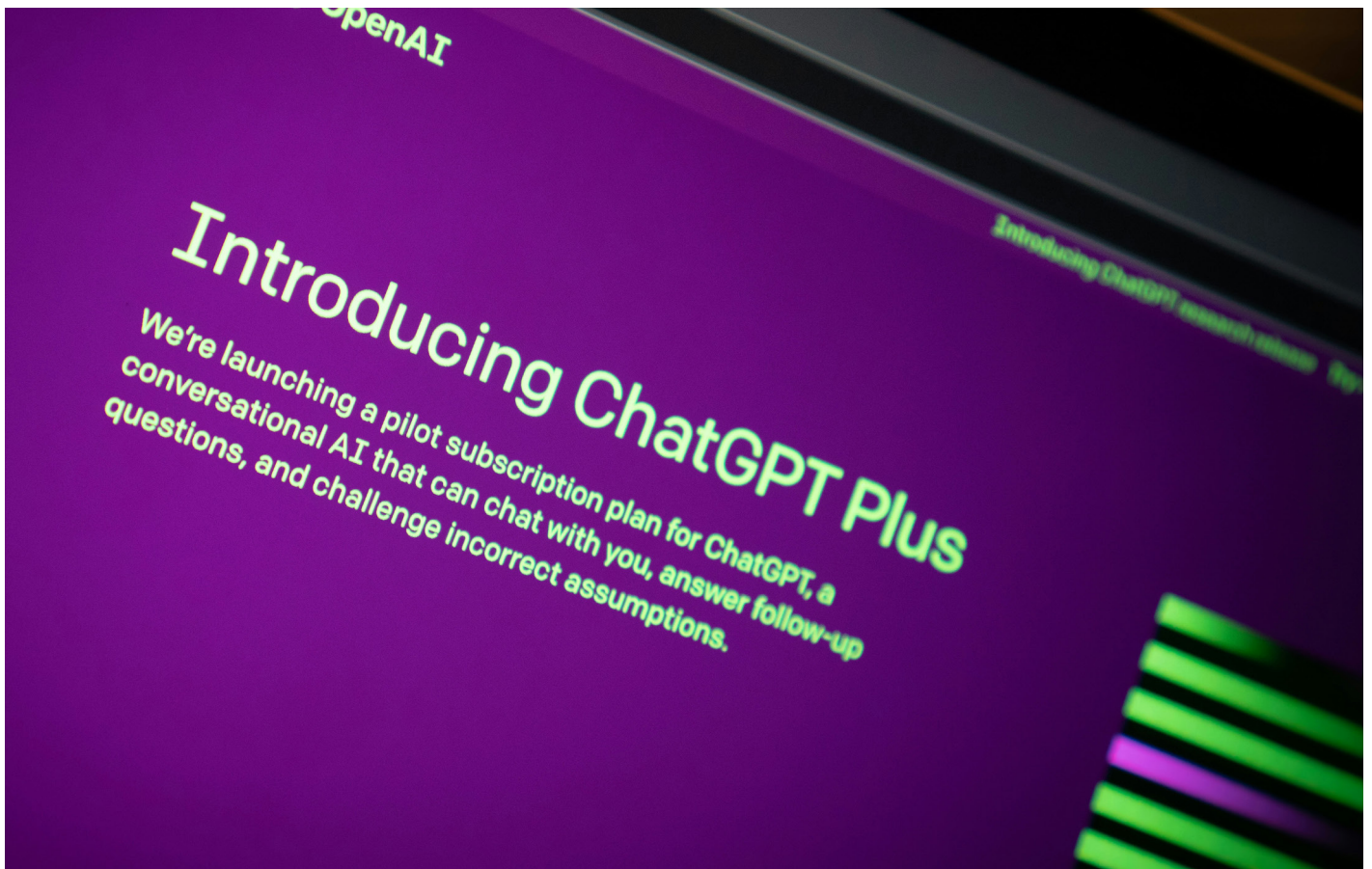


# AI REVOLUTION: LARGE LANGUAGE MODEL REDEFINES THE WORLD

## EXECUTIVE SUMMARY

1. The rapid advancements in Artificial Intelligence (AI) have been a major focus in the technology industry, especially with the emergence of large language models (LLMs) like OpenAI's ChatGPT. This report provides a comprehensive overview of recent developments in AI, highlighting key players in the industry and their impact on both US and Chinese stock markets.
2. There are good AI proxy stocks listed in both the US and Hong Kong markets. In the US market, notable examples include NVIDIA (NVDA), AMD (AMD), Microsoft (MSFT), Meta (META), Google (GOOGL) and TSMC (TSM). In the Hong Kong market, prominent stocks include SenseTime (20 HK), Baidu (9888 HK) and Tencent (700 HK).
3. EquitiesFirst can provide stock-backed loans on the tech stocks with low interest rates of 3-4% and non-recourse terms, meaning we do not pursue repayment in the event of a default by the borrower.

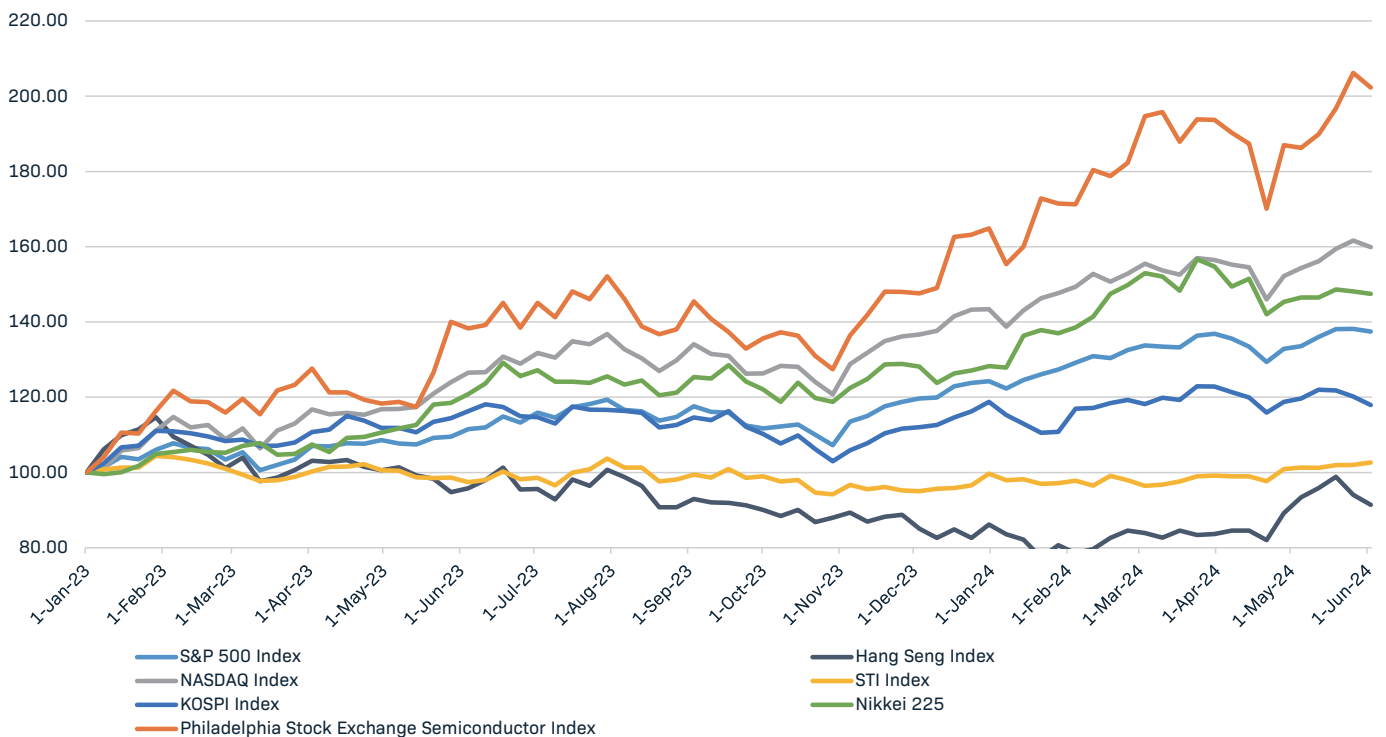


**BACKGROUND ON AI AND LLMS**

Artificial Intelligence, a branch of computer science, focuses on creating systems capable of performing tasks that typically require human intelligence. Over the past few years, there has been a significant shift towards developing more sophisticated AI models, particularly large language models (LLMs). These models are trained on vast datasets and can understand, generate and manipulate human language with unprecedented accuracy.

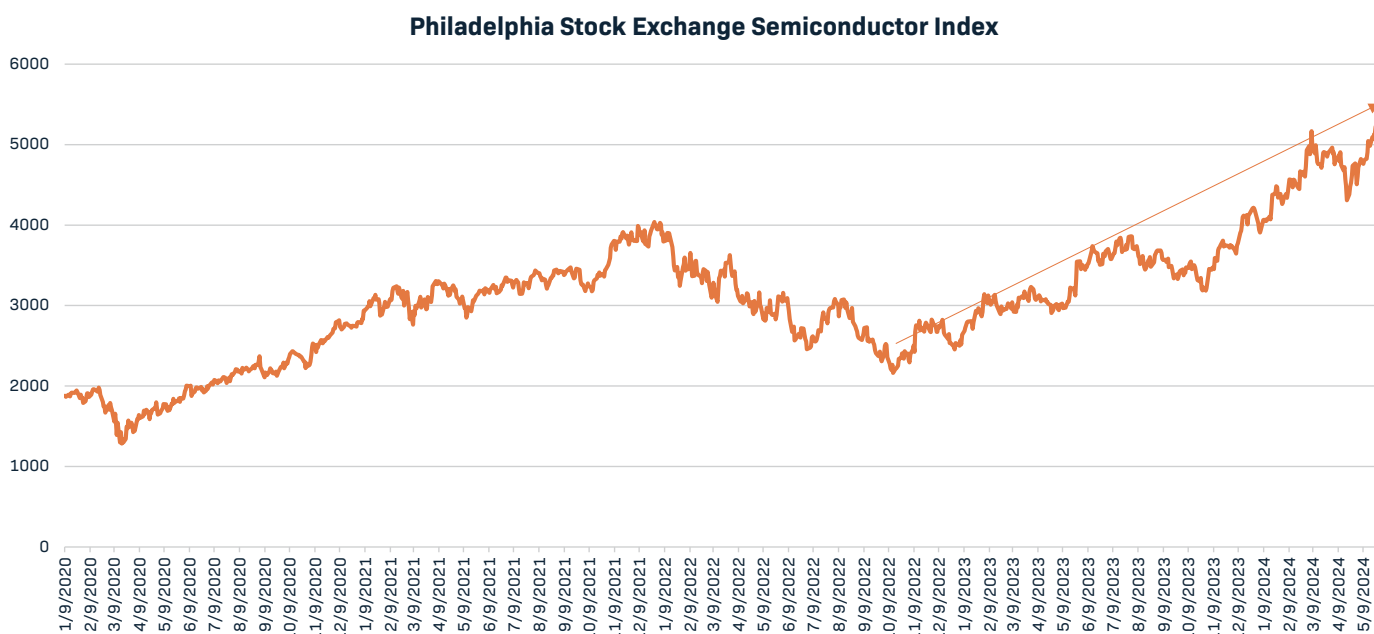
The launch of OpenAI's ChatGPT has been a pivotal moment in the AI landscape. ChatGPT, an LLM, uses a variant of the Generative Pre-trained Transformer (GPT) architecture, which enables it to generate human-like text based on the input it receives. This breakthrough has sparked widespread interest and investment in AI, leading to rapid advancements and applications across various sectors.

**Semiconductor Index Surged in 2023 and 2024 YTD (REBASED)**



The current unprecedented technological evolution has driven many technology companies, including Microsoft, Alphabet and Meta, to significantly increase their capital expenditure on GPUs, which are essential for training AI models. As a result, the semiconductor industry, particularly GPU manufacturers like Nvidia and AMD, has greatly benefited from this AI boom. Since 2022, their share price performance has substantially outperformed the overall market, reflecting the heightened demand and strategic importance of their products in the AI landscape.

## PHILADELPHIA STOCK EXCHANGE SEMICONDUCTOR INDEX



The Philadelphia Stock Exchange Semiconductor Index (SOX) is a key market index that tracks the performance of leading companies in the semiconductor industry. Comprising 30 major semiconductor firms, it serves as one of the major benchmarks for investors, reflecting the overall health and trends within the semiconductor sector, which is crucial for various technologies such as computers, smartphones and artificial intelligence applications.

## ANNUAL INDEX PERFORMANCE

### 2022 (DECLINED BY 36%):

The year 2022 saw a significant decline of 36% in the semiconductor index, impacted by global economic uncertainty due to rising inflation, interest rate hikes and geopolitical tensions, particularly the Russia-Ukraine conflict. Supply chain disruptions after several years of rapid growth also contributed to the downturn. These challenges led to a broad sell-off in technology and semiconductor stocks.

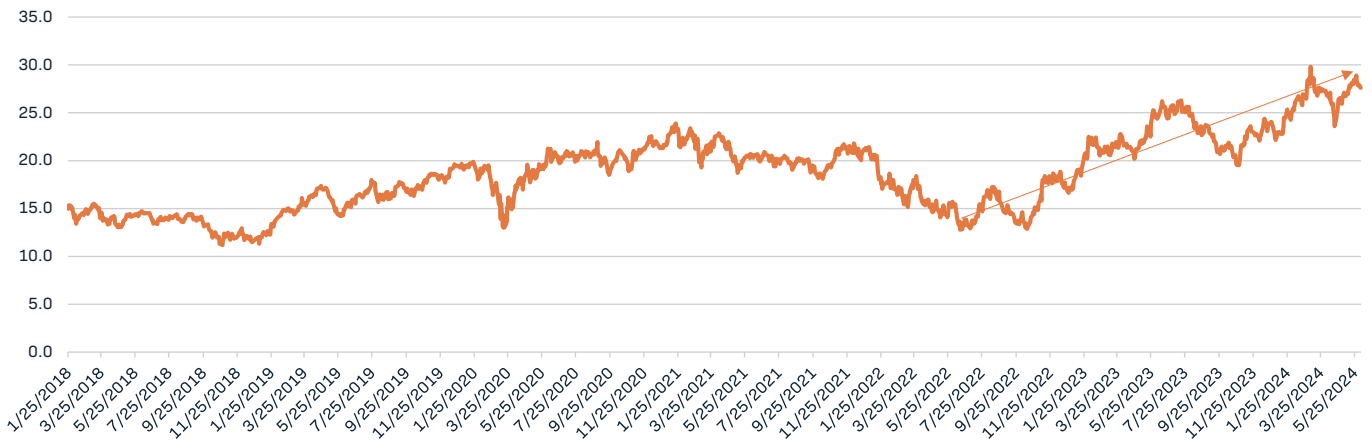
### 2023 (ADVANCING BY 65%):

The index rebounded strongly in 2023, increasing by 65% as supply chain issues began to resolve and production capacities expanded to meet pent-up demand. A significant driver of this growth was the surge in AI development, particularly with the advent of large language models like ChatGPT. These advancements spurred increased demand for advanced semiconductors capable of supporting AI applications. Government support through subsidies and investments in semiconductor manufacturing also created a favorable environment for growth.

### 2024 YEAR TO DATE AS OF JUNE 12 (UP 32%):

The positive trend has continued into 2024, with the index up 32% year-to-date till 12 June 2024. The ongoing development and adoption of AI technologies, led by breakthroughs such as ChatGPT, have significantly boosted demand for semiconductors. These advancements have driven growth in various sectors, including automotive, AI and cloud computing. Continued investments in expanding production capacities and developing new technologies, along with increased investor confidence driven by strong financial performances and optimistic outlooks of major semiconductor companies, have fuelled the upward trajectory.

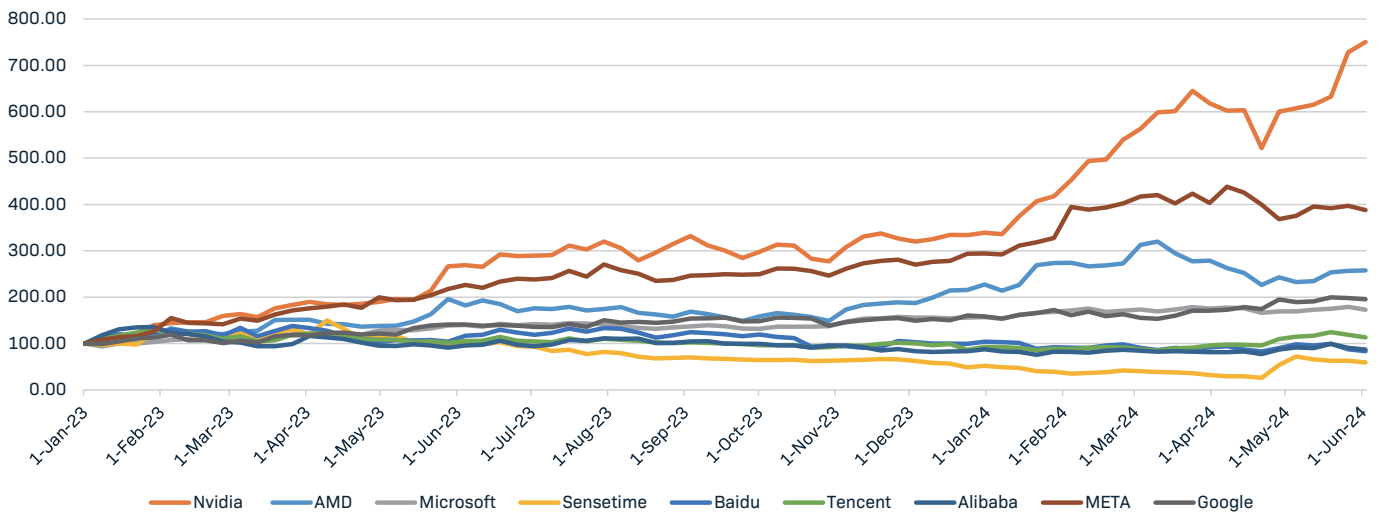
**Philadelphia Stock Exchange Semiconductor Index  
Forward 12-month P/E (x)**



The Philadelphia Stock Exchange Semiconductor Index's forward 12-month P/E ratio has shown significant re-rating over the years, particularly since 2019. This trend indicates increased investor confidence and higher valuation multiples assigned to semiconductor stocks. The sharp rise in the P/E ratio starting in 2019 reflects the robust demand for semiconductors driven by technological advancements in digitization, 5G and other emerging technologies. Despite fluctuations, the overall upward trajectory suggests that the market anticipates continued strong growth and profitability in the semiconductor sector due to the boom of AI.

**KEY PLAYERS IN AI DEVELOPMENT AND THEIR IMPACT ON US AND CHINESE STOCKS**

**Tech Stocks Surged in 2023 and 2024 YTD (REBASED)**



The advancements in AI and the growing adoption of LLMs have had a substantial impact on the stock prices of technology companies involved in AI research and development.

## **NVIDIA (NVDA US)**

NVIDIA Corporation, a leading American semiconductor company, has been at the forefront of AI development, particularly in providing the necessary hardware for training and deploying AI models. NVIDIA's GPUs are essential for the high computational demands of AI, making the company a critical player in the AI ecosystem. The company's advancements in GPU technology, such as the H100 and H200, have significantly enhanced the efficiency and performance of AI models, driving their adoption in various industries. The demand for AI-related hardware has propelled NVIDIA's stock, reflecting the company's leading position in providing the infrastructure necessary for AI development. As AI applications expand, NVIDIA's market share is expected to continue its upward trajectory.



**Nvidia Share Price Performance**



## NVIDIA SHARE PRICE PERFORMANCE

From 2019 to mid-2024, Nvidia's share price experienced significant growth, reflecting its strategic advancements and market positioning in the semiconductor industry. The initial steady rise from 2019 to early 2020 was driven by robust demand for GPUs across gaming, data centers and AI applications. The onset of the COVID-19 pandemic in 2020 further accelerated this demand as remote work and digital transformation surged, leading to a dramatic increase in Nvidia's stock price.

In 2021 and 2022, the stock continued to climb, fuelled by ongoing innovations in AI and machine learning and the expansion of data center and autonomous vehicle technologies. However, 2022 brought volatility due to market corrections, interest rate hikes, supply chain disruptions and geopolitical tensions.

The year 2023 marked a sharp rebound, largely driven by the explosive growth in AI technologies, particularly with the advent of large language models like ChatGPT. This surge in AI applications significantly boosted demand for Nvidia's high-performance GPUs, propelling the stock to new heights. As of mid-2024, the upward trajectory continues, supported by sustained demand for AI and semiconductor technologies and Nvidia's strategic innovations in these areas.

## AMD (AMD US)

Advanced Micro Devices (AMD) is another crucial player in the AI hardware market. While traditionally known for its CPUs, AMD has made significant strides in the GPU market, directly competing with NVIDIA. AMD's GPUs are increasingly being adopted for AI and machine learning tasks and the company's investments in AI-specific hardware underscore its commitment to this rapidly growing field. AMD's competitive positioning in the GPU market has positioned it well to benefit from the growing AI market.

## **MICROSOFT (MSFT US)**

Microsoft has established itself as a key player in AI through its extensive research and development efforts and strategic acquisitions. The company has integrated AI into many of its products, such as the Azure cloud platform, which provides AI and machine learning services to developers and enterprises. Microsoft's collaboration with OpenAI to integrate ChatGPT into its services demonstrates its commitment to leveraging cutting-edge AI technologies to enhance its product offerings. Microsoft's integration of AI into its cloud services and products has enhanced its growth prospects. The strategic partnership with OpenAI and the incorporation of advanced AI models like ChatGPT into its ecosystem have further boosted its market dominance.

## **META (META US)**

Meta Platforms, formerly known as Facebook, has significantly advanced its AI capabilities, particularly with the development of its large language model, LLaMA. The latest version, LLaMA 3, powers Meta's AI chatbot, Meta AI, which is integrated across various platforms to enhance user interactions with sophisticated, contextually aware responses. This AI innovation has driven notable improvements in user experience on Meta's social media and virtual reality applications.

## **GOOGLE (GOOGL US)**

Google, under its parent company Alphabet, has made remarkable strides in AI with the development of its AI chatbot, Bard. Leveraging advanced natural language processing, Bard is designed to enhance user interactions by providing accurate and contextually relevant responses. This innovation showcases Google's leadership in AI technology, further integrating AI into its extensive range of services, including Google Search, Google Assistant and Google Cloud.

## **TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY (TSM US)**

Taiwan Semiconductor Manufacturing Company (TSMC) has been pivotal in advancing AI technology. Renowned for its leadership in semiconductor manufacturing, TSMC develops highly sophisticated chips essential for AI applications. The company has a sustainable competitive advantage in producing advanced nodes, such as 5nm and 3nm processes, which are crucial for the high computational demands of AI workloads. TSMC's innovations enable faster, more efficient AI processing, supporting developments in areas like consumer electronics, data centers and autonomous vehicles.

## **IMPLICATIONS FOR CHINESE STOCK MARKET**

### **SENSETIME (20 HK)**

SenseTime, a leading AI company based in China, has made substantial advancements in AI, particularly with its LLMs. The company's LLM, known as SenseChat, showcases its cutting-edge natural language processing capabilities, enabling highly accurate and context-aware responses. This innovation is pivotal in SenseTime's strategy to integrate AI into various applications, including smart city solutions, healthcare, and education. The development of SenseChat has bolstered SenseTime's market position.

### **BAIDU (9888 HK)**

Baidu has recently achieved significant advancements in AI with the launch of its Ernie Bot. This advanced AI chatbot utilizes cutting-edge natural language processing to provide highly accurate and contextually relevant responses, representing a key milestone in Baidu's AI strategy. Baidu continues to integrate Ernie Bot into its core operations and expand its AI-driven offerings.

## **TENCENT (700 HK)**

Tencent, a major Chinese Internet player, has significantly advanced its AI capabilities, focusing particularly on LLMs. The company's AI model, known as Hunyuan, has demonstrated impressive natural language processing skills, facilitating sophisticated, contextually accurate interactions. Hunyuan powers various Tencent services, including WeChat and its cloud services, enhancing user experience and operational efficiency.

The rapid advancements in AI, particularly with the emergence of large language models, have significantly redefined the technology industries. Companies like Nvidia, AMD, Microsoft, Meta and Google in the US, have been at the forefront of this revolution, driving substantial growth and innovation. These developments have not only propelled their stock performances but also reshaped the landscape of AI applications across various sectors. The increasing capital expenditures on AI infrastructure, coupled with strategic partnerships and continuous innovation, underscore the critical role of these key players in the ongoing AI boom. As AI technologies continue to evolve, these companies are well-positioned to capitalize on new opportunities, ensuring sustained growth and market leadership in the years to come.

## **LOW-INTEREST LOANS FOR TECH STOCKS**

EquitiesFirst offers loans secured by shares from major stock exchanges, including those in Hong Kong, Japan, the US, Singapore and Thailand, etc. For the tech stocks mentioned above, particularly large-cap stocks listed in the US and Hong Kong, EquitiesFirst can provide loans at very competitive interest rates, often as low as 2.5% to 3%. These rates are significantly below the current US Treasury yield of 4% to 4.5%. With a loan-to-value ratio of up to 70% and a typical margin call threshold set at 50%, EquitiesFirst's lending model includes several attractive benefits, such as non-recourse loans that do not require personal guarantees.

Notably, EquitiesFirst voluntarily waives the right to seek repayment if the borrower defaults on their loan obligations. Tech stocks generally have higher beta. The volatility of the stocks also benefit the borrower due to the non-recourse feature of EquitiesFirst's loan. Borrowers have downside protection while they can keep the 100% market upside retention.



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