

IMPORTANT NOTE BEFORE WE START:

My vision for the project is to find companies that are currently cheap (note that the project was submitted at the end of 2023) relative to their potential for further growth, or multipliers. Accordingly, at least some of these companies are now not at their peaks, or even at very low values. In particular, they could have been falling over the past several years. Therefore, it is normal and expected that on our tests the portfolio will show an average negative return, and will behave much worse than the index. At the same time, I still insist that this portfolio is a good one. I will give a detailed explanation of why I included each company (with links to references in some cases), as well as state my opinion about the portfolio as a whole.

One more note:

I will attach a Python notebook, which is worth looking at. There will be useful graphs, as well as all the computations. I made sure notebook itself has all the necessary comments. Hence, I will not write some details (including how certain things were calculated) here so the reader will not read the same things twice.

1

I decided to make a portfolio consisting of 10 US stocks. Since there are no bonds, and I mainly focus on blue chips and growth stocks with high volatility, a portfolio type is an aggressive type. All the required additional conditions (passively managed portfolio, no short position, no marginal trading) are met.

2

I included the following stocks in the portfolio (all of them are included in S&P 500 index):

- **Alphabet (Google):** since clouding computing segment of Google beats its competitors, and Google creates its own large language models (LLMs), it is a very promising company nowadays. Moreover, the margin of Google recently has returned to its peaks.
- **Microsoft:** company is the main investor of OpenAI. As we know, today AI is the main trend, and the future belongs to text processing and NLP. Hence, companies which are leaders in this segment are forecasted to produce a lot of value and generate high amount of profit. Microsoft also shows high rates of growth in the revenue of Azure (their own cloud computing system).
- **Pfizer:** this company has shown mixed results recently, and the company also wrote off all COVID-19 revenue from forecasts, which disappointed investors and led the company to an unusually low valuation. However, the company has a strong drug pipeline and I expect the company to be one of the growth leaders in the pharmaceutical sector in the coming years.
- **Lockheed Martin:** company is the beneficiary of international instability and world tension. It produces the most advanced equipment that is in active demand around the world and in the US, including the F-35, HIMARS systems. Analysts do not expect revenue growth in the mid run, but long-term revenue growth is not far off as the company has a high backlog and new production capacity will be gradually introduced.
- **Disney:** company is recovering from failure it experienced over the last years and covid crisis. The company is undergoing significant changes concerning top management, and an activist investor is working to improve the company's efficiency. Disney is actively developing promising areas, such as streaming segment.

- **Verizon:** company costs less than historical averages, and maintains a plateau in revenue. There is also a lead cable scandal, but I do not expect a significant effect from it. Company also has high dividend yield.
- **Paypal:** valuation of the company has reached absolute historical lows, with revenue and profit growth rates increasing. So, I expect a solid growth in the future.
- **Tyson Foods:** this is defensive sector, offering food and animal products. The company has big profitability issues. However, I believe that the bottom in margins has passed. Moreover, the company is developing a more profitable prepared food segment.
- **Dollar General:** I believe the weak results are already priced in. Nevertheless, I expect that the company will show good results going forward due to the low base effect and store network development and aggressive expansion.
- **Qualcomm:** currently it is about 30-35% cheaper than the industry average on multiples, and that is less than any of the big chip makers except Skyworks. Furthermore, Qualcomm has one of the best margins, and now it also has the best dividend yield.

If you evaluate the portfolio's historical returns over the past few years, it will underperform the S&P 500 benchmark. However, as we know, past returns are not a guaranteed result of future returns. I believe that the stocks I have selected may perform better than the S&P 500 because they are companies that have faced serious, I emphasize, temporary difficulties and that can successfully get out of them. As a result, they are expected to show high rates of return.

3

I used Python to get data directly from Yahoo finance. I downloaded data for each stock, as well as for S&P 500 index. As for risk free rate, we will assume it to be the profitability of 10-year US government bonds (currently it is equal to ~3.93%). We will assume that risk premium is 0, since we usually compare countries with the US, hence it can be either negative (if country is safer than US in terms of investments), or positive (if the opposite holds). Since we work with the US market, the risk premium is zero.

4

For the simplicity of analysis, I will make several assumptions.

Assumptions:

- There are no dividends
- There is no inflation (although it does not really matter since our benchmark is S&P 500)
- Risk free is constant (~3.93%) over time (already explained where it comes from)
- No risk premium (already explained why)
- We distribute out money equally for all assets.

Firstly, I calculated the expected return on portfolio by just comparing stock values in December 2022 with the December of 2020. It was not actually needed, but I was interested in doing so. So average rate of return turned out to be negative (around -5%), while the rate of growth of index was approximately 4%. The formula is given in the notebook. I also plotted graphs just to see how stock dynamics look like.

Then I calculated betas for each stock (just the correlation between stock prices and benchmark) and calculated expected returns using CAMP model. Note that the portfolio beta is just the average of individual betas.

5

Since the rate of growth of S&P 500 is higher than risk free, and betas are mostly positive (and even if they are negative, their magnitude is still small), the expected rate of return of portfolio (which is just the average of rates of individual stocks) turned out to be bigger than risk free (and positive). However, as stock prices were declining from December 2022 to December 2023 (on average), the actual growth rate turned out to be negative. I knew it since this is actually one of the reasons why I have chosen those stocks.

The expected rate of return was about 4%, while the actual turned out to be almost -3%.

6

CAMP was a bad estimate for our task. The reason is that while the general market trend was positive, it was not the case with our portfolio. S&P 500 grew mostly because of giant companies (e.g. Google and Microsoft), while stock values of smaller companies (second and third echelon) were declining. Moreover, the information about the negative trend of stocks was not reflected in their market betas (I will talk more about it in next paragraphs). The reason is that the correlation with the index was mostly not significant by its absolute value. Companies that decreased in their value did it partially because of their inner issues, so it had nothing to do with overall market activity. However, there was still an important factor of high interest rates, therefore, high returns on bonds, which negatively affected prices of second and third echelon. That is why CAMP is a bad model a priori for our case:

- It assumed that our portfolio will grow, as market was growing. However, our portfolio was declining, while overall market was growing because of giant companies
- Betas are not informative. Index changes because of the general trend, while our stocks were changing because of the performance of the companies themselves (at least partially).

Certainly, portfolio underperformed the market. I anticipated it because I knew that those stocks are currently valued low. And a major reason is that their prices were falling. Nevertheless, now their issues are resolved (or at least are expected to be resolved in the near future), and the trend is about to change the direction. Meanwhile, companies of growth are still presented in the portfolio. This factor (as well as news and forecasts) influenced me to make the portfolio the way it is.

I do not think that portfolio is diversified enough, as we are limited to just 10 stocks and one country (which is not sufficient). Hence, the portfolio could be better diversified by adding stocks from other sectors and countries. For example, Chinese stocks are at historically low valuations, while Russian stocks offer good dividend yields. There are also no hedging instruments or, for instance, some instruments that can show high yields (20-year bond fund as an option). Having only US equities leads to higher country risk.

Nevertheless, the portfolio consists of solid companies from different segments (IT, food, pharmacy, metals, and so on). Moreover, stocks are different in terms of their market betas. We have two companies which are highly correlated with index (Google and Microsoft); there is one company (Qualcomm) which is moderately correlated with index. At the same time, most of the

companies are either low-correlated or almost uncorrelated with index. Finally, we have two companies (Lockheed Martin and Dollar General) which are inversely correlated with S&P 500, although not significantly. In that sense, portfolio can be considered diversified given that I am limited with only 10 stocks and one country.

Sources:

Investor relations of each of the ten companies

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