Private markets: Seize the broadening AI opportunity through VC, PE and real assets

How to position in AI through private markets?

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Seize the broadening AI opportunity through VC, PE, and real assets

Private markets

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- Artificial intelligence is the tech theme of the decade, in our view. We see solid investment opportunities across all three AI layers—enabling, intelligence, and application.
- While our strong investment case for AI in public markets remains intact, there are also interesting diversification opportunities through private markets due to broadening AI adoption and spending trends.
- While we recommend our actively managed “AI” portfolio for public markets, we see broad-based private AI opportunities in venture capital (VC), private equity (PE), and real assets (RA) with a focus on large language models, software applications, and data centers.

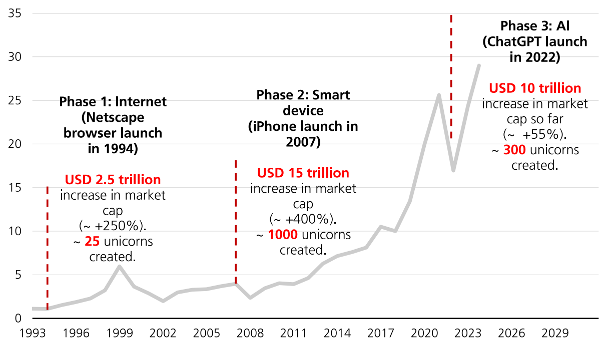
Source: Getty Images, UBS as of 2024

The launch of ChatGPT in 2022 has proven to be an inflection point for the adoption of AI, much like the Netscape browser was for the internet (launched exactly 30 years ago in October 1994) or the iPhone for the smart device industry (unveiled in January 2007). These events have all resulted in an explosion of investor wealth. As seen in Fig.1, the market cap for the publicly-listed tech-heavy Nasdaq index continues to soar while private markets have witnessed exponential growth in tech unicorns and funding.

Given our view that the AI theme is still in its early days with more signs of broadening demand and spending trends, we see significant investment opportunities ahead. Investors will likely be best rewarded by holding diversified exposure to the theme through both public and private markets. In this report, we shine a spotlight on AI's investment opportunities in private markets through venture capital (VC), private equity (PE), and real assets (RA).

Fig. 1: AI is the tech theme of the decade offering strong investment opportunities in both public and private markets

Market cap of Nasdaq composite index in USD trillion

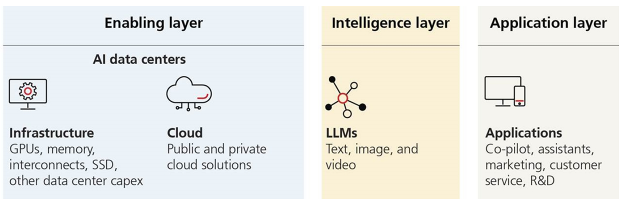


Source: Factset, Bloomberg, UBS estimate, as of Oct 2024

Seizing the broadening AI opportunity

Now almost two years into the generative AI cycle, some are beginning to wonder whether AI has become overhyped—and others whether it's underappreciated. What's been clear, however, is that the rate of innovation has been so rapid that the potential of generative AI applications continues to exceed already lofty expectations. While AI has fueled strong gains in the tech-heavy Nasdaq composite index since the start of 2023, we believe we are still in the early stages of the AI growth story given our view that AI penetration across key addressable markets is still very low with strong growth potential ahead. As the AI opportunity broadens, we think performance will also broaden from semiconductors—which have benefited the most due to their dominant presence in the enabling layer—to emerging beneficiaries in other industries like internet, software, and companies exposed to utilities, industrials, and financials. We believe diversified exposure through both public and private markets is how investors should best play and gain long-term exposure to this structural AI trend.

Fig. 2: With AI still in its early innings, we see broad based investment opportunities across the three AI layers



Source: UBS

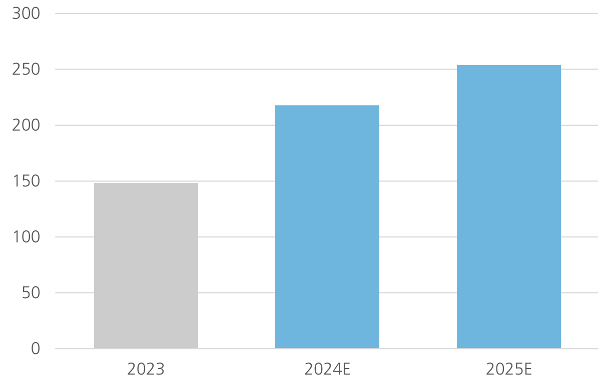
The way we approach the AI investment opportunity is to break the AI value chain down into three layers, as seen in Fig. 2. It starts with the enabling layer, which powers the intelligence layer, which in turn feeds the application layer. The enabling layer is the physical layer of data center infrastructure and compute necessary to train and run generative AI models. The intelligence and application layers are both software layers and refer to the data and algorithms that are used to build models for applications such as generating a piece of text or image on a particular subject area.

During the initial stages of the AI infrastructure rollout, we have maintained a clear preference for companies in the enabling layer given the strong capex spending favoring companies in industries like semiconductors and other data center-related segments. In fact, we recently raised our capex growth estimates across the "Big 4" tech companies leading the AI investment wave (which, in our view, refers to Microsoft, Meta, Alphabet, and Amazon), given their strong spending intentions.

As seen in Fig. 3, we now expect their combined capex to grow from USD 148bn in 2023 to USD 218bn in 2024 (47% growth) and to USD 254bn in 2025 (16.5% growth). Our capex estimates may still prove conservative, given the potential for higher-than-expected AI computing spend on next-generation models.

Fig. 3: With upward revisions, we expect more than 45% y/y growth for Big 4's capex in 2024 and more than 15% in 2025

Expected capex for Big 4 in USD bn

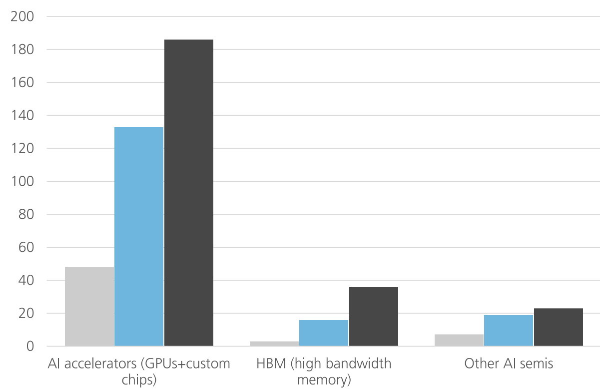


Source: Company reports, UBS estimates as of September 2024

Despite the strong capex spending outlook in favor of semiconductors, it's worth highlighting that most of the growth is being driven by select areas like AI accelerators, which include GPUs, custom chips and high-bandwidth memory. Other segments, like CPUs and traditional memory, have lagged behind due to limited content growth. With the market increasingly differentiating between AI beneficiaries and laggards amid the ongoing volatility, we have been recommending investors rightsize their AI allocations within public markets.

Fig. 4: Strong AI semi spending to continue in 2025 but mainly driven by AI accelerators and HBM

Revenues in USD bn in 2024, 2025E and 2026E

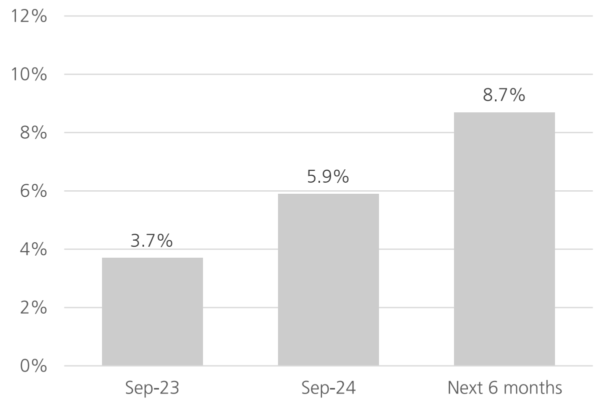


Source: Company reports, UBS estimates as of September 2024

Speaking about rightsizing, investors should not ignore emerging AI opportunities elsewhere as trends broaden. Three features distinguish the new wave of generative AI from past versions: Its ability to generate diverse human-like content; the scale of data inputs, model parameters, and compute; and its adaptive learning. Estimates for the size of the AI market vary widely, but some put annual AI-related revenues at the trillion-dollar threshold over the next decade as AI's impact across industries becomes ubiquitous with broadening trends. For more details, please refer to our report, "Artificial intelligence: Sizing and seizing the investment opportunity" published in June 2024.

Fig. 5: Broadening AI adoption trends support our structurally positive view

% of firms using/planning to use AI in the US



Source: Business Trends and Outlook Survey (BTOS), US Census Bureau, UBS as of Oct 2024

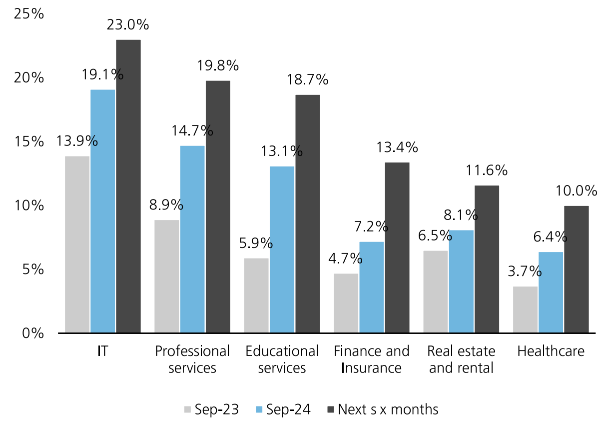
With more signs of broadening AI trends, we recommend investors hold broad-based exposure to the structural AI theme across both public and private markets. Encouragingly, a September 2024 report from the US Census Bureau on the results of its BTOS survey tracking AI adoption across 1.2 million firms in the US showed that AI adoption is picking up. As seen in Fig. 5, AI adoption continues to broaden with 5.9% of companies in the US are using AI as of 3Q24 vs. 3.7% in 3Q23.

Additionally, the forward-looking adoption rates of 8.7% is a positive trend. We think increasing future adoption should continue to support strong spending on AI infrastructure and potentially increased visibility on AI monetization, which is consistent with recent comments from leading cloud platforms.

From a customer point of view too, there are increased signs of broadening spending beyond big tech to include enterprise and sovereign customers. These account for more than 50% of AI capex today versus only 20% during the initial stages in 2023. Meanwhile, while the US remains a leader in AI adoption, more emerging markets are embracing AI including China, India, the Middle East, and others. Finally, Fig. 6 shows the top six industries that are leading AI adoption in the US based on the US Census Bureau data. We also see this trend broadening beyond Information Technology to other industries like education, healthcare, financial services, and interestingly, real estate.

Fig. 6: AI adoption in the US is mainly led by six industries

In %

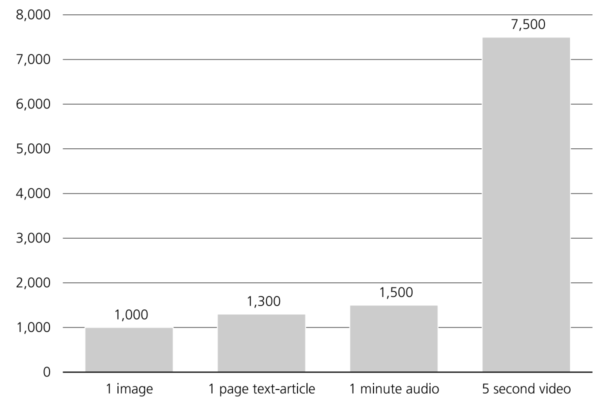


Source: Business Trends and Outlook Survey (BTOS), US Census Bureau, UBS as of Oct 2024

The broadening AI trend is also evident in the way the use cases for generative AI have been evolving beyond text with increasing multi-modal support like images or video. These changes have multiple investment implications. For example, tokens generated by AI chips and used by generative AI applications like ChatGPT or Gemini to create content can give us an idea of just how much more computational power may be needed in the near future for new use cases. We used the Gemini 1.5 Pro model to understand how many tokens are needed to generate various media. For the purpose of our study, we assumed a medium range of output, i.e., medium resolution for images, medium complexity for text-articles, medium speaking rate for audio and medium frames per second (fps) for video. Fig. 7 shows the number of tokens needed for one image, a one-page text article, a one minute audio and a five second video.

Fig. 7: Number of tokens required to generate various media by generative AI applications

Tokens required



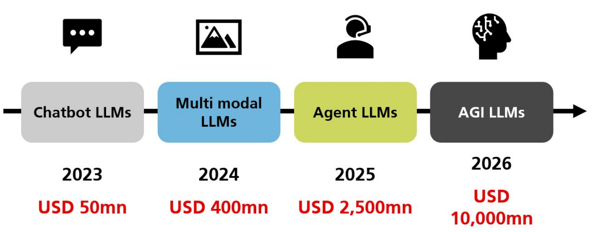
Source: Company reports, UBS estimates

As the results show, video undoubtedly requires the highest number of tokens at the moment and if and when computationally-intensive applications like text-to-video take off, investors need to apply a flexible investment strategy to both public and private markets to participate in these emerging business models and future innovation.

The evolving nature of generative AI is also well understood by how rapidly large language models (LLMs) are scaling. With increasing consensus emerging in the AI industry that "compute is the currency of the future," Fig. 8 shows how the computational cost to train frontier AI models is growing rapidly with broadening use cases. Interestingly, a lot of innovation in some LLMs is driven by emerging startups and unicorns, which drives home the point that diversification in public and private markets is key to play the structural AI trend.

Fig. 8: With AI's scaling laws intact, AI compute spending should continue to stay elevated

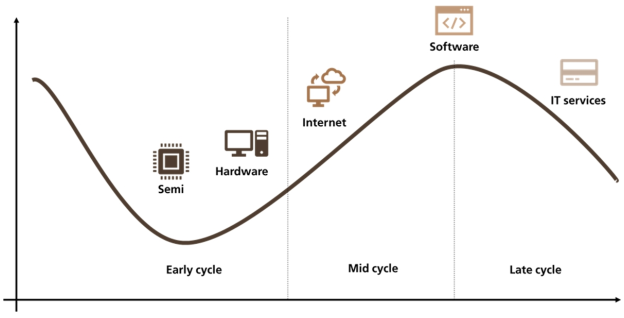
AI compute cost per each LLM in USD mn



Source: Company reports, UBS estimates as of Oct 2024

Note: AGI stands for artificial general intelligence

Fig. 9: Broadening AI trends and our tech playbook suggest potentially interesting opportunities ahead for internet and software platforms



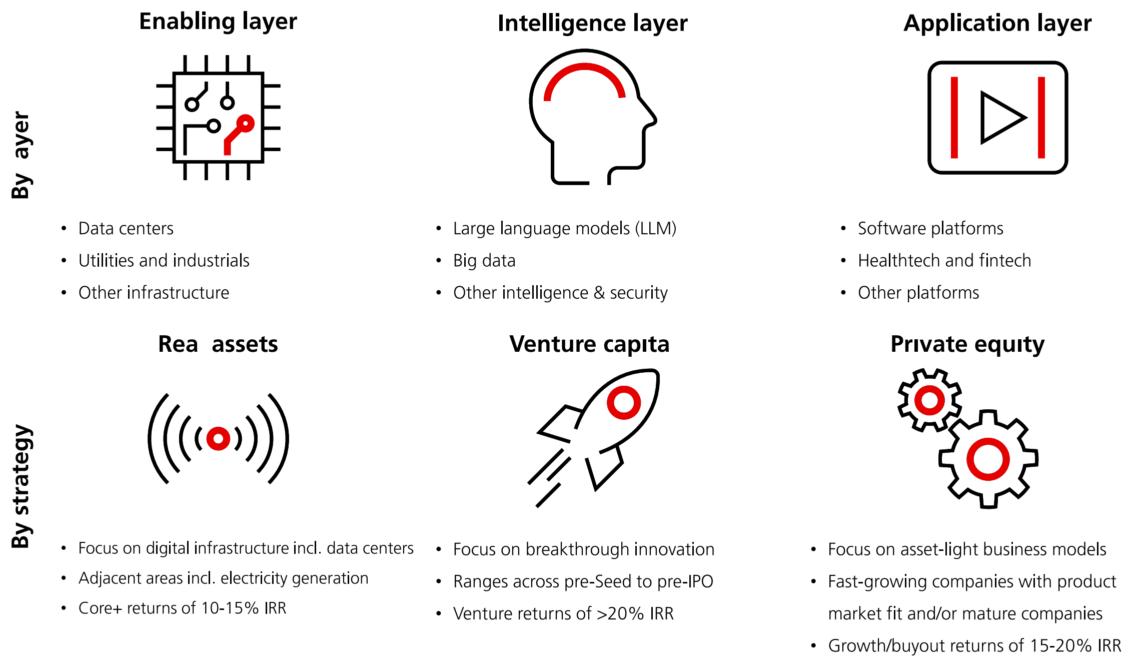
Source: UBS

The broadening AI trend is also consistent with our tech playbook (see Fig. 9), which favors early cyclicals like semiconductors during the initial stage of a business cycle recovery, before gradually moving into software and internet during the mid-cycle. It's worth highlighting that with AI infrastructure spending still robust, we believe it's too early to be cautious on semiconductors; instead we recommend investors clearly differentiate between AI winners and losers in semiconductors, while gradually building exposure in quality internet and software companies. In particular, software companies are both well positioned to benefit from rising AI monetization and also more rate sensitive. A benign rates outlook ahead could therefore present a favorable backdrop for the software industry in 2025 and beyond.

We've long highlighted our AI investment strategy across public markets, where our AI portfolio has 50% exposure to the enabling layer, 30% to the application layer, and 20% to the intelligence layer. It is worth highlighting that the enabling layer has more capex intensive segments like semiconductors, which traditionally favors well-established public companies with a long track record and deep pockets.

Given our view that a diversified approach through public and private markets is the best way to maintain structural exposure to AI, the rest of this report will take a deeper dive into the most interesting private opportunities that we currently see (Fig. 10).

Fig. 10: Where are the interesting AI opportunities in private markets?



Source: UBS

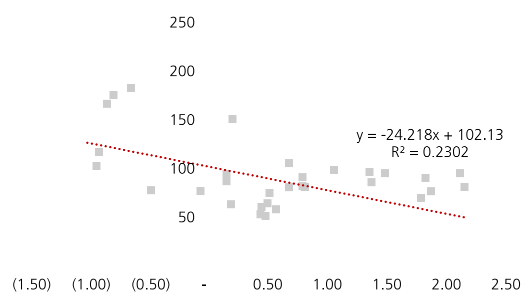
Finding AI opportunities in private markets

In private markets, we believe most opportunities lie across venture capital, private equity, and real assets. These offer exposure to AI across the three layers and with varying risk/return characteristics. While venture capital firms invest in innovative—but often unprofitable—startups that are at the forefront of AI intelligence and development, private equity managers tend to invest in mature companies with proven applications and established revenues. Real asset funds—be it infrastructure or real estate—focus on the underlying technologies and systems that enable AI development, such as data centers, cloud computing, telecommunications, but also electricity generation.

Although private market activity has slowed down since the interest rate hike cycle initiated by major central banks in the first half of 2022, data for the first half of 2024 points to a stabilization and the beginning of the Fed rate-cutting cycle should solidify the recovery, in our view. Fig. 11, for instance, demonstrates the relationship between VC deal activity and 10-year real interest rates. We observe a negative correlation, i.e., as interest rates come down, VC investment activity tends to pick up.

Fig. 11: Lower real yields have historically been correlated with higher deal activity

VC deal activity (y-axis, USD bn), US real 10Y yield (x-axis, in %)

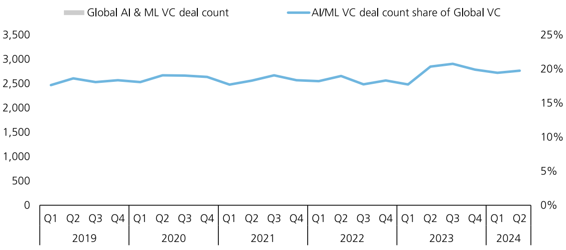


Source: Bloomberg, Factset, Pitchbook, UBS as of 2024

VC: At the forefront of the AI revolution

Having said this, opportunities related to AI have remained resilient in the last 24 months. Within VC, AI and machine learning (ML) deals have consistently averaged 2,100 counts per quarter, according to data from Pitchbook. This represents 19% of global VC deal activity and is in line with the five-year trend (Fig. 12). In fact, there are three times more investment opportunities today than a decade ago, and the addressable market continues to grow as firms move from focusing on predictive AI to generative AI.

Fig. 12: AI VC activity has remained resilient despite a broader slowdown in private markets since the 2022 rate hikes

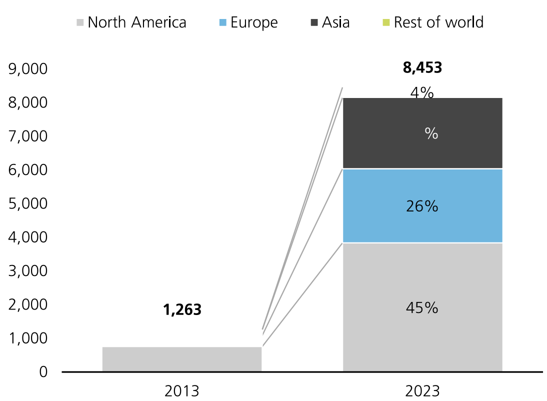


Source: Pitchbook, UBS

This is true across geographies. In 2023, North America accounted for c.45% of AI & ML VC deals globally, followed by Asia and Europe with c.25% each (Fig. 13). In terms of value, USD 89 billion were invested into AI & ML VC deals, representing 25% of all USD invested across VC globally and a near 15x increase in a decade. One in three VC dollars invested in North America in 2023 was allocated to AI & ML, compared to less than one in five dollars for Europe and one in ten for Asia. This regional breakdown reflects the technological maturity of each geography, regulatory environment, and funding availability. The US boasts a robust ecosystem with a deep talent pool, a high concentration of start-ups and research institutions, and strong VC funding. In Europe, public funding in particular, such as the Horizon Europe innovation program, and VC funding to some extent, are driving growth, despite more stringent regulations around data privacy and AI ethics. Likewise in Asia, significant government backing aims to create a conducive environment for start-ups and infrastructure projects in the region, in particular in countries like China, India, and Japan.

Fig. 13: There are three times more AI opportunities in VC today than a decade ago

AI & ML VC deal count



Source: Pitchbook, UBS as of October 2024

Unsurprisingly, it is in North America that the most valuable companies can be found. Out of the top 10 most valuable AI & ML start-ups that closed new financing rounds in 2024, nine are headquartered in the US (Fig. 14).

Fig. 14: Select AI & ML financing rounds in 2024

Company	HQ	VC Stage	Layer	2024 Closing	Deal size (USD million)	Post-money valuation (USD billion)
OpenAI	US	Late	Intelligence & Application	October	6,600	157.0
xAI	US	Early	Intelligence & Application	June	6,000	24.0
Anthropic	US	Late	Intelligence & Application	January	1,200	19.4
CoreWeave	US	Late	Enabling	May	1,100	19.0
Anduril Industries	US	Late	Application	August	1,500	14.0
Bolt	US	Late	Application	August	450	14.0
Scale AI	US	Late	Intelligence	May	1,000	14.0
Ramp	US	Late	Application	April	150	7.7
Mistral AI	France	Early	Intelligence & Application	June	651	6.5
Applied Intuition	US	Late	Application	March	250	6.0

Source: Pitchbook, UBS as of October 2024

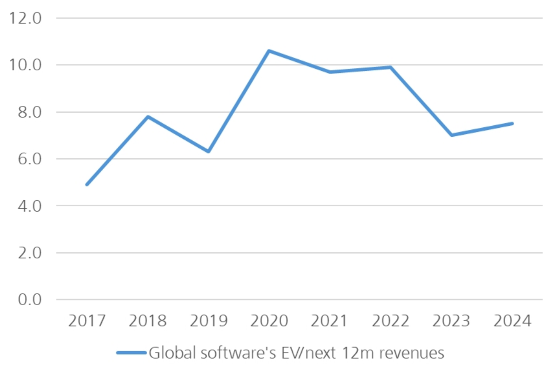
OpenAI's USD 6.6 billion round closed early October made headlines as it valued the company developing ChatGPT at USD 157 billion. In Europe, the French startup Mistral AI closed on EUR 600 million (USD 651 million) additional funding in June, making it the most valuable AI company on the continent with a post-money valuation of EUR 5.8 billion (USD 6.5 billion). Yet, it is the owner of TikTok, ByteDance, in Asia that tops all records to-date with a post-money valuation of USD 220 billion following a secondary transaction that closed in March 2023. According to CB Insights, more unicorns (companies valued at over USD 1 billion) are emerging from AI than any other sector. There were 186 AI unicorns at the end of 2023, up 10% y/y and representing around 15% of overall global unicorns. Only time will tell whether these high valuations are justified. In our view, nonetheless, AI is the tech theme of the decade, and we expect AI's share of global unicorns to continue to rise.

VC offers interesting exposure to innovation and asset light business models, in our view. These opportunities should be disproportionately present in the intelligence and application layer. VC investors have been focusing on such areas as natural language interfaces (e.g., chatbots, personal assistants), AI core platforms (for data training, model development, deployment, and management), and two-dimensional digital media content (images, video, avatars). Today, we think some of the best innovation in large language models (LLMs) or big data analytics is coming not from companies in public markets but from private markets which enjoy freedom from legacy assets. Investors should consider these benefits against the risks that come with VC investments, including the higher risk of failure for startups. Competition to invest in the best companies is also very high, which is why getting access to the best fund managers is paramount for success. Exposure to VC also needs to be adequately sized in line with an investor's objectives, time horizon, and risk appetite.

Private equity: Optimizing value creation with AI
The AI & ML opportunity is not limited to just VC, however. With USD 17 billion invested across >300 deals in 2023, the segment in a strict sense now accounts for 1.8% of global PE activity. One also needs to take into account spill-overs in other sectors including software, cybersecurity, finance, healthcare, manufacturing, and retail. In finance, for instance, AI has applications in trading and risk management as it can analyze market data and transactions faster and more accurately than humans. In healthcare, AI can enhance diagnostics and personalize treatments through predictive analytics and telemedicine. In manufacturing, AI can optimize production schedules and forecast equipment failures.

In our view, AI companies like chatbot agents, predictive analytic firms, or companies dedicated to fintech and healthtech offer unique AI monetization opportunities and good diversification options. Considering the valuations of mature unlisted tech companies are highly correlated to listed industries like software, we also believe valuations overall are not excessive at this stage. The valuations of global listed software companies are still 20-25% below the peak witnessed during the pandemic (Fig. 15).

Fig. 15: Trading significantly below peak, software industry valuations* are not excessive



Source: Factset, Bloomberg, UBS, as of Oct 2024

*We use the average valuations of companies in MSCI AC World Software index

Further, PE firms incorporate AI as an additional risk and opportunity to be assessed during due diligence on new investment opportunities, as well as during their regular evaluation of existing portfolio companies. They use AI as a new lever of long-term value creation for their portfolio companies, which should benefit the industry as a whole. Finally, PE firms also use AI to improve their own operations. Indeed, AI enables the automation of back-office workflows and improving data collection and sharing in an industry renowned for its lack of transparency. In our view, most returns will be derived from VC compared to PE, but this also comes at greater risk given the inherently high failure rate of start-ups.

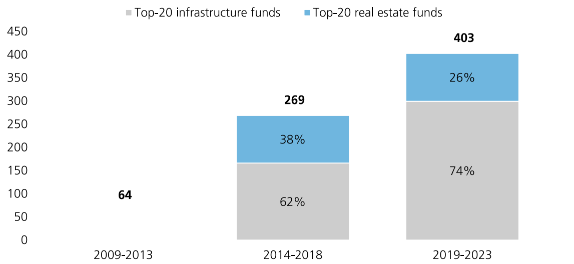
Real assets: Setting up the wire framework
As highlighted earlier, while it's true that the bulk of the profits today in the enabling layer are captured by the listed semiconductor companies given the dominant presence in the AI compute space, the AI opportunity in the enabling layer through private markets cannot be ignored.

This is where real assets (RA) can provide interesting exposure. The largest RA funds investing in digital infrastructure—anything from data centers to fiber solutions and telecommunication towers—have raised over USD 400 billion in the past five years (Fig. 16). This is 20% more than over the past decade combined, as the rise of AI is set to spur the technological advancements required to support these developments.

Much of the digital value chain is housed in data centers to support data generation, analyzing as well as refining and sending data across networks. To support the growing mobile network traffic, which is set to triple by the end of the decade, more investments are required in assets like towers and wireless infrastructure to support the continued rollout of 5G connectivity and upgrades to fixed and fiber networks. The same can be said about electricity generation, as AI has exponentially accelerated the demand for compute and data.

Infrastructure investments, including those related to AI, tend to provide consistent, lower-risk returns as they benefit from long-term contracts and stable revenue streams. Using data from DealEdge, data center investments between 2010-23 showed deal level IRRs ranging between 10.4% and 15.2%, thus offering solid core+ type of returns, with managers taking development risk targeting even higher returns. Risks that come with RA investments include illiquidity, long lock-up periods, and potentially lower transparency.

Fig. 16: The largest digital infrastructure funds have raised 20% more capital in the last five years than over the previous decade

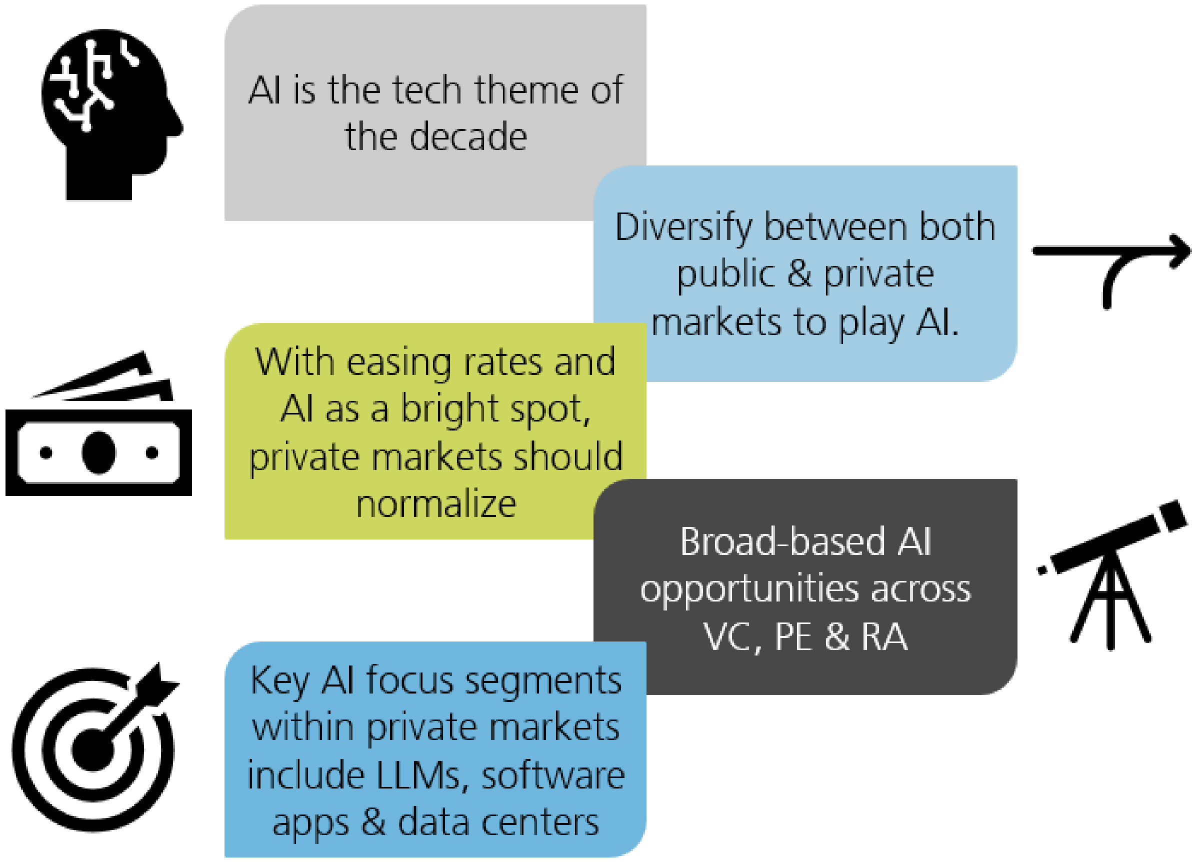


Source: Pitchbook, UBS as of October 2024

In summary, we recommend a barbell approach to play the structural AI trend by investing across public and private markets. In public markets, our AI portfolio gives exposure to publicly listed AI companies that offer strong scale, margin, balance sheets, and execution advantages. At the other end of the spectrum, companies in venture capital and private equity provide access to breakthrough innovation and strong long-term potential, while digital infrastructure offer an opportunity to invest in more stable assets that provide the building block for the AI revolution.

Investment conclusions

Fig. 17: Five key investment conclusions from the report



Source: UBS

Appendix

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