitments, reputational considerations or operational dependence on the underlying infrastructure.

Regarding the funding sources at the level of AI firms, the evidence indicates that investments are generally supported by strong cash flow generation, albeit alongside rising indebtedness. The document covers the main sources of funding, with an emphasis on the characteristics of the recent surge in bond issuance, which has benefited from favorable credit ratings. Through funding channels, private markets also play a role through the expansion of private credit, although evidence remains limited in the sample used in the document, as such financing is typically extended to smaller firms.

Finally, the analysis examines the implications of lease commitments associated with rented infrastructure and strategic partnerships, including commitments that have been contractually agreed but have not yet commenced, as well as their interaction with leverage dynamics. For tenants, these arrangements may generate future financial pressures, particularly in maintaining sufficient cash flow and liquidity to support continued growth and meet elevated financing requirements. For lessors, risks relate to technological obsolescence, lease non-renewals, tenant concentration, operational disruptions and growing power constraints, all of which may affect the sustainability of investment and financing arrangements.

The sustainability of current investment and funding strategies ultimately depends on the timely monetization of these investments and on revenues meeting expectations. Failure to convert these investments into stable cash flows would leave corporate balance sheets exposed and could also affect NBFIs that have provided capital to AI-related projects, potentially impairing the value and expected returns of their investments. By contrast, successful monetization would enable firms to gradually absorb leverage over the long term while supporting the sustainability of underlying financing arrangements. Furthermore, a deterioration in the macro-financial environment (through tighter financing conditions, weaker demand or reduced participation by NBFIs in AI-related projects) could further weigh on the sector's development and amplify pressures across both investing institutions and AI-related firms.

6 Conclusion

Investment and funding strategies examined in this document have facilitated capital formation, risk sharing, financial flexibility and strategic partnerships, enabling the deployment of resources at a scale that would be difficult to achieve through more traditional financing models. However, these strategies have also led to an extensive web of contractual, operational and financial linkages among AI-related firms, NBFIs investors, lenders and infrastructure providers that may increase the potential for risks to be transmitted across participants and markets.

This is particularly relevant in the context of the growing reliance of major AI-related firms on external financing and leverage, as well as the increasing complexity and opacity of their investment and funding structures. The increasing interconnectedness of funding arrangements, including circular investments and financing, crossholdings and SPV structures, may make it more difficult to distinguish between gross investment activity and net capital formation, while reducing transparency regarding ultimate funding sources and the concentration of risks.

In this context, financial authorities and market regulators have an important role in ensuring that rapidly evolving financial markets continue to support efficient capital allocation while preserving financial stability. This requires close monitoring of both public and private markets, where a growing share of AI-related investment and financing is taking place. At the same time, greater visibility over leverage, including future contractual commitments, funding structures and risk concentrations can strengthen the ability of authorities and market participants to assess risks, thereby supporting the continued provision of financing for innovation while safeguarding financial stability.

While primarily descriptive, the analysis presented in this document provides a foundation for further quantitative research and deeper investigation into this rapidly evolving area. The potential vulnerabilities identified may interact with sector-specific characteristics, including rapid technological change, substantial capital requirements and a relatively concentrated market structure. Many investment arrangements ultimately rely on the generation of future cash flows. Consequently, a deterioration in operating performance could create pressures not only for AI-related firms seeking to service debt and meet contractual obligations, but also for NBFIs investors and lenders exposed to AI-related projects. Future research could build on these insights by examining how investment and funding structures evolve over time, how risks may be transmitted through financial and commercial interconnections, and how technological, financial and macroeconomic developments may affect their long-term sustainability.

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Appendix. Examples of recent notable private-market transactions

OpenAI Later Stage VC rounds (selected for scale and breadth of participation)

OpenAI raised 40 billion USD of venture funding in a deal participated by 70 investors in the first half of 2025.³⁸ This large fundraising reflects the substantial capital requirements associated with OpenAI's transition from a non-profit organization to a for-profit entity.

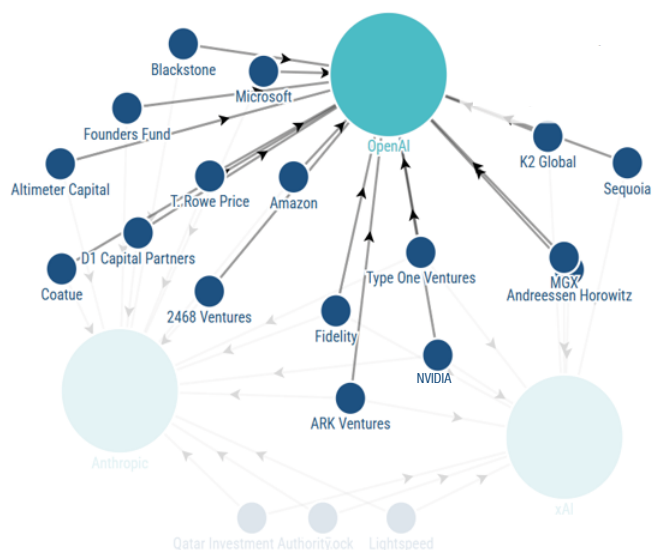
OpenAI investors' base includes venture capital firms, corporate strategic investors and private equity funds, but has received relevant strategic investments from major technology companies as well, most notably Microsoft. The main investor was SoftBank, and other frequent investors in AI (such as Thrive Capital, Fidelity, Blackstone and MGX) also participated.

In February 2026, the company continued to raise capital through later-stage venture rounds and secured 110 billion USD in a late-stage VC round (Figure A.1). The transaction was led by Amazon with a 50 billion USD commitment (an initial 15 billion USD tranche and the remaining USD 35 billion conditional on future milestones), followed by SoftBank and NVIDIA, which each contributed 30 billion USD.³⁹ Microsoft did not disclose its participation, but it is included in the illustration, taking into account its involvement in previous OpenAI VC funding rounds.

When analyzing interconnections across the sector, it is particularly relevant for two reasons: i) the same co-investors also took part in joint investments in competing firms; and ii) the magnitude and structure of the commercial commitments involved.

Figure A.1

Investor base of the OpenAI Later Stage VC in 2026

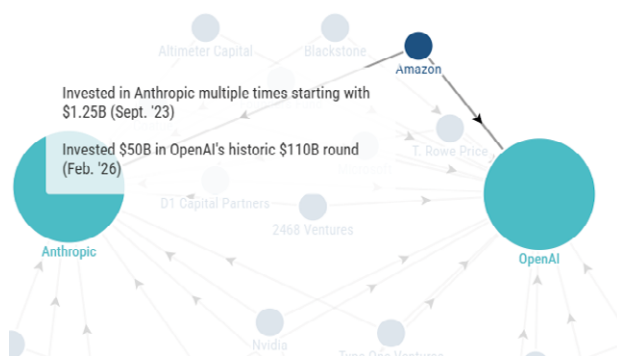
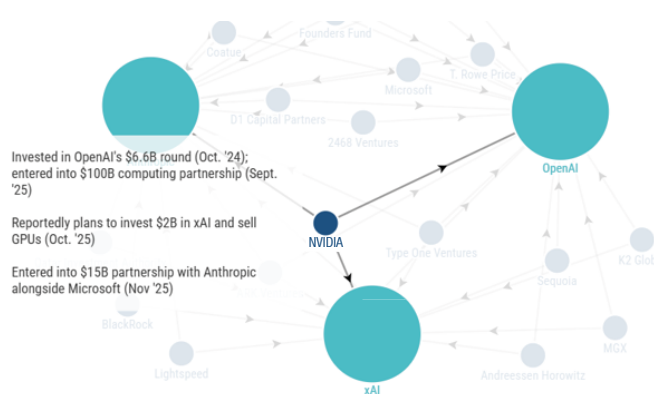
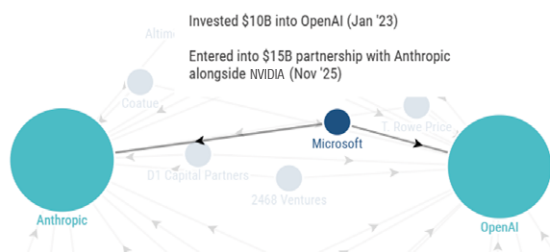


SOURCE: PitchBook.

³⁸ See [CNBC's news](#) on the funding round.

³⁹ See [OpenAI's announcement](#) and [Reuters' news](#) on the funding round.

Figure A.2

Overlapping investments in AI**2.a Investments by Amazon in OpenAI and Anthropic****2.b Investments by NVIDIA in OpenAI, Anthropic and xAI****2.c Investments by Microsoft in OpenAI and Anthropic**

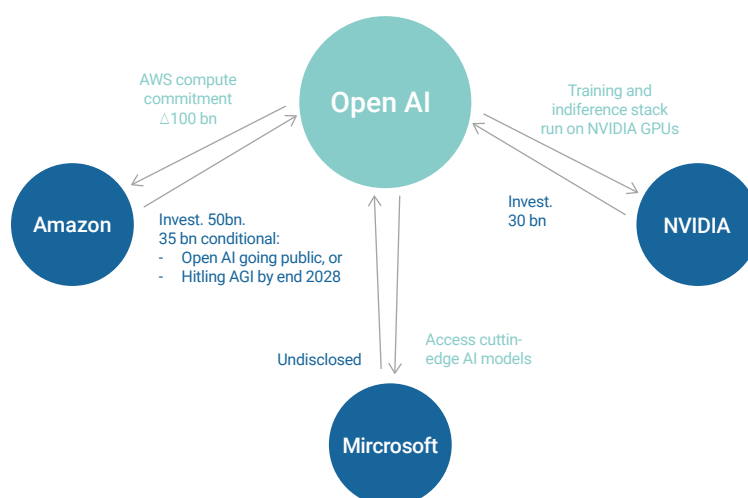
SOURCE: PitchBook.

i) Amazon, NVIDIA and Microsoft co-investing together in competing firms

Amazon, Microsoft and NVIDIA invested in OpenAI, but also in Anthropic (and xAI, before its merger with SpaceX, in the case of NVIDIA), primarily to secure demand for their core businesses (cloud infrastructure and chips) while gaining preferential access to frontier AI models that can be integrated into their products.

While this illustration focuses on the interconnections among AI-related companies, it is worth mentioning that there are several NBFIs also investing in these competing firms simultaneously. PitchBook offers an [interactively visualization of this network](#).

Figure A.3

OpenAI Later Stage VC in 2026

SOURCES: OpenAI website and AmazonNews.

ii) The magnitude and structure of the commercial commitments involved in the deal

The deal combined equity funding with commercial commitments, underscoring that the invested capital flows back to them in the form of long-term infrastructure demand and strategic integration.

OpenAI undertook substantial cloud-computing commitments with AWS (Amazon Web Services) reportedly exceeding USD 100 billion,⁴⁰ effectively tying future infrastructure demand to a key strategic partner. At the same time, NVIDIA is expected to benefit from OpenAI's reliance on its hardware and software stack for model training and inference, reinforcing demand for its accelerators and associated platforms. These arrangements exemplify a form of circular investment, where the funding provided is closely tied to the future revenues that the same parties will receive. The scale of capital provided by Microsoft was not publicly disclosed, but as an historical OpenAI's investor, Microsoft continues to benefit from access to frontier AI models, supporting its broader product and platform strategy.

Stargate Project JV (selected for scale)

Stargate Project LLC is a joint venture between OpenAI, SoftBank, Oracle and MGX, established to build large-scale AI infrastructure in the United States.⁴¹ It represents one of the largest private market financing initiatives ever undertaken in the AI and data center space. The deal included in the sample amounts 100 billion USD and represents only the first phase of the project, while the plan is to invest up to 500 billion USD in AI infrastructure by 2029.

⁴⁰ See [OpenAI and Amazon announce strategic partnership](#), published in the official blog of Amazon News.

⁴¹ See the project announcements issued by [SoftBank Group](#) and [OpenAI](#). SoftBank is one of the most active non-bank investors in the global AI ecosystem. At a lower scale, MGX has recently participated in some of the largest AI funding rounds in the world, including: Databricks' 10 billion USD raise, xAI's 6 billion USD round, OpenAI's 6.6 billion USD round, among others.

SoftBank and OpenAI are the lead partners: SoftBank is the financial architect, responsible for capital mobilization, structuring fundraising rounds and ensuring long-term financial sustainability, and OpenAI would be the operational lead. There is no official data available on the contributions of individual participants in these transactions. However, press reports⁴² suggest that SoftBank and OpenAI would each hold a 40% stake, with reported commitments of around 19 billion USD each. Oracle and MGX are expected to jointly contribute around USD 7 billion.

Through this co-investment initiative, OpenAI stands to benefit from the expansion of computational capacity, enabling it to accelerate both advanced AI research and large-scale deployment. For Oracle, the partnership strengthens its position in cloud infrastructure while securing a central role in supplying hardware and supporting the build-out of large-scale data center facilities.

At the time of publishing this report, press coverage points to delays and tensions among partners regarding the governance, financing and ownership of the Stargate Project, suggesting that its initial implementation timeline faces execution risks.

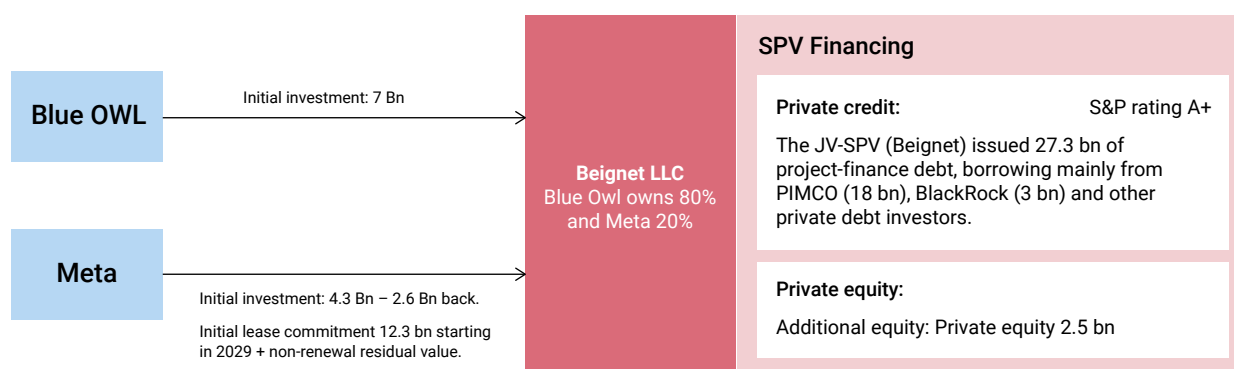
Meta-Blue Owl JV-SPV to build the Hyperion Data Center (off-balance sheet structure)

Meta and funds managed by Blue Owl Capital formed a joint venture to develop the Hyperion data center campus, with Blue Owl funds holding an 80% stake and Meta retaining the remaining 20%.⁴³ The joint venture is financed through the following arrangements:

- A Special Purpose Vehicle (SPV) associated with the Joint Venture (Beignet Investor LLC) issued 27.3 billion in project-finance private debt,⁴⁴ which was assigned an A+ rating, raised from private investors (mainly PIMCO and BlackRock).

Figure A.4

Meta – Blue Owl JV



SOURCES: Meta filings, S&P Global Ratings and Financial Times.

⁴² See the articles [OpenAI and SoftBank to both invest \\$19bn in Stargate - report](#) (DatacenterDynamics) and [OpenAI, SoftBank each commit \\$19 bln to Stargate AI data center, the Information reports](#) (Reuters).

⁴³ See information from the corresponding [Meta FORM 10-Q](#) and from the [press conference](#).

⁴⁴ See the [S&P Global rating assessment of the debt](#) and a [Financial Times article explaining the infrastructure of the transaction](#). The [Wall Street Journal](#) also reported the news, commenting on the role played by private investors in the transaction.

- The project-finance debt is not reported as Meta's corporate debt, but Meta payments to the SPV to use the data center facilities of the JV are recorded as lease expenses, which will commence in 2029. The initial lease commitment is approximately 12.3 billion USD for a four-year lease term, with options to renew for a total lease period of up to 20 years. These lease payments that the SPV will receive will be used to repay and back the interest expenses on the debt. This is a clear example of lease commitments that have not yet commenced; the implications for companies owning and operating data center facilities for tenants are discussed in Section 4.3.
- Besides the lease commitment, the support of Meta to the Joint Venture is also provided by a residual value guarantee for the first 16 years of operations.

Lambda and CoreWeave securing loans through SPVs, backed by NVIDIA chips and future cash flows (off-balance-sheet asset-based lending)

Lambda's uses asset-based lending through SPVs to expand its AI cloud infrastructure. One of the most notable and first-of-its-kind transactions of this type took place in 2024, through a dedicated GPU financing vehicle that structured a 500 million USD facility of private debt.⁴⁵ This financing enabled Lambda to acquire NVIDIA and Blackwell AI chips on demand. The debt raised was secured by the GPUs themselves and by the cash flows generated from cloud services. The transaction was led by Macquarie Group, with participation from Industrial Development Funding.

In a similar vein, in 2025 and 2026, CoreWeave secured delayed draw term bank loan facilities by assets held at the SPV level (CoreWeave Compute Acquisition Co. VII LLC and CoreWeave Compute Acquisition Co. VIII LLC respectively).⁴⁶ Previously, in 2024 and 2023, the company had also obtained financing secured by NVIDIA chips and customer contracts,⁴⁷ through private credit lenders. Further interconnections across companies can be found in the CoreWeave Compute Acquisition Co. VIII's term loan rating description,⁴⁸ which provides details on the backing mechanism: the facility is supported by contractual cash flow payable by Meta for access to GPUs and related equipment.

⁴⁵ As explained in Section 3.2, these SPVs generally acquire GPUs and lease them to AI companies or act as vehicles for their purchase. Additionally, they serve as vehicles to raise debt financing secured by those assets. The following Reuters article provides further details on Lambda's operation: [Lambda secures \\$500 mln loan with NVIDIA chips as collateral](#).

⁴⁶ See CoreWeave's press releases on its debt facilities [DDTL 3.0](#) and [DDTL 4.0](#). The structures behind these debt facilities are taken into account by the S&P Global credit rating revisions, see [Research Update: CoreWeave Outlook Revised To Positive, 'B+' Rating Affirmed; Proposed Senior Notes Rated 'B' \(Recovery Rating: '5'\)](#).

⁴⁷ [CoreWeave's S-4/A filing](#) with the SEC identifies the financing as GPU infrastructure-backed debt and outlines the company's wider debt arrangements.

⁴⁸ See [Fitch Rates CoreWeave Compute Acquisition Co. VIII's Loans 'A-sf'; Outlook Stable](#), Fitch Ratings April 2026.

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