Master of Science in Finance Program

FIN 575: Applied Science in Finance

Capstone Project

on

"In perpetuity investor, such as foundation, endowment with a tendency to stay fully invested in risky (and sometimes illiquid) assets all the time."

By

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1. About MacArthur Foundation

We have been approached by the MacArthur Foundation with the explicit objective of restructuring their entire investment portfolio. The task entails constructing a comprehensive and robust multi-asset, multi-security, and multi-instrument financial portfolio that aligns with the Foundation's specific requirements while adhering to its level of risk aversion.

The John D. and Catherine T. MacArthur Foundation, a privately held institution based in Chicago, allocates grants and investments to support nonprofit organizations globally. With an endowment of $8.2 billion, it disburses approximately $260 million annually. It ranks as the 12th largest private foundation in the United States and has distributed over $7.92 billion in grants since its establishment in 1978.

The Foundation is committed to promoting creativity, strengthening institutions, and building influential networks to create a more equitable, sustainable, and peaceful world. Its initiatives include addressing climate change, reducing incarceration rates, countering nuclear threats, supporting independent journalism, and meeting local needs in Chicago.

In 2019, the Foundation's funding for development increased by 27% to $109 million. Notable programs include the MacArthur Fellows Program, also known as the "genius" award, which grants $800,000 to exceptionally innovative individuals annually. Additionally, the Foundation's 100 & Change competition awards a $100 million grant every three years to a single proposal that promises real and measurable progress in solving critical problems of our time.

The Foundation traces its roots to John D. MacArthur, who, along with significant interests in various enterprises and substantial real estate holdings, established the Foundation with the guidance of their attorney, William T. Kirby, and chief financial officer, Paul Doolen, to be funded by their considerable wealth.

Additionally, their impact investments and grants aim to promote fairness, inclusivity, and sustainability globally, demonstrating the transformative power of money in addressing various challenges. They invest strategically to address funding gaps and advocate for others to join their efforts, concentrating on projects in Chicago, clean energy, indigenous autonomy, housing stability, and equity promotion. Their grants also contribute to advancing knowledge in investing, enhancing impact assessment, and fostering diversity within the finance sector. By funding various organizations and projects and employing diverse investment strategies, they strive to achieve their goals effectively.

2. Financial Analysis

MacArthur Foundation compounded net return from 2013 – 2022: 8.50% (*Exhibit 1*).

Given that the 10-year average return for this Foundation typically hovers around 8.5%, the MacArthur Foundation expresses a desire to maintain this performance and this stipulates a minimum annual rate of return of 9.5 % on the portfolio. This requirement considers a 1% portfolio

management fee. Consequently, our group is tasked with generating an annualized rate of return on the portfolio that is at least 9.5% on the Foundation portfolio over the long term.
This would ensure that the Foundation's asset base grows as it is stipulated to pay 5% of the average fair market value of assets under management every year to maintain its tax exemption.

Considering these parameters, our efforts will be dedicated to devising an investment strategy that meets and exceeds the specified performance benchmarks while managing risk within the defined parameters.

3. Our Investment Philosophy

Our team is confident in our ability to construct a portfolio of undervalued securities, selecting assets based on mean reversion and mispricing.

As asset managers, we prefer to use forward rates and implied growth rates rather than backward-looking historical growth rates.

The idea behind the same is that historical data can be subject to errors in data gathering and backward data may not be a true reflector of the current world. Further, it assumes the risk aversion of investors has not changed over time. It also assumes that the riskiness of the market has not changed over time.

In the past couple of years, we have witnessed immense disruption owing to a complex interaction between low rates and technological progress. We believe that a forward-looking attitude is appropriate across most asset classes. Unfortunately, some asset classes like commodities and hedge funds can be difficult to evaluate in terms of their forward expected returns and risk premiums. In that scenario, we use backward-looking data and apply certain forward-looking assumptions to project the expected return.

In short, our team prefers to use implied growth rates and value assets based on the present value of their future expected cash flows.

In our Foundation portfolio, we have allocated to both long-term allocations and short-term positions and we would be rebalancing and evaluating portfolio yearly.

4. Our Investment Outlook

The global economy is currently contending with potential repercussions from rate hikes by the Federal Reserve. While corporate earnings have demonstrated remarkable resilience in recent quarters, the short to medium-term outlook remains circumspect. The inversion of the US 2 to 10-year yield curve in mid-2022, historically preceding a recession within 18 months on average, suggests an impending economic downturn (*Exhibit 2*). Amid this macro-economic scenario, opportunities for generating alpha can be identified through discerning pockets of mispricing in the market.

5. Market Outlook

To compute our expected rate of return on the stock market, we utilize forward estimates to decipher the implied rate of return, which we believe are more appropriate for forecasting growth than historical and backward-looking estimates.

In light of the above, our analysis indicates an implied risk premium of 5.74% on the S&P 500, based on forward estimates and a longer-term growth rate of 4% (*Exhibit 3*).

Consequently, the derived implied cost of equity (expected yield) stands at 9.61%. Additionally, we have taken the current 10-year Treasury yield as the risk-free rate. This leads to the determination of the S&P 500's risk premium as 5.74%, better than recent historical averages. This was derived by discounting the future earnings of the S&P 500 at the cost of equity and using average analyst expectation of growth rate for the index.

The current expected equity return is 9.61% over the longer term. This return expectation is lower than what we have witnessed in the past. In the past, the S&P 500 has delivered a 10% return on average.

Such long-term growth rates make us convinced that US markets are not very attractive (as we have witnessed back in the past- we would prefer to be overallocated to the US if the yield was higher) and we would like to increase exposure in international markets and alternative investment classes in search of higher yield and diversification.

Our investment outlook across asset classes and the securities we prefer are as follows:

6. US Market Exposure – Equity

The Foundation's portfolio includes investments in the US-listed equity markets through passive ETFs in the large-cap and small-cap sectors. This we would do via three ETFs namely: $SPY- SPDR S&P 500 ETF Trust Large Cap, $IVV- iShares Core S&P 500 ETF, and $IWM- Russell 2000 Index ETF. Essentially, we are using two ETFs that track the S&P 500 and one that tracks the Russell 2000 (small-cap sector).

- **SPY – SPDR S&P 500 ETF Trust (Large Cap)**

SPY ETF, established on January 22, 1993, is the oldest in our portfolio, with a history spanning more than three decades. The ETF was designed to mimic the S&P 500 index, composed of all 500 equities in the S&P 500 Index, and pays dividends quarterly. However, a large portion of the Trust is invested in large-cap U.S. stocks.

The price of the ETF closed at $ 499.51 on February 16, 2024, with a market capitalization of $490.41 billion, and an assets record of $ 488.57 billion. Almost all assets of the Trust have been allocated in equity at 99.90% and the rest in cash.

Data of monthly annualized returns reveals that the ETF is performing well in terms of producing returns as well as mimicking the benchmark. The ETF maintains higher returns of double digits and tracks the S&P 500 which has given an average 5-year return of 14.63%.

However, the ETF fails to beat the benchmark in all horizons but, at least, the difference in annualized return between the two is not significant in the long horizon as it's recorded at about 4 percent points and only 0.56 percent points in 1-year and 5-year horizons respectively.

These results inform that investors can expect to gain returns that have very low tracking error on the S&P 500.

The ETFs beta is averaging at 1 for all horizons whereby the 5-year period records the smallest beta at 0.998 followed by 6-month 0.998 again, and amount 1.002 1-year period. This is what we would expect a market index beta to be, the beta of the market portfolio is 1 and this shows the efficacy of SPY trust in mimicking the returns of the S&P 500. The ETF's standard deviation would mimic the standard deviation of the S&P 500 i.e. 18.36% over the past 5 years.

The current expense ratio employed by the Trust is standing at 0.095% (very low). Hence, coupled with a low expense ratio and low tracking error SPY is a great ETF for us to take exposure in S&P 500.

- **IVV Fund iShares Core S&P 500 ETF**

iShares Core S&P 500 ETF is issued to investors with its underlying aim of tracking how the S&P 500 performs by investing in all 500 equities of U.S. large companies which make the S&P 500 Index. The current price of the Fund stands at $ 501.95. Its assets amount to $ 434.90 billion. Out of this pool, 99.67% is invested in equity and 0.33% is held as cash. The fund also has a total market capitalization of $ 434.91 billion and pays dividends quarterly.

The top industry where the Fund's assets have been invested is the Internet with an 11.83% share. Other industries where the fund has investments are software (11.32%), semiconductors (9.24%), computers (7.79%), pharmaceuticals (5.82%), and retail (4.97%).

The movement of the Fund's returns looks close to that of the benchmark in all investment horizons. The difference in return between IVV and the benchmark is a mere 0.03% over five years, indicating a low tracking error that we are willing to accept.

The ETF recorded price movement almost similar to the market movement as its beta was 0.999 in the previous 5 years. Beta was 1.004 and 1.003 in 6-month and 1-year periods respectively.

The ETF appeared to have a total of 38 winning periods in absolute returns vs the benchmark in the 5 years, equivalent to 64.41% of all the total periods. The above beta and low tracking error show the efficacy of IVV Trust Fund to track the S&P 500.

The issuer charges an expense ratio of 0.03% of the total investment in the Fund. This makes the fund attractive as the expense ratio is low.

- **Russell 2000**

The Russell 2000 Index is a stock market index that measures the performance of approximately 2,000 small-cap companies in the United States. It is one of the most widely followed benchmarks for small-cap stocks and is often used as a benchmark for the overall performance of the small-cap segment of the U.S. stock market.

US small cap have been trading at a significant discount to their historical valuation in comparison to S&P 500 over 30 years (*Exhibit 8*).

Currently, on valuation metric, we find an opportunity to derive alpha by getting exposure in the Russell Index, while these exposures may generate slight excess returns over a longer period markets have a habit of going towards irrationality. Therefore, we aim to generate alpha by strategically timing our entry for mean reversion, anticipating the pendulum to transition from prevailing pessimism to euphoria. In short, we are hoping to time the security well.

Based on intrinsic valuation, we estimate the expected rate of return of Russell to be 9.77%(*Exhibit 9*). We use the average analyst expectation for the next two years [1]and then assume the longer-term growth rate (terminal growth) to be equivalent to the GDP of the US estimated at 4%.

This expected return means that it has an additional return premium of about 16 bps on the S&P 500. This is derived from using analyst expectations. We believe despite not having high spreads in terms of risk premium over the S&P 500, the Russell 2000 is attractive based on mean reversion.

Thus, in our estimate on a relative basis, Russell is trading at a 30% discount to its historical valuation and thus, can perform well in the medium term.

$IWM ETF tracks Russell 2000 and will be added to our portfolio. This ETF has a low tracking error of 0.1% relative to the Russell 2000 index and thus is a good way for us to take exposure in the same. The ETF has a beta of 1.16, which is typical of a small-cap ETF. It has a Sharpe ratio of 0.57.

7. US Fixed Income

Domestic bonds are issued and traded within the internal market of a country and denominated in the currency of that country. Classified by the issuing organization, domestic bonds can be divided into government bonds and corporate bonds. The price of domestic bonds is also influenced by various factors, such as credit rating, maturity, market liquidity, and so on. If classified by maturity, United States Treasury securities can be divided into three main types, treasury bills, treasury notes, and treasury bonds.

- **Long-term US Treasury Securities**

[1] Average analyst expectation data given by Bloomberg

Compared to government bonds issued by other countries, US Treasury bonds have low default risk and high liquidity (they are AA-rated). Exhibit 10 illustrates the yields of global government bonds on February 17, 2024. It's evident from the data that among all government bonds, the United States offers the relatively high 10-year treasury note yield, which is 4.279%.

Exhibit 11 visualizes the movement of the 10-year and 20-year US Treasury bond yields, as well as the Fed Funds rate over the past three years. Starting from February 2022, Treasury yields increased from 2% to 5% due to a combination of factors, including Federal Reserve quantitative easing, heavy US government spending during COVID-19, and the Russia-Ukraine war.

As investment managers we do not possess and claim to be experts in timing the yields and estimating the macro environment, the reason we prefer the longer and mid-end of US Treasury bonds is that the bond market tends to move inversely to the stock market and we sense that the market cycle might be shifting and we might be near the end (which is generally positive for longer-dated bonds).

When bond yields rise, people often shift funds from the stock market to the bond market to chase safety. We believe that the US treasury is trading at a significant premium to developed market counterparts and has a positive differential with China's 10-year bond. Further, even when we compare with other emerging markets like India we find that India's 10-year government spread over the US 10-year has fallen a lot over the past few years. Hence, we believe that the US longer-term treasury is a great investment at the current moment. It is currently offering a positive real yield and we believe as stated above that the Fed will want to maintain its credibility and will bring inflation down in the coming quarters. This in turn would be positive for holders of high duration.

In addition to the factors mentioned above, the US treasury would be a great source of diversification and earn a decent yield. The S&P 500 Index and the yield rates of US Treasury bonds often move in opposite directions (*Exhibit 12*). The correlation of the daily change rate between the 10-year Treasury Bond yield and the S&P 500 index over the past 2 years was -0.019.

- **About Short-term US Treasury Securities**

While we tend to avoid keeping money in short-term US treasuries, however, owing to an inverted yield curve we do confess that the lower yield at the current juncture is attractive. However, we find the longer-dated bonds more attractive and prefer them.

We can see that the yields of short-term bonds are higher than those of long-term bonds (*Exhibit 10*). Generally, the longer the maturity of the bond, the higher the yield, because borrowing for a longer period should command a higher interest rate (term premium). This inverted yield curve historically has been a sign of an upcoming slowdown. Hence, owing to the possibility of recession we do find it desirable to have US treasury bonds in our portfolio

- **High-Yield Bonds and Investment-Grade Bonds**

As investors, strategic allocation gives us a powerful tool to shape our portfolios. It involves deciding how much of our money goes into different types of investments, in this strategy, we can see that high-yield bonds historically have added interesting returns (*refer Exhibit 16)*. It is often believed that junk bonds and low-rated bonds tend to provide higher returns. The reason behind these higher returns is that high-yield bonds come with an elevated level of risk, particularly a higher risk of default by the issuer. Hence, investors get compensated for risk.

At the current juncture, we believe that the risk-reward ratio is unfavorable in the high-yield market and investment-grade bond yields (*Exhibit 13, 14 and 15*). The spreads of AAA, High Yield, and BBB over the US 10-year are near all-time lows. The chart shows that the spreads are too low in comparison to history and this depicts that there are a lot of risk takers in the market. As a money management team, we believe in taking risks when it is favorable and the current environment is not conducive to the same.

Looking ahead, expectations are for Fed rate cuts to commence in 2024. The belief is that inflation is moderating. As inflation goes down slowly towards 2%, the current Fed Funds rate of 5.25% to 5.5% may seem high and thus, rate cuts are around the corner. Anticipating a slow growth environment driven by business, consumer, and government spending, and tight credit spreads, we maintain the view that high-yield and credit bond investments are not that appealing on a risk-adjusted basis. Thus, we would use a smart all-weather portfolio run by hedge fund managers to generate alpha in this area.

- **TIPS**

Treasury Inflation-Protected Securities, or TIPS, are crafted to shield investors from the impact of inflation. TIPS should be included in the portfolio to hedge any surprise inflationary risk that the economy may face. The yield on 5-year TIPS had become extremely attractive in 2022 and 2023 (*Exhibit 17*).

Currently, we believe that the most significant uptick in yields is now in the past. This makes us feel that the best time to invest in TIPS was back in the past and not now. However, we believe that surprises can be unexpected and thus, would have some exposure in the same although our allocation would be nimble. To invest in tips we use the $TIP Security.)

To understand TIPS we need to make a view on inflation. Our views on inflation are as follows:

- **Inflation Projection**

The Federal Reserve Bank of Cleveland's 10-year inflation expectation is that inflation is expected to average 1.5 percent per year over the next 10 years.

As of February 2024, the projected US breakeven inflation rate is 2.3%. This projection is derived from a model considering various factors such as treasury yields, inflation data, inflation swaps, and survey-based measures of inflation expectations.

Historically, in the past decade, US inflation has been benign and we estimate that 2022 was an anomaly. Hence, we would like to allocate only 0.1% of our portfolio to $TIP security, providing some exposure but a very small amount. We remain open to adjusting this allocation in response to future data on jobs, unemployment and inflation.

$ TIP

Our exposure in TIPS will be through the $TIP ETF . It is issued by iShares. It has 48 securities with a real yield of 2.53% and a weighted average YTM of 4.7%. The bond's convexity is 0.85 and has holdings in the US treasury. Exhibit 18 shows the past price movements of $TIP.

8. Alternative Investments

Alternative Investments have been the flavor of the past few years. They have dominated most of the asset classes by generating high returns.

On a fundamental level and asset class perspective the behavior of alternative investments, such as gold, REITs, hedge funds, commodities, private equity, etc., differs from that of traditional equity and bond investments.

Therefore including them in a portfolio can lead to the benefits of diversification while adding returns to the portfolio.

Exhibit 19 and Exhibit 20 depict the performance of hedge funds and private equity funds over the S&P 500. Historically, it has been observed that private equity funds and hedge fund returns rely on the skill of the asset manager. Hence, selecting the right alternative funds run by a capable hedge fund manager becomes vital to generating alpha in this category.

In our portfolio, we do so by investing in :
A. Pershing Square Holding
B. AQR Risk Balanced Commodities Fund
C. Invesco Global Listed Private Equity ETF
D. Oaktree Strategic Credit Fund

We believe investing in alternatives like hedge funds and private equity enables us to earn extra yield owing to their illiquidity premium. As a Foundation, our investment horizon is ultra-long term and we would like to take such risks to generate higher returns.

Further, we include two investment options that are liquid and we believe would be a great hedge to the inflationary risk and would lower portfolio risk while providing stable returns. The other two alternatives that we are interested in investing in are:

E. $VNQ- Vanguard Real Estate ETF

F. $GLD – Gold SPDR

Our Alternative Investments:

A. **Pershing Square Holding**

Pershing Square Holding consists of concentrated bets by the hedge fund manager Bill Ackman. It is an investment holding company. The 5-year CAGR returns of Pershing Square Holding as of December end 2023 was 27.43%. These returns highlight the superior ability of the fund manager to beat the market. We believe that the outperformance will continue due to the superior ability of the manager.

The fund is deployed in consumption stocks and brands with great moats. This would be a good diversification to our portfolio that has for the larger part avoided taking any stock-specific bet. As an investment team, we believe in the power of returns generated by great brands. The fund manager of Pershing Square has showcased that they have great ability in identifying brands at an early stage and thus, have been able to outperform the market. We estimate that the outperformance which was on an arithmetic basis more than 14% over the S&P would likely reduce in the future and estimate the future returns to be at 6% alpha to S&P 500.

Pershing square portfolio return on common stocks is 28% vs S&P 500 return on common equity is 18%. The fund has parked 9% of the portfolio in short-term US treasury and would seek to add on to the market at a more favorable time.

B. **AQR Risk Balanced Commodities Fund**

The coming time seems to be particularly interesting for commodities. The disruption created by electric vehicles is supposed to lead to an increase in demand for various commodities as commodities will be required for EV production. Further, the rise of AI has led to a sudden increase in electricity consumption that would lead to complex price movements in raw materials.

We have witnessed Microsoft narrating how their electricity expenses surged by 200% in 2 months owing to the wider requirement for electricity caused by AI. Such a staggering requirement for electricity would require significant investment in utilities and as a consequence would be beneficial for the power sector and certain kinds of commodities (a variety of metals, plastic, raw materials, and chemicals).

Further, talks about supply chain movement and companies moving away from China can lead to inflationary pressures. Hence, in light of the risks mentioned above, we prefer a balanced allocation in the commodity segment and would allocate to a hedge fund that has proven to beat the commodity returns over the past couple of years. Thus, we believe adding AQR Risk Balanced Commodity Fund to our portfolio would be an interesting bet on this hypothesis. AQR is a well-known hedge fund and has run many successful investment strategies. Historically, AQR has outperformed the commodity benchmark with a decent margin (*Exhibit 21*). It is diversified across geographies and is actively managed by a well-respected team of fund managers.

We believe allocating this product allows us to hedge any kind of inflationary risk that the world may face owing to geopolitical uncertainties as well as opportunities created by special situations in a sector that appears to have great prospects.

As investment managers, we always shy away from predicting how commodities will behave in the coming years. In this scenario, although we believe that the future is more interesting than the past on a conservative basis we take the historical return of 15% as the appropriate measure of future expected returns.

C. **Invesco Global Listed Private Equity ETF**

We believe investing in private equity is beneficial as it will help us earn illiquidity premium. As investment managers of the Foundation, we have a very long time horizon and earning an illiquidity premium is beneficial. Invesco Global Listed Private Equity ETF ($PSP) tracks the Red Rocks Global Listed Private Equity Index and has a decent asset size. Invesco Global Listed Private Equity ETF has marquee private equity players as holdings (*Exhibit 22*). The portfolio is pretty well diversified with top 10 holdings accounting for 46% of the portfolio (there is not much concentration risk). It has a dividend yield of 3.2% and the expense ratio is 1.06%.

Invesco Global Listed Private Equity ETF ($PSP) is further diversified across geographies and has skewed exposure toward developed markets namely the UK, Switzerland, Sweden, France, US (*Exhibit 23*).

D. **Oaktree Capital Strategic Credit Fund**

Howard Marks is one of the best bond fund managers in the US. He is widely acclaimed and is one of the most successful credit fund managers in the country. His company has a history of delivering excess returns in the credit and distress funds segment.

As interest rates have gone up there is no doubt concerns in the credit market regarding what lies ahead, but we believe there are vast sums of opportunities to exploit in this area.

To generate a good return on our allocation in fixed income, we believe allocating to a great fund house with an excellent investment management team, whose philosophy we believe in makes a compelling case. In this regard, Oaktree Strategic Credit Fund provides a compelling case to be optimistic. Oaktree has a specialty in executing complex trades in exotic derivative products/non-plain vanilla instruments and we would be undertaking our exposure in this segment via the same.

We believe that taking exposure in exotic credit markets requires day-to-day monitoring and researching for special situations as and when they arrive. Hence, giving money to a specialized and capable hedge fund would be our way to partake in this segment.

Oaktree Strategic Credit fund has an income-generating style and runs under the mandate of being a weather, diversified portfolio. It has a $2.3B asset under management and has an annualized distribution rate of 10.18%. It has a historical return to date of 7.74%(*Exhibit 24*).

Moving forward, we anticipate a potential drop in returns to around 6%, owing to diminishing spreads in the bond market and the potential for declining interest rates in the future.

E. **Vanguard Real Estate ETF**

To further diversify our portfolio we have ventured into allocation into real estate index funds. We believe that US real estate has had significant correction over the past two years. The negative news has been baked in and we believe that there are cogent reasons to be optimistic about the future.

Vanguard is one of the largest asset management companies in the world. They have had a great track record of managing money. The fund used to outperform the S&P 500 (*Exhibit 25*). However, owing to disruptions caused by COVID-19 it has had significant correction over the past few years.

There are reasons to be skeptical about the medium-term prospects of office spaces and commercial property but the correction in hotel assets is widely lucrative. We believe owing to stronger policies and the tension in the world the US remains a great travel and tourism destination. Further, the fund invests in broad-based luxury apartments, commercial property, and hotels and is thus, extremely diversified. The fund has given a 10-year CAGR of 5.92%. Meanwhile, the US Housing National Schiller Index has posted a y-o-y mean growth of 5.13% in the same time frame. We estimate growing forward the past returns to continue and thus, estimate a conservative 5% earnings growth for the Vanguard real estate fund. These estimates are extremely conservative as the fund is currently trading at a dividend yield of 4%.

F. **Gold**

The US economy is taking a lot of debt. Even the Federal Reserve members (who are supposed to be looking at interest rates and not fiscal policy) have expressed their concern about the trajectory of US government debt. In January 2024, the US government added $229 billion in debt. At the current pace, the US debt will surpass $36 trillion by the end of the year.

To hedge risk owing to US currency facing extreme volatility caused by soaring debt and potential political lockdown in terms of debt ceiling down the line, we believe Gold as an asset class is extremely attractive.

Gold has outperformed S&P 500 in the past 20 years and it has done so with lower volatility (*Exhibit 26*). Adding gold to our portfolio thus, not only hedges away risks but is a sound investment decision to generate alpha in our portfolio.

Critics of this analysis might point to the fact that Gold in the past 10 years has given a CAGR of 4.54% (as of the end of January 2024). In the last 100 years, Gold has given a CAGR of 1.82%. However, we must stress that our investment in gold is tactical and is subject to change once we believe that the US economy is out of the woods and we think that a soft landing is indeed going to happen.

To further add to our hypothesis, we believe there is a likelihood of interest rates coming down in the future. Commodities typically do well when the yield on risk-free assets goes lower. Therefore, we believe that this security possesses favorable attributes and is poised to deliver strong performance in the short to medium term.
Furthermore, technically, we are seeing the flows of retail have been lackluster in gold-backed ETFs despite the recent rise, and this historically is good for future returns. Typically, a bull market ends when the retail investors are in euphoria about a security and hence, from the perspective of behavioral finance, we find that Gold possesses good upside potential in the short to medium term.

Recently, the world witnessed Bitcoin ETF flow surpassing Gold ETF flow (in March 2024) and this signals to our investment team that people have forgotten the history. Our conviction is that gold, which is mined and can't be printed (unlike cryptocurrencies- where new currencies keep propping), is the actual store of value and can be thought of as an alternative to USD. Thus, our current position in Gold is speculative and tactical and we estimate it will be a great hedge during economic downturns.

The past 5-year return of gold is 8.6% the past average 5-year return has been 6.62% and top quartile returns have been 10.91% in the same period. Despite our optimism, we estimate conservatively that Gold's expected returns will be 1.8% and have decided to allocate 1.9% of our portfolio to the same.

9. International Equity

Within our Foundation portfolio, strategic allocation plays a pivotal role in optimizing returns and managing risk. Recognizing the potential for long-term growth and diversification benefits, we would be incrementally adding to international equity. This decision fulfills our search for higher yield opportunities outside borders. Our interest in international markets is as follows:

- **China**

The Market Capitalization as a Percentage of China's Gross Domestic Product (MCGDI) index serves as a crucial metric for understanding the relationship between China's stock market and its GDP. The Market cap to GDP of China is currently hovering at levels last seen in the year of 2009 (*Exhibit 28*). It is well known today that China has a debt problem and is currently undergoing a difficult phase in its relationship with the United States. The above reasons have led to the elevation of risk premium that investors are demanding for investing in China.

However, we believe that most of the pessimism has already been priced in the market and the equity risk premium of China is 19.05% in USD terms (*Exhibit 29*).

This was factored by finding the expected rate of return in local currency and then accounting for currency devaluations and subtracting the risk-free rate of a US 10-year bond.

In this particular scenario, China's currency is not traded on the forex market but we estimate that the longer-term forex movement would be dependent on inflation differential. Over the past 15 years, the inflation rates in US and China have been about the same. China's inflation over 15 years was 2.44%, US inflation over 15 years was 2.29%. China's inflation over 20 years was 2.15%, and US 20 year inflation was 2.53% (*Exhibit 30)* .

Hence, as quantified above historically US & China's inflation has been about the same and we believe the future would be similar.

Another method to look at the same would be to look at China's credit rating (A1) and subtract a spread to account for country risk from total expected returns. This method would be an approximation based on historical spread movements and is currently signaling that we should subtract a 0.77% country risk probability from our model. We prefer employing the inflation differential as our primary method for quantifying currency movements. However, the alternative approximation method does not offer a significant divergence from the above.

This would signal a 944 bps spread over the S&P 500.

Historically, despite occasional downturns, such as during the 2008 financial crisis and the 2019 COVID-19 pandemic, China's economy has consistently expanded, outpacing many other countries. This sustained growth, coupled with ongoing urbanization and population trends, provides a solid foundation for economic resilience.

Recently, China's central bank cut its 5-year prime rate to spur growth and in an attempt to create a soft landing for the economy.

Risks: We believe despite a lot of lucrative promises in terms of ERP, there are cogent reasons to be cautious on account of trade war, political risk, impending elections in the US, and debt situations in China. Hence, allocating some of our funds to China makes a compelling case owing to extremely rich valuation but we are constraining the same to 5%. This would enable us to earn extra yield by investing in an attractive asset class while limiting our losses if any uncertain event were to happen.

Ticker: 2823 HK EQUITY- iShares FTSE China A50 ETF

The iShares FTSE China A50 Exchange Traded Fund (ETF), established by iShares, has a proven track record of strong performance. This fund offers investors a diversified portfolio across various sectors, including Beverages, Banks, Insurance, Auto Parts & Equipment, Electric, Oil & Gas, Food, Auto Manufacturers, Diversified Financial Services, Electronics, and more (*refer Exhibit 33*).

With allocation percentages of 23.92%, 22.30%, 5.03%, 4.73%, 4.51%, 3.14%, 3.09%, 2.83%, 2.78%, and 2.74% respectively (in the above-mentioned sectors), this fund strategically spreads its investments to capture opportunities across different industries. The ETF invests money in the largest 50 companies in mainland China. The earning yield of the composite ETF is 8.46%, which makes it very attractive.

The asset class of the fund is heavily weighted towards equity, comprising 99.97%, with a minor allocation of 0.03% in cash and other assets.

We anticipate that as the Chinese economy continues to expand, this fund will experience further growth and provide investors with better risk-adjusted returns. Additionally, we believe that the fund is currently undervalued, presenting a favorable investment opportunity for investors seeking exposure to the Chinese market.

In conclusion, the iShares above Exchange Traded Fund (ETF) represents a compelling investment opportunity, characterized by its diversified sector allocations and heavy emphasis on equity. With the potential for continued growth and favorable valuation, this fund aligns with our investment strategy aimed at achieving superior risk-adjusted returns. In the long term any asset class returns can be broken down as a factor of earnings growth and multiple expansions, we foresee stable earnings for China and a significant case for multiple expansions and thus, find the above ETF attractive at the current moment.

- **India**

India's economy exhibits resilience and growth, with various sectors contributing to its upward trajectory. The IT, Banking, Chemicals, and Fast Moving Consumer Goods (FMCG) sectors, among others, have been pivotal in driving economic expansion and fostering investor confidence.

India's economy has witnessed significant structural changes in recent years, characterized by shifts in various sectors and policy reforms aimed at fostering growth. Notably, the recent increase in banking credit signifies a positive development with implications for economic expansion. The Indian commercial credit has risen from 6% in 2020 to 20% in 2024. This is at a 12-year high (*Exhibit 36)*. In the past, the Indian economy was coming out of a bad decade of NPAs and a case of overcapacity that was witnessed owing to the big boom in the early 2000s. We believe the offtake of the corporate credit is a heartening sign and showcases that the job market might become better down the line as corporate spending picks up.

India has embraced digital technology, leading to increased efficiency and innovation across industries. Initiatives like Digital India and the adoption of digital payment systems have promoted financial inclusion and accelerated business processes.

We are cautious about the above-average P/E (*refer Exhibit 37*) and high market cap to the GDP of India (*refer Exhibit 34)* but based on our analysis, India's equity risk premium is 6.27% in USD Terms (*Exhibit 35)*.

For USD-denominated return, we look at inflation differential historically. We find the India-US inflation differential over 10 years was 2.91% and 3.98% over 15 years. The RBI is expressing confidence that the longer-term inflation of India would be around 4% and the 30-year breakeven of the US is 2.33%. This shows an inflation differential of about 1.63%.

The 5-year USD INR forex rate is 93.64 depicting a devaluation of the rupee by 2.37% over the coming 5 years. Further, we know India is rated Baa3 and we would need to compute a risk premium for the same.

As per the credit rating of India, this would signify a spread of 239 bps (derived over the US 10 years to incorporate country risk and estimate the USD-denominated equity risk premium.

Based on the information provided, we derive three implicit forecasts for the depreciation of the INR:

1. A depreciation of 2.37%, based on forex rates.
2. An anticipated depreciation of 1.63%, calculated from breakeven and market-implied inflation rates.

3. A projected depreciation of 2.39%, as indicated by credit spread analysis.

We take the average of the above and estimate that the forex movement impact would be 2% and thus, compute the expected dollar return of Nifty 50 to be 12.14%.

Based on historical data and ongoing economic trends, we anticipate that the Indian markets will continue their growth trajectory in the coming years. The country's diverse economy, coupled with ongoing reforms and initiatives, positions India as an attractive investment destination offering promising returns for investors.

Hence, India would be a great choice of country for our portfolio. We have identified two securities that will be included in our portfolio to bet on India-

A. MSCI India ETF

B. HDB (Hdfc Bank- India's largest Bank by Market cap).

A. Ticker: $INDA- INDIA US EQUITY

India US Equity Exchange-Traded Fund (ETF) offered by iShares presents investors with a strategic opportunity to gain exposure to the Indian economy's equity asset class. This fund has exhibited remarkable performance over the past five years, boasting a total return of 59.63% and an annualized return of 9.80% (*refer Exhibit 39*).

A key strength of this fund lies in its diversified portfolio, strategically allocated across various sectors within the Indian economy. The top allocations include Banks (16.30%), Computer (10.87%), Oil & Gas (10.56%), Diversified Financial Services (6.58%), Auto Manufacturers (4.76%), Electric (4.09%), Pharmaceuticals (3.93%), Telecommunications (2.78%), Engineering (2.47%), and Construction and Chemicals (2.40%) (*refer Exhibit 40*).

These sector allocations reflect the fund's exposure to key drivers of India's economic growth, encompassing industries with significant potential for expansion and profitability. Notably, India's status as an emerging economy further underscores the potential for sustained growth in these sectors.

In conclusion, the India US Equity ETF presents a compelling investment opportunity for investors seeking exposure to the Indian economy's growth potential. With its impressive performance track record and a well-diversified portfolio, this fund is poised to continue delivering favorable returns in the future

B. Housing Development Finance Corp. (HDFC) Ticker: HDB

HDFC Bank, one of the leading banks in India, trades on the NYSE under the ticker symbol 'HDB' through an American Depositary Receipt (ADR). HDFC Bank, established in 1994, holds a prominent position in India's banking sector with a history of strong returns and consistent performance. We are taking a position in the HDB in our Foundation portfolio.

The bank's dedication to innovation and growth is evident through its recent introduction of new credit schemes tailored for businesses and consumers, showcasing a proactive approach to meeting evolving market demands.

We emphasize using price to book multiple to value HDFC. HDFC at present is trading at a steep discount to its history (*Exhibit 41*). Over the last five years, HDB's book value per share has demonstrated significant growth (*Exhibit 42*). We believe that HDFC Bank's strong financials present a promising growth opportunity. The historical P/B ratio of HDB reflects investors' confidence in the bank's future growth prospects.

Moreover, HDFC Bank has outperformed both the KBW Bank Index, which tracks the performance of leading banks in the U.S., and the DJUSBK, which represents the performance of banks on the Dow Jones exchange (*Exhibit 44 and Exhibit 45*).

This outperformance underscores HDFC Bank's strong market position relative to its peers in the banking sector.

The inclusion of HDFC Bank equity aligns with our strategic objective of capturing returns amid India's ongoing economic growth. The bank has been growing over 20% over the past decade and we believe considering the robust credit environment and upcoming demands by corporations that the best is ahead. Currently, the RBI has flagged some excesses in household lending via fintech platforms. This has led to severe actions by the RBI against the incumbent fintech players. These actions would in turn be beneficial for the older banks, which would be able to use the current disruption and chaos to their benefit.

Thus, we estimate that the Bank’s earnings growth over the decade would be 18%, and owing to valuation being available at a cheaper end, an investor at this stage would be able to earn a 20% CAGR over the long term (next decade). HDFC Bank is AAA-rated in India and would thus be viewed with a risk premium equivalent to India i.e. 200 bps country risk would have to be factored in. Hence, in USD terms the equity risk premium of HDFC Bank is 14.13% and the absolute return an investor can earn by allocating to the same is 18% in USD terms.

- **Netherlands**

In our pursuit of diversifying our investment portfolio, we found an interesting story playing out in Europe i.e. Netherlands.

The Netherlands boasts strong democratic institutions, a robust rule of law framework, and political stability, making it an attractive destination for investment. Its strategic location, coupled with a well-developed infrastructure and skilled workforce, further enhances its appeal to investors. It does not have any reliance on Russia for energy and has been largely insular from the refugee crisis.

We estimate the return expectation of the Netherlands as 11.08% based on implied analyst forecasts and assuming a terminal growth rate of 3% (*Exhibit 47*).

To convert the returns into USD:

The forex market estimates an appreciation of the Euro by 1.69%. The Euro area inflation breakeven is about 10 bps below the US 10-year inflation breakeven. (2.30 vs 2.40).

The Netherlands is rated AAA and based on rating is arguably safer than the US in terms of rating but has limited monetary policy autonomy.

Hence, we estimate in the longer term the euro would appreciate by about 0.85% (average of the above two forecasts), and thus, implied returns in USD terms are 11.93%.

We believe owing to the great technological strides the Netherlands has made (it has one the best-known chip makers in the form of ASML), a thriving property market, a robust travel and tourism industry, and historically demonstrated steadfast commitment to fiscal prudence make it an attractive investment avenue. In addition to the above, the current US-China tension in the chips segment can end up with the Netherlands as a winner.

We would prefer to invest in the Netherlands' large-cap securities to benefit from both high returns and diversification. The current market cap to the GDP of the Netherlands is at a significant discount to the 2021 peak (*Exhibit 46*) .

Following our choice to allocate funds to these global markets, we aim to acquire positions in the following security:

Ticker: EWN US EQUITY

The iShares European Equity Mutual Fund, managed by a US-based company, iShares, offers investors exposure to the Netherlands equity market. This fund has demonstrated robust performance over the past five years, showcasing significant growth in its Net Asset Value (NAV) and delivering impressive returns.

With a total return of 84.35% and an annualized return of 13.01% over the specified period, the fund has consistently outperformed expectations (*refer Exhibit 48*). Its strategic allocation in the equity sector positions investors to capitalize on the growth potential of the Netherlands market.

This allocation strategy aligns with our investment objectives, as we seek to leverage opportunities in global markets while managing risk effectively.

Based on the fund's strong historical performance and strategic asset allocation, we anticipate continued growth and favorable returns in the future. In conclusion, the iShares European Equity Mutual Fund represents a compelling investment opportunity for our portfolio.

10. Portfolio Summary

To estimate the correct weights for the portfolio we first found the covariance of the excess return of each security over the treasury bill. We then ran the solver function to arrive at the appropriate weights for the portfolio keeping in constraints of no individual security and the emerging market getting weights of more than 7% and allowed for a 15% cap on weights for all hedge funds and private equity as the same are well diversified and are run by credible management. Further, we had no constraints on S&P 500, Russell, and Developed market-oriented equity exposure. Furthermore, we created a constraint to have a dividend and interest yield of >1.5% of the portfolio. This would enable us to generate sufficient income in a bad year (if it were to arrive) and thus, we ended up allocating 21.1% of our money in fixed income and the rest of the money in a risky portfolio (*Exhibit 50*).

The portfolio's dividend and interest yield is 2.29%. This is without assuming growths in dividends for securities.

The allocation of our portfolio is as follows:

1. 10% allocation to US Domestic Equity,
2. 19% to Emerging Markets,
3. 7% to Other Developed Equity Markets,
4. 39% of the allocation to Hedge funds and Private Equity (which has predominant investments in the developed market),
5. 21.1% of our money is allocated to US bonds (primarily longer-dated bonds)
6. 2% in REIT and
7. 1.9% in Gold.

Our cumulative exposure in the US is 54.1%, Other Developed Markets 16%, Emerging Markets 19%, and Commodities 10.9%.

To measure the portfolio's performance, we use four methods:

1. Evaluating the performance against the composite benchmark (a blend of S&P 500 and AGG- weighted such that they mimic the risky portfolio of Foundations holdings and investment in bonds i.e. the weights of the risky portfolio will be given to S&P 500 and weights of Foundations fixed income portfolio will be given on $AGG).
2. Evaluating the performance against 5%+ inflation
3. Evaluating performance against other Foundation managers

Our benchmark consisted of 21.1% $AGG and 78.9% of S&P 100. Back-testing our portfolio against this benchmark, we discovered significant outperformance (*Exhibit* 51).

Our portfolio has an expected return of 12.42% with a standard deviation of 13.49%. The standard deviation of the composite benchmark (made up of 21.1% $AGG and 78.9% of S&P 100) is 14.32%. Hence, our portfolio promises better returns than the benchmark with lower volatility.

Our portfolio's Sharpe ratio is 0.63 and the Sharpe ratio of the composite benchmark is 0.415. The Sortino ratio of our portfolio is 1.33 (backward-looking estimate) vs the Benchmark Sortino Ratio of 0.694. The information ratio is 0.01.

Further, our portfolio return is estimated to be 12.42%, and using Monte Carlo we derive the likelihood of returns being higher than 5% is 29.73%.

US 10-year breakeven is at 2.4% and adding the same to 5% we get a required rate of return of 7.4%. Our historical returns have been better than 7.4% and our expected rate of returns of 12.42%

is also higher than 7.4%, hence, our portfolio is likely to beat the two benchmarks. The likelihood of our implied portfolio returns being lower than 7.4% is 35.03%.

MacArthur Foundation's 10-year historical return has been higher than peers. The past 10-year Foundation return is estimated at 7.3%[2] vs MacArthur's previous 10-year return of 8.5%.

- **Currency Overlay**

Our investment is weighted more in the USD, and thus, we seek exposure to other developed market currencies to manage risk.

As inflation in Europe is lower than in the US and is expected to remain so, we plan to take a long position in the Euro, factoring in the interest rate differential that favors the Euro in the future. Currently, the DXY index is overvalued as per our assessment.

The Eurozone has emerged from a decade-long period of negative interest rates, and the European economy is rapidly recovering from the disruptions caused by the Russia-Ukraine war.

To diversify away from the USD, we will purchase Euro futures contracts representing 0.05% of our portfolio value, with contracts priced at 1.07 and a contract size of 125,000 euros. This will require purchasing 30 contracts to establish the position.

In addition, to identify undervalued currencies, we utilize the Big Mac Index. This index, established in 1986, compares purchasing power parity and currently rates the US at 5.69, while Japan is rated at 3.04.

Japan's rating on the Big Mac Index is significantly lower than that of the US and even falls below China's. Considering historical trends and interest rate differentials, this trade shows promising potential.

The interest rate and inflation differentials between the Yen and USD suggest that the Yen should trade at a premium. We believe the current movement is an overreaction driven by hedge fund activities and a shift to US treasuries for their yield. Hence, our team would go long Yen owing to the macroeconomic factors and indicators mentioned above.

Therefore, we will establish a long position in the Yen representing 0.05% of our portfolio value. The Yen/USD futures contract for May 2024 is trading at 0.006526, with a contract size of 12.5 million yen. This translates to buying 51 contracts to establish the position.

- **Derivative Position**

We believe that the markets would most likely be sideways and don't have a huge upside in the short term. Hence, we would like to undertake call ratio spreads (bear call spread) i.e. buy out of

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[2] Commonfund.com

the money call options and go short at the money/ near in the money call option to generate yield for the portfolio.

In $SPY, we would go short 5200 CE maturing in November 2024 at the price of 333 with a delta of 0.5923 and we would go long CE of strike price 5500 with current price of 166.5 and delta of 0.4089. We want to limit this speculative bet to a total position size of $4.1 million. The contract size on the same as 100. We would be going short 8 contracts of 5200 CE of November 2024 and long 8 contracts of 5500 strike price call. We would be thriving to get a yield of 3.2% on the portfolio. In a Presidential re-election year, the S&P 500 has not fallen since 1952. We believe a 3.2% yield enhancer worth 0.05% of our portfolio is appropriate in this case. We are anyways long on S&P 500 so we are hedged if any adverse event were to happen. Further, the position size is too low to have any meaningful impact on the portfolio.

We would replicate the same strategy on iShares US $AGG by going long on out of the money call and writing in the money call option. In this case current market price of $AGG is 96.68, we would go short 97 call option trading at $1.1 and long call option at 98 for 0.6 (both for the June 2024 contract). In this case, we are speculating on the fact that the Federal Reserve won't change its stance in the June meeting as the inflation is sticky and thus, we can earn an extra yield on the same. We would be going short worth 2.5 million positions on the $AGG which has a lot size of 100. Hence, we would short 422 contracts worth $4.1 million and go long on 422 contracts of strike price 98 to hedge risk.

Hence, our derivative position of both trades would be worth 8.2 million or 0.1% of the portfolio.

11. Monte Carlo Simulation

We ran a Monte Carlo simulation of the portfolio to generate expected returns to understand what the dispersion of future returns looks like (*refer Exhibit 52*).

We find that the mean return is 12.49 % and the standard deviation of the portfolio is 14.21%, the yearly VAR using Monte Carlo simulation is 9.76%. This in turn would mean a monthly VAR at 95% confidence interval of 3.1% (monthly VAR at 99% confidence interval is 6.07%). These are lower than the historical VAR of benchmark (95% VAR -4.89% and 99% VAR -7.03%).

The real value of portfolio in next 5 years on an average is expected to be $12.07B (*Exhibit 53)*. Whereas, the nominal value of portfolio in next 5 years is expected to be $13.52B (*Exhibit* 54).

In conclusion, we are confident in the strength of our portfolio for several reasons:
1. It is projected to have a higher asset base in the future, both in real and nominal terms
2. It has shown lower VAR (value at risk)
3. The portfolio has both historical and implied higher sharpe ratio, sortino ratio and information ratio compared to the benchmark
4. There is a high likelihood of it outperforming the benchmark consistently with lower standard deviation.

The above factors underscore the resilience and strength of our portfolio, showcasing its robust diversification and consistent outperformance against the benchmark.

12. Exhibits

Exhibit 1: MacArthur Foundation Historical Returns

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
AUM (billions)	$6.3	$6.5	6.3	7.0	6.5	7.2	8.2	8.2	9.4	8.2
Net Returns	10.77 %	6.97 %	0.55 %	7.36 %	16.7 %	-1.97 %	17.07 %	19.52 %	21.78 %	-9.30 %

Exhibit 2: The Yield Curve Inversion

Exhibit 3: Risk Premium tabulation based on median analyst forecasts as model parameters

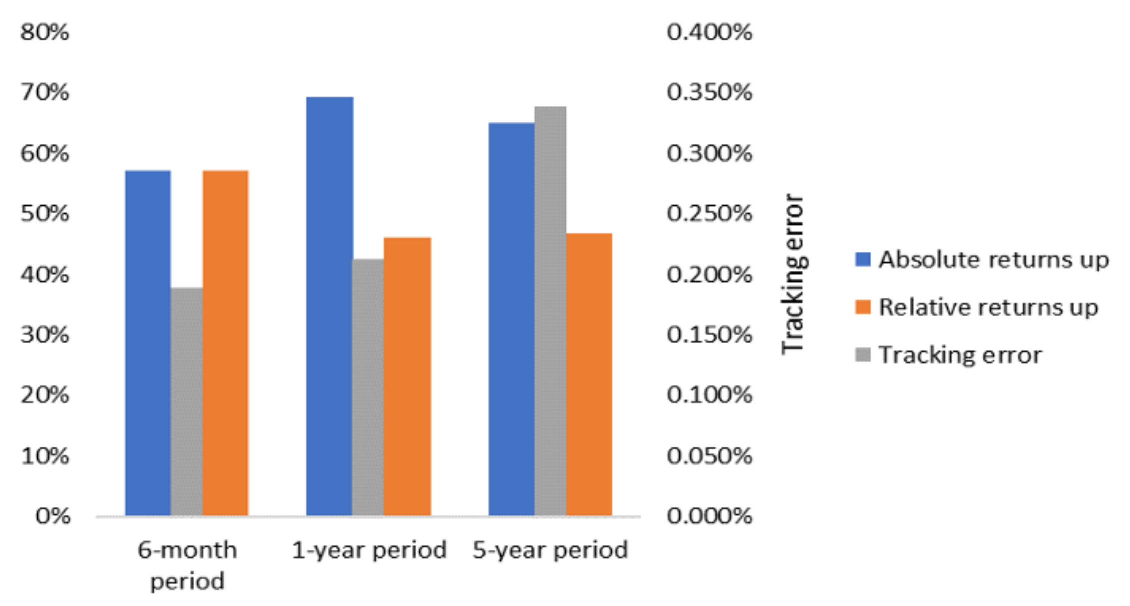
S&P 500 Current Market Price	**Treasury Yield implied (10-year, long-term)**	**Current Earnings Per Share**	
5107	3.87%	243	
EPS1	275.00	**EPS2**	298.50
Growth	4.00%		
	Year 1	**Year 2**	**Terminal value**
PV	250.89	248.4624	4607.8154
Total (NPV, target)	5107		
Rate of Growth (independent, IRR)	9.61%		
Risk Premium	5.74%		

Exhibit 4: Summary of Comparative Return Analysis of SPY Trust Fund

Security	Horizon	Total monthly Return	Annualized Returns
SPY Trust	5 years	73.27%	11.81%
SPX Index		79.20%	12.37%
SPY Trust	1 year	18.80%	18.8%
SPX Index		22.78%	22.78%
SPY Trust	6 months	7.22%	18.10%
SPX Index		14.53%	31.08%

Source: Bloomberg

Exhibit 5 : Figure: Risk Exposure Measures of the SPY Trust Fund



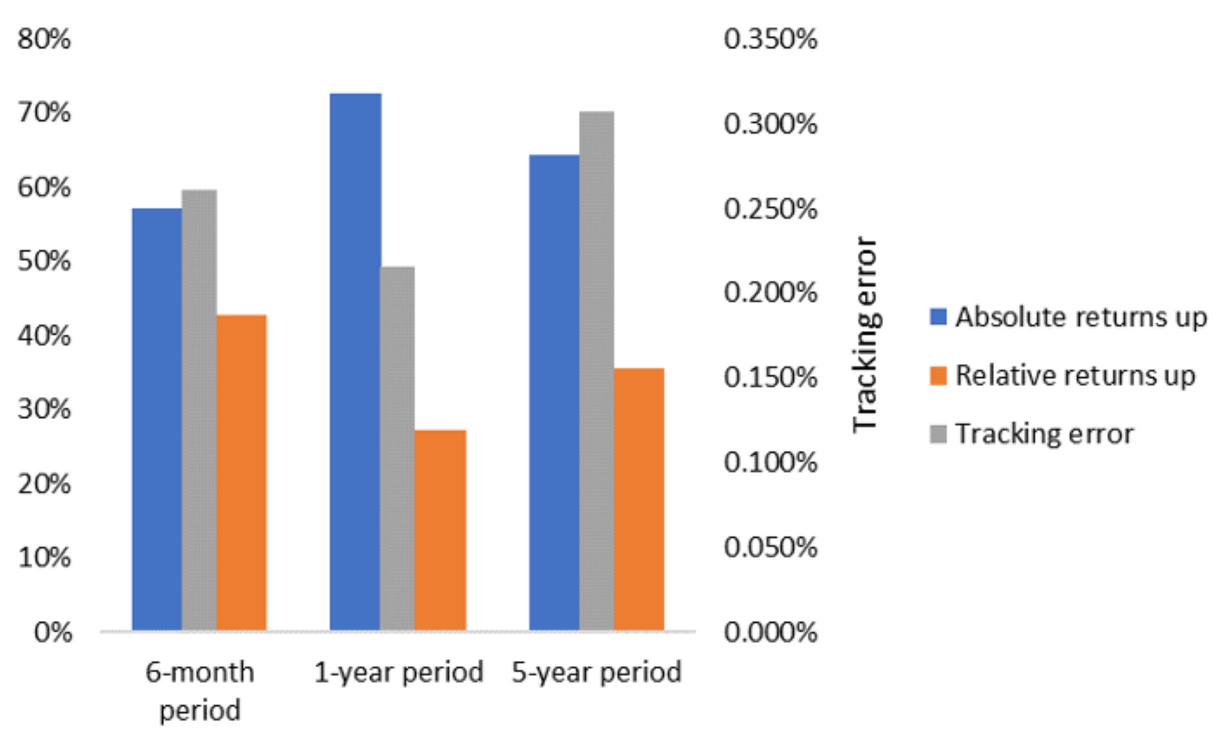
Source: Bloomberg

Exhibit 6: Table: Summary of Comparative Return Analysis of VVV Trust Fund

Security	Horizon	Total monthly Return	Annualized Returns
IVV Fund	5 years	78.68%	12.30%
SPTR Index		95.06%	14.29%
IVV Fund	1 year	18.83%	18.83%
SPTR Index		20.82%	20.82%
IVV Fund	6 months	5.44%	11.07%
SPTR Index		6.43%	13.16%

Source: Bloomberg

Exhibit 7 Figure: Risk Exposure Measures of the IVV Trust Fund



Source: Bloomberg

RSP Trust Fund Expense Ratio

Exhibit 8 Figure: Relative Performance of $RUT

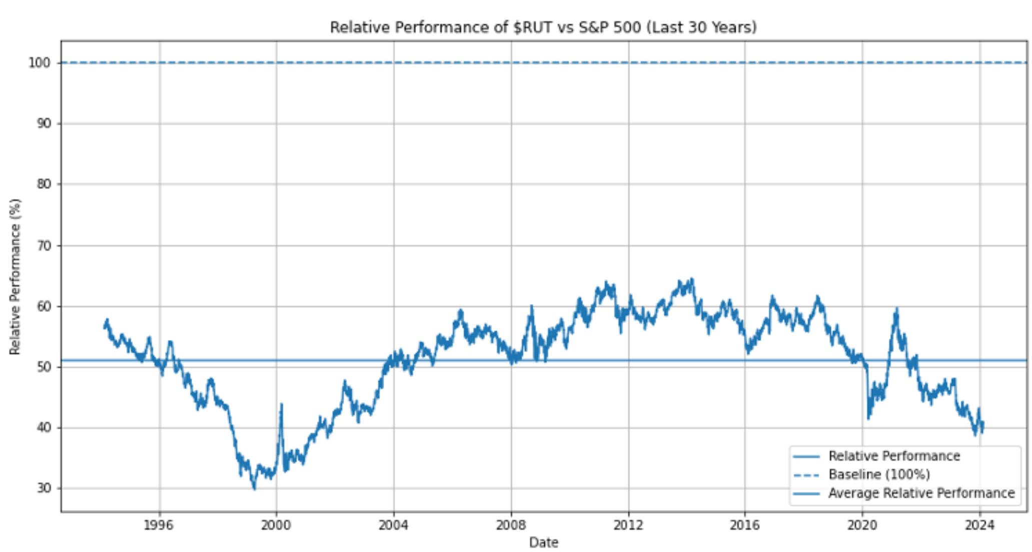


Exhibit 9: Risk Premium tabulation $RUT based on median analyst forecasts as model parameters

Russell 2000 as of Feb 1	**Treasury Yield implied (10-year, long-term)**	**Current Earnings Per Share**	**Terminal Growth Rate**
1959	3.87%	93.1737	4%

Analyst	Forward 1-year EPS	119.92	Forward 2-year EPS	117.21
5-year Present Value (PV) Calculation				
	Year 1	**Year 2**	**TV at year 2**	
PV	109.242031	97.26987149	1752.488662	
Total Value	1959.00056			
Rate of Growth (independent, IRR)	9.77%			
Risk Premium	5.90%			

Exhibit 10: Yields across Countries

Region	2 Year		3 Year		5 Year		7 Year		10 Year		15 Year		30 Year	
1) Americas														
10) United States	4.642	--	4.415	--	4.274	--	4.294	--	4.279	--			4.436	--
11) Canada	4.290	--	3.922	--	3.669	--	3.580	--	3.582	--			3.421	--
12) Brazil (USD)	4.916	--	5.223	--	5.466	--			6.260	--				
13) Argentina (U...					--	--			--	--	--	--	--	--
14) Mexico (USD)	4.935	--	4.963	--	5.283	--	5.552	--	5.838	--			6.292	--
2) EMEA														
20) United Kingd...	4.602	--	4.269	--	4.127	--	3.974	--	4.103	--	4.425	--	4.647	--
21) France	2.839	--	2.741	--	2.708	--	2.714	--	2.875	--	3.138	--	3.329	--
22) Germany	2.809	--	2.532	--	2.386	--	2.362	--	2.399	--	2.562	--	2.540	--
23) Italy	3.360	--	3.211	--	3.363	--	3.546	--	3.874	--	4.153	--	4.424	--
24) Spain	3.004	--	2.952	--	2.953	--	3.047	--	3.294	--	3.629	--	3.843	--
25) Portugal	2.586	--	2.575	--	2.639	--	2.817	--	3.130	--	3.335	--	3.527	--
26) Sweden	2.684	--			2.399	--	2.369	--	2.457	--	2.562	--		
27) Netherlands	2.747	--	2.608	--	2.555	--	2.588	--	2.712	--	2.810	--	2.727	--
28) Switzerland	0.954	--	0.899	--	0.821	--	0.814	--	0.825	--	0.866	--	0.798	--
29) Greece	2.722	--	2.636	--	2.938	--	3.208	--	3.468	--	3.758	--	3.742	--
3) Asia/Pacific														
30) Japan	0.136	--	0.121	--	0.340	--	0.457	--	0.724	--	1.203	--	1.779	--
31) Australia	3.856	+4.8	3.773	+4.7	3.819	+5.5	4.004	+5.6	4.191	+5.9	4.404	+6.1	4.536	+7.2
32) New Zealand	4.898	+0.7	4.742	+0.6	4.651	+2.2	4.721	+3.5	4.791	+4.7	4.969	+4.8	5.055	+4.8
33) South Korea	3.438	--	3.373	--	3.440	--			3.454	--			3.345	--
34) China	2.111	--	2.176	--	2.286	--	2.425	--	2.428	--	2.484	--	2.642	--

Source: Bloomberg

Exhibit 11: Federal Funds target rate, US 10-year and US 20-year visualized

Source: Bloomberg

Exhibit 12: Negative correlation between bonds and equity

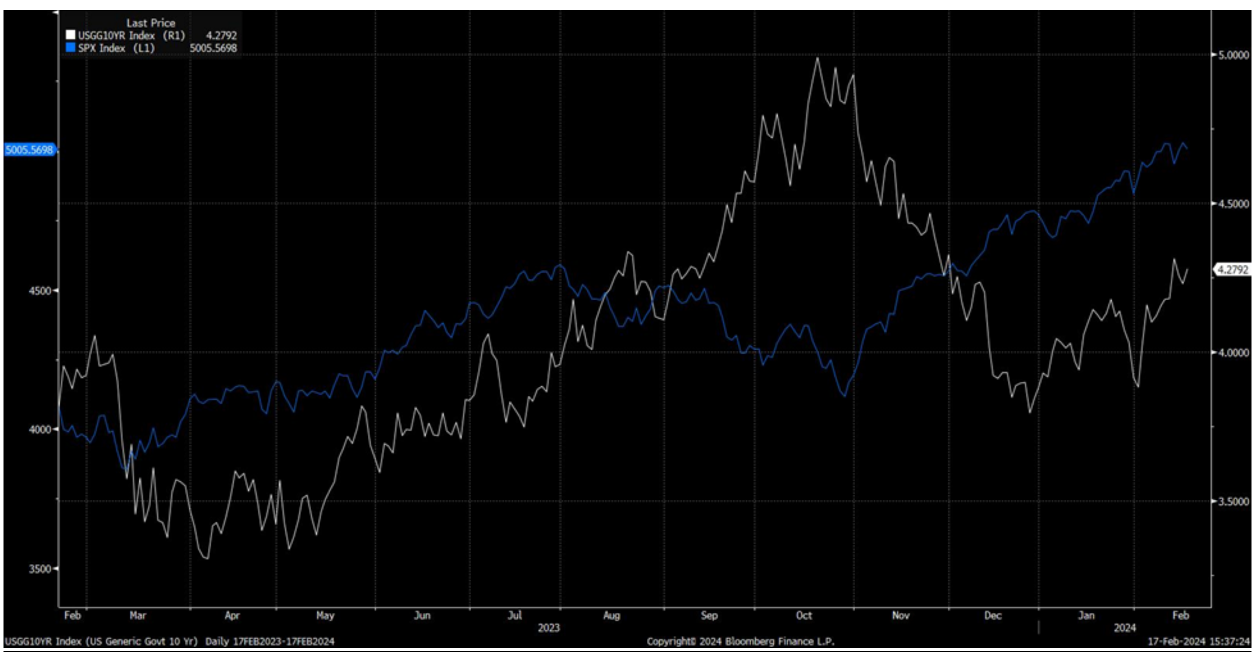


Exhibit 13: US AAA 10-year Spread

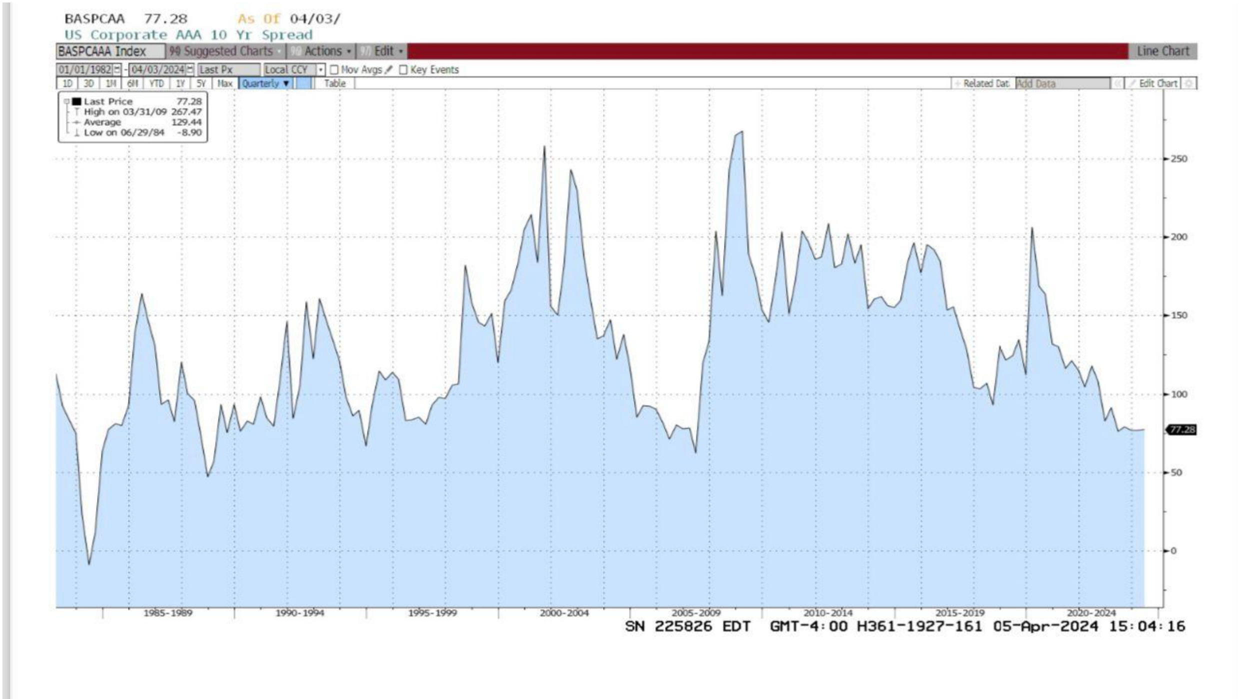
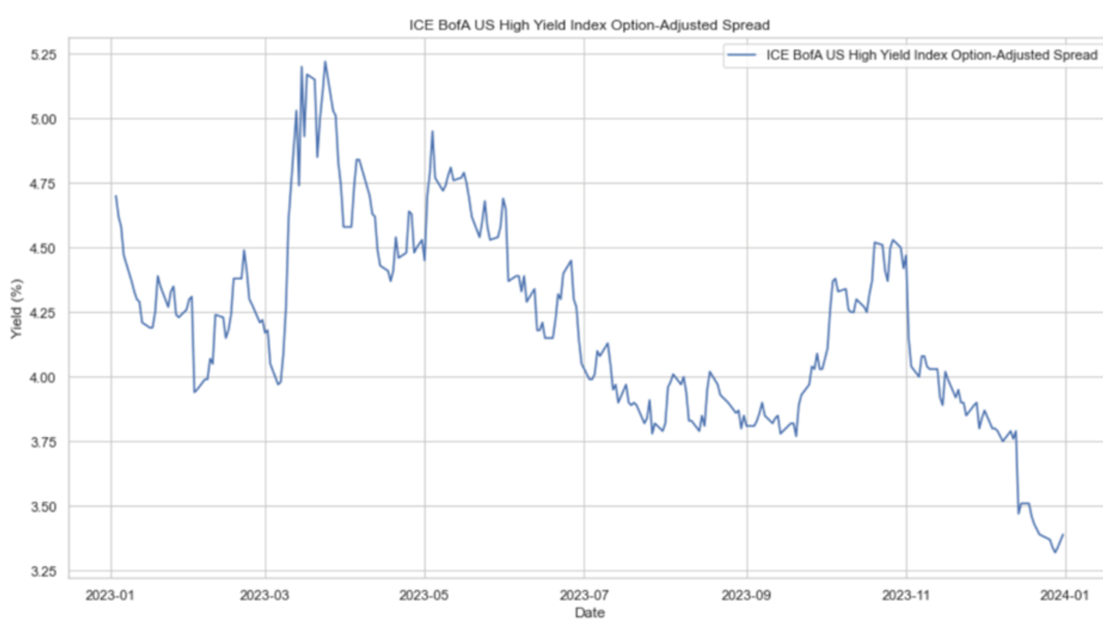


Exhibit 14: US High Yield OAS Spread



Source: Fred

Exhibit 15: US BBB 10-year Spread

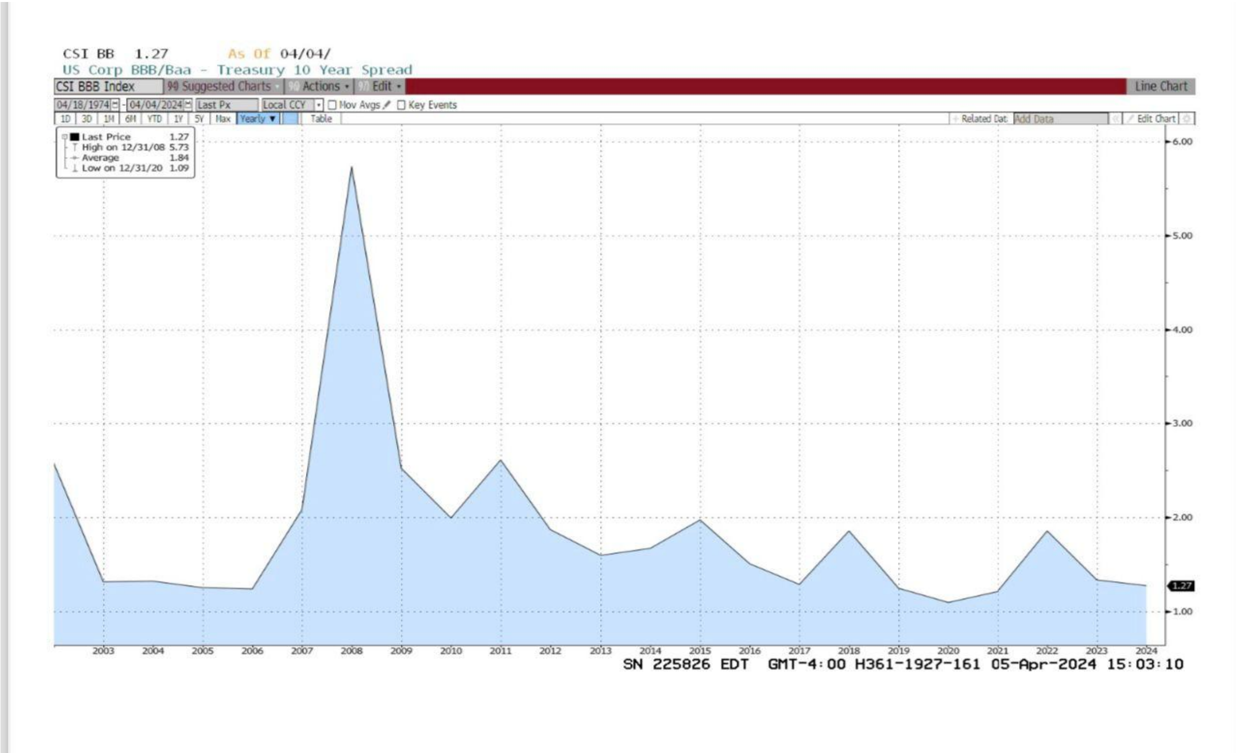


Exhibit 16: High Yield Returns

ICE BofA Index	4th Quarter 2023(%)	Full Year 2023(%)	Yield to Worst (%)Year-end	Year-end Option Adjusted Spread (Basis points)
US High Yield	7.06	13.46	7.69	339
US High Yield BB	7.34	11.44	6.37	205
US High Yield B	6.78	13.96	7.76	341
US High Yield CCC	6.60	20.36	13.03	902
US Investment Grade BBB	8.24	9.46	5.39	129
Global High Yield	6.71	12.97	7.69	385

Global High Yield BB	6.89	11.36	6.45	267
Global High Yield B	6.49	14.18	7.94	396
Global High Yield CCC	6.07	17.70	14.58	1090
EM High Yield	6.19	8.76	9.35	526
European High Yield	6.21	14.68	6.54	411
US High Yield Distressed	6.23	24.41	21.65	1831

Source: Bloomberg

Exhibit 17: 5-Year TIPS Yield

Exhibit 18: $TIP Historical chart

Exhibit 19: Relative Performance of Hedge Fund

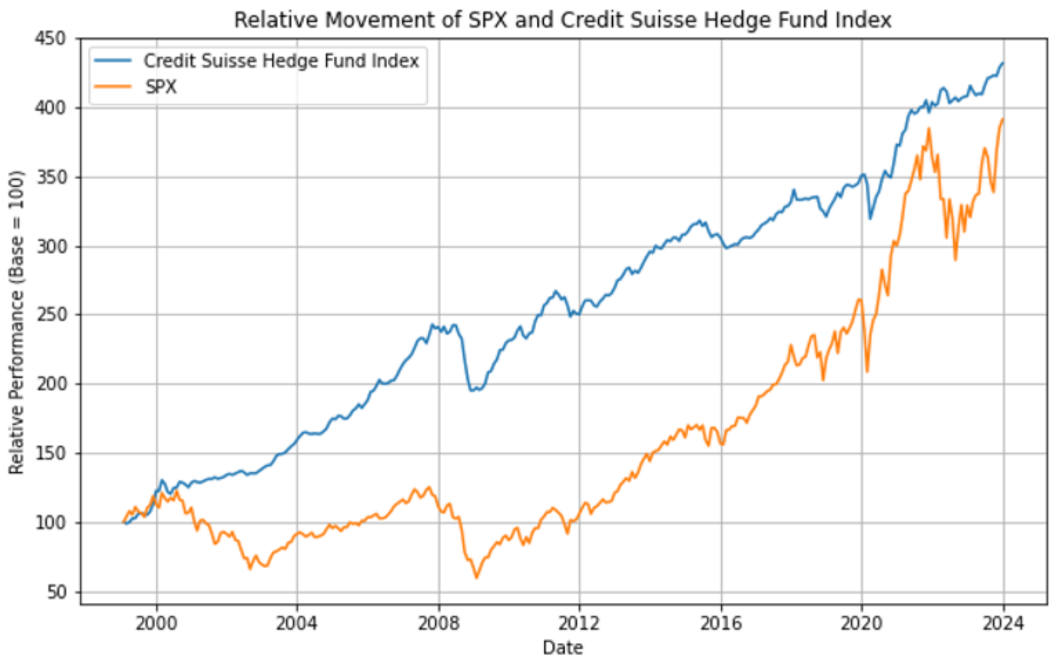


Exhibit 20: Relative Performance of Private Equity

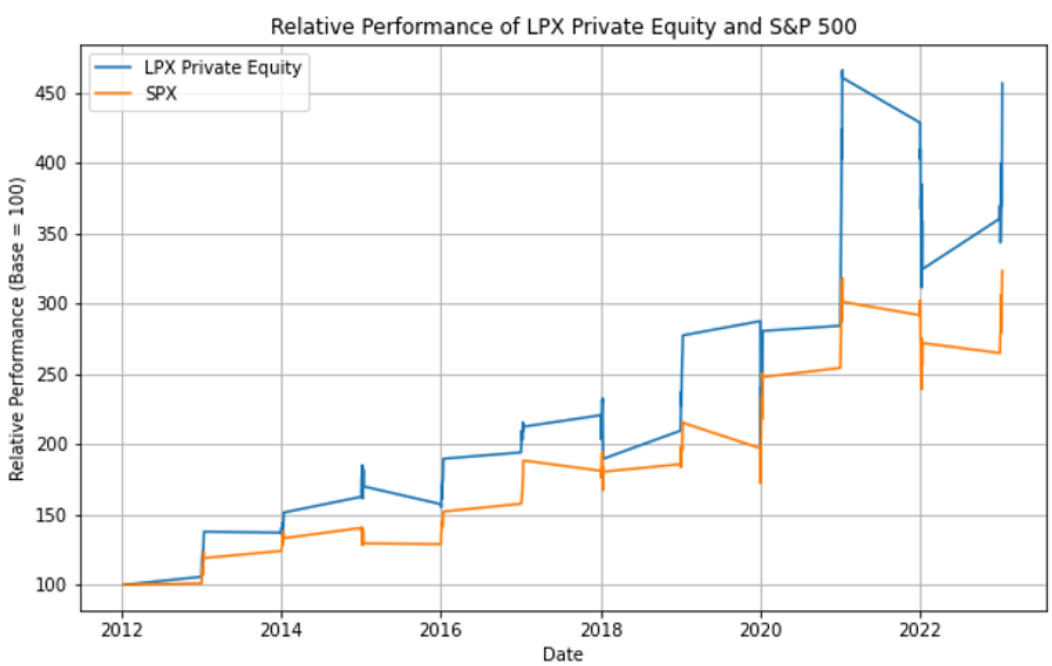


Exhibit 21: AQR Commodities Fund vs Bloomberg Commodity TR Index

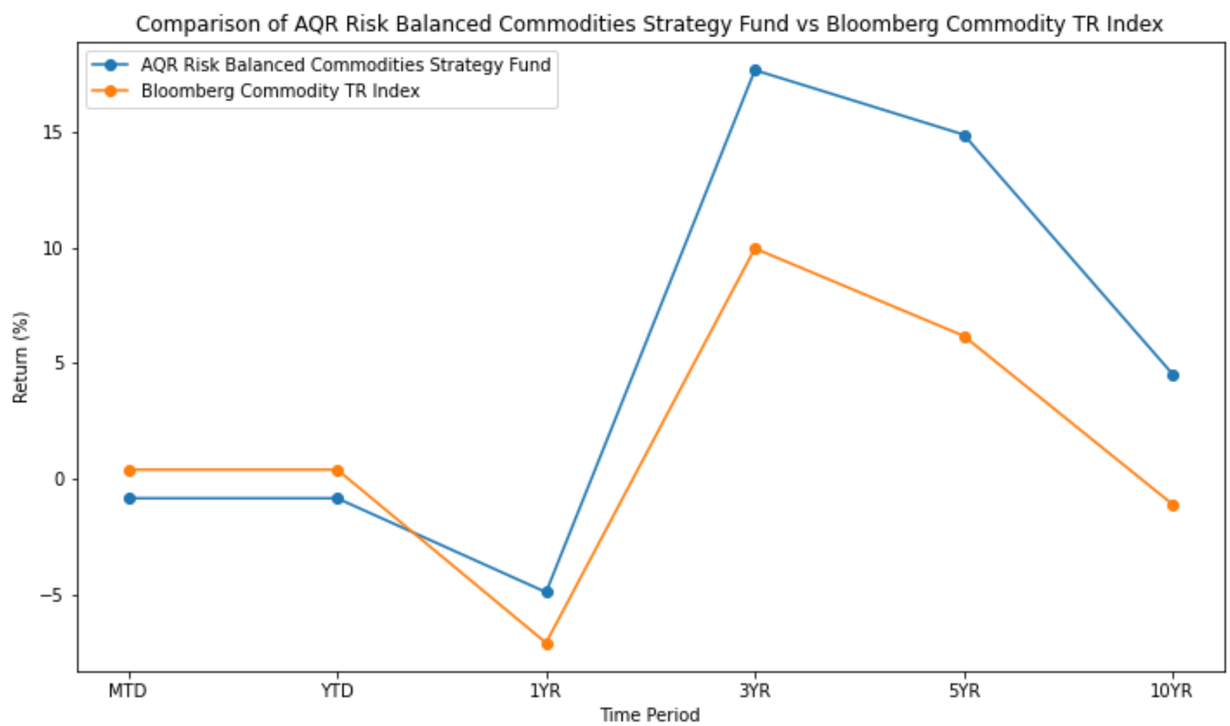


Exhibit 22: Invesco Global Private Equity: Holdings

Exhibit 23: Invesco Global Private Equity: Geographical Concentration

Exhibit 24: Oaktree Strategic Credit Fund Returns

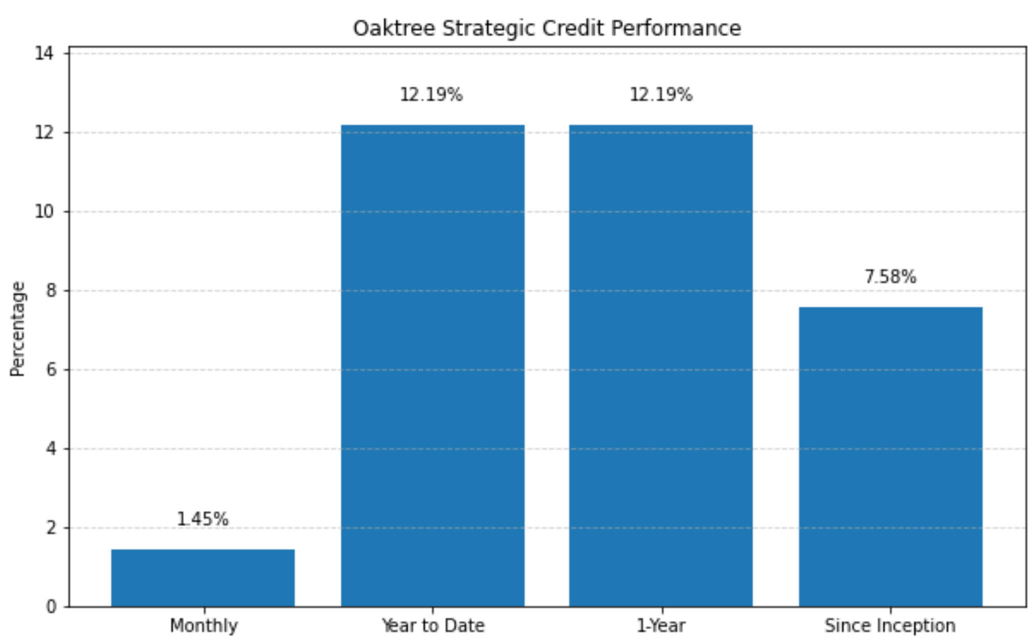


Exhibit 25: Relative performance of Vanguard Real Estate Index

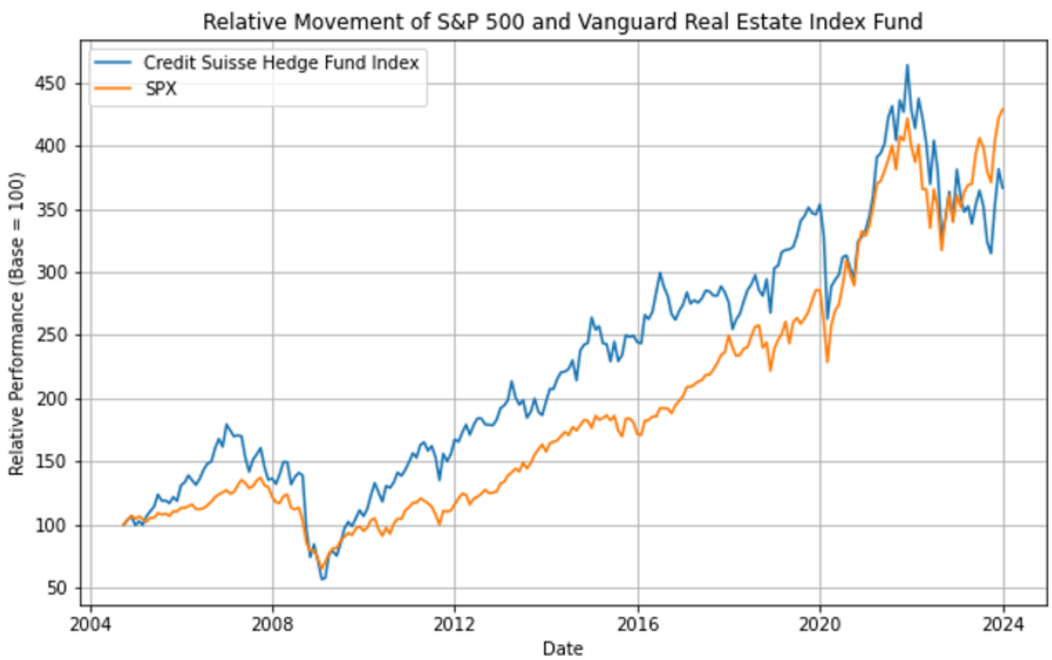


Exhibit 26: Relative performance of $GLD

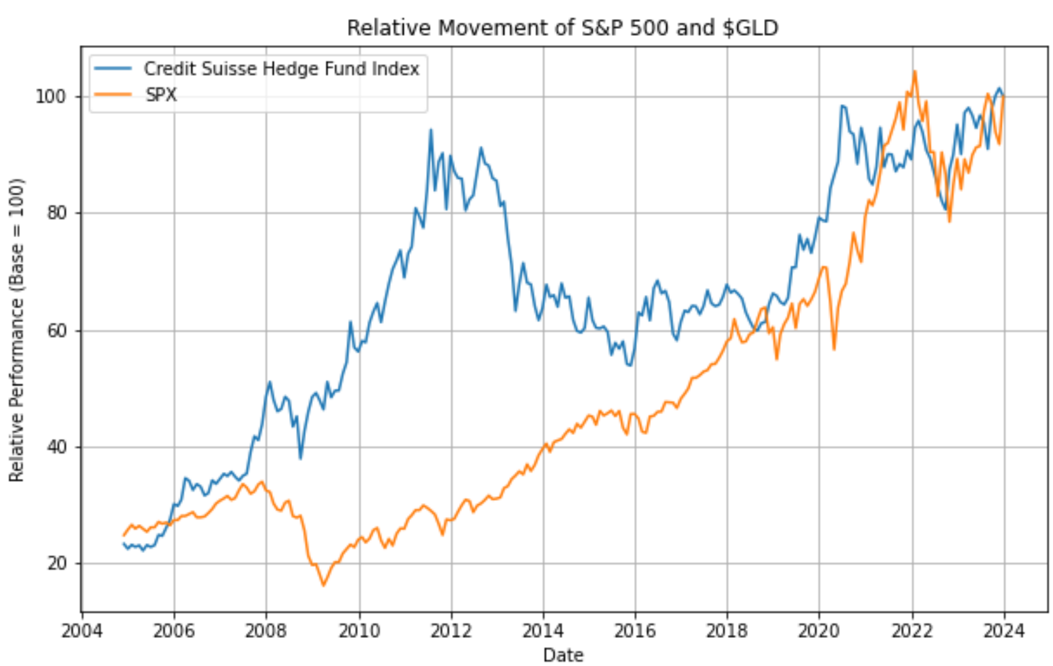


Exhibit 27: Gold vs M2 chart

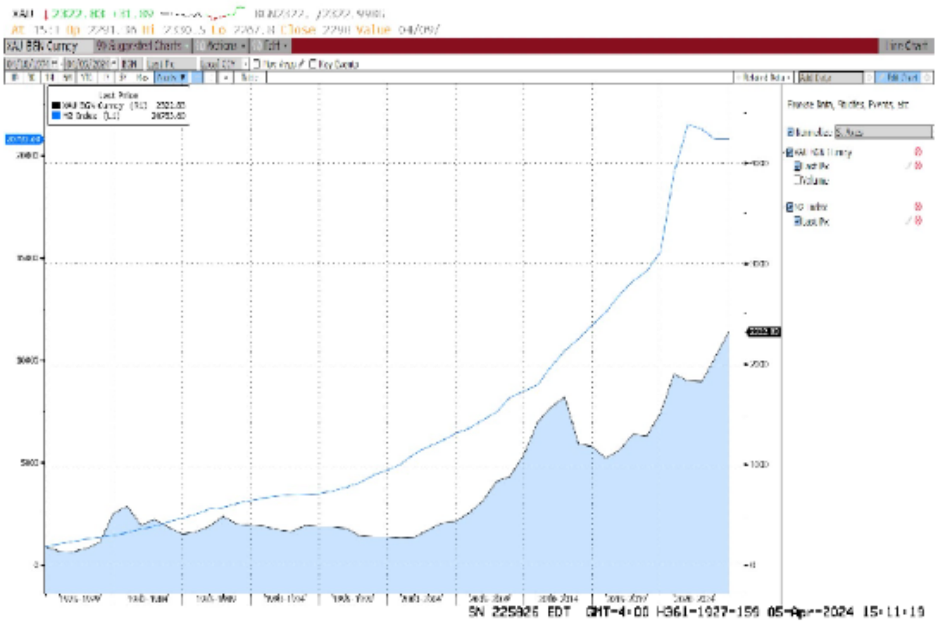
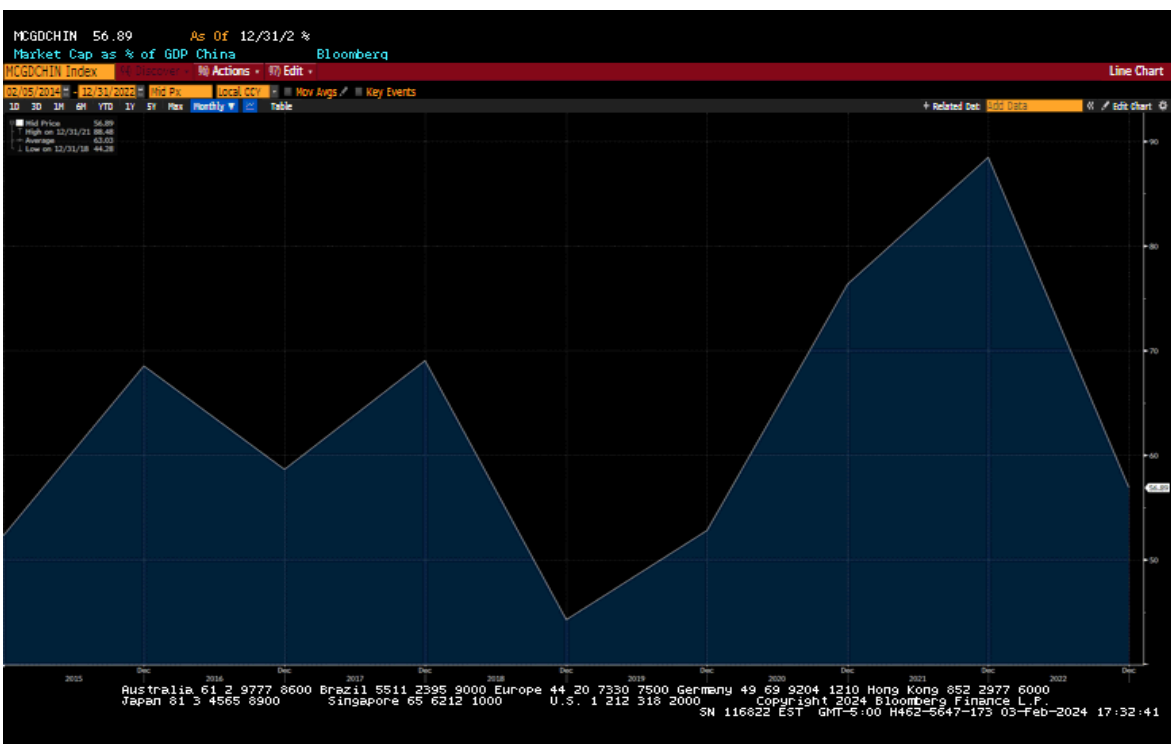


Exhibit 28: China Market Cap as % GDP



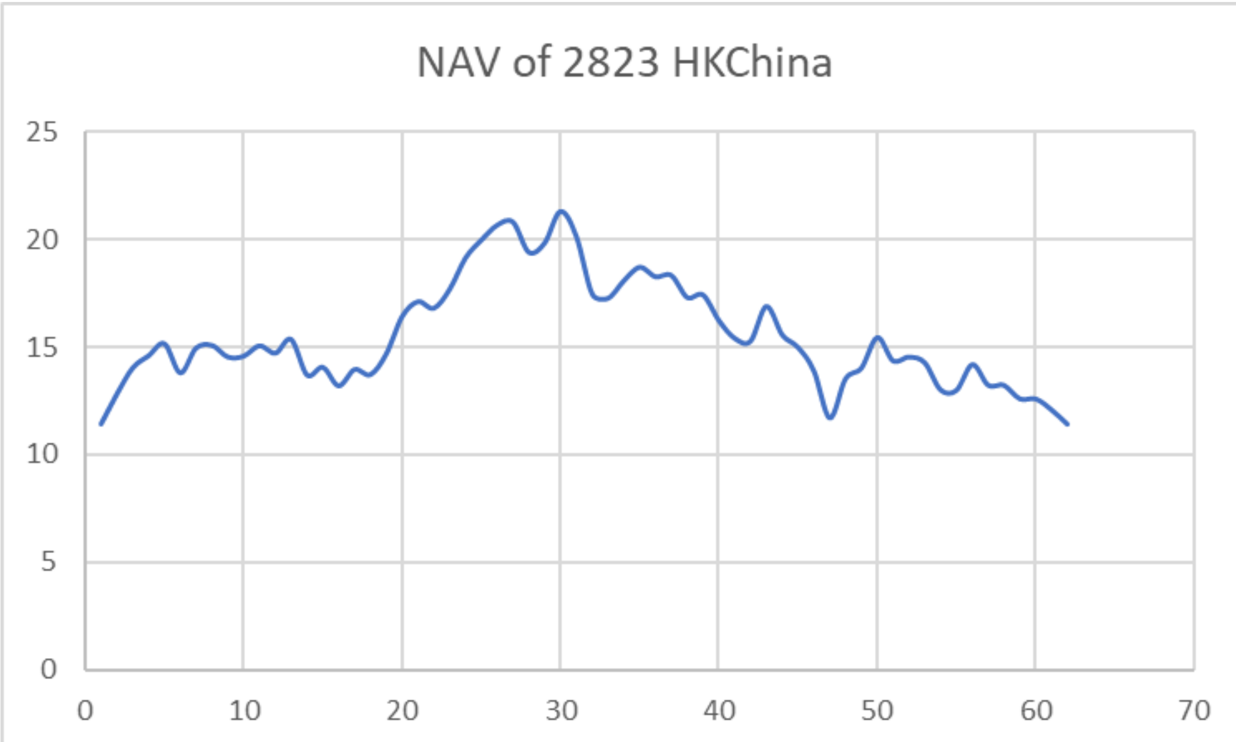
Source: Bloomberg

Exhibit 29: China ERP

Model Parameters						
Shcomp	**Treasury Yield implied (10 year, long term)**		**Current Earnings Per Share**		**Terminal Growth Rate**	
2770	3.87%		281.92		5%	
Analyst	Forward 1 year EPS	315.86	Forward 2 year EPS	466.2654		
5-year Present Value (PV) Calculation						
	Year 1	**Year 2**		**Tv**		
PV	256.973313	704.4608343		1808.565972		
Total Value	2770.00012					
Rate of Growth (independent, IRR)	22.92%					
Inflation Diff expectation	0.00%					
Risk Premium	19.05%					

Exhibit 30: China vs US: Inflation

Exhibit 31: Performance of 2823 HK EQUITY:NAV



Source: Bloomberg

Exhibit 32: Performance of 2823 HK EQUITY: Returns

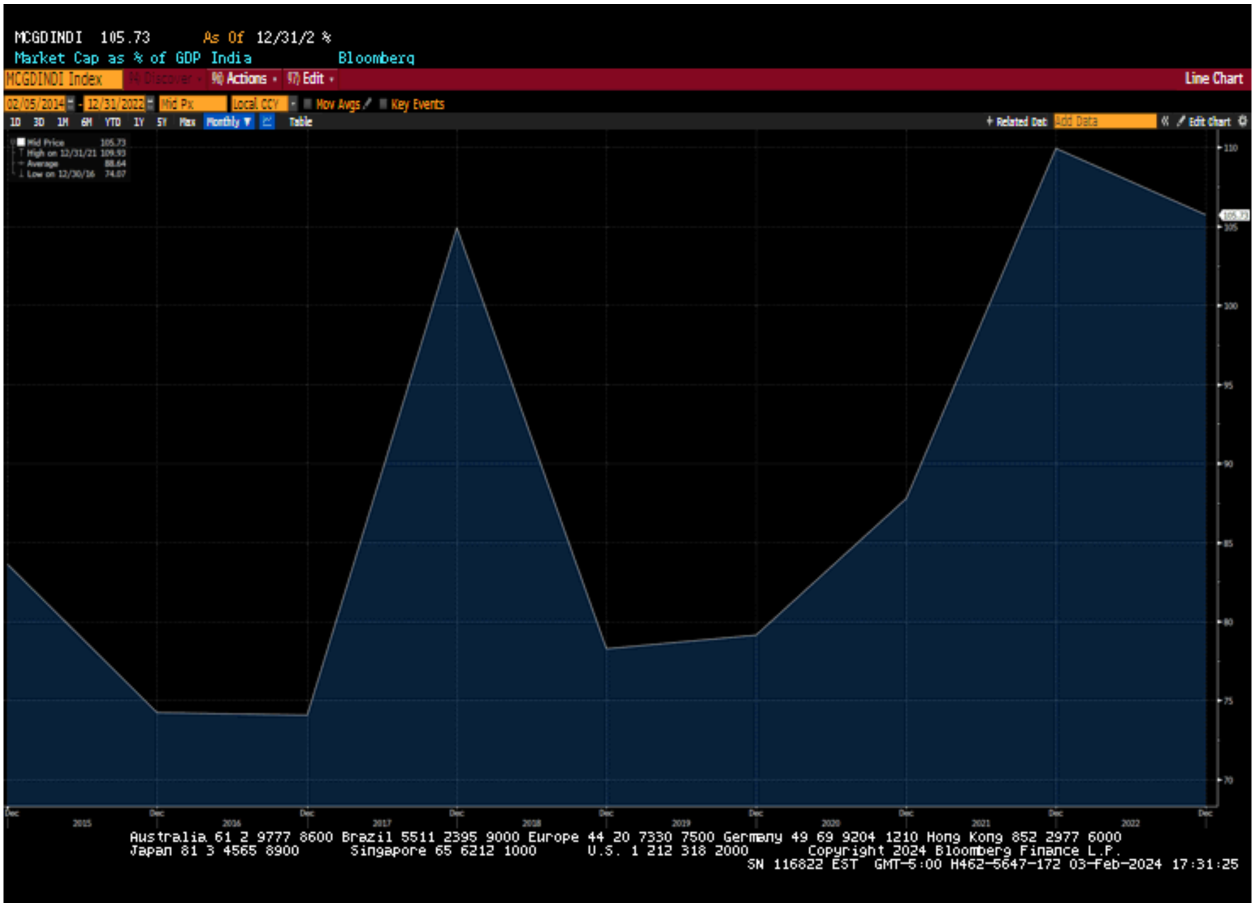
Source: Bloomberg

Exhibit 33: Allocations of 2823 HK Equity

Industry	**Allocation (%)**
Beverages	**23.92%**
Banks	**22.30%**
Insurance	**5.03%**
Auto Parts & Equipment	**4.73%**
Electric	**4.51%**
Oil and Gas	**3.14%**
Food	**3.09%**
Auto Manufacturers	**2.83%**
Diversified Financial Services	**2.78%**
Electronics	**2.74%**
Other	**24.93%**

Source: Bloomberg

Exhibit 34: MCGDINDI Index (India Market Cap as % GDP)



Source: Bloomberg

Exhibit 35: India ERP

Table: Risk Premium tabulation based on median analyst forecasts as model parameters

Model Parameters					
Nifty 50	Treasury Yield implied (10 year, long term)		Current Earnings Per Share		Terminal Growth Rate
21697	3.87%		1092		7%
Analyst	Forward 1 year EPS	1210.00	Forward 2 year EPS	1158	
5-year Present Value (PV) Calculation					
	Year 1	Year 2		Tv	
PV	1078.9903	1456.277778		19161.73192	
Total Value	21697				
Rate of Growth (independent, IRR)	12.14%				
Inflation Diff expectation	2.00%				
Risk Premium	6.27%				

Exhibit 36: India Commercial Credit Growth

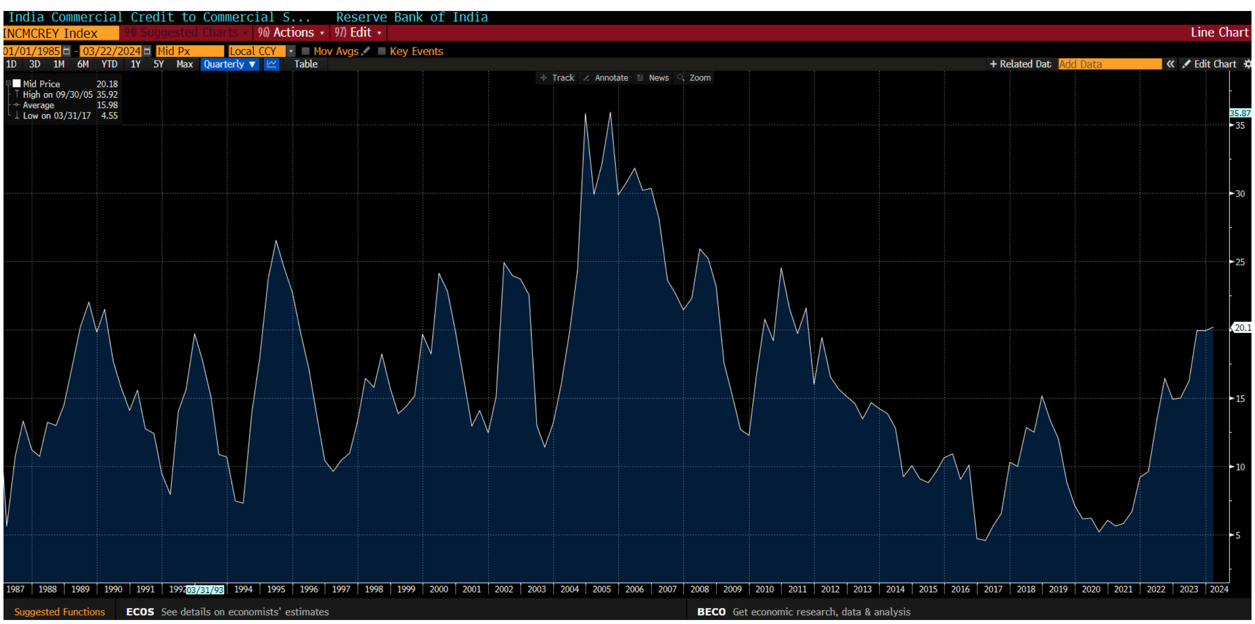
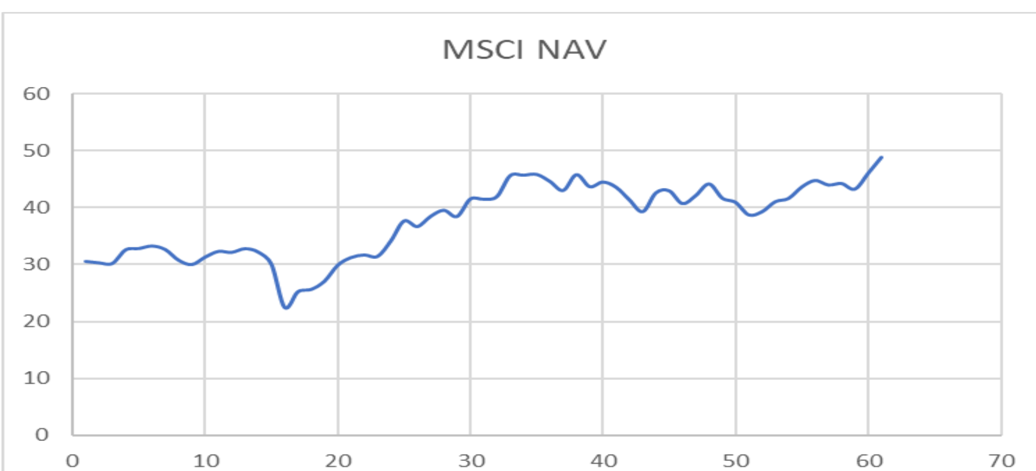


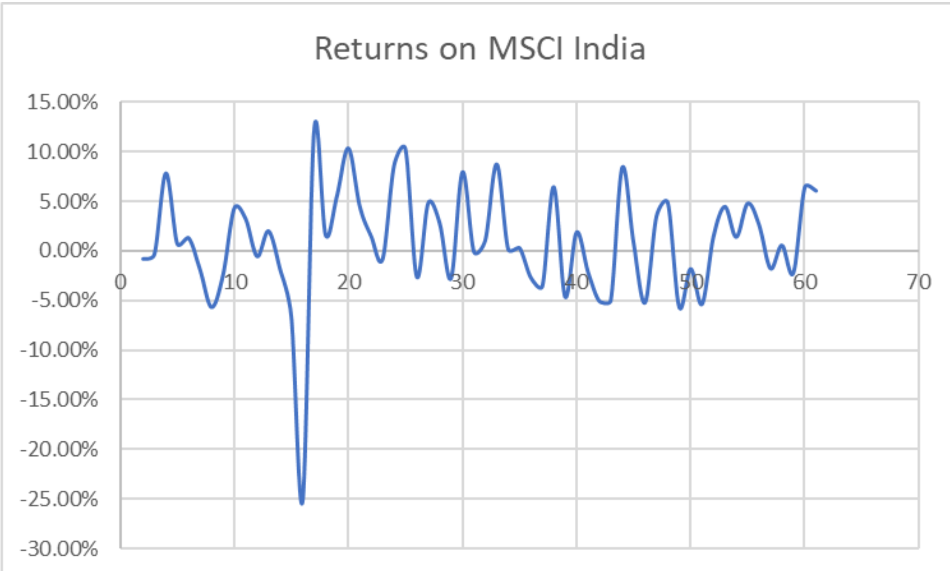
Exhibit 37: India P/E Ratio Historical

Exhibit 38: Performance of $INDA NAV



Source: Bloomberg

Exhibit 39: Returns of $INDA



Source: Bloomberg

Exhibit 40: Allocations of INDIA US EQUITY

Industry	**Allocation (%)**
Banks	**16.30%**
Computer	**10.87%**
Engineering	**2.47%**
Telecommunications	**2.78%**
Oil and Gas	**10.56%**
Pharmaceuticals	**3.93%**
Auto Manufacturers	**4.76%**
Diversified Financial Services	**6.58%**
Electronics	**4.09%**
Construction & Chemical	**2.40%**
Other	**35.26%**

Exhibit 41: HDFC P/B Valuation

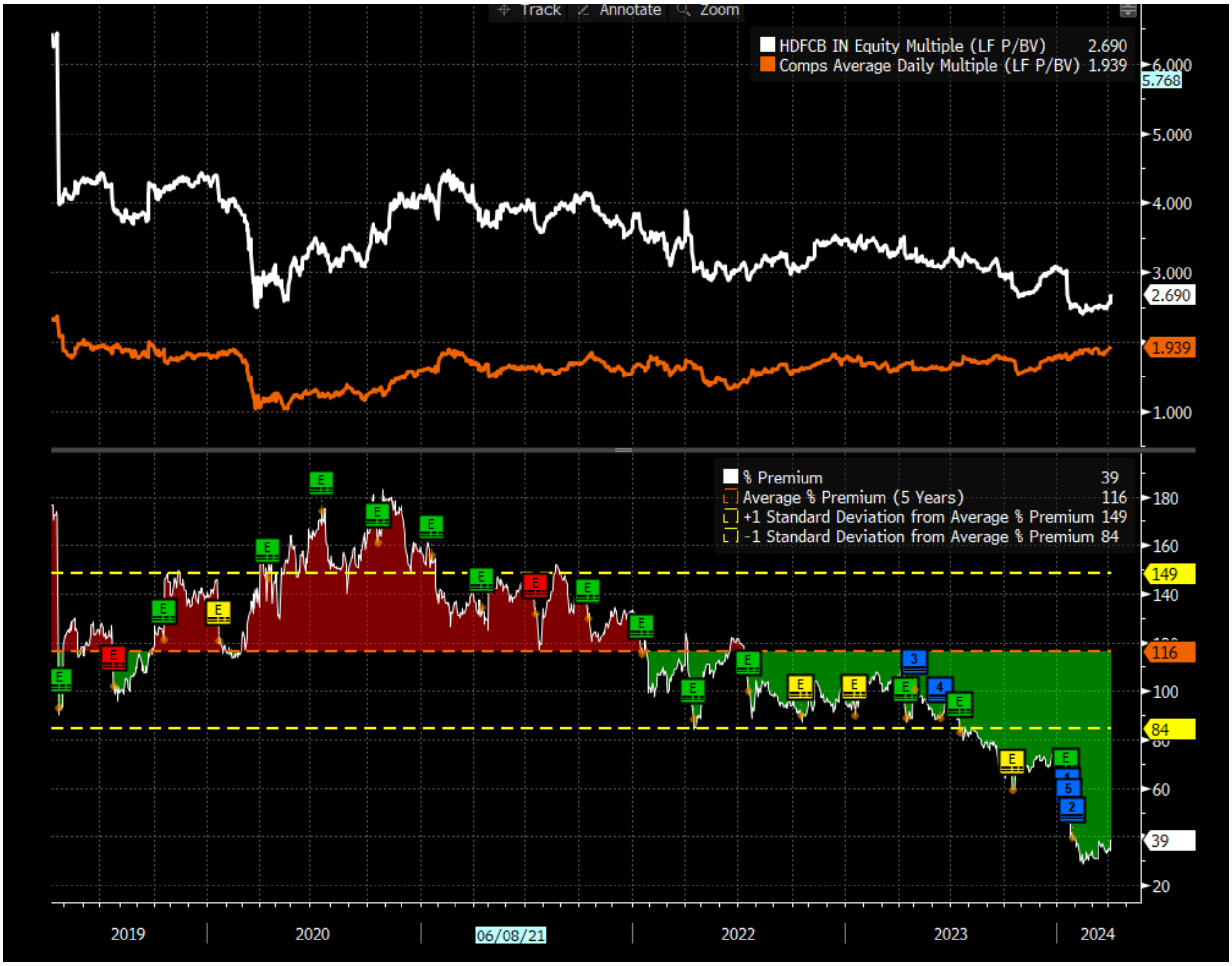


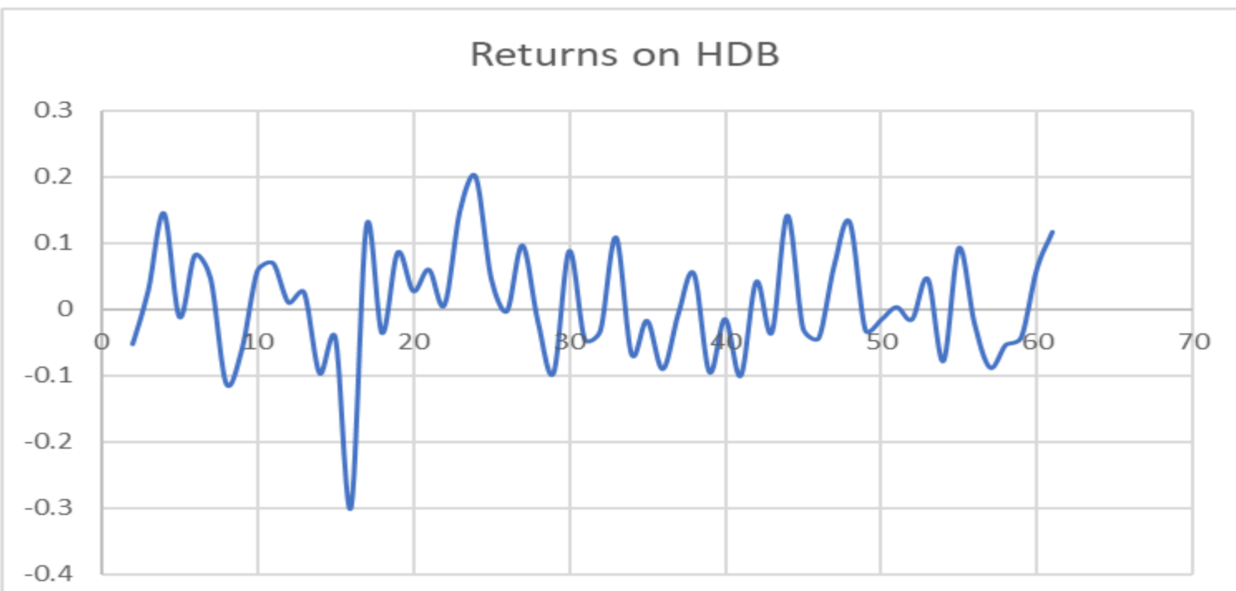
Exhibit 42: HDFC Bank P/B

EOY (ttm)	**Book Value ($)**
March 2019	12.94
March 2020	13.89
March 2021	16.14
March 2022	17.79
March 2023	19.03

Exhibit 43: Financials of HDB, Returns of HDB, and Key Ratios (2 charts and 1 table)

Housing Development Finance Corp. (HDFC)

Ticker: HDB: Returns

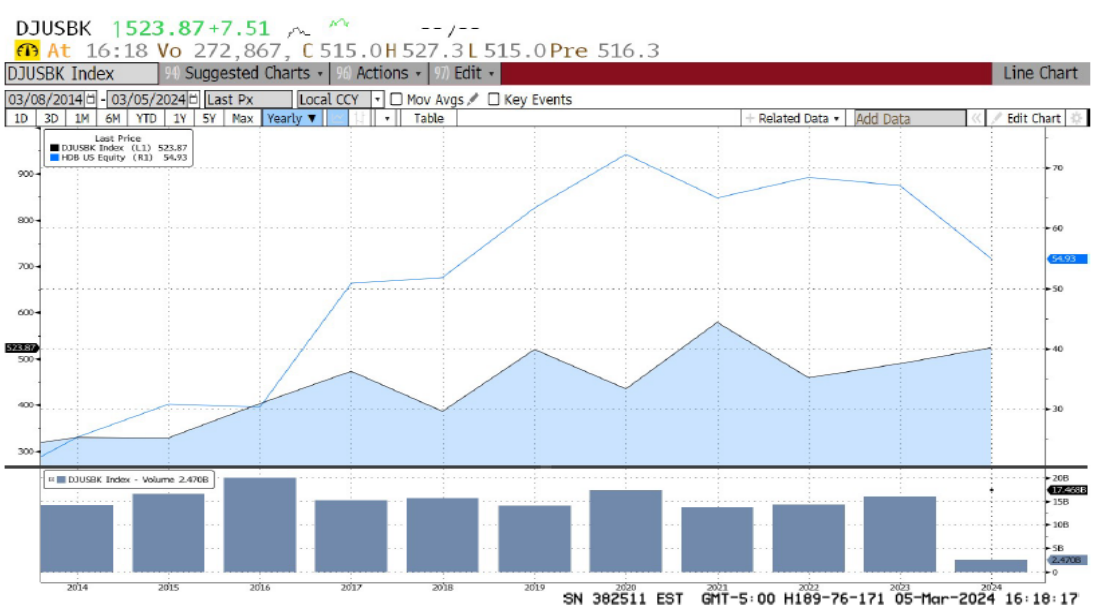


Source: Bloomberg

Exhibit 44: Performance of HDB compared to KBW

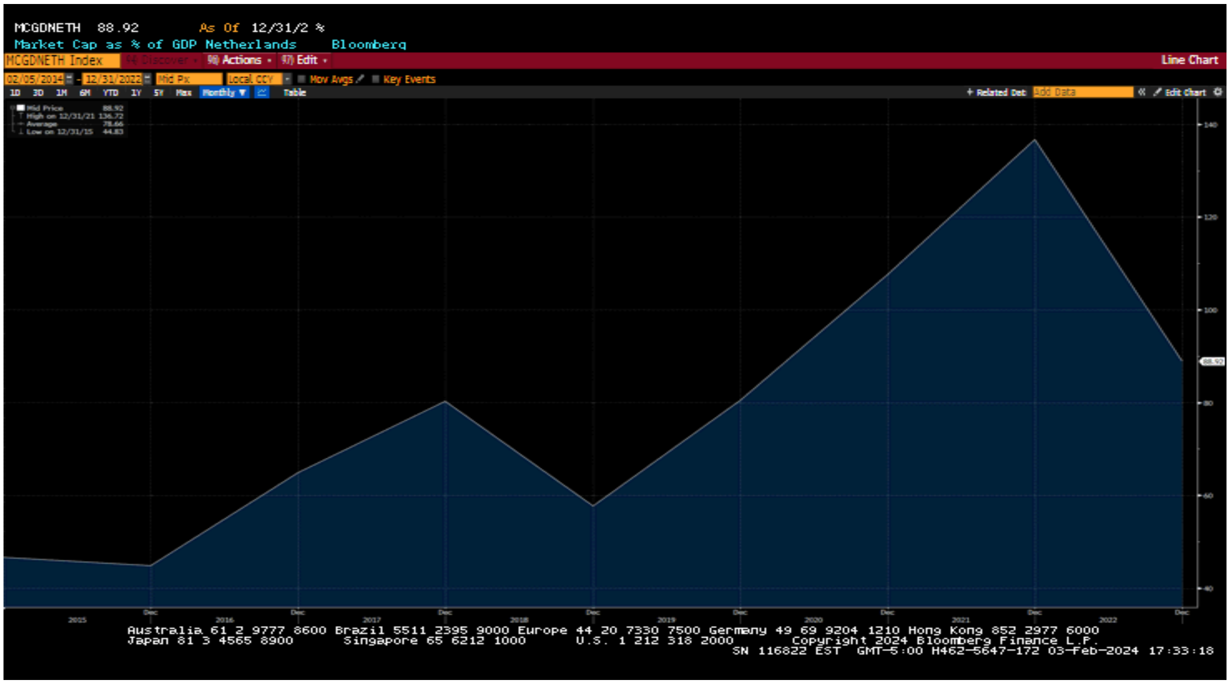
Source: Bloomberg

Exhibit 45: Performance of HDB compared to DJUSBK



Source: Bloomberg

Exhibit 46: Market Cap to GDP Netherlands



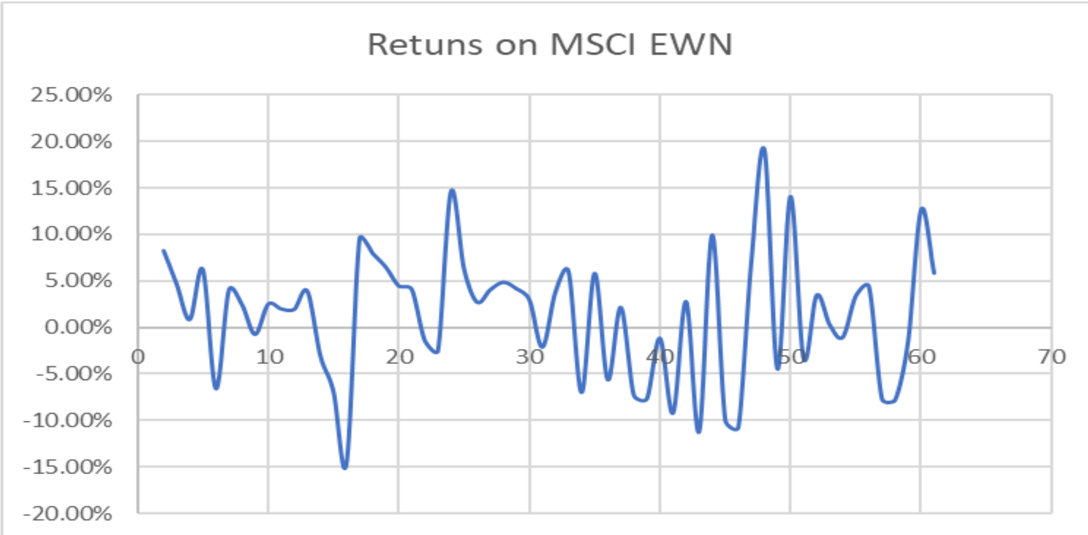
Source: Bloomberg

Exhibit 47: Netherlands ERP

Table: Risk Premium tabulation based on median analyst forecasts as model parameters

Model Parameters						
AEX	**Treasury Yield implied (10 year, long term)**		**Current Earnings Per Share**		**Terminal Growth Rate**	
822.09	3.87%		55.1025		4%	
Analyst	Forward 1 year EPS	59.91	Forward 2 year EPS	62.4139		
5-year Present Value (PV) Calculation						
	Year 1	**Year 2**		**Tv**		
PV	53.9404815	77.00491763		691.1446194		
Total Value	822.090019					
Rate of Growth (independent, IRR)	11.08%					
Inflation Diff expectation	-0.85%					
Risk Premium	8.06%					

Exhibit 48: Performance of EWN US EQUITY Returns



Source: Bloomberg

Exhibit 49: Allocations of EWN US EQUITY

Industry	Allocation (%)
Semiconductors	31.87%
Beverages	7.96%
Banks	7.65%
Internet	6.74%
Chemicals	5.26%
Commercial Services	4.90%
Media	4.55%
Insurance	4.31%
Food	4.03%
Diversified Financial Services	4.03%
Other	18.70%

Source: Bloomberg

Exhibit 50: Portfolio Weights

Securities	Weights
$IWM	5.00%
$HDB	7.00%
$INDA	7.00%
$EWN	7.00%
$MCHI	5.00%
$GLD	1.90%
$VNQ	2.00%
S&P 500	5.00%
AQR Risk Balanced Commodities Fund	9.00%
Pershing Square Holding ($PSHZF)	15.00%
$TLT	7.00%
$IEF	4.00%
$TIP	0.10%
Oaktree Strategic Credit	10.00%
$PSP	15.00%

Exhibit 51: Back testing the Portfolio

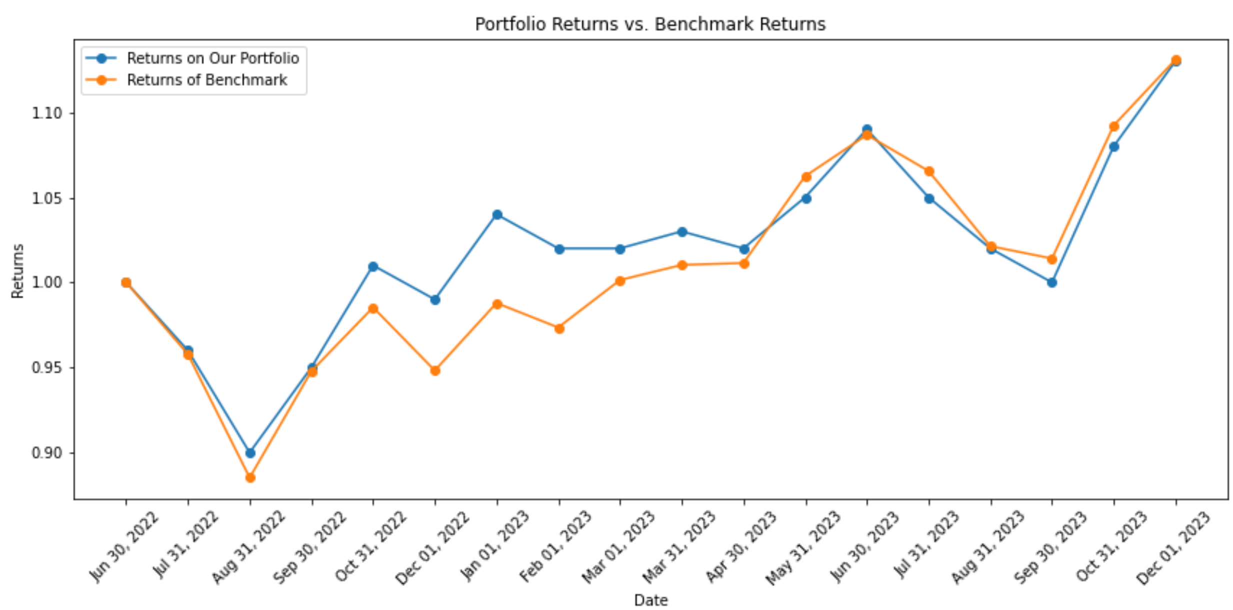


Exhibit 52: Monte Carlo Simulation MacArthur

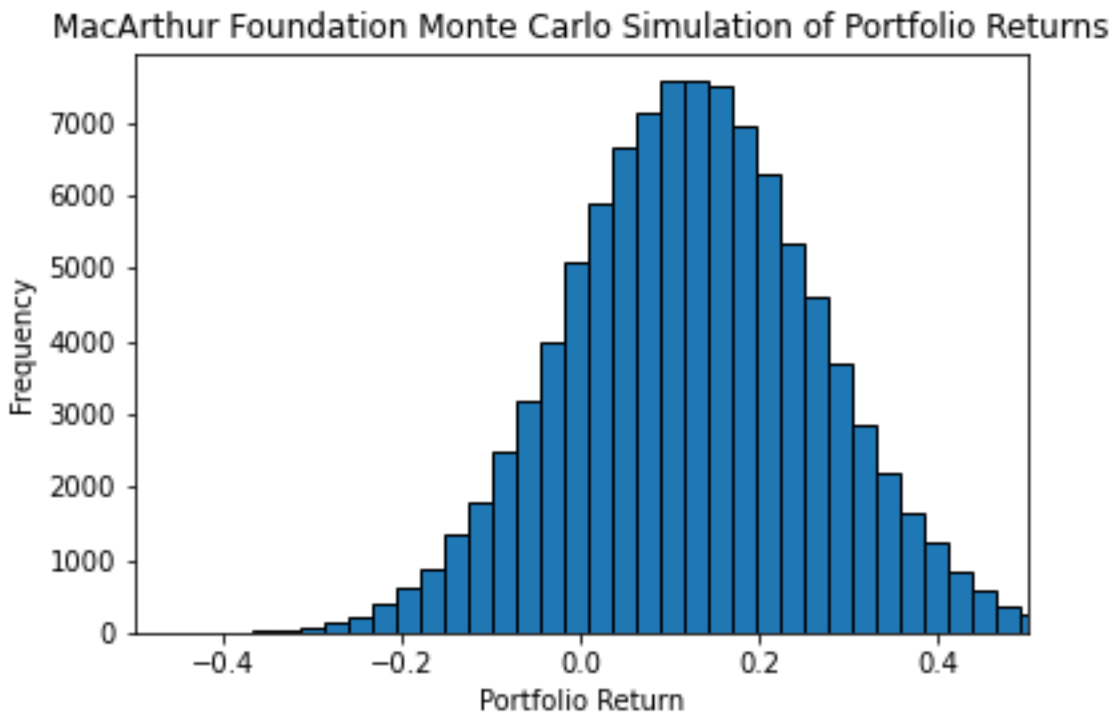


Exhibit 53: Monte Carlo Simulation MacArthur Real Values

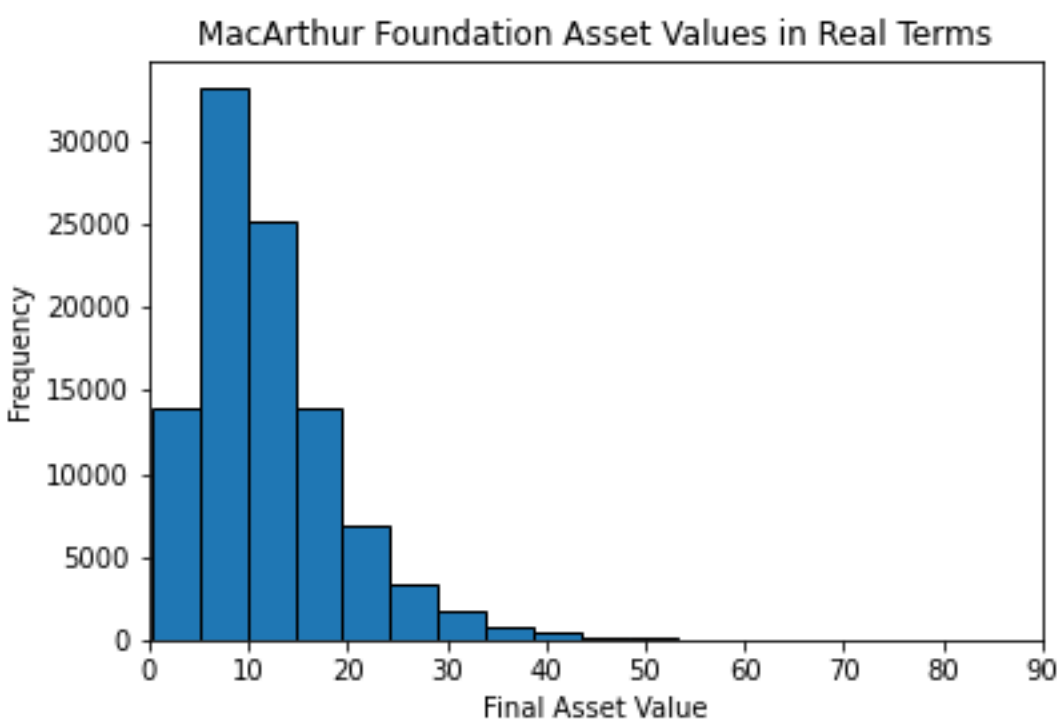
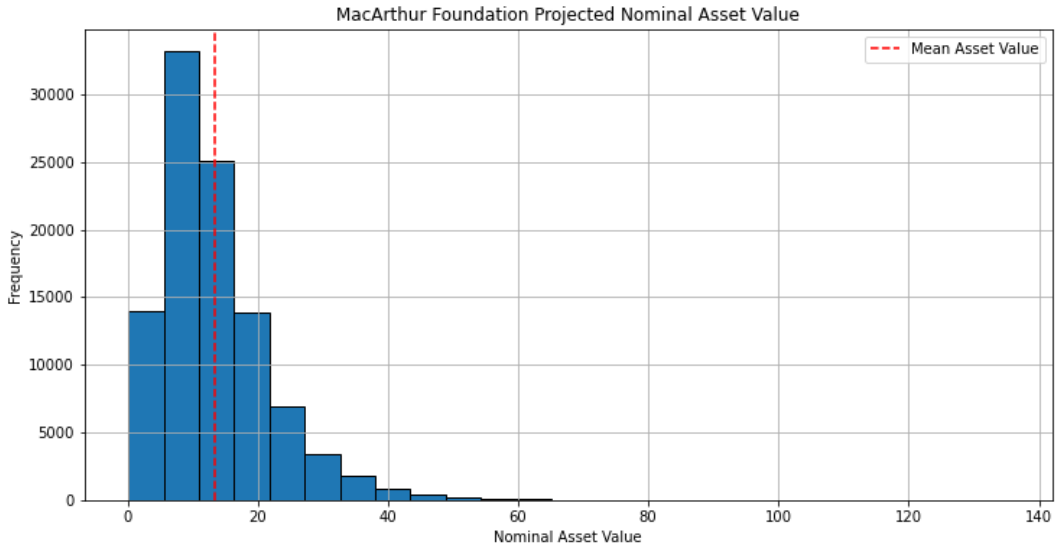


Exhibit 54: Monte Carlo Simulation MacArthur Nominal Values


MacArthur Foundation Projected Nominal Asset Value
Mean Asset Value
Frequency
30000
25000
20000
15000
10000
5000
0
0
20
40
60
80
100
120
140
Nominal Asset Value