USA Versus China from an Equity Perspective

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DOI: https://dx.doi.org/10.47772/IJRISS.2025.910000670

Received: 23 October 2025; Accepted: 28 October 2025; Published: 20 November 2025

ABSTRACT

This study provides a quantitative evaluation of equity market performance with the goal of comparing firms located in the United States with those located in China. Using share prices adjusted daily for significantly large companies over a time period from 2010 to 2025, the research investigates volatility, return and riskadjusted efficiency.

Performance indicators used to deduct the results include the compound annual growth rate (CAGR), annualized volatility, Sharpe, Sortino and Calmar ratios.

Results show superior characteristics of U.S firms relative to their Chinese counterparts, the S&P 500 index vastly surpass China's MCHI, so does the Nasdaq 100 index when compared to China's largest 50 companies index FXI. When compared to US companies, such as Apple, Microsoft and Nvidia, Chinese giants such as Alibaba and Baidu generate lower return, much lower alpha (positive abnormal return) and greater downturns.

Finally, and through correlation analysis and a correlation heat map, the study provides evidence based practical implications for investors, to allow them to achieve a more efficient risk management and better diversify their portfolio.

INTRODUCTION

From a purely financial perspective, global equity markets represent the most quantitative method to compare innovation, success and financial performance. The United States and China are the world's largest economies, and they dominate global capitalization, investor participation and market size. Despite these similarities, the two markets differ significantly in terms of transparency, governance and investor composition.

Regardless of political differences, the purpose of this study is to provide evidence based comparison between the performance of U.S and Chinese equities, using a quantitative purely data driven framework. From an investor's perspective, the research focuses on return, volatility and risk adjusted efficiency.

Earlier studies often focused on the entire American financial system and that of China, however by focusing on firm-level financial performance, this research aims to contribute to the general literature. ETF-level and mega cap stock data is used to compare the systems from a macro perspective, yet stock prices in addition to volatility are also employed to gain a micro insight in this comparison.

LITERATURE REVIEW

Across markets worldwide, a considerable number of scholars have examined the drivers of equity performance, efficiency and volatility. Even though old, the foundational work of Fama (1970) that established the Efficient Market Hypothesis (EMH) is still in use today, according to which security prices reflect all available information. Presuming the EMH theory holds, it would mean that this study can perfectly compare the entire

economies of the United States and China just by using security prices.

Subsequent research such as those of Lo and MacKinlay (1999), questioned strict efficiency especially in developing economies, their study suggests that short term return predictability and behavioural anomalies do exist and can be used to achieve superior return.

Whenever an analyst wants to study the performance of any market, the U.S. market which is characterized by significant liquidity and extreme institutional participation is used as the benchmark, especially regarding market efficiency (Malkiel, 2003; French, 2008), in an American environment that significantly support equity markets through innovation, capital and financial stability (Kamel, Beainy, & Bteish, 2025).

On the other end, in the Chinese equity market, state influence is a norm, and regulatory intervention is repetitive, which may result in additional inefficiency and higher volatility, these claims are supported by results of multiple scholars (Girardin & Liu, 2019; Chen et al., 2021), in addition Morck, Yeung, and Yu (2000) demonstrate stronger co-movement among Chinese stocks, attributed to herding Behavior (investors move together) and limited information transparency, even with the current modernization and the global index inclusion, recent studies and empirical analysis find that Chinese equities remain, more than anywhere else in the world, sensitive to policy and liquidity shocks (Li & Giles, 2022; Zhang, 2023).

Beyond the simply return analysis, empirical finance literature nearly always use risk adjusted metrics to evaluate efficiency, such as the Sharpe ratio (Sharpe, 1966) and Sortino ratio (Sortino & Van der Meer, 1991) that serve as a worldwide accepted tool to be able to compare excess return relative to volatility and downside risk. While other ratios such as the Calmar ratio (Young, 1991) provides an additional perspective on capital efficiency relative to drawdowns. The significance of these ratios are most apparent in emerging markets where they reveal significant deviations from developed markets, and this can be justified because of the weak governance, illiquidity and behavioural biases that are often the characteristics of an emerging economy (Bekaert & Harvey, 2017).

Past studies that focus on comparing the U.S and Chinese markets show mixed findings, as Wang and Chen (2020) highlight that U.S. equities offer lower volatility clustering and downside tails, while corrections in their Chinese counterparts are sharper and riskier. Huang, Yang, and Zhou (2021) support these findings, and they argue that although Chinese equities demonstrate positive skewness, their high kurtosis and tail dependence reduce long-term risk-adjusted returns. Regarding the correlation between the markets, recent research (Tang et al., 2022) indicates a currently moderate, yet increasing correlation between U.s and Chinese equities, this was particularly the case during the Covid-19 global stress period.

Reference the above previous findings, the literature supports three expectations, the first being that U.S equities should outperform their Chinese counterpart, especially on a risk adjusted basis, the second is that Chinese equities should have a much higher volatility in addition to heavier tail distribution (more risk of a major downward movement), and the third is that diversification benefits of investing in both Chinese and American equities are expected to be significantly limited. Those three assumptions are examined as hypotheses, using daily data, traditional and modern econometric methods and Python-based analytics, with the goal to link between the academic theories with the practical and actual performance of the largest firms within the two countries.

METHODOLOGY

The Goal of this study is to evaluate and compare the financial performance, risk and the inter-market correlation between major U.S and Chinese Equities. To succeed through this quantitative, empirical based and comparative design, daily data using a 15-year time horizon were used, and both broad market exchange traded funds (ETFs) and specific mega cap firms were studied in both economies. The research design aims to provide a four-dimensional view of the market, through descriptive performance measures such as return and volatility, risk adjusted efficiency metrics such as Sharpe, correlation analysis through a heat map and capital asset pricing relationships.

Through Yahoo Finance's public data interface, daily adjusted prices were retrieved covering the period from January 2010 to October 2025.

Table 1: U.S and Chinese samples used in the study

U.S sample		China sample	
Name	Description	Name	Description
SPDR S&P 500 ETF Trust	Tracks S&P 500 index, the largest 500 American companies constituting over 80% of the entire U.S market cap	iShares MSCI China ETF	Tracks the Chinese version of S&P 500, Large and mid-cap Chinese equities listed both internationally and within China
Invesco QQQ Trust	Tracks the NASDAQ-100 Index, (100 U.S companies) focused on large-cap technology companies.	iShares China Large-Cap ETF	Focuses on the 50 largest Chinese companies listed on the Hong Kong Stock Exchange (H-shares).
Apple Inc.	One of the Leading U.S. technology companies specializing in consumer electronics (Mobiles, watches, laptops), software, and digital services.	KraneShares CSI China Internet ETF	Focuses on China's internet and technology sector, including ecommerce and online media.
Microsoft Corporation	The global software and cloud computing leader, providing Windows, Office (Word, Excel, PowerPoint), Azure, and enterprise solutions.	Alibaba Group Holding Limited	By far, China's largest ecommerce and cloud computing company.
NVIDIA Corporation	U.S. semiconductor and AI company specializing in graphics processing units (GPUs) and data-center computing.	Baidu, Inc.	Leading Chinese internet company, known there as "China's Google," specializing in AI and search technology

As part of the analytical framework of the research, the study's methodology focused on five evidence base models to correctly derive the results and properly compare the different markets, the first module is performance and risk metrics, using indicators such as CAGR, annualized volatility, Sharpe ratio and Sortino ratio, in this part the main goal is to assess profitability, both absolute and risk-adjusted.

The second module is related to capital efficiency, using maximum drawdown and the Calmar ratio, the goal is to study how resilient are each of the markets and how efficient is their capital. Third, the study focused on tail and distributions, through analysing skewness, kurtosis, VAR, conditional VAR, we aimed to measure tail risks of American and Chinese firms. Also, the study employed the CAPM model and alpha-beta analysis, in this section the comparison was regional, using the SPY for S&P 500 tracking in the United States and MCHI to track the performance of the largest Chinese firms.

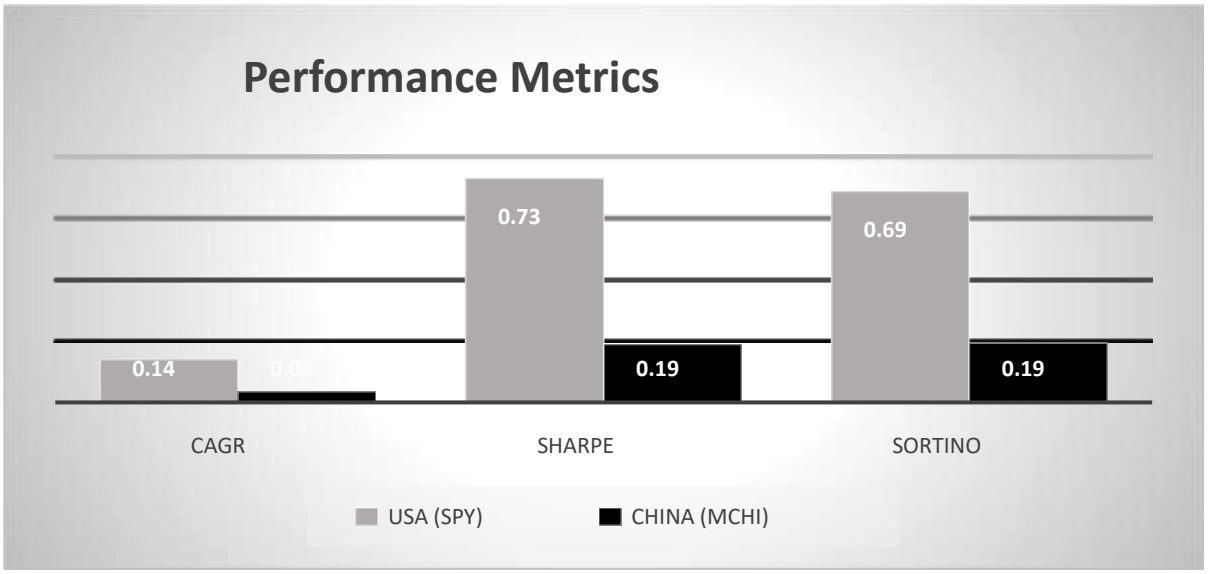
Finally, Pearson correlations were applied to identify intra (within the same country) and inter (between the two countries) correlations, this module was complemented by a correlation heatmap figure that illustrated clustering and exact correlation across the two markets.

RESULTS

Performance and Risk

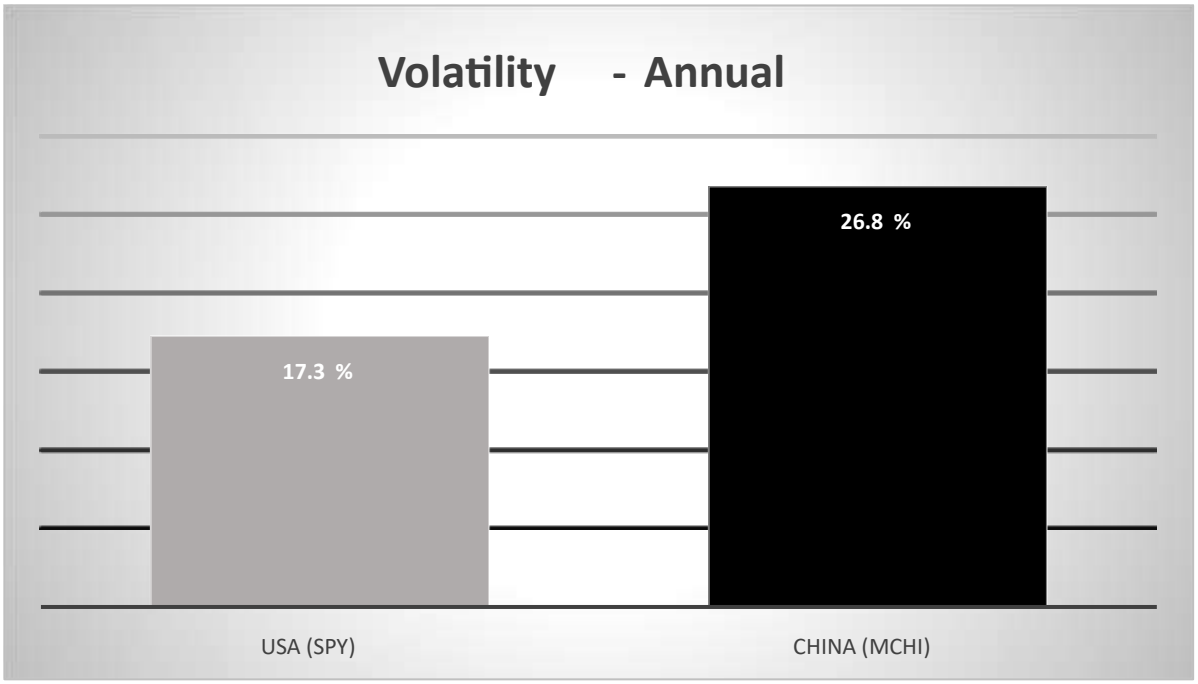
Results related to performance and risk were compared between the two countries under three subdivisions, the first is the broad market (S&P 500 and MCHI), the second is growth and technology companies (QQQ and KWEB) and the third is specific for mega caps companies, such as Apple and Microsoft from the United States versus Alibaba and Baidu from the Chinese market.

Figure 1: Performance metrics (Higher is better)



Source: USA versus China from an equity perspective

Figure 2: Volatility risk (Lower is better)



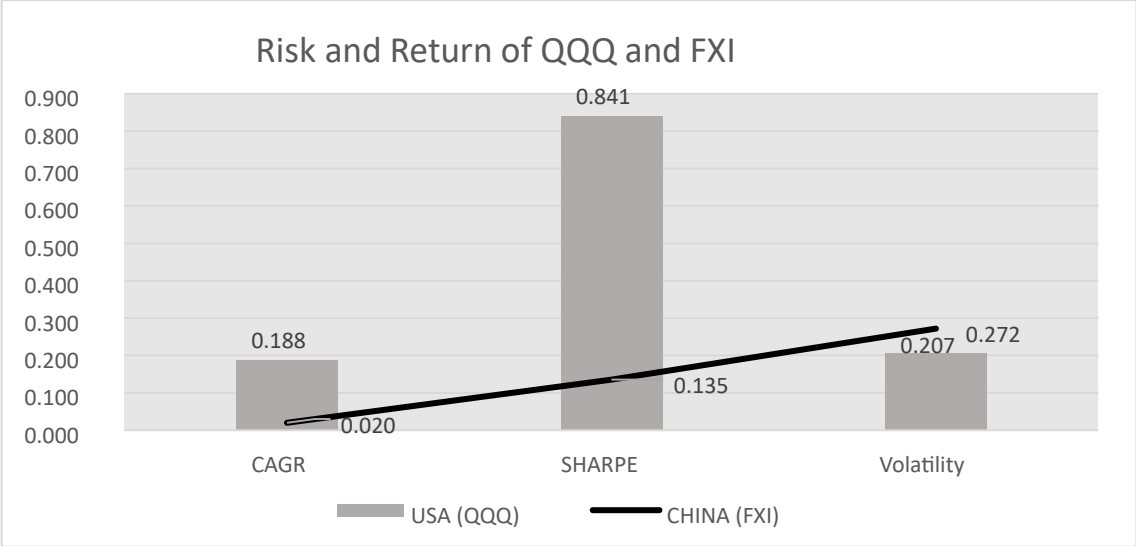
Source: USA versus China from an equity perspective

From a broad market perspective, the US market delivered substantially higher results, either in terms of compound annual growth rate (CAGR) 14% versus 4%, in terms of return per unit of total risk (Sharpe) 0.73

versus 0.19 or in terms of return per unit of downside risk (Sortino) 0.69 versus 0.19, this shows that SPY (American companies) outperformed MCHI (Chinese companies) on all counts.

Even in terms of risk, American companies exhibited a lower annualized volatility (17.3%) when compared to their Chinese counterparts (26.8%).

Figure 3: QQQ and FXI result comparison

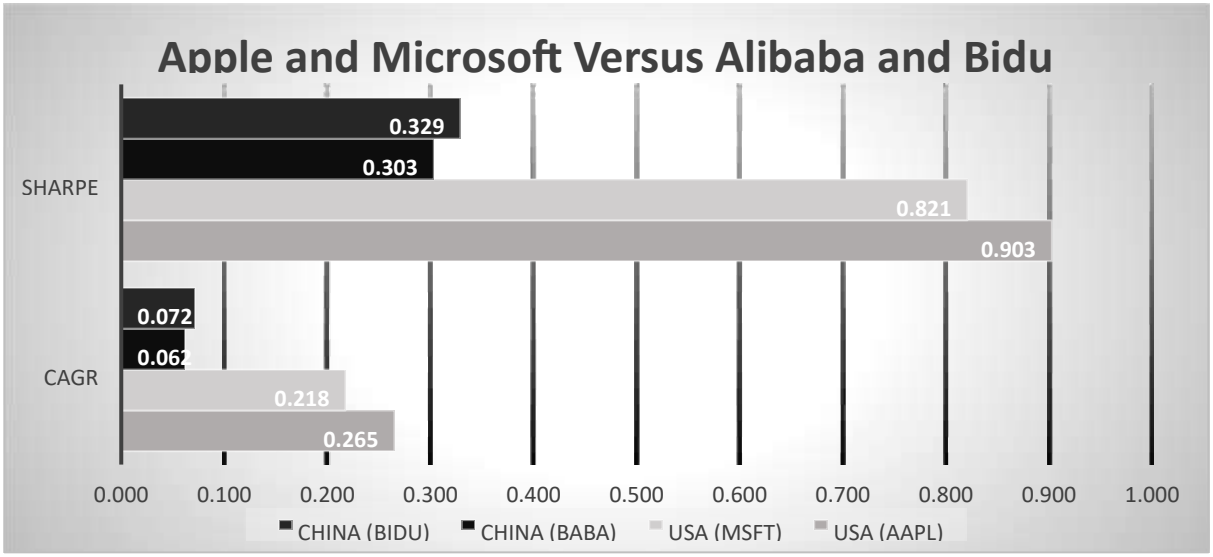


Source: USA versus China from an equity perspective

Even when compared on an intra market scale (within the U.S market), American QQQ companies outperform other companies in the United States, while in the Chinese case, FXI companies underperform other Chinese companies, which can be a symbol of the importance of technology and research and development in the United States as well as the financial stability (Beainy & Kamel, 2023).

When compared on an intermarket scale, American QQQ companies compound annual growth rate is 900% higher than that of Chinese companies (0.188 versus 0.020), and what is more significant is that this return is realized at a lower volatility (0.207 versus 0.272), making the difference of the results between the countries the largest and most significant, symbolizing the U.S dominance in this specific case.

Figure 4: Risk and return comparison (Company specific level)



Source: USA versus China from an equity perspective

Similar to the results on the broad market level, data related to firm specific levels support the previous findings, Apple and Microsoft show similar risk and return characteristics and both persistently outperform Chinese companies.

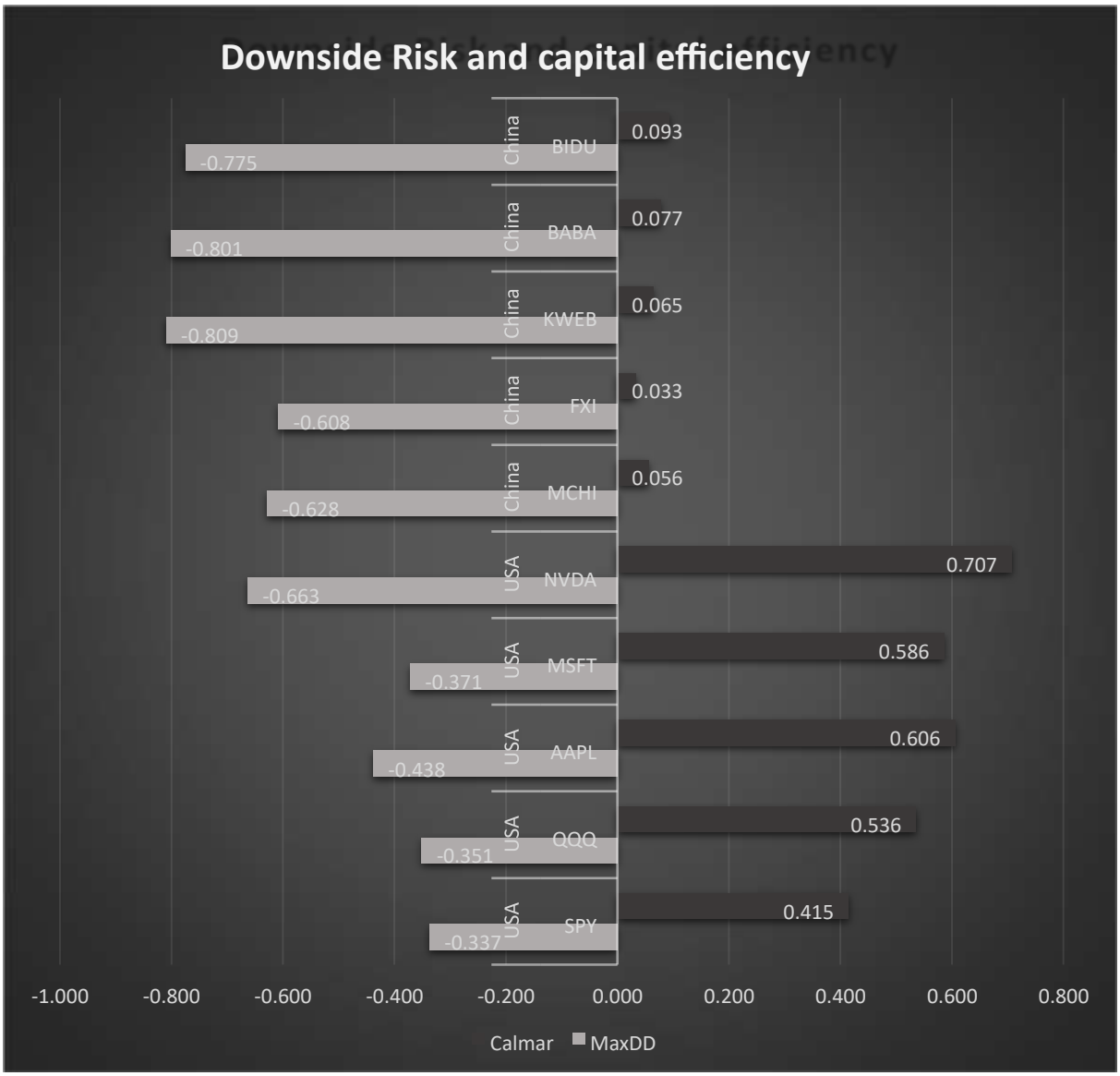
Drawdown and capital efficiency

For a more practical insight, in this section of the result the maximum drawdown (MaxDD) and the Calmar ratio are compared across 10 different samples.

Maximum draw down is calculated by dividing the difference between trough value and peak value with the peak value, the results are usually negative, with a smaller negative result signifying a smaller (better) downside risk.

As for the Calmar ratio, it integrates the annual return to the equation as a numerator and MaxDD to the denominator (Note: for the Calmar ratio to be correct, MaxDD is used in its positive, absolute value).

Figure 5: Max drawdown and Calmar comparison



Source: USA versus China from an equity perspective

Even though the difference of maximum drawdown appears small between American and Chinese samples, especially in the case of Nvidia, however once return is added to the equation (Calmar) the difference is

significant. Even for Nvidia were high volatility expressed through the high MaxDD is compensated through extremely high return, in fact once return is integrated, the company records the highest Calmar ratio among all samples in the study.

Table 2: Tails and Distribution Shape

Country	Ticker	Skew	Kurtosis	VaR	CVaR
USA	SPY	-0.334	12.095	-0.017	-0.026
	QQQ	-0.209	7.347	-0.021	-0.031
	AAPL	0.065	6.125	-0.027	-0.040
	MSFT	0.096	7.786	-0.024	-0.036
	NVDA	0.567	8.167	-0.042	-0.062
China	MCHI	0.468	9.381	-0.026	-0.037
	FXI	0.489	8.604	-0.027	-0.037
	KWEB	1.435	25.500	-0.036	-0.052
	BABA	1.218	15.797	-0.038	-0.056
	BIDU	0.997	13.177	-0.040	-0.058

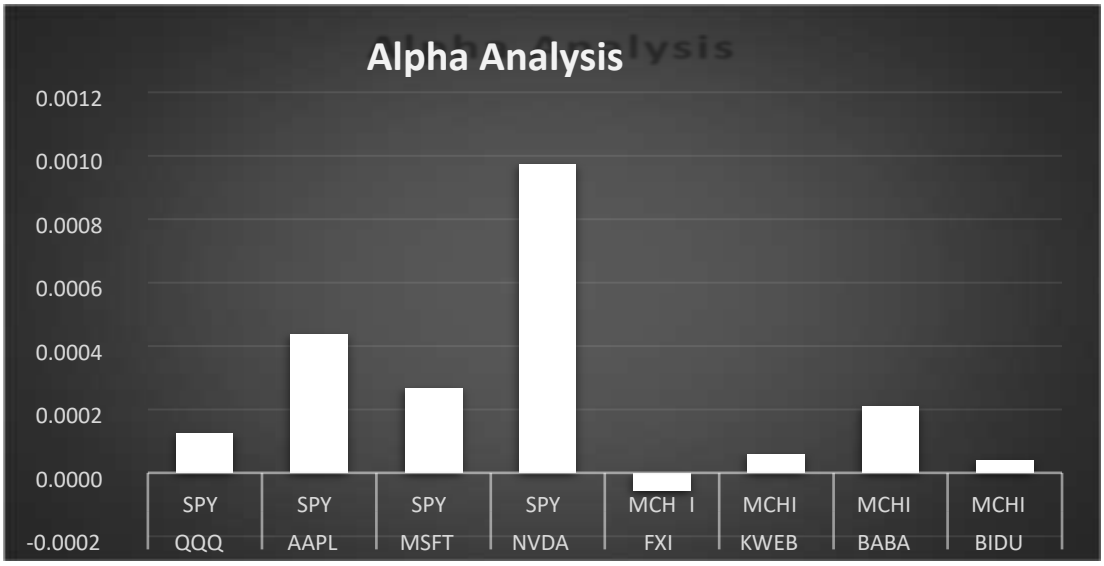
Source: USA versus China from an equity perspective

Tails, shape and value at risk

As kurtosis is above 3 in both US and Chinese samples, the return profile is leptokurtic which means the peak is very high (high return possibility) yet the tails are fat (high risk profile).

From a broad market perspective Var (the maximum expected loss for a single day at a 95% confidence level) is significantly lower in USA's S&P 500 than in China. However, some specific stocks such as Nvidia have a high value at risk (Var) further supporting the previous findings in the study.

Figure 6: Alpha analysis



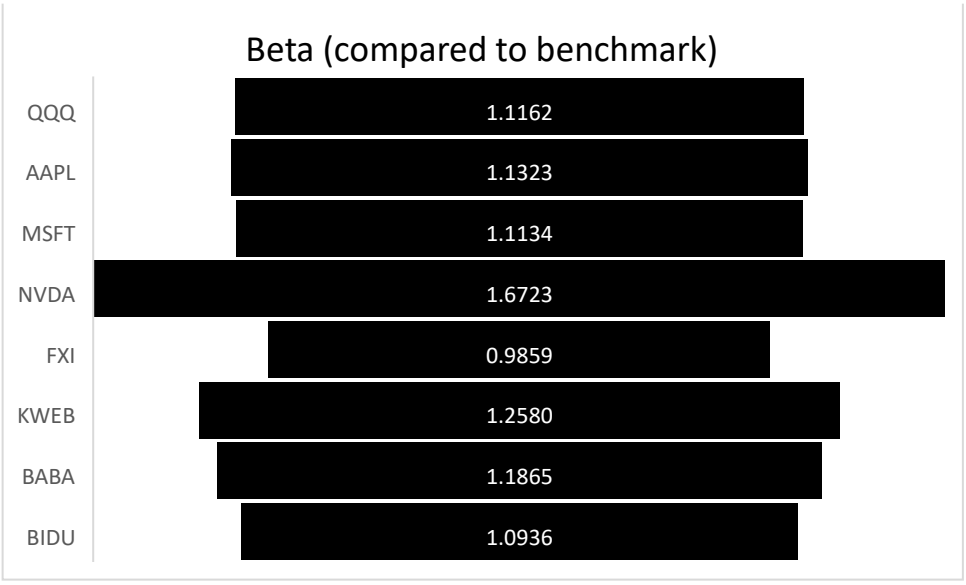
Source: USA versus China from an equity perspective

This section, results is analysed intra market, because American companies are compared to SPY (S&P 500) and Chinese companies to MCHI (MSCI).

With the exception of Alibaba, there is little potential to achieve a return superior to that of the market in China (Alpha), while in the United States, the three companies used in the study (Apple, Microsoft and Nvidia) achieved a significant alpha, which provides a signal for investor that active investing is recommended in the United States, while passive investing, due to the inability of achieving superior return, is recommended in China.

Finally, the negative Alpha of Chinese companies that are part of FXI represents a challenge for the Chinese government, the Chinese financial system and Chinese firms, as it is a symbol of a lack of recent success of firms that are part of FXI in China.

Figure 7: Beta analysis



Source: USA versus China from an equity perspective

While Alpha was a method to measure return, beta allows the measurement of systemic risk, with one being neutral, above one means an amplifier to market swings, and below one represents a change that is lower than that of the market or benchmark.

In this section, Beta is not analysed reference to the market, but to S&P 500 in the U.S case and to MSCI for the Chinese firms.

While all American samples represent an amplifier to S&P 500 swings, Nvidia has the highest beta (1.6723), on the other hand, the Chinese index for growth and tech companies FXI has an almost neutral responsiveness to market swings with a beta of 0.9859 (close to 1), the technical term used in cases similar to FXI is benchmark purity.

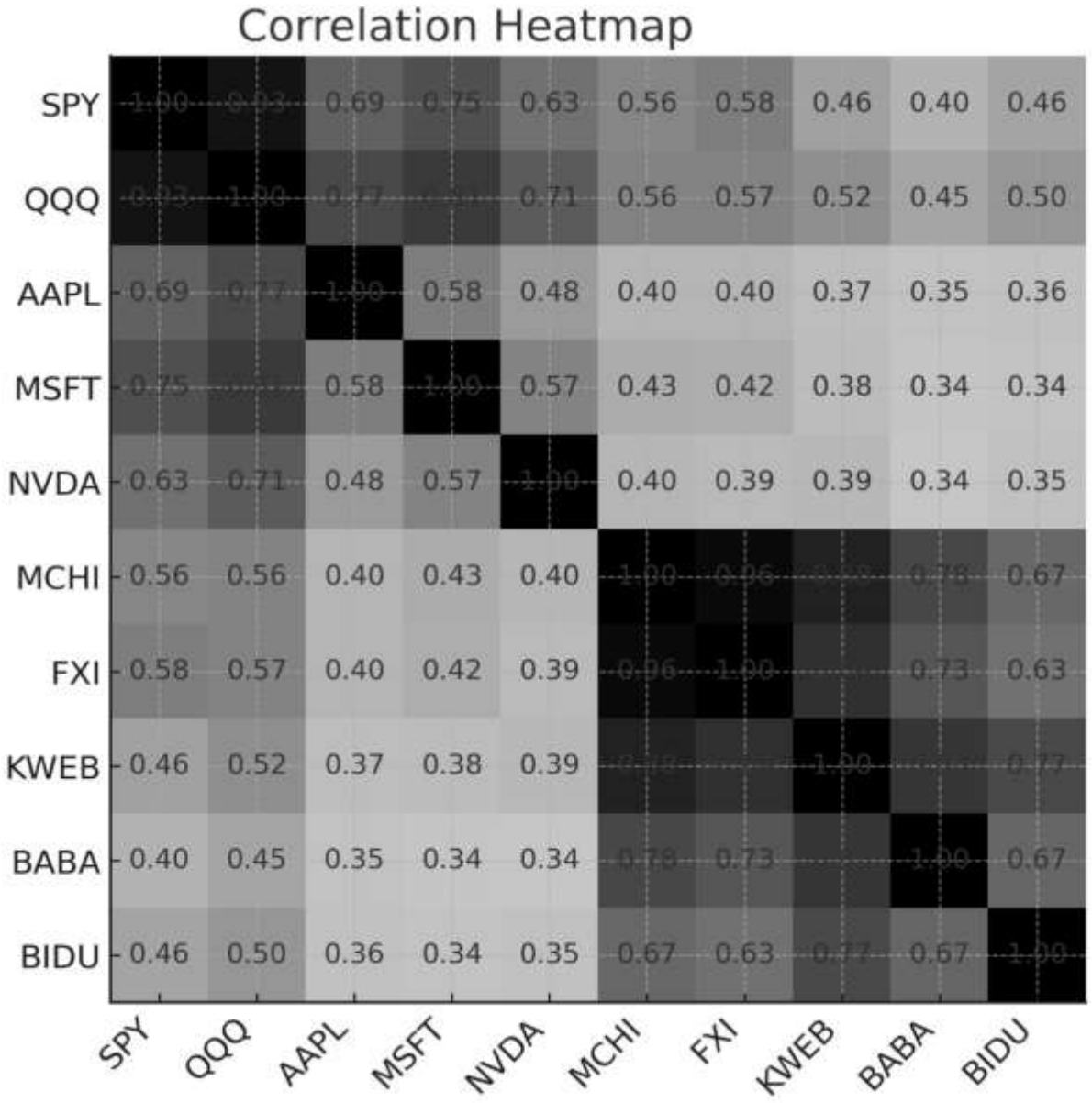
Table 3: Correlation Matrix

	SPY	QQQ	AAPL	MSFT	NVDA	MCHI	FXI	KWEB	BABA	BIDU
SPY	1.000	0.932	0.691	0.752	0.630	0.558	0.584	0.462	0.404	0.455
QQQ	0.932	1.000	0.772	0.813	0.713	0.565	0.566	0.521	0.453	0.499
AAPL	0.691	0.772	1.000	0.583	0.482	0.402	0.399	0.374	0.351	0.358

MSFT	0.752	0.813	0.583	1.000	0.566	0.426	0.423	0.376	0.337	0.344
NVDA	0.630	0.713	0.482	0.566	1.000	0.396	0.385	0.387	0.335	0.352
MCHI	0.558	0.565	0.402	0.426	0.396	1.000	0.964	0.883	0.778	0.667
FXI	0.584	0.566	0.399	0.423	0.385	0.964	1.000	0.843	0.733	0.629
KWEB	0.462	0.521	0.374	0.376	0.387	0.883	0.843	1.000	0.826	0.772
BABA	0.404	0.453	0.351	0.337	0.335	0.778	0.733	0.826	1.000	0.670
BIDU	0.455	0.499	0.358	0.344	0.352	0.667	0.629	0.772	0.670	1.000

Source: USA versus China from an equity perspective

Figure 8: Correlation heat map



Source: USA versus China from an equity perspective

According to the correlation heat map, the moderate correlation would allow an investor to benefit from diversification benefits if his investment strategy is active (specific companies in the United States), but would

achieve limited diversification benefits if the investment strategy is passive (Broad market, S&P 500 and QQQ) with a correlation with Chinese firms above 0.5 in some cases.

The lowest correlation recorded (best diversification benefit) is realized when combining Apple, Microsoft or Nvidia stocks with those of Alibaba.

CONCLUSION

This study conducted a comprehensive and extensive evidence-based comparison between U.S and Chinese equity markets, across a time horizon from 2010 to 2025. Reproducible results highlighted not only a stronger performance in the American equity market, both in the broad market perspective represented by SPY and QQQ, and in company specific perspective through companies such as Apple, Microsoft and Nvidia. American companies consistently exhibited higher compounded returns and lower relative volatility. In addition,

financial metrics such as Sharpe, Sortino and Calmar ratios all suggest the supremacy of American companies over their Chinese counterparts.

From the perspective of an investor, CAPM based analysis further underscored the success of U.S equities, as they produced positive and economically significant alphas with moderate beta, which implies that this outperformance is not the result of simple systemic risk but the result of the success of the American firms, American financial system and the American Model.

For policymakers and fellow scholars, the findings highlight how market maturity, proper governance and innovation support can significantly enhance performance outcomes.

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