Presentation

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Good morning, ladies and gentlemen, it is our pleasure to have the opportunity to address a presentation here.
自我介绍：school、name

This presentation is regarding portfolio construction.

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First, let’s go through the basic information of our portfolio.
The ingredient of our portfolio is listed on the right hand of the screen.
And the performance of our portfolio is on the left-hand side.
As you can see, the expected return of our portfolio is high with considerably low risk.
In the following sections, we would illustrate how did we select stocks, optimize portfolio and explain limitations.

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Then let’s move into the first section: stocks selection.

Our stocks selection strategy is quite straightforward: it is narrowing the range of options step by step.

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We are intended to establish a conservative portfolio. And this slide shows two types of elements of portfolio. The first element is growing stocks, which is selected by models. And the second element is large-cap stocks, selected by scenario analysis

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First, we decided to focusing on stocks in U.S. market.

Let’s briefly go through what happened worldwide.
The stock market has significant volatility in the past 2 years. Public events like the pandemic caused by

Coronavirus, and the trade war between China and the US influenced the market impressively.
And recently the market decreased due to a loss of confidence as a result of the conflict between Ukraine and Russia.
Depending on this situation, a stable market and a conservative portfolio are preferred.

That leads to the next question: Why do we think the U.S. market is a wise choice?

Firstly, it is widely known that the U.S. is the largest economy in the world, influencing the global economy. According to the measure of S&P Global, the US take account more than half of the global stock market.

Additionally, the U.S. capital markets bring together capital from all over the world and most of the world's leading companies choose to list or issue in the U.S..For example, in the UK stock market, we can easily invest in the energy or financial sectors. However, it is quite difficult to invest broadly in the information technology sector in UK since m*any of the giants in the IT are based in the U.S., it is almost impossible to construct portfolios without exposure to the US market.*

Hence, we have decided to invest in the U.S. market.

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Though we have already narrowing down the available range into U.S. market, it is still thousands of options available. To be honest, it is hard for rookies like us to figure out stocks that are worth investing in. To reduce the range, we decided to look for the stocks in S&P 500, there are three reasons behind this.

First, S&P 500 consists of 80% to 85% of the total market capitalization, which means it is large enough to cover the majority of potential stocks.

Secondly, the S&P 500 is selected on multi-dimensional criteria, a wide range of stocks with relatively stable performance is included, which indicates that the high-

quality stocks are basically in it.
Finally, its industrial composition is proper, which is informative for us.

Additionally, because the S&P500 shows a long-term stable trend, we also view it as market portfolio.

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The next step is to identify industries to invest in.

The correlation table of industry gives us some inspiration of industry choosing, since choose less correlated industries can diverse risk.

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Taking into account of the S&P’s weights of industry, the correlation table and the current hot topics, we decide to invest in industries listed on the screen.

We decide to invest most of our money in the technology industry, which shows a longer-term potential.

And health stocks make up a large part of our portfolio since the covid-19 is still influencing the world, we think medical stocks still have good prospects for growth.

Energy and Industrial are chosen because the tensions between Russia and Ukraine not only create a need for large amounts of energy and armaments, but also impact on the global energy supply chain, cause energy prices rising sharply.

Finally, we choose the financial industry because its correlation is lower compared to other industries that have not been selected.

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Then let’s move on to the next step which is selecting growing stocks.

Obviously, the target is selecting growing stocks, but this is very vague. So bring an indicator for growing stock is vital. We choose fair value as our indicator, estimated by P/B ratio.

Then the target turn into selecting high fair value stocks.

That’s lead to the first question: why we choose P/B ratio?

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First, I’d like to quote a sentence from the paper listed below. The key point is that the indicator P/B can significantly improve strategy performance.

Besides, P/B comes from balance sheet, which usually keep unchanged over a long period of time and are therefore more stable.

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Then we’d like to illustrate how we get fair value.

The first step is using a ML technology called XGBoost. In case, you are not familiar with it, we will use an example to explain it.

First, 80% of data regarding required elements obtained from yahoo finance are used to train XgBoost, XGBoost will get to know the relation between each parameter and P/B ratio, and learn to classify them, then the rest 20% data is used to test the accuracy of it. Once it is well-performed, we input the current related elements and XGBoost will classify it into different classes. As a result, top ranked stocks are moving into the next step.

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An article published by J.P Morgan list ratios that can potentially influence the P/B ratio. We take 2 of them from each class which is listed on the right hand side of the screen.

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Then we try to estimate P/B ratio.

Due to the lack of knowledge, we cannot predict P/B ratio directly. Instead, we first predict stocks’prices by stochastic simulation then calculate P/B ratio by formula.

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After predicting each stock’s P/B ratio, we then try to calculate the fair value by formula. And if the fair price of a stock is positive, we consider it as under-priced.

And the top ranked required amount of under-priced stock(s) from each industry will be selected.

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This slide showed selected stocks based on estimated fair value.(Some of them are low because the total industry have low fair value)

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Then let’s focusing on the other part of our portfolio which is large-cap stocks.

There are 3 stocks chose based on nowadays’s situation.

HII and LMT are selected because they are regarding military industry. In our opinion, due to the insecure environment, the demand for the military will rise.

PFE is chose because covid is still influential, especially in china. Recently, cronavirus is out of control in shanghai and other provinces, the drug used to cure covid made by PFE maybe highly demanded.

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After figuring out stocks to invest, the weight of each stock is needed to be determined. CAPM is used to determine the optimal portfolio which is determined by maximising the sharpe ratio which is calculated by $\frac{E[r_p]-r_f}{\sigma_p}$.

The risk free rate is 3 months treasure bond.

First, the expected return of each stock is determined by CAPM’s formula $E[r_p] = r_f + \beta_p(E[r_m] - r_f)$. The risk free rate is 3 months U.S. treasure bond.

Then based on historical monthly returns, we draw this correlation table, and input it along with expected return, risk averse 3 and borrow rate 3.5% into Matlab, it will help us figure out the optimal portfolio.

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This slide show the result of our portfolio, as you can see, all the weights has been listed, and the Sharpe ratio after optimisation is 2.97

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In this page we show the performance summary of our portfolio.

Value at risk (VaR) measures the size of a loss at a given confidence level.

A 5% VaR of -5.1% can be seen as the expected portfolio return is greater than -5.1% 95% of the time. Value at risk can be calculated directly from historical returns at a given percentile, or analytically from the mean and standard deviation of returns.
Conditional Value at Risk (CVaR) measures the size of the expected loss once a specific Value at Risk (VaR) breakpoint is breached, i.e. by being at and above VaR.

The picture on the right-hand side compared our portfolio with vanguard 500, as you can see our portfolio growth quicker than vanguard 500.

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The next section is the limitations.

The first limitation is we did not consider stocks out of S&P 500. Maybe there are some stocks able to provide abnormal return outside of S&P 500.

The second limitation is that CAPM is not a perfect model. For example, CAPM is capital pricing model, not a stock pricing model. CAPM’s assumption is not realistic, like every investor have homogeneous expectation and can borrow money at same rate.

The third limitation is regarding models. Some limitations like computational inaccuracy and the standard deviation of the prediction cannot be avoid. And the amount of parameters is not sufficient.

The next limitation is selection of large-cap stocks is very subjective.

The last limitation is Currency

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Thanks for your time.