**A close-up of a graph

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|  |  |
| --- | --- |
| **Abbreviations** | |
| **AAPL** | Apple |
| **AT** | Asset turnover |
| **CVX** | Chevron |
| **D/E** | Debt to equity |
| **EM** | Equity multiplier |
| **GOOGL** | Google |
| **IR** | Interest rate |
| **MSFT** | Microsoft |
| **NPM** | Net profit margin |
| **NVDA** | NVIDIA |
| **OTM** | Out the money |
| **P/E** | Price-earnings ratio |
| **ROA** | Return on asset |
| **ROE** | Return on equity |
| **TSLA** | Tesla |
| **VaR** | Value at risk |
| **VFS** | Vinfast |

# Trading philosophy

For profits with effective portfolio management, optimal strategy is conducted through investment preferences(Zheng and Zheng 2022). After pandemic, growth investing are considered more effective with low expenditure power; hence, being applied(Monge et al. 2023). Consequently, portfolio includes large growth stocks’ holdings with above-average gains, promising growth while balancing power, diversification and hedging targets are implemented with minor in low-risk and competitive stocks. Then, Top-down approach is conducted for initial move in industries analysis causing allocation dominance in technology, energy and minor in automotive, having 1.01%, 2.79% and 0.90% average monthly returns in past 2 years, respectively, higher than 0.36% of S&P500(Feng et al. 2011)(Figure 1,2,3). Then, allocation is based on risk-seeking style with all higher-than-1 beta companies. With high risk acceptance and returns, allocation is biased in most promising one, NVDA with recent positive news(Guo and Chen 2023). Besides, analysis is principally fundamental supported by news with model Dupont, applied by splitting ROE into NPM, AT, EM for deeper understanding companies movement’ insights alongside P/E, compared to industries for better capturing performances(Warrad and Nassar 2017). However, due to invalid computing EM with negative value, D/E is used instead for assessing leverage level(Chen and Zhao 2006).

|  |  |
| --- | --- |
| **Ratios(TTM)** | **Explanations** |
| NPM(%) | Gauging financial performance through profit from revenue, excluding expenses |
| AT | Showing how effectively company generate earnings from assets |
| D/E | Evaluating financial multiplier and leverage |
| ROE(%) | Evaluating profitability and management and decision-making efficiency in resources usage and operations |
| P/E | Determining overvaluation, undervaluation and growth expectations from market’s view |

**Table 1:** Explanations for Dupont analysis (Turner et al. 2015)

**Figure 1**: Returns between S&P technology and market adapted from Investing (2023)

**Figure 2**: Returns between S&P energy and market adapted from Investing (2023)

**Figure 3**: Returns between S&P Automotives and market adapted from Marketwatch (2023)

|  |  |
| --- | --- |
| **Stocks** | **Beta** |
| **TSLA** | 1.679 |
| **NVDA** | 1.604 |
| **CVX** | 1.014 |
| **AMD** | 1.653 |
| **MSFT** | 1.024 |

**Table 2**: Beta of passive stocks adapted from Investing (2023)

# Portfolio construction

**Figure 4:** Portfolio allocation

## **NVDA and AMD**

|  |  |  |  |
| --- | --- | --- | --- |
| **Ratios(TTM)** | **NVDA** | **AMD** | **Industry** |
| NPM(%) | 31.60 | -0.11 | 8.59 |
| AT | 0.7 | 0.32 | 0.61 |
| D/E | 39.07 | 5.19 | 51.6 |
| ROE(%) | 40.22 | -0.05 | 34.75 |
| P/E | 117.84 | -6.84 | 78.27 |

**Table 3**: Dupont analysis on NVDA and AMD

While NVDA is most invested with 50% portfolio, its competitor, AMD only accounts for 3%. Based on Dupont component, while NVDA's NPM is significantly higher than industry at 31.6%, showing efficient operations with significant profits and well-managed cost, higher relative AT shows high turning resource to revenue potential average though lower than 1, showing unoptimization(Chen et al. 2022). However, liquidity risk is not significant with guaranteed affordability with lower relative D/E with expected credit-rating increase(Jorgenson and Weitzman 2023). Hence, both ROE and ROA increased strongly in last 10 years with high profitability(Figure 4). Besides, NVDA has overwhelming P/E, 3/2 times market, showing growing expectations in innovative industry, strengthened by rapid demand reshape(Ashour et al. 2021)(Wright and Conwell 2023). Besides, with predetermined potential earning announcements on August 23, increasing significantly, boosting stock prices shortly thereafter is expected; leading to outweigh among portfolio(Brock 2023)(Nekrasov et al. 2022). Furthermore, value stock AMD in similar industry has opposite movements with negative ROE, including low NPM and AT, is reasonably used for hedging with minor allocation, avoiding downtrend in microchip industry instead of equal allocation. Hence, with up-to-date gain announcements, two stocks are brought into take advantage AI ​​trends in semiconductor industry.

**Figure 5**: ROE and ROA of NVDA in 2013-2023 adapted from Macrotrends (2023)

**Figure 6**: ROE and ROA of AMD in 2013-2023 adapted from Macrotrends (2023)

## **TSLA**

|  |  |  |
| --- | --- | --- |
| **Ratios(TTM)** | **TSLA** | **Industry** |
| NPM(%) | 12.97 | -69.98 |
| AT | 1.18 | 0.84 |
| D/E | 11.37 | 63.96 |
| ROE(%) | 27.96 | 12.92 |
| P/E | 66.44 | 28.04 |

**Table 4**: Dupont analysis on TSLA

**Figure 7**: ROE and ROA of TSLA in 2013-2023 adapted from Macrotrends (2023)

TSLA is chosen for potential profitability with effective sales and cost management, shown in higher relative NPM. Besides, AT is higher than 1 and industry with sufficient revenue generation from assets that TSLA provides more from invested capital for asset alongside low leverage that relative debt-to-equity is significantly small. Consequently, ROE and ROA gradually increase over time, bringing more returns. Notably, despite price cut, TSLA demand is guaranteed with increased profit, expectedly greater with “full self-driving technology”, allowing self-driving cars(Isidore 2023). More, expected upward trend with promising growth from market view, is determined by surpassing industry value at wide P/E margin.

## **CVX**

|  |  |  |
| --- | --- | --- |
| **Ratios(TTM)** | **CVX** | **Industry** |
| NPM(%) | 14.05 | 53.40 |
| AT | 0.84 | 1.01 |
| D/E | 13.59 | 2.04 |
| ROE(%) | 19.35 | 40.22 |
| P/E | 9.92 | 4.94 |

**Table 5**: Dupont analysis on CVX

**Figure 8**: ROE and ROA of CVX in 2013-2023 adapted from Macrotrends (2023)

Despite negative signs of smaller relative NPM, ROE with high leverage shown by 6 times higher relative D/E, company is expected to grow through doubling in relative P/E. It is explained by production expansion announced and bets on Permain basis, an energy-rich depression, having just shown effectiveness with production doubling, compared to competitors with 772,000 bbl increase per day, setting new record in Q2/2023, except Exxon(Valle 2023)(Crowley 2023)(Benzinga 2023). Additionally, increased production scale is shown through improving and promoting facilities in joint venture in Tengizchevroil(TCO), largest oil producer in Kazakhstan through lowering flowing wellhead pressures and gas injection compressors and injection wells(Kerr 2023). Despite increased expenses during expansion, value and potential are highly appreciated with expectations of improved cost structure and steady increase over 10 years and skyrocketing ROE to 20% in Q2/2023(Yahoofinance 2023). Notably, investors' value is concentrated with significant high dividend payouts with announcement of 6.3% increase to $1.51 in September alongside $75 billion stock buyback(Pound 2023)(Yahoofinance 2023).

## **MSFT**

|  |  |  |
| --- | --- | --- |
| **Ratios(TTM)** | **MSFT** | **Industry** |
| NPM(%) | 34.15 | -14.62 |
| AT | 0.55 | 0.62 |
| D/E (%) | 38.52 | 306.41 |
| ROE(%) | 38.82 | 60.43 |
| P/E | 33.76 | 45.49 |

**Table 6**: Dupont analysis on MSFT

**Figure 9**: ROE and ROA of MSFT in 2013-2023 adapted from Macrotrends (2023)

MSFT has strong profitability with significantly relative NPM with small leverage; however, realtive ROE is lower. Hence, company is undervalued with lower relative P/E that ROE and ROA grew steadily and especially high in 2 year period, showing safe sustainability with the AI integrations for improving efficiency and innovation, especially, announcement of AI Copilot, an impressive assistant for design, email ranking, prompts notes, and summarizing, making difference compared to competitors(Haselton 2023).

# CAPM

CAPM model is used for determining required rate of return and explaining risk-return trade off of investment(Pramono et al. 2022):

While market return's calculations are based on S&P 500, covering 500 largest stocks in US, risk-free rate's are based on monthly 3-month treasury bill. For two-weeks timeframe and optimizing accuracy, calculation's time frame is 10-years weekly. With annualized monthly data, risk-free rate is divided by 12 and 4(Appendix1). Then, due to normal distribution of two indices' data, average method is reasonably applied with sum of 5 passive stocks' weight beta(Appendix 2,3).

|  |  |
| --- | --- |
| **Components** | **Value** |
| Beta | 1.47 |
| Market return | 0.22% |
| Risk-free | 0.02% |
| Expected return | 0.31% |

**Table 7**: Summary of CAPM computing

# Risk identification

## **Systematic risk**

Systematic risk refers to internal risk of entire market with negative effects on stock returns, which cannot be controlled or minimized by any single organization or diversification. Instead, it is mitigated by hedging(Dor et al. 2021).

**IR risk**

**A line graph showing the growth of the stock market

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**Figure 10:** Downtrend of S&P (Silvercrest 2023)

Fed's increase comprehensively reduces liquidity, dampens investment and stock price(Sun 2023). However, US market is mainly sensitive to intentions instead of action, shown in first half of 2023’s recovery with Fed's announcement to keep IRs unchanged before deciding(Arestis and Karagiannis 2023). Fed had 25-basis point increase recorded in July and is expected to have another round in end of 2023 from Jerome Powell's statement at Jackson Hole on August 25, driving more recession possibility(Saraiva et al. 2023). Specifically, about our time trading, Chairman Powell's statements, although not directly signaling next decision, mentioning keeping raising IR need for US economy strength, show risks of continued increase, affecting investor sentiment(Rugaber 2023). Firstly, cost of borrowing climb with expensive credit balance, reduceing purchasing power with low spending confidence and driving to safe heavens instead of stock, which both reduces corporate earnings and stock price that S&P index witnessed downward trend since first rally(Figure 10)(Blanchard 2023). On business side, relying on debt financing, new projects' investment for expansion decreases with reduced affordability, causing low earnings(Abadi et al. 2023)(Siegel and Wright 2022). Besides, despite negligible influence on stock, high inflation risk promotes continued rise to meet 2%-target(Pire 2023).

## **Unsystematic risk**

**NVDA and AMD**

NVDA's main risk is supply. Due to inability to accurately determine demand and production delay, uncertain profits and revenue can cause negative on financial results(NVDA 2023). Due to main dependence on third parties for production, uncertainty of capacity, quality and component sourcing caused company to face launch time adjustment(NVDA 2023). More, AMD is subject to similar risks with dependence on third parties for design and development, especially, on Microsoft, which mainly finances AI ​​chip expansion for catching up trend(Reuters 2023). Moreover, with updated innovation requirement of industry alongside unsecured supply, capacity, cost and performance of NVDA will decrease. Specifically, recent cloud service NVIDIA DGX' timing and availability, has changed along with criticism about delays in packaging GPUs(Pires 2023). Besides, with more than 50% reliance on international trade, trading regulations from US significantly affected revenue with destroyed revenue and halt production from economic sanctions on Russia and Chinese stop supplying materials response(NVDA 2023). Besides, AMD faces liquidity risk with 2.95% and 2.375% senior notes of Xillinx worth $1.5 billion alongside revolving credit agreement, worsening financial performance and operations(Guzman and Smith 2023).

**TSLA**

Similarly, TSLA also encountered problems in production and delivery with thousands of raw materials from numerous international suppliers, strongly affected by chain disruptions with cost inflation and trade regulations, potentially causing shortage, and on-time delivery schedule(TSLA 2023). This production and launch ramping is severe with declined sales due to US-China war, destroying 40% and 20% battery supply chain and sales reliance of TSLA, respectively(Nikkei Asia 2023). Furthermore, TSLA is currently focusing on Model 3 and Y, requiring more resources, and skilled workers and is expanding production to potential non-experienced customers, promisingly causing supply and demand mismatch alongside rising cost and wrong timelines(TSLA 2023). Moreover, to ensure quality and differentiation, products are self-maintained by company and authorized experts, promoting volume but overloading inventory(Sanicola 2023).

**CVX**

In O&G industry, CVX's principal risk is commodity price, affected by economic conditions, OPEC’s production quotas, legal issues, and energy transition(CVX 2023). Indeed, due to slow economic growth with credit downgrade from AAA to Aa+ from Fitch on August 2, oil prices may decline as crude oil futures and Brent prices dropped 2.3% and 2%, respectively(Sanicola 2023). Price decline is potentially harmful to profitability, liquidity with financial conditions, especially serious to CVX with relative 6 times higher D/E. Furthermore, company face hazardous operational risk in factory at Wheatston, playing 13% of Western Australia's gas with labor strike due to inappropriate industrial right regarding salary, security and benefits, decreasing revenue(Jackson et al. 2023)(Marin and Macdonald 2023). Besides, energy trend conversion for renewable and environmental-friendly cause risks with halt due to emissions and low demand(CVX 2023).

**MSFT**

MSFT's biggest risk is competitor in platform-based ecosystem, cloud-based services, which competitors can diversify and rapidly improve, forcing to actively innovate and invest more in R&D with uncertain demand like risky approach to IoT with Azure(MSFT 2023). Products are available with increased operating cost and unguaranteed quality; evidently, outages in Teams, Outlook, and Azure, causing 77%, 18%, and 6% of users facing access, login, and connection issues, respectively(MSFT 2023)(Lahriri 2023). Furthermore, huge expenditure for AI, $13 billion on OpenAI along decreased cloud revenue’s expectations, decreased earnings report and price sharply(Capoot 2023)(Cheng 2023).

## **VaR**

**Figure 11**: Probability of passive portfolio return

|  |  |
| --- | --- |
| **Stocks** | **1-day VaR** |
| NVDA | -8.01% |
| TSLA | -12.30% |
| CVX | -5.12% |
| AMD | -8.63% |
| MSFT | -4.90% |

**Figure 12**: 1-day value at risk of passive stocks

VaR is used for determining riskiness with promising portfolio's loss provision in given period(Gaivoronski and Pflug 2005). Hence, 1-day 99%-VaR is -7.589% stating maximum 1-day portfolio loss is ($67,888), product of -7.589% and total passive portfolio investment. With historical analysis, passive portfolio has greatest chance of returns in 0-2% range in last day with highest probability alongside expectedly more positive instead of incurring loss due to positive skewness. Particularly, TSLA has potentially highest 1-day-loss risk with -12.30%. However, only basing on historical data, not capturing trendy fluctuations, method is not useful in forecasting, possibly improved by Monte Carlo approach for various scenarios(Hong et al. 2014).

# Hedging

## **Futures**



**Figure 13**: E-mini contract price on August 21 (Marketwatch 2023)

For hedging portfolio’s longing, belonging to S&P500, shorting E-mini contract is conducted with determined price on August 21, resulting in forced resale for $4,399.75 each on maturity for offsetting negative movements with contracts number:

|  |  |
| --- | --- |
| **Components** | **Value** |
|  | 1.47 |
|  | $894.569 |
|  | $4,399.75 |
|  | 50 |
|  | 5.98 |

**Table 8**: Summary of number of E-mini contracts computing

For odd result, choosing between overhedging and underhedging is considered. While overhedging create safer compensation for possible loss, underhedging is more risky with favorable trend(Gay et al. 2003). However, with biased portfolio with high risk tolerance for huge profit and unstable market fluctuations due to macroeconomic events and systematic risk, overhedging is purposefully chosen for exceeding initial portfolio position(Gay et al. 2003). Hence, amount obtained is 6 with further upward trend trade off, limiting profitability.

## **Options**

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**Figure 14**: NVDA’s triple movement (Patnaik 2023)

AI craze pushed NVDA to reach bubble peak with more than 200% rally(Figure 14). Hence, with sky-high valuations, waiting-to-burst stock pose implosion risk with slump if next quarter's earnings report is poor(Tayeb 2023). Furthermore, due to aggressive NVDA’s bet with nearly half portfolio alongside risks, NVDA is hedged by options.

|  |  |
| --- | --- |
| **Components** | **Value** |
| No. contracts |  |
| Investment’s value |  |
| Strike-price |  |
| Ask | $ |
| Premium | $ |

**Table 9**: Summary of number of options contracts computing

**Figure 15**: Returns of options contracts along price movement

For hedging initial-long position, OTM approach is conducted by choosing higher strike than spot price for offset from NVDA's downtrend(Benzoni et al. 2005). However, as uptrend possibility is no exception, $462.50, slightly higher than spot, limiting unnecessary excess premium cost, is selected for purchasing with $25,800 premium. Besides, for each contract's 100 shares requirement, 10 contracts are purchased with maximum $25,800 loss when spot price exceeds strike price; however, compensation amount is proportional to NVDA decrease(Figure 15).

# Reflection

## **Risk appetites**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Stocks** | **Purchase-date** | **Sell -date** | **Amount** | **Purchased-price** | **Sell-price** | **Profit** |
| **VFS** | 8/23/2023 | 8/25/2023 | 2800 | $35.90 | $71.21 | $98,848.00 |
| **AAPL** | 8/29/2023 | 9/5/2023 | 542 | $184.69 | $189.62 | $2,652.06 |
| **GOOGL** | 8/30/2023 | 9/5/2023 | 744 | $134.77 | $135.98 | $880.24 |

**Table 10**: Summary of active trading position overtime

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**Figure 16**: VFS candlestick chart (Tradingview 2023)

As risk-seeking, passive portfolio consists volatile stocks and NVDA’s bias; however, risk acceptance varies overtime due to financial goal, economic conditions, expressed specifically in active portfolio(Table 2,10). Initially, VFS was chosen with profit optimization by taking advantage of newly IPOs, highly fluctuated in beginning(Lowry 2003). After low initial volume due to low-confidence and market valuation process, positive range rating from EPA on August 21 exceeding initial estimate with 291 and 330 miles for VF 9-plus and VF 9-eco, respectively, was obtained, attracting huge investment with huge buying volume, leading to buying behavior on August 25 with 2,800 volume(Chamaria 2023)(Figure 16). Then, due to profit objective, after achieving as realizing VFS’s nearly double on August 25, selling was done with loss aversion, prioritizing preserve of achieved profit instead of more-profit opportunities with loss-risk(Cai and Yang 2010). Action is also supported by above-mentioned Fed's Powell's statement, negatively affecting investor confidence on August 25(Reuters 2023). Consequently, risk-bearing capacity becomes low with stable stocks investment: AAPL and GOOGL.

## **Comparison return**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Stock** | **Amount** | **Purchased-price** | **Sold-price** | **Change** | **Profit** |
| **TSLA** | 800 | $226.49 | $257.36 | 13.63% | $24,676.00 |
| **NVDA** | 1,000 | $453.79 | $487.67 | 7.47% | $33,860.00 |
| **CVX** | 1,250 | $159.81 | $166.42 | 4.14% | $8,242.50 |
| **AMD** | 280 | $107.07 | $111.26 | 3.91% | $1,153.20 |
| **MSFT** | 93 | $320.91 | $333.83 | 4.03% | $1,181.56 |

**Table 11**: Summary of passive trading position

|  |  |  |
| --- | --- | --- |
| **Component** | **Expected** | **Actual** |
| Change | 0.31% | 7.73% |
| Value | $2,760 | $69,113 |

**Table 12**: Expected and actual returns comparison

There is huge gap, 7.42% between expected and actual return, explained by CAPM's unrealistic assumptions, causing mismatch between portfolio and real market's characteristics along limitations(Rossi 2016). While CAPM assumes solely hazardous to unsystematic risk with diverse portfolio and all risk-adverse investors, significant unique impacts still exist even in extremely large portfolios while risk preference is diverse with psychological factors(Pratt and Grabowski 2014). Indeed, with small-scale portfolio, only 5 stocks and risk-seeking, assumptions are ineffective. Although beta is applied for capture systematic risk, constant assumption is unreasonable, causing inaccuracies with market fluctuations, especially under current inflationary and IR pressure. Moreover, as no corporation has privileges as US government, assumption borrow and lend at risk-free-rate ability is realistically unattainable(Rossi 2016). Finally, instead of backward-looking with historical reliance, gap is improved with forward-looking and estimated components with size and value risks additions by Fama French(Womack et al. 2003).



**Figure 17**: E-mini contract price on September 5 (Tradingview 2023)

## **Calculations**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Time** | **Passive-portfolio value** | | **Options** | | | |
| **Spot** | **Future** | **Options value** | **Purchasing NVDA** | **Non-exercising** | **Exercising** |
| 21/8 | $894,569 | $2,199,875 | $462,500 | ($487,680) | ($25,800) | ($25,800) |
| 5/9 | $963,682 | $2,258,500 | ($25,800) | ($25,180) |
| Gain/loss | $69,113 | ($58,625) | ($25,800) | ($50,980) |

**Table 13**: Summary of hedging activities returns with passive portfolio

**Figure 18:** Net returns of the total portfolio with hedging types

|  |  |
| --- | --- |
| **NVDA’s return** | |
| Options | $8,070.00 |
| Exercising | ($17,110.00) |
| Non-hedging | $33,870.00 |

**Table 14**: Summary of gain/loss of NVDA with options

**Figure 19:** Net returns of NVDA with options decision types

Obviously, returns decrease significantly to $1,087,069 with ineffective hedging transactions along options’negative effects to NVDA returns($17,110) and ($8,070) if exercising and non-exercising, respectively. Hence, ineffective hedging occurred due to mismatch between portfolio characteristics and future-contract price with correlation variation overtime(Ranasinghe et al. 2022). Particularly, NVDA’s bias caused huge profit decrease with skyrocketed movement. However, determining wrong options price comes from subjective perspective, not depending on any fitted models. Moreover, decline is more severe without active trading’s gains, whose profits are not constrained by hedging.

## **Comparison hedging**

Despite both type’s inefficiencies, returns are higher with options. Due to bullish market, covering whole portfolio’s risk o causes heavy negative returns due to undesired one-way moving of all stocks for hedging target(Stosic-Mihajlovic and Zravkovic 2016). Moreover, instead of being financial committed, options offer flexibility and provide more gains controll and hedging activities(Prager et al. 2020). Obviously, instead of worse scenario of $1,120,514 position when exercising, limit is extended with option for $1,145,694. However, in bearish market with systematic risks, situation is opposite with stronger compensation with entire portfolio’s cover(Boubaker et al. 2021). Therefore, hedging preference depends on market trend with bias towards options in realistic bullish 2-week, meaning more risks fitting my risk-seeking. Lastly, partly-hedging is more effective instead of impractical perfect hedging effort from futures(Crosby 2014).

## **AI**

**A screen shot of a graph

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**Figure 20:** Toggle’s prediction on AAPL’s movement (Toggle 2023)

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**Figure 21:** Fundamental analysis of AAPL (Tickeron 2023)

|  |  |  |
| --- | --- | --- |
| **Ratios(TTM)** | **AAPL** | **Industry** |
| NPM(%) | 24.68 | 20.22 |
| AT | 1.14 | 1.05 |
| D/E | 181.31 | 127.61 |
| ROE(%) | 160.09 | 121.08 |
| P/E | 29.59 | -19.71 |

**Table 15**: Fundamental analysis on AAPL adapted from Investing (2023)

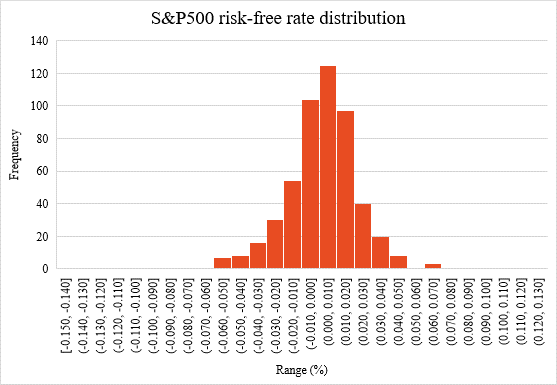
From Toggle, AAPL was added to active portfolio. Recommendations process sequentially through stages, including identifying responses from similar historical period, analyzing drivers; then similar response and factors period, are combined to predict next movement with statistical tests. If robust, insights are given. Price is predictably increased during trading period(Figure 20). with certainty level based on frequency of periods having consistency between asset volume and price variation with 86% those days, resulting in predicted 1.07% rise at maturity with 65.38% probability(Toggle 2023). By determining how often response happens for recommendations, they are lagging indicators, depending mainly on historical data, made up of different stages of economic conditions alongside unqualified input. Hence, movements, although similarly moved, are different regarding factors, possibly causing false recommendations with market fluctuations and operational risk in input quality. Especially, current IR risk by Fed cannot be explained. Additionally, risks are more severe in Tickeron's fundamental analysis when only considering profitability, which should be compared to industry for deeper understanding instead of S&P 500. Additionally, failing to consider leverage cause liquidity and IR risk due to relatively higher D/E(Table 15).

# Appendix

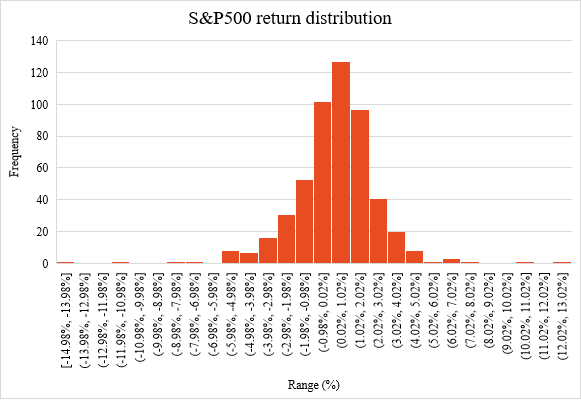
Beta, S&P Technology, Automotives, Energy, VaR, S&P 500 and necessary calculations are shown is in Excel file.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Stock** | **Beta** | **Allocation** | **Share price** | **Number of shares** | **Amount** | **Weighted beta** |
| **TSLA** | 1.679 | 20.25% | 226.49 | 800 | $ 181,192 | 0.340 |
| **NVDA** | 1.604 | 50.73% | 453.79 | 1000 | $ 453,790 | 0.814 |
| **CVX** | 1.014 | 22.33% | 159.81 | 1250 | $ 199,763 | 0.227 |
| **AMD** | 1.653 | 3.35% | 107.07 | 280 | $ 29,980 | 0.055 |
| **MSFT** | 1.024 | 3.34% | 320.91 | 93 | $ 29,845 | 0.034 |

**Appendix 1:** Summary of weight beta computing for beta



**Appendix 2:** S&P 500 risk free rate distribution



**Appendix 3:** S&P 500 risk return distribution

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